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Essays in Indian Corporate Finance

K.V.S. Vinay

Thesis submitted to the Indian Statistical Institute in
partial fulfilment of the requirements for the award of
the degree of Doctor of Philosophy

April 2001



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Thesis Supervisor: **Professor Shubhashis Gangopadhyay**

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Chapter 1

Introduction

1.1 Introduction

This thesis comprises of three essays in corporate finance focusing on the Indian economy. The first essay contains a theoretical model while the second and the third essays are empirical exercises. In the subsequent paragraphs of this section, we examine the broader issues to which the contents of the thesis contribute.

The past few years have seen rising interest in studies of financial institutions and corporate financial policies in countries other than the United States. One of the reasons for such a shift in attention is the diversity in the size and structure of financial arrangements all over the world. There are significant differences in methods of raising finance for corporate investment and in the institutional mechanisms that ensure the proper return to the suppliers of finance. As a result, there is a fast growing literature on cross-country comparisons as also on studying specific economies and issues

peculiar to them. While the former have the advantage of a broad coverage and rich comparative results, the sheer breadth required of such work makes them gloss over the (possibly interesting) differences between various countries. Individual country studies help fill up this gap by focusing on issues particular to an economy. They attempt to highlight the differences that get obfuscated in the cross-country studies or examine the impact of institutional changes in individual countries.

The three essays in this dissertation fall in the latter category with the focus on one developing economy — India. India has an established stock market with the largest number of listed firms. However, the institutional setup is characterized by high degree of governmental intervention. In 1991, the government undertook a programme of economic and financial liberalization. This has resulted in a number of important measures being implemented in various sectors economy. Vis-a-vis financing and governance of the corporate sector, important measures include allowing foreign majority ownership, tighter disclosure norms and regulations regarding insider trading and takeovers.¹ Such a state of transition with frequent institutional changes makes the study of the Indian corporate finance an interesting area. The first essay in the dissertation is in the area of law and finance. We examine a specific legal institution relating to the way firms could be taken over. The second essay looks at the impact of inside ownership on corporate value. This is closely connected to the issues addressed in the law and finance literature. The final essay examines the impact of credit rating information

¹For a comprehensive account of the reforms and their impact on the corporate sector. see Varma [76].

on the stock market investors.

Recent cross country work has established the importance of the legal institutions and their enforcement in explaining differences in important features of capital markets across the world. La Porta et. al [41] demonstrate that the nature and effectiveness of the financial system across countries is a function of investor protection against expropriation by insiders. They further show that in countries with poor investor protection laws even the largest corporations have controlling shareholders who are capable of expropriation.²

Our first essay focuses one particular method of increasing stake in a firm. This is called a *preferential allotment* of equity. Described as “legally sanctioned price rigging”³, the use of this method became a topic of debate in the early nineties when a number of foreign multinational corporations used this method to acquire majority stakes in and control of their Indian subsidiaries. It was widely regarded as being detrimental to the interests of the small outside shareholders. We examine how this method worked and why it was chosen over other methods by multinationals.

In their survey on corporate governance Shleifer and Vishny [67] emphasize that the existing ownership structure are a response to domestic legal environments that the companies operate in. They point out that corporate governance mechanisms across the world involve some combination of legal protection from expropriation (particularly to small investors) and ownership by large investors. Since the rational investors take the effectiveness of

²See La Porta et.al [42].

³Khanna and Palepu [39]

these mechanisms into account, ownership arrangements affect the value of the firm.

In the second essay we examine how ownership structure affects corporate value. In particular, we examine the relation between inside ownership and corporate value. We obtain a relationship that is dissimilar to the relation in the U.S., our benchmark for comparison. A non monotonic relation between inside ownership and firm value is observed in the United States. Various studies have on the United States have reported that higher inside ownership has a negative impact on firm value over certain range and positive impact over the other ranges of inside ownership (For example, see Morck et al [52]). Inside ownership refers to the shares held by the party that has control over decision making in the firm. What this exactly constitutes in the Indian context is a question addressed at length in the chapter. We conjecture and obtain a positive monotonic relation for India. We argue that this difference is an outcome of the differing effectiveness of institutions related to corporate governance in the two economies.

Our final essay is concerned more directly with the stock market's valuation of information. Rational investors incorporate new information that is expected to affect future cash flow into their valuation of the firm. We conduct an event study to examine whether the downgrading of firms' debt issue by credit rating agencies causes any abnormal price reactions. A developing economy like India is characterized by poor disclosure norms. Information acquisition is a costly process, especially for small investors. Though concerned with the probability of a firm defaulting on its debt, the credit rating agencies form one potential source of information for the stock market. They

communicate actively with the firms during the rating process and spend considerable resources in tracking a firm once it has been rated. Thus, it is possible that the rating change announcements contain information that is not known to the stock market. We examine whether that was the case in recent times in India. We do not find any significant abnormal reaction to announcement of the downgrades. We examine possible reasons for the absence of the reaction.

The remaining part of the chapter consists of summarized versions each of the essays separately.

1.2 Essay 1: Preferential Allotment and Share Value

As a part of the liberalization programme started in 1991, the Indian government allowed foreign corporate entities to hold majority stake (as opposed to an earlier ceiling of 40%) in Indian firms. An empirically observed fact is that most of these hikes took place via issue of *new equity shares* exclusively to the foreign partner. This is called a *preferential allotment* of equity. A preferential allotment was only one of the allowed methods of takeover. Yet, it was the most popular method. Were there any economic reasons that explain the observed preponderance of this method? In this essay, we examine the impact of using this method and compare it with other methods of hiking stake- a tender offer and a block purchase. We explain the observed preponderance of this method and examine whether the method added value

for domestic shareholders.⁴

A preferential allotment involves issue of new shares at a predetermined price subject to the approval of a majority of the current shareholders. The amount paid by the allottee goes into expanding the equity base of the firm. The *distinguishing feature* of a preferential allotment as opposed to a tender offer or a block trade is that the present shareholders continue to remain shareholders in the firm even after the allottee (in this case the foreign partner) acquires a majority. By contrast, in a tender offer or a block trade some (or all) of the current shareholders sell their shares. Thus, in a preferential allotment the allottee raises its stake by diluting the current shareholders' voting power even as they continue as part owners of the firm.

The pricing rule for a preferential allotment has been a subject of considerable attention. Between August, 1991 and August, 1992, the price was fixed by the erstwhile Controller of Capital Issues and was equal to the average price of the past six months. Subsequently, it was declared that allotment could be made at any price determined by the shareholders in the special resolution ratifying the allotment. This rule is much debated and is central to the paper. Since August 4, 1994, the government has reverted to a modified version of the previous pricing formula for preferential allotments. We focus on the law in the intermediate period, a period when foreign partners in a large number of well known firms used the preferential allotment route to acquire majority stakes.

⁴These are not independent issues. The multinational chooses the method it proposes to the government, which is determined by the comparison of its own payoffs across the different modes of enhancing its stake in the firm.

We model a scenario where a foreign minority partner wishes to acquire a *majority stake* in (and subsequent control of) the firm. There is a government imposed restriction on the maximum stake the foreign partner can acquire. The change in control is assumed to enhance firm value. The effect of using a preferential allotment on the payoff to the shareholders is examined first. We show that under a variety of equity ownership structures a preferential allotment *does not* lead to a rise in the payoff to the outside shareholders. Subsequently we show that whenever available, the foreign partner will at least weakly prefer a preferential allotment to a tender offer or a block purchase. What the preferential allotment essentially does is to eliminate the free rider problem that arises in the presence of dispersed shareholders.⁵

The key difference between various ownership structures examined in this essay is presence (or absence) of a pivotal domestic insider. The multinational can discriminate between this insider and other domestic shareholders by using transfers. In real life, these transfers are not necessarily pecuniary in nature. They can take the form of various private benefits. We show that in the presence of a pivotal insider, the multinational strictly prefers the use of a preferential allotment to a block purchase or a tender offer. In this case, the multinational prefers to give as high a transfer as is possible and the multinational and the insider gain at the expense of the outside shareholders.

In the absence of the pivotal insider, transfers cannot be used. However, in the preferential allotment may still be preferred in some circumstances. If there is a pivotal outside blockholder, the multinational has is indifferent between the preferential allotment and a tender offer. In the presence of

⁵the free rider problem was first discussed by Grossman and Hart [25].

dispersed domestic shareholders, the preferential allotment is preferred.

The main empirical implication is that takeovers using preferential allotments will not lead to an increase in the payoff of outside shareholders even if the change in control leads to a rise cash flow.

1.3 Essay 2: Inside Ownership and Corporate Value

The relation between inside ownership and firm value in the context of the Indian corporate sector is examined in this chapter. Inside ownership refers to the shares held by the party that controls the firm. The controlling interests of the firm could be vested in an individual or in a group of people or firms, which as affiliated to a business group operated by a family. India is an economy where examples of all the above types can be found.

Separation of the ownership and control of a firm and its consequences were first discussed by Berle and Means [5]. One of the consequences is that the party controlling the firm may maximize its own benefit at the expense of shareholder value. The controlling party's welfare is a function of the cash flows it obtains as a shareholder and private benefits of control. Based on the above premise, a strand of literature starting with Jensen and Meckling [34] has examined how the ownership of the firm's stock by the controlling party, an individual or a group, affects the value of the firm. It is now widely accepted that the actual relation between inside holding and value of the firm depends on the relative strength of the *convergence of interest* effect and the *entrenchment effect*. The former implies a positive relation between



inside ownership and performance and the latter a negative one whenever it is in operation.

The convergence of interest effect was first analyzed by Jensen and Meckling [34]. The insider - manager's payoff from managing a firm has two components - cash flows and private benefits. At the margin, higher percentage of inside equity holding increases the cost of an addition dollar of perquisites in terms of cash flow. Thus, higher percentage of equity holding aligns the interests of the management with more closely with that of other shareholders. This effect implies a positive relation between inside ownership and firm value. Entrenchment refers to the insider-manager's attempts to thwart challenges to its own incumbency in the firm. It has been examined theoretically by Stulz [69]. In the presence of an active corporate control market, acquiring higher stakes facilitates entrenchment by reducing the chances of a takeover. If this effect dominates the convergence of interest effect, one might expect firm value to decrease with inside ownership over some ranges.

Empirically, a non monotonic relationship was obtained for the U.S. economy by Morck, Shleifer and Vishny [52] and subsequently replicated by others like Cho [12] and McConnell and Servaes [47]. A recent paper by Sarkar and Sarkar [64] using Indian data is related to the work presented in this essay. They also show a non monotonic relation between inside ownership and firm value.

We suggest that the operation of the entrenchment effect in India is limited due to the following institutional features:

(a) *Low threat of hostile takeovers:* Till very recently (February 1997) a

takeover code was not in place. While 193 acquisitions have occurred between 1993 and 1997, there is scant evidence of any of these being hostile. There is also no evidence of management turnover.

(b) *A thin and illiquid stock market:* A liquid stock market can abet the value enhancing corporate control activity. It can also help the outside monitors like institutional shareholders monitor better. Despite the large number of stocks listed on the Bombay Stock Exchange, very few of them are liquid.

(c) *Interlocking directorships and crossholding of equity:* The directors of various firms sit on each other's boards. Besides firms hold each other's equity.

(d) *Weak and inflexible managerial labour market:* Competition among managers can ensure that they do not deviate from the goal of shareholder value maximization (Fama [19]). However, there is a general scarcity of professional managerial talent. Founding families who face little threat to their tenure generally provides managerial input.

These features imply that the incumbent management in India is already entrenched. Thus, it has little incentive to amass higher stake solely for entrenchment purposes. However, the convergence of interest effect continues to operate. Given these premises, we hypothesize a *monotonic positive relation* between inside ownership and firm value in the Indian corporate sector.⁶

We examine the relation in the Indian context using a sample of 1594

⁶The point is worth emphasizing. We are not saying that the entrenchment as a phenomenon is absent in India. We argue that weak disciplinary devices imply Indian managers can get easily entrenched even with low stakes. In particular, a weak corporate control market implies that they need not hold significant share of the firm to lower the already low probability of a hostile takeover.

publicly traded Indian firms for the financial year 1996-97. Unlike earlier literature, we report a *monotonic positive relation* between inside ownership and firm value, measured by the ratio of market value to book value of equity. Following much of the literature in this area, we use the piecewise linear specification to examine the possibility of a negative relation between inside ownership and firm value over some range of inside ownership.

One major contribution of our work lies in pointing out that while examining Indian data, the use of a single definition of inside ownership could be misleading. There is a dichotomy among the Indian firms based on whether or not they are affiliated to a business group. The composition of inside ownership for these two subsets is intrinsically different. In case of group firms inside ownership includes stakes held by other firms belonging to the same business groups. Our sample consists of both group affiliated firms and stand alone firms. The presence of a non monotonic relation is examined using the piecewise linear specification. The combined sample does reveal a non monotonic relation between inside ownership and firm value.

We examine the components of inside ownership separately group and non group firms to examine whether there is any difference in the relation across the two sets of firms. The splitting up of the sample between group and stand alone firms does not change the result of a monotonic positive relation between inside ownership and firm value. We also argue that the issue of inside ownership and firm value can be examined meaningfully only for stand alone firms. Given the form in which data is available to us, obtaining precise estimates of inside ownership for group firms is an infeasible task. Our essay demonstrates the how differences in institutions can result in difference in

observed relationships between ownership and firm value across economies.

In examining the ownership-value relationship, we use a number of control variables. One of them is a measure of liquidity of the stock. This variable finds a place since liquidity is an important issue in the study of emerging stock markets. We find a non monotonic relation between liquidity and firm values and conjecture possible reasons for observing this relation.

We conduct further tests to ascertain that our results are robust to the presence of outliers and are stable over time.

Combined with the previous essay, this exercise demonstrates two facets of the weak governance system that Indian firms face. This essay demonstrates the entrenched nature of the insiders, which is a function of the institutional features. Preferential allotments provide an example of the methods entrenched insiders can use to the detriment of the minority shareholders.

1.4 Essay 3: Information Content of Credit Rating Changes

This essay analyses the stock price reaction of Indian firms when their debt issues are downgraded. It consists of an event study around 54 announcements of downgrades of debt issues of 47 Indian firms between March 1, 1997 and December 31, 1998. There are two sets of questions that we need to address:

- (a) what can we hypothesize about the impact of credit rating, an opinion on the firm's debt issue, on stock returns? and
- (b) what specific issues do we need to consider such an event study with

Indian data?

Conducting event studies around credit rating changes is an established area of research.⁷ These studies are motivated by two main reasons. First, there has been considerable debate about the inability of rating agencies to predict default. The issue is here whether or not the agencies are too late in responding to the company's changing fortunes and thus serve the purpose of their existence. Second, information acquisition is a costly proposition for shareholders, especially if they are small and dispersed. The credit rating agencies spend considerable time and resources in studying the firms whose issues they rate and track them subsequently. It is possible that the announced rating changes may be conveying new information. Thus, the issue being asked here is whether the ratings change contains information not known to the investors (or they aggregate and infer from the publicly available information more skillfully than the individual investors). The latter issue attains greater importance in the a developing economy like India where the lack of institutional development makes information acquisition costly for stock market investors.

Credit rating is a relatively recent phenomenon in India. The first agency began in 1987 and at present there are three major players in this industry.⁸ There are two salient differences between the operating environment of Indian agencies and those operating in the U.S., the economy with the oldest rating

⁷Pinches and Singelton [58] were among the first to examine the impact of rating changes on stock returns. See Kliger and Sarig [40] for a recent and innovative treatment of the issue.

⁸A comprehensive set of regulations regarding credit rating agencies was formulated only as recently as July, 1999.

industry. In the U.S. the agencies can voluntarily rate firms while in India, the agencies rate only those firms that go to the agency for getting rated. Another difference is that the agencies were under contract to reveal only those ratings that were accepted by the firms. These factors put together create an incentive for overstatement of the firms creditworthiness by the agencies.⁹

Any new information that is expected to affect the firm value will be incorporated into the stock price. The event study methodology attempts to detect, measure and explain the such changes. The “canonical” event study, surveyed elegantly by Mackinlay [44], uses a test statistic constructed under a set of assumptions.¹⁰ Three of those assumptions germane to our exercise are

- (1) The date on which the new information reaches the market is known precisely.
- (2) Event windows of various firms in the sample do not overlap. This is called “no clustering” in the literature.
- (3) Asset returns are multivariate normally distributed.

A branch of the event study literature examines the appropriateness of using the standard test statistics and techniques when some of the assumptions are violated. Abnormal returns are simulated on random samples of actual daily return data. The power of various test statistics to detect these abnormal returns is examined.¹¹ Since relatively little is known about the

⁹This is no longer true under the new regulations. However, the above differences are valid for the period studied in this essay.

¹⁰Chapter 4 contains a detailed exposition of the canonical method.

¹¹For example see Brown and Warner [8], [9].

statistical properties of the Indian data, our modus operandi is to examine the significance of the abnormal returns using a variety of techniques in event study literature.

Lee and Varela [43] conclude that in the presence of event date uncertainty and a clustered sample (conditions similar to our sample), the test statistic constructed using the ordinary least squares method performs the best. In the specific context of rating changes, Holthausen and Leftwich [30] use a test statistic that explicitly accounts for cross correlation among the returns stream of various firms.¹²

The above test statistics are based on the assumption of normality of returns. Brown and Warner [9] have pointed out that despite non normality in daily return data, standard parametric tests perform well in their studies. Since there is no corresponding analysis with Indian data, we also examine the abnormal returns using a nonparametric test. A modification of the nonparametric rank test has been put forth by Corrado [14] for a one day event window. We use the extension of this statistic to longer event windows proposed by Cowan [15].

Using all these test statistics, we find no abnormal stock price reaction to rating changes. This could be a result of:

- (a) other concurrent happenings that confound the effect of the downgrade itself.
- (b) the fact that agencies could were allowed to publish only the ratings of acceptable to the firms.
- (c) some structural features of the stock market that render stock prices

¹²Clustering induces cross correlation among the returns stream of various firms.

insensitive to company specific news.

(d) the information on which the downgrade is based being already available to the stock market.

We conclude that the absence of reaction is most probably due to the fact that much of the information on which the downgrading decision is based was already in the public domain. Casual evidence suggests that the rating quality of at least the leading rating agency was not very different from international standards and that the period under consideration saw downgrades occurring because of deteriorating balance sheets of the firms.¹³

¹³See Raghunathan and Varma [60], Varma [76].

Chapter 2

Preferential Allotment and Share Value

2.1 Introduction

In a number of developing countries foreign investors face government imposed restrictions on ownership of shares. Such restrictions are eased (often partially) during the process of economic and financial liberalization. One such case is India where foreign equity participation norms have been eased since 1991. Foreign corporate entities, previously facing a ceiling of 40% are now allowed to hold majority stakes (even up to 100%) in Indian firms subject to government approval. An empirically observed fact is that most of the hikes in share of foreign equity have occurred via issue of *new equity shares* to the foreign partner. This is commonly referred to as a *preferential allotment* of equity.

The popularity of this method and the controversy surrounding it has

been noted by research and media literature on Indian corporate finance. Khanna and Palepu [39] describe the preferential allotments of 1993-94 as “legally sanctioned price rigging” (pp. 270). Varma [75] discusses the active use of preferential allotments by multinational corporations to hike stakes in their Indian subsidiaries at steep discounts to the market price (pp. 7-8) and the challenges faced by regulators in the context of modifying this procedure. As an example of media attention to preferential allotments, see *The Economic Times* dated August 28, 1995 [74]. In contrast, to the best of our knowledge, there were no instances of other allowed methods, namely tender offers or block purchases, to hike stakes in the early days of liberalization.

The implications of using a preferential allotment in order to acquire control are explored in this essay. By doing so we wish to

- (a) explain the observed preponderance of preferential allotments and
- (b) examine whether or not such preferential allotments added value for the domestic shareholders.

A preferential allotment involves issue of new shares at a predetermined price subject to the approval of a majority of current shareholders. The amount paid by the allottee goes into expanding the equity base of the firm. The *distinguishing feature* of a preferential allotment as opposed to a tender offer or a block trade — the other standard methods used to acquire shares — is that the present shareholders continue to remain shareholders in the firm even after the allottee (in this case the foreign partner) acquires a majority. By contrast, in a tender offer or a block trade some of the current shareholders sell their shares. Thus, in a preferential allotment the allottee raises its stake

by diluting the current shareholders' voting power even as they continue as part owners of the firm.

We model a scenario where a foreign minority partner wishes to acquire a *majority stake* in (and subsequent control of) the firm. There is a government imposed restriction on the maximum stake the foreign partner can acquire. The effect of using a preferential allotment on the payoff to the shareholders is examined first. We shall show that under a variety of equity ownership structures a preferential allotment *does not* lead to a rise in the payoff to the outside shareholders. Subsequently we show that whenever available, the foreign partner will at least weakly prefer a preferential allotment to a tender offer or a block purchase.

The impact of foreign equity restrictions has been analyzed in various contexts in the economics and finance literature.¹ While this restriction is important in this essay, our focus is on value creation and its distribution among various shareholders. In this context it is important to mention the work of Fröhls, Keown, McNabb and Martin [20]. They study the stock market price reaction to announcements of international joint ventures involving U.S. firms. They conclude that international joint ventures create wealth for the U.S. firm's shareholders when the joint venture partner is from an emerging economy. The issue we address is a mirror image of this. Our focus is on the impact on the domestic shareholders in the emerging economy.

While the impact of acquisition of majority by the foreign partner (or

¹For example, Eun and Janakiramanan [17] examine the impact of an equity cap on pricing of shares. Contractor [13] provides international evidence showing that easing of restrictions on foreign equity lead to a decrease in subsidiaries where the U.S. multinational has a minority and in 50-50 affiliates as a proportion of all U.S. affiliates in a country.

more generally a manager/insider) is far from clear, the distribution of created value is also an important issue.² The distribution of value among the shareholders depends on the method by which the acquisition of stake is affected. A *tender offer* with all domestic shareholders being atomistic can give rise to the free rider problem discussed by Grossman and Hart [25]. A tender offer, however, succeeds in the presence of a large shareholder who gains from the takeover after incurring the takeover costs and compensating the shareholders who tender their shares (Shleifer and Vishny [66]). The *key* point to be noted is that in a tender offer any value created in the process gets distributed evenly among *ex ante* shareholders of the firm either as tender price or as capital gains.³ Another mode of acquiring higher stakes that has been examined fairly extensively is the *purchase of block(s) of equity*.⁴ In a block purchase the seller of the block may be sufficiently large. In such a situation the division of the created surplus between the buyer and the seller of the block depends on the relative bargaining power of the two parties. Any benefits accruing to the remaining fringe shareholders is via capital gains.

In contrast to the above described methods we shall show that using the preferential allotment gives the stake acquiring party an opportunity to corner all the benefits from the hike in their stake. This happens because the preferential allotment method eliminates the free rider problem. Recall

²Jensen and Meckling [34], Morck Shleifer and Vishny [52], Stulz [69] and McConnell and Servaes [47] discuss the relation between ownership and value. For a more detailed discussion see Shleifer and Vishny [67].

³The latter is, of course, assuming that non tendering shareholders are not excluded from participating in the gains.

⁴For example see Barclay and Holderness [3], Wruck [80].

that a share is a bundle of cash flow rights and voting rights. While the other methods make the tendering shareholders give up the whole bundle, preferential allotment involves their exercising the voting right alone. Since he *continues* to remain a shareholder even after the multinational has hiked its stake, a domestic shareholder approves a preferential allotment as long as he is no worse off after it. This point will become clearer when we analyze the model formally.

The acquisition of stakes by blockholders need not necessarily imply a rise in firm value. It has been pointed out that large shareholders represent their own interests that may not necessarily coincide with the interest of the other shareholders. The large shareholder may accumulate votes and maximize its own welfare at the expense of others. There is some evidence on this from other countries. Barclay and Holderness [3] report that sales of blocks of shares in the U.S. stock market trade at a significant premium over the prevailing market price and interpret this as a reflection of the existence of benefits from holding blocks of shares. Wruck [80] shows that stock price reaction to private sales of equity is significantly negative when the buyer of the block is known to be aligned with the management.

Value created by managers holding higher stakes in the firm should show up in the firm's performance. Kaplan [35] examines the value created in management buyouts in the U.S. There was significant improvement in the operating performance of the firms after the management bought up the outstanding equity. Banerjee, Leleux and Vermaelen [1] question the ability of holding companies in France to add value to the firms in which they purchase stakes. In our case since the large shareholder is a multinational

firm the potential for divergence between two groups of shareholders is high. The foreign partner could indulge in transfer pricing or vote out the better projects into a wholly owned subsidiary.⁵ In our model we allow for cash flow changes in the firm and for private benefits to the party acquiring control.

The rest of the essay is organized as follows. Section 2.2 outlines the institutional structure under which preferential allotments to foreign partners are approved in India. Section 2.3 gives a flavour of the problem and an example specifying the way it has been modelled. The model is presented in section 2.4. In section 2.5 we relax an assumption made in the previous sections about the equity holding restriction and re-examine the results. Section 2.6 discusses the empirical implications of the model. Section 2.7 concludes the essay.

2.2 Indian Institutional Structure

The Indian government eased the foreign equity participation norms as a part of the new industrial policy introduced in July, 1991. The guidelines for raising foreign stakes in existing Indian companies were first announced on 19 November, 1991 and were subsequently revised twice.⁶ Since 1991, foreign firms have been allowed to hold 51 percent or even higher stakes in Indian

⁵The Economic Times of July 17, 1995 reports that a number of multinationals were in the process of establishment of wholly owned subsidiaries to expand business. The already established subsidiaries were being kept out of new activity and in some cases some of the more profitable projects were being voted out from the subsidiary into the wholly owned ones.

⁶See Press note no. 17 of 1991 of the Ministry of Industry, Press note no. 13 of 1992 of the Ministry of Industry and Press note no. 2 of 1994 of the Ministry of Industry.

companies as opposed to the earlier limit of 40 percent. There are two apex bodies involved in the approval of foreign equity hikes- the Reserve Bank of India (RBI) and the Foreign Investment Promotion Board (FIPB). The RBI provides "automatic approval" to two categories of firms that wish to raise foreign equity up to 51 percent:

(i) firms primarily engaged in a set of industries specified as *high priority* by the Industry Ministry, and

(ii) firms not primarily engaged in the high priority areas but wishing to expand by undertaking projects in one of the high priority sectors.

In either case, the increase in equity level must result from an expansion of the equity base of the company. In other words, a preferential allotment has to be made to the foreign entity and the money paid by the allottee comes into the firm as new equity investment. All other proposals that include preferential allotments in non-high priority areas or foreign equity hikes to above 51 percent or use methods in which the hike in stake is affected by acquisition of existing shares have to seek FIPB approval. The procedure for seeking an approval of a preferential allotment is similar irrespective of which of the two apex bodies is the concerned authority. Prior to approaching the RBI or the FIPB, the firm has to get the approval of the current shareholders through a special resolution under the Indian Companies Act (1956). This means seeking approval for the proposal of issuing a specified number of new shares to the foreign partner at a predetermined price. The resolution is passed if *at least 75 percent of the shareholders present in the meeting vote in favour of the resolution*. Having sought the shareholders' approval, the firm has to submit to the RBI or the FIPB a detailed proposal mentioning the

number of shares, the price per share, the change in equity level affected by the allotment and proof of the shareholders' approval. The RBI/FIPB has discretionary power to approve the proposal.

The pricing rule for a preferential allotment has been a subject of considerable attention. Between August, 1991 and August, 1992, the price was fixed by the erstwhile Controller of Capital Issues and was equal to the average price of the past six months. Subsequently, it was declared that allotment could be made at any price determined by the shareholders in the special resolution ratifying the allotment. This rule is much debated and is central to the essay. Since August 4, 1994, the government has reverted to a modified version of the previous pricing formula for preferential allotments. We will focus on the law in the intermediate period, a period when foreign partners in a large number of well known firms used the preferential allotment route to acquire majority stakes.

A note on the rights of minority shareholders is in order. The Securities and Exchange Board of India lists two types of rights for minority shareholders - rights as an individual and rights as a collective body. The former include the right to vote personally or through proxies, apply for winding up and receiving residual proceeds. As a group, shareholders having support of 10% or more of the stock can call an extraordinary general body meeting, can complain to company law board about oppression/mismanagement and can demand vote on any resolution.

However, the effectiveness of these rights is questionable. There have been relatively few (and very recent) instances of investor activism in shareholder meetings. Investor associations are in their infancy and they have no repre-

sentation in the company board at this point. Besides slow and costly legal procedures make it difficult to implement even the existing rights effectively

2.3 An Example

In this section we discuss the impact of using preferential allotment on shareholder value using an example. We provide a flavour of the way a preferential allotment differs from some other more standard methods of stake acquisition. It is useful to remember that a share is a bundle of cash flow rights and voting rights. In a tender offer or a block sale, the tendering shareholder *gives up* these rights for a high enough price. By contrast a preferential allotment involves *exercising the voting right*. We proceed further with the help of a stylized example.

Suppose the current cash flow of a given firm is 100. The firm currently has 100 outstanding shares so that the market value of each share is one. The foreign partner (M) currently has 30 of these shares.⁷ It is allowed a maximum proportion of 0.5 in the firm and that is all it requires to acquire control. This change in control enhances the cash flow of the firm to 110. Additionally M derives private benefits of control worth 25. Assume that all domestic shareholders are small and hold one share each. Suppose M announces a tender offer for 20 percent of the shares with the condition that all extra shares will be returned on a prorata basis. The outcome here will be similar to the one described in Shleifer and Vishny [66]. The takeover will

⁷M is a mnemonic for multinational, often used interchangeably with the foreign partner in common parlance in India.

go through if M pays the tendering shareholders 1.1 and it will gain on its existing shares.

Now consider the following alternative. M proposes that the shareholders approve a preferential issue of 40 new shares to it so that M acquires 50% stake in the firm.⁸ For each of these shares it pays a price π and the whole amount goes into expanding the firm's equity base. A representative shareholder continues to remain a shareholder in the firm even after the preferential allotment goes through. This being the case, he approves the preferential allotment if he is no worse off by it, i.e., he continues to get at least 1 even after the preferential allotment goes through.

This is not the only equilibrium. However, it is the most plausible equilibrium. Multiple equilibria are a common feature of voting games. We assume a small amount of noise so that each voter could be pivotal with a small probability. In such a case the equilibrium described here is unique.⁹

In this case the minimum price π that M has to pay will be such that the payoff to the small shareholder is still 1. The value of the firm will be $[110+40\pi]$. The latter term is the value added by the expansion of the equity base of the firm due to the preferential allotment. Since the number of shares is 140, the minimum price that M needs to pay is such that

$$\frac{1}{140}[110 + 40\pi] = 1$$

or

$$\pi = \frac{3}{4} = 0.75$$

⁸It will own 70 of the 140 outstanding shares of the firm if the proposal is approved.

⁹In other words, we assume that no voter uses *weakly dominated voting strategies*. This is a standard assumption in the voting literature, e.g., see Besley and Coate [7].

Under a preferential allotment the benefits of higher cash flows do not get passed on to the outside shareholders.

The net gains, to M, from the two methods above are compared in Table 2.1. When M acquires control, there are two sources of increase in its payoffs — increase in the value of its stock and private benefits. The level of private benefits (equal to 25 in our example) is independent of the method of acquiring control. Thus, we focus on the change in the value of M's stock. At the end of a successful tender offer, M holds 50 shares, each worth 1.1, and the aggregate value is 55. It spends 22 of this in buying up the tendered shares to acquire control. However, each of the 30 old shares is now worth 1.1 now. Thus, the net appreciation in the value of M's stock (which occurs only on the old shares) is three.

Table 2.1: Comparison of Alternate Methods

Method	Value of M's Stock		Expenditure Incurred (3)	Net Gain (2) - (1) - (3)
	Before (1)	After (2)		
<hr/>				
Tender				
Offer	30	55	22	3
<hr/>				
Preferential				
Allotment	30	70	30	10
<hr/>				

Let us now examine what happens in a preferential allotment. After a preferential allotment, M holds 70 shares in the firm. Each of these shares is valued at one. Thus, there is no appreciation in the value of its old shares. The 40 new shares are also valued at one. However, M has acquired them by paying only 0.75 per share or an aggregate cost of 30. Thus, under a

preferential allotment, M's stock appreciates by 10.¹⁰ Thus, M will choose the preferential allotment route.

The design of a preferential allotment depends on the equity holding pattern among the domestic shareholders. We shall consider the following cases

(a) *Presence of an insider*: The insider derives private benefits of control in addition to the cash flows.

(b) *No insider*: The insider described above is not present (or its presence is inconsequential).

The insider becomes important if it is *pivotal*, i.e., at least some of its votes/shares are *necessary* for the multinational to acquire higher stakes. In case the insider is not pivotal M does not need to bother as it can always procure the outsiders' vote and acquire control. However, while designing the preferential offer a pivotal insider, if present, has to be compensated for the loss of private benefits. This compensation could be through the offered price or through non price methods which can be represented by a lump sum transfer.¹¹

We modify the above example. We now introduce a (large) domestic

¹⁰Combining the private benefits with the net gains under each method, M's payoff is 28 and 35 under tender offer and preferential allotment respectively.

¹¹The compensation for loss in private benefits can take various forms like retaining the former insider on the board of directors or even as a manager. We assume these can be denoted by some monetary equivalent. For instance, the promoter of Maharaja International was paid Rs.50 million as "non-competition compensation" by AB Electrolux. The promoter held 49% stake prior to the preferential allotment. This amount was paid over and above the sum paid by the multinational as price for the new shares issued to it. (See The Economic Times dated January 4, 1995 [72])

insider (L) in the firm who has 0.55 stake in the firm. In addition to his current cash flows he derives private benefits worth 25 from the firm. Even if M buys up equity shares of all outside shareholders, its stake will be 0.45, which is insufficient to acquire control. Thus L is pivotal. L's current payoff is

$$0.55(100) + 25 = 80$$

The minimum price acceptable to L in a preferential allotment is such that

$$\frac{55}{140}[110 + 40\pi] = 80$$

or

$$\pi = \frac{117}{44} = 2.34$$

The total equity base of the firm after the preferential allotment equals

$$110 + 40\pi = 203.64$$

Thus, net payoff to M is

$$\{0.5(203.64) - 30\} + 25 - 40\pi = 3.18$$

The term inside the parenthesis represents the appreciation in M's stock after the preferential allotment. The subsequent figures are respectively M's private benefits from control and its expenditure on the preferential allotment.

Now suppose M could have a side deal with the insider to approve the preferential allotment at zero price. The transfer (T) that makes it possible is such that

$$\frac{55}{140}(110) + T = 80$$

or

$$T = 36.79$$

M's payoff in this case is

$$\{0.5(110) - 30\} + 25 - 36.79 = 13.22$$

Thus M would prefer to use a transfer to compensate the insider rather than using the price alone. The interesting aspect of this affair is the fate of the (passive) small outsider. In this case their votes play absolutely no role and they are totally ignored. Notice that the payoff of an outsider after the preferential allotment is $11/14$ so that he is worse off compared to his prior situation after the preferential allotment.

In case the insider is not pivotal M does not need to bother as it can always procure the outsiders' vote. Thus, we model the case with a pivotal insider.

2.4 The Model

We examine the impact of a preferential allotment under two different assumptions about the domestic shareholding patterns:

- (a) *Presence of a pivotal domestic insider*, who derives private benefits in addition to the cash flows and a fringe of small shareholders.
- (b) *No insider*, the domestic shareholders' only gains from the firm are their claims to the cash flows.

We introduce some basic notation used in the model.¹²

¹²The mnemonics L and M carry the same meaning as before.

N = number of currently outstanding shares in the firm

α = fraction of equity currently held by M

$\bar{\alpha}$ = fraction of equity required by M to acquire control. We assume it is also the maximum stake M is allowed.

β = fraction of equity held by L, the large domestic insider.

V^L = Current value of the firm.

V^M = Value of the firm if M acquires control.

K^L = Private benefits accruing to L.

K^M = Private benefits to M on acquiring control.

T = Transfer payment by M to L to compensate for the loss in private benefits.

Assumption 1: $V^M > V^L$

We restrict our attention to cash flow enhancing stake hikes. Notice that in addition to enhancing value, M derives private benefits worth K^M from the firm on acquisition of control.¹³ There is *no informational asymmetry* between shareholders. The current market value and the value in the event of acquisition of control by M are known to all shareholders.

Definition: A *preferential allotment* (P) gives θ new shares to M at a predetermined price π per share such that its stake rises to the allowed limit ($\bar{\alpha}$), where θ is determined by the identity

¹³Apart from the standard interpretation of managerial perquisites K^M can also be interpreted as benefits to multinational corporations from indulging in transfer pricing or voting out positive NPV projects from this firm to other fully owned subsidiaries. (See The Economic Times, July 17, 1995 [73])

$$\bar{\alpha} = \frac{\alpha N + \theta}{N + \theta} \quad (2.1)$$

The amount paid by M for these new shares goes into expanding the equity base of the firm. The choice of the mode and the subsequent price that ensures the equity hike depends on the current distribution of shares within the firm. We shall first analyze the case where M confronts an insider. Initially we examine the impact of a preferential allotment on the shareholders. The choice of the mode of takeover is examined subsequently.

2.4.1 The Domestic Shareholders

We assume that L is the only domestic blockholder in the firm. The remaining domestic shares are dispersed among a set of small outside shareholders who hold one share each. In terms of the model this implies

Assumption 2: $\alpha + \beta < 1$

The presence of this blockholder raises two complementary issues. First, whether or not M needs its votes/shares for securing a majority vote of approval. Secondly, if the votes are crucial, under what conditions does L approve the preferential allotment? L's votes/shares are crucial if and only if it is a *pivotal shareholder*. As mentioned earlier, we shall compare a preferential allotment with a tender offer and a block purchase. The large insider L is pivotal in all three regimes if the following assumption holds.

Assumption 3: $\alpha + \beta \geq \bar{\alpha}$

2.4.2 Preferential Allotment in the Presence of an Insider

The insider is denoted by L. The current market value of the firm is V^L . In addition to the cash flows L derives *private benefits* worth K^L from the firm. Thus L's current payoff from the firm is

$$\beta V^L + K^L \quad (2.2)$$

We introduce the possibility of side payment by M to L in order to compensate for the loss in private benefits. The new equity base of the firm after the preferential allotment is $V^M + \pi\theta$.¹⁴ M gets a portion $\bar{\alpha}$ of this. However it has to pay to the firm an amount $\pi\theta$ and to L, it has to compensate for the loss of L's private benefits. The compensation is denoted by T. The left hand side of (2.3) is, therefore, the net value to M of the preferential allotment.

$$\bar{\alpha}[V^M + \pi\theta] + K^M - \pi\theta - T \geq \alpha V^L \quad (2.3)$$

Inequality (2.3) says that the net value of the preferential allotment to M must be at least as high as its current payoff. This gives us the maximum price (as a function of the transfer) that M would be willing to pay. Substituting for θ from 2.1, we get the maximum price that M is willing to pay ($\pi^M(T)$), given a transfer T.

$$\pi^M(T) = \frac{\bar{\alpha}V^M - \alpha V^L + K^M - T}{(\bar{\alpha} - \alpha)N} \quad (2.4)$$

¹⁴ $\pi\theta$ is the amount that is paid by M and goes into expanding the firm's equity base.

The insider(L) holds βN shares prior to P. Since P increases the total number of shares in the firm L gets a smaller stake $\beta N/(N + \theta)$ but of a higher value of the firm. Besides L is also compensated for the the loss of private benefits. L agrees to a (T, π) pair that satisfies

$$\frac{\beta N}{N + \theta}[V^M + \pi\theta] + T \geq \beta V^L + K^L \quad (2.5)$$

where the right hand side is its current payoff. For a given T, from inequality (2.5) we get the lowest price that L is willing to accept for a given level of transfer

$$\pi^L(T) = \frac{V^L}{N} - \frac{1 - \bar{\alpha}}{(\bar{\alpha} - \alpha)N}(V^M - V^L) + \frac{1 - \alpha}{(\bar{\alpha} - \alpha)N} \frac{K^L - T}{\beta} \quad (2.6)$$

Proposition 1: *Under assumptions 1 and 2, a preferential allotment succeeds if and only if*

$$T \geq \frac{1}{1 - \alpha - \beta} [(1 - \alpha)K^L - \beta K^M - \beta(V^M - V^L)] \quad (2.7)$$

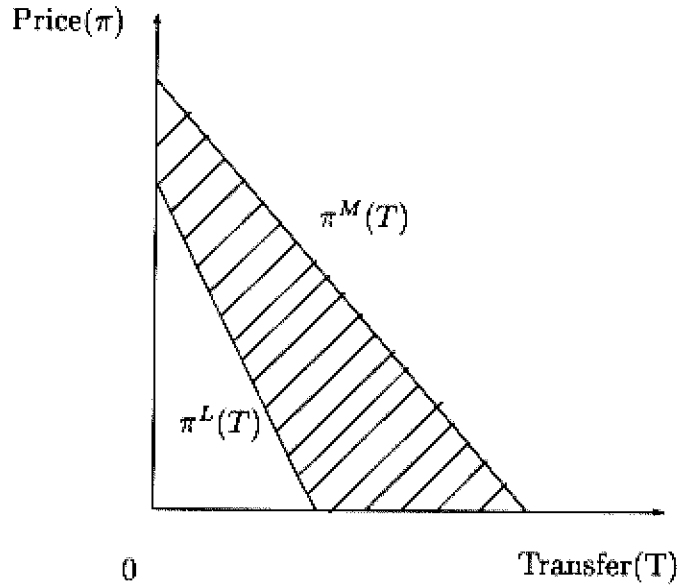
Proof: A preferential allotment succeeds if there exists at least one (T, π) combination that is acceptable to both M and L. Since $\pi^M(T)$ and $\pi^L(T)$ are linear in the transfer, it is sufficient to compare the prices alone. A preferential allotment succeeds if and only if

$$\pi^M(T) \geq \pi^L(T)$$

This reduces to (2.7) on solving out. ■

The set of feasible outcomes depend on the relative value of π^M and π^L at $T = 0$. Equation (2.4) implies

$$\frac{\partial \pi^M(T)}{\partial T} = -\frac{1}{(\bar{\alpha} - \alpha)N} \quad (2.8)$$


 Figure 2.1: $\pi^M(0) > \pi^L(0)$

and from (2.6) we have

$$\frac{\partial \pi^L(T)}{\partial T} = -\frac{1-\alpha}{\beta(\bar{\alpha}-\alpha)N} \quad (2.9)$$

$$-\frac{1}{(\bar{\alpha}-\alpha)N} > -\frac{1-\alpha}{\beta(\bar{\alpha}-\alpha)N} \Leftrightarrow \beta < 1-\alpha \Leftrightarrow \alpha + \beta < 1$$

Since the slopes are negative, the $\pi^M(T)$ curve is always flatter than the $\pi^L(T)$ curve in (T, π) space. If $\pi^M(0) \geq \pi^L(0)$ the set of possible equilibria is the shaded area in Figure 1.¹⁵

¹⁵This is equivalent to the condition $V^M + K^M \geq V^L + \frac{1-\alpha}{\beta} K^L$.

If $\pi^M(0) < \pi^L(0)$ then the set of feasible outcomes is the shaded region of Figure 2.

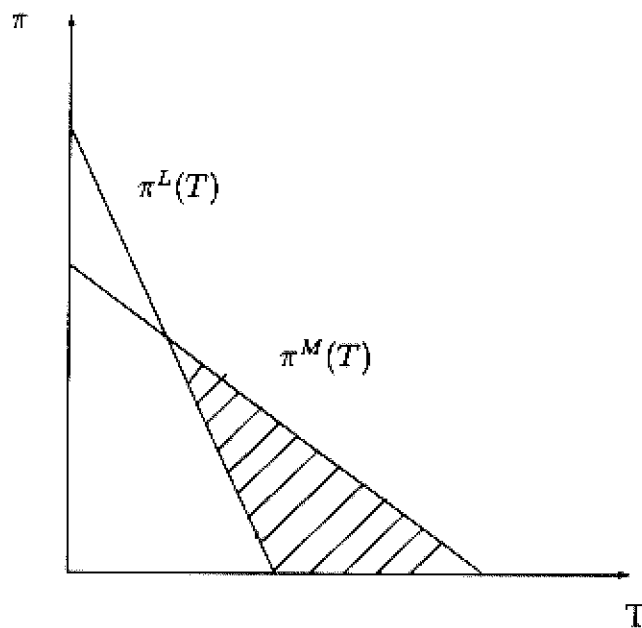


Figure 2 : $\pi^M(0) < \pi^L(0)$

Proposition 2: *Given assumptions 1 and 2 and assuming*

$$[\bar{\alpha}(1 - \alpha - \beta) + \beta]V^M - (1 - \alpha)(\alpha + \beta)V^L + (1 - \alpha)(K^M - K^L) \geq 0$$

the preferential allotment is approved at zero price (i.e., $\pi = 0$).

Proof: The above condition ensures that the set of preferential allotment equilibria is nonempty. In terms of the above diagram it implies that the $\pi^M(T)$ locus does not lie wholly below the $\pi^L(T)$ line.

Denote the post takeover payoffs to L and M by $R^i(\pi, T)$ ($i = L, M$). For any pair (π, T) payoff to M is

$$R^M(\pi, T) = \bar{\alpha}[V^M + \pi(T)\theta] + K^M - \pi(T)\theta - T \quad (2.10)$$

The payoff to L is

$$R^L(\pi, T) = \frac{\beta N}{N + \theta}[V^M + \pi(T)\theta] + T \quad (2.11)$$

Let M choose a lower price $\pi - \epsilon$ ($\epsilon > 0$) and a transfer T' such that

$$R^L(\pi - \epsilon, T') = R^L(\pi, T)$$

Solving for T' gives us

$$T' = T + \frac{\beta N}{N + \theta}\epsilon\theta$$

Putting this into M's payoff we find that

$$R^M(\pi - \epsilon, T') - R^M(\pi, T) = \epsilon\theta[1 - \bar{\alpha} - \frac{\beta N}{N + \theta}]$$

Substituting for the value of θ from (2.1) we get

$$\frac{\beta N}{N + \theta} = \frac{\beta(1 - \bar{\alpha})}{1 - \alpha}$$

or

$$R^M(\pi - \epsilon, T') - R^M(\pi, T) = (1 - \bar{\alpha})\epsilon\theta[1 - \frac{\beta}{1 - \alpha}] \quad (2.12)$$

$$\alpha + \beta < 1 \Rightarrow R^M(\pi - \epsilon, T') - R^M(\pi, T) > 0$$

This implies that there exists a deviation from π such that L is no worse off and M is *strictly* better off. Since this is true for any $\pi > 0$, M reduces the price and gives a higher transfer till equilibrium $\pi = 0$. ■

The previous proposition implies that unless extraneously constrained, M has incentive to undertake a preferential allotment at zero price (i.e., $\pi = 0$).¹⁶ When is P chosen over other modes by M to hike its stake in the firm? This issue is taken up in the next section. Proposition 2 implies that M has an incentive to push the allotment price π to zero. Therefore, we compare a *preferential allotment with zero price* with other methods.

2.4.3 Choice of Method of Stake Hike

We compare a preferential allotment with zero price (PA hereafter) with two other methods of acquiring shares, a block purchase and a tender offer.

Block Purchase (BP): M negotiates with L to buy $(\bar{\alpha} - \alpha)$ of the shares at a price p^B per share.

Tender Offer (TO): M offers a price p^T per share for $(\bar{\alpha} - \alpha)N$ number of the shares. Any additional shares received are returned on a prorata basis.

For a meaningful comparison of these methods, one has to ensure that all these modes are feasible.¹⁷

PA is feasible iff

$$\left(\bar{\alpha} + \beta \frac{1 - \bar{\alpha}}{1 - \alpha}\right) V^M + K^M \geq (\alpha + \beta) V^L + K^L \quad (2.13)$$

¹⁶Till 1994 Indian law required the minimum price of a preferential offer to be a mere ten rupees, i.e., the par value. Recall the discussion in Section 2.2 on the pricing rule between August, 1992 and August, 1994.

¹⁷We compare the three methods as if these are three different regimes. This is justifiable given the institutional setup in India. As pointed out in Section 2.2 all the three routes were allowed in theory. However, in practice, the preferential allotment route was generally favoured by the government on the grounds that it infused fresh equity into the firm.

BP is feasible iff

$$(\alpha + \beta)V^M + K^M \geq (\alpha + \beta)V^L + K^L \quad (2.14)$$

TO is feasible iff

$$V^M + K^M \geq V^L + \frac{1 - \alpha}{\beta} K^L \quad (2.15)$$

Whenever a tender offer is feasible, all methods are feasible. Thus, we assume the feasibility condition for tender offers holds. M chooses that method which maximizes the difference between the maximum it has to spend to acquire control and the minimum it needs to do so in that method. We denote by E_i , ($i = \text{PA, BP, TO}$) the minimum expenditures required in each of these three modes.

Proposition 3: *The maximum expenditure M can undertake under any method is the same and is equal to $\bar{E} = \bar{\alpha}V^M + K^M - \alpha V^L$.*

Proof:

M finds BP worthwhile if and only if

$$\bar{\alpha}V^M + K^M - p^B(\bar{\alpha} - \alpha)N \geq \alpha V^L \quad (2.16)$$

A tender offer(T) is offered if and only if

$$\bar{\alpha}V^M + K^M - p^T(\bar{\alpha} - \alpha)N \geq \alpha V^L \quad (2.17)$$

The maximum expenditure that M is willing to incur in order to acquire the higher stake is

$$\bar{E} = \bar{\alpha}V^M + K^M - \alpha V^L \quad (2.18)$$

From equation (2.3) it follows that the maximum expenditure that M is willing to undertake for the success of the preferential allotment PA is also \bar{E} . ■

Equation (2.18) says that the *maximum* expenditure that M is willing to incur under any method is its total gain from acquiring the $\bar{\alpha}$ stake and the resultant control of the firm. In each of the three modes the stake hike goes through if \bar{E} is greater than or equal to the minimum expenditure required for the success of the stake hike in that particular mode. The reasoning adopted by M in choosing the method for hiking its stake is as follows. In equilibrium M and the domestic shareholders split the surplus $\bar{E} - E_i^L$. We assume that M has all the bargaining power and thus pushes the domestic shareholders to their reservation utility under each method. Thus, it is in the interest of M to choose the route that has the *lowest minimum expenditure* i.e., $\text{Min}(E_i, i = PA, BP, TO)$. Since our interest is the preferential allotment, we shall compare it with each of the other methods.

The minimum expenditure required to ensure a successful preferential allotment with zero price is obtained from (2.5). In this case the only expenditure is the transfer to L. Substituting the value of θ from (2.1) into (2.5) we get

$$E_{PA} = \frac{\beta}{1 - \alpha} [(1 - \alpha)V^L - (1 - \bar{\alpha})V^M] + K^L \quad (2.19)$$

Comparison of PA and BP

The insider is willing to sell its block if and only if¹⁸

$$[\beta - (\bar{\alpha} - \alpha)]V^M + pN(\bar{\alpha} - \alpha) \geq \beta V^L + K^L \quad (2.20)$$

The second term on the left hand side of (2.20) is the accrual to L from the sale of shares while the first term denotes the payoff L gets from the residual

¹⁸Recall Assumption 3, which states that $\alpha - \beta \geq \bar{\alpha}$.

shares it holds in the firm. The minimum expenditure for a block offer to succeed is

$$E_{BP} = \beta V^L + K^L - [\beta - (\bar{\alpha} - \alpha)]V^M \quad (2.21)$$

Proposition 4: *Given assumptions 1 — 3, M strictly prefers a preferential allotment with zero price to a block offer (BP) in the presence of a pivotal domestic insider.*

Proof: We have to prove $E_{PA} < E_{BP}$. Comparing (2.19) with (2.21)

$$E_{PA} < E_{BP} \iff \alpha + \beta < 1$$

The latter is true owing to the presence of the small outsiders. ■

The large insider (L) is left with a stake in both PA and BP after M acquires control. L's stake after PA is

$$\beta \frac{1 - \bar{\alpha}}{1 - \alpha}$$

while its stake after BP is

$$\beta - (\bar{\alpha} - \alpha)$$

The assumption that $\alpha + \beta < 1$ implies

$$\beta \frac{1 - \bar{\alpha}}{1 - \alpha} > \beta - (\bar{\alpha} - \alpha)$$

Thus, L has a greater stake in than firm after a PA than after a BP. In BP the only shareholder diluted is L and it has to be compensated at least to the extent of its reservation payoff. Since the stakes of all domestic shareholders are diluted under PA, the insider (L) has a larger ex post stake

under this route. Thus, the use of transfers allows M to discriminate between the pivotal insider and other domestic shareholders.

Comparison of PA and TO

A tender offer (TO) for $(\bar{\alpha} - \alpha)N$ shares in the presence of L is slightly more involved. M has to design the offer such that L tenders at least that portion of its shares, which ensures the success of the tender offer. We make a *tie breaking assumption* that if L is indifferent between tendering and holding out, it tenders. Once L tenders sufficient number of shares, M does not have to bother about the small shareholders. However, the payoff to L depends on whether or not the small shareholders tender. This is because M is restrained to accept only $(\bar{\alpha} - \alpha)$ of the shares. All excess shares have to be returned on a prorata basis. Let us first look at the representative small shareholder's tender decision.

If the representative small shareholder knows that the tender offer will succeed independent of his tender decision, he tenders only if with a certain positive probability he receives a payoff at least as high as what he gets when he holds back. On holding back the small shareholder gets $\frac{V^M}{N}$. In case he tenders and his share gets accepted he gets a price p^T which is determined by the solution to L's tender decision problem. L's payoff is linear in the tender price. Thus, if it finds the price attractive it will tender all of its βN shares. How many of these get accepted depends on how the small shareholders behave. They tender iff

$$p^T \geq \frac{V^M}{N} \quad (2.22)$$

1. When (2.22) does not hold the small shareholders do not tender. In this case TO is identical to BP as L is the only party that tenders its shares.
2. When (2.22) holds the small shareholder also finds it profitable to tender. This affects the ex post payoff to L. It tenders its shares if and only if

$$\delta p^T \beta N + (1 - \delta) \beta V^M \geq \beta V^L + K^L \quad (2.23)$$

where

$$\delta = \frac{\bar{\alpha} - \alpha}{1 - \alpha}$$

is the probability of a tendered share being accepted.

Before proceeding further, we have to ensure that there exist feasible tender offers where the small shareholders and L tender. Given (2.22) holds, we get the condition when L also tenders from (2.23).

$$p^T \geq \frac{V^M}{N} \Leftrightarrow \beta V^L + K^L - \beta V^M \geq 0$$

A tender offer is feasible if and only if $\bar{E} \geq E_T^L O$. This implies

$$\beta V^L + (1 - \alpha) K^L - \beta V^M - \beta K^M \leq 0$$

A tender offer where the small shareholders also tender is one where the above conditions hold simultaneously. Comparing the two conditions a tender offer has small shareholders tendering if and only if

$$\alpha K^L + \beta K^M \geq 0$$

This condition is automatically met as we have assumed the existence of private benefits.

The minimum expenditure M has to incur for a successful tender offer is

$$E_{TO} = p^T(\bar{\alpha} - \alpha)N \quad (2.24)$$

Putting in the value of p^T from (2.23), we get

$$E_{TO} = V^L(1 - \alpha) - V^M(1 - \bar{\alpha}) + K^L \frac{1 - \alpha}{\beta} \quad (2.25)$$

Proposition 5 : *Given assumptions 1 – 3, the multinational (M) strictly prefers a preferential allotment with zero price (PA) to a tender offer (TO) in the presence of the pivotal insider (L).*

Proof:

1. When (2.22) does not hold, TO is identical to BP and Proposition 3 applies.
2. When (2.22) holds the small shareholders also tender. From (2.23) the payoff to L is

$$R_{TO}^L = \delta p^T \beta N + (1 - \delta) \beta V^M \quad (2.26)$$

or

$$R_{TO}^L = \beta V^M + \beta \frac{\bar{\alpha} - \alpha}{1 - \alpha} [p^T N - V^M] \quad (2.27)$$

This reduces to

$$R_{TO}^L = \beta \frac{1 - \bar{\alpha}}{1 - \alpha} V^M + \frac{\beta}{1 - \alpha} E_{TO} \quad (2.28)$$

The payoff to L from PA (obtained by substituting for the value of θ from (2.1) and putting $\pi = 0$ in (2.5)) is

$$R_{PA}^L = \beta \frac{1 - \bar{\alpha}}{1 - \alpha} V^M + E_{PA}^L \quad (2.29)$$

Since L is pushed to its reservation level in either case

$$R_{TO}^L = R_{PA}^L = \beta V^L + K^L$$

Comparing (2.28) and (2.29) notice that L has the same stake in the post equity hike scenario in either case (first term on the right hand side of each equation). This implies

$$\begin{aligned} \frac{\beta}{1-\alpha} E_{TO} &= E_{PA} \\ \Rightarrow E_{TO} &> E_{PA} \end{aligned}$$

(since $\alpha + \beta < 1$) ■

Unlike the comparison in Proposition 4, L is left with the same ex post stake under PA and TO. In the preferential allotment, *all* of M's expenditure accrues to L. In the tender offer case the participation of the small shareholders implies that part of the total expenditure accrues to them. Thus, the overall expenditure to M is lower for a preferential allotment than for a tender offer. This is the reason PA is preferred to TO. The preferential allotment with side payments allows the bidder to discriminate between shareholders.

An alternate way of interpreting the results in this section is as follows. M and L jointly maximize their surplus from the exercise leading to a change in control. The preferential allotment method allows them to extract greater surplus than is possible with other methods.

The results in this section show that in the presence of an insider the multinational *strictly* prefers a preferential allotment with zero price and

transfer payments to a block purchase or a tender offer. The empirical implication of this is that there could be low enough strictly positive prices where a preferential allotment remains the cheapest preferred alternative for M.

The impact of a preferential allotment in the presence of a pivotal insider on a (passive) outside shareholder is of special interest. The representative outsider's payoff after a preferential allotment is

$$\frac{1}{N + \theta} [V^M + \pi\theta] \quad (2.30)$$

If the equilibrium price is zero the payoff is $V^M/(N + \theta)$ which could actually be less than his current payoff of V^L/N . Thus, a preferential allotment in the presence of a pivotal insider who can be compensated using transfers is *detrimental* to the outside shareholder's interest.¹⁹

2.4.4 Absence of a Large Insider

In this section we examine the motivation for M to use preferential allotment in the absence of a pivotal insider. We denote the current market value of the firm by V^O .²⁰ In the absence of an insider, M cannot use transfer payments to compensate the domestic shareholders. The only instrument available to M is the price of the preferential allotment. Thus, our exercise in this section essentially boils down to comparing the various methods when

¹⁹Note that if there is no upper bound on the stake of M, there is incentive to dilute the domestic shareholders' stake to near zero.

²⁰The letter O is a mnemonic to indicate that we are dealing with a case where there are only outside shareholders. This notational change has been adopted to steer clear of any confusion that might arise from the use of V^L . We continue to analyze a value enhancing change in control, i.e., $V^M > V^O$.

transfers cannot be used.

There are two situations we need to consider.

(a) Presence of a pivotal outside shareholder.

(b) M is the sole large shareholder.

Case (a): Presence of a pivotal outside shareholder.

We continue to denote the stake of this outsider (also denoted O) by β . This pivotal outsider does not possess any control over the firm's operational decisions. One might ask that if M is already a large shareholder in the firm then who are the insiders in the firm?²¹ We could assume that the firm is currently managed by professional managers for a fixed salary. Alternately M could, on account of being a blockholder, be deriving benefits worth K^O from the firm. In this case the analysis goes through as long as M has incentive in the form of additional private benefits from acquiring majority in the firm.²²

The pivotal outsider says "yes" to P if the price offered is such that it gets at least its current payoff. Thus O will approve a price π if it satisfies

$$\frac{\beta N}{N + \theta} [V^M + \pi\theta] \geq \beta V^O \quad (2.31)$$

where the right hand side is O's current payoff and the left hand side is what it would get after the preferential allotment goes through. The minimum price that O would approve is

$$\pi^O = \frac{V^O}{N} - \frac{1 - \bar{\alpha}}{\bar{\alpha} - \alpha} \frac{(V^M - V^O)}{N} \quad (2.32)$$

²¹I thank Professor Shubhashis Gangopadhyay for raising this point and clarifying it.

²²This is a fairly realistic situation. In the particular context of multinational K^O could be the benefits M derives from placing it's representatives on the board of directors. However acquiring majority control might allow it to replace the current management with one whose interests are more closely aligned to M.

Since the outside shareholders cannot be compensated using side payments, the maximum M is willing to pay is obtained by putting $T = 0$ in (2.4)

$$\pi^M = \frac{\bar{\alpha}V^M - \alpha V^L + K^M}{(\bar{\alpha} - \alpha)N} \quad (2.33)$$

A preferential allotment is feasible if and only if

$$\pi^M \geq \pi^O$$

The minimum expenditure M has to incur for a preferential allotment, obtained from (2.32) is denoted by²³

$$E_{PA}^O = (1 - \alpha)V^O - (1 - \bar{\alpha})V^M \quad (2.34)$$

A block purchase is meaningful only in the presence of a pivotal outsider. The minimum expenditure incurred for a block purchase is

$$E_{BP}^O = \beta V^O - [\beta - (\bar{\alpha} - \alpha)]V^M \quad (2.35)$$

The design of a tender offer in the absence of a pivotal insider is similar to that in the previous section. However, the reservation payoff of the pivotal player (O) is βV^O . This gives us

$$E_{TO}^O = (1 - \alpha)V^O - (1 - \bar{\alpha})V^M \quad (2.36)$$

as the minimum expenditure required for a tender offer.

²³We use the superscript O to distinguish the minimum expenditure figures computed in this section from those in the previous section.

Proposition 6: *In the presence of a pivotal domestic outsider (O) and when assumptions 1 — 3 hold,*

(a) *the multinational is indifferent between preferential allotment and a tender offer.*

(b) *the multinational strictly prefers a preferential allotment to a block purchase.*

Proof: (a) This follows straight from the comparison of (2.34) and (2.36).

(b) Rewriting (2.34) and (2.35) we get

$$E_{PA}^O = (\bar{\alpha} - \alpha)V^M - (V^M - V^O) \quad (2.37)$$

and

$$E_{BP}^O = (\bar{\alpha} - \alpha)V^M - \beta(V^M - V^O) \quad (2.38)$$

Comparing (2.37) and (2.38) it is obvious that $E_{PA}^O < E_{BP}^O$ (since $V^M > V^O$ and $\beta < 1$). ■

In the absence of transfers, M is indifferent between a preferential allotment and a tender offer because the pivotal outsider is unable to free ride in either case. As has been pointed out earlier preferential allotment eliminates the free rider problem. In a tender offer O is unable to free ride on account of being nonatomistic. The last terms on the right hand side of (2.37) and (2.38) are respectively the amount of the ex post gains that M can appropriate to itself using the preferential allotment and block purchase routes. As shown earlier (Proposition 3) the pivotal shareholder is left with a larger ex post stake under the preferential allotment as compared to the block purchase. Thus, M can expropriate a larger chunk of the gains while leaving O at its reservation payoff under a preferential allotment than under

a block purchase. Thus, the preferential allotment mode weakly dominates a tender offer and strictly dominates a block purchase in the presence of a pivotal outsider.

The preferential allotment is the preferred mode because it allows M to appropriate the cash flow gains that arise from its acquisition of control. The power of the preferential allotment lies in the fact that it prevents the outside shareholders from free riding. The transfer in the previous scenario was to compensate for the loss in private benefits rather than cash flow losses. The use of the transfer implied that the shareholders could be worse off than their *ex ante* position. While that possibility is ruled out in this case, the outsiders are still “worse off” in the sense that the cash flow enhancement resulting from the change in control are not passed on to them.

Case (b): M is the sole large shareholder

This is similar to the example discussed in section 2.3. Here the only relevant comparison is between a preferential allotment and a tender offer. The tender offer succeeds only if M announces a tender price of V^M/N , the post takeover value of the firm. However, as we have seen in section 2.3, the preferential allotment goes through at a lower price. Thus, the multinational prefers a preferential allotment to a tender offer.

2.5 Note on $\bar{\alpha}$

We have assumed in the essay that $\bar{\alpha}$, the maximum stake M is allowed, is also the stake required to acquire control. It could be argued that M could actually acquire control (and thus affect change in the cash flows) at a lower

level of stake, say $\underline{\alpha}$. However, assuming $\underline{\alpha} < \bar{\alpha}$ further enriches our results. In the presence of the large insider, it is clear that PA dominates TO and BP even if M wanted to raise its stake only to $\underline{\alpha}$.²⁴ But there is an impetus to raise stake beyond $\underline{\alpha}$ using the preferential allotment as the joint surplus of M and L is greater at this point. Thus, even if M can acquire control at a lower stake, it will use the preferential allotment method to acquire maximum allowed stake. A preferential allotment is a more powerful tool for M in this case. In the absence of the inside shareholder, M is indifferent between acquiring $\underline{\alpha}$ and $\bar{\alpha}$ (or indeed any level in between) as all the surplus is extracted through the price. It is the use of transfers that allows M to discriminate between inside and outside shareholders.

2.6 Empirical Implications

We have analyzed the impact of a preferential allotment on value accruing to the share holders under a variety of equity distribution patterns within the firm and also shown that a preferential allotment is at least weakly preferred to a block purchase and a tender offer under all circumstances. The above analysis implies that *takeovers using preferential allotments will not increase the payoff to outside shareholders even if the change in control leads to higher cash flow. In other words, even if there are potential performance gains from the takeover, these may not get translated into higher returns to outside equity*

²⁴The results obtained do not depend on the value of the stake required to affect change in cash flows. Thus, results go through for $\underline{\alpha} (> \alpha)$.

holders.²⁵ This can be examined in two possible ways:

- (a) Examining the financial data of the firm. If acquisition of majority by the foreign partner is expected to bring about a change in the operating performance, the post takeover performance of the firm may differ significantly from prior performance where performance is measured using accounting numbers. However, the returns per share may vary significantly.
- (b) An event study of preferential allotment announcements. The rational shareholders will react to the announcement of a preferential allotment.

A theoretical issue related to the empirical implications is the apparently passive behaviour of the small shareholders despite expropriation. However, it is important to distinguish the nature of expropriation being discussed in our essay. Except in the presence of an incumbent pivotal insider, the small shareholders are not expropriated of their ex ante gains. A preferential allotment only excludes them from participation in ex post gains. In the presence of a pivotal domestic insider, it is intuitively possible that an announcement of a preferential allotment leads to sale of shares by small shareholders. This is empirically testable using the event study methodology. An additional factor is specific to the context of multinationals in India. Given that they have historically performed better than the majority of domestically owned firms, it is possible that the small shareholders' payoffs in these firms even after expropriation is better than the other alternatives open to them.

An ideal empirical exercise would involve examination of both accounting

²⁵As we have mentioned earlier, most of the equity hikes took place via the preferential allotment mode. Thus, an empirical exercise involving a comparison of all three methods is not feasible.

and stock market data. We are constrained by the non-availability of the relevant information for the empirical exercise at this stage.

2.7 Conclusion

The easing of equity participation norms for foreign investors by the Indian government in 1991 led to a number of foreign firms and multinational corporations taking up majority stakes in their Indian subsidiaries. Empirically it was observed that most of the hikes in stake occurred using the preferential allotment method. The distinguishing feature of this method is that the current shareholders continue to remain shareholders even after the bidder acquires the desired stake. This is done by issuing new equity exclusively to the bidder subject to the approval of the current shareholders.

We examined the implications of using a preferential allotment to acquire a controlling stake. This was carried out under a variety of assumptions about the existing equity holding pattern within the firm. Our results suggest that this method enables the multinational to acquire majority in a fashion which could exclude the outsiders from participating in any potential cash flow gains that may accrue to the firm. This happens because the current shareholders' stakes get diluted on account of the preferential allotment. In case of the outsiders this happens because the preferential allotment eliminates the free rider problem discussed by Grossman and Hart [25]. In the presence of a large insider, the multinational prefers to give as high a transfer as possible and the insider and the multinational gain at the expense of the outside shareholders.

We show that whenever the multinational faces a *pivotal insider* it strictly prefers using a preferential allotment (at the minimum allowed price) over a block offer or a tender offer. In the presence of a *pivotal outsider* the multinational still prefers a preferential allotment to a block offer and is indifferent between a preferential offer and a tender offer. Thus, a preferential allotment (weakly) dominates other modes of stake hike for the multinational. Since the multinational is free to choose the allotment price, it chooses that price which pushes the outsiders closest to the minimum possible price. In the presence of a domestic insider this may result in the small shareholders getting less than their original payoff.

Our modeling apparatus allows us to draw an interesting difference between the preferential allotment and an open offer as examined by Grossman and Hart [25] and Shleifer and Vishny [66]. The motivation behind these papers is that the free rider problem may cause value enhancing opportunities to be passed up. The preferential allotment provides an institution where this does not happen. The free rider problem is eliminated and the value enhancing project is undertaken here. However, it has a flip side — the small shareholders do not share any of the value gains. The derivation of this intuitive result as a part of our model facilitates demonstrating that the payoffs to the multinationals (which is just the complement of payoffs to domestic shareholders) is greater under a preferential allotment than under other methods, thus explaining the choice of this route to hike stakes.

Prior to June, 1994 the limit on the price was a floor of a mere ten rupees, the par value of shares. Since June 1994 the Securities and Exchange Board of India has imposed a price floor on the price of preferential allotments. Firms

undertaking preferential allotments are now required to charge a minimum price that is equal to the greater of the two following two prices- the average of the past six months and average of the past six weeks. This has set a ceiling on the transfers that are feasible between the multinational and the domestic insider.

Chapter 3

Inside Ownership and Corporate Value

3.1 Introduction

The relation between inside ownership and firm value in the context of the Indian corporate sector is examined in this essay. Inside ownership refers to the shares held by the party that controls the firm.

Separation of the ownership and control of a firm and its consequences were first discussed by Berle and Means [5]. Subsequently the issue has been examined theoretically and empirically. It is now widely accepted that the actual relation between inside holding and value of the firm depends on the relative strength of the *convergence of interest* effect and the *entrenchment effect*. The former implies a positive relation between inside ownership and performance and the latter a negative one whenever it is in operation. The convergence of interest effect was first analysed by Jensen and Meckling [34].

Entrenchment refers to the insider-manager's attempts to thwart challenges to its own incumbency in the firm. In the presence of an active corporate control market, acquiring higher stakes facilitates entrenchment by reducing the chances of a takeover. If this effect dominates the convergence of interest effect, one might expect firm value to decrease with inside ownership over some ranges. Theoretical underpinnings of the impact of entrenchment on firm value have been provided by Harris and Raviv [28] and Stulz [69]. Empirically, a nonmonotonic relationship for the U.S. was first obtained by Morck, Shleifer and Vishny [52] and subsequently by others like Cho [12] and McConnell and Servaes [47].

Institutional features suggest that the operation of the entrenchment effect in India is limited. Low threat of hostile takeovers, a thin and illiquid stock market, interlocking directorships, crossholding of equity and a weak and inflexible managerial labour market imply that the incumbent management in India is already entrenched. Thus, it has little incentive to amass higher stake solely for entrenchment purposes. However, the convergence of interest effect continues to operate. Given these premises, we expect a *monotonic positive relation* between inside ownership and firm value in the Indian corporate sector.

In a recent paper Sarkar and Sarkar [64] obtain results which suggest that a nonmonotonic relation between inside ownership and value exists in India. Using data from the financial year 1995-96, they obtain a result that firm value decreases till inside ownership goes up to 25% and it increases thereafter.¹

¹The figure of 25% is not ad hoc. Under Indian company law, many proposals require

Our work re-examines the relation using data from a different year. The key issue addressed in here is the composition of inside ownership. We argue that the inside ownership cannot be defined in a uniform fashion for all types of firms in the Indian corporate sector. Two distinct types of firms exist in the Indian private sector - firms affiliated to a business group and unaffiliated or stand alone firms. This essay argues that the two sets of firms should be examined separately as inside ownership means different things for each of these types of firms. We examine the two types of firms separately and examine the behaviour of the components of inside ownership for each type of firm.

Further, we argue that given the structure of available ownership data in India, a meaningful definition of inside ownership can be obtained only for stand alone firms. Obtaining precise estimates of inside ownership for group firms is not feasible, given the form in which data is available to us. We examine a sample of stand alone firms and show that this sample supports the hypothesis of a positive monotonic relation between inside ownership and firm value.

Two recent papers by Khanna and Palepu [38], [39] also report a positive relation between inside ownership and firm value for Indian firms. At a later point in the essay, we elaborate on the complementarity between our work and their findings.

The rest of the essay is organized in the following fashion. The Indian institutional structure is discussed in section 3.2. Section 3.3 contains in-approval of 75% of the shareholders. Thus, having more than 25% gives a party the power to veto a number of proposals.

formation on the data and the variables used in this study. The results are presented and discussed in section 3.4. We offer concluding remarks in section 3.5.

3.2 Indian Institutional Structure

In the presence of an active corporate control market, managers have an incentive to acquire additional stakes in order to entrench themselves. The Indian corporate control market can be regarded as weak for following reasons:

- *Low threat of hostile takeovers:* Till very recently (February 1997) a takeover code was not in place. While 193 acquisitions have occurred between 1993 and 1997, there is scant evidence of any of these being hostile. There is also no evidence of management turnover. As Ghemawat and Khanna [21] point out, controversies around individual transactions evoke a trial and error flavour. Thus, by and large the corporate control market plays a weak role in disciplining the management.
- *Thin and illiquid stock market:* A liquid stock market can abet the value enhancing corporate control activity. It can help a potential value enhancing raider to mask its operations while building up its position before making a formal takeover bid. Besides, Maug [46] has shown that market liquidity is crucial if a large outside shareholder has to monitor effectively. He develops a model where the large shareholder monitors only when the stock market is sufficiently liquid in the hope of being able to gain from trading on the information vis-a-vis uninformed liquidity traders. A less liquid stock mar-

ket implies that the block shareholder prefers to diversify its portfolio and monitor less. Despite the large number of firms listed on the Bombay Stock Exchange, very few of the stocks are highly liquid.

- *Interlocking directorships and crossholding of equity:* These phenomena are well known in the Indian context. The directors of various firms sit on each others' boards. Crossholding of equity refers to the phenomenon of firms holding each other's equity. The above phenomena are especially pervasive in firms affiliated to business groups. Recognizing their role is important as they facilitate managerial entrenchment even with very low stakes.

Intuitively, it possible that deregulation decreases the role of business groups as intermediaries between affiliated firms and thus reduces the importance of crossholding and interlocking directorships in issues of corporate control. However, recent research by Khanna and Palepu [37] demonstrates that at least the largest Indian business groups have moved increased their role as intermediaries between group affiliates and increased their efforts to create an identity for the group as a whole since liberalization. Thus the interlocks of directorships and equity holdings among group firms continue to be important.

- *Weak and inflexible managerial labour market:* The above features imply that the pressure from the corporate control market on the managers is low. However, it may be argued that an active corporate control market is not the only way of disciplining managers of a firm. Management can be forced towards shareholder value maximization even with a very small stake by the presence of an active market for managerial labour (Fama [19]). Competition in the managerial labour market ensures that the more capable

managers will get higher responsibilities. Internal monitoring among managers disciplines management. If a manager deviates from shareholder value maximisation, prospective candidates would try to replace him. However the managerial labour market in India is also weak and inflexible relative to some of the advanced economies. There is a general scarcity of professional managerial talent. The managerial input is provided by founding families over generations. Besides, obscure labour laws make it tough to sack inefficient employees.² This set of features is common to both group and non group firms.

The combination of these factors creates the scope for entrenchment and significant managerial discretion even with relatively small stakes. Thus, in the Indian context, the management has little incentive for taking on a higher stake *specifically* for entrenchment purposes. The convergence of interest hypothesis, however, should still hold true. Based on these premises we hypothesise that a *monotonic increasing relationship* holds between insider ownership and value for firms in India.

The point is worth emphasising. We are not saying that the entrenchment as a phenomenon is absent in India. We argue that weak disciplinary devices imply Indian managers can get easily entrenched even with low stakes. In particular, a weak corporate control market implies that they need not hold significant share of the firm to lower the already low probability of a hostile takeover.

²For example, see Appendix A of Khanna and Palepu [36].

3.3 Data and Variables

Data Sources and Selection

We examine a one year cross-section of firms traded on the Bombay Stock Exchange. All the data for the exercise were taken from Prowess, an electronic database compiled and maintained by Centre for Monitoring Indian Economy (CMIE). We use data for the financial year 1996-1997.³ The latest available equity holding pattern of the firm is used. This is consistent with the market based measure of performance (rather than an accounting one) used here. We leave out observations with incomplete records. Further, we also drop firms that have zero sales or whose net worth has been eroded. This leaves us with a final sample of 1594 firms. The common feature of all these firms is that they belong to the Indian private sector. Government controlled public sector enterprises and firms controlled by foreign individuals or entities are not included. In our sample, 657 firms are affiliated to business groups and 937 are stand alone firms.⁴

Identifying Group Affiliation

The group is not a legal construct in India. However information on group affiliation is reliable because firms are members of only one group. Further, there is scant movement of firms across groups. We use the Prowess classification of firms to identify group affiliation. This classification is based on a variety of sources. Prior to 1991, a comprehensive list of firms belonging to

³The financial year for most Indian firms start on April 1 of a calendar year and ends on March 31 of the next calendar year.

⁴Our sample consists of firms whose ownership status is categorised as "Private(Indian)" or as being affiliated to some Indian business group in the Prowess database.

“Large Industrial Houses” was published by the government. This information is the starting point and is supplemented by other efforts to continuously track and monitor the firm. These include the following : (a) identifying the original promoters of the firm and tracing whether they retained the affiliation with the firm (b) announcements by individual firms of their group affiliation, and announcements by groups of lists of affiliated firms (c) identifying the interest that a group has in a particular firm through the board of directors. Group structure changes are also monitored. Firms that cannot be classified as being a part of the groups are classified as stand alone firms.

Variables of Interest

Dependent Variable

We use the market value-to-book value ratio, an approximate measure of Tobin’s Q, as the indicator of firm value.

$Q = \text{Ratio of market value of equity to the sum of book value of equity and reserves.}$

Since corporate debt is not actively traded and the data on replacement cost of assets do not exist we use an equity based approximation of Tobin’s Q. This measure has been used by a number of earlier studies for developing countries, for example Banerjee [2] and Sarkar and Sarkar [64] for India and Xu and Wang [81] for China. There is evidence to suggest that this equity based approximation of Q is used by institutional investors to assess performance while selecting target companies (Smith [68]).⁵

⁵Some studies also use accounting measures of performance. Reasons for preferring the market-to-book ratio over accounting measures are explained well in Sarkar and Sarkar [64].

Ownership Measures

The data on shareholding pattern in Indian firms are not as detailed as those available in some of the developed countries. The various measures of block ownership used in this study are denoted by the following notation:

DIR = Percentage of equity held by the board of directors and their relatives.

CORP = Percentage of equity held by other Indian corporate bodies.

FOR = Percentage of foreign holdings in the firm.

INS = DIR + CORP

The above is the definition of insider ownership adopted by Sarkar and Sarkar [64]. We use this definition and their specification as a starting point for our exercise. We argue later that this definition is inadequate.

A class of blockholders that we have not included in our analysis is the domestic institutional investors, which include banks and mutual funds. This is mainly because in India, most of these institutions are government owned and their relatively passive role as monitors is well documented (For example Chibber and Majumdar [11] and Khanna and Palepu [39]). Unlike business groups in some other economies like Japan, Indian business groups do not have a main bank under the group umbrella. This further limits the scope of the banks playing strategic role in corporate governance.

The literature in the area of ownership and firm value uses the spline specification to examine the presence of a non monotonic relation. A piece-wise linear function which has different slopes over various ranges of inside ownership is estimated. We examine a spline specification which has a turning point (or knot) at 25%. The choice of the knot at 25 % is not accidental. Under Indian company law, many important resolutions require the approval

of 75% of the shareholders. Thus, owning more than 25% of the firm's stake bestows veto right upon a blockholder in such situations.

Based on the above measures of block holding, we define the following spline variables

$$DIR0 - 25 = \begin{cases} DIR & \text{if } DIR < 25 \\ 25 & \text{if } DIR \geq 25 \end{cases}$$

$$DIR25+ = \begin{cases} 0 & \text{if } DIR < 25 \\ DIR - 25 & \text{if } DIR \geq 25 \end{cases}$$

$$INS0 - 25 = \begin{cases} INS & \text{if } INS < 25 \\ 25 & \text{if } INS \geq 25 \end{cases}$$

$$INS25+ = \begin{cases} 0 & \text{if } INS < 25 \\ INS - 25 & \text{if } INS \geq 25 \end{cases}$$

$$CORP0 - 25 = \begin{cases} CORP & \text{if } CORP < 25 \\ 25 & \text{if } CORP \geq 25 \end{cases}$$

$$CORP25+ = \begin{cases} 0 & \text{if } CORP < 25 \\ CORP - 25 & \text{if } CORP \geq 25 \end{cases}$$

$$FOR0 - 25 = \begin{cases} FOR & \text{if } FOR < 25 \\ 25 & \text{if } FOR \geq 25 \end{cases}$$

$$FOR25+ = \begin{cases} 0 & \text{if } FOR < 25 \\ FOR - 25 & \text{if } FOR \geq 25 \end{cases}$$

Control Variables

Intangibles:

ADVINT = Ratio of advertising expenditure to sales.

We expect to observe a positive relation between this variable and the firm value as a higher level of intangibles implies a higher market value.

Depreciation

DEPINT = Ratio of depreciation expenditure to sales.

It is used to control for technology used by the company. Higher the capital intensity of the company's technological process, higher will be the ratio of depreciation to total sales.

Size:

LSALES = $\log(\text{sales})$

It is necessary to control for unobservable factors related to firm size. In the product market size reflects possible entry barriers that might arise from economies of scale. Size also reflects the extent of market power of a firm. Size reflects the companies' ability to finance investment from internal projects as well as higher ability to raise outside finance. On the other hand, it is easier to own a large part of a firm with low value. In the absence of a control for size, large inside ownership may proxy the small firm size.

Leverage: The variable used is

LEVG = Ratio of long term debt to the sum of book value of equity and reserves.

The ratio of long term debt to book value of equity plus reserves is used to control for the effect of debt on the firm's market valuation. This is a variable whose sign cannot be predicted a priori. The pecking order theory of Myers and Majluf [53] suggests that debt issued is negatively related to the profitability and therefore with Q. On the other hand one can argue for

a positive coefficient of debt on the basis of the tax advantage of debt. The signalling model of Ross [62] implies that debt equity ratio rises in the cross section as firm value increases. The free cash flow hypothesis of Jensen [33] also implies a positive relation between debt and firm value. Thus, an a priori prediction of the sign is difficult.

Liquidity:

The variable used is

RELTF = Relative trading frequency of a stock. This is the ratio between the number of days the stock traded in a trading year to the total number of trading days in that year.

While the importance of a liquid stock cannot be undermined, the relation between the liquidity of a stock and market valuation is grey area. A relatively liquid stock may be followed more by investors as there are greater possibilities of this stock being traded. Thus, other things being equal, managers of more liquid firms may have lesser chance to take value eroding actions.

However, there may be a reverse causality between liquidity and performance. Better performing firms may enjoy more liquid markets, especially because of the attention bestowed upon them by institutional investors, who trade frequently.

Banerjee [2] reports that there is a U shaped relation between RELTF and the firm value. What is the cause of firms with very low liquidity having high market valuations? There is no full blown theory explaining this. An explanation can be offered by drawing inspiration from the event study literature. One of the issues that concerns event study researchers is that of

thin or infrequent trading of stocks. Infrequent trading introduces many zero returns and *large non zero returns* into the returns stream.⁶ The latter implies that whenever trading occurs, there are large movements in price. Since we are working with year closing prices, it is possible that insiders manipulate price by buying small amounts of the stock to make performance look more impressive before announcing annual results. Thus, we shall examine a linear and a nonlinear specification for the relation between liquidity and performance.

Industry Effects: We use industry dummies at the 2 digit level of the 12 digit classification used by CMIE. We have a total of 20 industry dummies.

Group Effects: We include a dummy variable (BIZDUM) that takes the value 1 if the firm is affiliated to a business house.

3.4 Results and Discussion

The data are classified separately into stand alone and group firms and are summarized separately in Table 3.1 and Table 3.2 respectively. The tables reveal differences in the characteristics of the two sets of firms. The group firms have higher value on an average (0.98) compared to the stand alone firms (0.77). Comparison of the average sales suggests that the group firms are also bigger firms.

The distribution of shareholding pattern is interesting. The average value of inside ownership (INS), which is a generated variable, is similar across the two subsets of firms (43%). However, the *composition* of inside ownership is

⁶For example, see Campbell and Wasley [10].

starkly different across the two sets. The stand alone firms have an average directors' holdings of 23% and the corporate holding of 19.7%. The group firms have much higher average corporate holdings (35%) and very low directors' holding (8.75%). Institutional holdings are much higher in group firms and top fifty individual shareholders have much higher stakes in the stand alone firms.

We first examine our combined sample 1597 firms using data from the financial year 1996-1997. We begin with the specification used by Sarkar and Sarkar [64] to obtain their main result.

$$Q = \beta_0 + \beta_1(INS0 - 25) + \beta_2(INS25+) + \beta_3(FOR0 - 25) + \beta_4(FOR25+) + \theta'Z + \epsilon \quad (3.1)$$

where Z is the vector of control variables and ϵ is the error term.

The results from the estimation of equation (3.1) using the combined sample are presented in Table 3.3. The first two columns of the table show that inside ownership has no significant impact on firm value till the 25% level.⁷ Beyond 25%, a one per cent increase in inside ownership leads to a 2% increase in firm value, thereby indicating operation of the convergence of interest effect. The absence of a significant negative spline implies the absence of significant entrenchment effects. Since the data is cross sectional, we test for heteroscedasticity using the procedure suggested by White [79]. The test procedure rejects homoscedasticity. Thus, all further results in this essay are based on White's heteroscedasticity consistent covariance matrix.⁸

⁷i.e., $INS0 - 25$ has a statistically insignificant coefficient.

⁸Since White's test is an omnibus test, acceptance of the null implies not only ho-

At this stage we also introduce liquidity (RELTF) as an additional control variable. As can be seen from the subsequent columns of Table 3.3, liquidity is significant in the quadratic specification. The sign of the coefficients suggest a U shaped relation where the turning point is at 64%.

Inside ownership means different things for the two types of firms.⁹ The holdings by directors and their relatives can be treated as part of inside holding for either type of firm. In case of firms affiliated to business groups, part of the insider holdings are stakes held by other group firms. This part is buried in the holdings of the corporate bodies (CORP). This figure also contains information on the stakes held by other companies purely for investment purposes. However, for any given group firm, the split between stakes of the group companies and that of the other companies is not known.

In the case of stand alone firms, it is likely that these shares are held by other firms for investment (rather than control) purposes.¹⁰ Shares may also be held by companies which have some vested interests in this firm (e.g., suppliers of raw materials or customers of the firm) . These parties could use their block shareholding to influence the firms to make decisions that moscedasticity but also that the linear model is correctly specified. Rejection of the null could be on account of mis-specification rather than heteroscedasticity per se. To check whether this was the case, the plots of the fitted values of the dependent variable and the square of the error terms were examined. The plots suggest the presence of heteroscedasticity. Thus, we use White's estimate of the variance covariance matrix.

⁹Khanna and Palepu [39] also point out that the concept of inside ownership is difficult to interpret when group and non group firms are considered together.

¹⁰If significant stakes were held by firms that were related in some way then these firms would have been classified into a group, given the classification methods of CMIE.

are detrimental to shareholder interests.¹¹ It cannot be predicted *a priori* whether this negative influence will dominate the positive influence which is an outcome of the monitoring role played by the corporate bodies.

Since the profile of the components of CORP differs among the two sets of firms, it is worth examining the behaviour of components of inside holding separately. We first examine the components of inside ownership for the combined sample. The results are presented in Table 3.4. For the combined sample of group and non group firms, there is no significant negative influence of directors' holding or corporate holding on firm value.

We now split the sample into group and stand alone firms and estimate examine the components of inside ownership. Any difference in the behaviour of corporate bodies across the two sets of firms will be instructive in identifying the insiders in either type of firm. Thus, we estimate the following model for each of the subsamples (group and stand alone firms) separately:

$$\begin{aligned}
 Q = & \gamma_0 + \gamma_1(DIR0 - 25) + \gamma_2(DIR25+) + \gamma_3(CORP0 - 25) \\
 & + \gamma_4(CORP25+) + \gamma_5(FOR0 - 25) \\
 & + \gamma_6(FOR25+) + \theta'Z + \nu \quad (3.2)
 \end{aligned}$$

The results for estimates of equation (3.2) for both stand alone and group firms are reported in Table 3.5 and Table 3.6 respectively. Directors holdings have no impact across the two types of firms till the 25% mark. The difference is that even beyond 25%, directors' ownership has no significant impact on

¹¹This type of influence is termed as "conflict of interest" by Pound [59] the context of the role played by the large blockholders.

the value of group firms. For the stand alone firms, one percent increase in directors' holding beyond 25% increases firm value by 1.7 per cent.

Corporate bodies, acting as a group, appear to behave in similar patterns of influence across group firms and stand alone firms. At low levels of ownership (below 25%) the corporate holdings have an insignificant impact on firm value. At higher levels corporate bodies have a positive influence on firm value. However, the positive impact is significant only among group firms. A one percent increase in firm value leads to an increase in firm value by about 2 percent.

The unaffiliated firms have fairly large corporate holdings (average holding = 19.6%). Beyond 25% a one per cent increase in corporate holding increases Q by 0.05, but the effect is statistically insignificant. If there are corporate equityholders whose interests conflict with those of the other shareholders, their negative influence on company value is not significant. The directors' holdings, on the other hand, represent insider holding. The unaffiliated firms, therefore, offer us a cleaner sample in which inside ownership can be defined more precisely than it is for group firms or for the combined sample. The above results indicate that insider holdings (or directors' holdings) do not have any significant negative influence on firm value in the stand alone firms. The results indicate that there is a positive monotonic relation between directors' ownership and firm value beyond the 25% mark.

What can one say about the role of corporate holdings in group firms? As discussed earlier, part of insider holdings in the group firms are buried in the corporate holdings figure. Thus, for this set of firms, obtaining *precise* estimates of inside ownership is difficult. This in turn implies that it is not

possible to make any unequivocal statements about the relation between inside and firm value. Corporate holdings are not significant at lower levels but have a positive influence at higher levels. If a large part of corporate holding is by non group companies, then one can conclude that these companies are effective monitors. If we assume that the corporate holdings mainly consist of group firms and re-estimate equation (3.1) for the business group firms alone, then there is still no indication of a significant negative effect. This concurs with our hypothesis of a positive monotonic relation between inside ownership and firm value.

However, another possible explanation of the positive relation in group firms is as follows. A business group in India is typically a collection of publicly traded firms operating as separate legal entities. Khanna and Palepu [38] have shown that the ability of groups to use "internal capital markets" to fund the *ongoing* activities of a group firm using cash flows of another is limited. The most important financing activity of the group as an entity is to launch new ventures where the controlling family and the existing group firms invest. Thus the group performs more like a venture capitalist than playing an role in allocation of working capital among its affiliates. Assuming that a high proportion of CORP consists of group holdings and that ownership structures are relatively stable, a positive relation could imply that better are the projects of a group affiliated firms, higher is the investment in it by other firms in the same group.

Foreign ownership is positively related to firm value at all levels. It is however, insignificant at lower levels for the stand alone firms. This sign has to be interpreted carefully. Our regressions cannot distinguish between the

possibility that the foreign shareholders are buying better managed firms and the possibility that foreign share owners as a block perform a monitoring role. Khanna and Palepu [39] provide evidence suggesting that the positive relation is an outcome of the monitoring role performed by the foreign shareholders.

This is a convenient point to discuss how this essay relates to work by Khanna and Palepu [38], [39] which reports a positive relation between inside ownership and firm value. Our results are complementary and add substance to their results.

Neither of the papers mentioned above focus explicitly on the empirical relation between inside ownership and firm value.¹² In focusing on this relation and demonstrating the absence of negative relationship between inside ownership and firm value, our results add veracity to the monotonic specification for the relation between inside ownership and performance that they have assumed in their work.

Additionally, the data sets have qualitative differences. Our paper uses cross sectional data from a later year.¹³ We have more firms in either of the categories and thus a larger sample overall. The proportion of stand alone firms is higher in our data set.

Control Variables

The behaviour of control variables also differs across the two firms. Adver-

¹²In [38] they examine the effect of the level of diversification of the business group on an affiliated firm's value. In [39] they examine the interaction between foreign ownership, inside ownership and domestic institutional ownership in Indian firms. They are interested in examining the impact of monitoring by the foreign and domestic institutional owners.

¹³Khanna and Palepu use 1993 data in both papers.

tising intensity is significant for the group firms alone indicating that group affiliation has considerable intangible value. Leverage is significant only for the stand alone firms.

High leverage could be mean a signal a la Ross [62] or because of the tax advantage of debt. The average return on assets (ratio of post tax profit to total assets) for stand alone firms is -0.005. Thus, it is unlikely that the positive coefficient of leverage is a result of free cash flow. Size and depreciation intensity of the firm are insignificant across both sets of variables.

The U shaped relation between liquidity is a consistent feature of all regressions. The one plausible reason for this relation between firm value and liquidity has already been discussed earlier. In this context, a comparison of the values of Q and the return on assets is revealing. The average value of Q in firms lying in the top two deciles of trading frequency ($> 90\%$) and bottom decile is are very similar (trading frequency $< 25\%$) are 1.162 and 1.177 respectively. However, the corresponding average return on assets reveal a very different story. The lowest decile has an average of -0.026 while the highest two deciles have an average return of 0.38 on their assets. Thus, U shaped relation is plausibly because of reasons stated earlier in the essay.

3.4.1 Robustness Tests

We also conduct two robustness tests in order to examine the time stability of the results and to test the influence of outliers. Since the sample is a one year cross section data, the time stability of the results is open to question. Assuming that ownership structures remain relatively stable, we re-estimate all the equations using same ownership data but financial data from the

subsequent financial year, 1997-98. The results are presented in Tables 3.7, 3.8 and 3.9. The results on inside ownership have some interesting features. When the spline variable based on INS is used, we obtain a significant negative relation between INS and Q till the 25 per cent mark. However, when we use separate splines for directors' holdings and corporate holdings, the significant negative relationship disappears.

This anomaly is resolved if we recall the fact that while $INS = DIR + CORP$, the spline variable INS_{0-25} is not the sum of the corresponding variables derived from DIR and CORP. Using INS amounts to the presumption that DIR and CORP have a similar influence on firm value. There is no reason to presume so. In case of stand alone firms, the two entities represent different interest groups. In case of group firms there is alignment of interests between directors and only a part of the corporate bodies (other firms belonging to the same group).

We also perform a test to examine the influence of outliers. The observations are ordered by the value of inside ownership and the regressions are estimated again after leaving out the top five per cent and bottom five per cent of the observations. The results confirm our earlier findings on the ownership variables. The results of this are reported in Table 3.10- 3.12. The results indicate a phenomenon similar to the one reported above in the time stability test. The results on directors' ownership remain unchanged.

3.5 Conclusion

The non monotonic relation between inside ownership and firm value observed for the U.S. economy depends on the interaction of the *convergence of interest* effect and the *entrenchment* effect. The Indian institutional structure suggests that the entrenchment effect is weak in case of the Indian corporate sector, thereby indicating a positive monotonic relation between inside ownership and firm value. This contrasts with recent paper by Sarkar and Sarkar [64], which obtains a non monotonic relation between inside ownership and firm value.

The main contribution of this work lies in pointing out that while examining Indian data, the use of a single definition of inside ownership can be misleading. There is a dichotomy among the Indian firms based on whether or not they are affiliated to a business group. The composition of inside ownership for these two subsets is different. We also argue that the issue of inside ownership and firm value can be examined meaningfully only for stand alone firms. Obtaining precise estimates of inside ownership for group firms is an infeasible task, from the database used.

Inside ownership was defined in previous work as the sum of the directors' holding and the holding of the other corporate bodies. However, the composition of corporate bodies across the two sets of firms is very different. We examine the components of inside ownership separately. For the stand alone firms insider- directors' holding does not have a significant negative impact on firm value over any range. This is in line with our hypothesis of a positive monotonic relation between inside ownership and firm value.

The behaviour of corporate bodies is not different across the two subsam-

ples. The similarity of results masks the different role played by corporate bodies. In case of the stand alone firms, the corporate bodies play an effective monitoring role at high levels of ownership. In case of firms affiliated to business groups, the proportion of corporate bodies stake held by other firms affiliated to the same group is not known. Thus, the results, obtained for group firms do not lend themselves to easy interpretation. Given the data, the ownership — performance relation is issue that can be addressed meaningfully only in for stand alone firms. The results for stand alone firms support the hypothesis of a positive monotonic relation between inside ownership and performance.

3.6 Tables for Chapter 2

Table 3.1: Descriptive Statistics: Stand Alone Firms

Variable	Notation	Obs	Mean	Std. Dev.	Min	Max
Tobin's Q	Q	937	0.770242	2.743128	0	70.02041
Directors' Holding	DIR	937	23.41424	17.80027	0	79.33
Corporate holding	CORP	937	19.73734	17.14587	0	94.46
Insider holding	INS	937	43.15158	19.58777	0	97.84
Foreign Holding	FOR	937	7.224685	10.66344	0	96.24
Institutional holding	INSTN	937	6.099776	10.45415	0	79.59
Top 50 holding	TFIF	937	10.19615	9.808599	0	83.58
Return on Assets	ROA	937	-0.00512	.1085552	0.714774	0.322393
Depreciation Intensity	DEPINT	937	0.123639	0.880604	0	17.28572
Advertising Intensity	ADVINT	937	0.006646	0.056679	0	1.666667
Leverage	LEVG	937	0.698633	2.335146	0	36.41935
Sales	SALES	937	42.41693	66.92336	0.01	1006.67
Relative trading freq.	RELTF	937	61.01233	26.93279	0.53	100

Table 3.2: Descriptive Statistics: Group Firms

Variable	Notation	Obs	Mean	Std. Dev.	Min	Max
Tobin's Q	Q	657	0.989018	1.36296	0	20.90423
Directors' Holding	DIR	657	8.740259	14.58556	0	97.49
Corporate holding	CORP	657	35.08686	19.20768	0	99.58
Insider holding	INS	657	43.82712	19.05696	0	99.58
Foreign Holding	FOR	657	8.954231	12.82889	0	74.04
Institutional holding	INSTN	657	17.26304	16.94507	0	79.23
Top 50 holding	TFIF	657	4.955662	6.611832	0	79.31
Return on Assets	ROA	657	0.02097	0.095617	-0.98529	0.278888
Depreciation Intensity	DEPINT	657	0.046205	0.102005	0	1.717687
Advertising Intensity	ADVINT	657	0.005582	0.014363	0	0.108926
Leverage	LEVG	657	0.770135	1.020017	0	15.45125
Sales	SALES	657	308.7943	721.0541	0.14	9926.49
Relative trading freq.	RELTF	657	76.61756	24.98808	0.43	100

Table 3.3: Inside Ownership: Combined Sample

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>INS0 - 25</i>	-0.01367	-1.489	-0.01374	-1.504	-0.01284	-1.426
<i>INS25+</i>	0.019218	3.284 (***)	0.018529	2.793 (***)	0.018624	2.817 (***)
<i>FOR0 - 25</i>	0.009611	1.965 (**)	0.010047	2.074 (**)	0.007859	1.503
<i>FOR25+</i>	0.031992	3.109 (***)	0.031552	3.032 (***)	0.033348	3.115 (***)
<i>LEVG</i>	0.618431	2.024 (**)	0.618432	2.018 (**)	0.619899	2.038 (**)
<i>DEPINT</i>	-0.04377	-0.814	-0.03878	-0.664	-0.0586	-0.99
<i>ADVINT</i>	1.139624	1.346	1.246248	1.452	0.991977	1.237
<i>LSALES</i>	0.037078	1.134	0.056204	1.032	0.028165	0.496
<i>RELTF</i>			-0.0026	-0.678	-0.03845	-2.917 (***)
<i>RELTF²</i>					0.000323	2.786 (***)
<i>BIZDUM</i>	0.028101	0.252	0.032993	0.296	-0.02082	-0.171
N=1594	$R^2 = 0.3837$		$R^2 = 0.3843$		$R^2 = 0.3932$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

INS0 - 25 takes value *INS* if $INS < 25$ and equals 25 if $INS \geq 25$. *INS25+* takes value 0 if $INS < 25$ and equals $(INS - 25)$ if $INS \geq 25$. The definition of the spline variables based on *FOR* is similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = $\log(\text{sales})$. *BIZDUM* takes value 1 if the firm is affiliated to a business group.

Table 3.4: Components of Inside Ownership: Combined Sample
 Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistic
<i>DIR0 - 25</i>	-0.00061	-0.133
<i>DIR25+</i>	0.014653	2.584(***)
<i>CORP0 - 25</i>	-0.00941	-1.35
<i>CORP25+</i>	0.032193	2.33(**)
<i>FOR0 - 25</i>	0.008018	1.56
<i>FOR25+</i>	0.034223	3.564(***)
<i>LEVG</i>	0.617347	2.068(**)
<i>DEPINT</i>	-0.06654	-1.058
<i>ADVINT</i>	0.942387	1.258
<i>LSALES</i>	0.033694	0.631
<i>RELTF</i>	-0.03984	-3.041(***)
<i>RELTF</i> ²	0.000334	2.883(***)
<i>BIZDUM</i>	-0.18414	-1.054
N=1594	$R^2 = 0.4009$	

*** significant at 1% level,

** significant at 5% level,

* significant at 10% level,

DIR0 - 25 takes value *DIR* if *DIR* < 25 and equals 25 if *DIR* ≥ 25. *DIR25+* takes value 0 if *DIR* < 25 and equals (*DIR* - 25) if *DIR* ≥ 25. The definition of the spline variables based on *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = log(sales). *BIZDUM* takes value 1 if the firm is affiliated to a business group.

Table 3.5: Results on Stand Alone Firms

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistics
<i>DIR0 - 25</i>	-0.00473	-0.754
<i>DIR25+</i>	0.016949	2.194(**)
<i>CORP0 - 25</i>	-0.01526	-1.234
<i>CORP25+</i>	0.046702	1.627
<i>FOR0 - 25</i>	0.00267	0.363
<i>FOR25+</i>	0.02712	2.618(***)
<i>LEVG</i>	0.6805	2.124(**)
<i>DEPINT</i>	-0.09039	-1.178
<i>ADVINT</i>	0.077158	0.206
<i>LSALES</i>	-0.0156	-0.181
<i>RELTF</i>	-0.05331	-2.754(***)
<i>RELTF</i> ²	0.000474	2.727(***)
N=937	$R^2=0.435$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

DIR0 - 25 takes value *DIR* if *DIR* < 25 and equals 25 if *DIR* ≥ 25. *DIR25+* takes value 0 if *DIR* < 25 and equals (*DIR* - 25) if *DIR* ≥ 25. The definition of the spline variables based on *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = log(sales).

Table 3.6: Results on Group Firms

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistic	Coefficient	t-statistic
<i>INS0 - 25</i>	-0.02138	-1.335		
<i>INS25+</i>	0.018691	2.584(***)		
<i>DIR0 - 25</i>			0.008492	1.387
<i>DIR25+</i>			0.011453	1.329
<i>CORP0 - 25</i>			-0.01173	-1.05
<i>CORP25+</i>			0.02165	2.148(**)
<i>FOR0 - 25</i>	0.017968	3.057(***)	0.017571	3.008(***)
<i>FOR25+</i>	0.02207	1.715(**)	0.024767	2.048(**)
<i>LEVG</i>	0.078005	1.644	0.077201	1.563
<i>DEPINT</i>	-0.18688	-0.396	-0.27711	-0.539
<i>ADVINT</i>	14.14237	3.166(***)	14.43842	3.238(***)
<i>LSALES</i>	0.059937	0.89	0.058737	0.835
<i>RELTF</i>	-0.01295	-1.848(*)	-0.01453	-2.08 (**)
<i>RELTF</i> ²	9.66E-05	1.555	0.000109	1.702(*)
N=657	$R^2 = 0.4586$		$R^2 = 0.4598$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

INS0 - 25 takes value *INS* if *INS* < 25 and equals 25 if *INS* ≥ 25. *INS25+* takes value 0 if *INS* < 25 and equals (*INS* - 25) if *INS* ≥ 25. The definition of the spline variables based on *DIR*, *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = log(sales).

Table 3.7: Time Stability Test: Combined Sample

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistics	Coefficient	t-statistics
<i>INS0 - 25</i>	-0.01972	-1.853(*)		
<i>INS25+</i>	0.012282	3.658(***)		
<i>DIR0 - 25</i>			0.00835	1.713(*)
<i>DIR25+</i>			0.006525	1.125
<i>CORP0 - 25</i>			-0.00799	-1.402
<i>CORP25+</i>			0.016304	3.053(***)
<i>FOR0 - 25</i>	0.010099	1.799(*)	0.009433	1.637
<i>FOR25+</i>	0.023745	2.513(**)	0.028361	3.129(***)
<i>LEVG</i>	0.14219	4.348(***)	0.142615	4.374(***)
<i>DEPINT</i>	0.135908	1.089	0.145335	1.159
<i>ADVINT</i>	5.052185	1.908(*)	5.097016	1.924(*)
<i>LSALES</i>	0.081155	2.082(**)	0.089106	2.329(**)
<i>RELTF</i>	-0.02938	-5.82(***)	-0.0297	-5.876(***)
<i>RELTF²</i>	0.000289	5.997(***)	0.000294	6.048(***)
<i>BIZDUM</i>	-0.01534	-0.154	-0.00593	-0.064
N=1345	$R^2=0.39$		$R^2=0.391$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

INS0 - 25 takes value *INS* if *INS* < 25 and equals 25 if *INS* ≥ 25. *INS25+* takes value 0 if *INS* < 25 and equals (*INS* - 25) if *INS* ≥ 25. The definition of the spline variables based on *DIR*, *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = log(sales). *BIZDUM* takes value 1 if the firm is affiliated to a business group.

Table 3.8: Time Stability Test: Stand Alone Firms

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistics
<i>DIR0 - 25</i>	0.003997	0.679
<i>DIR25+</i>	0.004295	1.541
<i>CORP0 - 25</i>	-0.00714	-1.199
<i>CORP25+</i>	0.017472	2.782(***)
<i>FOR0 - 25</i>	0.012775	1.32
<i>FOR25+</i>	0.016283	1.686(*)
<i>LEVG</i>	0.13826	1.461
<i>DEPINT</i>	0.184066	1.129
<i>ADVINT</i>	1.009744	0.459
<i>LSALES</i>	0.076218	1.948(*)
<i>RELTF</i>	-0.03071	-3.876(***)
<i>RELTF</i> ²	0.000326	3.767(***)
N=756	$R^2 = 0.3468$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

DIR0 - 25 takes value *DIR* if $DIR < 25$ and equals 25 if $DIR \geq 25$. *DIR25+* takes value 0 if $DIR < 25$ and equals $(DIR - 25)$ if $DIR \geq 25$. The definition of the spline variables based on *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. $LSALES = \log(\text{sales})$.

Table 3.9: Time Stability Test: Group Firms

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistics	Coefficient	t-statistics
<i>INS0 - 25</i>	-0.03795	-1.796(*)		
<i>INS25+</i>	0.020631	2.708(**)		
<i>DIR0 - 25</i>			0.012154	1.536
<i>DIR25+</i>			0.02246	0.826
<i>CORP0 - 25</i>			-0.00985	-0.741
<i>CORP25+</i>			0.016555	2.161(**)
<i>FOR0 - 25</i>	0.006961	0.999	0.005	0.725
<i>FOR25+</i>	0.031981	1.863(*)	0.037835	2.335(**)
<i>LEVG</i>	0.14085	5.812(***)	0.141987	5.688(***)
<i>DEPINT</i>	0.015058	0.099	0.047681	0.329
<i>ADVINT</i>	12.89545	2.344(**)	13.00316	2.301(**)
<i>LSALES</i>	0.08241	0.989	0.086039	1.007
<i>RELTF</i>	-0.03039	-3.35(***)	-0.03005	-3.175(***)
<i>RELTF²</i>	0.000289	3.461(***)	0.00029	3.418(***)
N=589	$R^2 = 0.4619$		$R^2 = 0.4579$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

INS0 - 25 takes value *INS* if *INS* < 25 and equals 25 if *INS* ≥ 25. *INS25+* takes value 0 if *INS* < 25 and equals (*INS* - 25) if *INS* ≥ 25. The definition of the spline variables based on *DIR*, *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = log(sales).

Table 3.10: Robustness to Outliers: Combined Sample

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistic
<i>INS0 - 25</i>		
<i>INS25+</i>		
<i>DIR0 - 25</i>	0.00246	1.346
<i>DIR25+</i>	0.004729	2.773(***)
<i>CORP0 - 25</i>	0.000802	0.404
<i>CORP25+</i>	0.002962	2.164(**)
<i>FOR0 - 25</i>	0.004217	2.266(**)
<i>FOR25+</i>	0.013768	4.378(***)
<i>LEVG</i>	0.039253	2.648(***)
<i>DEPINT</i>	0.013207	0.906
<i>ADVINT</i>	0.505206	1.728(*)
<i>LSALES</i>	0.055719	5.58(***)
<i>RELTF</i>	-0.01563	-6.922(***)
<i>RELTF</i> ²	0.000114	6.149(***)
<i>BIZDUM</i>	0.034424	1.03
N=1435	$R^2=0.6972$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

INS0 - 25 takes value *INS* if $INS < 25$ and equals 25 if $INS \geq 25$. *INS25+* takes value 0 if $INS < 25$ and equals $(INS - 25)$ if $INS \geq 25$. The definition of the spline variables based on *DIR*, *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = $\log(\text{sales})$. *BIZDUM* takes value 1 if the firm is affiliated to a business group.

Table 3.11: Robustness to Outliers: Stand Alone Firms

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistic
<i>DIR0 - 25</i>	0.002441	1.291
<i>DIR25+</i>	0.00602	3.421(***)
<i>CORP0 - 25</i>	0.001569	0.735
<i>CORP25+</i>	0.002868	1.67(*)
<i>FOR0 - 25</i>	0.002663	1.202
<i>FOR25+</i>	0.014677	3.567(***)
<i>LEVG</i>	0.051929	2.565(***)
<i>DEPINT</i>	0.010577	0.684
<i>ADVINT</i>	0.229594	1.855(*)
<i>LSALES</i>	0.046244	4.114(***)
<i>RELTF</i>	-0.01816	-6.56(***)
<i>RELTF</i> ²	0.000147	6.211(***)
N=854	$R^2 = 0.6948$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

DIR0 - 25 takes value *DIR* if *DIR* < 25 and equals 25 if *DIR* ≥ 25. *DIR25+* takes value 0 if *DIR* < 25 and equals (*DIR* - 25) if *DIR* ≥ 25. The definition of the spline variables based on *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = log(sales).

Table 3.12: Robustness to Outliers: Group Firms

Dependent variable is $Q = (\text{mkt value of equity}) / (\text{book value of equity} + \text{reserves})$

Variable	Coefficient	t-statistic	Coefficient	t-statistic
<i>INS0 - 25</i>	-0.009557	-1.25		
<i>INS25+</i>	0.003809	2.038(**)		
<i>DIR0 - 25</i>			0.003034	0.78
<i>DIR25+</i>			0.000565	0.118
<i>CORP0 - 25</i>			-0.0013	-0.254
<i>CORP25+</i>			0.002934	1.467
<i>FOR0 - 25</i>	0.007897	2.423(**)	0.007204	2.179(**)
<i>FOR25+</i>	0.008289	1.456	0.010709	2.009(**)
<i>LEVG</i>	0.025372	1.084	0.023795	1.014
<i>DEPINT</i>	-0.056241	-0.358	-0.06239	-0.379
<i>ADVINT</i>	6.68303	2.801(***)	6.941227	2.905(***)
<i>LSALES</i>	0.055314	2.625(***)	0.056309	2.542(**)
<i>RELTF</i>	-0.011782	-2.865(***)	-0.01248	-3.077(***)
<i>RELTF²</i>	0.000071	2.237(**)	0.000076	2.402(**)
N=581	$R^2 = 0.7248$		$R^2 = .72$	

*** significant at 1% level

** significant at 5% level

* significant at 10% level

INS0 - 25 takes value *INS* if *INS* < 25 and equals 25 if *INS* ≥ 25. *INS25+* takes value 0 if *INS* < 25 and equals (*INS* - 25) if *INS* ≥ 25. The definition of the spline variables based on *DIR*, *CORP* and *FOR* are similar. *LEVG*, *DEPINT*, *ADVINT* and *RELTF* are as defined in Tables 3.1 and 3.2. *LSALES* = log(sales).

Chapter 4

Information Content of Credit Rating Changes

4.1 Introduction

This essay analyses the stock price reaction to the downgrading of debt issues of Indian firms. Analysis of the informational content of credit rating is important for two reasons. First, information acquisition is a costly proposition for shareholders particularly in less developed stock markets. The ratings and the announced changes might be conveying new information not known to the shareholders. Second, credit rating is a recent phenomenon in India and the role played by the rating agencies has been the focus of discussion in recent times.¹

Much of the existing research on this issue pertains to the U.S. economy. Pinches and Singleton [58] examine a set of 207 rating changes from 1950

¹Eg. see Raghunathan and Varma [60].

to 1972. They do not find any significant abnormal behaviour in the stock prices in the month when the downgrade is announced. They report that abnormal returns stream turns positive (negative) well before the month of announcement of the upgrade (downgrade). Thus, their study questions the hypothesis that rating changes contain any new information. Griffin and Sanvicente [24] examine the adjustment in stock price of firms eleven months before and after a bond reclassification and compare these abnormal returns with the abnormal returns of a control portfolio where the event has not occurred. They find that controlling for other factors, a downgrade leads to a significant negative response in stock prices in the month of announcement and in the cumulative returns in the eleven months that precede the downgrade. Subsequent papers have refined their analysis by using daily returns on stocks. Holthausen and Leftwich [30], Hand, Holthausen and Leftwich [27] and Nayar and Rozeff [54] examine the stock price reaction of changes in rating and find that downgrades have a significant negative impact on stock price. The reaction to upgrades is mixed.

We conduct an event study around the announcements of downgrades of Indian firms on a sample of 54 events using daily stock returns data. Conducting event studies using daily returns of Indian firms is a relatively new area of research and little is known about the statistical properties of the returns data. Thus, our modus operandi is to examine the significance of the abnormal returns using a variety of techniques in event study literature. We do not find a significant abnormal price reaction to announcements of downgrades. The average returns of the firms seem to bottom out well before the actual announcement of the downgrade. The rest of the essay is as follows.

Section 4.2 briefly discusses the credit rating and the industry in India. In section 4.3 we discuss the literature on the linkages between ratings and stock price. Section 4.4 describes the sample. In the subsequent section, we discuss the event study methodology adopted in this essay. The results are discussed in section 4.6. Section 4.7 concludes the essay.

4.2 Credit Rating: General Issues and the Indian Context

The essence of credit rating is explained succinctly by the following passage, obtained from the website of a leading Indian credit rating agency:²

The credit rating is ... a symbolic indicator of the current opinion of the relative capability of the issuer to service its debt obligation in a timely fashion. ... A rating is specific to a debt instrument and is intended as a grade, an analysis of the credit risk associated with the particular instrument. It is based upon the relative capability and willingness of the issuer of the instrument to service the debt obligations (both principal and interest) as per the terms of the contract. Thus, a rating is neither a general purpose evaluation of the issuer, nor an overall assessment of the credit risk likely to be involved in all the debts contracted or to be contracted by such entity. The primary objective of rating is to provide guidance to investors/creditors in determining a credit

²The quote is taken from the website of ICRA, one of the leading Indian credit rating agencies (www.icraindia.com/method.htm.)

risk associated with a debt instrument/credit obligation. It does not amount to a recommendation to buy, hold or sell an instrument as it does not take into consideration factors such as market prices, personal risks preferences and other considerations which may influence an investment decision. The rating process is itself based on certain “givens”. The agency, for instance, does not perform an audit. Instead, it is required to rely on information provided by the issuer and collected by analysts from different sources, including interactions in-person with various entities.

Credit rating is a very recent phenomenon in India. The oldest credit rating agency Credit Rating and Information Services of India Limited (CRISIL) was established in 1987. The two other main players are ICRA Limited³, established in 1991 and Credit Analysis and Research Limited (CARE), established in 1993. All three are in the business of rating a firm’s debt issues and preference shares. The number of issues (as of end March 1998) graded by each of these agencies is given in Table 4.1. Firms can go to multiple rating agencies to seek ratings for their instruments. Under the regulations of the Reserve Bank of India and the Securities and Exchange Board of India — the nation’s capital market watchdog — credit rating is compulsory for the following issues:

- (a) a public issue of debentures or bonds with a conversion or redemption period of more than eighteen months,
- (b) an issue of commercial paper (issuance of commercial paper is allowed only if it gets one of the top two ratings from the rating agency),

³formerly known as Investment Information and Credit Rating Agency.

(c) a fixed deposit of a non-banking financial company that has a net worth of more than Rs. 5 million.

Till very recently Indian rating agencies were under contract from the firm to make public only those initial ratings that were accepted by the firm issuing the security. This is a major difference in the operating environment of ratings agencies between India and the U.S. Very recent legislative amendments have made it compulsory for the Indian rating agencies to reveal all ratings whether or not they are accepted by the firms.⁴ These regulations were not in force during the period of study considered by this essay. However, in both countries once an instrument is rated, agencies track the firms and changes in ratings are always made public. The point is worth re-emphasizing. The clause that the agency could publicize only the ratings accepted by the issuing firm held only for initial ratings and not any subsequent changes. All subsequent announcements of changes in ratings are announced unilaterally by the rating agency. This implies that should the agencies be accurate in their task, there is a potential bias in the ratings observed by the public. Only good firms will have published ratings since the bad firms will not consent to release of their ratings.

There is another difference between the operation of rating agencies in the U.S. and in India. In the U.S. agencies rate firms voluntarily. Thus, there is incentive for the agencies to build reputation by assigning ratings that are accurate assessments of the default risk. The bigger agencies like Standard and Poor's and Moody's have in fact built their reputation in this

⁴Securities and Exchange Board of India (Credit Rating Agencies) Regulations, July 7, 1999.

fashion. The smaller agencies try to build their reputation by offering similar ratings or even predicting "whether and how the rating agencies might try to change their opinions of the firms' debt, for such regradings shift its relative value."⁵ In India, credit rating agencies rate only those firms which go to the agency for getting rated. This has been recognised as a distortion in the incentives of the rating agencies.⁶ The combination of this with the clause that only the accepted ratings be made public creates incentives for potential overstatement of ratings in India.

4.3 Information Content of Rating Changes

Credit rating is an opinion on the firms ability to service a particular outstanding debt instrument. Literature has focussed on the role of credit rating agencies as a predictor of default. The key issue there is whether the absence of abnormal performance implies that rating agencies react belatedly to the firm's performance while the stock market has already incorporated the information in its valuation of the firm. Our interest is whether it can provide any *new* information to the investors in a country like India where the financial market and the complementary institutions have not evolved to the extent to which they have in the developed countries.

One view of the rating agencies is that they use only publicly available information in the ratings process. The implication here is that investors and researchers can replicate the rating agencies and thus asset prices are unresponsive to rating changes. Wakeman [77] argues that even though the

⁵See *The Economist*, May 15, 1999, pp. 88-89.

⁶See *The Economist*, July 15, 1995, pp.61-62.

agencies use publicly available information, firms desire to have their bonds rated to reassure the public about its prospects, because the rating agencies have a reputation for analyzing public information that influences investors and the value of the assets. Thus, it is possible that the rating changes carry information. How this reputation is developed is not outlined in this theory.

The second view is that the rating agencies possess private information. Holthausen and Leftwich [30] note that the bond rating agencies and management confer and communicate during the ratings process. The agencies also maintain that the ratings are meaningful because of their access to the information and their ability to process it.

Academic research in this area has utilized several approaches to address the issue. One stream of the literature has looked at bond price returns and bond yields to assess the information content of rating changes. Grier and Katz [23], Hettenhouse and Sartoris [29], Ingram, Brooks and Copeland [31], Katz [36], and Weinstein [78], examine the bond market reaction to rating changes. The evidence is mixed. Using monthly bond returns, Weisenstien reports no significant price reaction to rating changes while Ingram, Brooks and Copeland find a significant fall in monthly bond yields in response to downgrades. Another part of the literature focuses on the impact of the ratings change on stock market.

Hypothesizing about the impact of a credit rating (which is an opinion on the firm's debt) on equity returns is a bit more complex. Pinches and Singleton [58] describe the process of ratings change as a dichotomous one. The rating agencies continuously re-evaluate the rated firms as a part of their normal review process. Sometimes they find that the financial conditions

surrounding the firm have changed sufficiently to warrant a change in rating. However, occasionally, a company specific event may occur which causes the agency to immediately review the rated firm in order to re-assess the assigned rating. Given this dichotomous nature of the evaluation process, the response of stock price to rating changes depends on whether or not the rating was anticipated. Using monthly returns data, they report that for upgrades the positive abnormal stock returns occur about 24 months in advance and for downgrades they occur about 18 months before the downgrade. The event month itself shows no significant abnormal returns.

However, Griffin and Sanvicente [24] contend that the above analysis is inadequate as it does not have sufficient controls. They observe that since the rating change, to a degree, is also a reflection of publicly available market and accounting data, such public information should be carefully controlled for if any of the price adjustments are to be attributed to the rating per se. They use a control sample to account for these effects and examine the share price behaviour in months prior to the reclassification. Other papers have also tried to control for the information effects by distinguishing between "contaminated" and "non contaminated" firms by examining whether there was any simultaneous release of other information around the time of the reclassification.

Holthausen and Leftwich [30] contend that it is difficult to draw inferences about the timing of a downgrade from the security behaviour prior to a rating change. Without knowing the rating agency's loss function, we cannot identify the *optimal* time to change the rating. Credit ratings try to measure probability of default, a continuous variable that changes as new

information arrives. However, the rating categories are discrete. Thus, we expect to see some abnormal price behaviour prior to a rating change but we cannot determine whether it is “too much” or “too little”, i.e, whether the agency acts too early or too late. Instead, they argue that a significant abnormal response to announcement of a rating change is evidence that agencies provide some information that is not already incorporated in the security prices.

Hand, Holthausen and Leftwich [27] examine excess stock and bond price returns associated with announcements of additions to the ratings agencies' watchlist and to actual rating changes. Their paper controls for the market's expectation of the rating. They find that the bond and stock prices behave asymmetrically. Bond returns are significant for upgrades while stock returns are significant for downgrades. The creditwatch placements are significant only if the placement is unexpected. Nayar and Rozeff [54] provide evidence that not only changes but initial ratings of new commercial paper have an impact on stock prices. In particular they find that a downgrade leads to negative excess returns.

Goh and Ederington [22] emphasize that it is unlikely that all downgrades have informational content with negative implications. Some of the downgrades may be anticipated by market participants. Besides, downgrades triggered by an anticipated move to transfer wealth from bondholders to stockholders may have a positive stock reaction. Based on announced reasons of downgrade, the authors separate firms on basis of the implications for stock price and whether or not the rating has changed in response to recently released public information. They report a significant negative stock return

reaction only when the rating agency downgrades on account of deterioration of financial prospects of the firm.

The above mentioned studies usually control for concomittant information to control for the effect of confounding events. The controls were necessary because the rating changes were triggered off by fundamental changes in the issuer's risk while the objective is to isolate the informational value of an announcement per se. In a recent paper Kliger and Sarig [40] employ a new approach to examining this issue. They examine the bond and stock return effects on ratings changes that occurred when Moody's refined its rating system. Finer ratings were assigned to all firms on the same day, based on the existing underlying information. Kliger and Sarig [40] also control for expectations and distinguish between ratings changes that affect firm value and those which affect the division of wealth between bonds and equity. They conclude that rating information does not affect firm value. They also find that results in tune with asset substitution theory. Bond and stock price react in opposite directions. Debt value increases while equity value decreases when Moody's announces a better than expected rating.

Several studies have also examined the cross sectional determinants of abnormal returns. The determinants include the initial and the new ratings, the total outstanding debt of the firm and whether or not the firm was placed on a credit watch. These issues need to be examined in greater depth only if the abnormal returns to the event are significantly different from zero.

The rating agencies themselves take an ambivalent stand regarding the information content of their ratings. On the one hand they emphasize the effort undertaken in accessing company specific information and their com-

parative advantage in assessing the available information about the firm. On the other hand, they also emphasize that in the end it is just an opinion and not a recommendation to buy. An equally ambivalent and confusing opinion on the role of credit rating is presented by the media.⁷

4.4 Data

Our sample consists of 54 downgrades from 47 firms between March 1, 1997 and December 31, 1998. Five firms have two events and one has three events. We examine downgrades because bulk of the ratings information we have been able to obtain are only about downgrades or reaffirmations of rating. Upgrades are rare. All these firms are traded on the Bombay Stock Exchange. Since the returns data are not readily available for Indian firms, we have calculated the returns series for each individual firm. Our sample size was also restricted by the availability of complete information on dividends, i.e., the dividends per share and the ex dividend date, both of which are needed for the returns computation.⁸ The stock price and dividends data and the information on the downgrades have been obtained from Prowess, an electronic database maintained by Centre for Monitoring Indian Economy

⁷See, for instance, the note on credit rating in www.indiainfo.com. While instructing investors to take the ratings as a base point or a reference, this site also advises them to keep a tab on the stock price since “as a collective, the market is far smarter at predicting problems than any credit rating agency.” The site also suggests on the basis of casual observation that there is a sharp erosion in stock prices of companies much before their credit ratings were downgraded.

⁸The dividend data was cross checked from the website of the Bombay Stock Exchange — www.bseindia.com.

(CMIE). Prowess collects the news from two sources — direct press releases from the rating agency and reports of such downgrades in the press. *The date of the down grade as obtained from Prowess is designated as date 0 of the event.*⁹ The estimation period is the days [-140,-21] before the date zero and the event window is the interval [-20, +4]. Returns for day t were calculated using the formula

$$R_t = \frac{P_t - P_{t-1} + Div_t}{P_{t-1}}$$

where P_t and P_{t-1} are prices adjusted for bonuses and stock splits and Div_t is zero for all days other than the ex dividend date.¹⁰ The market portfolio is approximated by the BSE-200 index, a value weighted index of 200 stocks traded on the Bombay Stock Exchange.

It must be noted that though there are multiple events from some firms, there is no overlap between the event window of one period and estimation period of the subsequent event for such firms.

We include an event in the sample irrespective of the number and the term structure of the issues that were downgraded on day zero. Previous papers in the literature have adopted various approaches to the problem.

⁹This assumes that the gap between the time of the press release and the time when the press publishes it is short. This assumption is fair if downgrading of a firm's instrument is big news and thus is reported fast. Additionally we define a suitably long event window before date zero to account for the possible lag in information between the press release and the news paper report of the same event.

¹⁰Using the formula

$$R_t = \log\left(\frac{P_t + Div_t}{P_{t-1}}\right)$$

to compute returns does not alter the results as the returns series are almost similar.

Some include a firm in the sample if only one instrument is downgraded. Hand, Holthausen and Leftwich [27] select a maximum of five bonds with longest maturity periods in such a case. We do not restrict our selection procedure for two reasons. First, the sample size has already been limited by other factors like non availability of dividend information. Second, the number of bonds downgraded becomes an important issue only if we are interested in examining the bond yields or the bond price reaction. We are more generally interested in whether downgrading as a phenomenon has any information content for the stock market since it is generally believed that acquiring information is costlier in relatively underdeveloped markets like India.¹¹

Table 4.2 has the date of announcement of the downgrade, name of the rating agency and the source of information for each event in the sample. The ratings before and after the downgrade are presented in Table 4.3.¹²

4.5 Event Study: Methodology and Issues

An event study measures the impact of a particular event on the value of the firm by examining the stock price reaction to the event's announcement. This tool has been used in various branches of economics and finance.¹³ Any

¹¹In this context, just the fact that multiple instruments have been downgraded may convey some information to the investors as opposed to the fact that only one issue has been downgraded.

¹²Prowess did not contain the ratings in six cases. We have nevertheless included these in the sample as a downgrade was reported. Multiple ratings imply more than one instruments has been downgraded.

¹³See Mackinlay [44], Petersen [57] for surveys on event studies and their applications .

new information that is expected to affect firm value will be incorporated into prices. Thus, the release of new information that can potentially affect the firm value will result in an abnormal change in the firm's returns stream. Abnormal returns are measured as the difference between the actual ex post return of the security over the event window and the predicted normal return for the same period. Formally, for firm i and event date τ the abnormal returns are usually measured as

$$AR_{it} = R_{it} - E(R_{it}/X_t) \quad (4.1)$$

where AR_{it} , R_{it} , $E(R_{it}/X_t)$ are the abnormal, actual and expected returns and X_t is the conditioning information for the normal return model. We model the fair (or normal) returns using the market model

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it} \quad (4.2)$$

where e_{it} is an error term with zero mean and a given variance. The expected stock return can be written as

$$E(R_{it}) = \alpha_i + \beta_i E(R_{mt}) \quad (4.3)$$

We define the estimation period to be days [-140,-21] and the event window as [-20,+4].¹⁴ In practice there are no hard and fast rules about the size or shape of the event window, though symmetric windows are used more often. However, as pointed out earlier, our date zero is a mix of actual press releases and newspaper reports. The relatively long span of the event window before the date zero is to allow for a gap between the actual announcement

¹⁴These correspond to the actual estimation and event periods used in this essay.

of the downgrade and its being reported in the press. The small post event window is consistent with the rest of the literature which examines the immediate impact of the rating change.

The abnormal returns for day τ in the event window are given by

$$AR_{i\tau} = R_{i\tau} - (\hat{\alpha} + \hat{\beta}R_{m\tau}) \quad (4.4)$$

where $R_{m\tau}$ is the return on the market portfolio in the event window and $\hat{\alpha}$ and $\hat{\beta}$ are estimates based on an estimation window distinct from the event window. If the precise date of the event is unknown then the abnormal returns are cumulated over the event window. The cumulative return for firm i between days -20 and τ of the event window is

$$CAR_i(\tau) = \sum_{t=-20}^{\tau} AR_{it} \quad (4.5)$$

The specific design of the event study is determined by the nature of the sample. In a canonical event study, the test statistic for examining the abnormal returns is constructed under the assumptions that the event date is known precisely and that the event windows of various firms in the sample do not overlap. When the former is not satisfied, inferences are based upon the cumulative abnormal return technique, pioneered by Fama, Fisher, Jensen and Roll [18].¹⁵ Violation of the latter assumption is called the phenomenon of “clustering”. The sample in this essay has clustered events. The general impact of clustering is to lower the number of securities whose performance around the event is independent. Clustering increases the variance of the abnormal returns and hence lowers the power of the test in detecting abnormal

¹⁵See for instance, Brown and Warner [8].

performance.^{16, 17}

The event study literature has handled clustering in two ways:

- (1) The abnormal returns are aggregated under a portfolio dated using calendar time, eg. Jaffe [32].
- (2) The second approach uses a multivariate regression on the security returns with dummy variables for the event dates. This method is more useful when there is perfect clustering of events across firms, i.e., the day zero is the same for all firms. Generalized least squares (GLS) procedure is used to account for the presence of cross correlation. Such methods are commonly used in regulatory event studies, e.g. Schipper and Thompson [65].

Our sample of firms do not have perfect overlaps of event windows but since the time span examined is relatively short, there is a fair amount of clustering in our sample.¹⁸ The key issue is to gauge the appropriateness of using the more convenient standard techniques despite the presence of the clustering. Brown and Warner [9] simulated abnormal returns using actual returns data for randomly selected samples and found that the market model was robust in the the presence of cross correlations. However, the power of

¹⁶Bernard [6] discusses some problems related to cross sectional dependence among abnormal returns. He points out that cross sectional dependence among the abnormal returns is likely to exist when at least some of the securities' returns are sampled from a common time period. In such cases, the procedures based on the independence assumption can yield biased estimates of the standard errors of the abnormal returns and thus lead to incorrect inferences.

¹⁷Salinger [63] presents a formula for the variance of cumulative abnormal returns, taking into account the contemporaneous and intertemporal correlation among abnormal returns.

¹⁸Holthausen and Leftwich [30] explicitly account for cross correlations while examining the stock price effect of rating changes. We follow suit in this essay.

the tests decreased substantially with the use of cumulated returns.

In response to the above issues, Lee and Varela [43] examine the performance of a menu of test statistics in the presence of event date uncertainty and clustering, conditions similar to our sample. They simulate abnormal returns in individual firms and in portfolios of securities and examine the performance of the test statistics computed using OLS, GLS and the standardized t tests of Patell [55] and Jaffe [32]. They conclude that for individual securities (as opposed to portfolios of stocks), OLS is the best test procedure. The GLS procedure rejects the null hypothesis too often in the absence of abnormal returns.

In addition to the OLS results, we also test for abnormal returns using a nonparametric test statistic.

4.5.1 OLS Approach

The impact of the event is examined by testing whether the cumulative abnormal returns are significantly different from zero. The null hypothesis is that the event has no impact. The cumulative abnormal returns are averaged across firms and the average effect of the event for each day in the event window is tested. The *average* cumulative abnormal return (ACAR) on day τ is

$$ACAR_{\tau} = \frac{1}{N} \sum_{i=1}^N CAR_{i\tau} \quad (4.6)$$

and its variance is

$$var(ACAR_{\tau}) = \frac{1}{N} \sigma^2(\tau) \quad (4.7)$$

where

$$\sigma^2(\tau) = \frac{1}{N-1} \sum_{i=1}^N (CAR_{i\tau} - ACAR_\tau)^2$$

The test statistic used here is

$$t_1 = \frac{ACAR_\tau}{[\text{var}(ACAR_\tau)]^{0.5}} \sim N(0, 1)$$

The above statistic follows standard normal distribution under the null hypothesis.

We also conduct a test similar to the one used by Holthausen and Leftwich [30]. They estimate the variance of the cumulative average abnormal return using the time series average of the average abnormal return and its (estimated) variance. The use of this estimate of variance accounts for the *cross sectional dependence* between the abnormal returns. The *average abnormal return* on any day t is

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (4.8)$$

An estimate of the variance of this series is

$$\sigma_{AAR}^2 = \frac{1}{120} \sum_{t=1}^{120} (AAR_t - \bar{A})^2$$

where

$$\bar{A} = \frac{1}{120} \sum_{t=1}^{120} AAR_t$$

The cumulative average abnormal return between days $[-20, \tau]$ of the event window are given by

$$CAAR_\tau = \sum_{t=-20}^{\tau} AAR_t$$

The significance of $CAAR_t$ is tested using the statistic

$$t_2 = \frac{CAAR_t}{\sqrt{d}(\sigma_{CAAR})} \quad (4.9)$$

where d is the number of days in the window over which the returns are cumulated. The above follows Student's t distribution with 119 degrees of freedom under the null hypothesis of no impact.

4.5.2 Nonparametric test

The tests performed above assume that returns are normally distributed. Brown and Warner [9] have pointed out that despite severe non normality in daily returns data, the standard parametric tests perform well in their simulation studies. Since there is no formal analysis of how these parametric tests perform with Indian data, we also conduct a nonparametric test to supplement our previously obtained results. A standard nonparametric test is the rank test.

Corrado [14] proposes a rank test to examine the abnormal returns for a one day event window. Like other nonparametric tests it does not depend on the mean and variance of the returns stream. However, unlike the traditional rank and sign tests it does not require the assumption that the distribution of the abnormal returns be symmetric. We perform an extension of Corrado's test to longer event windows proposed by Cowan [15]. The test treats the stream of abnormal returns over the estimation window and the event window as a single time series. These observations are ranked in an ascending order of the values of the prediction errors. Define¹⁹

¹⁹Ties are treated by the method of midranks. Each number of a group of tied obser-

$$K_{it} = \text{Rank}(AR_{it})$$

where

$$AR_{it} > AR_{is} \Rightarrow K_{it} > K_{is}, t \neq s$$

The ranking procedure transforms the distribution of the security abnormal returns into a uniform distribution across possible rank values regardless of any asymmetry in the original distribution. Under the null hypothesis of no impact the day zero abnormal return is a draw from uniform distribution. The average rank is 73.²⁰ For a sample of n stocks, the rank test statistic for the event window composed from day $[-20, (-20+d)]$ is

$$Z_R = \sqrt{d} \frac{\bar{K}_D - 73}{\left[\sum_{t=-120}^{+4} (\bar{K}_t - 73)^2 / 145 \right]^{0.5}} \quad (4.10)$$

where

$$\bar{K}_t = \frac{1}{n} \sum_{i=1}^n K_{it}$$

and \bar{K}_D is the average rank across n stocks and d days of the event window.

4.6 Results and Discussion

The average abnormal returns across all events and the cumulative abnormal returns are presented in the first two columns of Table 4.4. Observe that the variations is assigned the simple average of the ranks.

²⁰This is the value for our sample as the abnormal return series for each firm is 145 days long.

AAR follows no particular pattern. The cumulative average abnormal return is negative from second day of the event window and reaches its lowest on day -9. The day zero CAAR is actually positive though the abnormal returns are negative. We examine the significance of the abnormal returns using the OLS procedure suggested by Lee and Varela [43]. The results for this test are presented in the column labeled t_1 in Table 4.4. The Holthausen-Leftwich statistic t_2 is presented in the last column. It is easy to see that there are no significant abnormal returns in the event window.

The result of the nonparametric test is presented in Table 4.5. The computed test statistics of the extended Corrado rank test are surprisingly small, thereby indicating that the event has no impact. Observe from Figure 1 that the AAR follows no particular pattern. The plot of the average cumulative abnormal returns during combined estimation and event period shows that CAAR across firms attained a trough about 100 days before the day zero. This is similar to the finding of Pinches and Singleton [58], who find that the cumulative returns turn negative about 18 to 24 months before the actual downgrade. They conclude that the stock market in the U.S. is much more efficient in processing the information and thus the bond rating changes carry very little information content.

What does one conclude from these results? The results indicate that announcement of a downgrade has no significant impact on the stock returns. The absence of a negative reaction could be explained by the following:

- (a) other concurrent happenings that confound the effect of the downgrade itself
- (b) the fact that agencies could were allowed to publish only the ratings of

acceptable to the firms.

(c) some structural features of the stock markets render stock prices insensitive to company specific news.

(d) the information on which the downgrade is based being already available to the stock market

The possibility that concurrent positive events confound the impact of a downgrade is remote. Such considerations are likely to be more important when the day zero of the is the same for all firms. Regulatory reform and unanticipated shocks to particular types of firms are examples of such events.

The fact that only accepted initial ratings could be made public has two implications depending on whether or not the CRA overstates the initial ratings:

(1) Rational investors in the stock market will discount these ratings if they have reason to believe that the agencies rate new issues at unrealistically high levels in order to attract business. As an extension, subsequent downgrades should not come as such a surprise to the investors.

(2) Even if there is no incentive to overstate, there is a selection bias because only the ratings of good firms get published. Mild downgrades of such firms may not elicit reactions from a stock market that is confident about the fundamentals of the firm.

Could the absence of reaction be attributed to such "strategic" delays in down grading? Raghunathan and Varma [60] examine the rating record of CRISIL. They find that the internal consistency of CRISIL ratings is almost at par with international agencies. The study concludes that CRISIL ratings are liberal only to the extent of giving one rating higher than Standard and

Poor's in a similar situation. Thus, the argument of initial ratings being unreasonably high need not be taken very seriously. This suggests that the agencies place a premium on reputation building and perhaps the government has a limited role in regulating their activities. In future research, it would be interesting to examine how the emergence of competition affects the incentives of the incumbent agencies.

Observe from Table 4.3 that of the events for which we have rating information, all except two continue to remain in the "high investment" or "investment" grade. Only for two events the downgraded instruments are classified as having substantial risk. Thus, the bulk of the sample may have experienced only mild downgrades. These downgrades may not be enough to generate substantial negative abnormal returns. In their very detailed study, Holthausen and Leftwich [30] demonstrate that downgrades across ratings classes are associated with negative abnormal returns while no such association is observed for downgrades within classes. This argument can be taken seriously if the stocks that comprise the sample are among the best investments available in the economy even after the downgrade. In such a case, the investors will prefer to hold these stocks even after the firm's debt issue is downgraded. The above hypothesis can be examined fruitfully by a rigorous comparison of the returns of these stocks with alternative assets over a longer period.

Widespread illiquidity is a common feature of many emerging stock markets. With majority of the shares being held in blocks, and for control purposes, there may be little trading in response to news. It may be argued that the observed lack of response to the downgrade announcement on day zero is but

one facet of the general lack of reaction to news.²¹ However, this argument is not tenable as our sample actually displays negative cumulative average abnormal returns observed before day zero in Figure 1, which is indicative of some reaction. The market is not totally unresponsive to new information.

The returns stream reacts abnormally only to unexpected events. If rating changes provide information, the sign and magnitude of abnormal performance should depend on whether the market *anticipated* the downgrade. Controlling for the anticipation of a rating change will improve the power of the test for abnormal returns. Hand, Holthausen and Leftwich [27] conduct an exercise that controls for the market's expectation of a rating change, using bond market information. However, this is difficult to carry out in our case, given the nascent Indian bond market. Another way to control for concurrent happenings is to examine whether there are any news events prior to the downgrade that maybe responsible for observed negative returns. The placing of firms on the watch list by the rating agencies is one such move. Placement of an issue on the watch list implies the agency has reason to track this firm separately. The present study is hampered by the lack of such detailed information.

What is the reason for the absence of reaction? We offer an explanation based on the description of the ratings review process offered by Pinches and Singleton [58]. It is likely that the downgrades were an outcome of the normal review process rather than unanticipated company specific events. Thus, much of the information on which the decision to downgrade is based may

²¹The issue of why markets may not react to information has been examined by Bhattacharya et al [4] in the context of the Mexican stock market.

already be public information. Varma [76] points out that recent downgrades in India have been in response to deterioration of corporate balance sheets as a result of tight money. Such information may already be public information and explain the absence of any significant abnormal reaction. The pattern of abnormal returns in Figure 1 concurs with this possibility. The cumulative average abnormal returns are negative much before the event suggesting that the stock market was reacting to some negative information even before the downgrade was announced.

4.7 Conclusion

The focus of this essay was to examine whether or not credit rating downgrades convey new information to the stock market. This was motivated by the fact that information acquisition is a costly process, especially in less developed markets.

Our results indicate that stock returns do not react significantly to the news of downgrading of firms. We argued that the possible reasons for this result are:

- (a) other concurrent happenings that confound the effect of the downgrade itself .
- (b) the fact that agencies could were allowed to publish only the ratings of acceptable to the firms.
- (c) some structural features of the stock market that render stock prices insensitive to company specific news.
- (d) the information on which the downgrade is based is already available to

the stock market.

The plot of the average cumulative abnormal returns over the entire period shows that the stock market had gauged the poor performance of the firms before the downgrades. Based on this pattern we can conclude that, for our sample there was information about the firms in the public domain that caused returns to decline even before the downgrade was announced. We reasoned that concurrent events and lack of liquidity were not important explanations in our context. The possibility rating information in the public domain was only about the best firms and the announcements in our sample were relatively mild downgrades can be examined in future research by comparing returns of these assets with other assets over a longer period of time.

Would it be correct to conclude that Indian credit rating agencies perform little economic function from the standpoint of the stock market investors? It is not appropriate to generalize that the credit rating agencies serve no purpose at all for two reasons. First, our sample size is relatively small. There is scope for future research on this issue using a larger sample of rating change announcements. Second, being able to control for other news that could affect the firm value would help to isolate the pure effect of the downgrade. A larger sample could also help us distinguish between mild and severe downgrades to investigate whether the lack of severity of downgrades in our sample explains the lack of reaction.

It is difficult to infer about the optimal time for an agency to announce a rating change. A significant price reaction to such a rating change would certainly imply that the announcement carries new information but the absence

of the same need not imply that the agency reacted late. The agency might have chosen to announce the downgrade at the time of the normal review of the firm's rating. Thus, it is possible that the information on which these downgrades were based were already in public domain and the downgrade was not an "unanticipated" event.

Future research which rigorously controls for expectations will be useful in shedding additional light on the role of credit rating agencies as information providers to stock markets. Such research, in the spirit of Hand, Holthausen and Leftwich [27], will become possible with the development of an active debt market, which is at a relatively nascent stage in India at this point in time.

4.8 Tables for Chapter 4

Table 4.1: Outstanding Rated Issues

Agency	Established	Number of issues
CRISIL	1987	2797
ICRA	1991	1352
CARE	1993	891

Source: RBI Report on Currency and Finance, 1997-98.

Table 4.2: List of Events

EVENT	CRA	DATE	SOURCE
CORE HEALTHCARE	ICRA	31.7.97	ET
ITC BADRACHALAM 1	CRISIL	20.8.97	ET
WOOLWORTH	CRISIL	20.8.97	TOI
BINANI INDUSTRIES LTD.	CARE	28.8.97	FE
MUKAND LTD 1	CRISIL	5.9.97	IE
SAIL 1	CRISIL	5.9.97	TOI, IE
A.C.O.	ICRA	15.9.97	PPJ
TAMIL NADU NEWSPRINT	CRISIL	18.9.97	HBL
LUPIN LABS	CRISIL	19.9.97	FE
PUNJ WIRELESS 1	CRISIL	19.9.97	TOI
HOTEL LEBLA 1	ICRA	24.9.97	FE
DCW LTD 1	CRISIL	8.10.97	IE
GARWARE POLY 1	CRISIL	7.11.97	HBL
GARWARE WALL ROPES	CRISIL	9.11.97	HBL
ATUL LTD.	CRISIL	10.11.97	PPJ
HINDUSTAN CONSTRUO	ICRA	25.11.97	HBL
RELIANCE CAPITAL	CARE	27.11.97	BS
BANK OF RAJ.	ICRA	12.12.97	BS
BOMBAY DYING	CRISIL	17.12.97	TOI
ARVIND MILLS LTD. 1	CRISIL	11.3.98	ET
HINDUSTAN ORGANIC CHEM 1	CRISIL	18.3.98	ET
ITC BADRACHALAM 2	CRISIL	27.5.98	HBL
JINDAL VIJAYNAGAR 1	CRISIL	27.5.98	HBL
OESC	ICRA	14.6.98	HBL
BHAPAT BARTH MOVERS	CRISIL	10.7.98	ET
PENTAFOUR PRODS	CARE	16.7.98	FE
RAYMOND	CRISIL	27.7.98	ET
GUJ IND POWER	CARE	30.7.98	CARE PR
TISCO	CRISIL	11.8.98	BS
LLOYDS FIN	CARE	22.8.98	FE
NAGARJUNA FERTILIZERS & CHEMICALS LTD.	CARE	22.8.98	FE
20TH CENTURY FIN	CRISIL	26.8.98	FE
GARWARE POLY 3	CRISIL	31.8.98	TOI
ASHOK LAYLAND	CRISIL	11.9.98	HBL
TELCO	CRISIL	11.9.98	HBL
GUJARAT ALKALI	CARE	16.9.98	CARE PR
KINDALCO	CRISIL	16.9.98	PPJ
JINDAL IRON AND STEEL	CRISIL	23.9.98	FE
JINDAL STRIPS LTD.	CRISIL	23.9.98	FE
HOTEL LEBLA 2	ICRA	26.9.98	PPJ
MUKAND LTD 2	CRISIL	5.10.98	CRISIL PR
ITC BADRACHALAM 3	CRISIL	15.10.98	HBL
GUJARAT AMBUJA	CRISIL	17.10.98	BS
ESSAR OIL	CRISIL	23.10.98	FE
ESSAR SHIPPING	CRISIL	23.10.98	FE
PUNJ WIRELESS 2	CRISIL	29.10.98	CRISIL PR
SHAMKUN MULTIFAR	CRISIL	19.11.98	CRISIL PR
MADRAS CEMENT	CRISIL	24.11.98	CRISIL PR
INDIAN SEAMLESS	CRISIL	25.11.98	CRISIL PR
CROMPTON GREAVES	CRISIL	25.11.98	CRISIL PR
SUPREME INDUSTRIES	CRISIL	3.12.98	CRISIL PR
PRISM CEMENT	CRISIL	6.12.98	CRISIL PR
SAWPIPES	CRISIL	18.12.98	CRISIL PR
HINDUSTAN ORGANIC CHEM 2	CRISIL	29.12.98	CRISIL PR

BS= Business Standard

CARE PR = Press release from CARE

CRISIL PR = Press release from CRISIL

ET= The Economic Times

FE= Financial Express

PPJ= Free Press Journal

HBL = The Hindu Business Line

ICRA PR = Press release from ICRA

CRISIL PR = Press release from CRISIL

Table 4.3: Pre and Post Event Ratings

EVENT	PRE-EVENT	POST EVENT
CORE HEALTHCARE	LA-,MA-	LBB,MBB
ITC BADRACHALAM 1	FAAA,A	FAA,A-
WOOLWORTH	A	A-
BINANI INDUSTRIES LTD.	CARE AA	CARE A+
MUKAND LTD 1	A+	AA-
SAIL 1	FAAA, AA+	FAA+,AA
ACC	LAAA	LAA+
TAMIL NADU NEWSPRINT	FAAA	FAA
LUPIN LABS	N.A.	N.A.
PUNJ WIRELESS 1	AA	A+
HOTEL LEELA 1	LAA+,MAA+	LAA,MAA
DCW LTD 1	FAA, AA	FAA-, AA-
GARWARE POLY 1	A+	A
GARWARE WALL ROPES	FAA	FAA-
ATUL LTD.	AA-	A
HINDUSTAN CONSTRUC	LA+	LA
RELIANCE CAPITAL	CAREAAA	CAREAA+
BANK OF RAJ.	MAA+, A1+	MA, A2+
BOMBAY DYEING	AA+	AA
ARVIND MILLS LTD. 1	AA+	AA
HINDUSTAN ORGANIC CHEM 1	N.A.	N.A.
ITC BADRACHALAM 2	A	AA-
JINDAL VIJAYNAGAR 1	BBB-	BB
OESC	N.A.	N.A.
BHARAT EARTH MOVERS	A+	A-
PENTAFOUR PRODS	CARE AA-, CARE AA-	CARE BBB, CARE BBB
RAYMOND	AA	AA-
GUJ IND POWER	CARE AA-	CARE A
TISCO	AAA	AA+
LLOYDS FIN	AA, AA	A+, A+
NAGARJUNA FERTILIZERS & CHEMICALS LTD.	CAREAA+, CAREAA	CAREAA, CARE AA-
20TH CENTURY FIN	FA+	FAA+
GARWARE POLY 3	A	BB
ASHOK LEYLAND	AA	AA-
TELCO	AAA	AA+
GUJARAT ALKALI	CARE AA+	CARE AA
HINDALCO	PI+	PI
JINDAL IRON AND STEEL	A+,FAA-	BBB,FA-
JINDAL STRIPS LTD.	FAA-,A+	FA-,B+
HOTEL LEELA 2	LAA,MAA	LAA-,MAA-
MUKAND LTD 2	A+	BBB
ITC BADRACHALAM 3	FA,A	FB,AA-
GUJARAT AMBUJA	AAA	AA+
ESSAR OIL	BBB+	BB+
ESSAR SHIPPING	AA-	HBB+
PUNJ WIRELESS 2	BBB,FA-	D,D
SHAMKEN MULTIFAB	AA+,FAAA	AA,FAA+
MADRAS CEMENT	A+,FAA-	BBB+,FA
INDIAN SEAMLESS	N.A.	N.A.
CROMPTON GREAVES	A+	A
SUPREME INDUSTRIES	BBB	BBB-
PRISM CEMENT	FAA	FA
SAWPIPES	N.A.	N.A.
HINDUSTAN ORGANIC CHEM 2	N.A.	N.A.

Note: The table lists *all* the instruments downgraded on date zero. N.A. implies the rating information was not available.

Table 4.4: Results from Parametric Tests.

day	aar	caar	t_1	t_2
-20	0.001792	0.001792	0.044401	0.338371
-19	-0.00395	-0.00216	-0.04534	-0.28836
-18	-0.00572	-0.00788	-0.12744	-0.85936
-17	-0.00156	-0.00944	-0.15125	-0.89163
-16	0.003059	-0.00639	-0.08594	-0.53921
-15	-0.00028	-0.00667	-0.08095	-0.5141
-14	0.004749	-0.00192	-0.02045	-0.13706
-13	-0.007	-0.00892	-0.08632	-0.59583
-12	0.001117	-0.00781	-0.0732	-0.49143
-11	-0.0029	-0.01071	-0.09224	-0.63964
-10	0.006203	-0.00451	-0.04047	-0.25668
-9	0.004478	-3E-05	-0.00023	-0.00165
-8	0.002566	0.002536	0.020055	0.132807
-7	-0.00474	-0.0022	-0.01751	-0.11105
-6	0.00789	0.005689	0.041084	0.277396
-5	0.004129	0.009819	0.070646	0.463525
-4	-0.00524	0.00458	0.032377	0.209759
-3	-0.0053	-0.00072	-0.00484	-0.03206
-2	-0.0046	-0.00532	-0.03594	-0.23058
-1	0.007247	0.001925	0.01271	0.081274
0	-5.44E-06	0.001919	0.012628	0.079091
1	-0.00265	-0.00073	-0.00476	-0.02945
2	-0.00109	-0.00182	-0.01146	-0.07161
3	-0.00496	-0.00677	-0.04083	-0.26114
4	0.002766	-0.00401	-0.02313	-0.15141

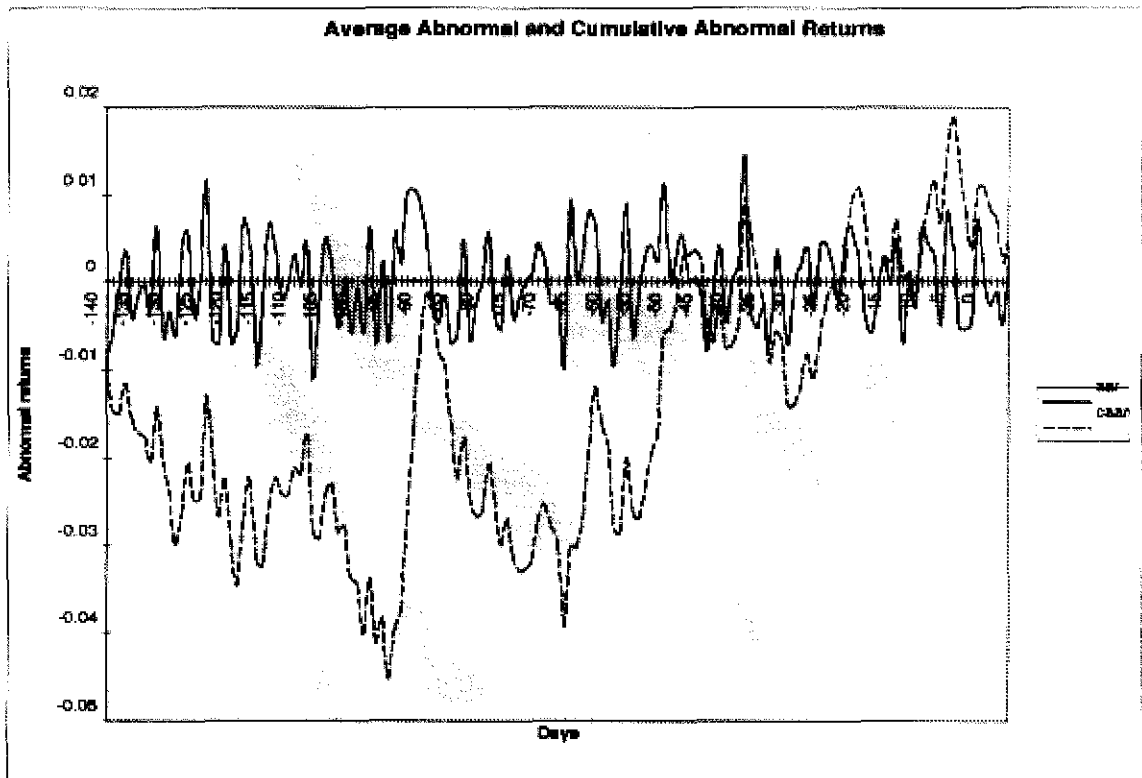
$ACAR_d$ is the average of across the cumulative abnormal returns of 54 events over the window $[-20, d]$ where d is the d -th event day. The t_1 statistic is based on Lee and Varela (1997). The t_2 statistic is similar to the one used by Holthausen and Leftwich (1996).

Table 4.5: Results of the Rank Test

Event day	Z_R
-20	0.000917
-19	-8.40E-05
-18	-0.00035
-17	-0.00033
-16	-0.00012
-15	-6.80E-05
-14	-5.80E-05
-13	-0.00011
-12	-7.30E-05
-11	-7.50E-05
-10	-4.10E-05
-9	-1.80E-05
-8	9.65E-06
-7	-1.90E-05
-6	7.58E-06
-5	3.16E-05
-4	1.77E-05
-3	1.96E-06
-2	-4.97E-06
-1	1.61E-05
0	2.94E-07
1	-7.71E-06
2	-9.74E-06
3	-1.70E-05
4	3.23E-07

The column Z_R is the value of the test statistic computed using the formula in section 4.5.2. It is computed for each day in the event window.

Figure 1



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