Appendix 1: Derivation of Model Constraints

Case 1: Assume that each investment possibility occurs with a probability of 1/3. Assume that $q_2 > q_1$ and that $x(q_1 - 1) > \text{f}$.

Expected Value of Cash Retention ≥ Expected Value of Cash Disbursement

$$\frac{1}{3}q_2x + \frac{1}{3}q_1x + \frac{1}{3}q_0x \geq \frac{1}{3}[\max(q_2x - x - \phi; 0) + x] + \frac{1}{3}[\max(q_1x - x - \phi; 0) + x] + \frac{1}{3}x$$

By the assumption the $x(q_1 - 1) > \phi$ **(1A)**

$$\frac{1}{3}q_2x + \frac{1}{3}q_1x + \frac{1}{3}q_0x \geq \frac{1}{3}[q_2x - x - \phi + x] + \frac{1}{3}[(q_1x - x - \phi + x] + \frac{1}{3}x$$

$$q_2x + q_1x + q_0x \geq [q_2x - \phi] + [q_1x - x - \phi + x] + x$$

$$q_0x \geq -2\phi + x$$

$$q_0x - x \geq -2\phi \text{ becomes } -q_0x + x \leq 2\phi \text{ or } x(1 - q_0) \leq 2\phi$$

$$\frac{x(1 - q_0)}{2} \leq \phi \quad \textbf{(1B)}$$

It is clear that the requirements which favour a policy of cash retention depend upon the values of q_0, q_1, and ϕ. Condition (1A) depends upon q_1 and condition 2 (1B) depends upon q_0.

Case 2: Assume that each investment possibility occurs with a probability of 1/3. Assume that $q_2 > q_1$ and that $x(q_1 - 1) < \phi$ and $x(q_2 - 1) > \phi$.

Expected Value of Cash Retention ≥ Expected Value of Cash Disbursement

$$\frac{1}{3}q_2x + \frac{1}{3}q_1x + \frac{1}{3}q_0x \geq \frac{1}{3}[\max(q_2x - x - \phi; 0) + x] + \frac{1}{3}[\max(q_1x - x - \phi; 0 + x] + \frac{1}{3}x$$

By the assumption the $x(q_1 - 1) < \phi$, $x(q_2 - 1) > \phi$. **(2A)**

$$\frac{1}{3}q_2x + \frac{1}{3}q_1x + \frac{1}{3}q_0x \geq \frac{1}{3}[q_2x - x - \phi + x] + \frac{1}{3}[0 + x] + \frac{1}{3}x$$

$$q_2x + q_1x + q_0x \geq [q_2x - \phi] + [x + x]$$

$$q_1x + q_0x \geq 2x - \phi$$

$$q_1x + q_0x - 2x \geq -\phi \text{ becomes } -q_1x - q_0x + 2x \leq \phi$$

$$x(2 - q_1 - q_0) \leq \phi \quad \textbf{(2B)}$$

As in Case 1, predictions from this model will rely upon the values of q_0, q_1, and ϕ. In this case the q_1 value is necessary in both conditions (**2A** and **2B**).

Case 3: Assume that each investment possibility occurs with a probability of 1/3. Assume that $q_2 > q_1$ and that $x(q_1 - 1) < \phi$. In this case, the expected value of disbursing cash reaches its minimum. According to the model, the constraint B should become less stringent given the initial assumptions.

Expected Value of Cash Retention ≥ Expected Value of Cash Disbursement

$$\frac{1}{3}q_2x + \frac{1}{3}q_1x + \frac{1}{3}q_0x \geq \frac{1}{3}[\max(q_2x - x - \phi; 0) + x] + \frac{1}{3}[\max(q_1x - x - \phi; 0) + x] + \frac{1}{3}x$$

By the assumption the $x(q_1 - 1) < \phi$ and $x(q_2 - 1) < \phi$, **(3A)**

$$\frac{1}{3}q_2x + \frac{1}{3}q_1x + \frac{1}{3} + q_0x \geq \frac{1}{3}x + \frac{1}{3}x + \frac{1}{3}x$$

$$q_2x + q_1x + q_0x \geq x + x + x \text{ becomes } x(q_2 + q_1 + q_0) \geq 3x$$

$$(q_2 + q_1 + q_0) \geq 3 \quad \textbf{(3B)}$$

Clearly, condition 2 (**3B**) depends purely on upon the quality of the investment opportunities; therefore, condition 2 is less stringent in this case than in the previous two cases. In Case 3, the restricitive constraint is **3A** which requires that the fee, ϕ be large in order to satisfy its requirements. Another way to interpret the constraint is that the quality of the investments must be low which contradicts constraint **3B**. The only way it appears possible for Case 3 to hold is if the fee f is prohibitively large.

Appendix 2: Deriving the Relationship between Investment Probability and ϕ

Case 1: Re-examining constraint (1B) without the assumption that $P = 1/3$. $q_o = 0$ is still the assumption used in examining this case.

$$\frac{P}{2}q_2x + \frac{P}{2}q_1x + (1-P)q_0x \geq \frac{P}{2}[q_2x - x - \phi + x] + \frac{P}{2}[q_1x - x - \phi + x] + (1-P)x$$

$$P(q_2x) + (q_1x) + (2-2P)(q_0x) \geq P[q_2x - \phi] + P[q_{1^x} - \phi] + (2-2P)x$$

$$Pq_2x + Pq_1x + 2q_0\boldsymbol{x} - 2Pq_0x \geq Pq_2x - P\phi + Pq_1x - P\phi + 2x - 2Px$$

$$2q_0x \geq 2x - 2Px - 2P\phi + 2Pq_0x$$

By assuming that $q_0 = 0$, this simplifies to :

$$2P\phi \geq 2x - 2Px$$

$$\phi \geq \frac{2x(1-P)}{2P}$$ In order to solve for P:

$$\phi \geq \frac{x}{P} - x$$ this can be rearranged so that

$$P \geq \frac{x}{\phi + x} \qquad \textbf{(1B)}$$

This is the new constraint (1B) used to analyse the solutions favouringa cash retention policy. Clearly, the relationship between P and ϕ can be determined given various values for x.

Case 2: Finding the breakeven level of x, given constraint (2A).

From Appendix 1, Case 2, we know that constraint (2B) is $x(2 - q_1 - q_0) \leq \phi$. By substituting the values assumed for the study ($q_0 = 0$; $q_1 = 1.1$; $\phi = 50{,}000$) we can easily find the breakeven level of x.

$x(2 - 1.1 - 0) \leq 50{,}000$ which is obviously $.9x \leq 50{,}000$.

Given the assumptions the breakeven level of x is clearly $x = \frac{50{,}000}{.9}$ or

55,555. As discussed earlier, for Case 2 to meet constraint (2B) realistically, the assumption of $\phi = 50{,}000$ and $q_1 = 1.1$ may need to be altered.

Re–calculating constraint **(2B)** to find the relationship between probability and premium ϕ.

$$\frac{P}{2}q_2x+\frac{P}{2}q_1x+(1-P)q_0x\geq\frac{P}{2}[q_2x-x-\phi+x]+\frac{P}{2}[0+x]+(1-P)x$$

$$P(q_2x)+P(q_1x)+(2-2P)(q_0x)\geq P[q_2x-\phi]+P[x]+(2-2P)x$$

$$Pq_2x+Pq_1x+2q_0x-2Pq_0x\geq Pq_2x-P\phi+Px+2x-2Px$$

$$Pq_1x+2q_0x-2Pq_0x\geq -P\phi+Px+2x-2Px$$

$$Pq_1x\geq -P\phi-Px+2x \text{ by assuming that } q_0=0.$$

$$Pq_1x+Px-2x\geq -P\phi \text{ or equivalently, } -\left(\frac{Pq_1x+Px-2x}{P}\right)\leq\phi$$

This can be written $as\ \frac{2x}{P}\leq\phi+q_1x+\boldsymbol{x}$ which is rearranged:

$$P\geq\frac{2x}{\phi+q_1x+x} \tag{2B}$$

Case 3: Finding the relationship between probability of a good investment and the premium value, ϕ.

$$\frac{P}{2}q_2x+\frac{P}{2}q_1x+(1-P)q_0x\geq\frac{P}{2}[x]+\frac{P}{2}[x]+(1-P)x$$

$$P(q_2x)+P(q_1x)+(2-2P)(q_0x)\geq P[x]+P[x]+(2-2P)x$$

$$Pq_2x+Pq_1x+2q_0x-2Pq_0x\geq Px+Px+2x-2Px$$

$$Pq_2x+Pq_1x+2q_0x-2Pq_0x\geq 2Px+2x-2Px$$

$$x(Pq_2+Pq_1-2Pq_0)\geq 2x-2q_0x \text{ this is equivalent to}$$

$$x(Pq_2+Pq_1-2Pq_0)\geq x(2-2q_0)$$

From $Pq_2+Pq_1-2Pq_0\geq 2-2q_0$ it is straightforward to see that the new constraint:

$$P\geq\frac{2-2q_0}{q_2+q_1-2q_0} \tag{3B}$$

Clearly, this is not really a relationship between *P* and ϕ, for f never plays a role in expected values of either strategy. The required probabilities for a dominant strategy of cash retention will depend on the actual q values of the investments.

Notes

1 Introduction

1. Corbett and Jenkinson (1994) compare these differences and discuss the adjustments needed for flow-of-funds and company accounts.
2. See Allen (1993) and Stiglitz (1992) for detailed discussions.
3. There are three all India development banks: Industrial Development Bank of India (IDBI), Industrial Finance Corporation of India (IFCI), Industrial Credit and Investment Corporation of India (ICICI). At the state level each state has a State Financial Corporation (SFC) and an Industrial Development Corporation (SIDC).
4. *Reserve Bank of India Bulletin*, 1993.
5. See Harris *et al*. (1994) for similar evidence in Indonesia, Jaramillo *et al*. (1993) for Ecuador, Nabi (1989) for Pakistan, and Tybout (1983) for Colombia.

2 Internal Finance as a Source of Investment

1. The neoclassical theory of investment is due to Jorgenson *et al*. (1963, 1966, 1967, 1971), primarily based on the neoclassical theory of optimal capital accumulation. The liquidity theory is based on the work of Meyer and Kuh (1957), Duesenberry (1958), Kuh (1963) and others. The accelerator theory, the oldest of the investment models, is based on the work of Clark (1917), Chenery (1952), Koyck (1954), Eisner (1964) and others. The managerial and asymmetric information approaches to investment can be considered versions of the liquidity theory and therefore fall under the rubric of cash flow theory of investment. Some explanations exist for the liquidity theory: (a) realised profits measure expected profits and investment is determined by profit expectations (Tinbergen, 1938), and (b) investment may be constrained by the supply of funds (Meyer and Kuh, 1957; Meyer and Glauber, 1964; Kuh, 1963; Duesenberry, 1958; Meyer and Strong, 1990). In the strong version of the liquidity theory, the financial constraint operates at all times; the cost of funds schedule becomes inelastic when internal funds are exhausted. In the weaker version, financial constraint operates at low rates of capacity utilisation while extreme pressure on capacity may result in the use of outside sources of finance.
2. Financing hierarchy may also be based on transactions costs, tax advantages, costs of financial distress, etc.; however, these are likely to be less important than agency and asymmetric information problems.
3. Baumol (1959,1967), Marris (1963, 1964), Grabowski and Mueller (1972) and others are examples of the managerial capitalism approach. The agency cost approach focuses on contracting aspects within the overall framework of the

principal agent model and is associated with Jensen and Meckling (1976) and others.
4. Stultz (1990) presents a model in which managerial discretion and information asymmetries exist simultaneously.
5. *Financial slack* is defined as the difference between internal finance and capital expenditures and shows how far the firm can avoid external finance while undertaking capital expenditures. *Financial slack* will be used and discussed in greater depth in the following chapters.

3 Cash Retention Strategies

1. Point C in Figure 3.1 is depicted at the same level of r as A, but depending on the lending multiplier, the new r level of point C will vary. More often, it is higher than point A during a credit crunch.
2. Asymmetric information in its simplest form creates a situation in capital markets characterised by Akerlof's *Lemons Problem* as discussed earlier.
3. Tobin's q is calculated as (market value of common equity + value of long-term debt)/ gross assets. Gross assets are used as replacement costs since it incorporates both the assets and liabilities of a firm as well as its holdings of other firms (Summers, 1981).

   Under certain conditions marginal and average q are equal (Hayashi, 1982). However, there are several instances when the average q and the marginal q can differ. These include the following: private managerial information, speculative bubbles in the stock market, or market fads where values differ from their fundamentals (Blanchard, Rhee and Summers, 1993, 116).
4. The variation in investment quality does not have to be finite since there could be an infinite number of investments which differ in quality. Estimations of an investment's quality will differ according to different analyses. The model simplifies this issue by considering three discrete investments; however, the q parameter of these projects could be altered. The probability can be varied to capture both managerial choices and underlying economic conditions.
5. Figures 3.4 and 3.5 will depict the set of solutions for Case 1 and Case 2 respectively. These graphs will be discussed when benchmark cases of the model are examined, i.e., an external finance premium and a cash flow x are assumed.
6. In determining the breakeven level of x = 100,000 used in the figure, ϕ was assumed at 50,000; therefore, to accurately depict the situation, the plot should be truncated at ϕ = 50,000 (and appropriately at the corresponding probability P).
7. By requiring that $x(q_1 - 1) \leq \phi$, there is another constraint which will cut through the region above the breakeven curve. If x and q_1 are fixed at a certain *benchmark* then this constraint becomes a vertical line at the value ϕ determined by the constraint.
8. A banking relationship could reduce the importance of net worth (the partial $\frac{\partial \phi}{\partial w}$ declines) and causes the effect of maturity or size to be non linear. In this case, $\frac{\partial^2 \phi}{\partial w^2} > 0$; therefore, as a firm matured or grew bigger,

the ϕ would drop substantially. Clearly, different sources of external finance would have different effects, not all of which would reduce external finance premium.

9. Many firms were acquired by others or became bankrupt during the period under examination. These were removed to keep the yearly data consistent regarding which firms remained in the sample.
10. Both Tobin's q and the market to book ratio were used as quality measures. Since all Tobin's q values appeared to be less than unity, this suggested that no firms had good investments. This is not necessarily a bad finding for many studies have revealed that Tobin's q for the aggregate economy was lower than unity during this period in India. By using the mean as a dividing point, the empirical work which follows seeks to determine if relative investment quality reveals that firms are following optimal earnings retention strategies.

4 The Cost of Capital

1. The financial statements for the largest 100 publicly traded firms were gathered. There has been some debate as to the weighting and the choice of firms used in this survey since small firms as a group face very different constraints in financial markets compared to their larger counterparts, as indicated in the previous chapter. Therefore, these comparative statistics are used a general guide and not as specific measures.
2. The Re-finance Corporation for Industry Ltd (RCI) was established for this purpose in 1958 and was subsequently merged with the Industrial Development Bank of India (IDBI) which was set up in 1964.
3. The first of these was the Industrial Finance Corporation (IFC), established in 1948. This was followed in 1951 with the setting up of regional institutions – the State Financial Corporation (SFC). Subsequently, the National Industrial Development Corporation (NIDC) was set up in 1954 and the Industrial Credit and Investment Corporation of India (ICICI) was floated in 1955. In 1964 the Industrial Development Bank of India (IDBI) was established as an institution for long and medium term finance.
4. Commercial banks are committed to providing 40% of their finances to 'priority sectors' which in addition to agriculture and other non-industrial activities, includes small-scale industry as well. Approximately 30% of this is at concessional rates of interest.
5. Other financial institutions including life insurance companies had been nationalised earlier. All property insurance companies were taken over by the central government in 1971.
6. Since 1988, there has been some simplification in the structure of administered rates.
7. A more detailed examination and discussion of leverage-induced bankruptcy costs will follow in the next chapter.
8. 'Moderate ranges' excludes firms such as holding companies whose main purpose might be to assume significant levels of debt and then used as a proxy firms during takeovers, mergers, etc.
9. Based on calculations in Titman and Wessels (1988) and DeAngelo and Masulis (1980).

10. See Maddala (1992) under modified zero regression method.
11. Gupta (1984) devised a measure for the real cost of equity. It is the sum of the average earnings yield and the ten year average growth rate in real non-farm domestic product. This is an approximate measure of the expected earning prospects of firms after taking into account firms' current yields and the past growth of the economy excluding the farm sector.
12. However, a problem may arise with this estimator if the unobservable effects which have been included in the error term are correlated with some of the regressor variables. For example, managers' risk aversion may cause them to invest in fewer positive net present value projects and thus slow the growth of their firm. This would imply that the omitted variable measuring risk is correlated with both leverage and growth. This simultaneity would render the 'random effects' estimators inconsistent. However, the estimation approach known as 'fixed effects' yields consistent estimates regardless of the correlation between firm-specific error components and the regressors.
13. A cross-comparison of common ratios amongst firms with different levels of debt will lead to significant discrepancies, as shown by Platt (1990). Therefore, one solution to this problem is to limit the sample to firms with similar levels of leverage in their financial structure (Platt and Platt, 1990).
14. Excess implies greater than the average for this particular data set which had already been pre-selected based on their 35%–40% levels of debt in their financial structures. Therefore, firms with excessive debt are those with greater than average debt within this pre-selected set. The same holds true for excessive retained earnings.
15. Bhagwati notes: 'the Indian embrace of bureaucratic controls was also encouraged by additional objectives, none of them served well by the control system in practice. One was the prevention of concentration of economic power by licensing the creation and expansion of capacity. But, if monopoly power was to be reduced, the virtual elimination of domestic and foreign competition, i.e., the elimination of the contestability of the market, was hardly the way to do it' (Bhagwati, 1993).

5 Earnings Retention as a Specification Mechanism in Predicting Corporate Bankruptcy

1. Government of India, BIFR (1995).
2. This might lead to a problem of *moral hazard* by having the same bank or financial institution as creditor as well as designer of the restructuring scheme.
3. These figures are the result of two sets of data. The first is a list of decisions taken by the BIFR in its first five years between July 1987 and July 1992 entitled *Review of Disposals* (*September 1992*). The second data set is taken from a set of reports describing sanctioned schemes under Section 18(4) of the SICA. This data has been used in several reports and studies including one by the Government of India, 1993.
4. The following is an excerpt from a Board member's report arguing how liquidation instead of rehabilitation 'would destroy all possibilities of

salvaging productive facilities, choke off the chance of debt recovery, finish the prospect of protecting a large proportion of employment' (Mahfooz, 1993).

5. Government of India, Ministry of Finance, Department of Economic Affairs (1993).
6. Government of India, Ministry of Finance, Department of Economic Affairs (1993).
7. Based on marginal gains model in Ponssard (1981).
8. For six of these firms, projections were based on 350 working days, and for another one 356. These figures are from actual data presented in annual BIFR reports.
9. In Ananth, Gangopadhyay and Chaudhari, (1994) a restructuring proposal was discovered where capacity figures were almost 33% than actual capacity. Even with such blatant overestimation, the project was labelled viable.
10. The DSCR is a ratio of the amount of income left for covering debt repayment in each year to the debt (interest and principal) that has to be repaid to term lenders.
11. Based on an examination in Ananth, Chaudhari and Gangopadhyay (1994) of 120 rehabilitation schemes over a three year period.
12. Tobin's q is calculated as (market value of common equity + value of long-term debt)/gross assets. Gross assets are used as replacement costs since it incorporates both the assets and liabilities of a firm as well as its holdings of other firms (Summers, 1981).
13. $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$ where Z= overall index; X_1 = Working Capital/Total assets; X_2 = Retained Earnings/Total Assets; X_3 = Earnings Before Taxes and Interest/Total assets; X_4 = Market Value of Equity/Book Value of Total Debt; X_5 = Sales/Total Assets. Due to the original computer format arrangement, variables X_1 through X_4 must be calculated as absolute%age values. Only variable X_5 should be expressed in a different manner; that is, a Sales/Total Assets ratio of 200% should be included as 2.0.
    For private companies, Altman based his model on a 1969–75 mixture of 61 manufacturing and 50 retailing organisations. Thus, the model for private companies is the following:
    $$Z = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$$
    where X_4 becomes Book Value of Equity/Book Value of Total Liabilities and the Cut-off Points are the following: $Z \geq 2.90$ Æ Healthy; $2.90 \geq Z \geq 1.23 \geq$ Gray Area; $Z \leq 2.90 \geq$ Distress.
14. Wilcox Model: $x > 0$ = Healthy; $x < 0$ = Distress;
    P (Failure) = 1 if $x < 0$
    = $[(1 - x) / (1 + x)]^N$ if $x > 0$
    N = Adjusted Cash Position / a
    Adjusted Cash Position = [Adjusted Cash Position + 0.7(Current Assets other than Cash) + 0.5(Long-term Assets – Liabilities]
    a = [Mean Adjusted Cash Flow]^2 + Variance of Adjusted Cash Flow]$^{0.5}$
    x = [Mean Adjusted Cash Flow / A]
    Adjusted Cash Flow = [Net Income – Dividend – 0.3 (period-to-period increase in Non-Cash Assets – 0.5(period-to-period increase in long-term assets + Stock Issued in Merger or Acquisition]

15. $(X_{i,E})$ = Mean $(X_{i,F})$
    X = financial ratio, i = ratio 1,….,n; E = estimation period; F = forecast period
    'Industry relative ratios for a given industry are more stable than unadjusted ratios since there is a zero difference in their means between the estimation and forecast periods as compared to some difference for the unadjusted ratios. Thus, industry relative ratios are relatively more stable over time and hence should lead to more accurate forecasts' (Platt and Platt, 1990).
16. This derivative shows that the rate of change in probability with respect to X involves both B and the level of probability from which the change is measured. This value is greatest when $P = .5$.
17. The list of textile companies was prepared from the following:
    a. sick cotton textile companies coming under the National Textile Corporation Ltd.
    b. companies listed as sick by the Industrial Credit & Investment Corporation of India Ltd.
    c. companies explicitly taken over by the government for bankruptcy reasons.
    d. companies being assisted by the Industrial Reconstruction Corporation of India Ltd.
18. High technology industries might use higher gearing ratios so that they have greater leverage, whereas low technology industries might not use as much debt. A cross-comparison of common ratios amongst the different industries will lead to significant discrepancies, as shown by the Platts' study (Platt and Platt, 1990).
19. As it is difficult to quantify the specific number of cases, it occurred with greater frequency between 1990 and 1992, the latter portion of the period under study.

6 Factors Affecting the Market for Corporate Control

1. Other regulations pertaining to take over activity in India:
   (a) Indian Companies Act (1956) – any scheme of arrangement or settlement by shareholders/creditors of the firm, if and when approved by not less than 3/4 of the creditors and members, also requires the sanction of the courts. Companies in India are not allowed to invest more than 30% of their net worth in the shares of other companies without government approval (Section 372 of the Act).
   (b) Monopolies and Restrictive Trade Practices Act (1969) [MRTP] – To ensure that companies controlling 25% or more of the market for any product shall not become anti-competitive and are therefore prohibited from acquiring more than 10% stakes in any other company (Section 108A to 108I of the Act).
   (c) Foreign Exchange Regulations Act (1973) [FERA] – Regulates the dealings in foreign exchange and as such becomes relevant if and when shares in Indian firms are allotted to non-resident individuals.
   (d) Sick Industrial Companies Act (1985) [SICA] – SICA is a special statute to remove bottlenecks contained in various laws in the way of revival and rehabilitation of sick firms.

2. See Bradley, Desai and Kim (1988); Asquith, Bruner and Mullins (1987); Lang, Stultz and Walkling (1989).
3. See Rumelt (1974). He provides evidence that conglomerate firms underperform other firms . Sicherman and Pettway (1987) also provide evidence that prediction errors of contracting inefficiency is significantly higher from real asset diversification than real asset concentration.
4. Nearly identical to *financial flexibility*.
5. The minimum requirements for the sample set included the following:
   (a) Daily stock returns must be available in for the 100-day period starting 110 days before the initial take over announcement.
   (b) Public announcement of take over.
   (c) Balance sheet availability.
6. Liquidity is defined as the ratio of Current Assets/Current Liabilities.
7. Abnormal returns for targets and bidders are computed as the cumulative market model prediction error from the announcement date of the take over until the effective date. Cumulative market model prediction errors are measured around the announcement of all financing events. The cumulative prediction error for the common stock of firm j on day t is defined as the following:

$$\sum_{t=1}^{T} PE = R_{jt} - (\alpha + \beta_j R_{mt})$$

   R_{jt} = continuously compounded rate of return for the common stock of firm j on day t.
   R_{mt} = continuously compounded rate of return for the BSE equally weighted index on day t.
   α_j, β_j = OLS estimates of firm j's market model parameters. (Doukas, 1995)
8. Other classification procedures have been tested including cut-offs at one, the industry average, and the industry median. For the purposes of the testing conducted in this paper, a relative rather than an absolute measure was needed and therefore a simple dummy variable method is used.
9. See Bradley, Desai and Kim (1988); Asquith, Bruner and Mullins (1987); Lang, Stultz and Walkling (1989).
10. This might be due to noise, mispecification, and the inclusion of further omitted variables might help.
11. See Lang, Stultz and Walkling (1989) and Bradley Desai, and Kim (1988).
12. Tirole requires banks to be competitive, thus earning zero profits. By equating the expected return from giving the loan D with the opportunity cost of D, or $(1 + r_o)D$, r_o is implicitly defined.
13. In this model, dividends also signal high firm quality because they also restrict cash flows.
14. The exact details are suppressed here to get to the issue of contract design under the threat of predation.
15. With the two-period problem, the exact result of this model is that: $R1^* = \pi 1$, $\beta 1^* = 1$, $R2^* = \pi_o$.
16. Derived from Poitevin's model of two or greater player games.
17. Poitevin's signalling equilibrium.

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