Company Financing, Capital Structure, and Ownership: A Survey, and Implications for Developing Economies

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COMPANY FINANCING, CAPITAL STRUCTURE, AND OWNERSHIP: A SURVEY, AND IMPLICATIONS FOR DEVELOPING ECONOMIES[?]

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Abstract

This paper critically surveys the key literature on corporate financing policy, capital structure and firm ownership in order to identify the leading theoretical and empirical issues in this area. The theoretical component of the survey attempts to reconcile competing theories of capital structure and appraises recent models which use agency theory and asymmetric information to explore the impact of managerial shareholdings, corporate strategy and taxation on the firm's capital structure. The empirical component focuses on univariate analyses as well as multivariate models of capital structure, and makes a comparison between theoretical predictions and empirical results. Implications are identified in terms of promising research ideas (PRIs) for further research. The bulk of the empirical research that we survey is concerned with the experience of a few western industrial countries, and the implications of this research are assessed accordingly. However, we also aim to draw out implications for new research in developing and newly industrialised countries with an expanding corporate sector.

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Contents

1. Introduction

Financing policy by firms requires managers to identify ways of funding new investment. The managers may exercise three main choices: use retained earnings, borrow through debt instruments, or issue new shares. Hence, the standard capital structure of a firm includes retained earnings, debt and equity; these three components of capital structure reflect firm ownership structure in the sense that the first and third components reflect ownership by shareholders while the second component represents ownership by debtholders. This is the pattern found in developing and developed countries alike (see La-Porta, Lopez-de-Silanes and Shleifer, 1999).[1] Capital structure also affects corporate behaviour (Hutton and Kenc, 1998). Thus, financing policy, capital structure and firm ownership are all strongly linked in explaining how economic agents form and modify their asset-acquisition behaviour through firms and capital markets, and thereby influence their incomes and returns to asset holdings, whether in the form of direct remuneration, capital gains or dividends.

There is a large volume of research on these issues in industrial countries, but virtually no work has been done on developing countries, apart from a limited amount of empirical research by, for example, Hamid and Singh (1992), Singh (1995), Hussain (1995), Brada and Singh (1999) and Prasad (2000). It is scarcely an exaggeration to state that, until recently, corporate finance did not exist as an area of research investigation in developing countries. Some of the reasons for this are clear. Many developing countries initially chose a state-sponsored route to development, with a relatively insignificant role assigned to the private corporate sector. In the poorer countries, irrespective of development strategy, there is only an embryonic corporate sector. Moreover, most of the corporate financing needs were met by regional and international development banks, which either took an equity interest in the firms or provided the debt component of a firm's capital. However, in almost all these countries, development banks have experienced serious difficulties (Murinde, 1996; Murinde and Kariisa-Kasa, 1997). Thus, there is a conspicuous gap in the empirical research on corporate finance in developing countries; this gap requires urgent attention, given that the research is likely to have profound policy implications for promoting poverty-reducing economic growth.

This paper conducts a critical survey of the key literature in order to isolate the leading theoretical and empirical issues surrounding company financing policy, capital structure, and ownership that are particularly relevant for developing economies. The idea is to take stock of existing knowledge in this area and identify the main strands of the theoretical and empirical literature, considering the policy implications of existing knowledge, and spelling out the current policy problems which should be addressed by future research. As the subject area is vast, the survey is highly selective. Well-known theories are not discussed at length; only the main arguments within the literature are

[1] La-Porta, Lopez-de-Silanes and Shleifer (1999) survey firm ownership around the world. See also the literature on ownership and firm value; for example, Griffith (1999).

highlighted. Also, we concentrate, as far as possible, on the direct relationships among financing, capital structure and ownership. We do not explicitly cover the numerous topics, such as dividend policy, which are more or less indirectly related to capital structure but which are the subject of a substantial literature in their own right. In the empirical part of the survey, we again concentrate on research involving the direct description and analysis of capital structure and ownership, especially orthodox regression studies whose main goal is usually to understand the temporal and, more particularly, the cross-sectional differences among companies' capital structures. In general, we do not cover research based on event studies, although we do cite such studies where relevant. Event studies constitute a vast and varied literature in their own right and it has been the subject of several recent surveys, an example being MacKinley (1997). Likewise, we do not dwell in detail on each individual set of results from the industrial countries. Rather, we summarize the main results, and seek to evaluate their implications for developing countries. Of course, we also draw on the small body of research that is directly concerned with developing countries.

The literature as a whole is fragmented, and there are numerous ways in which a review could be organised. We chose to follow the approach of Harris and Raviv (1991) in organizing the survey around the "*driving forces*" behind financing policy and capital structure. This method is used since it does not suffer from the unnecessary repetition that characterises some other approaches.[2] The theoretical component of the survey draws extensively on Masulis (1988) and Harris and Raviv (1991), but also substantively extends their work by examining the impact of managerial shareholdings, corporate strategy and taxation on the firm's capital structure. Sections 2-4 of the paper cover the leading issues in the theoretical literature; section 2 focuses on agency theory and capital structure; asymmetric information models are discussed in section 3; section 4 addresses the issue of taxation.

The empirical component of the survey distinguishes first between univariate and multivariate studies, the former aimed at documenting basic facts and testing general descriptive hypotheses, the latter typically using a regression approach to test more specific, theoretical hypotheses. Much of the empirical literature on developing countries is in the form of univariate studies. Univariate studies of developed and developing countries are discussed in section 5. Section 6 contains a preliminary overview of the main empirical methods used in multivariate research, before we turn to the main research results themselves. Most multivariate studies can be interpreted either as a precise test of a certain theory, or more loosely, as a test of the role of particular variables in determining capital structure, such variables usually serving as measures of some specific predictions of a more general theory. Accordingly, section 7 discusses studies that investigate the following: the influence of ownership and control structures on capital structure; the role of bankruptcy costs; the influence of corporate strategy; and tests of the pecking order hypothesis against trade-off theories. In section 8,

[2]See Cleaver (1990) for the "*mother-daughter*" and Masulis' (1988) "*wishing list*" approaches of organising the literature.

we organize the results by explanatory variable, and review particularly the influence on capital structure of: tangibility, size, profitability, growth, risk, non-debt tax shields, and the industrial classification of firms. The major empirical research findings are organized in a way that allows comparisons to be made between theoretical predictions and empirical results. Promising research ideas (PRIs) are identified to form the context for future research relating to "corporate finance and development", and these are set out in the final section, 9.

2. Agency Theory and Capital Structure

2.1 The background: reconciling Modigliani-Miller and the traditional theories

The background to the modern debate on corporate capital structure derives from Modigliani and Miller (MM, 1958). MM's paper overturned the traditional view of corporate finance (TV). The latter is based on the firm's weighted average cost of capital (r_a) i.e. the weighted sum of debt and equity costs or the minimum overall return that is required on existing operations to satisfy the demands of all stakeholders. TV begins with the observation that debt is generally cheaper than equity as a source of investment finance. Hence, a firm can lower its average cost of capital by increasing its debt relative to equity (ie. its leverage), provided the firm's cost of debt and equity remain constant. However, this process cannot be extended indefinitely because, in reality, higher levels of debt increase the likelihood of default resulting in debtholders and shareholders each demanding greater returns on their capital. Therefore, the r_a schedule is U-shaped when plotted against leverage, with the cost of debt and equity both rising at an increasing rate as bankruptcy risk increases. The corresponding company market value schedule is an inverted U-shape. Optimal leverage occurs where r_a is minimised and the value of the firm is maximised.

Unlike the TV, MM assumes a perfect capital market and uses a simple arbitrage mechanism to derive three, now well-known, propositions relating to: the value of the firm, the behaviour of the equity cost of capital, and the cut-off rate for new investment. MM's Proposition I states that the market value of any firm is independent of its capital structure. Hence, the firm's average cost of capital is also independent of its capital structure. It does not have an "optimal", market-value maximising, debt-equity ratio: any degree of leverage is as good as any other. This is a consequence of the perfect capital markets assumption, which implies that both the r_a and the market value schedules are horizontal, when plotted against leverage. MM's Proposition II states that the rate of return required by shareholders rises linearly as the firm's debt-equity ratio increases. That is, the cost of equity rises so as to offset exactly any benefits accrued by the use of cheap debt. However, some criticisms of this proposition show that a disparity normally exists between the capitalisation rate and the cut-off rate (see, for example, Peyser, 1999). Proposition III states that a firm will only undertake investments whose returns are at least equal to r_a.

There are two essential differences between the conclusions of TV and those of MM. First, under TV, the firm's value and cost of capital are related to its capital structure, whereas MM's

Proposition I states that they are independent of capital structure. Second, under MM's Proposition II, if management aim to maximise shareholder returns, they would employ debt until 100 percent leverage is reached. Clearly this cannot be precisely true, since a firm which is 100% debt-financed is technically bankrupt.[3] However, MM's Proposition II does imply a linear relationship between shareholders' rate of return and firm leverage. Thus, at low levels of debt, the cost of equity rises faster under MM than under TV. At higher levels of debt, the risk of default increases, and the cost of equity rises faster under TV than under MM's Proposition II.

An alternative argument for the TV relates to the comparative advantage of firms over households in the debt market. If transactions costs are such that the costs of borrowing are higher for shareholders than for firms, it may be cheaper for investors to borrow *via* a firm by purchasing its shares. Investors who have higher costs of borrowing will be willing to pay a higher premium for the shares of levered firms than will low-cost borrowers. Also, as a firm's leverage increases, the number of investors willing to hold its shares will decrease. The counter-argument in the spirit of MM is to question the assumption that firms do, in fact, have a comparative advantage in the debt market. If they do not, investors will be indifferent between the shares of a leveraged firm and "home-made" leverage: a combination of shares in an unlevered firm and their own debt.

MM's propositions have to be modified to accommodate taxation, a topic we take up in detail in section 4, and financial distress. Proposition II implies that maximising the return on shareholders' equity is equivalent to 100% debt financing. This is based on two assumptions: (i) the firm does not face any costs associated with financial distress which rise as the level of leverage increases; and (ii) the marginal rate of return which debt holders require remains constant. In reality, it is more likely that the higher the leverage of a company, the greater its liquidation costs. Moreover, as leverage rises, the risk of default also rises, resulting in debtholders demanding a higher rate of return for them to hold an additional unit of debt. This situation is compounded if there are multiple debt claims each having different rights.[4]

In general, therefore, market imperfections such as taxes and financial distress affect the firm's capital structure. There are many other market imperfections, especially those which are characteristic of developing economies, such as the costs associated with asymmetric information, and conflicts between economic agents associated with the firm, as well as with capital markets. These are discussed below.

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[3] If the firm is bankrupt, its shares are worthless, and lenders become the new owners of the firm. They in turn will demand the same rate of return on their capital since they now bear all the firm's business risk. Firms do not, in fact, swing from being 100 percent equity financed to 100 percent debt financed, or bankrupt, and back to being 100 percent equity financed again.

[4] If the managers want to maximise the value of the firm, the difference between the benefits and costs of debt must be maximised. The optimal level of debt is determined at the point when the marginal gain from leverage is equal to the marginal expected loss associated with increased financial distress. Accordingly, the value of the firm is inversely related to its probability of financial distress and to the discount at which its assets may be disposed of in a forced sale

2.2 Agency costs

The seminal work on agency theory and capital structure is Jensen and Meckling (1976); the main extensions of the seminal work include Ross (1973), Shavell (1979), Fama (1980, 1990), Arrow (1985) and Jensen and Meckling (1992). Here, a particular single-owner firm wishes to finance projects in excess of the firm's internal resources. The firm has two options: to issue equity or debt. If the firm issues equity, the owner-manager's fractional interest within the firm decreases. This increases the incentives for an owner-manager to undertake excessive perk consumption since the costs to the owner of such activities have been lowered as a result of a reduction in his fractional interest. Such costs include: (i) the monitoring expenses of the principal (the equity holders); (ii) the bonding expenses of the agent (the manager); and (iii) the money value of the reduction in welfare experienced by the principal due to the divergence between the agent's decisions and those which maximise the welfare of the principal. However, in the presence of efficient markets which incorporate expectations, external investors anticipate such actions by the owner-manager of the firm (see, for example, James, 1999). Accordingly, the price of new equity is discounted to take into account the monitoring costs of external shareholders. Under these circumstances, the owner-manager would prefer to finance new projects using debt rather than equity.

However, issuing debt to finance investment also incurs agency costs. These arise as a result of the conflict of interest between external lenders and the owner-manager. The issue of debt increases the owner-manager's incentive to invest in high-risk projects which, if successful, offer high returns which accrue exclusively to the owner-manager but at the same time, increase the likelihood of failure. If the projects fail, the owner-manager's exposure is limited to the value of his equity holdings. Debt-holders on the other hand do not share the profits of success, but will share in the costs of a bankruptcy: they are incurring extra risk without additional expected returns. Debt-holders can be thought of as having written a European Put on the firm's assets, with bankruptcy corresponding to exercise of the Put by shareholders. As the amount of debt increases, debtholders will demand a higher premium to compensate them for the increased probability of failure. Thus, the agency costs of debt include the opportunity costs caused by the impact of debt on the investment decisions of the firm; the monitoring and bond expenditures by both the bondholders and the owner-manager; and the costs associated with bankruptcy and reorganisation (see, for example, Hunsaker, 1999).

Since equity and debt both incur agency costs; the optimal debt-equity ratio involves a trade-off between the two types of cost. Agency costs associated with equity are at a maximum when the owner-manager's share of equity is zero, and the firm is wholly owned by outside shareholders. These costs fall to zero as the owner-manager's equity share rises to 100%. Similarly, the agency costs of debt are at a maximum when all external funds are obtained from debt. As the level of debt falls, agency costs are reduced: first, because the amount of wealth that can be reallocated away from debt-holders falls; and second, since the fraction of equity held by the owner-manager is being reduced, the owner-manager's share of any reallocation also falls. The total agency cost schedule is

therefore a U-shaped function of the ratio of debt to outside equity; and the optimal ratio of debt to outside equity is that which minimises total agency costs.

When a firm is close to bankruptcy, equityholders have no incentive to inject new capital into value-increasing projects since the returns of such a venture will accrue mainly to debtholders. Thus, the larger the debt level of the firm, the less the incentive to invest in value-increasing projects. Myers (1977) notes that this has specific implications for the nature of debt contracts, and for the characteristics of highly levered firms. First, we would expect bond contracts to include features which prevent "asset substitution", such as the sale of profitable parts of the business to finance new high-risk projects. Second, industries which have limited scope for such asset substitution should have higher levels of debt, *ceteris paribus*; for example: regulated public utilities, banks and firms in mature industries with low growth potential. Third, firms with low growth prospects and strong cash flows should have high amounts of debt that would use up resources that would otherwise be used for perquisites. Such firms are typically thought to be those in "mature" industries, such as steel, chemicals, brewing and tobacco.

2.3 Conflicts between equityholders and managers

The conflict between equityholders and managers takes several distinct forms. The first, pointed out by Jensen and Meckling (1976), is that managers prefer to have greater perquisite levels and lower effort levels, provided that they do not have to pay for these through lower wages or by a lower market value of their personal equity holdings. A second arises because managers may prefer short-term projects, which produce early results and enhance their reputation quickly, rather than more profitable long-term projects. On this point, see Masulis (1988). Third, managers may prefer less risky investments and lower leverage to lessen the probability of bankruptcy. See Hunsaker (1999). Fourth, managers will wish to minimise the likelihood of employment termination. As this increases with changes in corporate control, management may resist takeovers, irrespective of their effect on shareholder value. See Garvey and Hanka (1999). Managers and shareholders may also disagree over a firm's operating decisions: Harris and Raviv (1990) observe that managers will typically wish to continue operating the firm even if liquidation is preferred by shareholders[5]; managers may also prefer to invest all available funds even if shareholders want to be paid dividends.[6] On both these points, see Stulz (1990).

[5] Debt gives investors the option of liquidation if cash flow is poor. The costs here are the information costs associated with determining whether or not liquidation should occur. Higher levels of debt make default more likely thereby making the liquidation decision more appetising. Consequently, firms with higher liquidation values will have more debt than those with lower liquidation values, *ceteris paribus*.

[6] Here, the optimal capital structure is determined by trading off the benefit of debt in preventing investment in value-decreasing projects against the cost of debt in impeding investment in value-increasing projects. Thus firms with good investment opportunities have low debts. Furthermore, those firms which have more value-increasing investments than value-decreasing investments will have less debt, *ceteris paribus*.

An equally varied menu of solutions has been proposed to resolve or at least limit these principal-agent problems. For example, Jensen (1986) argued that management prefers to increase firm size, whereas shareholders are seeking to maximise the value of their shares. Management will attempt to evade shareholder control by financing less profitable projects using internal funds, which are subject to a minimum of external monitoring. Shareholders can prevent management from undertaking unprofitable expansion by reducing this "free" cash flow. This can be done either by increasing the firm's dividend payment or by increasing its leverage. As Hunsaker (1999) points out, an increase in leverage also increases the risk of bankruptcy, and therefore limits management's consumption of perquisites.

Other vehicles for removing shareholder-manager conflicts include the provision of incentive-compatible managerial contracts, and the role of the managerial labour market in exerting discipline on managerial behaviour. Shleifer and Vishny (1989) develop a model in which a manager has an incentive to invest the firm's resources in those assets that are more highly valued under that manager than under the next best alternative manager. By this means, the manager counters the disciplinary forces: of the managerial labour market, of product market competition, of the threat of take-over, and of a monitoring board of directors. If successful, managers can demand higher compensation together with greater autonomy. Shleifer and Vishny show that, when investment projects are irreversible, the firm over-invests in those specific projects whose value is greater under one particular manager than under the next best manager. Such specific projects incur two distinct types of loss: (i) a social cost in relation to investments not being value maximising, and (ii) a transfer of economic rent from shareholders to managers. This analysis helps explain why managers like growth: growth promotes those areas specific to the manager's skills and provides management benefits through entrenchment. However, Jensen and Meckling (1976), Green (1984), and Smith and Warner (1979) argue that management can still be disciplined by the use of convertible debt. Convertibles reduce the agency costs of monitoring because they give lenders an opportunity to share in a firm's profits. It may be expected that the greater the growth opportunities available to a firm, the greater the probability that management will over-invest. This implies a positive relationship between firm growth opportunities and the level of convertible debt, and a negative relationship between growth and ordinary (long-term) debt.

A more radical solution to shareholder-manager conflicts is proposed by Kensinger and Martin (1986). They argue that, if the firm is reorganised into a limited partnership (or royalty trusts), the managing partner has limited discretion in dividend/re-investment decisions. The re-investment of profits is in the hands of individual partners (shareholders) which reduces the manager-shareholder agency costs by removing the management's decision-making power.

An alternative approach to analysing shareholder-manager conflicts uses transactions-cost economics, developed particularly by Williamson (1988). In this approach debt and equity are regarded as vehicles for corporate governance rather than as financial instruments; see, for example,

Core, Holthausen and Larcker (1999), Brada and Singh (1999), and Vilasuso and Minkler (2001). Williamson (1988) argued that the financial structure of a firm is affected by the "specificity" of the different types of assets that it owns. "Specificity" concerns the extent to which assets can be redeployed in different investment projects, with only limited modifications. Evidently, the more specific the asset, the lower will be its liquidation value. In this context, debt acts as a straitjacket for investment opportunities: lenders will not lend to very specific projects since, in the event of failure (liquidation), the amount realised will be very low. Thus, leverage should decrease as the degree of asset specificity rises. Equity-holders are less affected by specificity, since they necessarily surrender the firm's assets to lenders at liquidation. In total, as asset specificity rises, the costs of debt and equity rise, with the costs of debt rising faster than equity. Consequently, highly redeployable assets should be financed by debt whilst equity should be used for highly non-redeployable assets. Williamson (1988) concluded that this argument was at odds with more conventional corporate finance literature, as it suggests that debt is a neutral financial instrument with equity being the instrument of last resort. However, this conclusion was foreshadowed by the pecking order theory of Myers (1984), and Myers and Majluf (1984), that we discuss in section 3.

Corporate strategy may also impact on capital structure. Strategy consists of those actions and plans that influence the portfolio of activities in which the firm is involved. It determines how assets are allocated and the level of debt the firm carries. Most important, the goals of management strategy may conflict with those of shareholders. The relationship between corporate strategy and capital structure is less commonly examined in the mainstream corporate finance literature. Nevertheless, five themes can be identified within the literature that has appeared:

(i) The application of applied discounted cash flow techniques to the development of value-based planning models; see Hax and Majluf (1984).

(ii) The relationships among the strategic decisions of a firm, stock market performance and the level of systematic risk; see Chang and Thomas (1989).

(iii) The dependence between stochastic inflation rates and the firm’s asset structure, which reflects the firm’s strategic decisions; see Kracaw *et al.* (1994).

(iv) The relationship between corporate strategy and the debt-equity ratio; see Barton and Gordon (1987, 1988), Lowe *et al.* (1994) and Krishnaswami, Spindt and Subramaniam (1999). It is argued that the goals, risks, and strength of external monitoring influence the firm’s capital structure. Specifically, firms which adopt single and related strategies are the most conservative and are therefore most risk averse while those having unrelated strategies are likely to be least risk averse. This runs counter to standard diversification arguments, and suggests that strategic "focus" implies a lesser willingness to take risks.

(v) The relationship between the structure of the firm and the leverage of the firm. Riah-Belkaoui and Bannister (1994), amongst others, assert that a change in a firm's organisational structure will result in a change in its capital structure. They argue that the adaptation of a multi-divisional ("M-form") corporate strategy is associated with an increase in free cash flow. If so, and as noted above, the capital market may force such firms to finance new capital by debt rather than by equity in order to reduce management's misuse of cash (Jensen 1986).

2.4 Conflict between equityholders and debtholders

Various underlying factors have been identified within the literature on the conflict of interest between equityholders and debtholders. Smith and Warner (1979) identify four major sources of conflict:

(i) *Dividend payments*: Here bonds are priced according to the level of dividends paid by the firm. In the limit, a firm could sell all its assets and pay a liquidating dividend to its shareholders with the bondholders being left with valueless claims.

(ii) *Claim dilution*: Bonds are normally priced assuming that the firm will not carry any more leverage. If the firm does issue additional debt, then existing debt will fall in value if the newly issued debt has higher priority. Even if it does not, existing debt will fall in value if the risk of bankruptcy is perceived to have increased.

(iii) *Asset substitution:* Bonds are priced in relation to the risk of the project which is being financed. Thus, lenders' claims are reduced if the firm substitutes projects that increase the firm's variance. This transfers wealth from bondholders to shareholders.

(iv) *Under-investment and mis-investment*: Here, a firm in financial difficulties has an incentive to reject low-risk, low (positive) net present value projects whose benefits accrue mainly to bondholders, in favour of high-risk, high net present value projects, thus creating under-investment or misallocation of investment.

Myers (1977) argues that the greater is the proportion of growth assets in a firm, the greater is the potential conflict of interest between stockholders and bondholders, because the easier it is to alter a firm's market value and risk in such a way as to benefit stockholders at the expense of bondholders. To minimize these conflicts, firms with high growth opportunities should have higher leverage and use a greater amount of long-term debt than firms in more mature industries. Alternatively, if capital market participants have rational expectations and perfect information, they will anticipate these conflicts of interest and counteract them by adjusting the price and conditions on a firm's bond. In fact, information in capital markets is far from perfect; and the two main competing hypotheses concerning the impact on firm value of bondholder-stockholder conflicts are built on the assumption of imperfect information: the Irrelevance Hypothesis and the Costly Contracting Hypothesis.

The Irrelevance Hypothesis predicts that the conflict of interest between bondholders and stockholders does not change the value of the firm. Smith and Warner (1979) argue that this is true, regardless of whether the firm's investments and therefore its cash flows are fixed. If investment is fixed, debt covenants will only alter the distribution of payoffs between bondholders and stockholders, but will not alter the overall value of the firm. If the firm's investment policy is not fixed, dividend payouts, asset substitution and under-investment may cause changes in the investment policies of the firm. In principle therefore, the value of the firm may change if stockholders engage in activities that maximise their wealth at the expense of bondholders. Galai and Masulis (1976) utilise an option model[7] to show that a redistribution of wealth from bondholders to shareholders will result from any of: an increase in the risk of the firm, an increase in debt, or a distribution (payout) of assets to shareholders. However, as Jensen and Meckling (1976) observe, if investors are aware of the conflict between stockholders and bondholders and discount any bonds which are issued, stockholders will not gain from such actions since any *ex-post* transfers to stockholders will be sub-optimal to the firm. Moreover, Galai and Masulis (1976) argue that the problem of conflict can always be circumvented if investors hold an equal proportion of their portfolio in equity and debt. Any redistribution of income streams amongst different types of claim holders would still leave each individual investor with unchanged wealth. There can only be conflict if different agents hold debt and equity. See also Harris and Raviv (1991) on this point.

The Costly Contracting Hypothesis predicts that the use of contracts to control stockholder-bondholder conflicts of interest will increase the value of the firm. By imposing restrictive covenants on debt, the value of the firm will increase, for two reasons. First, the covenants reduce the costs which debtholders incur if shareholders do not maximise the value of the firm. Second, they reduce the monitoring costs of bondholders. This leads to increased monitoring, improved management decisions, and hence an increase in the value of the firm as a whole. However, restrictive covenants involve costs, particularly the transactions costs of writing the contracts. In principle therefore, the benefits of covenants can be traded against their costs to arrive at a unique set of optimal contracts that will maximise the value of the firm. In this setting, information asymmetry and monitoring problems play an important role. See Krishnaswami, Spindt and Subramaniam (1999).

Agency costs have several important implications for the features of debt contracts. Green (1984) and Masulis (1988) argue that convertible debt will have lower agency costs than plain debt. The conversion rights enable bondholders to share in any positive wealth transfers to stockholders and to gain from any increase in risk. Consequently, stockholders have fewer opportunities to engage in those activities that would result in the increase of stock values at the expense of bondholders. Thus, convertible debt tends to moderate both shareholder-manager conflicts and shareholder-bondholder conflicts. Such debt issues should therefore be less discounted than plain debt issues. This

[7] The stock of a levered firm is analagous to a European call option on the firm's cash flows, with an excercise price equal to the face value of the debt.

conclusion is also supported by the work of Thatcher (1985), who argues that the gain accruing to convertible bondholders from investments in profitable low risk projects, which would otherwise be rejected by shareholders, is reduced to the conversion premium, since bondholders have less incentive to convert. This allows shareholders to capture most of the profits in these profitable low risk projects thereby reducing the agency problem.

A potential problem with covenanted debt is that the partitioning of debt into various separate classes with different rights creates a potential for new conflicts of interest among the various classes of debtholders. According to Masulis (1988), such conflicts are greatest during periods of financial distress. Bulow and Shoven (1978) focus on conflicts of interest arising from differences in the seniority and time priority of debt. When a firm has net negative worth, shareholders will not buy additional stock to enable the firm to avoid bankruptcy. However, short-term debtholders may extend additional credit in exchange for a partial payment of their existing claims so that the firm can avoid default (Hunsaker, 1999). This is beneficial to the firm since it prevents immediate bankruptcy and allows short-term debt to be paid off, thereby maintaining the time priority of short-term debt. On the other hand, if bankruptcy was declared, the claims of long-term debt will be accelerated which in turn may result in non-payment to short-term debtholders, if the long-term claims are of senior or equal standing to the short-term debt claims. Hart and Moore (1990) consider the relationship between the seniority of debt and the firm's capital structure[8]. They show that either an increase in the return on the firm's initial dowry of assets or in the return on new assets will be associated with an increase in the firm's debt-equity ratio. Moreover, for profitable investments, the debt-to-equity ratio falls as the variance of the return on existing assets increases, but increases as the rate of return on debt rises; but for unprofitable investments, the reverse is true. The opposite occurs for the case where the investment is unprofitable. Given the multitude of different bond covenants used in practise, it is not altogether surprising that the theoretical literature has produced a host of special cases, but fewer general conclusions about the implications of covenants. See Smith and Warner (1979).

If debt covenants can be used to help resolve stockholder-bondholder conflicts then, in principle, other forms of constraint may also work. Since dividend payments are the main route by which stockholders divert cash from bondholders, it is natural to consider constraints on dividend payments. Wald (1999) develops a model in which conflict arises, not because of information asymmetries, but because of incomplete contracts: debt contracts cannot cover all possible future contingencies. Wald shows that a dividend constraint can solve the moral hazard problem that arises in the presence of incomplete contracts. In this setting, more profitable firms that can afford higher dividends will have lower debt-equity ratios so as to avoid hitting the dividend constraint.

[8] Hart and Moore's model has some parallels to that of Jensen (1986). However, Jensen analyses the role of the firm's financial structure in controlling funds out of the firm, whereas Hart and Moore consider the role of the financial structure in controlling the funds into the firm.

A further important issue in situations of conflict of interest and imperfect information is that of managerial reputation. Diamond (1989) analyses the influence of managerial reputation on reducing the problems of adverse selection and moral hazard. A firm can invest in a safe asset, a risky asset, or a combination of the two. Firms investing in a safe project will not default; those investing in the risky project may default. Investors, *ex-ante*, cannot distinguish between firms, consequently, the lending rate will reflect their beliefs regarding the riskiness of a firm's investment. Diamond assumes that investors can only observe defaults. It follows that, the longer the period of non-default, the better is a firm's reputation as a safe firm, and the lower will be its borrowing costs. This suggests that older firms will choose the safe project to maintain reputation. Younger firms with a lesser reputation may choose risky projects with higher prospective returns; but, if they survive, they will eventually choose the safe project. Accordingly, older firms will have lower levels of debt, *ceteris paribus*.

This analysis can be extended in terms of individual managerial reputations. Hirshleifer and Thakor (1989) analyse the financial decisions of a firm in which a manager may alter investment policy so that he/she can develop a reputation for high ability. Thus, the manager is motivated by the *perceived* value of her human capital. If the market for managerial labour infers ability by the success or failure of projects, managers will chose those projects that have the greatest probability of success even though they may have poor or inadequate risk adjusted cash flows. This divergence of interests between the manager and the shareholder, and the resulting moral hazard, create managerial conservatism in project selection. Hirshleifer and Thakor (1989) conclude that *"for an unlevered firm, ceteris paribus, managerial reputation building can cause excessive conservatism in investment policy relative to the shareholders' optimum"*. This observation suggests that the value of the firm is lower when such an outcome occurs than in the case when it does not. However, agency costs between shareholders and debtholders may be reduced as a result of management being concerned about its reputation, because managers will chose the risky projects. This results in lower rates of expropriation of debt by shareholders, thus reducing the cost of debt. As the cost of debt falls and leverage increases, there is an increase in the value of the interest tax shield of the debt, and the value of the firm rises.[9]

Managerial reputation is one method by which management signals to outsiders. If however, there is a high level of managerial share ownership, reputation is less important. Under these circumstances, various conflicting theories of the relationship between equityholders and debtholders have been proposed. One line of argument draws on three basic points. First, firms with high inside ownership may face high equity agency costs. Second, firms with high inside ownership will face lower agency debt costs arising from the lower divergence of managerial and shareholder interests. Third, firms with high inside ownership may issue more debt than is optimal simply for the insiders to maintain

[9] It is also worth noting that in levered firms, the pressure for reputation building and managerial preservation may become so acute as to incline management to the rejection of any slightly risky but profitable project; thus resulting in the value of the firm falling.

control of the firm. As Kim and Sorenson (1986) conclude, these arguments all suggest that firms with high inside ownership will issue more debt (and possibly excessive debt) than those in which ownership is more dispersed. Grossman and Hart (1982) argue that managers increase the level of debt so as to commit themselves to generating the necessary cash flows to meet debt repayments and consequently reducing the possibility of management engaging in excessive perquisites. This in turn increases the value of the firm's equity. Correspondingly, the costs of issuing additional equity should fall as a result of external investors perceiving that management have reduced their "shirking".[10]

However, other theories suggest that high levels of insider ownership will be associated with lower levels of debt. For example, Jensen (1986) argues that owner-managers will prefer lower debt levels so as to increase their discretion over the use of free cash flow. Friend and Lang (1988) and Hunsaker (1999) point out that lower debt levels will reduce the risk of bankruptcy, and therefore help preserve the management's stake in the firm. Thus owner-managers will have a level of debt which is lower than optimal; and the greater the concentration of management ownership the lower will be the firm's level of debt. A further consideration, due to Short and Keasey (1999), is that well-diversified external shareholders would be willing to incur higher debt levels than those which would rationally be sought by less diversified risk-averse owner-managers.

Notwithstanding the arguments of the previous two paragraphs, it can be claimed that firms with a high degree of insider ownership would not, in fact, suffer from equityholder-debtholder conflicts. It is natural to suppose that the higher the proportion of shares owned by the management, the more difficult it becomes for outsiders to discipline such owner-managers, without the aid of high levels of debt. However, Grossman and Hart (1982) show that if we start from a situation in which managers do not have any equity, then, as their ownership increases, owner-managers' and external shareholders' interests are increasingly tied together. The dispersion of external shareholders is also important. For example, Zeckhauser and Pound (1990) and Chen and Steiner (2000) argue that the presence of a few large external shareholders in a firm may prevent owner-managers from adjusting debt ratios to suit their own interests. Large external shareholders, by acting as monitors, help to lower some of the agency problems of debt financing. Thus, such firms should have a higher level of debt than those firms with no large external shareholders. Alternatively, large external shareholders may act as a signal to the market that managers are less able to engage in profit-reducing activities, thereby mitigating the need for debt to be used as a signal of firm quality. As a practical matter, these arguments obviously suggest important questions about the role of investment funds in the monitoring process.

3. Theories of Asymmetric Information between Firms and the Capital Market

3.1 Introduction

[10] This argument is consistent with that of Ross (1977), as we explain in what follows.

It is generally thought that there are informational asymmetries between borrowers and investors. When the firm issues a debt, it enters into a contract with debtholders that by itself provides information, since the firm is a going concern. Also, when management defaults on repayments, wide dissemination of information is needed to placate investors. We follow and draw on Harris and Raviv (1991) in picking three main theoretical strands of literature on asymmetric information between the firm and the capital market: the interaction of investment and capital structure; signalling with the proportion of debt; and models based on marginal risk aversion.

3.2 The interaction of investment and capital structure

Myers and Majluf (MyM, 1984) is the seminal contribution to this literature,[11] which draws attention to the use of debt to avoid the inefficiencies in a firm's investment decisions which would otherwise result from information asymmetries. The nature of the asymmetric information in this case is that managers know more about their companies' prospects, risks and values than do outside investors. Asymmetric information leads to adverse selection and moral hazard; in some respects, the problem is similar to the one originally identified by Akerlof (1970) in that potential investors can purchase securities which are "lemons"- a product whose quality cannot be ascertained by its buyer. If there exists an asymmetry of information between investors and firm insiders, then the firm's equity may be under-priced by the market. This has the effect of also under-pricing new equity which is used to finance new investment projects. If management's objective is to maximise the return to all shareholders, the net effect is that new investors obtain a higher capitalised cash flow from this investment than pre-existing shareholders, which may cause the project not to be accepted on these grounds even when it has a positive NPV. See Rock (1986) for a detailed analysis. In principle, the problem of under-pricing of new equity could be solved by using financial securities that may not be undervalued by the market, particularly internally generated funds. In contrast to MM, this suggests that there will exist a specific hierarchy or "pecking order" of securities to be used in the financing of projects.

Moreover, if the firm has financial "slack", but asymmetric information means that the market does not know this, managers will not issue fresh equity, even though it may involve passing up a good investment opportunity, so that the interests of present shareholders are protected. If investors understand this point, then the market will assume that a decision not to issue shares is "good" news. If management does propose a new share issue, it will be interpreted as "bad" news, and the share issue will precipitate a fall in the firm's share price. MyM also show that if a firm can issue debt, it will do so rather than issue equity, and this will result in the *ex-ante* value of the firm being higher, since the loss in market value is reduced due to the reduction in under-investment losses.[12]

These results lead to the Pecking Order Hypothesis, which Myers (1984) summarised in four parts:

(i) To finance new investment, firms prefer internal finance to external finance. Asymmetric information creates the possibility that they may choose not to issue new securities and therefore miss a positive NPV investment; or may issue equity at a low price which disadvantages existing shareholders.

[11] Cleary (1999) is representative of some recent contributions.

[12] More recent work by Guariglia (1999) suggests also that there exists a strong linkage between internal finance and inventory investment, especially work-in-progress and material inventories.

(ii) Managers adapt their target dividend payout rates to their investment opportunities, notwithstanding the downward inflexibility of dividends. In setting the target payout rates, managers try to ensure that "normal" investment plans can be met by internal finance.

(iii) If retained earnings are less than investment outlays, the firm first depletes its financial "slack" (its cash balances or marketable securities). If instead, retained earnings exceed investment, it first invests in cash or marketable securities, and then pays off debt. If the firm is persistently in surplus, it may increase its target payout rate.

(iv) If financial slack is depleted and a sufficiently favourable investment opportunity is presented, the firm will resort to external finance. In this event, it starts with the safest security (plain debt); then hybrid securities such as convertible bonds. As it climbs up the pecking order, a firm faces increasing costs of financial distress inherent in the risk class of debt and equity securities. Only when it runs out of debt capacity, and the potential costs of financial distress become important, will it finally resort to a new equity issue.

Thus, internal finance is at the top, and equity is at the bottom, of the pecking order. A single "optimal" debt-equity ratio does not exist: a result which takes us back to the original no-tax MM proposition I, but by a very different route. The original MM propositions would suggest that firm financial policy is irrelevant; and this is obviously not an implication of the Pecking Order hypothesis.

Like the MM propositions, MyM's Pecking Order hypothesis has generated substantial debate. MyM's model is not easily applied to new firms. This omission was rectified by Narayanan (1988) who considers the information asymmetries associated with assets-in-place. He also allows for the possibility of risky debt. The conclusions of Narayanan's model are that: (i) the firm should issue less risky securities over more risky ones; (ii) debt should be used in preference to equity; (iii) internal finance should be used in preference to external finance; and (iv) if equity is used, the stock price falls since the market views the firm as a "lemon". Evidently, these conclusions are consistent with MyM. However, when this model is extended, by Heinkel and Zechner (1990), to allow the firm to choose an optimal capital structure before its investment decision, it transpires that the use of debt or hybrid securites, such as preferred stock, tends to cause under-investment. This implies that the firm does once more have an optimal capital structure, consisting of a mixture of debt and equity, a result that remains robust when the analysis is extended to include corporate taxes.

Brennan and Kraus (1987) argue that MyM's model only incorporates equity and riskless debt. Since the pecking order theory relies in part on the costs of distress and bankruptcy, this is potentially an inconsistency. They present a counter-example to MyM, the essential ingredients of which are asymmetric information, and the existence of a signalling equilibrium in which the market will still under-price shares as lemons[13]. In their model, if firms choose a financing mix that minimises the cost of raising the required investment funds, then, depending on the structure of the investment

[13] The concept of a signalling equilibrium is discussed in the section 3.3.

payoff function, it is possible that investors can infer the main parameters of this function from the financing mix chosen. This amounts to costless signalling of information to the market. Less formally, it can be thought of as a (complex) form of revealed preference. If the market can infer a firm's financial position from its observable financial policy, the firm cannot improve on the pricing of its securities by changing that policy. It transpires that the cost-minimising financial policy includes a share issue, and will often involve using part of the proceeds of the issue to retire debt. Constantinides and Grundy (1989) show that similar arguments are applicable to firms in which managers have an equity stake. Such firms can invest in positive NPV projects by issuing sufficient amounts of a hybrid security, such as convertible debt, so as to undertake the projects and repurchase some of the firm's existing equity. Evidently, both these results contradict the pecking order prediction that equity is the financing of last resort.

3.3 Signalling with the proportion of debt

This literature is concerned with the ability of firms to signal their true financial position to outsiders, by the capital structure that they choose. Typically, it is assumed that the investment opportunity is fixed. The seminal contribution in this strand of literature is due to Ross (1977); more recent contributions, such as Hunsaker (1999), link the role of debt to bankruptcy. The basic model assumes two types of firm facing different, positive present value, investment projects, one of which (A) is superior to the other (B). A signalling equilibrium for these firms can be established using a particular cut off value of debt as a signal of the firm's type. If the actual value of debt issued exceeds the cut-off value, the market perceives the firm to be of type A (a high quality, high leverage firm); alternatively, if debt is less than the cut-off value, the market perceives the firm to be of type B (low quality and leverage). If a firm signals itself to be of type A, it must not issue more debt than the net present value of the investment project for firm A, otherwise it will go bankrupt. Similarly, if the firm is of type B, it must not issue more debt than the net present value of the investment project for firm B. This constitutes an equilibrium provided that each firm has no incentive to signal incorrectly. If type A managers signal that they are of type B, they will issue less debt, and therefore will not raise sufficient funds to finance type the A investment project. Their compensation is therefore less than if they signal correctly. If type B managers signal that they are of type A, then the amount of debt issued is greater than the present value of the type B project, and bankruptcy occurs. A type B manager will signal truthfully if the marginal gain of a false signal is less than the cost of bankruptcy. Since both types of firm signal truthfully, outsiders can infer the quality of the firm from its debt level.

Ross's model has three main empirical implications. First, in a recapitulation of MM's irrelevance theorem, the cost of capital is independent of the financing decision of the firm, despite each firm having its own unique level of debt. Second, the level of bankruptcy risk rises as the amount of debt issued by the firm increases. Third, the value of the firm is positively related to its debt-equity ratio: higher quality firms issue more debt.

A similar approach is used by Heinkel (1982), but with somewhat more general assumptions. A key difference arises from the fact that Ross assumes that management does not hold shares in the firm; management compensation is determined by a contingent contract, related to the value of the firm. Heinkel, on the other hand, considers the case of the owner-managed firm. As before, a costless signalling equilibrium is one where the value-maximising decisions of insiders determine the optimal level of debt to be issued. Heinkel proves that the greater the quality of the firm, the lower the amount of debt issued. For a low quality firm to misrepresent itself as high quality, it must issue more "under-priced" debt and reduce the amount of its "over-priced" equity. Similarly, for a high value firm to misrepresent itself as a low value firm, it must issue less "over-priced" debt and more "under-priced" equity. These actions by themselves are beneficial to outsiders but detrimental to insiders in the firm. Thus, value-maximising insiders have no incentive to signal incorrectly; and their financing decisions will support a costless, fully revealing equilibrium. Heinkel's model implies that high quality firms will have low levels of debt. This is exactly the reverse of the result of Ross (1977) that high quality firms have high levels of debt! Once again, this underlines the point that, in recent models of capital structure, small changes in assumptions can produce large changes in results.

Poitevin (1989) uses another model where debt is used as a signal. Here, there is an incumbent firm and a new entrant; the financial structure of each firm is endogenous. There are also two types of entrant firms: a low cost type and a high cost type. In a separating equilibrium,[14] the entrant's type can be inferred by observing its financial policy. If financial policy is consistent with a low-cost entrant, investors agree to finance it. If any other financial policy is observed, the investors assume that the firm is a high-cost one and will not finance its investment. The incumbent will finance using only equity that is actuarially fairly priced (since his marginal cost and thus firm value is known). The low-cost entrant will partially finance with debt. The level of debt chosen is such that it would bankrupt the high-cost firm with certainty; and it is this property of the financing decision which enables the low-cost firm to signal itself truthfully as low-cost. The high-cost entrants cannot masquerade as low-cost because the resulting high level of debt and probability of bankruptcy, with its associated costs, will be too high. Therefore, the advantage of debt is that the capital market places a higher value on the debt-financed firm because it is perceived to be low-cost; the disadvantage of debt is that it makes the entrant prone to be attacked by the all-equity incumbent *via* a price war, threatening the entrant with bankruptcy. The model suggests why younger firms may be more financially vulnerable than established firms. Investors can assess the value of the incumbent and its securities more easily than they can the entrant and its securities.

3.4 Models based on marginal risk aversion

[14] A separating equilibrium is one in which the two different firms can be correctly identified by outsiders on the basis of the contracts offered by the respective firms. This concept is due to Rothschild and Stiglitz (1976)

Models based on marginal risk aversion invariably assume that there is an owner-manager of the firm who is risk averse.[15] Therefore, the level of debt that the firm incurs depends, in part, on the degree of risk-aversion of the entrepreneur. The more risky a project, the smaller will be the entrepreneur's desired stake. In a seminal work, Leland and Pyle (1977) consider an entrepreneur who wants to undertake an investment project and plans to hold a certain fraction, α, of the firm's equity. The remaining equity is raised from outside lenders. As before, a signalling equilibrium exists in which the entrepreneur's ownership increases with the quality of the firm, because the amount of equity retained by the entrepreneur is interpreted by the market as a signal of quality. Since entrepreneurs are known to be risk-averse, one who takes a high stake in a risky project must be confident of its success. Entrepreneurs with inferior projects will not choose a higher equity stake (to signal a higher quality firm), because it would increase their exposure to the project's idiosyncratic risk, and thus reduce their utility.

Leland and Pyle (1977) derive several implications from the signalling equilibrium. First, it has the desirable property that a project will be undertaken only if its true market value exceeds its cost. Second, the market treats higher entrepreneurial ownership as a signal for a more favourable project. Third, entrepreneurs make larger investments in their own projects than would be the case if they could costlessly communicate their true expected return. Thus, the entrepreneur suffers a welfare loss of investing more than is optimal in a project, so as to communicate its worth. This may cause some profitable projects to be rejected. Leland and Pyle suggest that intermediaries which specialise in information-gathering and monitoring of entrepreneurial projects could reduce this welfare loss by offering entrepreneurs better terms of finance. Fourth, an increase in the specific risk of the project, or the risk aversion of the entrepreneur, will reduce their equilibrium stake in the project. Fifth, an increase in the specific risk of a project will result in a greater expected utility for the entrepreneur.

[15] In most developing economies, owner-manager firms are predominant; almost all local firms start as owner-managed and expand their businesses for later floation on the stock market. The firms are predominantly risk-averse, although Green, Lensink and Murinde (1999) have found evidence to suggest that in Poland (as a transition economy) firms are risk-lovers.

4. Theories of the Impact of Taxation on Capital Structure

The theoretical literature has examined two main aspects of the impact of tax on the firm's capital structure. The first concentrates on aspects of the corporate tax deductibility of debt, whilst the second looks at the way in which taxes influence the decisions of the firm's security holders, and hence their willingness to hold the firm's securities. Modigliani and Miller (1963) recognised at an early stage that their perfect capital markets assumptions need modifying to allow for corporate tax. In particular, debt typically offers a tax shelter, because interest is deducted before taxable profits are struck. Thus, in the presence of corporate taxes, MM showed that the value of the firm as a whole rises as the level of leverage increases, suggesting that firms have no constraint on the incentive to issue debt, other than the direct threat of bankruptcy.

However, owners of debt and shares are also subject to tax on their security income, and this affects their after-tax returns. King (1974, 1977) was among the first to consider these issues more generally, and he pointed out that the marginal tax rate applicable to securities depends both on the official tax rates and on the precise system under which tax is collected. Under the *classical system* operated in most countries, debt interest is a deductible expense for firms, but is taxed as income in the hands of debtholders. Dividends on the other hand are effectively taxed twice: once in the hands of the firm at the corporate profits tax rate, and then a second time in the hands of shareholders at the rate appropriate to dividend income, which may be different from the rate applicable to interest or other income, and may differ among individual recipients. Under the *imputation system*, the double-taxation of dividends is partially relieved by an "imputation": a tax credit which effectively enables shareholders to credit the profits tax already paid by a firm to their own tax liability on account of their dividend income from that same firm[16].

King (1977) examines the financing decisions of a firm whose objective is to minimize the overall tax liability of its shareholders. This is a reasonable objective in the world of MM, in which taxation is the only factor that can be used to distinguish among securities. To summarise his results, we define the following:

z = the capital gains tax rate;
t = the corporate profits tax rate;
m = the marginal rate of income tax on unearned income.

Hence (1 - m) can be interpreted as the opportunity cost of retained earnings in terms of net dividends forgone, and equals the additional potential disposable income which shareholders could receive if one unit of retained earnings were distributed. King distinguishes three cases, which, for

[16] Imputation systems typically involve some complexity in the exact manner in which the impuation is calculated, and set against the firm's profits tax on the one hand and the individual's dividend tax on the other. A detailed discussion of such systems is beyond the scope of this survey. The United Kingdom operated an imputation system until 1999.

simplicity, we set out under the classical system with a common income tax rate for interest and dividend income.

(i) If equity is given, and: $(1 - m)/((1 - t)(1 - z)) > 1$, the firm chooses to finance with debt over retentions

(ii) If retentions are given, and: $1/(1 - t) > 1$, the firm chooses to finance with debt over equity, a result which recapitulates that of Modigliani and Miller (1963).

(iii) If debt is given, and: $(1 - m + z) > 1$, the firm chooses to finance with equity over retentions

King's analysis still suggests that, abstracting from other issues, exogenous tax rates imply all-or-nothing financing decisions. In contrast, Miller (1977) argues that marginal income tax rates are, in fact, heterogeneous, as shareholders typically include a combination of taxable and tax-exempt entities. In Miller's view, the firm will issue debt until at the margin, the corporate tax savings are equal to the personal tax loss, *i.e.*, until the (marginal) corporate tax rate is equal to the investor's personal tax rate. Since these two rates cannot be controlled by the firm, at equilibrium, the tax structure determines the aggregate level of debt, but not the amount issued by a single firm. In this sense therefore, Miller's analysis implies that leverage is determinate, but still irrelevant for the individual firm. However, it can still be argued that the marginal (personal) lender faces an upward schedule of the return that is required for them to lend an additional unit of funds, because of heterogeneous personal tax rates. Likewise, any individual firm typically has pre-existing non-debt tax shields, and will face an increasing probability of distress as debt increases. Thus, the marginal (corporate) borrower will also face rising costs of debt, because the value of the potential tax shield will tend to fall as leverage increases.

In general, as Auerbach and King (1983) point out, the existence of a Miller tax equilibrium depends on there being institutional constraints on corporate and individual behaviour, to rule out tax arbitrage for example. Moreover, the nature of the equilibrium depends crucially on the exact nature of the constraints. Small realistic changes in the constraints, allowing for different kinds of tax-exempt institutions for example, can generate equilibria with a distinct optimal debt-equity ratio for each firm. This argument was developed by DeAngelo and Masulis (1980), who incorporate into the analysis non-debt-tax-shields such as depreciation and investment tax credits. Their results overturn Miller's irrelevancy theorem without the need for bankruptcy, agency, or any other leverage-related costs. They argue that firms with large non-debt tax-shields relative to their cash flow will have less debt in their capital structure, because the non-debt tax-sheltered expenditures effectively exhaust the firm's tax-saving capacity. There is a direct negative relationship between the value of the marginal corporate tax saving and the amount of debt issued: the higher is leverage, the higher is the probability that the potential corporate tax shield from additional debt will be partially or totally lost. The optimum level of debt occurs when the marginal corporate tax benefit of debt is equal to its marginal personal tax disadvantage.

Subsequent contributions to this literature have continued to emphasise the role of corporate taxes and constraints in supporting an interior optimum capital structure, but extending the analysis to allow for the possibility of bankruptcy[17]. This is sometimes called the Tax-Shelter-Bankruptcy-Cost model. Kim (1978) applies mean-variance analysis to show that, when firms are subject to taxes and to costly bankruptcies, corporate debt capacity occurs at less than 100 percent debt financing. Brennan and Schwarz (1978) also study the impact of corporate taxes and bankruptcy on the relationship between capital structure and valuation. The issue of debt has two effects on the value of the firm: first, it increases the tax savings as long as the firm survives; but second, it reduces the probability of survival. Depending on which is the stronger of the two, the value of the firm might rise or fall as a result of a debt issue. The optimum value of debt is that at which the marginal tax benefits associated with one extra unit of debt is equal to the expected marginal cost of default (which rises as the firm's gearing increases). Among the predictions of this model are: first, that firm value increases the most following a debt issue for firms that have the least business risk; second, that, as the maturity of debt increases, the optimal leverage ratio falls; and third that an increase in earnings risk also reduces the optimal leverage ratio. Masulis (1988) notes, that within these models, debt is usually subject to a higher personal tax rate than is equity, although the differential is assumed to vary among investors. This implies that investors who currently prefer equity must be persuaded to switch to debt by a price reduction. This is an additional factor that diminishes the overall tax advantage of debt.

One immediate problem with theories of an optimal debt ratio based on bankruptcy costs is that there is debate about the quantitative importance of such costs. The seminal study by Warner (1977) of US railroad bankruptcies found that the direct costs of bankruptcy were practically trivial. Altman (1984) argued that once the indirect costs are taken into account, bankruptcy costs are much larger, and certainly sufficient to influence firm behaviour. In this respect, an important contribution of the Tax-Shelter-Bankruptcy-Cost model is to establish that there is an interaction between the tax system and financial distress. As Mayer (1986) points out, corporate tax payments are non-negative: national tax authorities typically allow companies to carry forward losses but not to claim immediate tax refunds on account of current losses. Financially distressed firms encounter tax exhaustion well before they are close to bankruptcy, and this imposes an immediate and significant cost on the use of debt for such firms, independently of the immediate costs of bankruptcy *per se*.

5. Univariate Empirical Research

A vast volume of work has empirically investigated the capital structures of firms in the industrial economies. In recent years there have also been some empirical studies of firms in developing economies. Most of these latter studies aim at documenting basic facts about corporate financial structures in developing economies, and are based on the analysis of financial ratios. They may

[17] We do not include in this review the numerous theoretical and empirical papers concerned with the tax systems of particular countries.

therefore be classified as univariate empirical studies. On its own, a set of financial ratios does not necessarily provide much information; accordingly, in this section, we emphasize *inter*-country comparisons among industrial countries and between industrial and developing countries. Moreover, since few specific hypotheses are tested in the papers under review, we follow Mayer (1990), and classify the results in a set of "observations", each one representing a broadly acceptable stylized fact. In making these observations, we begin by noting that commentators and researchers usually distinguish between firms in "market-based" or "Anglo-Saxon" financial systems (especially the US and UK) and those in more "bank-based" or "European" systems (especially Germany and Japan). See for example Mayer and Alexander (1990).

Observation 1: *Regardless of whether de-facto market-based capital structure behaviour is observed, retentions are the dominant source of finance for firms in the main industrial countries.*

This observation is drawn from our synthesis of the findings by Corbett and Jenkinson (1994), Mayer (1988, 1990), Borio (1990) and Wright (1994). Corbett and Jenkinson (CJ, 1994) examine corporate capital structures at the aggregate level in Japan, Germany, the UK and US, for the period 1970-1989. Internal funds were the main source of finance in all countries, with the UK financing the highest proportion (97.3%) of its investment by retentions, and Japan financing the lowest (69.3%). Similar results are reported by Mayer (1988) for France, Japan, Germany, the UK and US for 1970-1985. The UK was again the highest user of retentions (107%[18] of investment) while Germany was the lowest with 67%. This finding is supported by Mayer (1990), Murinde, Agung and Mullineux (1999), and Borio (1990). Moreover, Wright (1994) finds that the level of retained earnings employed by non-North Sea Industrial and Commercial Companies in the UK has remained essentially the same over the period 1982-1994.

Observation 2: *Firms found in bank-based financial systems have higher leverage than do firms in market-based ones.*

Observation 2 is almost part of economic "folklore", and it can be found in the results of Borio (1990), Bisignano (1990) and many others. Borio's study of developed economy corporate capital structures finds that countries are either "high leverage", such as Japan, Germany, France and Italy, or "low leverage", such as Canada, the UK and US. A similar conclusion is drawn by Bisignano (1990) who surveys the aggregate capital structures of Japanese, German and US firms.[19]

However, there are, in fact, many qualifications to observation 2. First, it depends on the precise definitions used in the calculation of leverage. Rajan and Zingales (1995) observe that, if leverage is calculated as a ratio of debt to total assets, all expressed at book value, then Canadian firms (at 36%) are the most highly geared of the G-7 economies with German firms being the lowest at 20%

[18] This shows that retained earnings have been used to retire other sources of finance.
[19] Wensley and Walker (1995) note that Japanese firms carry more leverage than do New Zealand firms.

On this definition, the gearing levels of US and Japanese firms are comparable at 35% and 31%, respectively. If however, leverage is calculated as the ratio of debt to debt-plus-equity, all at market value, then UK and German firms have the lowest gearing at 16%, with Italian companies having the highest with 28%. CJ (1994) find that both British and American firms are more highly geared than German firms if book values are used to calculate the ratio of debt to debt-plus-equity. However, Rutterford (1985) estimates that German firms have lower effective corporate tax rates, relative to their nominal rates, than do firms in other countries. The value of the tax-shield provided by debt is therefore lower, implying lower levels of leverage, *ceteris paribus*.

Second, CJ (1994) note that, although US and UK firms are located in market-based financial systems, the proportion of internal funds employed by US firms increased from 74.5% in 1970 to 103.7% in 1989; and US and UK firms both reduced their reliance on market-based sources of finance over this period. They suggest that this was due to financial innovation over the period. Bisignano (1990) also notes that US firms' dependence on new equity issues has fallen, especially during the 1980's. However, he suggests that merger activity may have been responsible for this development.

Third, Atkin and Glen (1992) report that, throughout the post-World War II period, bonds constituted a significantly higher fraction of external finance for US firms than did new equity. Moreover, loans (ie. mortgages and commercial paper), and trade credit, each separately provided more new finance than did equity. Atkin and Glen's data highlight some important changes in the capital structures of US firms post-World War II: a decline in equity and bank finance, and an increased use of directly-intermediated debt.

Fourth, the dependence of Japanese firms on debt is neither long-standing nor necessarily persistent. Elston (1981) notes that, during the 1930's, 60% of all funds employed by Japanese firms were equity. This fell to 17% in the mid-1970's, compared to 40% for West Germany, 50% for the UK and 60% for the US. More recently however, Japanese firms have relied less heavily on bank debt and more on retained earnings and non-bank external sources. The previously strong *keiretsu* bonds between affiliates have also become weaker due to changes in banking law which forced bank portfolios to become more diversified. This is generally reckoned to have increased the cost of debt, but has also allowed firms to be freer to raise funds from equity. During the 1970s, equity issued increased from 6% to 10% of total external finance, while bond financing increased from 4% to 8% in the same period. Moreover, the internationalisation of Japanese business, together with the increasing flow of overseas investment, has given rise to a natural desire to raise funds from abroad. This has been in the form of eurocurrency, national markets, or foreign currency bonds. Atkin and Glen (1992) also find that the reduction in Japanese leverage has been very marked in recent years, falling from 400% (of equity) in 1977 to 100% in 1988. The authors assert that this decrease can be explained by the liberalisation of the Japanese financial markets. In addition, during the same period,

share prices have steadily risen implying that the cost of equity has fallen. In turn, this has caused a switch from debt to equity.

Bisignano (1990) notes several apparent differences in the financial behaviour of firms that are all meant to be in bank-based financial systems. In 1965-1989 for example, the issues of securities and bonds by German firms are small in comparison to both their Japanese and US counterparts, a difference that cannot be explained by regulatory or other market restrictions. Since the mid-1970's, holdings of the German corporate sector by banks have fallen, like they have in Japan; but, unlike Japan, bank lending is still the dominant source of finance. Overall, it appears that Japanese firms, which have, historically, been closer to German firms, are now approaching those of the US. See, for example, Rajan and Zingales (1995) and Borio (1990). Indeed, there are similar patterns of corporate finance for firms found within both the market-based and bank-based systems. For example, UK and US firms have relied less on market sources of finance whilst those in Germany have increased theirs. Of the four countries that were studied by CJ (1994), Japan is the only one that relies more heavily on external rather than internal sources. Likewise, Bertero (1997) notes that the French financial system could be classified as a bank-based system, but there are still features which are either unique to France, or more like other systems. Typically, the French system was more of an overdraft system, like the UK, rather than a German- or Japanese-type bank system. More recently, as in Japan, French firms have increased their use of retained earnings at the expense of short-term debt and have also increased their use of equity and bonds. Bertero (1997) asserts that the latter has been as a result of increased capital market efficiency caused by financial reform.

The "battle of the systems", regarding the relative merits of bank-based and market-based financial systems, is integral to the developing policy debate on the evolution of financial systems in developing and transition economies. See Murinde and Mullineux (1999). It is therefore important to observe at this stage that, in the industrial countries, it can safely be concluded that many of the stereotypes of firms found within either market-based or bank-based financial systems have broken down, or perhaps never did exist in the precise form that the "folklore" would have it. Firms in all countries are increasingly influenced by the global capital market in which securities are traded and international banks are active. But each country's system of corporate finance retains some of its own distinctive features, partly because of its historical development, and partly because of current economic circumstances, particularly the existing regulatory regime.

?? **Observation 3:** *Firms located in developing economies rely less heavily on internal finance than those found in developed economies.*

Observation 3 was first suggested by Hamid and Singh (1992) who analyse the corporate finance characteristics of the top 50 manufacturing firms in: India, Thailand, Jordan, Malaysia, Taiwan, Mexico, Pakistan, Zimbabwe and South Korea over the period 1980-1987. They find that firms in developing countries used less internal finance than their developed economy counterparts. They

attribute this to different growth rates, and to lower retention ratios, rather than, for example, to the distorting influences of inflation which has had a major influence in at least some developing economies. Atkin and Glen (1992), and Singh (1995) reach similar conclusions. As with firms found within the developed economies, the use of internal sources of finance does vary across developing countries. Atkin and Glen (1992) survey macro-economic data on the corporate sector in several developing economies (Zimbabwe, Pakistan, Malaysia, India and South Korea), and find that Zimbabwean and Pakistani firms rely most heavily on internal finance: 58.5% and 58.3% respectively of all sources, whilst South Korean firms were least dependent with 12.8%. See also Guariglia (1999). They argued that, as South Korea has a more advanced financial system, it provides a greater number of external financing options for investment projects; and, indeed, South Korean firms do use a greater amount of external finance, both equity and long-term debt, than do Pakistani firms. Cobham and Subramaniam (CS, 1998) find that Indian firms use rather more equity and less retained earnings than do their UK counterparts.

?? **Observation 4:** *Equity and debt are equally important as the major source of firm finance in developing countries, although one is more important in some countries and the other is more important elsewhere.*

Hamid and Singh (1992) and Singh (1995) find that firms found within developing economies rely more heavily on equity than on debt to finance growth relative to their counterparts in the developed economies. A reverse pecking order is observed. Singh (1995) argues that the dependence of firms in developing economies on capital markets is due to: (i) active government sponsorship, such as privatisation, and specific policies that encourage the demand and supply of funds; (ii) financial liberalisation which has resulted in higher real interest rates and therefore reduced demand for bank finance; and (iii) rising price-earnings ratios that have reduced the cost of equity capital. CS (1998) note that these conclusions are puzzling, given the developing countries' lax accounting and auditing protocols, which increase information imperfections, their less well-defined property rights, and small and inefficient capital markets. Taken together, these factors suggest that firms will use bank-based finance rather than the capital markets. CS (1998) argue that the studies of Hamid and Singh (1992) and Singh (1995) suffer from small-sample bias. To correct for this, CS conduct a micro-study using two data sets for India: the *ICICI* (composed of 1013 firms for 1980-1992) and the *RBI* (containing 1650 firms for 1975-1990), and one for the UK (*Business Monitor* consisting of 2000 firms for the period 1982-1990). It was found that the behaviour of large Indian and UK firms were the same in terms of borrowing through the issue of bonds; however, from the ICICI sample, a negative dependence was noted between size and equity-finance ratios. CS suggest that this behaviour is due to smaller firms having lower agency costs since the firms will most likely issue new

equity to existing shareholders/directors who are already familiar with the firm rather than to the public directly.[20]

?? **Observation 5:** *Firms in developing economies may use more or less debt than those in developed countries.*

Here we cite the differences found by two different sets of studies as evidence for this observation. Hamid and Singh (1992) together with Singh (1995) note that companies found within Jordan, Malaysia, Taiwan, Mexico, Pakistan and Zimbabwe have gearing levels that are similar to those of firms in developed economies, whereas firms in Thailand and South Korea have higher levels. The studies also note that Indian firms have gearing levels that are similar to those of companies found within developed countries. CS (1998) find the opposite: Indian firms employ more bank-based and bond finance than their UK counterparts. However, they also find that the gearing levels of the largest Indian firms are broadly similar to those of their larger UK peers.

Although we have set out five more or less consensual observations, it will be clear that, overall, it is difficult to generalize about corporate capital structures: either within the industrial countries, or within the developing countries, or in comparisons between the two. Depending on the country, the time period, and the data definitions, different studies come to different conclusions. This suggests that the root of the differences in corporate capital structures may lie in the different underlying circumstances faced by individual firms. If firms in the same country all faced exactly the same circumstances and constraints, we would expect to see greater uniformity of results within individual countries. It would appear particularly important therefore to survey the various tests of theories of corporate capital structure, as these theories seek the source of cross-sectional differences among firms in more fundamental differences of circumstance among individual firms: their industry, shareholders, bondholders, managements, and workforce. We therefore turn next to the multivariate research results.

6. Multivariate Empirical Research: Methodology

6.1 Single Equation Models

A majority of empirical studies employ a model in which leverage is regressed on a list of explanatory variables:

$$d = f(\mathbf{X}_i) \qquad (1)$$

[20] Indeed, this suggests that there is a large degree of *intra*-country differences in capital structures. This (i) concurs with the observation made by Mayer and Banks (1990) who find *intra*-country differences in the capital structures of German and UK firms; and (ii) the major disadvantage of using flow-of-funds data when making any comparisons since a potentially large amount of information is not captured by the data. Also, and unlike the majority of ratio studies, CS use aggregate flow-of-funds data against company accounts. This could also explain the difference between CS' and Hamid and Singh's findings.

where: d is a measure of firm gearing and $\boldsymbol{X}_i$ is a vector of explanatory variables. The explanatory variables typically consist of empirical proxies that capture certain latent (unobservable) attributes of the firm. Most empirical research assumes a linear relationship between the underlying latent variable and its proxy. Titman and Vessels (1988) note that linearity is an unreliable assumption for a number of reasons: (i) the relationship between the unobserved determinant and the observed proxy may be imperfect, resulting in errors-in-variable problems when used in regressions analysis; (ii) measurement errors in the proxy variable may be correlated to those of the dependent variable thereby creating spurious correlation even though the unobserved variable may be unrelated to the dependent variable; (iii) proxy variables may be chosen by the goodness-of-fit criteria; however, bias may arise in interpretation; and (iv) it is difficult to use measures of one attribute that are unrelated to other variables of interest.

In principle, a linear structural model, such as LISREL, can be used to overcome some of these problems, as it explicitly specifies the relation between the unobservable attributes and the observable variables. See Jöreskog and Sörbom (1981). Titman and Vessels (1988) and Chiarella *et al*. (1992) use this technique. LISREL is basically a factor-analytic model consisting of two parts: a measurement model and a structural model, which are estimated simultaneously. In the measurement model, unobservable firm-specific attributes are measured by relating them to observable variables, e.g. accounting data. In the structural model, measured debt ratios are specified as functions of the attributes defined in the measurement model. The measurement model is specified as:

$$x = ?e + ? \tag{2}$$

while the structural model can be specified as:

$$y = ?e + ? \tag{3}$$

where y is a $p?1$ vector of individual firm debt ratios; $\boldsymbol{x}$ is a $q?1$ vector of observable indicators; e is an $m?1$ vector of unobservable attributes; q is the number of observable indicators; and m is the number of unobservable attributes. Hence, $?$ is a $q?m$ matrix of regression coefficients; $?$ is a $q?1$ vector of measurement errors; $?$ is a $p?m$ matrix of factor loadings and $?$ is a $p?1$ vector of disturbance terms. The parameters of the model are estimated by fitting the covariance matrix of observable variables implied by the specification of the model to the covariance matrix of the variables observed from the sample. See Jöreskog and Sörbom (1981) for details.

The form of non-linearity that can arise in corporate financial decisions is often of the all-or-nothing variety as, for example, if the pecking-order hypothesis predicts that a firm will not issue new equity in the current time period. Discrete variable techniques (logit and probit) can be used to model such decisions. For more detail on the precise techniques, see for example, Greene (1993). The logit method can be used to model the relationship between the probability of a firm switching from one

branch of a decision to another, subject to a vector of explanatory variables. For example, Gardner and Tzcinka (1992) test Myers' (1977) theory of the relationship between a firm's growth opportunities and its debt levels. They do this by estimating a logit model giving the relationship between a firm's growth rate (and other variables) and the probability of its choosing all-equity financing *versus* debt and equity. Jordan *et al.* (1998) apply similar procedures when modelling the impact of corporate strategy on the firm's capital structure.

The logit model is naturally applicable to problems of binary choice, ie. when a decision has only two possible outcomes. In more general situations, where there are several possible outcomes, or a multi-step decision tree is to be analysed, the probit model or sequential logit or probit is more applicable. For example, Chehab (1995) applies a sequential probit model to investigate the preferred choice of the firm between three or more financing alternatives. This is a special case of a general multi-response model since it is used to estimate successive sequential binary choices. Such an approach is used to investigate the choices of financial sources and the popularity of one source over another in relation to the firm's characteristics. A habit persistence model was also used to investigate if the financing choice of the previous period determines the current one. Such a procedure can be used to test if the firm's management develops a preference or is forced by capital markets to be persistent in the sources of funds.

6.2 Multi-Equation Models

The single-equation methods reviewed above implicitly assume that capital structure decisions can be thought of in a series of binary, or at least simple, steps: choice of debt-equity ratio; whether or not to issue debt or equity; and later, how much to issue; and so on. Arguably though, the capital structure decision is better thought of as a single decision, involving the question as to what type of financing to use, *and* simultaneously, that of how much of each type to use. A convenient example is Jensen, Solberg, and Zorn (1992) who estimate a cross-section model of the simultaneous determination by firms of debt, dividends, and insider finance. Three (linear) equations are estimated as follows:

$$\begin{aligned} Debt &= f(Dividends, Insider, X_1, X_2, X_3, X_4,) \\ Dividends &= f(Debt, Insider, X_1, X_2, X_6, X_7,) \\ Insider &= f(Debt, Dividends, X_1, X_3, X_5, X_8) \end{aligned} \qquad (4)$$

with: X_1 = a measure of business risk; X_2 = profitability; X_3 = R & D spending as a proxy for agency costs; X_4 = fixed assets; X_5 = size; X_6 = growth rate; X_7 = investment; and X_8 = the firm's industry classification. This model is a simultaneous equations model in the sense that the endogenous variables all appear as explanatory variables in each other's equation; that is, dividends, debt and insider financing are assumed to impact on each other independently of the other explanatory variables.

The problem with a system such as (4) is that it can only be identified if sufficient exogenous variables are excluded from all three equations. This is largely arbitrary and each exclusion restriction has the effect of restricting the impact of the exogenous variables to effects that have to come *via* the other endogenous variables. In contrast, Chowdhury, Green and Miles (CGM, 1994) argue that financing decisions are better treated by analogy with portfolio decisions. This suggests respecifying (4) as a system of demand equations, or perhaps more properly as supply equations of liabilities. CGM (1994) adapt Cuthbertson's (1985) buffer-stock approach to the demand for money to analyse the determinants of UK companies' short-term financial decisions using a panel of 694 firms covering 1969 to 1983. The following equations were estimated:

$$f_{it} = \alpha_i + \sum_k \beta_{ik} m_{kt} + \sum_j \gamma_{ij} F_{jt-1} + \sum_1 \delta_{il} M_{lt-1} + \sum_h \theta_{ih} Z_{ht} + u_{it} \qquad (5)$$

The endogenous variables (f_i, i =1 ... 4) are the short-term or "quick" financial flows[21]; F_j are the corresponding stocks of quick finance assets and liabilities; m_k are the cash flows generated by all other (mainstream) activities; M_l are the stocks of assets and liabilities associated with mainstream activities; and Z_h are other explanatory variables (both firm-specific and economy-wide); α_i, β_{ik}, γ_{ij},

[21] They consist of trade credit given and received, bank borrowing and liquid assets.

$?_{il}$, $?_{ih}$ are parameters; and u_i are the error terms. This specification is somewhat analogous to Brainard and Tobin's (1968) methods for modelling financial asset demands, and is foreshadowed by the remarkable early contribution of Heston (1962). Chowdhury and Miles (1989) use the same approach to analyse UK companies' debt, dividend, and equity decisions. Given the appropriate degree of aggregation, total external long-term funding is just the sum of equity and debt raised, less dividends paid. If these three variables are treated as a simultaneous system of supply functions of liabilities, with common explanatory variables, any one of the three equations is "redundant", because the parameters of any one equation can be inferred from the parameters of the other two. See Greene (1993). Since equity issues are typically intermittent, whereas debt and dividends are more usually regular flows, the efficient estimation of an equation for equity flows poses more difficult econometric problems than does the estimation of debt and dividend equations. Chowdhury and Miles exploit this point to concentrate on estimating equations for debt and dividends, which have the same general linear structure as (5) with a common set of explanatory variables which test for: taxation effects, the influence of macroeconomic variables, the cost of funds, external regulatory controls, bankruptcy and other risk proxies, learning and expectations proxies, and the impact of the firm size.

It would appear that the system approach is a methodological improvement over the single equation approach, especially, as noted earlier by Tobin and Brainard (1968), because it forces the investigator to confront the broader implications of any estimated model. For example, a model may appear to offer a sensible explanation for debt and dividends, but its implications for equity issues may be nonsensical. However, the models of Jensen, Solberg, and Zorn, and Chowdhury and Miles are essentially static cross-section explanations of capital structure, and do not consider adjustment mechanisms. This is important, for as Fischer, Heinkel and Zechner (1989) observe: *'Large transaction costs could possibly explain the wide observation in actual debt ratios, since firms would be forced into long excursions away from their initial debt ratios… If adjustment costs are large, so that some firms take extended excursions away from their targets, then we ought to give less attention to refining our static trade-off stories and relatively more to understanding what adjustment costs are, why they are so important and how rational managers would respond to them*". Myers (1984) and Shyam-Sunder and Myers (1999) also emphasize this point. Static optimisation generates an optimal leverage level for any firm. This optimum will change over time in response to changes in the external factors. This suggests the need for a dynamic multivariate approach to modelling capital structure.

The response to this argument is limited to a relatively few papers, in part because many balanced panels of company accounts data do not have a time dimension which is sufficiently long to estimate the necessary dynamics. Chowdhury, Green and Miles (1990) develop and estimate the dynamic and the long-run implications of their model, but argue that, if short-term finance is a buffer, the long-run equilibrium is either notional or largely irrelevant. Chehab's (1995) habit-persistence model is

effectively also a dynamic model of the firm's financing behaviour. Homaifa *et al*. (1994) use an autoregressive distributed lag (ADL) model to study the capital structure decisions of a panel of 370 US firms for the period 1979-1988. Possibly the most complete attempt to reconcile static and dynamic theories of capital structure is due to Vogt (1994), who constructs a partial stock adjustment model to test the pecking order hypothesis. His model assumes that there is a value-maximising capital structure for each firm, but that transactions costs, information asymmetries and corporate control issues prevent the firm from instantaneously reaching this point and give rise to an adjustment mechanism. If the existence of a target capital structure is rejected then there is support for the pecking order hypothesis.

7. Multivariate Empirical Research: Main Empirical Findings

In this section, we discuss the empirical findings which relate to key leading issues, specifically: the impact on corporate capital structures of ownership and control structures, bankruptcy costs, and corporate strategy; as well as testing of the pecking order hypothesis.

7.1 Ownership and control structures and the financial structure of the firm.

The empirical literature on ownership and control is conveniently divided into two themes. The first examines the influence of ownership structure on the dividend policies of the firm. The second investigates the impact of management shareholdings on the firm's debt ratio. Although clearly relevant to capital structure, dividend policy is a major subject in its own right and the literature on this topic is well surveyed by Short (1994). Accordingly, in this section we concentrate on the impact of management shareholdings on debt ratios. The main studies in this area are summarised in Table (1).

Table 1 about here

Zeckhauser and Pound (1990) test whether large shareholders improve corporate performance by encouraging performance-tilting, the practice which arises under asymmetric information between shareholders and managers and results in improvements of corporate performance without the diminution of managerial effort or of excess pay. This is because large shareholders can exploit economies of scale in information costs, which reduces the agency (monitoring) costs of debt. If true, this implies that the leverage of firms with at least one large shareholder should be higher than that of a firm that does not have a large shareholder. In fact, Zeckhauser and Pound (1990) find that there is no significant difference in leverage ratios between such groups of firms. They conclude that large shareholders appear to perform a monitoring function only for equity owners and do not have a positive impact on debtholders.

Friend and Hasbrouck's (1988) study differs from Zeckhauser and Pound in terms of investigating whether there is a systematic relationship between insider (manager) holdings and debt. Two proxies are used here: the first is a fractional ownership variable, the largest fraction of shares that is held by an insider, whilst the second is an absolute variable, the market value of equity held by the largest insider. *A priori*, there could be either a negative or positive relationship between debt and insider holdings: negative, if the rise in bankruptcy costs for insiders outweigh the reduction in their agency costs; positive, if the reverse is true. Friend and Hasbrouck find that, when both the fractional and absolute insider holdings are included, the former becomes positive and significant whilst the latter becomes more negative. In addition, the explanatory power of the fractional variable dominates that of the absolute. These results provide some weak support for the hypothesis that insider ownership does reduce the agency cost of debt. However, in these regressions, it should be noted that causality runs from the insider holding measure to the debt ratio. Friend and Hasbrouck suggest that a reverse causality may also occur: a high level of debt increases the risk of firm stock, and tends to drive out outside shareholders.

Friend and Lang (1988) extend the empirical work of Friend and Hasbrouck in two ways. First, the sample of firms is divided into two equal sized groups: closely held companies (CHCs) where the dominant insider shareholders hold more than 13.825 percent of overall equity, and publicly held corporations (PHCs) where managers hold less than 13.825 percent. Second, Friend and Lang argue that those firms who have dominant insider equityholders will have less debt than those companies who do not. Consequently, CHCs should have lower debt levels than PHCs. Moreover, if there are economies of scale in information gathering, those firms that have large external shareholders may monitor the behaviour of managers more effectively than those corporations who do not. Therefore, each category of firms was sub-divided into two further groups: CHC_o and CHC_1, which represent closely held corporations with and without non-managerial principal investors; and PHC_0 and PHC_1, representing publicly held corporations with and without non-managerial principal investors. Friend and Lang also include an additional explanatory variable in their model: the fraction of equity held by dominant non-managerial stockholders who are not either a officer or director but hold more than ten percent of out standing shares (FRO). Finally, and in order to reduce heteroskedasticity, they used the log of a firm's market value (LMV) as an explanatory variable instead of its market value (MV). Otherwise, Friend and Laing used essentially the same methods as Friend and Hasbrouck.

When used with the other explanatory variables, including LMV, the coefficient for FRO was positive and statistically significant in each of the CHC_o, CHC_1, PHC_0 and PHC_1 sub-samples. The last result was contrary to *a priori* expectations. However, when LMV was excluded, the coefficients were still statistically significant but changed sign from positive to negative in all sub-samples. Thus, LMV dominates FRO implying, as in Friend and Hasbrouck, that management uses the market value of equity to determine debt levels.

Another study that tests the influence of insider equity holders on firm leverage is that of Kim and Sorensen (1986). Here the authors test whether the cross-sectional variation in corporate leverage ratios can be related to agency costs. Firms were classified into three groups: heavy, average, and low inside ownership. Unlike Friend and Lang's classification, insider ownership is defined here as insiders owning more than 25% of the outstanding equity of the firm. The sample of low or "diffuse" insider ownership firms consisted of those in which less than 5% of the outstanding equity is held by insiders. The third sample of (168) average inside-ownership firms consisted of those with 50% insider ownership and 50% diffuse ownership. Debt was defined as the ratio of long-term debt to total capitalisation using book value. Analysis of variance and ordinary least squares regression techniques were utilised. Here, it transpires that insider firms have between 6 to 7 percent higher debt-to-total capitalisation ratios than diffuse ownership firms in the same industry. This suggests that large firms who are heavily owned by insiders tend to finance projects with greater amounts of long-term debt. This can be explained by three observations. First, insiders may have sold debt so as to maintain control of their firm. Second, due to high agency costs of equity, firms with high insider ownership would issue debt to avoid costs of external equity associated with the incentive to consume perks. Third, firms with high insider ownership have lower agency costs on the grounds that (i) standard debt provisions and covenants may be more effective when there is a close control of ownership; and (ii) if a large proportion of inside ownership indicates that the problem of sub-optimal investment is likely to occur thereby implying lower agency costs.

Firth (1995) considers the impact of institutional shareholders and management interest on the firm's capital structure. Firth's study differentiates itself from those of Friend and Lang (1988) and Friend and Hasbrouck (1988) by using the whole of the sample data with managerial shareholder ownership expressed as a continuous variable instead of classifying firms into groups according to whether they had either above or below median managerial share holdings. Firth tested to see if: first, there is a negative relationship between executive share holdings (FMS) and the firm's debt-equity ratio; and second, if there is a positive dependence between the level of institutional shareholdings (LVMS) and the firm's debt-equity ratio. The former hypothesis represents the human-capital motivation while the latter is an implication of the usual firm value maximising arguments. On the whole, Firth (1995) concludes that there is sufficient empirical evidence to support either hypothesis. The capital structure of the firm is dependent upon the relative influence and power of substantial institutional shareholders.

Hussain (1995) extends the analysis to developing economy firms in Indonesia. His analysis recognises the observation by Whitely (1992) that many firms within developing economies can be characterised as being family owned or controlled. Hussain (1995) essentially tests whether the influx of foreign capital has altered the firm's capital structure via the proportion of shares held by these families. The main finding was that the inflow of foreign capital, which has reduced the

concentration of family ownership, has resulted in the gearing of the firm falling. This is consistent with the findings for firms found in developed economies.

Two other points emerge from the studies summarised in table 1. The first relates to the impact of managerial ownership in the context of agency conflicts. Using *par* values to measure firms' capital, Chen and Steiner (2000) find a clear positive relationship between managerial ownership and leverage. This provides evidence against the hypothesis that management prefers to reduce the risk associated with their individual portfolios in the firm: instead of reducing leverage, they actually "gear up". However, as noted by Firth (1995) and by Friend and Hasbrouck (1988), there tends to be a negative relationship between the proportion of the *market* value of the shares held by management and the firm's gearing level. This latter result is more consistent with the predictions of theory, which would suggest that managements are influenced by the current values of their undiversified portfolios to spread risk: one method of avoiding increased risk is to maintain low capital gearing. Therefore, a possible interpretation of these results is that managements are more concerned with the market value of their holdings than with their absolute proportions. The second issue that table 1 highlights is the role of shareholder concentration on the firm's capital structure. It is argued that external shareholders, who are thought to be well diversified, would prefer the firm to attain its optimal debt level and therefore have a higher level of leverage than that sought by the firm's management. However, in the presence of large shareholders, monitoring costs should be lower which reduces the cost of debt and therefore increases leverage. The empirical evidence here appears to be unambiguous: Amihud *et al.* (1990), Zeckhauser and Pound (1990), and Hussain (1995) all find a negative relationship between large shareholders and firm leverage. Thus, there is clear support for the hypothesis that the presence of large shareholders reduces the agency costs of debt that in turn increases a firm's gearing.

7.2 The influence of bankruptcy costs on the firm's capital structure

In the majority of existing empirical studies, the impact of bankruptcy costs on the firm's financial structure is investigated directly.[22] For example, Ang, Chua, and McConnell (Ang *et al*. 1982) examine if there is a relationship between bankruptcy costs and the capital structure of the firm. Three types of costs are associated with bankruptcy: first, administrative expenses paid to various third parties involved in the bankruptcy proceedings; second, the indirect costs of re-organisation and the shortfall in realised value when assets are liquidated; and third, the loss of tax credits when the firm goes bankrupt. Haugen and Senbet (1978), Miller (1977) and Warner (1977) argue that the last two costs are the most relevant ones when a decision about the liquidation of the firm is about to be done. Such costs would be borne by the security holders of the firm regardless of how much equity and debt the firm carries and are irrelevant to the firm's capital structure. Given this, Ang *et al.'s* paper studies the direct administrative costs of corporate bankruptcy, concentrating in

[22] This approach should not be confused with the impact of the likelihood of the firm becoming bankrupt (examined normally via a risk measure), which is reviewed later in this paper.

particular on the possible scale effects of such costs. Warner (1977) argues that such costs are a concave function of the market value of the firm at the time of bankruptcy. Accordingly, Ang *et al.* estimate two equations[23], one with a quadratic functional form:

$$B = b_0 + b_1 A + b_2 A^2 \quad (6)$$

and the other with a logarithmic form:

$$log\ B = a_0 + a_1\ ln\ A \quad (7)$$

Here, B is the cash amount of administrative expenses, and A is the liquidating value of the firm, including funds used to pay for the administrator's expenses. Necessary conditions for concavity are that: $b_0 = 0$, $b_1 > 0$, and $b_2 < 0$ in (6), or that: $a_0 = 0$, and $0 < a_1 < 1$ in (7). Ang *et al* found that all the b_i coefficients were significant and had correct sign. For the logarithmic function, a_0 was statistically insignificant whilst a_1 was significant and fell within the predicted interval. Thus, they concluded that administrative expenses are a concave function of the market value of the firm. The results imply that estimated bankruptcy costs are 2% of the firm's liquidating value if the firm's value is in excess of US$1m. However, it should be noted that these results are based on a restricted sample of small companies located within a specific geographical region (Western District of Oklahoma), and may not be representative of US firms in general.

A similar model to Warner's (1977) is applied by Bradbury and Lloyd (1994). The authors provide estimates of the direct costs of bankruptcy in New Zealand via an analysis of 27 corporate receiverships for the period 1980 through 1987. In relation to previous bankruptcy studies, Bradbury and Lloyd innovate by estimating how sensitive bankruptcy costs are to various measures of firm size as well as estimating two non-linear functions relating bankruptcy administration costs to firm size:

$$logAC = a_0 + a_1 ln\ RP \quad (8)$$

$$AC = b_0 + b_1 RP^2 \quad (9)$$

In these equations, AC is the administration costs, RP is receivership proceeds, and the hypotheses are: a_0, $b_0 > 0$ and $0 < a_1 < 1$ with $b_1 > 0$. Bradbury and Lloyd find that a_0 is significant, indicating that there are fixed costs associated with bankruptcy. However, this conclusion cannot be made for the quadratic model since b_0 is found to be insignificant. In sum, it was concluded that the administration costs are a concave function of the firm's liquidation value, a finding that is consistent with previous studies. However, one deficiency of this study lies with the exclusion of indirect bankruptcy costs. These could not be modelled due to lack of data.

Altman (1984) investigates the impact of both direct and indirect bankruptcy costs as well as the likelihood of bankruptcy for a sample of 12 US retailers (1970 - 1978) and 7 industrial bankruptcies

[23] The estimation procedure is ordinary least squares.

(1975 - 1978). Indirect costs are measured in terms of forgone sales and profits. That is, the difference between actual and estimated profits was applied. For both industrial and retailing firms, it was found that, in general, there was a marked decrease in the value of the firm in the period prior to bankruptcy, a decrease that was especially acute for industrial corporations. Marked increases in the costs of individual firms were observed, with the greatest increases occurring in the period immediately prior to bankruptcy. Thus, for both types of firms, bankruptcy costs cannot be treated as trivial. Interestingly, it was noted that the likelihood of a firm entering bankruptcy was correctly interpreted by security analysts who discounted the market value of the firm up to three periods prior to bankruptcy. Chen and Merville (1999) also find that the indirect costs of financial distress may be considerable. In a sample of 1041 US firms covering 1982 - 92, they find that the annual average loss per firm due to financial distress was 10.3% of market value, *per annum*. This estimate is substantially larger than most previous estimates mainly because Chen and Merville include the cost of lost investment opportunities. Firms in distress are constrained in their ability to finance new investments for the reasons discussed in previous sections, particularly the concerns of debtholders that the firm may not survive to realise the rewards of a potentially profitable investment opportunity; and this effect turns out to be particularly important in Chen and Merville's results.

Table 2 about here

Table 2 summaries the main findings of these bankruptcy studies. A number of observations can be made; these include: (i) heterogeneity in terms of measuring firm size; (ii) bankruptcy costs seem to be non-linearly related to firm size with the mean costs ranging from 2.1% to 38.8% of firm value; (iii) numerous studies have shown that liquidation costs are represented by transfer of control and are thus independent of the costs relating to the borrowing decision. See in particular Haugen and Senbert (1978) and Ang *et al.* (1982); (iv) for those studies that report relative bankruptcy costs as a ratio of firm value in years prior to bankruptcy, it is clear that bankruptcy costs are highest during the year of bankruptcy.

7.3 The impact of corporate strategy on the firm's capital structure

Whitley (1992) observes that developing economy firms follow corporate structures that are similar to those of conglomerates. This suggests that the issue of the relationship between a firm's strategy and its capital structure has special relevance to any study examining the financial behaviour of firms in a developing economy. The empirical literature on these issues can be divided into two groups. The first examines the direct impact of diversification strategies on capital structure while the second explores the influence of firm-specific assets on capital structure.[24]

[24] The latter can be indirectly examined via the impact of tangibility on the demand for debt. This issue, along with other hypotheses that are simultaneously tested within previous research, will be reviewed later in this paper. What follows considers only the former strand of work.

Formal econometric testing of the impact of corporate strategy on the firm's capital structure was started by Barton and Gordon, (BG, 1988). Strategy is a proxy for management values, goals and motivations for firm diversification. It must therefore also include managers' preference for debt and equity. A central issue here is the impact of diversification on risk, which in turn influences the firm's gearing. Thus, firm strategies which involve diversification into unrelated activities have the lowest risk associated with them since there is no order to the process of diversification, *ceteris paribus*; the reverse is true for firm strategies which involve diversification into related activities. Accordingly, management strategy impacts on the firm's financial structure. A sample of 279 *Fortune-500* US industrial firms covering the period 1970 - 1974 was divided into four groups: single strategy, dominant strategy, related strategy and unrelated strategy. Several results emerged from this research. First, overall, there was sufficient statistical evidence for not rejecting the hypothesis that corporate strategy does influence the capital structure decisions of the firm. In relation to single strategy firms, it was found that the average debt level was significantly lower than all other categories. However, there was no significant difference between the average debt level of firms following dominant strategies and the overall average debt level of the sample as a whole. The average debt level of firms that adopted a related corporate strategy was lower than that for firms in the unrelated category. Finally, firms with an unrelated strategy had the highest debt ratios of all. Moreover, such debt levels were significantly higher than those for single and related category firms.

Lowe *et al*. (1994) extend BG's work by investigating whether the corporate strategy of the firm influences its capital structure in a sample of Australian public companies for the period 1984 to 1988. The sample was divided into the same four groups used by BG. This procedure initially gave results that were mostly insignificant. However, by pooling the data and using dummy variables to differentiate the effects of each type of strategy in the whole sample, more efficient estimates were obtained. Lowe *et al*. report that the gearing of firms which adopt either a single-firm, a dominant-firm or a related-firm strategy is not affected by that strategy, but the gearing of firms which adopt an unrelated strategy is affected by the strategy. These are clearly not the same as BG's results. Riahi-Belkaoui and Bannister (1994) also consider the impact of corporate strategy on the financial structure of the firm. They conduct a longitudinal study to capture the effects of the implementation of a decentralised M-form (multi-divisional) organisation structure on the firm's capital structure. Data for a period of 5 years before and 5 years after the point of restructuring was collected from COMPUSTAT and MOODY's Industrials Manual for 62 firms. Covariates of firm size, growth in total assets and growth in GNP are used as control factors for the early/late adaptation of M-form structures. This is motivated by the belief that late adapters learn from the experience of early movers and thereby restructure faster and more efficiently. An analysis of covariance is used to test the overall relationship between the organisation structure and capital structure. The results indicate that those firms that adopt a change in structure to form a multidivisional organisation are associated with a shift in capital structure and a significant increase in long-term debt in comparison with those with an hierarchical structure.

All the work reviewed so far has concentrated on large firms. Jordan *et al*. (1998) extended the analysis by examining the role of strategy in smaller UK firms. The influence of strategy should be different from that in large firms, since the ownership and risk characteristics of small firms are distinct from those of large firms. The role of competition is thought to be more eminent than that for corporate strategy in determining the demand for funds by smaller firms. Jordan *et al*. effectively test for the impact of both competitive and corporate strategies. Using a sample of 275 small UK firms for the period 1983 - 1993, which (as with BG and Lowe *et al*.) was split according to whether the firm adopted either a corporate or a competitive strategy. In relation to the former, it was found that corporate strategy *per se* did not influence smaller firm's capital structure. However, when the same analysis was applied to firms that used competitive strategies, it was found that competitive strategy did influence capital structure.

Table 3 summaries the main findings of these studies. It seems clear that strategy does influence the firm's capital structure, but further research is required to identify the precise channels through which this influence is felt, as the results of the main studies do not offer a clear consensus on this point.

Table 3 about here

7.4 Testing the Pecking Order Hypothesis

According to the Pecking Order hypothesis, information asymmetries between the firm and the market imply that firms prefer to finance using retained earnings, followed by debt, and finally by equity. There are two main ways in which the pecking order hypothesis is tested within the literature. The first is by examining the impact of profitability on the firm's leverage. Here a negative dependence suggests that the firm will, for a given level of dividends, prefer to use retained earnings over leverage and so adhere to the pecking order hypothesis. However, this approach does not specifically test for the pecking-order hypothesis in isolation since the influence of a number of other capital structure determinants is simultaneously investigated. The second approach involves specifically testing for the pecking order hypothesis. In this approach, there are two further ways of proceeding, and these consist either of estimating a specific econometric model or of conducting interview or survey research. Interview research is a large subject in its own right with specific methodologies attached. Accordingly, in this paper, we concentrate on the modelling approach to corporate capital structure. See Ang and Jung, (1993) and De Haan *et al*. (1994) for discussion of the interview/survey approach.

Klein and Belt (1994) apply Logit regression analysis to test the likelihood that a firm will choose internal over external sources of finance, and to model the probability of choosing between debt and equity. This study was carried out for all non-financial and non-regulated firms in the US for the period 1983-1988. In relation to whether the firm chooses between internal and external financing, it was found that faster growing and more operationally efficient firms would employ external over internal sources of finance. Also, the greater the information asymmetry between the firm and the capital market, the lower the likelihood of using external sources of finance (Krishnaswami, Spindt and Subramaniam, 1999). In relation to the preference of debt over equity, it was found that the most efficient firms prefer to use debt. Such a preference rises in the presence of increasing information asymmetries. Both of these results effectively provide more support for the pecking order hypothesis. However, Marsh (1982) uses the same general Logit model approach, but finds that the deviation of the current debt ratio from the firm's target debt ratio helps explain the probability of debt and equity issues. This would suggest that firms are adjusting towards a target capital structure, an hypothesis that is not consistent with the pecking order model.

Like Klein and Belt (1994), Baskin (1989) examines whether US firms adhere to the traditional pecking order hypothesis. A structural model is constructed for 378 firms for 1972. Unlike previous models, Baskin (1989) argues that the existence of a pecking order is, in part, due to the stickiness of dividend payments that restrict the free use of retained earnings. Dividend stickiness is a central hypothesis of the original Lintner model (Lintner, 1956). In this model, the past level of dividends influences current dividends, so that high past dividends increase the expectation of larger future ones. In turn, this increases the demand for free cash flow and therefore increases the demand

for debt, *ceteris paribus*. Baskin (1989) finds support for Lintner's argument and for a pecking order: the payment of high levels of past dividends statistically increases the demand for leverage; dividend payments are sticky; and the demand for debt is significantly negatively related to past profitability. Overall, this provides interesting support for the traditional pecking order hypothesis in the context of the Lintner dividend model.

Unlike the previous approaches, Allen (1993) investigates the pecking order hypothesis via the impact of past returns and growth on firm leverage. The following equation was estimated using a sample of 89 industrial and commercial firms for the period 1954 to 1982:

$$NDAR_{jt} = a_1 + a_2\, ROA_{j,t} + a_3\, ROA_{j\,t-1} + a_4\, ROA_{j,t-2} + a_5\, ROA_{j\,t-3} + a_6\, GROWTH_{j,} + e_{j,t} \quad (10)$$

where $NDAR_{j,t}$ = the leverage ratio; *GROWTH* is the growth in the firm's assets and defined as the ratio of the firm's total assets at the beginning of the sample period to total assets at the end of the sample period; $ROA_{j,t-i}$ is the return on total assets before interest and taxation for period *t-i*, and is intended to capture the firm's past profitability. Firms within the banking, finance and mining sectors were excluded on the grounds that their particular activities influence their capital structure in a manner that would make it the tests more difficult to interpret. The reported regression results show a significant negative relationship between past profitability and debt ratios which rejects the static optimal capital structure model and provides support for the pecking-order hypothesis.

Chua and Woodward (1993) add an interesting twist and assert that if the pecking order hypothesis is correct, then there should be a negative relationship between liquidity and internally generated cashflows with leverage. Leverage is regressed against internally generated cash flows, external funds required and liquidity for a sample of 43 private Canadian firms for the period 1983 to 1988. It is found that there was a negative dependence between liquidity and internally generated funds; accordingly, support is given to the pecking order hypothesis.

Claggett (1991) also addresses whether there is support for the pecking order hypothesis by examining two competing theories relating to capital structure of the firm within a sample of 253 US firms for the period 1979 - 1988 across 13 industrial groups: (i) the pecking order hypothesis; *versus* (ii) an optimal capital structure, which is however time-varying in response to variations in the business risk of the industry. Claggett examines these two hypotheses by considering a firm with an initial low level of debt. If the pecking order hypothesis is adhered to, the firm will prefer to use internally generated funds over those that are obtained externally (debt and equity). Accordingly, the firm's capital structure should move away from rather than towards the industry's mean over time. Likewise, for firms that have higher levels of debt, for any given income stream, retained earnings will be lower, resulting in the firm employing more debt, in turn causing their gearing levels to move away from the industry's norm over time. If on the other hand, there is an optimal capital structure, firms' capital structures will more nearly tend to converge over time, once allowance is made for time-variations in the optimal capital structure itself. Claggett (1991) finds weak evidence that firms'

capital structures do indeed tend to converge over time, as do studies by Lev (1969), Marsh (1982), Jalilvand and Harris (1984), and Murinde, Agung and Mullineux (1999)[25]. These studies use various different methodologies: Marsh employs a logit model; Jalilvand and Harris employ a target-partial-adjustment model; while Murinde, Agung and Mullineux use cointegration techniques. Taken together, these studies do suggest the existence of optimal industry target leverage levels for individual firms. However, there is some evidence of asymmetries in convergence as between firms having an above-average industry leverage ratio and those having a below-average leverage ratio. This may provide a partial reconciliation between the static optimal capital structure theory and the dynamic pecking order models of the firm.

Shyam-Sunder and Myers (1999) argue that it is possible to discriminate between pecking order and static trade-off theories of capital structure by a relatively simple technique. This involves a comparison between two ordinary least squares regressions:

$$?D = b_0 + b_1 (D^*_t - D_{t-1}) + u_t \qquad \text{and} \qquad ?D_t = a_0 + a_1 DEF_t + v_t \tag{11}$$

In these regressions, $?D_t$ is the change in a firm's debt ratio, D^*_t is the optimal debt ratio and D_{t-1} the actual ratio in the previous period. DEF_t is the firm's (flow) financing requirement, defined as the difference between committed payments (capital spending, dividends, working capital and debt repayment) and free cash flow. Shyam-Sunder and Myers argue that for non-distressed firms, we would expect to find $0 < b_1 < 1$ if the static trade-off theory is true; and $a_0 = 0$ and $a_1 = 1$ if the pecking order hypothesis is true. They employ a sample of 157 US firms for which sources and uses data are available from 1971. They find that $0 < b_1 < 1$, that a_1 is positive but less than unity, and that the pecking-order model has higher explanatory power than the trade-off model. Shyam-Sunder and Myers also perform simulations of firm debt policy under the two different hypotheses, and conclude that the power of their test is such that the pecking order hypothesis should be preferred to the trade-off model. This is questioned by Chirinko and Singha (2000) who argue that the analysis is not robust to changes in the underlying model, particularly in the specification of alternative hypotheses. For example, the regression of $?D_t$ on DEF_t cannot easily distinguish between the pecking order as proposed by Myers and Majluf (1984) and different financing priorities such as internal financing followed by a preference for equity over debt.

Overall therefore, the evidence on the pecking order hypothesis is still inconclusive. One difficulty in comparing the pecking order with theories of optimal capital structure is that the former is an essentially dynamic model containing predictions of how a firm behaves over time and is more naturally tested in that context. This requires time series data on individual firms and, where such data are available in computerised form, they mostly have a relatively short time dimension. Many of

[25] Murinde, Agung and Mullineux (1999) empirically test for convergence in the EU in terms of the structure of the financial systems as well as the patterns of corporate financing activities by banks, bond markets, stock markets and NFCs themselves through retained earnings; the results show convergence in terms of capital market activities only.

the records of company accounts in the major industrial countries date back to the previous century, but compiling these data for the purposes of investigating capital structure questions is a Herculean task. See Shannon (1932). The problems in this respect are likely to be more acute in studies of developing counties. On the other hand, static trade-off theories are naturally tested using panel or cross-section data, of which there is a general abundance, even in developing countries. This suggests that there may be value in giving further consideration to the ways in which the two classes of theory can be compared within a cross-sectional context.

8. Empirical results on general capital structure themes

8.1 Empirical determinants of capital structure

The discussion so far has concentrated on the testing of specific theories. Many of these studies have generated further interesting empirical results as a by-product of the main theoretical tests. In addition, there are numerous other studies that are more empirically oriented, and aim to examine the influence on leverage of certain specific variables. The hypotheses tested are motivated by theoretical or empirical concerns, and involve the use of a variety of more or less *ad hoc* variables that aim to measure the underlying concepts to be tested. In this section therefore we examine these results, organizing the discussion according to the main variables which have been found by a large number of studies to influence the firm's capital structure. Appendix table A1 sets out in summary form the results of these studies, most of which examine the role of specific firm characteristics in determining leverage. A careful study of the table indicates a number of common characteristics that are thought to determine capital structure: tangibility, size, profitability, growth, firm risk, non-debt-tax-shields and industrial classification (see also Rajan and Zingales, 1995). Each of these will now be discussed in turn and will allow a comparison between *a priori* expectations and empirical findings. The text tables that accompany this discussion provide a more compact summary of the results for these main variables.

A few *caveats* apply when making this type of cross-study comparison. First, in relation to the explanatory variables, proxies are always applied and are difficult to interpret. Cross-study comparisons are done with results mostly taken at face value, ignoring any differences in measurement, definition and techniques, except insofar as these differences are crucial to an understanding of the results. Second, leverage can be expressed as a ratio to either the market or the book value of equity. The former is consistent with the theory of capital structures. However, like the vast majority of the empirical literature, the following results together with those of Appendix table A1 are those derived under the book value of equity. This is for a number of reasons. First, the market value of equity and leverage is dependent upon a number of factors orthogonal to the firm; consequently, any changes in the leverage ratio when using the market values may not reflect any underlying alteration within the firm. Second, the market value of leverage is not readily obtainable, although where data are available, they suggest that there is a high correlation between

market and book values of leverage. See Bowman (1980). Thus, empirical differences between book and market values should not be that great, *ceteris paribus*. Third, Baskin (1989) suggests that the book debt ratio accurately indicates the financing mix that managers actually obtain from outside sources. Fourth and finally, book ratios better reflect management's target debt ratios. See Thies and Klock (1992).

8.2 Tangibility

The tangibility of assets represents the effect of the collateral value of assets on the firm's gearing level (Rajan and Zingales, 1995). Its *a priori* direction of influence is debatable. Turning first to those studies that support a positive relationship, recall that Galai and Masulis (1976), Jensen and Meckling (1976), and Myers (1977) argue that stockholders of leveraged firms have an incentive to invest sub-optimally, and thus transfer wealth away from the firm's bondholders. If however, debt can be secured against assets, the borrower is restricted to using loaned funds for a specific project, and creditors have an improved guarantee of repayment, depending on the value of the assets used as collateral. Clearly, no such guarantee exists if unsecured debt is used. This positive direction is further underlined by MyM. It is argued that the process of selling debt secured against assets with known values will reduce the asymmetric information costs of issuing debt. In addition, Scott (1977) asserts that a transfer of wealth from unsecured to secured creditors will occur when secured debt is used.

The main argument for a negative relationship between leverage and the level of firm's assets comes from Grossman and Hart (1982). It is argued that the agency costs of managers consuming more than the optimal level of perquisites increases for firms that have low levels of assets used as collateral. This result arises because shareholder monitoring costs of capital outlays of firms with fewer assets that can be used as collateral will be higher *a priori* than those that have more collaterisable assets. Shareholders will therefore prefer that firms with low levels of collateral assets should have higher gearing levels, *ceteris paribus*. Thus, unlike Rajan and Zingales (1995) who argue for only a positive relationship, overall, the theory suggests that the influence of the collateral value of the firm's assets on its leverage is <u>indeterminate</u>.

Table 4 about here

Table 4 presents a summary of the empirical findings on the impact of tangibility on the firm's capital structure. The results are mixed: some support a positive relationship, others show a negative relationship, and some are indeterminate. It is clear a majority of studies provide support for a positive impact of tangibility on firm leverage. This suggests that the evidence does support the hypothesis that leverage reduces the ability of the firm to invest sub-optimally, and that tangibility (collaterisable assets) diminishes the information asymmetries associated with the issue of debt. Thus, we may tentatively conclude that the evidence supports the hypothesis that stockholder-debtholder conflicts of interest are reduced by firms securing debt against assets.

8.3 Size

A number of authors including Warner (1977), Ang *et al*. (1982), and Bradbury and Lloyd (1994) have shown that the firm's bankruptcy costs are quadratically related to its value, in such a way that bankruptcy costs are found to be relatively smaller for large firms than for small ones. Titman and Vessels (1988) argue that larger firms tend to be more diversified than their smaller counterparts and are therefore less prone to collapse. Likewise, the liquidation values of smaller firms are lower than their larger counterparts, *ceteris paribus*. Accordingly, it will be more likely that bondholders get a partial payment, indicating that agency costs of debt will be lower for larger corporations. Furthermore, it is postulated that transaction costs will be comparatively higher for smaller firms than for their larger peers. Accordingly, a positive dependence is expected to be observed between leverage and firm size. An alternative argument is that firm size can be viewed as a proxy for information asymmetries between the firm and the market. It is thought that the larger the firm, the more information that is available for it and the lower the costs caused by information asymmetries, *ceteris paribus*. In turn, this too would suggest a positive relationship between size and debt, both long-term and short-term, *ceteris paribus*.

Table 5 about here

Table 5 shows that 65 percent of all those studies considered have found a positive statistical dependence between size and firm leverage. This suggests that the evidence does support our *a priori* expectations. However, some of these studies have found a negative dependence, indicating that as the size of the firm increases, the proportion of leverage incurred falls. In turn, this suggests that large firms have larger agency, bankruptcy and costs of asymmetric information. Titman and Vessels (1988) suggest that this finding arises from small firms using more short-term finance than their larger counterparts. That is, smaller firms have higher transactions costs when they issue long-

term debt or equity. The authors further add that such behaviour may cause a "small firm risk effect": by borrowing more short term, these types of firms will be more sensitive to temporary economic downturns than larger, more longer-geared firms.

8.4 Profitability

The traditional theories of financial development point to a positive dependence between leverage levels and profitability. The argument here is that the market will be reluctant to offer funds to those firms who are currently unprofitable. Moreover, for those firms with poor shareholder returns, increased leverage will result in heavy income gearing that will depress equity valuation and restrict equity issues, *ceteris paribus*. On the other hand, Donaldson (1961) argues that, as a result of transaction costs, firms will prefer to raise capital from retained earnings, then from debt and finally from issuing new equity: the transactions-costs motivation for the pecking order hypothesis. Myers (1984) and Myers and Majluf (1984) draw identical conclusions in explaining corporate financing decisions in the presence of asymmetric information. Thus, a negative relationship may exist between retained earnings and leverage ratios.

Table 6 about here

Table 6 presents a summary of empirical findings of those papers that have examined the influence of profitability on firm leverage and surveyed by this review. Unlike the previous two attributes, the same number of studies find statistical evidence for a positive relationship between profitability and leverage as do those which find a negative relationship. In sum, the debate as to whether firms adhere to the static theory or the traditional pecking-order hypothesis remains unresolved.

8.5 Growth

Galai and Masulis (1976), Jensen and Meckling (1976), and Myers (1977), amongst others, argue that when the firm issues debt, the managers have the opportunity to engage in asset substitution, and transfer wealth away from bondholders to shareholders. Jensen and Meckling (1976), Smith and Warner (1979) and Green (1984) note that such moral hazard could be reduced by the firm issuing convertible debt. On the other hand, Myers (1977) argues that if the firm issues short-term rather than long-term debt, this problem will be resolved; this suggests a positive dependence between short-term debt and growth. This is a result that is found by Hall, Hutchinson, and Michaelas (2000) in a study of 3000 unquoted small and medium-sized UK companies. However, many studies do not distinguish carefully between long-term and short-term debt; and unless this is done, a negative relationship between leverage and growth is probably to be expected. This is consistent with the increased operating efficiency hypothesis of Higgins (1977), who argues that firms that are better

managed rely less on outside financing. Indirectly, this negative relationship can also be employed to test for the pecking order hypothesis.[26]

As with profitability, Table 7 shows that the main empirical research that has examined the influence of growth on firm leverage suggests that the overall direction of impact remains unresolved. A number of studies find support for the *a priori* negative influence; conversely, a number of other studies have found a positive dependence. These conflicting results may be due to the fact that the growth measure tends to pick up the positive dependence between leverage and tangibility. For example, there is an indirect link between leverage and growth with firms borrowing against plant, machinery or other assets when they are required to expand to meet the increase in sales that accompany growth.

Table 7 about here

8.6 Firm risk

The theoretical literature argues that the greater the risk faced by a firm, the lower its debt level. See DeAngelo and Masulis (1980). The argument here is that an additional unit of debt increases the likelihood of bankruptcy for the firm. For firms who have variability in their earnings, investors will have little ability to accurately forecast future earnings based on publicly available information. The market will see the firm as a "lemon" and demand a premium in order to lend funds to it. In turn, this drives up the costs of debt. Furthermore, Castanias (1983) argues that if the earnings level of the firm is normally distributed, an increase in the business risk of earnings will lead to an unambiguous increase in the risk of the firm defaulting. This results in leverage becoming less attractive at the margin implying that the optimal level of firm gearing falls. In addition, any increase in the variability of the firm's income implies that banks and other lenders of finance will have a greater probability of forfeiting their funds. In turn, they will be less willing to lend or will charge a higher risk *premium* in comparison with firms who have lower levels of risk. *A priori*, there should be a <u>negative</u> relationship between leverage levels and business risk.

Scott (1977) as well as Jaffe and Westerfield (1987) note that this relationship may <u>not</u> be monotonic and that under certain conditions this relationship will instead be positive. Thies and Klock (1992) note that the simulation results of Bradley, Jarrell and Kim (1984) point to the dependence between these two variables being "U"-shaped. Moreover, the clear strong negative *a priori* direction is not supported by the empirical research that has tested the proposition, and which we have surveyed, as reported in Table 8.

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[26] See, for example, the observation by Copeland and Weston (1988, p. 507) that, "a*n unusually profitable firm in an industry with relatively slow growth ends up with an unusually low debt-to-equity ratio*".

Table 8 about here

Nevertheless, a number of studies have found a positive dependence. Indeed, a number of unusual observations may be noted. First, a positive relationship with short-term debt is found by Thies and Klock (1992). It is suggested that this is due to credit rationing: firms are restricted in the extent to which they can borrow long-term, and therefore make up any deficiencies using short-term debt. Second, the results of Kale *et al.* (1992) show that risk is not monotonically related to leverage. Moreover, Shenoy and Koch (1996) put forward an explanation for the positive dependence between risk and the demand for debt. It is asserted that this is due to firms with high leverage having a significantly greater amount of risk associated with them *i.e.*, there is a bi-directional relationship between risk and leverage instead of a unidirectional relationship from risk to leverage. This suggests a reconsideration of the estimation and testing procedures for these variables.

8.7 Non-debt tax shields

The basic point about corporate tax is that the firm will exploit the tax deductibility of debt interest payments to reduce its tax bill. Therefore, firms that have other tax shields, such as depreciation deductions, have less need to exploit the debt tax shield. Indeed, if a firm in this position issues excessive debt, it may become "tax-exhausted" in the sense of having potential tax shields which it is unable to use. Ross (1985) explains that firms face a decline in the expected value of their interest tax savings as outstanding non-debt tax shields increase. See also Downs (1993). Thus, the incentive to finance with debt diminishes as non-debt tax shields increase: debt is "crowded out". There is a further effect that arises from the risk of bankruptcy. DeAngelo and Masulis (1980) postulate that the marginal corporate savings from an additional unit of debt declines as non-debt tax shields increase. This is a result of the increased likelihood of bankruptcy occurring at higher debt levels. For low leverage levels, the marginal tax shield value is positive since it can be fully employed to reduce the company's overall tax liability. For higher leverage levels, the marginal advantage of debt is negative as a result of the increased probability that the potential tax shield from an extra quantity of leverage will be partially or totally lost through bankruptcy. These arguments would all suggest that there should exist a negative relationship between debt and non-debt tax shields.

However, arguments also exist for a positive relationship between leverage and non-debt tax shields. Scott (1977) and Moore (1986) suggest that firms with substantial non-debt-tax-shields invariably have considerable collateral assets which can be used to secure debt; and secured debt is less risky than that which is unsecured. Overall then, these arguments suggest that the expected effects of non-debt-tax-shields on the supply of debt by firms are not known *a priori*.

It is also worth emphasising that, even if the effect of non-debt tax shields on the supply of debt is known, the effect on leverage may nevertheless be uncertain. For a given firm size, if the supply of debt falls, equity or retained earnings must rise, *ceteris paribus*. However, if a change in the non-

debt tax shields of the firm is associated with a change in the size of the firm, then the supply of equity and retained earnings may change endogenously, thus also changing the firm's leverage. This is most likely to be an issue for firms in conditions of financial distress. In these conditions, a firm may sell collateral assets, reducing its non-debt tax shields, and shrink in size, in an effort to stave off bankruptcy. Even if, for example, debt is reduced, the leverage ratio may either decrease or increase as a result of the change in the size of the firm associated with the reduction in debt[27].

Table 9 summarises the evidence on non-debt tax shields. The preponderance of this evidence would suggest that there is, in fact, a negative relationship between non-debt tax shields and leverage. However, a number of studies do find a positive relationship. Moreover, there may be indirect relationships between tax shields and leverage which cannot easily be uncovered by a simple cross-sectional study. For example, Zarowin (1988) detects a negative dependence between non-debt tax shields and common stock returns, suggesting that stockholders do not, in fact, attribute positive value to tax shields in the way one might expect. A possible explanation for this and related results is that the estimated relationship between tax shields and leverage actually depends critically on the way in which the tax shields are measured. Ignoring the maturity structure of the depreciation tax shield will cause the drawing of incorrect inferences on the grounds that the firm's long-term debt ratio (considered within a time horizon greater than one period) will take into account the value of its present and future tax-shields and must implicitly impound the present value of them. Thus, the comparison of leverage with a nominal annual depreciation deduction will not correctly estimate their true long-run association. This suggests that non-debt tax shields should be measured as the present value of expected tax depreciation deductions.

Downs (1993) extends this argument, and examines whether non-debt tax shields crowd out debt financing. The sample is drawn from the US for the period 1968 - 1985 across 10 *two*-digit industries. What separates Downs' study from previous ones is the way in which how non-debt tax shields are measured. Normally, depreciation and related items would be scaled by the firm's total assets so as to remove firm-specific heterogeneity effects, and to reduce heteroskedasticity. Downs (1993) notes that this procedure ignores the maturity structure of non-debt tax shields, and in particular, that of depreciation. He proposes instead that the present value of the future stream of depreciation charges should be applied. As the latter increases in relation to *pre*-tax cash flows, the value of the tax shield provided by debt interest payments, and its present value, decreases. Therefore, a better scaling of depreciation charges would be provided by using *pre*-tax cash flows as divisor, rather than the firm's total assets. However, *pre*-tax cash flows alone will underestimate debt crowding out *per se*, as they ignore the present value of the firm's future cash flows. To rectify this, the present value of these cash flows should be employed. Once this is done, Downs does indeed find a positive relationship between non-debt tax shields and leverage.

[27] Of course, this is a general point in connection with any study of leverage. One cannot always assume that firm size is, in some sense, exogenous to the analysis.

8.8 Industrial classification

The identification and usage of firms' industrial classification are important aspects of financial market research. Besides being used to explain corporate capital structure characteristics, Kahle and Walking (1996, p. 311) note four additional applications of industrial classification. They are applied: first, to identify control firms within the same industry; second, to describe the industrial composition of the sample; third to filter firms for specific investigations; and fourth, to determine whether mergers and acquisitions are horizontal, vertical or conglomerate. In common with all uses of industrial groupings, the authors argue (p. 309) that researchers have been "cavalier" in their application of these classifications. Specifically and, in relation to this survey, a number of important issues have not been addressed: (i) consistent classification of firms across different databases when using the same method of compartmentalisation; (ii) consistency of corporate classification when different procedures are applied; (iii) successful identification of utilities and financials; and (iv) consistent grouping over time. In relation to (i), discrepancies arise despite a common classification being applied. Kahle and Walking (1996) argue that, *a priori*, the errors induced are expected to be commensurate with the number of digits used: the higher the level of classification (the fewer the digits), the greater the disparity among firms. Turning to (ii), clearly different grouping procedures will be based on different principals and will produce different classifications. Again a positive relationship is expected to be observed between inconsistencies of corporate classification and the level of classification used. In relation to (iii), in comparison with other industries, utilities are typically regulated whereas financials are regulated and have special capital characteristics, invariably being highly leveraged. Thus, these two groups are generally isolated and will have a higher level of conformity between various classification procedures. As a rule of thumb, the more specialised the industry the firm is within, the greater the accuracy of its classification across different categorising procedures. In terms of (iv), many studies employ historic data. This will induce errors in that, when the firm progresses to a different stage of growth over time, its very structure, nature and industry may change. The transformation of American Can into a financial services conglomerate is just one of the more dramatic examples of this process.

Kahle and Walking (1996) argue that, in general, errors in the use of industrial classification schemes are expected to be proportional to the level of classification employed: a detailed four-digit SIC code will be more sensitive than a coarser two-digit code to changes in corporate nature and product mix over time. For example, using the first digit of the SIC code will only classify firms into very broad categories, and this creates a number of very unlikely industries: *"It is doubtful that Olympia Brewing perceives Helena Rubinstein or Standard Oil as competitors. All three are in the industry 2XXX."* (Bowen, Daly and Huber, 1982, p. 11). Clearly this classification level is unacceptable. Two digits classify corporations into better-defined groups, but Bowen, Daly and Huber (1982) argue that such an apportionment may still be too coarse and suggest a yet finer partition using four digits. A coarse partition has the potential to create anomalies in comparisons

among firms. However, a much finer partition, such as the four-digit classification, creates instead the potential for classification errors and anomalies within firms. Firms with a range of business activities, especially but not exclusively conglomerates, become increasingly difficult to allocate accurately to one particular group at detailed levels of any industrial classification scheme. This suggests the desirability of a coarser classification, such as the two-digit SIC codes, and this is the conclusion reached, for example, by Clarke (1989).

The errors created under (i) to (iv) above are found within developed capital markets where corporate data is widely published under tight institutional and regulatory rules. In comparison, company information is not widely distributed and published under such a rigid framework in developing markets. See, *inter alia*, Kitchen (1986) and Whitley (1992). This suggests that the problems involved in using industrial classifications will be more acute in developing countries. In particular, the problem of comparability within firms is likely to be more acute in many developing countries, where there is a greater preponderance of industrial conglomerates than in the industrial countries. See Prasad (2000). This also points to the desirability of a coarser classification scheme in this context.

There are several reasons for thinking that the industry in which a firm operates will have a significant effect on its capital structure. A good example is Titman (1984), who begins with the argument that the firm will choose a level of leverage that will maximise its liquidation costs. It is postulated that if the likelihood of liquidation of a firm increases, this will reduce its current income stream. This effect may arise, according to Titman (1984), because, post liquidation, the after-sales service of the firm will effectively disappear. Prior to liquidation therefore, consumers are less likely to purchase durable goods from the firm at risk, because of the expected increase in maintenance costs of the product, following the firm's disappearance. The more specialised the product, the lower is the liquidation value of the firm, because the harder it is to replace the after-sales service. *A priori*, this suggests that there will be *inter*-industry differences in leverage across industries, as firms producing more specialised products seek a level of leverage to help offset their lower liquidation costs, *ceteris paribus*.

Table 10 summarises the literature on industrial classification and leverage. This clearly suggests that firms located within different industries do have different gearing levels. Harris and Raviv (1991) note that Drugs, Instruments, Electronics and Food have low leverage whilst Paper, Textiles, Mill Products, Steel, Airlines and Cement have high leverage. The authors also note that utilities are more heavily geared than non-utilities. However, it should be pointed out in conclusion of this section that identifying capital structure differences between industries does not necessarily explain them, since there is not a one-for-one relationship between a firm's industrial group and the degree of specialisation of its product.

8.9 Other variables

Appendix table A1 presents a summary of empirical findings relating to a catalogue of variables that affect firm leverage. This evidence leads to the following main observations.

It is shown that debt is used as a source of finance for the firm mainly due to its tax advantages. Accordingly, the higher the tax rate, the larger the advantages of using debt, resulting in its supply increasing. From the empirical studies that have been surveyed by this review, it is clear that the evidence here is mixed: Chowdhury and Miles (1989) as well as CGM support such a relationship while Homaifa *et al*.(1994), Hussain (1995), Kim and Sorensen (1986), Lowe *et al*.(1994) and Mackie-Mason (1990) find an indeterminate influence. This is a clear PRI.

The studies also find that past leverage levels are negatively related to present ones. This suggests that the firm (a) has a target capital structure; and (b) employs an adjustment mechanism. Moreover, the negative dependence suggests that any adjustments that take place decline with time thereby indicating a converging capital structure path. On the other hand, the evidence provided by Chowdhury and Miles (1989) suggests that any costs of adjustment do not influence the firm's capital structure.

There seems to be further support for the pecking order hypothesis of M*y*M. This is in the form of the negative relationship between liquidity and gearing found by Hallet and Taffler (1982), Jordan *et al*. (1998), Shenoy and Koch (1996), and by Lowe *et al*. (1994). However, a number of studies find that liquidity does not have a statistical impact, see Chiarella *et al*. (1992), Mackie-Mason (1990) and Chatrath (1994). CGM note a negative dependence between equity and debt, suggesting that these two liabilities are substitutes for each other.

It is also to be noted that there seems to be some support for Williamson's (1988) transactions-cost economics hypothesis, which suggests that the more specialised assets of the firm will be financed using equity rather than by debt. Downs (1993) as well as Titman and Vessels (1988) find a negative dependence between debt and how unique the firm's assets are. Moreover, Munro (1996) finds that the higher is the level of the fixed assets of a firm, the greater is its leverage. In turn, this suggests that the firm uses its assets as collateral against which to secure debt.

Perhaps more surprising is the number of studies that effectively estimate a demand equation for debt without including its price or cost within it. However, Thies and Klock (1992) find a positive relationship between debt and interest rates. A similar conclusion is noted by CGM when they use an inter-bank market rate. Both observations are against *a priori* expectations and suggest that firms within these studies engage in "distress borrowing". The application of interest rates on debt is a clear PRI that needs to be explored further.

A final comment concerns the impact of inflation on the demand for debt. *A priori*, inflation reduces the "real" cost of employing debt via the erosion of the repayment of the principal. Accordingly, a positive dependence should be noted between leverage and inflation, *ceteris paribus*. Homaifa *et*

al.(1994) find such a relationship. However, the authors also note that a negative relationship is found with past levels of inflation.

8.10 Extensions of comparative research

An important general issue is to establish how far empirical results in one country carry over to other countries, especially in widely varying institutional settings. It is clear from our discussion in section 5 that much of the emphasis in recent comparative research has been on documenting more or less stylised facts through univariate studies. Evidently, it is important to establish more precisely the causes of observed differences in outcomes in different settings. This is a more difficult task, as it is not always apparent if a uniform benchmark for comparison across countries can be established. An interesting effort to apply conventional market-oriented theory to a bank-based system is reported by Hirota (1999), who explores the determinants of capital structure of between 407 and 546 Japanese firms in 4 cross-sections: from 1977, 1982, 1987, and 1992. Hirota seeks to explain the leverage of these firms by a combination of conventional capital structure variables (non-debt tax shields, asset tangibility, growth opportunities, business risk, profitability, and size) and Japanese institutional variables, including: bank relationships (measured by the proportion of debt due to the largest bank lender), keiretsu membership, regulation of new equity issues (measured by a dummy representing firms who satisfy the voluntary code enforced by major Japanese security companies between 1973 and 1996), and a variable representing a firm's incentive to exploit free cash flows (a firm-specific debt-equity yield differential). Almost all the variables in both groups entered the regressions with the expected sign in each of the 4 cross-sections, and most were significant. This suggests that conventional capital structure theory can help understand the behaviour of firms in a country that is usually thought to be either "non-Anglo-Saxon" or at least bank-based. But the results for the institutional variables also show that there is more to firm financial behaviour in Japan than is captured by the conventional variables. For example, one might expect the information-pooling which, in theory is involved in keiretsu membership, to be impounded in variables such as profitability and the market-to-book ratio (measuring growth opportunities). But, since keiretsu membership helps explain leverage independently of profitability and the market-to-book ratio, it is clearly not wholly impounded in these variables.

Gul (1999) reports similar findings to Hirota (1999), but for a shorter list of explanatory variables. Gul investigates a panel of more than 1000 Japanese firms covering 1988 - 1992. He finds that size, profitability, and growth opportunities are all significant and correctly signed but that keiretsu affiliation is also independently significant in explaining leverage. These two studies raise interesting questions for further research. It would be very useful, especially from a policy perspective, to understand more fully the relationship between the conventional variables and the institutional variables and, more particularly, to uncover the precise channels through which the institutional variables do affect leverage.

A more explicitly comparative study is undertaken by Prasad (2000) who studies the financing decisions of a sample of 165 Malay and 174 Thai companies over the period 1987 - 1995. Although Prasad finds numerous detailed differences in the behaviour of firms as between the two countries, overall, a conventional capital structure model performs equally well in both countries. Family ownership is a particularly important institutional issue in southeast Asia. See for example Hussain's (1995) study of Indonesian companies. However, Prasad found little evidence that family ownership was an important factor in either Malaysia or Thailand over and above conventional capital structure determinants.

9. Conclusion and PRIs

The review carried out in this paper has concentrated on the main issues in the literature on corporate financing, capital structure and firm ownership structure. We have sought to codify the major hypotheses about corporate financial behaviour, the extent to which they may be expected to be relevant to low-income developing countries, and the state of the evidence concerning these hypotheses. In this section, we summarise the main points and suggest PRIs for a research programme on capital markets and development.

In the last 50 years, theoretical research has come full circle from the traditional view of corporate capital structures. In the traditional view, the firm's cost of capital and its value are interdependent. MM's seminal paper turned this theory on its head and argued that the cost of capital is actually independent of capital structure. However, when the perfect capital market assumptions underlying MM are relaxed, it transpires that we reach conclusions that are similar to those found under the traditional view. Imperfections in the capital market can be divided into three groups: agency costs, information asymmetries and taxation.

Agency costs arise in several situations involving shareholders, managers, and debtholders. To alleviate shareholder-manager agency costs, the firm issues debt over equity. However, this can lead to further costs involving shareholders and debtholders. With regard to shareholder-manager costs, this survey has emphasised the importance of corporate strategy for capital structure. The work here has only recently been started and is a fertile ground for future research. With regard to shareholder-debtholder costs, there are two schools of thought: the Irrelevance Hypothesis and the Costly Contracting Hypothesis (CCH). The former states that agency costs do not impact on a firm's value; while the latter asserts that they do affect a firm's value, but this effect can be mitigated by the use of covenants. In this context, we also reviewed the impact of ownership structure (managerial and institutional) on a firm's capital structure; and the results of this research are still in their relative infancy. This issue is particularly important for developing economies where the role of institutional factors is particularly pronounced; and it is a clear PRI for future work. See Whitley (1992).

The literature on information asymmetries emphasises the difference between the information possessed by the firm and that possessed by the market, and it can be summarised in three main

results. The first result is MyM's pecking order hypothesis which argues that firms do not have a unique long-run optimal capital structure, but instead use a financing instrument of "first-choice", which is conditional on the state of each firm and of the market. The theory explains how a firm chooses its incremental financing but not how (or if) it chooses a particular long-run level of leverage. The second result, suggested by managerial risk aversion, argues that there will be a positive relationship between the level of equity held by management and the quality of the firm. However, this result is also consistent with the shareholder-manager agency cost literature, and illustrates a general problem in this field: two very different theories generating similar empirical predictions. The third result involves management's use of debt as a device with which to signal the quality of the firm. One of the implications of the model that is employed here is that the level of the firm's bankruptcy risk rises as its gearing increases. This is identical to that noted under the traditional view and further illustrates the theoretical literature coming full circle. However, the link between gearing and the quality of firm management is still one which has to be resolved. This is a clear PRI for theoretical work.

The third group of market imperfections is that associated with tax. The relative levels of personal, corporate and capital taxes together with the type of tax system (classical or imputation) will influence the capital structure of the firm. In general, a firm will choose its leverage to set the marginal tax benefits of debt equal to its costs. This gives rise to an optimal, static capital structure, but one which may be augmented by considerations of bankruptcy risk and non-debt tax shields.

A main conclusion that emerges from our survey of empirical work is that only a limited number of studies have examined the financial behaviour of firms within developing economies and capital markets. Thus, we do not yet know how far theories that have been formulated for firms in developed capital markets can be applied to those in developing countries. This deficiency constitutes a critical PRI that must be addressed. It is also a primary question that would need to be addressed by any research programme on capital markets and development, given that policies towards asset formation contribute to growth and poverty-reduction.

In terms of methodology, existing empirical research can be divided into those that employ ratio analysis, and those that apply a formal multivariate model. With regard to the former, we find that, following financial liberalisation in many countries, the capital structures of firms found within traditional market-based and bank-based financial systems are beginning to converge. Moreover, and regardless of the level of development, firms in most countries generally place a heavy reliance on retained earnings as a source of finance. For developing countries however, some studies suggest that firms follow a reversed pecking order in their financing, a result which is at variance with the evidence from the industrial countries, and therefore an important further PRI.

The results from multivariate models clearly imply that management is concerned with the market value of the firm, as basic theory would suggest. By gearing up their firms, managers enhance

earnings per share and market value. Large shareholders play a positive role in capital markets by lowering monitoring costs and thus reducing the agency costs of debt. Bankruptcy costs are a concave function of the market value of the firm at the time of bankruptcy. However, research has so far has concentrated only on a small number of firms, and on the direct costs of bankruptcy. Widening this research to include more firms and to study indirect costs are both interesting PRIs. Direct testing of the pecking order hypothesis employed several distinct methodologies, but most of the evidence so far supports this hypothesis. However, the negative dependence between profitability and leverage suggested by the pecking order is not clearly supported in the empirical literature. In addition, we drew attention to the difficulty of comparing pecking order and optimal capital structure theories: the former being essentially a time series hypothesis and the latter a cross-sectional hypothesis. For this reason, notwithstanding the evidence in favour of a pecking order, we cannot conclude that pecking order theory should supplant optimal capital structure theory. Indeed, the immense range of panel data studies that we have reviewed testifies to the continuing strength of the optimal capital structure hypothesis. Clearly this is an important subject for further research: hence a PRI.

Specific firm characteristics that have been found to influence capital structure include: tangibility, size, profitability, growth, risk, non-debt tax shields, and industrial classification. Larger companies in industrial countries appear to use tangible assets as collateral for debt, whilst smaller firms seem to face fewer information asymmetries. However, the combination of inadequately defined property rights and inefficient capital markets may undermine these two observations in the context of developing economies and they therefore constitute two more PRIs. The impact of firm growth on capital structure is ambiguous, as is the impact of risk. These are clearly important factors in developing countries and are both PRIs for future work.

Equally important, this review has highlighted three major omissions from the empirical literature surveyed. First there is considerable evidence to suggest that many firms do have a target capital structure. Insofar as this target may not be reached instantly, an adjustment mechanism is applied which must be included within any capital structure model. This issue has scarcely been tackled by the empirical literature. Second, the empirical literature has mainly concentrated on the determinants of leverage. Although a firm's capital structure can be inferred from the identity: total assets ? debt + equity, there are advantages in considering both variables explicitly. Moreover, there are substantial differences between the management and use of shareholders' funds which are retained profits and those which derive from the issued share capital of a company. A study of leverage sheds no explicit light on the retentions-equity decision, and a considerable amount of information that could be used to explain the financial behaviour of firms is lost. An interesting PRI would be to consider the simultaneous impact of the determinants of capital structure on both equity and debt, following Chowdhury and Miles (1989), so as to produce a more informed picture of the financial behaviour of the firm. Third, few studies have considered the direct impact of the cost of debt, or any other

liability, on the firm's capital structure decision. Research has so far effectively constructed a demand function for debt without including its price: the interest rate that is charged. This is important from the firm's point of view since it is the actual cost of using debt. An exciting PRI would investigate the impact of liability prices on the financial behaviour of the firm. It would determine if these liability prices can better explain corporate capital structure than those firm-specific characteristics that have mainly been employed in the literature so far.

In conclusion, the empirical literature on corporate capital structure is fragmented, and has so far paid relatively little attention to developing countries. In this paper, we have substantially extended and updated the review of empirical work contained in Harris and Raviv (1991)[28]. We have also aimed to classify the empirical results more systematically than has previously been attempted. Our summary of the relationships among firms' characteristics and their capital structures enables comparisons to be made between theoretical predictions and empirical results and, more importantly, it provides a benchmark that can be used by future researchers in the construction of capital structure models. This should help reduce the, at times, ethereal and *ad-hoc* methodologies that have been employed in many empirical studies.

[28] It should be emphasised that the objective of Harris and Raviv's paper was to provide a detailed survey of the theoretical literature, with an intentionally shorter overview of the empirical evidence.

References

Aggrawal, A. and Mandelker, G. (1987), "Managerial Incentives and Corporate Investment and Financing Decisions", *Journal of Finance*, Vol. 42, p. 823-37.

Akerlof, G.A. (1970), "The Market for 'Lemons': Quality and the Market Mechanism", *Quarterly Journal of Economics***,** Vol. 84, pp. 488- 500.

Allen, D.E. (1993), "The Pecking Order Hypothesis: Australian Evidence", *Applied Financial Economics*, Vol. 3, pp. 101- 112.

Allen, D.E. and Mizuno, H. (1989), "The Determinants of Corporate Capital Structure: Japanese Evidence", *Applied Economics*, Vol. 21, pp. 569- 585.

Altman, E. (1984), "A Further Empirical Investigation of the Bankruptcy Cost Question", *Journal of Finance*, Vol. 39, September, pp. 1067-1089.

Amihud, Y., Baruch, L. and Travlos, N.G. (1990), "Corporate Control and the Choice of Investment Financing: The Case of Corporate Acquisitions", *Journal of Finance*, Vol. 45 p. 603-616.

Ang, J.S., Chua, J.H. and McConnell, J.J. (1982), "The Administrative Costs of Corporate Bankruptcy: A Note", *Journal of Finance*, Vol. 37, pp. 219- 226.

Ang, J.S. and Jung, M., (1993), "An Alternate Test of Myers' Pecking Order Theory of Capital Structure: The Case of South Korean Firms", *Pacific-Basin Finance Journal*, Vol. 1, pp. 31- 46.

Arrow, K., (1985), The Economics of Agency", In J. Pratt and R. Zeckhauser (eds), *Principals and Agents: The Structure of Business*, Boston, Harvard Business School Press.

Atkin, M. and Glen, J. (1992), "Comparing Corporate Capital Structures around the Globe", *The International Executive*, Vol. 34, pp. 369- 387.

Auerbach, A.J. and King, M.A. (1983), "Taxation, Portfolio Choice, and Debt-Equity Ratios: A General Equilibrium Model", *Quarterly Journal of Economics*, Vol 98, no. 4, November, pp. 587-609.

Barton, S.L. and Gordon, P.J., (1987), "Corporate Strategy: Useful Perspective for the Study of Capital Structure", *Academy of Management Review*, Vol.12, pp.67-75

Barton, S.L. and Gordon, P.J. (1988), "Corporate Strategy and Capital Structure", *Strategic Management Journal*, Vol. 9, pp. 623- 632.

Baskin, J. (1989), "An Empirical Investigation of the Pecking Order Hypothesis", *Financial Management*, Vol. 18, pp. 26 -35.

Bertero, E. (1997), "The Banking System, Financial Markets and Capital Structure: Some Evidence from France", *Oxford Review of Economic Policy*, Vol. 10, pp. 68- 78.

Bisignano, J. (1990), "Structures of Financial Intermediation, Corporate Finance and Central Banking", Basle: Bank of International Settlements, Switzerland, *mimeo*.

Borio, C.E.V. (1990), " Leverage and Financing of Non-Financial Companies: An International Perspective", *BIS Economic Papers*, No. 27, May, Basle: Bank of International Settlements, Switzerland.

Bowen, R.M., Daly, L.A. and Huber, C.C. (1982), "Evidence on the Existence and Determinants of Inter-Industry Differences in Leverage", *Financial Management*, Vol. 11, pp. 10- 20.

Bowman, R.G. (1980), "The Importance of a Market Value Measurement of Debt in Assessing Leverage", *Journal of Accounting Research*, Vol. 18, pp. 242- 254.

Boyle, G.W. and Eckhold, K.R. (1997), "Capital Structure Choice and Financial Market Liberalisation: Evidence from New Zealand", *Applied Financial Economics*, Vol. 7, pp. 427- 437.

Brada, J.C. and Singh, I. (1999), *Corporate Governance in Central Eastern Europe: Case Studies of Firms in Transition.* Armonk, N.Y. and London: Sharpe.

Bradbury, M. and Lloyd, S. (1994), "An Estimate of the Direct Costs of Bankruptcy in New Zealand", *Asia-Pacific Journal of Management*, Vol. 11, pp. 103- 111.

Bradley, M., Jarrell, G. and Kim, E.H. (1984), "On the Existence of an Optimal Capital Structure: Theory and Evidence", *Journal of Finance*, Vol. 39, pp. 857- 878.

Brainard, W. and Tobin, J. (1968), "Pitfalls in Financial Model Building", *American Economic Review*, Vol. 58, pp. 99-122.

Brennan, M. and Kraus, A. (1987), "Efficient Financing under Asymmetric Information", *Journal of Finance*, Vol. 42, pp. 1225- 1243.

Brennan, M. and Schwartz, E.S. (1978), "Corporate Income Taxes, Valuation and the Problem of Optimal Capital Structure", *Journal of Business*, Vol. 51, pp. 593- 607.

Bulow, J. and Shoven, J.B. (1978), "The Bankruptcy Decision", *Bell Journal of Economics*, Vol. 14, pp. 437-55.

Burton, B.M., Lonie, A.A. and Power, D.M. (1996), "Corporate Growth Opportunities and the Market Response to New Financing Announcements", *Discussion Papers in Accountancy and Business Finance*, Department of Accountancy and Business Finance, University of Dundee, UK.

Castanias, R., (1983), "Bankruptcy Risk and Optimal Capital Structure", *Journal of Finance*, Vol.38, pp.1617-1635

Chang, Y. and Thomas, H. (1989), "The Impact of Diversification Strategy on Risk-Return Performance", *Strategic Management Journal*, Vol. 10 pp. 271-284.

Chatrath, A. (1994), *Financial Leverage and the Cost of Capital: A Re-examination of the Value-Relevance of Capital Structure*, Unpublished Ph.D., Cleveland State University: USA.

Chehab, A. (1995), *Essays on the Determinants of Capital Structure*, Unpublished PhD. Dissertation, University of New Orleans: USA.

Chen, G.M. and Merville, L.J. (1999), "An Analysis of the Underreported Magnitude of the Total Indirect Costs of Financial Distress", *Review of Quantitative Finance and Accounting*, Vol. 13, No. 3, pp. 277-293.

Chen C.R., and Steiner T.L. (2000), "Tobin's q, Managerial Ownership, and Analyst Coverage - A Nonlinear Simultaneous Equations Model", *Journal of Economics and Business*, Vol. 52, No. 4, pp. 365-382.

Chiarella, C., Pham, T.M., Sim, A.B. and Tan, M.M.L. (1992), "Determinants of Corporate Capital Structure: Australian Evidence", in S.G. Rhee and R.P. Chang (eds.): *Pacific Basin Capital Markets Research*, Vol. 3, Amsterdam: Elsevier, The Netherlands.

Chirinko, R.S. and Singha, A.R. (2000), "Testing Static Tradeoff against Pecking Order Models of Capital Structure; A Critical Comment", *Journal of Financial Economics*, Vol. 58, pp.417-425.

Chowdhury, G. and Miles, D. (1989), "Modelling Companies' Debt and Dividend Decisions with Company Accounts Data", *Applied Economics*, Vol. 21, pp. 1483- 1507.

Chowdhury, G., Green, C.J. and Miles, D. (1990), "What determines the bank borrowing and liquid lending of UK companies? Explanations based on aggregated and disaggregated data", ch. 14 in T. Barker and M. H. Pesaran (eds), *Disaggregation in Econometric Modelling*, New York, Routledge, pp. 300-324.

Chowdhury, G., Green, C.J. and Miles, D. (1994), "UK Companies' Short-term Financial Decisions: Evidence from Company Accounts Data", *The Manchester School of Economics and Social Studies*, Vol. 62, pp. 395 - 411.

Chua, J.H. and Woodward, R.S. (1993), "The Pecking Order Hypothesis and Capital Structure of Private Companies", *Financial Management*, Vol. 22, pp. 18- 19.

Claggett, E.T. (1991), "Capital Structure: Convergent and Pecking Order Evidence", *Review of Financial Economics*, Vol. 1, pp. 35-48.

Clarke, R.N. (1989), "SICs as Delineators of Economic Markets", *Journal of Business*, Vol. 62, pp. 17- 31.

Cleary, S. (1999) The Relationship between Firm Investment and Financial Status, *Journal of Finance*, 54(2), April, pp. 673-92.

Cleaver, E.E. (1990), *Financing Strategies of Large UK Corporations 1979-1988: Some Evidence on Changes in Capital Structure, Size, Profitability and Debt Maturity*, Unpublished MPhil, University of Southampton: UK.

Cobham, D. and Subramaniam, R. (1998), "Corporate Finance in Developing Countries: New Evidence for India", *World Development*, Vol. 26, No. 6, pp. 1033-1047.

Constantinides, G.M. and Grundy, B.D. (1989), "Optimal Investment with Stock Repurchase as Signals", *The Review of Financial Studies*, Vol. 2, pp. 445- 466.

Copeland, T.E. and Weston, J.F. (1988), *Financial Theory and Corporate Policy*, Wokingham: Addison-Wesley, Reading, Mass., USA.

Corbett, J. and Jenkinson, T. (1994), "The Financing of Industry, 1970-89: An International Comparison", *CEPR Discussion Paper*, No. 958, Centre for Economic Policy Research, London: UK.

Core, J.E., Holthausen, R.W. and Larcker, D.F. (1999), Corporate Governance, Chief Executive Officer Compensation, and Firm Performance, *Journal of Financial Economics*, 51(3), March, pp. 371-406.

Cornelli, F., Portes, R. and Schaffer, M.E. (1996), "The Capital Structure of Firms in Central and Eastern Europe", *CEPR Discussion Paper* No. 1392, Centre for Economic Policy Research, London: UK.

Crutchley, C.E. and Hansen, R.S. (1989), "A Test of the Agency Theory of Managerial Ownership, Corporate Leverage and Corporate Dividends", *Financial Management*, Vol. 18, pp. 33-46.

Cuthertson, K., (1985), "Sterling Bank Lending to UK Industrial and Commercial Companies", *Oxford Bulletin of Economics and Statistics*, Vol.47, pp.91-113

De Haan, L., Koedik, K.G. and De Vrijer, J.E. (1994), "Buffer Stock Money and Pecking Order Financing: Results from an Interview Study Among Dutch Firms", *De Economist*, Vol. 14, pp. 287- 305.

DeAngelo, H. and Masulis, R.W. (1980), "Optimal Capital Structure under Corporate and Personal Taxation", *Journal of Financial Economics*, Vol. 8, pp. 3- 29.

Diamond, D.W., (1989), "Reputation Acquisition in Debt Markets", *Journal of Political Economy*, Vol. 97, pp.828-862.

Donaldson, G., (1961), “Corporate Debt Capacity: A Study of Corporate Debt Policy and the Determinants of Corporate Debt Capacity”, Division of Research, Harvard School of Business Administration, Boston: Mass., USA., *mimeo*.

Downs, T.W. (1993), “Corporate Leverage and Non-Debt-Tax Shields: Evidence on Crowding Out”, *Financial Review*, Vol. 28, pp. 549- 583.

Elston, C.D. (1981), “The Financing of Japanese Industry”, *Bank of England Quarterly Bulletin*, Vol. 21, pp. 510- 518.

Fama, E., (1980), “Agency Problems and Theory of the Firm”, *Journal of Political Economy*, Vol. 88, No. 2, pp. 288-307.

Fama, E., (1990), “Contract Costs and Financing Decisions”, *Journal of Business*, Vol. 63, No. 1, pp. 71-91.

Firth, M. (1995), “The Impact of Institutional Stockholders and Managerial Interests on the Capital Structure of Firms”, *Managerial and Decision Economics*, Vol. 16, pp. 167- 175.

Fischer, E.O., Heinkel, R. and Zechner, J., (1989),”Dynamic Capital Structure Choice: Theory and Tests”, *Journal of Finance*, Vol. 44, pp.19-40.

Friend, I. and Hasbrouck, I. (1988), “Determinants of Capital Structure”, in J. Chen (ed.): *Research in Finance*, London: JAI Press.

Friend, I. and Lang, L.H. (1988), “An Empirical Test of the Impact of Managerial Self-Interest on Corporate Capital Structure”, *Journal of Finance*, Vol. 43, pp. 271- 281.

Galai, D. and Masulis, R. (1976), “The Option Pricing Model and the Risk Factor of Stock”, *Journal of Financial Economics*, Vol. 3, pp. 631- 644.

Gardner, J.C. and Trzcinka, C.A. (1992), “All-Equity Firms and the Balancing Theory of Capital Structure”, *Journal of Financial Research*, 15, pp. 77-90.

Garvey, G.T. and Hanka, G. (1999), "Capital Structure and Corporate Control: The Effect of Antitakeover Statutes on Firm Leverage", *Journal of Finance*, Vol. 54, No. 2, pp. 519-46.

Green, R.C. (1984), “Investment Incentives, Debts and Warrants”, *Journal of Financial Economics*, Vol. 13, p. 115- 136.

Green, C.J., Lensink, R. and Murinde, V. (1999) “Are Polish Firms Risk-loving or Risk-averting? Evidence on Demand Univertainty and the Capital-Labour Ratio”, *Working Papers in Economics*, Loughborough University, January.

Greene, W.H. (1993), *Econometric Analysis*, 2nd edition, New York, MacMillan.

Griffith, J.M. (1999), "CEO Ownership and Firm Value", *Managerial and Decision Economics*, Vol. 20, No. 1, February, pp.1-8.

Grossman, S.J. and Hart, O.D. (1982), “Corporate Financial Structure and Managerial Incentives,” in J. McCall (ed.): *The Economics of Information and Uncertainty*, Chicago: University of Chicago Press, USA.

Guariglia, A. (1999), "The Effects of Financial Constraints on Inventory Investment: Evidence from a Panel of UK Firms", *Economica*, Vol. 66, No. 261, pp. 43-62.

Gul, F.A. (1999), "Growth Opportunities, Capital Structure and Dividend Policies in Japan", *Journal of Corporate Finance*, Vol. 5, No. 2, pp. 141-168.

Hall, G., Hutchinson, P., and Michaelas, N. (2000), "Industry Effects on the Determinants of Unquoted SMEs' Capital Structure", *International Journal of the Economics of Business*, Vol. 7, No. 3, pp. 297-312.

Hallet, M.P. and Taffler, R.J. (1982), “Balance Sheet Financing in the U.K.: An Empirical Analysis”, The City Business School: UK., *mimeo*.

Hamid, J. and Singh, A. (1992), “Corporate Financial Structures in Developing Economies”, *IFC Technical Paper* No.1, IFC, Washington DC.

Harris, M. and Raviv, A. (1990), “Capital Structure and the Informational Role of Debt,” *Journal of Finance*, Vol. 45, pp. 321-349.

Harris, M. and Raviv, A. (1991), “The Theory of Capital Structure,” *Journal of Finance*, Vol. 49, pp. 297- 355.

Hart, O. and Moore, J. (1990), “A Theory of Corporate Financial Structure based on the Seniority of Claims”, MIT: MA, *mimeo*.

Haugen, R.A. and Senbet, L.W. (1978), “The Insignificance of Bankruptcy Costs to the Theory of Optimal Capital Structure”, *Journal of Finance*, Vol. 23, pp. 383- 393.

Hax, A. and Majluf, N. (1984), *Strategic Management: An Integrative Perspective*, Engelwood Cliffs: Prentice-Hall, New Jersey.

Heinkel, R. (1982), “A Theory of Capital Structure Relevance Under Imperfect Information”, *Journal of Finance*, Vol. 37, pp. 1141- 1150.

Heinkel, R. and Zechner, J. (1990), “The Role of Debt and Preferred Stock as a Solution to Adverse Investment Incentives”, *Journal of Financial and Quantitative Analysis*, Vol. 25, pp. 1- 24.

Heston, A.W. (1962), "An Empirical Study of Cash, Securities and Other Current Accounts of Large Corporations", ch. 3 in D. D. Hester and J. Tobin (eds), *Studies of Portfolio Behaviour*, New York, John Wiley & Sons, pp. 66-117.

Higgins, R.C., (1977), “How Much Growth Can a Firm Afford?, *Financial Management*, Vol.6, pp.7-16.

Hirota, S. (1999), "Are Corporate Financing Decisions Different in Japan? An Empirical Study on Capital Stucture", *Journal of the Japanese and International Economies*, Vol. 13, pp. 201-229.

Hirshleifer, D. and Thakor, A.V., (1989), "Managerial Reputation, Project Choice and Debt", Anderson Graduate School of Management at UCLA: CA, USA., *mimeo*.

Holderness, C.G. and Sheehan, D.P. (1988), "The Role of Majority Shareholders in Publicly Held Corporations: An Exploratory Analysis", *Journal of Financial Economics*, Vol. 20, pp. 317- 346.

Homaifa, G, Zietz, J. and Benkato, O. (1994), "An Empirical Model of Capital Structure: Some New Evidence", *Journal of Business Finance and Accounting*, Vol. 21, pp. 1- 14.

Hunsaker, J. (1999), "The Role of Debt and Bankruptcy Statutes in Facilitating Tacit Collusion", *Managerial and Decision Economics*, Vol. 20, No. 1, pp. 9-24.

Hussain, Q. (1995), "Implications of Foreign Capital Inflows and Shareholder Concentration on Financial Sector: A Case Study of Indonesia", School of Economics and Law, University of Gothenburg, Sweden, *mimeo*.

Hutton J. and Kenc T. (1998), "The Influence of Firms' Financial Policy on Tax Reforms", *Oxford Economic Papers*, Vol. 50, No. 4, pp. 663-684

Jaffe, J.F. and Westerfield, R. (1987), "Risk and the Optimal Debt Level", in T. E. Copeland (ed.): *Modern Finance and Industrial Economics: Papers in Honour of I. Weston*, Oxford: Blackwell, UK.

Jalilvand, A. and Harris, R., (1984), "Corporate Behaviour in Adjusting to Capital Structure and Dividend Targets: An Econometric Study", *Journal of Finance*, Vol. 39, pp.127-144.

James, H.S. (1999), "Owner as Manager, Extended Horizons and the Family Firm", *International Journal of the Economics of Business*, Vol. 6, No. 1, pp. 41-55.

Jensen, M.C. (1986), "Agency Costs of Free Cash Flow, Corporate Finance and Take-overs", *American Economic Review*, Vol. 76, pp. 323- 339.

Jensen, M.C. and Meckling, W.H. (1976), "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure", *Journal of Financial Economics*, Vol. 3, pp. 305- 360.

Jensen, M.C. and Meckling, W.H. (1992), "Specific and General Knowledge, and Organizational Structure", in L. Werin and H. Wijkander (eds.), *Contract Economics*, Massachusetts, Blackwell.

Jensen, G.H., Solberg, D.P. and Zorn, T.S. (1992), "Simultaneous Determination of Insider Ownership, Debt and Dividend Policies", *Journal of Financial Quantitative Analysis*, Vol. 27, pp. 247- 261.

Jordan, J., Lowe, J. and Taylor, P. (1998), "Strategy and Financial Policy in UK Small Firms", *Journal of Business Finance and Accounting*, Vol. 25, pp. 1- 27.

Jöreskog, K.G. and Sörbom, D. (1981), *LISREL V, Analysis of linear structural relationships by the method of maximum likelihood*, Chicago, National Education Resources, USA.

Kahle, K.M. and Walking, R.A. (1996), "The Impact of Industry Classifications on Financial Research", *Journal of Financial and Quantitative Analysis*, Vol. 31, pp. 309-355.

Kale, J.R., Noe, T.H. and Ramirez, G.G. (1991), "The Effect of Business Risk on Corporate Capital Structure: Theory and Evidence", *Journal of Finance*, Vol. 46, pp. 1693- 1715.

Kensinger, J. and Martin, J. (1986), "Royalty Trusts, Master partnerships and Other Organisational Means of 'Unfirming' the Firm", *Midland Corporate Finance Journal*, Summer.

Kester, C.W. (1986), "Capital and Ownership Structure: A Comparison of United Studies and Japanese Manufacturing Corporations", *Financial Management*, pp. 5- 16.

Kim, E.H. (1978), "A Mean-Variance Analysis of Optimal Capital Structures", *Journal of Finance*, Vol. 23.

Kim, W.S. and Sorensen, E.H. (1986), "Evidence on the Impact of the Agency Costs of Debt in Corporate Debt Policy", *Journal of Financial and Quantitative Analysis*, Vol. 21, pp. 131- 144.

King, M.A., (1974), "Taxation and the Cost of Capital", *Review of Economic Studies*, Vol. 41, no. 1, pp. 21-35.

King, M.A., (1977), *Public Policy and the Corporation*, London: Chapman and Hall, UK.

Kitchen, R.L. (1986), *Finance for the Developing Countries*, Chichester: Wiley, UK.

Klein, D.P. and Belt, B. (1994), "Sustainable Growth and Choice of Financing: A test of the Pecking Order Hypothesis", *Review of Financial Economics*, Vol. 3, pp. 143- 154.

Kracaw, W.A., Lewellen, W.G. and Woo, C.Y. (1994), "Corporate Growth, Corporate Strategy and the Choice of Capital Structure", *Managerial and Decision Economics*, Vol. 13, pp. 515- 526.

Krishnaswami, S., Spindt, P.A. and Subramaniam, V. (1999), "Information Asymmetry, Monitoring, and the Placement Structure of Corporate Debt", *Journal of Financial Economics*, Vol. 51, No. 3, pp. 407-34.

La-Porta, R., Lopez de Silanes, F. and Shleifer, A. (1999), "Corporate Ownership around the World", *Journal of Finance*, Vol. 54, No. 2, April, pp. 471-517.

Leland, H. and Pyle, D. (1977), "Informational Asymmetries, Financial Structure and Financing Intermediation", *Journal of Finance*, Vol. 32, pp. 371- 388.

Lev, B. (1969), "Industry Averages as Targets for Financial Ratios", *Journal of Accounting Research*, Autumn, pp. 290- 299.

Lintner, J. (1956), "Distribution of Incomes of Corporations among Dividends, Retained Earnings, and Taxes", *American Economic Review*, Vol. 46, pp. 97-113.

Lowe, J., Naughton, T. and Taylor, P. (1994), "The Impact of Corporate Strategy on the Capital Structure of Australian Companies", *Managerial and Decision Economics*, Vol. 15, pp. 245- 257.

Mackie-Mason, J. (1990), "Do Firms Care Who Provides Their Financing?", in R. G. Hubbard (ed), *Asymmetric Information, Corporate Finance and Investment*, Chicago and London: University of Chicago Press.

MacKinlay, A.C. (1997), "Event Studies in Economics and Finance", *Journal of Economic Literature*, Vol. 35, No. 1, pp. 13 - 39.

Marsh, P. (1982), "The Choice between Equity and Debt: An Empirical Study", *Journal of Finance*, Vol. 37, pp. 121- 144.

Masulis, R.W. (1988), *The Debt/Equity Choice*, Cambridge: Ballinger, Massachusetts.

Mayer, C. (1986), "Corporation Tax, Finance and the Cost of Capital", *Review of Economic Studies*, Vol. 53, pp. 93-112.

Mayer, C. (1988), "New Issues in Corporate Finance", *European Economic Review*, Vol. 32, pp. 1167- 1189.

Mayer, C. (1990), "Financial Systems, Corporate Finance and Economic Development", in R.G. Hubbard (ed), *Asymmetric Information, Corporate Finance and Investment*, Chicago: University of Chicago Press, USA.

Mayer, C. and Alexander, I., (1990), "Banks and Securities Markets: Corporate Financing in Germany and the United Kingdom", *Journal of the Japanese and International Economies*, Vol. 4, pp. 450- 475.

Miller M.H. (1977), "Debt and Taxes", *Journal of Finance*, Vol. 32, pp. 261- 275.

Modigliani, F. and Miller, M.H. (1958), "The Cost of Capital, Corporation Finance and the Theory of Investment", *American Economic Review*, 48, pp. 261- 297.

Modigliani, F. and Miller, M.H. (1963), "Corporate Income Taxes and the Cost of Capital: A Correction", *American Economic Review*, Vol. 53, pp. 433- 443.

Moore, W. (1986), "Asset Composition, Bankruptcy Costs and the firm's Choice of Capital Structure", *Quarterly Review of Economics and Business*, Vol. 26, pp. 51- 61.

Munro, J.W. (1996), "Convertible Debt Financing: An Empirical Analysis", *Journal of Business*

Finance and Accounting, Vol. 23, pp. 319- 334.

Murinde, V. (1996), *Development Banking and Finance*, Aldershot: Ashgate.

Murinde, V., Agung, J. and Mullineux, A.W. (1999) "Convergence of European financial systems: banks or equity markets?", in: M. Fischer and P. Nijkamp (eds.) *Spatial Dynamics of European Integration: Political and Regional Issues at the Turn of the Millenium*, Springer-Verlad, Munich.

Murinde, V. and Kariisa-Kasa, J. (1997) "The Financial Performance of the East African Development Bank: A Retrospective Analysis", *Accounting, Business and Financial History*, Vol. 7, No. 1, 1997, pp. 81-104.

Murinde, V. and Mullineux, A.W. (1999) "Introductory Overview: Issues Surrounding Bank and Enterprise Restructuring in Central and Eastern Europe", in A.W. Mullineux, and C.J. Green (Eds), *Economic Performance and Financial Sector Reform in Central and Eastern Europe*, Edward Elgar, Cheltenham, pp. 1-20.

Myers, S.C. (1977), "Determinants of Corporate Borrowing", *Journal of Financial Economics*, Vol. 5, pp. 147- 175.

Myers, S.C. (1984), "The Capital Structure Puzzle", *Journal of Finance*, Vol. 34, pp. 575- 592.

Myers, S.C. and Majluf, N.S. (1984), "Corporate Financing and Investment Decisions when Firms have Information that Investors do not have", *Journal of Financial Economics*, Vol. 13, pp. 187- 221.

Narayanan, M.P. (1988), "Debt versus Equity under Asymmetric Information", *Journal of Financial and Quantitative Analysis*, Vol. 23, pp. 39-51.

Peyser, P.S. (1999), "Firm Theoretic Limitations on Proposition III", *Review of Quantitative Finance and Accounting*, Vol. 12, No. 1, pp. 65-88.

Pham, T., and Chow, D. (1989), "Some Estimates of Direct and Indirect Bankruptcy Costs in Australia: September 1978 - May 1983", *Australian Journal of Management*, Vol. 14, pp. 75- 79.

Poitevin, M. (1989), "Financial Signalling and the 'Deep- Pocket' Argument", *Rand Journal of Economics*, Vol. 20, pp. 26- 40.

Prasad, S.K. (2000), *Corporate Financial Structures in Developing Economies*, Unpublished PhD Thesis, Cardiff Business School, University of Wales.

Rajan, R. and Zingales, L. (1995), "What Do We Know about Capital Structure? Some Evidence from International Data", *Journal of Finance*, Vol. 50, pp. 1421- 1460.

Riah-Belkaoui, A. and Bannister, J.W. (1994), "Multidivisional Structure and Capital Structure: The Contingency of Diversification Strategy", *Managerial and Decision Economics*, Vol. 15, pp. 267- 276.

Robertson, D.K. and Tress, R.B., (1985), "Bankruptcy Costs: Evidence from Small-Firm Liquidations", *Australian Journal of Management*, Vol.10, pp.49-60

Rock, K. (1986), "Why new issues are underpriced", *Journal of Financial Economics*, Vol. 15, pp. 187-212.

Ross, S. (1973), "The Economic Theory of Agency: the Principal's Problem", *American Economic Review*, Vol. 63, No. 2, 134-139.

Ross. S. (1977), "The Determination of Financial Structures: An Incentive Signalling Approach", *Bell Journal of Economics*, Vol. 8, No. 1, pp. 23-40.

Ross, S. (1985), "Debt and Taxes and Uncertainty", *Journal of Finance*, Vol. 40, pp. 637- 657.

Rothschild, M. and Stiglitz, J.E. (1976), "Equilibrium in Competitive Insurance Markets: An Essay in the Economics of Imperfect Information", *Quarterly Journal of Economics*, November, pp. 629-649.

Rutterford, J. (1985), "An International Perspective on the Capital Market Puzzle", *Midland Corporate Finance Journal*, Vol. 3, pp. 60- 72.

Scott, J.H. (1977), "Bankruptcy, Secured Debt and Optimal Capital Structure", *Journal of Finance*, Vol. 32, pp. 1-19.

Shannon, H.A. (1932), "The First Five Thousand Limited Companies and their Duration", *Economic History*, Vol 2, pp. 396-424.

Shavell, S., (1979), "Risk Sharing and Incentives in the Principal and Agent Relationship", *The Bell Journal of Economics*, Vol. 10, pp. 55-73.

Shenoy, C. and Koch, P.D. (1996), "The Firm's Leverage-Cash Flow Relationship", *Journal of Empirical Finance*, Vol. 2, pp. 307- 331.

Shleifer, A. and Vishny, R.W. (1989), "Management Entrenchment: The Case of Managerial Specific Investments", *Journal of Financial Economics*, Vol. 25, pp. 123-139.

Short, H. (1994), "Ownership, Control, Financial Structure and the Performance of Firms", *Journal of Economic Surveys*, Vol. 8, pp. 203- 249.

Short, H. and K. Keasey (1999), "Managerial Ownership and the Performance of Firms: Evidence from the UK", *Journal of Corporate Finance*, Vol. 5, No. 1, pp. 79-101.

Shyam-Sunder, L. and Myers, S.C. (1999), "Testing static trade-off against pecking order models of capital structure", *Journal of Financial Economics*, vol. 51, pp.219-244.

Singh, A. (1995), "Corporate Financial Patterns in Industrialising Economies: A Comparative Study", *IFC Technical Paper No. 2*: IFC, Washington DC, USA.

Smith, C. and Warner, J. (1979), "On Financing Contracting: An Analysis of Bond Covenants," *Journal of Financial Economics*, Vol. 7, pp. 117-161.

Stultz, R. (1990), "Managerial Discretion and Optimal Financing Policies", *Journal of Financial Economics*, Vol. 26, pp. 3-27.

Thatcher, J.S. (1985), "The Choice of Call Provision Terms: Evidence of the Existence of Agency Costs of Debt", *Journal of Finance*, Vol. 40, pp. 549-61.

Thies, C.F. and Klock, M.S. (1992), "Determinants of Capital Structure", *Review of Financial Economics*, Vol. 1, pp. 40-52.

Titman, S. (1984), "The Effect of Capital Structure on the Firm's Liquidation Decision", *Journal of Financial Economics*, Vol. 13, pp. 137-151.

Titman, S. and Wessels, R. (1988), "The Determinants of Capital Structure Choice", *Journal of Finance*, Vol. 43, pp. 1-19.

Van *der* Wijst, R. and R. Thurik (1993), "Determinants of Small Firm Debt Ratios: Analysis of Retail Panel Data", *Small Business Economics*, Vol. 5, pp. 55-65.

Vilasuso, J. and Minkler, A. (2001), "Agency Costs, Asset Specificity, and the Capital Structure of the Firm", *Journal of Economic Behaviour and Organisation*, Vol. 44, No. 1, pp. 55-69.

Vogt, S.C. (1994), "The Role of Internal Financial Sources in Firm Financing and Investment Decisions", *Review of Financial Economics*, Vol. 4, pp. 1- 24.

Wald, J. (1999), "Capital Structure with Dividend Restrictions", *Journal of Corporate Finance*, Vol. 5, No. 2, pp. 193-208.

Warner, J.B. (1977), "Bankruptcy Costs: Some Evidence", *Journal of Finance*, Vol. 32, pp. 337-347.

Wensley, P. and Walker, G. (1995), "Capital Structure Differences between Japan and New Zealand", *International Company and Commercial Law Review*, Vol. 6, pp. 47- 55.

Whitley, R. (1992), *Business Systems in East Asia: Firms, Markets and Societies*, London: Sage, UK.

Williamson, O.E. (1988)," Corporate Finance and Corporate Governance", *Journal of Finance*, Vol. 43, pp. 567-591.

Wright, K. (1994), "Company Profitability and Finance", *Bank of England Quarterly Bulletin*, Vol. 34, pp. 241- 249.

Zarowin, P. (1988), "Non-Linearities and Nominal Contracting Effects: The Case of the Depreciation Tax Shield", *Journal of Accounting and Economics*, Vol. 10, pp. 89- 110.

Zeckhauser, R.L. and Pound, J. (1990), "Are Large Shareholders Effective Monitors? An Investigation of Share Ownership and Corporate Performance", in R.G. Hubbard (ed.): *Asymmetric Information, Corporate Finance and Investment*, University of Chicago Press: Chicago, pp. 149- 180.

Table 1: The Influence of Ownership and Control on Capital Structure (Section 7.1)

Author(s)	Period and Sample	Control Classification	Dependent Variables	Results
Kim and Sorenson (1986)	1970-1980. 84 insider and 84 outside US firms by industry.	Insiders:> 25% owned by insiders. Outsiders: < 25% owned by insiders.	Ratio of long-term debt to total capitalisation.	Insider firms have on average, 5.7% significantly higher debt ratios than outsider firms, *ceteris paribus.*
Aggrawal and Mandelker (1987)	1974-1982. 153 acquiring firms and 56 divesting firms involved in sell-offs.	R1: ratio of value of stock + options held to total annual compensation. R2: ratio of value of stock+options held to annual salary + bonus. R3: ratio of stock owned to total stock outsatnding. R1, R2 and R3 calculated for (1) highest ranked managers and (2) all officers and directors.	Change in variance of stock returns (*post*-investment announcement compared with *pre*-) Ratio of book value of long-term debt + preferred stock to book value of long-term debt + preferred stock + market value of equity.	R1, R2 and R3 significantly higher for firms in which variance increases than those in which variance decreases. Firms that increase their debt/equity ratio after the acquisition/ sell-off have significantly higher R1, R2 and R3 for top manager and top two managers than firms that decrease their debt/equity ratio. (All directors is not significant.)
Friend and Lang (1988)	1974-1983. 984 US firms (cut-off point of 13.85% management ownership used to separate sample into two equal size groups of 'publicly held' and 'closely held' firms)	CH1: > 13.85% owned by officers/ directors and > 10% by non-man-agerial share-holders(NMS). CH0: > 13.86% owned by officers/ directors and < 10% owned by NMS. PH1: < 13.85% owned by officers/ directors and > 10% owned by NMS. PH0: < 13.85% owned by officers and < 10% owned by NMS.	Debt/asset ratio defined on a book-value basis and excludes trade credit and short-term accruals.	CH1 has average debt ratios than CH0. PH1 has higher average debt levels than PH0. For CH1, CH0 and PH1 debt is negatively related to management shareholdings. For PH0, debt is positively related to management share holdings.
Friend and Hasbrouck (1988)	1983 *only*. 1470 non-financial and non-utility US firms.	MV: market value of insider holdings. FR: Market value of insider holdings/ total market value of equity.	DRT: book value of long- term debt/ book value of total assets.	FR is significant and positively related to firm gearing; MV is significant and negatively related to firm gearing.

Table 1 (*continued*): The Influence of Ownership and Control on Capital Structure

Author(s)	Period and Sample	Control Classification	Dependent Variables	Results
Holderness and Sheehan (1988)	1979- 1983. 101 majority held and 101 diffusely held US firms, matched by industry and size.	MH: ? 50% but < 95% by one individual, family or entity. DH: ? 20% held by any shareholder.	Capital expenditure, advertising expenditure, research and development expenditure.	MH firms have larger average expenditures than DH firms. But differences are not significant.
Amihud *et al*. (1990)	1981-1983. 165 acquiring US firms.	OWN2: percentage of shares held by the largest two insiders (officers and directors). OWN5: percentage of shares held by largest five insiders. OWNALL: percentage of shares held by all insiders.	Method of payment for acquired firm:- cash/notes or stock exchange.	Cash financed acquisitions associated with significantly larger insider ownership than stock financed acquisitions.
Zeckhauser and Pound (1990)	1988- 1989. 286 US firms drawn from 22 industries, 11 industries classified as being closed information structure industries, based on the ratio of RnD to sales (proxy for asset specificity).	Large shareholder defined as single external entity owning 15% or more of stock outstanding voting stock.	Book value of total debt/book value of total debt plus market value of equity.	No significant difference between firms with large shareholders and those without for both open and closed information structure industries (but, on average, large shareholders are associated with lower debt ratios).
Chatrath (1994)	1973- 1990. 151 US non-financial firms.	Percentage of equity held by insiders (*Value-Line* supplied figure).	Market price of debt/market capitalisation; Book value of debt/ book value of equity.	A significant positive influence of insider ownership on the firm's gearing was found for both dependent variables.
Hussain (1995)	1988-1993 179 listed Indonesian firms.	LPUBLIC: Log of proportion of firm's shares owned by the public. LLS: Log of the proportion of shares owned by the largest shareholders (shares greater than or equal to 15%).	LDE: log of debt-equity. LLR: Log of debt/ total assets.	Both have significant influences. With LLS, an increase is found whilst a decline when LPUBLIC is employed for both definitions of gearing.

Table 1 (*continued*): The Influence of Ownership and Control on Capital Structure

Author(s)	Period and Sample	Control Classification	Dependent Variables	Results
Chehab (1995)	1978-1991. 304 US firms drawn from Standard & Poor's 500.	Percentage of outstanding stock owned by all management. (*Value-Line* supplied figure).	Long-term debt/ book value of equity.	A positive dependence was noted but was found to be insignificant.
Firth (1995)	1989 *only*. 1038 listed US firms.	Long-term debt/total assets.	LVMS: log of the end-of-year market value of the management's shares in the firm. FMS: Percentage of ownership by management. IS: Percentage of ownership held by institution investors.	LVMS is found to be negative and significant whilst IS is found to be positive and significant. On the other hand, FMS is negative but statistically insignificant.

Notes: The results, methodologies and layout of some authors are drawn from Short (1994).

Table 2: The Influence of Bankruptcy Costs *per se* on Capital Structure (Section 7.2)

Author(s)	Period & Sample	Firm Size (*mean*)	Relative Bankruptcy Costs[1]
Warner (1977)	11 US railroad bankruptcies (1937- 1945)	$50 million (Market value of traded securities)	5.3% (t=0); 2.5% (t=-2) 1.4% (t=-5)
Ang, Chua, and McConnell (1982)	86 US firm bankruptcies (1963- 1979)	$108771	7.5% (t=0)
Altman (1984)	12 US retailer bankruptcies (1976- 1978) 7 US industrial bankruptcies (1975- 1978)	$167.7 million (Market value of firm) $107 million (Market value of firm)	4.0% (t=0) 3.1% (t=-3) 2.8% (t=-5) 9.3% (t=0) 6.2% (t=-3) 11.1% (t=-5)
Robertson and Tress (1985)	308 Australian Liquidations (1980)	AS$7254 (Book value of Assets)	38.8% (t=0)
Pham and Chow (1989)	14 Australian liquidations (1976- 1980)	AS$69.3 million (Market value of equity and book value of debt)	3.6% (t=0) 2.6% (t=-2)
Bradbury and Lloyd (1994)	29 New Zealand receiverships (1980- 1987)	AS$1258141- Estimated Asset Values AS$1072386 - Receivership proceeds AS$2353258 - Listed debt	4.0% (t=0) 4.7% (t=0) 2.1% (t=0)

Notes: 1. t= time relative to year of bankruptcy: 0 = year of bankruptcy; *-n* = *n* number of years prior to bankruptcy.

Table 3: Corporate Strategy and Capital Structure (Section 7.3)

Author(s)	Period and Sample	Dependent Variable	Strategy Variable	Result
Barton and Gordon (1988)	1970- 1974 279 US firms	Equity / (Total assets- current liabilities)	?? Single » ?? Dominant » ?? Related » ?? Unrelated »	?? Low positive relationship with debt ?? No significant influence. ?? Low positive relationship with debt. High positive relationship with debt.
Lowe *et al*. (1994)	1984- 1988 176 Australian firms.	Debt/ equity	?? Single » ?? Dominant » ?? Related » ?? Unrelated »	?? Insignificant influence on leverage. ?? Insignificant influence on leverage. ?? Insignificant influence on leverage. ?? High positive relationship with debt.
Riahi-Belkaoui and Bannister (1994)	1950- 1978 62 US firms	Long-term debt/ equity	?? M- Form » ?? Related/ vertical integration »	?? Positive dependence with leverage. ?? A negative relationship with debt.
Jordan *et al*. (1998)	1983- 1993 275 UK firms	*Natural logarithm* of : average debt/ equity.	?? The corporate » competitive strategies will affect corporate capital structure ?? Diversification » negatively related to debt. ?? Innovation is » negatively related to debt. ?? Firms » innovation strategies have lower debt levels than competitive ?? Firms » cost leadership strategies have lower debt levels than differentiation strategies firms, but higher debt levels.	?? No impact of strategy on debt; but strong affect of competitive strategy. ?? No support. ?? Strongly supported. ?? Strongly supported. ?? Weak support as regards cost and differentiation, but strong support as regards innovation.

Table 4: The Influence of Tangibility on Firm Leverage (Section 8.2)

+	-	*insignificant*
Friend and Hasborouck (1988)	Barton and Gordon (1988)	Titman and Vessels (1988) [-]
Friend and Lang (1988)	Van der Wijst and Thurik (1994)[2]	Lowe *et al*. (1994) [+]
Jensen, Solberg and Zorn (1992)	Cornelli *et al*. (1996)	
Thies and Klock (1992)		
Downs (1993)		
Van der Wijst and Thurik (1994)		
Chehab (1995)[1]		
Rajan and Zingales (1995)		
Shenoy and Koch (1996)		
Jordan *et al*. (1998)		
Hirota (1999)		

Notes: Signs within parentheses represent the direction of influence of insignificant coefficients.
1. found for short-term debt only.
2. found for long-term debt only.

Table 5: The influence of Size on Firm Leverage (Section 8.3)

+	-	*insignificant*
Barton and Gordon (1988)[1]	Barton and Gordon (1988)[1]	Kim and Sorensen (1986) [-]
Friend and Lang (1988)	Titman and Vessels (1988)	Lowe *et al*. (1994) [+]
Crutchley and Hansen (1989)	Kale *et al*. (1991)	Van der Wijst and Thurik (1994) [+]
Chiarella *et al*. (1992)	Chatrath (1994)	
Downs (1993)	Munro (1996)	
Chowdhury, Green, Miles (1994)		
Homaifa *et al*. (1994)		
Klein and Belt (1994)		
Hussain (1995)		
Rajan and Zingales (1995)		
Cornelli *et al*. (1996)		
Shenoy and Koch (1996)		
Jordan *et al*. (1998)		
Hirota (1999)		

Note: Signs within parentheses represent the direction of influence of insignificant coefficients.
1. dependent upon firm strategy.

Table 6: The Influence of Profitability on Firm Leverage (Section 8.4)

+	-	*insignificant*
Hallet and Taffler (1982)	Kester (1986)	Titman and Vessels (1988) [-]
Barton and Gordon (1988)	Friend and Lang (1988)	
Friend and Hasbrouck (1988)	Allen and Mizuno (1989)	
Chowdhury and Miles (1989)	Chowdhury and Miles (1989) [1]	
Chiarella *et al*. (1992)	Thies and Klock (1992)	
Jensen, Solberg and Zorn (1992)	Lowe *et al*. (1994)	
Downs (1993)	Van der Wijst and Thurik (1994)	
Chowdhury, Green and Miles (1994) [2]	Chowdhury, Green and Miles (1994)	
Hussain (1995)	Rajan and Zingales (1995)	
Cornelli *et al*. (1996)	Chehab (1995)	
Boyle and Eckhold (1997)	Jordan *et al*. (1998)	
	Hirota (1999)	

Notes: Signs within parentheses represent the direction of influence of insignificant coefficients.

1. found for past profitability only.
2. found under the net profit ratio which is defined as net profit divided by sales.

Table 7: The Influence of Growth on Firm Leverage (Section 8.5)

+	-	*insignificant*
Kester (1986)	Kim and Sorensen (1986)	Downs (1993) [+]
Titman and Vessels (1988)	Barton and Gordon (1988)	Klein and Belt (1994) [-]
Chowdhury and Miles (1989)	Kale *et al*. (1991)	Munro (1996) [-]
Thies and Klock (1992)	Chiarella *et al*. (1992)	
Chatrath (1994)	Gardner and Trcinka (1992)	
Homaifa *et al*. (1994)	Lowe *et al*. (1994)	
Chehab (1995)	Rajan and Zingles (1995)	
Boyle and Eckhold (1997)	Burton *et al*. (1996)	
Jordan *et al*. (1998)	Hirota (1999)	
	Gul (1999)	
	Hall, Hutchinson, and Michaelas (2000)	

Note: Signs within parentheses represent the direction of influence of insignificant coefficients.

Table 8: The Influence of Risk on Firm Leverage (Section 8.6)

+	-	*insignificant*
Kim and Sorensen (1986)	Friend and Hasborouck (1988)	Kester (1986) [+]
Barton and Gordon (1988) [3]	Friend and Lang (1988)	Titman and Vessels (1988) [-]
Crutchley and Hansen (1989)	Barton and Gordon (1988) [3]	Allen and Mizuno (1989) [-]
Kale et al. (1991) [1]	Chowdhury and Miles (1989)	Hussain (1995) [-]
Gardner and Trcinka (1992)	Mackie-Mason (1990)	Chehab (1995) [-]
Thies and Klock (1992) [2]	Jensen, Solberg and Zorn (1992)	
Lowe et al. (1994)	Thies and Klock (1992) [4]	
Shenoy and Koch (1996)	Downs (1993)	
	Boyle and Eckhold (1997)	
	Hirota (1999)	

Notes: Signs within parentheses represent the direction of influence of insignificant coefficients.

1. under a quadratic risk measure.
2. found for short-term debt only.
3. dependent upon firm strategy.
4. found for long-term debt only.

Table 9: The Influence of Non-debt Tax-shields on Firm Leverage (Section 8.7)

+	-	*insignificant*
Gardner and Trcinka (1992)	Bowen, Daly and Huber (1982)	Titman and Vessels (1988) [-]
Downs (1993)	Kim and Sorensen (1986)	Allen and Mizuno (1989) [-]
Homaifa et al. (1994)	Crutchley and Hansen (1989)	Van der Wijst and Thurik (1994) [?] [2]
Boyle and Eckhold (1997)	Mackie-Mason (1990)	
	Kale et al. (1991)	
	Jensen, Solberg and Zorn (1992)	
	Homaifor et al. (1994) [1]	
	Shenoy and Koch (1996)	
	Hirota (1999)	

Notes: Signs within parentheses represent the direction of influence of insignificant coefficients.

1. found for past NDTS.
2. negative influence found on long-term debt whilst a positive impact was noted for short-term debt.

Table 10: The Influence of Industrial Classification on Firm Leverage (Section 8.8)

Significant	*Insignificant*
Bowen, Daly and Huber (1982)	Friend and Hasbrouck (1988)
Hallet and Taffler (1982)	Hussain (1995)
Titman and Vessels (1988)	
Allen and Mizuno (1989)	
Chatrath (1994)	
Munro (1996)	
Jordan *et al*. (1998)	

Appendix 1: Summary of Recent Empirical Research on Corporate Capital Structure

General notes for appendix table A1(1) - (6)

Unless stated otherwise, the dependent variable is the book value of leverage/ gearing measures.

+/- positive/negative coefficients, respectively; and statistically significant.

? coefficients have indeterminate sign; and statistically significant.

ns coefficients not significant.

si coefficients significant (sign is immaterial).

Table A1(1): Summary of Recent Empirical Research on Corporate Capital Structure

Determinant	Authors					
	Barton and Gordon (1988)	Boyle and Eckhold (1997)	Burton, Lonie and Power (1996)	Bowen, Daly and Huber (1982)	Kester (1986)	Allen and Mizuno (1989)
Dividend		+				ns
Risk	?[1]	-			ns	?[2]
Profitability	+	+			-	-
NDTS		+		-		ns
Tangibility	-					
Growth	-	+	-		+	
Past Growth					ns	
Size	?[1]					
Industrial Group				si		si
Country Classifications					si	
Earning Power		+				

Notes: 1. Dependent upon the strategy followed by the firm; of the four types, two were found to be positively related and two negatively. Overall, impact of this attribute was noted to be indeterminate.

2. When the market value of leverage was employed, risk was found to have a significant negative influence on firm leverage. On the other hand, when the book value of leverage was used, risk was found to have an insignificant impact on leverage. [5] Blanks within the table represent variables that were not tested for.

Table A1(2): Summary of Recent Empirical Research on Corporate Capital Structure

Determinant	Author					
	Jensen, Solberg and Zorn (1992)	Kale *et al*. (1991)	Klein and Belt (1994)[1]	Kim and Sorensen (1986)[2]	Lowe *et al*. (1994)	Friend and Hasbrouck (1988)[3]
Dividend	-					
Risk	-	+[4]		+	+	-
Profitability	-				+	-
NDTS	-	-		-		
Tangibility	+				ns	+
Operational Efficiency			+			
Growth		-	ns	-	-	
Size		-	+	ns	ns	ns
Information Asymmetry		+				
Tax				ns	ns	
Tax Subsidy		-				
Liquidity (cash holdings)					-	

Notes: 1. results taken from table 5, regression 1, p. 150.

2. results taken from table 2 using the book value of leverage.

3. results taken from table 6, p. 14.

4. quadratic risk measure employed here.

Table A1(3): Summary of Recent Empirical Research on Corporate Capital Structure

Determinant	Author					
	Crutchley and Hanson (1989)	Bradley *et al*. (1984)	Chowdhury and Miles (1989)	Chiarella *et al*. (1992)	Cornelli *et al*. (1996)	Chowdhury, Green, Miles (1994)
Dividend						+
Risk	+		-			
Profitability			-	-	-	+
Past Profitability			+			
NDTS	-			-		
Tangibility				ns	-	
Growth			+	+		
Size	+			+	+	+
Tax			+			+
Past Tax			+			
State Ownership					si	
Liquidity (cash holdings)				ns		
Cost of Funds			ns			
Costs of adjustments			ns			
Investment			+			+
Leasing			+			
Stock Building						+
Miscellaneous Sources						-
Miscellaneous Expenses						+
Capital Issues						-
Sale of Fixed Assets						ns
Equity						-
Past leverage						-
Interest rates						?[1]
Tax Discrimination						ns
Rate of return on Capital						-
Net Profits (% of sales)						-

Notes: 1. Dependent upon the rate applied: negative influence is found with the inter-bank rate whilst a positive one with the CD rate.

Table A1(4): Summary of Recent Empirical Research on Corporate Capital Structure

Determinant	Author					
	Downs (1993)1	Gardner and Trzcinka (1992)	Homaifa *et al*. (1994)	Hussain (1995)	Hallet and Taffler (1982)	Jordan *et al*. (1998)
Risk	-	+		ns		+
Profitability	-			-	-	+
NDTS	+	+	+			
Past NDTS			-			
Tangibility	+					+
Growth	ns	-	+			+
Past Growth			-			
Size	+		+	+		+
Past Size			-			-
Tax			ns	ns[2]	-	
Past Tax			-			
Industrial Group				ns	si	si
Liquidity (cash holdings)					-	-
Uniqueness	-					
Past leverage			-			
Market Conditions			-			
Past Market Conditions			-			
Inflation			+			
Past inflation			-			

Notes: 1. results of estimates when the sample was unrestricted and was allowed to vary across industries.

2. a negative dependence was noted for this variable post 1988.

Table A1(5): Summary of Recent Empirical Research on Corporate Capital Structure

Determinant	Author					
	Friend and Lang (1988)	MacKie-Mason (1990)	Munro (1996)1	Rajan and Zingales (1995)[2]	Shenoy and Koch (1996)	Titman and Vessels (1988).
Dividend					+	
Risk	-	-			+	ns
Profitability	-			-		ns[4]
NDTS		-			-	ns
Tangibility	+			+	?[3]	ns
Growth			ns	-		?[5]
Size	+		-	+	+	-
Investment					+	
Tax		ns				
Industrial Group			si			si
Liquidity (cash holdings)		ns				
Past Liquidity					-	
Intangibles			-			
Uniqueness					?[3]	-
Leverage			-			
Past leverage					-	

Notes:
1. results of estimates contained within panel B, model III, pg. 327 using the book value of leverage.
2. results were the same when either the book or market value of equity was employed.
3. this attribute has a positive coefficient in two of the four equations, and negative in the other two.
4. significant only when the market value of equity was used.
5. coefficient was negative when using the market value of equity, and positive when using the book value.

Table A1(6): Summary of Recent Empirical Research on Corporate Capital Structure

Determinant	Author					
	Thies and Klock (1992)	Vogt (1994)	Van der Wijst and Thurik (1993)	Chehab (1995)	Chatrath (1994)	Hirota (1999)
Dividend				+	-	
Risk	?[1]			ns		-
Profitability	-		-	-		-
NDTS			ns			-[5]
Tangibility	+[2]		?[3]	+		+
Operational Leverage	ns					
Growth	+			+	+	-
Size			ns		-	+
Tax	+					
Industrial Group					?[4]	
Liquidity (cash holdings)		-			?[4]	
Uniqueness					?[4]	
Interest rates	+					

Notes:
1. a negative/positive coefficient was found for this variable in the equation for long/short-term debt.
2. coefficient for long-term debt was insignificant.
3. a negative/positive coefficient was found for this variable in the equation for short/long-term debt.
4. a positive coefficient was reported for some equations, negative and insignificant for the rest.
5. significant in one out of four cross-section equations; significant at the 10% level in the whole (pooled) dataset.