

# **Target Gearing in the UK: A Triangulated Approach**

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## TARGET GEARING IN THE UK: A TRIANGULATED APPROACH

### Abstract

**Purpose** – This study investigates the incidence of target gearing behaviour in firms as well as the drivers of such behaviour.

**Design/methodology/approach** – The paper employs a triangulation approach across three methodological phases: a questionnaire survey, logistic regression modelling of firm data, and interviews with finance directors. The results are then discussed under the key themes of gearing optimality, valuation issues, external drivers, the finance life-cycle, the impact of risk, and the relationship between gearing and corporate strategy.

**Findings** – The results reveal that the majority of firms engage in targeting, though targets are subject to fairly frequent revision as both external and internal drivers evolve. Important external drivers include macroeconomic variables and analysts' views, whereas important internal drivers include income gearing and profitability.

**Practical implications** – Given the range and variety of drivers, target gearing evidently represents a complex strategic decision for finance directors. The paper provides a benchmark perspective for finance directors when determining their firm's gearing strategy.

**Originality/value** – The innovation of the paper is the study of target gearing across three methods, the results of which are then triangulated to provide a deeper understanding of both the quantifiable and qualitative drivers of gearing. This provides a far broader insight into the real-world determination of gearing strategy than a conventional empirical approach.

**Keywords** – gearing, leverage, targeting, industry, capital structure

**Paper type** – research paper

## **1. Introduction**

There has been substantial research interest in gearing over the years. Indeed it can be regarded as one of the major themes of finance and there are many interesting questions to be considered such as: Do practitioners set target gearing levels? Are targets popular or not? Do firms use book values or market values? How often are targets revised? Are internal factors more important than industry norms in the determination of targets? Are decisions to target consistent with a firm's ability to cover interest payments and with their general profitability? What role is there for systematic risk, if any, in the determination of targets? Once a target is fixed, what reasons are advocated for revising it? In the past, the methodologies have tended to be either postulational i.e. typified theoretically by the famous Modigliani and Miller (1958) article, or positivistic following a deductive reasoning beginning with hypotheses through to the identification of key variables, then on to data collection and statistical testing, usually with regression analysis. Some examples of each approach are explored in the literature review.

An alternative paradigm that is utilised especially in other branches of management is the phenomenological approach (see Hussey and Hussey, 1997). This is not constrained by predetermined hypotheses, or by the collection of data restricted to categories that are typically set at the literature review stage of the research. The phenomenological paradigm by contrast has an evolving design shaped by the phenomena being studied. It is not intended to lead to a proof, either in the mathematical sense, following axioms as in the case of the postulational approach, or in the statistical sense, as in the case of the positivist paradigm of financial research. These positivistic approaches tend to begin with a theorem or hypothesis. Instead a qualitative approach tends to end with a model or framework that, although not proven mathematically or statistically, is nevertheless grounded in, that is, supported by phenomena.

In this research we employ mixed methodologies, in order to gain further insights, and attempt to triangulate some of the key results. The aims of the paper are: to investigate the incidence and measurement of target gearing; to establish the financial characteristics which discriminate targeting from non-targeting firms; and to determine, from a practitioner viewpoint, both the factors which impact on the target level of gearing and the drivers which lead to a revised target. Consistent with these aims, Phase I of the research is based upon a questionnaire survey of finance executives. Phase II is devoted to statistical testing, combining the dichotomous split in the targeting decision with the financial characteristics of the firms. Phase III comprises an interview-based approach, addressing the targeting policies adopted by finance executives.

The structure of the rest of the paper firstly comprises the relevant literature, which is reviewed to examine the theoretical and empirical evidence relating to gearing policy generally, and target gearing in particular. Secondly, the methodological approaches and results of the three phases of the study are discussed in turn. Thirdly, the results are triangulated, seeking out consistencies or otherwise across the three phases. The salient results from the study are then drawn together and discussed in the conclusion.

## **2. Literature review**

This paper focuses primarily on the issue of capital structure targeting and the literature underpinning capital structure dynamics. A broader review of the underlying literature can be found in Harris and Raviv (1991) or more recently in Frank and Goyal (2008).

The capital structure debate is still far from being resolved. Academic research would appear to have crystallised into one of two camps: supporters of the trade-off theory and supporters of the pecking order theory. The pecking order theory suggests that firms prefer to employ retained earnings to external finance, and that when external finance is required, debt is preferred to new equity (Myers and

Majluf, 1984). The trade-off theory, however, argues that firms arrive at an optimal gearing ratio where the marginal benefits of debt such as interest tax shields equal the marginal costs of debt such as financial distress and bankruptcy costs (Kim, 1978). Alternatively, we could trade-off the agency costs and benefits of debt to arrive at this optimum.

Empirical support for the pecking order theory is provided by authors such as Krishnan and Moyer (1996) for firms from the US, Germany, Japan and Italy. Empirical support for the trade-off theory is provided by Leary and Roberts (2005) and Flannery and Rangan (2006) for US firms and Bunn and Young (2004) and Beattie et al. (2006) for UK firms.

More recently, there is an emerging body of work which proposes that the pecking order theory might explain gearing within a certain range whilst the trade-off theory explains gearing when it moves outside of this range and therefore requires correction. Authors such as Beattie et al. (2006) argue that models combining elements of both theories may improve our understanding of gearing.

Andersen (2008) argues that multinationals have available more strategic opportunities which, for exploitation in a dynamic environment, require a real option value-induced financial slackness, associated with lower gearing levels. He appropriately finds that gearing is negatively related to return on assets (ROA), despite a low correlation. Although he finds an insignificant correlation between multinationality (i.e. combining numbers of countries and branches) and gearing, but he does find a weakly significant multinational-leverage interaction regression coefficient, which is negatively associated with ROA performance. Classical theory suggests that multinational companies are able to maintain higher gearing than domestic firms due to the risk reduction which results from having operations in less than perfectly correlated markets. However, the evidence suggests that internationalisation actually gave rise to reduced gearing

in US firms (Lee and Kwok, 1988; Burgman, 1996), due to the growth opportunities, increased agency costs and exchange rate risks of multinational firms. More recently, Kwok and Reeb (2000) extended their study to firms from 32 countries and found a similar negative relationship between internationalisation and gearing. Whilst international diversification may lead to lower gearing, it is argued that most firms are constrained to some extent by their access to foreign financial markets and by other country-specific factors. Whilst Bancel and Mittoo (2002) found in their study of 17 European countries that gearing determinants are common across countries, Booth et al. (2001) found evidence of persistent differences in gearing across countries, as a result of differences in macroeconomic and capital market factors. Globalisation has clearly created some important financing opportunities for firms, though many barriers still persist to achieving a true globally-sourced capital structure.

Rutterford (1986) tested Miller's general equilibrium model and found that, for several countries, tax was not a significant factor in determining the capital structure of the firm. This proposition was supported by Ashton (1991) who suggested that taxation played a minor role in shaping UK corporate financial policy. Indeed, Bevan and Danbolt (2002) rejected the tax shield hypothesis. Using a postal survey of US and UK multinational firms, Hooper (1994) showed that there was more support for tax irrelevance than for the view that raising debt finance in countries with high corporate tax rates increases the value of the firm. Nevertheless, one third of multinationals in his sample supported the value-increasing hypothesis. However these propositions are contradicted by Norton (1991), who through use of a questionnaire survey of US finance managers, found that tax implications were key determinants of capital structure. Pointon (1997) demonstrated that the ungeared firm can be worth more than the geared firm, even under an imputation system, due to the differential treatment of equity and sterling debt under UK capital gains tax, and due to the possibility of tax losses induced by debt finance. But do UK finance executives consider tax as a key variable? Norton (1991) also found a role for financial flexibility and stock

market conditions. Indeed, regarding the latter, Baker and Wurgler (2002) suggested that previous market returns have an impact on the firm's financing decisions.

We know that debt finance may reduce agency costs by reducing the freedom of financial managers to utilise the cash flow of the firm for purposes other than shareholder wealth maximisation (Jensen and Meckling, 1976). Morellec (2004) emphasises management preferences demanding lower gearing to reduce control mechanisms upon managers, who seek personal benefits from firm investment. But agency costs can be reduced. Harford, Li and Zhao (2008) demonstrate that firms with a stronger internal corporate governance board mechanism are associated with higher levels of gearing (and a greater use of short-term debt). Managers may use a gearing adjustment as a tactic for a hostile takeover defence. However, in Goergen and Renneboog's (2004) assessment of cumulative abnormal returns of both takeover targets and bidder firms in Europe, debt interest coverage was not a significant variable. Further, Field and Karpoff (2002) found that the likelihood that a firm will employ takeover defences was not related to firm capital structure in US IPOs. In their regressions using US data, Crutchley and Jensen (1996) found support for Jensen's (1986) free cash flow argument that managers prefer expansion at the expense of shareholder wealth maximisation while Mackie-Mason (1990) found that financial distress variables were significantly negatively related to the probability of issuing debt in the US. It has been argued by Hackbarth, Hennessy and Leland (2007) that bankruptcy regimes affect the structure of debt itself, and that banks can exercise some bargaining power, such that smaller firms employ only bank debt, whereas larger firms raise market debt as well, but place the bank debt in senior priority. Credit ratings can have gearing implications. Sufi (2007) shows that low credit-quality firms, that gain a bank loan credit rating, expand their debt levels.

Myers (1994) pointed out that the pecking order hypothesis advocates that firms should prefer to use retained earnings in preference to external finance, and that

external debt is preferred to new equity. Rajan and Zingales (1995) found a negative correlation between profitability, as measured by earnings to the book value of assets, and gearing, suggesting a pecking order effect whereby more profitable firms prefer internal funds to debt. Krishnan and Moyer (1996) and Wald (1999) found support for a pecking order hypothesis in their analysis of several countries including the US, Germany and Japan. Also, Bevan and Danbolt (2002) found support for the pecking order hypothesis in the UK. In a further country-specific study by Tucker (1997) a positive long run relationship between inflation and gearing was found in the UK, the Netherlands, Germany and France. Furthermore Graham and Harvey (2001) illustrate that firms avoid equity when they perceive that it is undervalued. Welch (2002) found no significant influence of profitability or growth on the firm's debt ratio. Johnson (2003) demonstrates that short-term debt reduces the negative impact of growth opportunities on gearing. But since short-term debt increases liquidity risk, he argues that firms trade this off against the cost of problems caused by underinvestment. In a study by Billet, King and Mauer (2007), there is a evidence of an increased use of debt covenants protecting bondholders and that, despite a negative relationship between gearing and growth opportunities, an interaction variable jointly linking growth opportunities to covenant protection is positively related to gearing. They conclude that covenants are used to control conflicts of interest between bondholders and shareholders in high growth firms, and can reduce agency costs.

At the industry level, Yam (1998) in an empirical study of Singaporean companies found significant variations in industry gearing ratios but within fairly broad industrial groupings (see Harris and Raviv (1991) regarding industrial leverage rankings). Firm size is another significant determinant of gearing. Rajan and Zingales (1995) find that size is positively correlated with leverage in the US, Japan, France, Italy, the UK and Canada. The rationale is that larger firms are less risky because of their wider diversification. Additionally, there are significant flotation costs associated with debt as opposed to equity. Jahera and Lloyd



(1996) found that size is a determinant of the ratio of the book value of debt to the market value of equity. Ozkan (2001) found little evidence from his study on UK firms that firm size has a positive effect on the leverage position of firms. However, Bevan and Danbolt (2004) found in their study of UK firms that company size was positively correlated with all debt components other than short-term securitized debt, where there is no relationship with size.

Ali, Chen and Radhakrishnan (2007) show that there is a significant difference in leverage between family and non-family firms on the S&P 500 list, in that family firms have lower gearing. They also show that although gearing is not a factor explaining differences in performance (adjusted for discretionary accruals), gearing is positively related to the disclosure of high quality financial information. On the French stock exchange, Sraer and Thesmar (2007) show that family firms generally outperform their counterparts and are subject to lower interest rates on borrowed funds. Anderson and Reeb (2003) test whether large US firms founded by families reduce risk through diversification and gearing adjustments, but actually find not only lower diversification levels, but similar gearing levels to other firms.

Jahera and Lloyd (1996) also found that there is a negative relationship between research and development expenditure and gearing, where debt is measured at its book value and equity at its market value. The rationale is that intangible assets have a lower liquidation value than tangibles, of which the latter can support greater levels of debt. The proposition that tangibility is positively correlated with leverage is supported by Rajan and Zingales (1995).

The weight of theory and empirical evidence to date would appear to suggest that all firms should logically engage in capital structure targeting. Finance directors target in order to trade-off the costs and benefits of employing debt in the firm's capital structure – in this regard targeting is a form of optimising behaviour. The finance director may be pursuing a particular single target or a

target range, constrained into doing so by debt covenant conditions or even the expectations of analysts and investors. In a fast changing environment the target could be subject to frequent revision whilst in a stable environment it may remain unchanged for some years.

More interestingly perhaps is consideration of why a firm may choose not to target its capital structure. Not targeting would suggest that the firm is not subject to such tight constraints imposed by debt holders or equity holders (and analysts). There are a number of reasons why firms may not need to target. Firstly, it may be that a firm is entirely equity financed and therefore targeting is irrelevant. Secondly, the firm might enjoy a very stable business environment and thus will not be preoccupied with managing total risk. Thirdly, firms with significant growth opportunities may consider book value capital structure measures to be irrelevant and therefore target market value ratios or even not target at all. Fourthly, family-controlled firms may have priorities other than achieving a certain capital structure ratio (such as maintenance of control for example). Finally, the firm may be so well diversified across industries or segments to render targeting, and in particular targeting in relation to an industry norm, meaningless. Therefore, whilst arguably we might expect firms to engage in capital structure targeting, certain firms or industries may find that targeting is an inappropriate strategy, preferring to concentrate attention instead on maximising the returns on the firm's portfolio of investment projects.

### **3. Methodology**

This paper employs a novel methodological approach to the study of target gearing. Three methods are employed: a survey analysis, statistical testing and econometric modelling, and an analysis of interview responses. The benefit of this approach is that it allows for triangulation of results across the three methods, thereby both validating key results and illustrating them from different perspectives.

### **3.1 Survey analysis**

The purpose of the survey analysis was to ascertain the proportion of firms which target gearing ratios and to discover the measurement convention of this ratio. The survey enabled the identification of those individual firms which target and those which do not, thus providing the binary dependent variable for the logistic regression models discussed in the second phase.

As part of an earlier research project in August 1997, a questionnaire had been despatched to the finance directors of 1,292 UK quoted firms to determine practitioner perspectives on the cost of capital. Part of the questionnaire was devoted to the subject of target gearing behaviour. Firms were asked whether they have a target gearing ratio, and for those firms which did, how this target ratio was measured. Additionally, firms which target were asked whether the target was fixed for longer than one year and if not, what factors determined revisions in the target. Finally, firms were asked whether the target was based upon an industry norm, internal factors, or other factors which the firm was invited to state.

The questionnaire survey enabled the construction of a sample of firms which target and firms which do not. This categorisation provides the dependent variable in the logistic regression analysis. Additionally it serves as a grounding exercise to support the specification of a general-form econometric model. The survey also enables the identification of a sample of finance directors who are willing to be interviewed by telephone in the interview analysis. The survey returned 193 usable responses, a reasonable response rate given the fact that the finance directors are likely to be swamped by such surveys and are extremely busy people anyway.

### **3.2 Statistical testing and econometric models**

The aim of the second phase of the study is to derive testable hypotheses relating to the determinants of the firm's decision whether to gear or not, and

then to test these hypotheses on a sample of UK quoted firms. A series of logistic regression models was established for this purpose.

Two tests are undertaken as a precursor to modelling. Firstly, a series of analysis of variance tests is undertaken and measures of central location are calculated to examine differences in key determinants between firms which target and firms which do not. Secondly, a bivariate correlation matrix is computed to examine the linear association between the predictor variables to be modelled in the regression analysis.

The sample is obtained from the DATASTREAM financial database and from survey responses. The sample of 124 firms comprises those UK quoted firms which responded to the postal survey and whose financial and accounting data are recorded on DATASTREAM. The variable TARGET is assigned a value of '1' where the firm states that they are engaged in target gearing in the survey and '0' where the firm states that they do not engage in such targeting activities. Such responses relate to August 1997 when the survey was conducted. This factor is the dependent variable in the econometric modelling.

The financial year ending 1998 is selected for the accounting variables to capture the immediate future period to which the stated gearing policies relate. The variable DDEMV is the debt-to-debt-plus-equity ratio of the firm for the financial year ending 1998. Here debt includes only long-term debt measured in terms of book value and equity is measured in terms of market value. The variable LNASS is simply the natural log of total assets employed, measured at the financial year ending 1998. The variable labelled ROCE is the return on capital employed for the financial year ending 1998. The interest cover measure labelled ICOV is defined as earnings before interest and taxation, depreciation and amortisation divided by interest expense for the financial year ending 1998. An industry variable is included, labelled INDUSTRY, such that '1' represents firms in the manufacturing sector and '0' represents firms in the service sector.

The variable BETA is the standard beta coefficient given by DATASTREAM, measured as at March 2000. This measure covers the 60 month period within which the targeting policy is articulated. The rationale here is that finance managers will consider both past trends in systematic risk as well as future expectations before deciding upon a gearing policy which may significantly impact upon the overall risk of the firm. The market to book value, labelled MTBV is also measured as at March 2000 to pick up the long-term trend and expectations with regard to the firm's market capitalisation.

The modelling approach employed is consistent with the 'general-to-specific' approach of Hendry (1980). Here, a general model is estimated upon the full set of predictor or independent variables and that model is then reduced by means of a stepwise backward development process to arrive at the ultimate reduced-form model. The explanatory power of regression coefficients is gauged by the Wald statistic and the significance probability is also computed. The explanatory power of each model is measured by the chi-square statistic. The hypothesis may then be tested by examining the sign and significance of individual predictors and the relative importance of each predictor may be gauged by comparing the specification of the general (full) model against that of the reduced form model.

There are six key hypotheses that can be deduced from the literature. These are highlighted below along with the rationale for the likely impact of each associated determinant upon the decision of whether or not to target gearing.

***Hypothesis H1:*** Firms with higher levels of systematic risk are more likely to target. The rationale for this relationship is that firms with greater shareholder risk need to target carefully to avoid compounding the total risk by excessive borrowing.

**Hypothesis H2:** Firms with higher gearing levels are more likely to target. The rationale here is that highly geared firms need to monitor gearing more closely to avoid financial distress.

**Hypothesis H3:** Firms with greater interest cover are less likely to target. The proposition with respect to interest cover is that firms with lower cover are more financially risky; consequently the need to target is greater.

**Hypothesis H4:** Larger firms are more likely to target. Firms that are larger are more likely to benefit from economies of scale in borrowing thereby leading to higher levels of borrowing and increasing the need to target.

**Hypothesis H5:** The higher the market to book value, the less likely are firms to target. The rationale here is that as market and book values diverge, book value measures become inadequate as monitoring variables and, since market values fluctuate, neither book nor market values (or a combination of both) can be used to target.

**Hypothesis H6:** The greater a firm's profitability, the less likely are firms to target. Here claimholders are less worried about the risk of their claims as firms are more able to provide ample returns to all providers of long-term finance.

Two logistic regression models are estimated in the study. The first is a full model which takes each variable in the correlation matrix as a predictor of whether the firms target or not. The second is a reduced model, representing that combination of independent variables which results in a more significant overall model, in terms of the chi-square probability of the regression deviance. With regard to individual variables, they are more significant, the greater the regression coefficient from zero and the smaller the standard error, *ceteris paribus*. These factors are reflected in a higher Wald statistic.

### **3.3 Interview analysis**

The interview analysis of this study can be represented by five sequential steps: selection, interviews, transcriptions, coding and key factor identification. From the wider survey, a selection of 26 companies is made on the basis of such companies having previously indicated a willingness to be interviewed by telephone if requested. Although the sample is non-random, the profile of companies represents a wide spread of industrial classifications. The interviews were conducted by telephone in the summer of 1999. There is no advantage seen in face-to-face interviews as far as the content of the material is concerned and of course this approach is seen as an exercise in sound financial stewardship. The semi-structured interviews comprise six questions:

1. Do you have a target gearing ratio?
2. If yes, how is it measured?
3. How often do you revise it?
4. What factors determine the level of target gearing?
5. What factors commonly cause the level of target gearing to change?
6. If you do not have a target, what factors determine the mix of debt and equity?

The purpose of the questions is to help establish an unbiased dialogue with a view to identifying key factors in target gearing. The next stage involves coding the information. The coded concepts utilised were grouped under six categories: the existence of a target, measurement, frequency of revisions, determinants of the initial target, factors causing a change in the target, and finally the debt-equity mix where there was no target. As the interviews are analysed, some concepts tend to be repeated. Each concept is not only cross-referenced to the appropriate transcripts to maintain an audit trail, but also briefly listed along with the context in which it was stated. At this stage there were about 30 concepts, though these are then reduced down to a smaller list of key factors/themes.

## 4. Results

### 4.1 General results

The results are presented in Tables 1 to 4. Table 1 presents the results of the survey questionnaire. Table 2 presents the results of the ANOVA tests according to whether a firm targets or not. Table 3 gives the correlation matrix of model predictor variables, and the logistic regression models are presented in Table 4. The results are discussed in relation to six key themes: the optimality of the gearing decision; issues related to valuation; the impact of the external environment; the finance life-cycle; the impact of risk; and the relationship between gearing and corporate strategy. In so doing, the themes allow for triangulation across the three methods employed. However, first it is necessary to determine whether the measured predictor variables of this study are correlated and to review the overall results of the regression analysis.

In Table 3, we set out the correlation matrix of the variables which later become the predictor variables in the econometric modelling. Several pairs have correlation coefficients close to zero: gearing and beta, size and interest cover, market to book value and interest cover, return on capital and interest cover, market to book value and size, and return on capital and market to book value. Most importantly, however, the correlation matrix does not suggest problems of multicollinearity in the subsequent logistic regression models.

Table 4 gives the results of the logistic regression models. In the full model, apart from the constant, interest cover is the most significant factor with a significance probability of 5.1%. The performance of the full model is good, reflected in the chi-square of the regression deviance having a significance probability of 1.7%. An augmented version however is the reduced model which, apart from the constant, includes only return on capital and interest cover.



The reduced model represents an improvement on the full model, as it produces a significance probability of the chi-square of the regression deviance of only 0.1%. Interest cover is significant at the 5% level, whereas return on capital is significant at the 10% level. The signs of the estimates of the regression coefficients support hypotheses H3 and H6 that firms with greater interest cover (financial safety) and greater profitability are less likely to target. Further discussion of the hypothesis testing is given in the triangulated results presented below.

#### **4.2 The optimality of the gearing decision**

Table 1 reveals that 61.7% of firms surveyed have a target gearing ratio and that 44% of respondents keep the target fixed for longer than a year. Interestingly, then, this implies that whilst the majority of UK firms surveyed maintain a target gearing ratio, a significant minority do not. Further, as only the minority fix the target for longer than a year, firms would appear to revise their target gearing ratios relatively frequently as key internal and external drivers change through time. Whilst targeting behaviour is seen by many authors as implying optimising behaviour, interviewee number 11 is more explicit as they see the overall objective in their financing decision in terms of “trying to get an optimum weighted average cost of capital” as pointed out by interviewee number 11. Interestingly, whilst tax is the driver of the capital structure relevance debate in the existing literature, tax was not expressly mentioned in this context by any of the interviewees.

#### **4.3 Issues related to valuation**

Table 1 reveals how finance directors who maintain a target actually measure gearing. Contrary to the classical economic view of gearing that all financing claims should be measured in market value terms, only a small minority based their target on market values (9.3%) or even a mix of the market value of equity and the book value of debt (7.8%). Instead, book values for each component constitute the most popular measure (46.6% of firms). The remaining firms did

not indicate how they calculate the target. Evidently, then, finance managers typically draw upon readily available book value measures when computing their target gearing, perhaps due to the relative variability of market-value measures through time and the relative ease of obtaining book value accounting measures. However, a number of finance managers interviewed illustrate the shortcomings of book value based gearing measures and financial reporting constraints more generally. The write-off for research and development clearly leads to an understatement of balance sheet values. Indeed, interviewee number 3 states that “we are now writing off on the balance sheet what is spent on R&D as we go along. And that’s a curious situation in that the R&D is contributing to the market value”. Other interviewees see financial reporting constraints as effectively undermining the usefulness of the gearing measure to the extent that targeting was an irrelevant concept. In particular, the issue of brand values and goodwill are highlighted. Interviewee number 16 pointed out that “we do not have a target gearing ratio because the brand is not recognised on our balance sheet and the value of the company is the name of the brand”. Interviewee number 25 stated that “we don’t regard gearing as important. If we’re, as we’re doing, acquiring typically about 75% of the purchase price of the types of the business we’re interested in would be goodwill. Accounting goodwill, that is. And so, you know, certainly until the accounting standard changed, we were continually writing off, you know, pretty large amounts of purchase price to reserves, which really sort of makes a bit of a farce of gearing as a measure certainly of financial risk.” Evidently, then, there are a wide variety of target gearing measures employed by firms, and the targeting decision is driven at least in part by financial reporting constraints rather than the wider drivers of gearing.

#### **4.4 The impact of the external environment**

The external environment can exert an important impact on the gearing decision of the firm and its target gearing decision. The results of the survey, the econometric models and the interviews illustrate the impact of the macro

economy, capital market conditions, industry norms, and institutional constraints, on firm gearing.

The macroeconomic environment can influence the firm's gearing decision through a number of mechanisms. Firstly, rising interest rates can make new debt a less attractive option at the margin, as is the case for existing debt with variable rates. Interviewee number 6 illustrates this mechanism arguing that "if interest rates are much higher, we would probably feel more comfortable with a lower gearing ratio". Secondly, for those firms raising debt finance on international markets, the risk of currency movements has an important impact on desired gearing. This point was also supported by interviewee number 14. Both transactions and economic currency risk can bear upon the gearing mix in this scenario. Thirdly, the business cycle gives rise to effects which are transmitted through various supply-side and demand-side variables, such as interest rates and aggregate consumption (or investment) expenditure respectively, simultaneously impacting upon corporate gearing. Interviewee number 22 expressed well such competing influences, stating that "we tend to look at things like the ability to service the debt, volatility of interest rates, the seasonality or cycles within our business".

Capital market conditions can, in a similar way, affect the firm's gearing decision. Interviewee number 4 argues that their target gearing would change "if interest rates moved substantially (and one would) take a different view". Interviewee number 15 illustrates how changing capital market conditions may actually be of advantage to the firm, stating that "if capital market conditions are right, we would go to the market on an opportunistic basis".

Much of the early literature focuses on the impact of industry norms on corporate gearing. However, in the survey, only 19.2% of firms that have a target gearing ratio chose that ratio based on an industry norm. The logistic regression model shown in Table 4 includes an industry norm dummy whereby sample firms are

divided into service and manufacturing sectors. However, the industry dummy is insignificant, even at the 10% level. Further, the chi-square significance probability is 18.2%, exceeding the 5% critical level of significance. However, in the interviews, interviewee number 15 states that “we determine the level of the target to be well within our peer group in the UK and US. It is a range, not a target”. Therefore, in both the survey and the interview analyses, industry norms are not generally considered an important influence, though there is some suggestion that a target range rather than a specific target norm may be a consideration for some firms.

Institutional constraints on corporate gearing include the opinions of investment analysts/investors and credit rating agencies, as well as the more direct impact of bank covenant restrictions. Interviewee 22 argues that “it is one of those things which you tend to look at in a rather judgemental way, and say, well, the market doesn’t like companies to be too highly geared, and therefore you’ve got to be constrained in a way, by what the market is likely to think regardless of whether actually, from a corporate finance point of view, that actually always makes sense, because it doesn’t necessarily”. Firms are often very focused on maintaining hard-earned credit ratings when contemplating changes in gearing. Indeed, interviewee number 17 highlights “our strategic desire to have a triple A credit rating. We want the lowest possible financial risk because we believe that the operating risk and the underlying commodity risk in the industry are high enough”. Finally, most firms are subject to the constraints of existing debt covenants, as interviewee number 8 explains: “what we have now is a set of covenants that we’re working with the bank on. We’re negotiating revised covenants in fact, but they are in reality covenants which have been determined from the bank and they range from comparison of the interest to the profit and comparison of senior service cover ratio, which is the cash generated compared to the cash which is utilised to service the debt to net worth of the business and the value of our debtors. The last two are a little dubious in my opinion but the

first two I think are probably relevant to being comfortable that we are in a position to service the debt and to continue the service in the future”.

The institutional environment therefore exerts an important impact on the firm’s gearing, a result which is largely underplayed in the existing literature due to its focus on more readily measurable and statistically testable accounting-based internal factors. Firms are very often proactive rather than reactive to this environment, though necessarily operate within the boundaries of institutional constraints and expectations.

#### **4.5 The finance life-cycle**

The size of a firm and its current or potential growth, whether it has a cash deficit or is cash generative, and whether it is family controlled or has more dispersed ownership, can all impact upon a firm’s gearing. These influences are usefully discussed within the finance life-cycle framework.

The size of a firm and its growth rate can impact on a firm’s decision to target its gearing. However, Table 2 shows that firms which target and those which do not exhibit statistically insignificant differences in size (the natural logarithm of assets). Indeed there is no significant difference between the mean size of the targeting and non-targeting firms (12.8% probability), nor between their standard deviations (9.4% probability), nor between their medians (15.1% probability). Further, in the logistic regression model shown in Table 4, size is an insignificant driver of the targeting decision. We may safely reject hypothesis H4.

If we interpret the market to book ratio as a proxy for future growth opportunities, we can examine the impact of future growth on the decision whether to target or not. However, Table 2 shows that there is no statistical evidence that future growth opportunities drive the decision to target, as the mean market to book value ratios of targeting and non-targeting groups are very similar. The medians are not significantly different (14.3% probability) and the standard deviations are

not critically different (19.3% probability). In the logistic regression models shown in Table 4, the market to book value ratio is also insignificant, and therefore we can reject hypothesis H5.

At earlier stages in a firm's finance life-cycle, and in particular at the launch and growth stages, there is typically a cash deficit which requires external financing. Firms may only become highly cash generative and draw down external debt in the maturity phase of their life-cycle. However, firms in certain sectors, such as retailing for example, may be highly cash generative throughout the finance life-cycle. Interviewee number 23 illustrates the 'drawing-down' financing strategy well: "we are cash generative as a company. The sort of policy we have is that we are obviously aiming to reduce our borrowing to nil; that would be very nice". Debt is not always regarded as value-enhancing as certain firms, perhaps those with higher business risk, would like to see a target gearing ratio approaching zero percent.

Family controlled firms can set in place strategies for equity (and control) maintenance which are atypical of the conventional finance life-cycle strategy evident in listed companies with more dispersed ownership and other financial claims. Interviewee 24 reports that they do not use a target gearing ratio because "we're a family company and therefore there's not a great desire to increase the equity beyond which point they would lose control". Similarly, interviewee number 7 also focuses on the control characteristic of equity: "we don't have a target gearing ratio in the traditional sense of the word. We are a family controlled company and haven't issued any new equity since (date withheld by researchers for confidentiality reasons) apart from new share options of top executives. So debt has been something we've been focusing on for a long time. And since the family is risk averse, they are comfortable with a certain level of debt, perhaps lower than other companies might be. To them, equity is a lot more valuable than the price of our shares".

Evidently, then, the life-cycle model is of less importance to the gearing (and targeting) decision than the existing literature suggests. Of greater importance than size and growth opportunities is the desire to maintain control and equity value in family controlled firms, and the degree of cash generation in firms more generally.

#### **4.6 The impact of risk**

A firm's risk, whether systematic (external) or financial (internal), can impact upon its gearing decision, and indeed impact upon its decision whether or not to target. We can gauge systematic risk from the firm's beta, whereas financial risk can be measured fairly directly by means of the gearing ratio or gauged inversely by means of interest cover.

In terms of systematic risk, Table 3 shows that there is a moderate degree of correlation between beta and firm size, that is larger firms in the sample display greater levels of systematic risk, with a correlation coefficient of 48%. However, we observe from the analysis of variance tests in Table 2 that targeting firms and non-targeting firms have similar mean betas. Bartlett's test was used to see if the variances of the betas also differed, but there was no evidence of this. Since the equal variance assumption is implied in the ANOVA test, this does not invalidate the ANOVA findings. The median betas of the two groups were also not statistically different, as indicated by the significance probability of the Kruskal-Wallis test (19.1%) exceeding the 5% critical level. Interestingly, and contrary to expectations, firms which target actually exhibit lower rather than higher betas. In the logistic regression models reported in Table 4, beta is not a significant variable in the model. Therefore, hypothesis H2 is rejected as there is no evidence that firms with higher levels of systematic risk are more likely to set a target gearing ratio.

We might expect that firms with higher gearing levels would be more likely to target, cognisant of their higher financial risk and the need to monitor and/or

stabilise their gearing by means of targeting. We can see from Table 2 that whilst targeting firms do indeed have a higher mean level of gearing, there was not a statistically significant difference at the 5% level, since the ANOVA p-value was 11.7%. The equal variance assumption was confirmed by Bartlett's p-value (65.9%) exceeding 5%. However at the 5% level of significance, there was a critical difference between the median gearing levels with the Kruskal-Wallis p-value at only 2.9%. Hence there is mixed evidence considering mean and median tests that more highly geared firms are more likely to target. Table 4 reveals that gearing is not a statistically significant logistic regression model variable. Thus there is only weak evidence in support of hypothesis H2.

Interest cover is often employed as an inverse measure of financial risk (or conversely as a measure of financial safety) in the existing literature. We might expect firms with lower interest cover to be more likely to engage in targeting behaviour. Table 2 reveals that this is indeed the case as the mean interest cover for targeting firms (10.260) is considerably less than that for non-targeting firms (55.603). Although the ANOVA probability (0.7%) is highly significant, the equal variance assumption of the ANOVA test is violated, as indicated by Bartlett's test. It can be seen from Table 2 that the standard deviation of the non-targeting group far exceeds that of the targeting group. Thus more reliance should be placed upon the Kruskal-Wallis median test. This indeed is also highly significant (0.7%), and so there is evidence on the basis of the median, to support the hypothesis that firms with greater interest cover are less likely to set a target gearing ratio. Table 4 reveals that interest cover is a significant logistic regression model variable at the 5% level. The sign of the coefficient estimate suggests that firms with greater interest cover are less likely to target. In the interviews, interest cover proved to be an important driver of the firm's financing, and in particular a driver of its credit rating. Interviewee number 16 mentioned that "to maintain that strong high rating, we need to maintain a relatively conservative interest cover (between 5 and 8 times)". Thus, credit rating agencies give rise to constraints on interest cover which in turn constrain



financial gearing. In terms of targeting, interviewee number 13 in answering how the level of target gearing was determined stated: “we really arrived at it starting from our minimum interest cover target – we worked it out from that”. Thus, to a greater extent than the gearing ratio itself, interest cover can drive both the level of gearing and the decision to target. Firms with lower interest cover find it more necessary to target due to their increased financial risk, supporting hypothesis H3.

Whilst external/systematic risk is not an important driver of gearing or targeting behaviour, internal risk is an important driver. In particular, firms focus far more on income gearing than on capital gearing, highlighting the importance of income statement over balance sheet-orientated financial risk.

#### **4.7 Corporate strategy**

The corporate strategy of the firm will clearly be an important driver of all decisions within the firm, and in particular the firm’s gearing decision. The firm’s strategy drives its current and future profitability and thus profitability provides us with a measure of strategic success. Further, the risk profile of the firm’s business portfolio and thus investments, divestments and mergers are all linked to its financial policy.

We can see from Table 1 that 50.3% of firms that have a target gearing ratio base that target on “internal” factors. Thus, the external environment, including capital market conditions, is not the sole preoccupation of finance managers when setting the firm’s gearing. Focusing on profitability, a measure of strategic success, we might expect that firms with greater profitability (measured by return on capital employed) are less likely to set a target gearing ratio. Table 2 shows that this is indeed the case as the ANOVA probability of 2.81% is significant at the 5% level. For non-targeting firms, the mean return is 31.7%, whereas the mean return is 18.3% for targeting firms. The Kruskal-Wallis test has a probability value of 1.4% and so there is also a significant difference between the

medians at the 5% level. Table 4 confirms that profitability is a negative driver of target gearing in the reduced model, significant at the 8% level. Both the ANOVA test and logistic regression model support hypothesis H6, then, as firms with greater profitability are less likely to target. Thus claimholders are less worried about the risk of their claims as firms become more able to provide ample returns to all providers of long-term finance.

The interviews revealed a wealth of information on the impact of strategic drivers on the firm's gearing decision, focusing in particular on the risk profile of the firm's business portfolio. Interviewee number 22 indicated that the strategic considerations of the business and the economic environment impact upon a company's ability to service debt. Interviewee number 4 stated that "gearing is a function of, *inter alia*, the risk profile of our business portfolio" while interviewee number 17 mentioned that "the firm needs a gearing level which will allow you to continue with your investment programme". Major new capital investments will have an important impact on the firm's gearing target. Interviewee 12 stated that "it may well be revised, for example, if we wanted to do a major investment". Interviewee 17 emphasised the lengthy time span of highly significant investments and the need to be sure of the firm's financial position up to 7 years ahead. Finally, major structural changes such as corporate acquisitions and demergers can impact significantly upon the gearing policy of the firm. Interviewee number 1 said "they divested half of the shares in their company, bought and added a new company. The other half was sold off to a venture capitalist". Another structural change related to business portfolio risk, as pointed out by interviewee number 4: "if the risk of our portfolio was changing quite substantially, but we were investing more heavily into riskier areas of the business or in terms of geographies".

Corporate strategy impacts significantly, then, on the firm's gearing ratio and its decision whether or not to target. The aspect of corporate strategy most discussed by interviewees was the firm's portfolio of investment projects and how

target gearing changes as the investment portfolio evolves. Business profitability, a tangible gauge of strategic success in the short-term, is an important driver of the targeting decision as more profitable firms feel less compelled to set gearing targets (financing policy), focusing instead on the portfolio of projects (investment policy).

## **5. Triangulating the research results**

It is important to triangulate the main results for consistency between the different methodologies. However, care needs to be exercised because of the different perspectives being addressed at each phase. We will focus on five key issues: valuation, industry norms, interest cover, internal factors and the external environment. Let us first of all revisit valuation and the use of book or market values as targets. It was clearly established in phase I that book values are much more popular than both purely market measures and mixed measures. It is consistent to suggest, as in phase III, that inadequacies of financial reporting practices regarding brand valuations, goodwill on acquisitions and research and development expenditure were regarded as reasons for rejecting a target gearing ratio. Given that, for many firms, book values are adequate for target purposes, but for only some are inadequate, it is reasonable to expect that serious discrepancies as revealed in very high book to market values do not affect the majority of firms. Consequently, an insignificant market to book value in phase II is *post hoc* not surprising.

At the interview stage (phase III) peer group assessments were sometimes mentioned as a determinant of the gearing ratio. This is consistent with being amongst the 1 in 5 firms using an industry norm as the target (phase I). Given that for many firms there is a self-confessed lack of an industry based target (phase I), an insignificant industry dummy in the logistic regression analysis in phase II is consistent with phase I. Also at the interview stage (phase III), a minimum interest cover was frequently mentioned. This is supported by the

econometric analysis (phase II), as the likelihood of setting a target is strongly negatively correlated with interest cover.

There is an implied 50:50 split between the importance of internal and external factors in target gearing, for half the respondent firms (50.3%) base their targets on internal factors. By default, the other half might consider external factors when arriving at a target. As to internal factors, major capital investments and structural changes in the business, the latter comprising corporate acquisitions and demergers, were mentioned during the interviews (phase III) as the reasons for revising the target gearing ratio. Conversely, external considerations when setting a target included interest rates, currency risk, cyclicity and analysts' views. Furthermore in revising the target, market conditions such as substantial changes in interest rates and capital market opportunities were cited.

## **6. Conclusions**

We began with a discussion of the literature on capital structure. The two strongest theories focussed on: valuation within a trade-off framework, and a pecking-order hypothesis. This research has demonstrated that the role of taxation, so central to early trade-off theory, is not upheld by UK practice of target gearing. But this research has progressed much further than this, for a trade-off valuation model actually addresses the wrong question. It has been discovered that target gearing is not so much about capital stocks, although of some importance, but about income flows. It is not primarily managed in terms of valuation, despite its conceptual elegance. The key to target gearing is found in interest cover as a measure of financial safety in controlling income flows.

Having side-stepped trade-off theory at least in a valuation framework, what can we now say about pecking order as an alternative? The objectivity of the econometrics reveals that there is evidence, although weak, to suggest that greater profitability, the first in the pecking order, is associated with a lower likelihood to engage in targeting. This suggests minor support. More important

are not only the identified dynamic pressures, such as interest rate volatility, exchange rates and business cycles, that play upon companies forcing them to change their targets, but also the less dynamic financial reporting practices, particularly in relation to R&D and brands, that lead companies not to have a target in the first place. Such static and dynamic pressures are so strong that even the industry norm is not a key factor in target gearing.

Nevertheless, there remains an important role for the finance director, for there are many dynamic forces that need to be actively managed, and which so often can involve structural changes in the capital investment portfolio of the business, both internally and externally, the latter through corporate acquisitions and de-mergers, for example. It is *inter alia* the investment on the other side of the financial position statement, which can drive revisions in gearing-targets. This brings us, not quite full circle to the Modigliani-Miller (1958) business risk classification, but to a higher position in our hermeneutical spiral of target gearing. This designated position embraces the macro-economic environment, of volatile interest rates and exchange rates, and also key players, such as bank covenant partners, credit rating agencies, and analysts.

**Table 1: Questionnaire responses to target gearing (%)**

1.	Firms that have a target gearing ratio	61.7
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The following responses relate to those that do have a target gearing ratio:

2.	Firms that base the target gearing ratio on market values of debt and equity	9.3
3.	Firms that use book values of debt and equity	46.6
4.	Firms that use the market value of equity and the book value of debt	7.8
5.	Firms that keep the target fixed for longer than a year	44.0
6.	Firms that chose a target based on an industry norm	19.2
7.	Firms that base the target on internal factors	50.3

The table shows selected responses in percentage terms from 193 firms which responded to a survey undertaken by the authors in August 1997.

**Table 2: ANOVA tests according to whether a firm targets or not**

Dependent Variable	Mean (No Target)	Mean (Target)	Standard Deviation (No Target)	Standard Deviation (Target)	ANOVA P-Value	Bartlett's Test: P-Value	Kruskall-Wallis Test: P-Value
BETA	0.633	0.557	0.283	0.261	0.155	0.570	0.191
DDEMV	0.145	0.198	0.177	0.167	0.117	0.659	0.029*
ICOV	55.603	10.260	141.684	15.964	0.007**	0.000**	0.007**
LNASS	12.414	11.739	2.567	2.033	0.128	0.094	0.151
MTBV	9.875	9.497	41.217	49.830	0.968	0.193	0.143
ROCE	31.704	18.287	33.702	28.814	0.0281*	0.262	0.014*

Notes: \*\* = significant at 1 per cent level; \* = significant at 5 per cent level. The sample consists of data for 124 UK quoted firms drawn from Datastream. BETA is the standard Datastream beta coefficient and MTBV is the market to book value ratio, both of which are measured as at March 2000. The remaining measures relate to the financial year ending 1998: DDEMV is the debt-to-debt-plus-equity ratio; ICOV is interest cover defined as earnings before interest and taxation, depreciation and amortisation divided by interest expense; LNASS is the natural log of total assets employed; and ROCE is return on capital employed.

**Table 3: Bivariate Pearson correlation matrix of predictor variables**

	BETA	DDEMV	ICOV	LNASS	MTBV	ROCE
BETA	1.000	-	-	-	-	-
DDEMV	-0.098	1.000	-	-	-	-
ICOV	0.154	-0.261	1.000	-	-	-
LNASS	0.480	0.157	-0.021	-	-	-
MTBV	0.150	-0.179	-0.004	0.034	1.000	-
ROCE	0.146	-0.155	0.072	0.247	0.078	1.000

The sample consists of data for 124 UK quoted firms drawn from Datastream. BETA is the standard Datastream beta coefficient and MTBV is the market to book value ratio, both of which are measured as at March 2000. The remaining measures relate to the financial year ending 1998: DDEMV is the debt-to-debt-plus-equity ratio; ICOV is interest cover defined as earnings before interest and taxation, depreciation and amortisation divided by interest expense; LNASS is the natural log of total assets employed; and ROCE is return on capital employed.



**Table 4: Logistic regression on target gearing**

<b>Variable</b>	<b>Regression Co-efficient</b>	<b>Standard Error</b>	<b>Wald Statistic</b>	<b>Significance Probability</b>
<b>Full Model</b>				
Constant	2.827	1.376	4.219	0.040
DDEMVB	0.292	1.561	0.035	0.852
BETA	-0.336	0.977	0.119	0.731
MTBV	0.0015	0.004	0.118	0.732
LNASS	-0.130	0.122	1.133	0.287
INDUSTRY	0.429	0.454	0.894	0.344
ROCE	-0.0102	0.007	1.873	0.171
ICOV	-0.0213	0.011	3.805	0.051
Chi-square of regression Deviance (7d.f)	-	-	-	0.017
<b>Reduced Model</b>				
Constant	1.382	0.320	18.623	0.000
ROCE	-0.013	0.008	3.066	0.080
ICOV	-0.019	0.010	3.828	0.050
Chi-square of Regression Deviance (2d.f.)	-	-	-	0.001

The sample consists of data for 124 UK quoted firms drawn from Datastream. The dependent variable TARGET took a value of '1' where the firm stated that they were engaged in target gearing in the survey in August 1997 and '0' where the firm stated that they did not engage in such targeting activities. The independent variables are BETA, MTBV, DDEMVB, ICOV, LNASS, INDUSTRY, and ROCE. BETA is the standard Datastream beta coefficient and MTBV is the market to book value ratio, both of which are measured as at March 2000. The remaining measures relate to the financial year ending 1998: DDEMVB is the debt-to-debt-plus-equity ratio; ICOV is interest cover defined as earnings before interest and taxation, depreciation and amortisation divided by interest expense; LNASS is the natural log of total assets employed; and ROCE is return on capital employed.

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