PRACTITIONERS’ PERSPECTIVES ON THE UK COST OF CAPITAL

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Abstract

The aims of this paper are to determine how UK finance practitioners derive and review the cost of capital, and to ascertain whether the final figure varies with the choice of method. To investigate behaviour in the real world a survey questionnaire was employed, eliciting responses from the finance directors of 193 UK quoted firms. The results suggest that the cost of capital calculation is subject to wide variation across firms, both with regard to the overall figure and the precise computation of its components. The intuitive appeal of the WACC and CAPM approaches appears to ensure their continued popularity in the real world. However, firms tend not to make all of the adjustments to the overall figure which academics might expect, only making simple adjustments for risk and the tax advantage to debt. The after-tax money cost of capital which is approximately 10 per cent, is influenced by the choice of method, and firms do not appear to revise their overall cost figure rapidly in response to the environment. The cost of capital decision is of such strategic importance for the longer-term maintenance and expansion of firm value that it is nearly always made within the domain of the board of directors.

Keywords: cost of capital; CAPM; WACC; dividends; earnings
Practitioners’ Perspectives on the UK Cost of Capital

1. Introduction

The aims of this paper are to determine how UK finance practitioners derive and review the cost of capital, and to ascertain whether the final figure varies with the choice of method. The objectives in pursuit of these aims are to determine: how the base cost of capital is computed; the extent to which the figure varies across the organisation or across projects; the frequency and causes of revision; the level within the organisation at which the decision is made; the influence of taxation upon the cost of capital figure; and the impact of the cost of capital computation method on the final figure.

The cost of capital is a crucial issue for the firm as it provides the discount rate in the evaluation of capital investment projects. Additionally, minimisation of the cost of capital may be regarded as a critical pursuit in the choice of capital structure to finance such projects. Furthermore, the derivation of the cost of capital figure is of strategic importance in assessing the net benefits from corporate restructuring.

The measurement of the cost of capital, however, forms the basis for debate amongst practitioners and academics. Given fluctuations in share prices, the weighted average cost of capital based on market values can change daily. Yet, the evaluation of capital expenditure proposals can be a lengthy and complex process. More frequent revisions of the cost of capital would seem necessary to ensure that the firm is responsive to the economic environment as reflected by share prices and changes in interest rates. Book values may be more objective yet less sensitive to economic reality than market values.
The cost of capital should incorporate the risk premium. This is an explicit component of the computation when using the capital asset pricing model. Small variations in the estimate for the risk premium may give rise to bias in the overall cost of capital. Although, for quoted firms, objective beta estimates are readily available from sources such as Datastream, views on the size of the risk premium, for the market as a whole, vary widely in the academic literature. The problem is indirectly avoided by using dividends or earnings-based models of the cost of equity.

The paper commences by reviewing the cost of capital literature.

2. Review of Literature

A number of authors have engaged in research to survey capital budgeting practice in the UK (McIntyre and Coulthurst, 1985; Mills and Herbert, 1987, as cited by Al-Ali and Arkwright, 2000; Pike, 1996; Arnold and Hatzopoulos, 2000), as well as in the US and Canada (Graham and Harvey, 2001). However, few authors have engaged in applied studies of the way in which the cost of capital employed as the discount rate in capital budgeting is itself determined. The following review examines the existing literature concerning the method used to calculate the overall cost of capital, as well as that concerning the calculation of the cost of the individual equity and debt components.
**Calculation of the overall cost of capital**

Since most firms are financed by a mix of equity and debt, the appropriate method for calculating the overall cost of capital is based upon a weighted average of the cost of those components. Following the famous papers by Modigliani and Miller (1958, 1963) and Miller (1977), there has been some debate concerning the role of taxation in obtaining an optimal capital structure that minimises the weighted average cost of capital (WACC). Some authors have suggested that under the UK imputation tax system the net advantage to debt may be close to zero (Ashton, 1989) or even occasionally negative, either due to the presence of differential borrowing and lending rates (Dempsey, 1991) or the presence of tax losses (Pointon, 1997). There is a need to discover whether practitioners make adjustments to the overall cost of capital for tax effects.

The WACC here is simply calculated by determining the cost of each source of finance employed by the firm and then calculating a weighted average of these costs where the weight is generally the market value of each source.

There have been a number of survey-based studies examining the use of the WACC in arriving at the overall cost of capital. Hodgkinson (1989) found that 36 per cent of her sample of large listed UK firms used the WACC as the discount rate. Arnold and Hatzopoulos (2000) studied a sample of 96 UK firms and found that 54 per cent of those firms used the WACC to arrive at a cost of capital. There are various estimates of the overall cost of capital for UK firms. Al-Ali and Arkwright (2000) found the WACC for their sample of UK firms to have a mean of just over 11 per cent. This
compares with the study by Gregory, Rutterford and Zaman (1999) of a small sample of UK firms who determined a nominal WACC approaching 12 per cent.

**Calculation of the cost of equity capital**

There are three generally accepted methods of calculating the cost of equity capital: dividend growth models, earnings models and the Capital Asset Pricing Model (and its variants such as the Arbitrage Pricing Model). For the further discussion of the latter see Goldenberg and Robin (1991).

Regarding dividends, Gordon (1962) established that the rate of growth in future dividends is an appropriate means of determining the cost of equity capital. He derived his well-known formula for the cost of equity capital as the sum of the dividend yield (based on the year-ahead dividend) plus the constant compound growth rate of dividends. This derivation was previously recognised by Williams (1938). Ashton (1995) further refined the dividend growth model to deal with inconsistencies in growth rates for dividends, earnings and assets. Barker (1999) found in his questionnaire survey of 42 UK analysts, that the dividend yield tends to be used in the financials and utilities sector. However, in the US and Canada Graham and Harvey (2001) found that few firms used the dividend discount model to estimate their cost of equity.

An earnings model can be employed to estimate the cost of equity capital by taking the inverse of the price-earnings ratio. However, care needs to be exercised to avoid double counting, for example, where earnings are generated from retentions and also
when dealing with exceptional and extraordinary events affecting earnings per share. Lamont (1998) found that US earnings yields are less successful than dividend yields in forecasting future returns, particularly if dividend forecasts are high. Barker (1999) found that UK analysts preferred an earnings model to the dividend yield in the services, industrials and consumer goods sectors of the UK stock market.

Sharpe (1964) established a well-known model for determining the cost of equity capital, based on various assumptions, including that equity holders are well diversified and are, therefore, only concerned with the systematic aspect of investment risk. The measure of systematic risk is beta which is particular to individual investments. The Capital Asset Pricing Model (CAPM) holds that risky investments are expected to yield a risk-free minimum return to which is added a risk premium, based on an equity risk premium multiplied by beta. Fama and French (1992,1993,1995a, 1995b, 1996) demonstrate that the beta is an inadequate determinant of average return, whereas size (market capitalisation) and the ratio of the book to market value of equity are key determinants. However, Dimson and Marsh (1999) suggest a reversal in the UK small-firm anomaly of superior returns, whereas Ashton and Tippett (2000) demonstrate that the anomaly never existed but was a mis-measurement error from the spurious use of arithmetic means.

In terms of the equity risk premium, which is a critical component of the CAPM expression, historical empirical evidence suggests a high US premium over short-term government securities of around 8.8 per cent from 1926 to 1997 (Siegel, 1998; and Buckley, 1999). Similarly, there has been a high UK premium of around 8.7 per cent
gross (8.1 per cent net of tax) over the Treasury bill rate from 1919 to 1980 (Dimson and Marsh, 1982). However, Brealey and Myers (1999) believe the market risk premium in the US to be in the range of 6 to 8.5 per cent. There are objections that could be raised regarding these premia. Firstly, long data series often exhibit survivorship bias leading to overstated risk premia (Brown, Goetzmann and Ross, 1995; Freeman and Davidson, 1999). Secondly, long-horizon common stock returns exhibit negative autocorrelation creating an upward bias in the estimate of the risk premium (Indro and Lee, 1997). Thirdly, high stock market volatility is associated with a higher risk premium yet volatilities (in the US) have been much reduced since 1938 (Mayfield, 1999). These factors suggest a reduced equity risk premium (see also Buckley, 1999). Given strong recommendations for historical risk premia of the order of 8 per cent in the academic literature, excepting very recent research in this area refuting such a high premium (as indicated above), this would suggest that practitioners using the CAPM or its variants are likely to overestimate the cost of capital compared with a dividend-based or earnings-based model.

Empirical evidence suggests widespread use of the CAPM by practitioners. Gregory, Rutterford and Zaman (1999) found, in interviews with 18 finance specialists of large UK firms, that the majority of their sample firms used the CAPM. Arnold and Hatzopoulos (2000) found that, of a sample of UK firms employing the WACC to determine their overall cost of capital, 70 per cent used the CAPM to arrive at the cost of equity capital. Al-Ali and Arkwright (2000) found that 85 per cent of their UK sample firms used the CAPM. As to the US, Graham and Harvey (2001) report that
73.5 per cent always or almost always use the CAPM, and cite Bruner et al (1998) who found that 85 per cent of 27 best-practice firms use the CAPM or a modified version.

**Calculation of the cost of debt capital**

Calculation of the cost of debt capital proves more problematic than for equity capital because the contractual interest rate on debt may differ from the return on that debt when default is probable but difficult to quantify (Weston, 1994). The seminal Modigliani and Miller literature, discussed earlier, proposes that any tax benefits associated with such debt should be taken into account in the calculation of the cost of debt. The finance manager should decide whether or not to include the cost of short-term debt in the calculation of the cost of debt (and the WACC), which may present problems when classifying the various components of the firm’s debt structure. Further, there exist some important timing problems when arriving at a cost of debt figure, as we could either use the historical cost of debt or base our figure on cost of debt expectations (Weston, 1991).

In terms of evidence on the cost of debt capital, Al-Ali and Arkwright (2000) found in their survey of UK firms that: 34 per cent of firms included the short-term cost of debt in their calculation; 43 per cent of firms used the rate paid on current long-term debt whilst 52 per cent used the rate applying to new long-term debt; and 79 per cent of firms used the after-tax cost of debt in their calculation of the cost of debt capital. Hodgkinson (1989) found divergences from established theory in the area of tax, with firms, for example, using an inappropriate rate of tax to deduce the cost of debt, ignoring advance corporation tax time lags and differences between statutory marginal
tax rates. Further, Morgan (1992), in her postal survey of large UK listed firms, found that 42 per cent of such firms assessed investment projects without reference to the effect of tax.

In sum, it is clear that the calculation of the cost of capital figure to be used in capital budgeting is somewhat contentious. Whilst the use of a WACC figure would appear intuitive, the calculation and weighting of its constituents provides for both theoretical debate and potentially wide variation in practice.

3. **Methodology**

To determine the precise techniques employed by practitioners to arrive at the cost of capital, a survey questionnaire was felt to be the most appropriate method. Such an approach can be employed to elicit responses to both closed and open-ended questions, thereby facilitating both positivistic and phenomenological enquiry (Hussey and Hussey, 1997).

The finance directors of 1,292 firms were surveyed by questionnaire in the summer of 1997, with firms selected on the basis of being listed on the UK Stock Exchange, and being firms for which accounting data was available on the Datastream financial database. The survey resulted in 193 useable responses, with the majority of firms not responding, probably due to the frequency with which firms are sent survey requests for information. Many companies replied that it was not their policy to respond to questionnaires. Finance directors did not respond for a range of reasons including that: they felt the questionnaire not to be applicable given their circumstances; they felt that
their business was relatively unsophisticated in investment decision-making; or for practical reasons unrelated to financial matters. Although it is uncertain how non-respondent firms address cost of capital issues, the present sample includes a wide cross-section of industrial sectors and some of the results can be compared with Al-Ali and Arkwright’s (2000) smaller sample of 73 companies.

4. Results of the questionnaire survey

The results of the survey questionnaire provide some important insights into practitioner computation of the overall cost of capital, as well as the computation of its equity and debt components. The results also reveal some interesting patterns in the revision of the cost of capital figure and confirm the level of seniority of that decision.

Computing the overall cost of capital

Table 1 shows survey responses regarding the calculation of the overall cost of capital. The Table shows that the majority (53.4 per cent) of firms use the weighted average cost of capital as the discount rate in project appraisal. This is an appropriate measure as most firms finance investment using both debt and equity finance, weighting the cost of each component to arrive at an overall figure. The next most popular measure (27.5 per cent of firms) is a long-term borrowing rate, which is perhaps surprising as this would appear inappropriate as a discount rate since it ignores the rate of return required by shareholders, although it may be a crude proxy for a project of lower than average risk. Finally, the least popular measure used as a discount rate was the equity cost of capital, a measure used by only 11.4 per cent of firms. This would appear
appropriate for firms financed solely by equity and investing in projects with risk characteristics which are representative of the firm as a whole.

Where firms used the WACC, some respondents provided a narrative measure to explain its use in more detail. With regard to risk adjustment, five companies mentioned that they use a WACC plus a risk factor, including one which mentioned that the WACC is adjusted for country risk differentials from the group average. In relation to the question of rates applied to new/upgrade projects, one company offered that:

“The weighted average cost of capital is used for new projects, but where expenditure relates to existing projects which are being replaced/upgraded, we require/use a discount rate equivalent to that currently earned if higher than the weighted average cost of capital.”

Such an approach would clearly appear appropriate, by reflecting opportunity costs of existing projects, when the firm is already furnished with detail on actual project returns.

Where firms used some measure as the discount rate which did not readily match the categories specified above, many provided some narrative to explain their techniques. Firms admitted to: employing simple payback periods, particularly for small projects; setting a higher-than-WACC arbitrary hurdle rate; setting a rate which “reflects project risk, bearing in mind the market, product, technology, etc.”; using an internal rate of return and then comparing to the WACC for larger projects or the borrowing rate for smaller ones; and to employing an “internally set” rate.
The variation in overall cost of capital computation is thus very marked, often reflecting practical considerations and firm-specific factors rather than a purist theoretical discount rate which reflects the economic cost of capital.

Graham and Harvey (2001), in their sample of US and Canadian firms, found that most practitioners used a single company-wide discount rate to evaluate a project. Our sample firms were similarly asked whether they adjusted the overall cost of capital for variations in the type of project under consideration. Respondent firms indicated that 22.3 per cent adjusted for the size of the project, 17.6 per cent for the division/department responsible, and 13.5 per cent for the cost of non-economic projects. The responses were surprisingly low as, given the stochastic nature of project returns, large projects can have a more extreme impact on a company than a group of small projects that are less than perfectly correlated, and firms would be expected to reflect this in their cost of capital adjustments. Clearly different divisions within the firm will produce different services/products with inherent differences in project risk, though this was reflected in the overall cost of capital by only a small number of firms. Most firms should be characterised by a number of smaller, but significant, projects not assessed under economic considerations (such as human resource or public relations functions), though the results above suggest that these tend not to be adjusted for in computing the overall cost of capital.

In terms of reflecting risk in the computation of the overall cost of capital, where equity betas are used a different beta is used for each project in only 10 per cent of
firms and a weighted average of equity and debt betas is taken in only 12.4 per cent of cases. With regard to the latter, the vast majority of firms (75 per cent) who take a weighted average of betas assume a debt beta of zero.

The respondent firms provided an interesting insight into the impact of tax on the overall cost of capital. Since interest on borrowing is a tax-deductible expense and dividend payments used to give rise to timing differences on advance corporation tax payments and setoffs, tax should have been relevant to the discount rate. It was discovered that 67.4 per cent of firms take tax into account in deducing the cost of capital. However, although 25.9 per cent of companies experience temporary tax losses, these include only 6.2 per cent that rework the cost of capital because of the losses. Similarly, although 27.5 per cent of firms experience surplus ACT, only 8.8 per cent rework the cost of capital accordingly. In theory even for large companies the taxable income can be reduced, because of capital allowances or other features, to a level that lies between the marginal relief bands for corporation tax purposes leading to a different marginal tax rate. In practice only 5.7 per cent of respondents fell within this category, including 3.1 per cent that did, appropriately, rework the cost of capital on account of this situation.

Determination of an appropriate overall cost of capital figure for UK quoted firms was a key stated objective of the survey. Firms were asked to indicate the after-tax money cost of capital within pre-specified ranges, as it was felt that asking them the actual figure directly would illicit a poor response due to the sensitive/strategic nature of such a figure. The median after-tax money cost of capital was over 10 per cent. Indeed, 6.7
per cent of firms had a cost of capital within the range of 0.1 to 5 per cent, 42.0 per cent within the range 5.1 to 10 per cent, 46.6 per cent within the range 10.1 to 15 per cent, with the remaining 3.6 per cent with a cost of 15.1 per cent or higher. However, using a simple chi-square contingency test at the 5 per cent level, the number of companies that indicated an overall cost of capital up to 10 per cent was not significantly different from the number that indicate a higher cost of capital. Thus, an estimate of 10 per cent appears reasonable for the after-tax money cost of capital of UK quoted firms.

This estimate for the overall cost of capital can be further employed to estimate an equity risk premium for UK quoted firms, ultimately implying a perceived premium of approximately 5.75 per cent. Taking an estimate of the risk free rate in 1997 to be around 6 per cent, then an equity risk premium of 5.75 per cent would suggest an equity cost of capital of 11.33 per cent. With a cost of corporate debt of around 7 per cent and a corporate tax rate of 33 per cent, the after tax cost of debt would be 4.69 per cent. Tucker (1994) estimated the debt to debt-plus-equity ratio to be 20 per cent for the UK, and thus the WACC should be 11.33% (0.8) + 4.69% (0.2) = 10 per cent. This estimate is slightly in excess of that suggested in a review article in the *European Journal of Finance* (Buckley, 1999), where it was argued on the basis of evidence of mean-reverting prices that the equity risk premium is between three and five per cent. However, it is fairly consistent with the Al-Ali and Arkwright (2000) survey figure of a 5 per cent average risk premium used by UK firms, although their sample was much smaller and they reported wide variations.
The impact of the industry to which a firm belongs on its cost of capital can usefully be determined from the survey responses. Table 2 details the cost of capital responses of 155 respondent firms in Datastream Global Index Level 3 groups. A chi-square test was undertaken for the larger groups (consumer goods, general industrials and services) to determine whether the cost of capital varied significantly across industries. The ranges were aggregated so that cost of capital responses were categorised into the ranges 0.1 to 10 per cent and 10.1 per cent and above, to improve the statistical validity of the test. However, the industry effect was found to be insignificant at the 5 per cent level.

There are a number of computation method biases which can be tested for in the responses. Firstly, firms using book values of equity in the cost of equity calculations (when, for example, calculating the earnings yield) will tend to overestimate the cost of equity capital as such book values tend to provide conservative estimates of equity value. The survey shows that the higher overall cost of capital firms were indeed more likely to use a book value equity figure in a chi-square test at the 5 per cent level of significance. Conversely, firms using a long-term borrowing rate would tend to underestimate the overall cost of capital since such a figure ignores any equity premium for financial and business risk. A chi-square test reveals that higher overall cost of capital firms were less likely to use a long-term borrowing rate as the discount rate and were more likely to use the WACC, significant at the 1 per cent level. Firms with a higher marginal tax rate, particularly those with a taxable income which lies between the marginal relief bands, should be less likely to have a higher after-tax cost
of capital, an expectation which is confirmed from the survey at the 5 per cent level of significance.

Computing the cost of equity capital

Table 3 presents firm responses regarding the computation of the cost of equity capital. Firms were asked which of the following three main approaches they employed: a dividend-based model, with or without a growth factor; an earnings yield perhaps based on the inverse of the price-earnings ratio, with or without adjustments for depreciation and working capital; or a CAPM-based approach.

The most popular approach is the CAPM, with 47.2 per cent of all firms using equity betas to compute the cost of capital. Indeed, at the 5 per cent level of significance this represents the majority of firms. Of those firms that used the WACC, 69 per cent apply the CAPM in the determination of the cost of equity capital. Indeed, there is a significant association between the use of the WACC and the use of the CAPM at the 1 per cent level on the basis of Pearson’s Chi-square contingency test.

The next most popular approach to calculating the cost of equity capital is to use a dividend yield, with 27.5 per cent of respondent firms indicating this choice of approach. Of these firms, 75.3 per cent include a growth factor, and of these firms in turn, 72.5 per cent use a past trend to estimate the growth factor. However, as a proportion of those firms that use the WACC, only 33 per cent employ a dividend-based model, with or without growth. The relationship between the use of the WACC
and the use of a dividend-based model is not significant at the 5 per cent level on the basis of Pearson’s Chi-square contingency test.

Narrative explanations provide some further insights into the determination of the dividend growth factor in the dividend yield computation. Of firms who stated that their growth factor was based on expectations, six firms said that these were based on future prospects or outlook; five firms said that these were based on market expectations; four firms said that these were based on future policy, strategic plans or internal projection; and two firms stated that such expectations were based upon stated corporate aims or aspirations.

Where respondents indicated that the growth factor was determined by influences other than expectations, one firm indicated that the growth factor was equal to inflation; another that it was based on a past trend but compared with earnings yield to arrive at a rate; and another firm indicated that although the dividend yield plus a growth factor was not used to calculate the cost of equity, it was used as a “kind of check” on the result.

Marginally the least popular approach is to use an earnings yield to calculate the cost of equity, with 26.9 per cent of firms indicating use of this approach. Of the firms employing an earnings yield approach, however, only a minority make the expected adjustments to produce a discount rate more compatible with a cash flow approach, with 30.9 per cent adjusting earnings for depreciation and 29.0 per cent adjusting for working capital. Clearly, if project returns are to be assessed in terms of cash flow, the
adjusted earnings should be evaluated as a return on the economic value of equity, rather than the book value. Interestingly, however, 5.2 per cent of firms use the book value of share capital in the calculation of the cost of equity and a further 26.4 per cent use the book value of share capital plus reserves. By contrast, 18.1 per cent use a long-term predicted share price whilst twenty-three executives who offered a narrative explanation of their approach to calculating the cost of equity mentioned market values/capitalisation.

It is instructive to test for relationships between the choice of equity computation method used and the overall cost of capital figure. In Table 4 it is shown that higher cost of capital firms are more likely to use CAPM in computing the cost of equity component (significant at the 1 per cent level), and less likely to use a dividend model (significant at the 5 per cent level), although the earnings model was not significant. These differences could be due to underestimates in dividend growth rates or overestimates in the size of the equity risk premium.

**Computing the cost of debt capital**

Table 1 revealed that tax was taken into account in deducing the cost of capital in the majority of firms. Table 3 shows that in deducing the cost of debt, market values and book values tend to be equally as popular, representing 40.9 per cent and 39.9 per cent of firms respectively. A small number of firms gave further narrative insight into how they arrive at their debt cost of capital where this was employed as the discount rate in project appraisal. Two firms stated that they used a long-term borrowing rate, with one firm stating that they adjusted this rate for risk/uncertainty and an “industrial reward
premium.” Further, another firm indicated that they used a hurdle rate greater than the borrowing rate, partly dependent on uncertainty. Interestingly, one firm stated that:

“There is a lot of borrowing to equity and it varies a lot over time. As equity is cheaper at 4 per cent, we tend to use the debt cost plus a risk adjustment.”

Finally, one loss-making firm suggested that their WACC was difficult to assess as a result of their current profitability status, though they tended to use a long-term borrowing rate and a high equity rate to reflect market expectations of their shares. So, it has been noted that some firms which employ a cost of debt capital as their discount rate tend to make risk adjustments to a long-term borrowing rate, and that the majority of firms take tax into account in arriving at their final discount rate.

*The assessment and reassessment of the cost of capital*

Table 5 presents the survey responses regarding the frequency of reassessment of the overall cost of capital figure. The volatile nature of the external financial environment should lead to the finance director or board reviewing the cost of capital on a periodic and potentially frequent basis. The majority of respondent firms (53.9 per cent) reviewed the cost of capital only annually, 2.6 per cent bi-annually, 18.1 per cent quarterly, and 4.7 per cent monthly. Thus, relatively few firms reassess the cost of capital frequently, probably reflecting the fact that the assessment and reassessment of the cost of capital figure is a decision of strategic importance to the firm, used to maintain long-term project profitability, and not a decision to be taken lightly. In terms of other responses on the frequency of revision, 6.2 per cent of firms adjust the overall cost of capital on a project-by-project basis, whilst 3.1 per cent adjust this figure when long-term interest rates change. It is perhaps surprising that long-term interest rate
changes are not a more important driver of overall cost of capital changes. Evidence on
the revision of the cost of debt figure also presented in the Table, broadly confirms this
pattern of less frequent revision.

Narrative explanations further illustrate the revision process within the firm. Nine
firms specifically mentioned that the cost of debt is reassessed when interest rates
changed, with one firm stating that revision only occurred after significant *cumulative*
changes. A common narrative response, mentioned by seven firms, was that the cost of
capital was reassessed when *major* projects are evaluated, with one firm stating that
reassessment would occur only when considering major *international* projects. On the
subject of major investments, two firms suggested that the cost of capital tended to be
reassessed specifically prior to an acquisition. Three further firms also recorded that
revision resulted from corporate restructuring, though as a result of capital structure
rather than asset structure changes. Finally, six firms suggested narrative explanations
that they reassessed the cost of capital less frequently than annually, including one firm
which admitted to *never* reassessing this figure!

Clearly, the rate of return on capital investment is of strategic importance to the firm. If
the rate is too high then valuable opportunities can be missed and if it is too low then
the firm can offer only inferior returns to investors compared with its competitors. The
pivotal role of the hurdle rate to the finance function should place its determination
with the board of directors of the firm. Indeed, 62.2 per cent of firms stated that the
hurdle rate to be adopted was a board level decision. However, there were some
interesting narrative responses where the decision was not made by the board of
directors. Firstly, some respondents stated that the board only sometimes set the hurdle rate. More specifically, two firms indicated that the board is notified of the rate when a project is put forward for approval; one firm described a threshold project level of £20,000, above which the decision was made by the board; and a further firm suggested that “larger” projects were made by the main board rather than the local management board. Secondly, many respondents stated that the hurdle rate was set by the finance director or executive members specifically: ten firms stated that the finance director/group finance made the decision; five stated that the decision was made by executive members; and two firms stated that the decision was made by the finance director plus the chief executive officer. Interestingly, one firm mentioned that the board was informed of WACC calculations whilst senior executives set the hurdle rate. Thirdly, some firms suggested that the hurdle rate is actually set through wider consultation, with one firm stating that the management board take the decision in consultation with the chief executive and finance director, whilst another firm indicated that the rate was discussed by the finance director and the managing director/chairman before being proposed to the board. One firm indicated even wider consultation, stating that their investment bankers externally benchmarked the hurdle rate.

Summary and conclusions

This paper has produced a number of important innovations and contributions to the field of cost of capital computation with particular reference to the behaviour of UK corporate practitioners. With regard to the computation of the overall cost of capital, there appear to exist varied approaches to the detail of the computation, but the WACC
is the dominant approach, consistent with finance theory. The small minority of firms make the adjustments to the WACC suggested by theory, such as project-specific cost of capital figures, divisional or non-economic project adjustments, temporary tax loss or ACT adjustments. This suggests some departure of theory from practice, with such adjustments perhaps being considered as ‘splitting hairs’ by practitioners. However, tax does indeed matter as most firms adjust the overall cost of capital for tax. The UK after-tax cost of capital is approximately 10 per cent, consistent with the more recent UK surveys, and providing further evidence of a gradual reduction in the equity risk premium over the last couple of decades. It is somewhat surprising that there is little evidence of an industry effect on the overall cost of capital, suggesting that business risk has little effect on this figure, though it is important to note that the study only examines the largest quoted companies in the UK. Various bias effects on the overall cost of capital figure are apparent, one of which is the tendency of firms using book value equity to overestimate the overall cost of capital.

With regard to the computation of the equity and debt components, the most popular technique for calculating the equity cost of capital is the CAPM, followed almost equally by the dividend yield (sometimes including an expectations-based growth factor), and earnings yield approaches (with only a minority of firms making adjustments to the latter consistent with a cash-flow approach). Book and market value measures are equally popular when calculating the cost of debt, with firms tending to employ an after-tax long-term borrowing rate. The computation of the cost of equity figure, then, is clearly more contentious of the two components, and is open to wide variation in approaches across firms. The choice of method for calculating the
cost of equity component has a significant impact upon the overall cost of capital. Firms with a higher overall cost of capital are associated with using the CAPM rather than a dividend yield with or without a growth factor.

Review of the cost of capital figure is relatively infrequent, with most firms engaging in such an exercise annually. Some respondents revealed that drivers of revision are interest rate changes or changes in the asset base through large new investment projects or corporate restructuring. Given the strategic importance of the decision, the cost of capital is typically set by the board of directors, though sometimes by a subgroup of the board (such as the finance director and/or the non-executive directors). However, sometimes the decision is made by wider consultation and at times board approval is required only for larger projects.
References


Table 1: Computing the overall cost of capital

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<th>Description</th>
<th>%</th>
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<tbody>
<tr>
<td>The discount rate used in project appraisal:</td>
<td></td>
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<tr>
<td>A weighted average cost of capital</td>
<td>53.4</td>
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<tr>
<td>The equity cost of capital</td>
<td>11.4</td>
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<tr>
<td>A long-term borrowing rate</td>
<td>27.5</td>
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<td>Adjustments to the cost of capital:</td>
<td></td>
</tr>
<tr>
<td>For the size of the project</td>
<td>22.3</td>
</tr>
<tr>
<td>For the division/department responsible</td>
<td>17.6</td>
</tr>
<tr>
<td>For the cost of non-economic projects</td>
<td>13.5</td>
</tr>
<tr>
<td>Where CAPM is used:</td>
<td></td>
</tr>
<tr>
<td>A different beta is used for each project (4.7/47.2 x 100)</td>
<td>10.0</td>
</tr>
<tr>
<td>A weighted average of equity and debt betas is taken</td>
<td>12.4</td>
</tr>
<tr>
<td>Where a weighted average of betas is taken:</td>
<td></td>
</tr>
<tr>
<td>A zero debt beta is assumed (9.3/12.4 x 100)</td>
<td>75.0</td>
</tr>
<tr>
<td>Adjustments to the overall cost of capital for tax effects:</td>
<td></td>
</tr>
<tr>
<td>Tax taken into account in deducing the cost of capital</td>
<td>67.4</td>
</tr>
<tr>
<td>Reworking the cost of capital for tax losses, where there are tax losses (6.2/25.9 x 100)</td>
<td>23.9</td>
</tr>
<tr>
<td>Reworking the cost of capital for surplus ACT, where there is surplus ACT (8.8/27.5 x 100)</td>
<td>32.0</td>
</tr>
<tr>
<td>Reworking the cost of capital for marginal relief, where income lies within the bands (3.1/5.7)</td>
<td>54.4</td>
</tr>
<tr>
<td>Tax situations:</td>
<td></td>
</tr>
<tr>
<td>Temporary tax losses experienced</td>
<td>25.9</td>
</tr>
<tr>
<td>Surplus ACT experienced</td>
<td>27.5</td>
</tr>
<tr>
<td>Taxable income within marginal relief bands</td>
<td>5.7</td>
</tr>
<tr>
<td>The after-tax money cost of capital lies within the range:</td>
<td></td>
</tr>
<tr>
<td>0.1-5%</td>
<td>6.7</td>
</tr>
<tr>
<td>5.1-10%</td>
<td>42.0</td>
</tr>
<tr>
<td>10.1-15%</td>
<td>46.6</td>
</tr>
<tr>
<td>15.1 +</td>
<td>3.6</td>
</tr>
<tr>
<td>Industry (155 firms)</td>
<td>0.1 - 5%</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Consumer goods</td>
<td>5</td>
</tr>
<tr>
<td>General industrials</td>
<td>4</td>
</tr>
<tr>
<td>Resources</td>
<td>0</td>
</tr>
<tr>
<td>Services</td>
<td>3</td>
</tr>
<tr>
<td>Utilities</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
</tbody>
</table>
Table 3: Computing the components of the overall cost of capital

<table>
<thead>
<tr>
<th>Cost of equity capital:</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods to estimate the cost of equity:</td>
<td></td>
</tr>
<tr>
<td>Dividend yield</td>
<td>27.5</td>
</tr>
<tr>
<td>Earnings yield</td>
<td>26.9</td>
</tr>
<tr>
<td>Equity betas</td>
<td>47.2</td>
</tr>
</tbody>
</table>

Where a dividend yield is used:
A growth factor is included (20.7/27.5 x 100) | 75.3 |

Where a growth factor is included:
A past trend is used to estimate growth (15/20.7 x 100) | 72.5 |

Where an earnings yield is used:
Earnings are adjusted for depreciation (8.3/26.9 x 100) | 30.9 |
Earnings are adjusted for working capital (7.8/26.9 x 100) | 29.0 |

In the calculation of the cost of equity firms use:
Share capital (book value) | 5.2 |
Share capital plus reserves (book value) | 26.4 |
Long-run predicted price | 18.1 |
Other (see narrative) | 20.7 |

Cost of debt capital:

In deducing the cost of debt:
Market values are taken | 40.9 |
Book values are taken | 39.9 |
Table 4: Impact of choice of equity computation method on after-tax overall cost of capital

<table>
<thead>
<tr>
<th>Number of Firms</th>
<th>Low Cost Of Capital (≤ 10%)</th>
<th>High Cost Of Capital (&gt; 10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Dividend Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used</td>
<td>32</td>
<td>21</td>
</tr>
<tr>
<td>Not used</td>
<td>52</td>
<td>72</td>
</tr>
<tr>
<td>b) Earnings Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Not used</td>
<td>54</td>
<td>68</td>
</tr>
<tr>
<td>c) CAPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used</td>
<td>28</td>
<td>63</td>
</tr>
<tr>
<td>Not used</td>
<td>52</td>
<td>29</td>
</tr>
</tbody>
</table>

Notes

1: (with or without growth) a significant association at 5%; chi-square = 5.06; sample = 177. Higher cost of capital firms do not tend to use a dividend model.

2: no significant association at 5%; chi-square = 0.48; sample = 174.

3: a significant association at 1%; chi-square = 19.25; sample = 172. Higher cost of capital firms tend to use CAPM.
<table>
<thead>
<tr>
<th>Frequency in reassessing the cost of capital:</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annually</td>
<td>53.9</td>
</tr>
<tr>
<td>Quarterly</td>
<td>18.1</td>
</tr>
<tr>
<td>Monthly</td>
<td>4.7</td>
</tr>
<tr>
<td>Other: Six monthly</td>
<td>2.6</td>
</tr>
<tr>
<td>When long-term interest rates change</td>
<td>3.1</td>
</tr>
<tr>
<td>On a project by project basis</td>
<td>6.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency in reassessing the cost of debt:</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annually</td>
<td>41.5</td>
</tr>
<tr>
<td>Quarterly</td>
<td>19.2</td>
</tr>
<tr>
<td>Monthly</td>
<td>10.9</td>
</tr>
</tbody>
</table>