

How to set the hurdle rate for capital investments

by Jon Tucker

EXECUTIVE SUMMARY

- There exists a wide range of approaches to setting the hurdle rate for capital investments.
- It is essential that we do not set the hurdle rate too high, thereby foregoing valuable investment opportunities, or too low, thereby destroying value for shareholders.
- Whilst academics tend to advocate a series of at times complex adjustments, most CFOs settle for a relatively simple approach and allow for complexity instead in their cash flow projections.
- The most common approach is to employ a CAPM-based equity cost as an input to a WACC calculation.
- A company-wide hurdle rate is typically employed by companies, though adjustments are made for projects of atypical risk.

INTRODUCTION

Chief Financial Officers are charged with the task of maximising shareholder wealth. They do this by pursuing two key goals: maximising the stream of future cash flows and minimising the company's cost of capital. Cognisant of the separation theorem, we tend to separate one goal from the other. However, both are of strategic importance – a healthy stream of cash flows can actually destroy value (and hence reduce shareholder wealth) if the company suffers from a high cost of capital. In a very real sense, then, a company's cost of capital represents an important "hurdle" which its portfolio of projects must exceed in order to create wealth for shareholders. Clearly the cost of capital as implied by the company's financing mix is a good starting point when arriving at the hurdle rate for capital investment appraisal (capital budgeting), but the way in which the company arrives at this cost of capital and the adjustments made thereafter to arrive at the hurdle rate warrant further explanation.

HURDLE RATE: A DEFINITION

The hurdle rate is the required rate of return in investment appraisal above which an investment project is worth pursuing. We know when computing a project's NPV (net present value) that if the discount rate exceeds the project's IRR (internal rate of return) then we should not proceed with the project. The starting point for the hurdle rate is, then, the company's cost of capital, to which a company may then decide to make some adjustment for that project's specific risk, perhaps adding a risk premium. The difficulty for practitioners is that there exists a wide variation of approaches to arriving at the hurdle rate – even academics cannot agree on the best way forward.

Some examples of the difficulties involved are: How do we arrive at the cost of equity capital? How do we arrive at the cost of debt and other financing components? Do we employ the weighted average cost of capital (WACC) or some other metric to arrive at the cost of capital? If we do employ the WACC, how do we weight the cost of each financing component? What additional adjustment do we make for risk? We will tackle each of these issues in turn and explore the broad alternative approaches available to the CFO.

THE COST OF EQUITY

There are a variety of ways in which CFOs tend to compute the cost of equity capital. The most prominent and widely employed approach is the capital asset pricing model (CAPM):¹

$$r_e = r_f + \beta (r_m - r_f)$$

Where:

r_e = the expected cost of equity capital for a company

r_f = the risk-free rate of return

β = the share's beta

r_m = the return on the market portfolio

$(r_m - r_f)$ = the expected premium offered by the market portfolio over and above the risk-free rate

However, we encounter a number of difficulties with this approach in a practical setting. Which risk-free rate should be employed – a three month treasury bill rate or a long-term government bond rate? Most academics would suggest the latter, though in practice, the three month rate is often employed. Should CFOs compute their own beta coefficient or employ a beta computed by data agencies such as Bloomberg? This is a matter of personal choice, though in practice most companies probably employ an externally published source. What equity risk premium should be employed and is it realistic in terms of expectations? We could apply an average historical risk premium here or even estimate the rate implied by current asset prices. Further, if we compute our own average historical premium figure, then applying the geometric average premium is probably the best approach. Each of these issues could warrant a chapter to itself – in the real world CFOs arrive at a CAPM-based equity cost of capital after much debate within the company and consultation with their external corporate advisors (such as investment banks). Academics have extended the CAPM to a multi-factor framework to better capture equity risk, adding size and book-to-market factors, though in practice it is unlikely that companies employ such models extensively.

¹ See Sharpe, W.F., 1964, "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk", *Journal of Finance*, 19, 425-442, and Lintner, J., 1965, "The Valuation of Risk Assets and the Selection of Risk Investments in Stock Portfolios and Capital Budgets", *Review of Economics and Statistics*, 47, 13-37.

An alternative approach is to employ an earnings model to arrive at the cost of equity capital, that is, to compute the earnings to price ratio (or earnings yield) for a company. This is a relatively simple procedure given the wide availability of PE ratios and the broad understanding and use of asset yields in the financial media, though is most appropriately employed for non-growth companies. The cost of equity, then, is equal to the inverse of the PE ratio:

$$r_e = (E / P)$$

Where:

r_e = the company's cost of equity capital

e = the company's earnings

P = the company's share price

A further alternative is to arrive at the cost of equity capital by means of a simple dividend model. When we re-arrange the dividend model, the cost of equity capital equals the expected dividend yield (D_1/P_0) plus the constant compound growth rate of dividends, the latter often based on past trends as a proxy for growth expectations:

$$r_e = (D_1 / P_0) + g$$

Where:

r_e = the company's cost of equity capital

D_1 = the dividend in year 1

P = the company's share price in year 0

g = the growth rate of dividends

In the real world, CFOs should probably compute a cost of equity using all three approaches, benchmark their rate with other companies in their industry (which are likely to have similar betas, business models, and enjoy similar access to financial markets), and only then settle on a suitable figure. In the case of pure equity financed companies, the cost of equity capital is, by definition, the pivotal figure in arriving at the hurdle rate.

THE COST OF DEBT

A minority of companies set their overall cost of capital at the cost of debt. However, even the cost of debt presents a number of interesting issues to the CFO. Firstly, do we employ the historical cost of debt or the more meaningful expected cost of debt? Do we look at the cost of total debt, thereby including the cost of short-term debt, or do we focus upon the cost of long-term debt? Regardless of these variations, we certainly need to take into account the tax advantage to debt arising from the deductibility of debt interest payments (whereas equity enjoys no such advantage). Even here we face an added complication – do we apply a tax advantage based upon statutory corporate tax

rates or marginal rates? Many CFOs will in practice employ a long-term debt rate, expressed after tax, based on the marginal corporate tax rate. Further, for the purposes of economic consistency, debt should also include lease obligations. If a company is bond-financed and there is an active market for those bonds, then the yield to maturity is the appropriate rate, whereas with non-traded debt (such as bank loans) the stated interest rate is the appropriate rate.

THE WEIGHTED AVERAGE COST OF CAPITAL

The WACC is simply the average discount rate applied by the debt-holders and equity-holders of the company to its future cash flows. Discounting the stream of a project's future cash flows by the WACC gives us the capitalised value of that project, whereas so doing for the company's total cash flows gives us the capitalised value of the entire company.

We compute the WACC as follows:

$$\text{WACC} = (D / D + E) r_d (1 - T_c) + (E / D + E) r_e$$

Where:

WACC = the weighted average cost of capital

D = the market value of debt

E = the market value of equity

r_d = the company's cost of debt capital

r_e = the company's cost of equity capital

T_c = the corporate tax rate

The WACC for a company, then, is simply the cost of the company's financing components (r_d and r_e), weighted by the proportion of those components in the company's capital structure ($(D/D+E)$ and $(E/D+E)$, respectively). We can easily extend this expression for additional forms of financing by weighting them by their proportion in the company's capital structure. The correct approach to weighting here is to compute the market value of each component as a proportion of the total market value of all claims against the company. Note that the cost of debt is effectively reduced by virtue of the fact that there is a tax advantage to debt, as discussed earlier, hence the cost is not r_d but $r_d (1 - T_c)$. This merely reflects the calculation of the corporate tax liability after debt interest costs have been deducted. Employing the WACC as the basis for the hurdle rate makes intuitive sense as the company must ensure that it is exceeding, on average, the average rate of return required by all of its claimholders. If it is not, then it is destroying value for shareholders.

DEALING WITH RISK

As a general rule, the company should consider investing in projects that generate returns which are higher than the company's hurdle rate. Further, the hurdle rate should be higher for riskier projects than for safer projects.

How do we adjust for risk then? We could adjust the hurdle rate for numerous project characteristics, including: the size of the project, the division within which the project is located, whether the project will be at home or overseas, whether the project is new or existing, and so on. The most simple approach is to apply a company-wide cost of capital as the hurdle rate. The dangers of this approach, however, are that the project under consideration may be more or less risky than the “average” risk of the company’s portfolio of investment projects. Large projects are often scrutinised more carefully than smaller projects, given their more material impact on the company’s cash flows, and a premium for risk is added to the cost of capital figure to arrive at an appropriate hurdle rate. Most companies add a premium over and above the domestic project hurdle rate for foreign investments. New projects are more risky than existing projects and should therefore reflect a premium over and above the observed earnings yield of an existing project investment. Ventures such as mergers are more risky still and thus their returns should exceed a much higher hurdle rate before being sanctioned. Some companies employ a sliding scale of discount rates, depending on a project’s nature – discount rates increase as we move from equipment upgrading, through expansion of existing business lines, through new project investments, to more speculative projects.²

In the real world, some practitioners argue that we cannot expect the hurdle rate to “take all of the strain” when adjusting for risk. Instead, many argue that the project cash flows themselves should be adjusted for risk to achieve a more realistic estimation of a project’s IRR or NPV. Project risk will have a differential impact on the range of cash inflows and outflows and therefore a risk-adjusted hurdle rate does not always adequately deal with risk – it can be too blunt an instrument. A carefully computed hurdle rate, in conjunction with risk-adjusted cash flows and a comprehensive scenario analysis might be the best way forward, taking care not to double-count risk in the process.

However, presuming that we do indeed employ a hurdle rate which captures risk in some objective and appropriate manner, one way of assuring a more robust approach to capital investment appraisal is to accept only those projects with the highest IRRs, that is, those that exceed the hurdle rate by the highest margin. This may be necessary for most companies in the real world anyway in the presence of limited investment funds and capital rationing.

FREQUENCY OF REVISION

Given the real-world complexity and strategic sensitivity of the hurdle rate figure, it is likely that most companies do not revise the rate on a very frequent basis, often maintaining the same figure for months or even as long as a year. Events

² A useful discussion of the cost of capital and how we deal with risk can be found in Brealey, R.A., Myers, S.C. and Allen, F., 2008, “Principles of Corporate Finance”, McGraw Hill / Irwin, New York, pp.239-240.

which may encourage CFOs to take another look at the company-wide hurdle rate might include changes in the returns required by investors (such as interest rate changes), the consideration of major projects, and the prospect of corporate restructuring. Major corporate restructuring has an impact not only on the profile of future cash flows but also on the returns required by both existing and new claimholders in relation to those cash flows. Given the strategic importance of the hurdle rate, it is typically decided at the level of the Board of Directors, who take the advice of the CFO and his/her advisors (consultants, bankers, and so on.)

CASE STUDY – DETERMINING THE HURDLE RATE FOR A FOOD RETAILER

Company X plc is a FTSE100 food and drug retailer, listed on the UK stock exchange. The market value of its capital structure components is £12 billion for equity and £8 billion for debt. The β computed by a reputable data agency is 0.9. The UK 3 month Treasury bill rate is 4.5% and you estimate that the market tends to pay a premium over and above this rate of 4.7%. The UK corporate tax rate is 30% and the rate paid by the company on its 10 year bonds is 5.5%. We start by computing X plc's cost of equity capital:

$$r_e = r_f + \beta (r_m - r_f)$$

$$r_e = 4.5\% + 0.9 (4.7\%) = 8.73\%$$

We then compute the proportions of debt and equity in the company's capital structure:

$$D / (D + E) = 40\% \text{ and } E / (D + E) = 60\%$$

We can then compute its weighted average cost of capital:

$$WACC = (D / D+E) r_d (1 - T_c) + (E / D + E) r_e$$

$$WACC = (40\% \times 5.5\% \times (1 - 0.30)) + (60\% \times 8.73\%) = 6.78\%$$

Company X plc applies a hurdle rate of 6.78% to projects of average risk, but adds a margin for projects of higher risk such as an investment in a new product line (plus 5%) or a company acquisition (+10%).

CONCLUSION

In the real world, most practitioners have little appetite for adjusting the hurdle rate for the multitude of factors advocated so fervently by academics. Excepting the all-equity financed case, company CFOs should typically pursue a CAPM-based weighted average cost of capital and then make sensible and consistent

risk adjustments to determine project hurdle rates. All capital structure components should be expressed at market values and all costs should be forward-looking. A company-wide hurdle rate is probably adequate for many investment projects, though the figure should always be reviewed when dealing with more material, large scale projects or indeed corporate restructuring.

THE BEST SOURCES OF HELP

Books:

Bierman, H. and Smidt, S., 2006, "The Capital Budgeting Decision: Economic Analysis of Investment Projects", Routledge.

Journal articles:

Bruner, R., Eades, K., Harris, R., and Higgins, R., 1998, "Best Practices in Estimating the Cost of Capital: Survey and Synthesis", Finance Practice and Education, 14-28.

McLaney, E., Pointon, J., Thomas, M., and Tucker, J., 2004, "Practitioners' Perspectives on the Cost of Capital", European Journal of Finance, 10, 123-138, April.