

Kicking The Tires: Determining the Cost of Capital

Howard E. Johnson

The cost of capital refers to the discount rate or capitalization rate that is used by corporate acquirers in assessing the value of an acquisition target, and in determining the price the acquirer might be willing to pay. In acquisition analysis, the cost of capital normally is expressed as a weighted average cost of capital- a blend of the after-tax cost of debt and the cost of equity. The discount rate is either derived pursuant to a 'build-up' approach, or as an established 'hurdle rate' that is adjusted based on the specific facts of each case.

Discount rates vs. capitalization rates

A discount rate is the rate of return used in a discounted cash flow valuation methodology to convert a series of forecasted discretionary cash flows to present value. In both theory and practice, the discounted cash flow methodology typically is the preferred basis of valuing corporate acquisition targets. A capitalization rate is the rate of return used to convert estimated 'normalized' discretionary cash flow into value, which assumes that the cash flows will continue into perpetuity. The capitalization rate is applied in determining the 'terminal value' portion of a discounted cash flow valuation methodology, or is used by itself in a 'capitalization of maintainable cash flow' valuation methodology.

The capitalization rate is derived by deducting a growth factor from the discount rate. The growth factor normally is comprised of the inflation rate, and in some circumstances may incorporate a real rate of growth (i.e. beyond inflation) and other fact-specific adjustments. The inverse of a capitalization rate often is referred to as a 'multiple'. In corporate acquisition analysis, the cost of capital should be determined as a discount rate, with adjustments as necessary to convert the discount rate to a capitalization rate.

Principles of discount rate determination

In determining a discount rate it is important to take note of a number of underlying principles. First, discount rates should be applied to forecasted discretionary cash flows. It is discretionary cash flows, and not accounting earnings that drives economic value. Discretionary cash flows typically are defined as cash flow from operations less income taxes, capital investment

requirements (net of the related income tax shield), and changes in non-cash working capital. In corporate acquisition analysis, discretionary cash flows typically are determined on an 'unlevered' basis, that is, before consideration of debt servicing costs (interest expense and changes in debt principal). Therefore, the value obtained by discounting prospective (unlevered) discretionary cash flows by a discount rate that is a weighted average cost of capital represents the 'enterprise value' of the company. That is, the total value of the company, including its debt and equity components.

Second, there must be consistency between the derivation of the discount rate and the cash flow stream to which it is applied. For example, where prospective discretionary cash flows are expressed in nominal terms (including inflation), the discount rate also should be expressed in nominal terms, and vice versa. Discounting cash flows that incorporate an element of inflation by a discount rate that is expressed in real terms (net of inflation) would overstate the value conclusion, and could lead to erroneous business pricing decisions.

The third principle in discount rate determination is referred to as the 'risk-return tradeoff'. That is, all other things equal, a more optimistic cash flow forecast should be subject to a higher discount rate to reflect the greater risk in achieving same, and vice versa. There is a direct interrelationship between the cash flow projections and the discount rate applied to them, and these things cannot be considered in isolation of each other.

Fourth, the discount should reflect both operating risk and financial risk. Operating risk is the risk that a business will fail to generate operating cash flows as projected, assuming that the company is financed entirely by equity. Financial risk is the risk assumed by equity holders by employing debt in a business, which ranks ahead of equity holders in terms of its claim on the net cash flows and net assets of the company. Financial risk is related to the capital structure of a business. Both operating risk and financial risk are accounted for where the discount rate is expressed as a weighted average cost of capital.

Finally, due consideration should be afforded to rates of return prevailing in the market, including risk-free rates of return, stock and money market conditions, and so on. Corporate acquisition analysis in many ways is fundamentally different from the analysis of publicly-traded securities. Given the long-term objectives of corporate acquirers, the cost of capital employed in corporate acquisition analysis typically does not fluctuate with near-term changes in interest rates and observed stock market rates of return. However, market rates of return do influence the cost of capital used in corporate acquisition analysis over the long term, and therefore the current state of the financial markets, trends, and expectations should be considered.

Weighted average cost of capital

The discount rate (and capitalization rate) used in corporate acquisition analysis normally is expressed as a weighted average cost of capital ('WACC'). WACC is a blend of the after-tax cost of debt and the cost of equity based on a capital structure that is considered 'appropriate' given the nature of the acquisition target, and the industry in which it competes. The simplified formula for determining WACC is as follows:

$$WACC = K_U \times [1 - (T \times D/(D+E))]$$

K_U is the cost of unlevered equity - the required rate of return to equity holders, based on the operating risk of the acquisition target. T is the marginal income tax rate at which interest expense is deducted. And $D / (D+E)$ is the 'appropriate' ratio of debt to debt plus equity of the acquisition target, (i.e. its capital structure), which incorporates financial risk.

For example, assuming a nominal cost of unlevered equity of 15%, a capital structure comprised of 30% debt and 70% equity, and a marginal income tax rate of 40%, the nominal WACC discount rate would be calculated as $15\% \times [1 - (40\% \times 30\%)] = 13.2\%$.

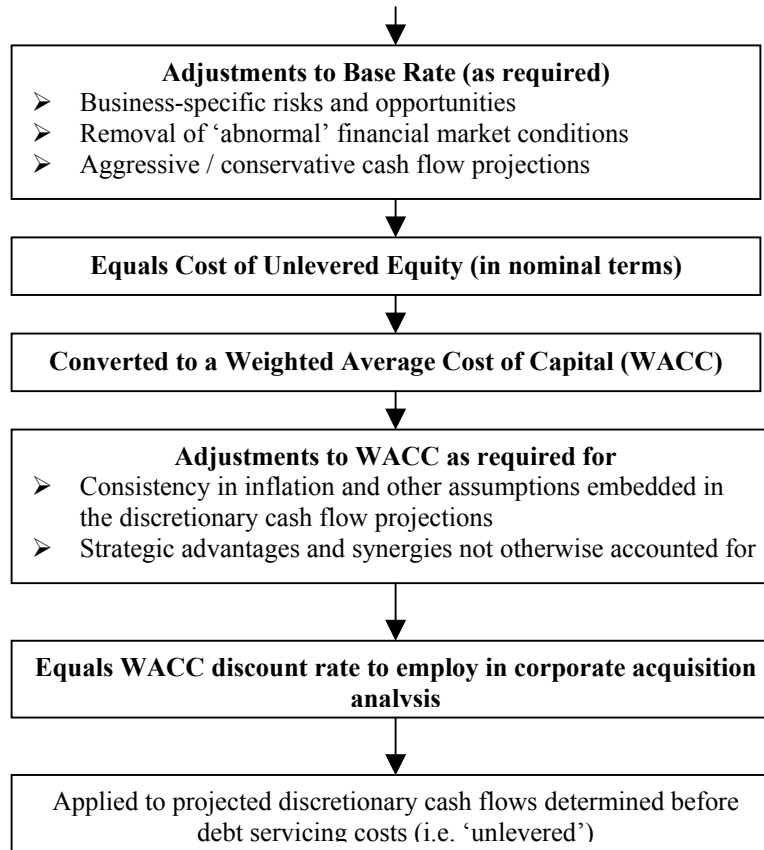
If it is further assumed that inflation is 2%, and long term sustainable real growth is 1%, the WACC capitalization rate would be calculated as $13.2\% - 2\% - 1\% = 10.2\%$. Alternatively, the WACC capitalization rate can be expressed as a cash flow multiple derived as $1 / 10.2\% = 9.8$.

Discount rate determination

A discount rate expressed as a WACC can be derived using a 'build-up' approach, which first entails determining the cost of unlevered equity, comprised of a 'base rate' of return, plus and minus fact-specific adjustments, as deemed necessary. The cost of unlevered equity is then converted to a WACC as demonstrated in the previous paragraph. In some cases, further adjustments are made to the WACC for purchaser-perceived post-acquisition strategic advantages that have not otherwise been accounted for. A schematical overview of the derivation of a discount rate that is expressed as a WACC is set out below.

Determining a Weighted Average Cost of Capital Discount Rate

Base Rate of Return
= Nominal 'risk free' rate of return
+ Equity risk premium for corporate acquisitions
+/- Industry-specific risks and opportunities



The base rate of return component of the cost of unlevered equity normally is calculated as the prevailing 'risk free' rate of return on long-term government bonds plus an equity risk premium. The equity risk premium applied in corporate acquisition analysis should be consistent with the long-term objectives of corporate acquirers, and should reflect the risks and benefits of acquiring the shares or net assets of a company 'en bloc'. Consequently, the equity risk premium derived for purposes of corporate acquisition analysis may be different (often greater) than the observed equity premium in public equity markets where normal-sized blocks of marketable securities are freely traded. In addition, the base rate may incorporate an adjustment (increase or decrease) for industry-specific risks and opportunities where such factors are not sufficiently accounted for in the equity risk premium. Industry risks and opportunities are those that affect all businesses in a given industry, such as regulation, the structure of competition, technological developments, and so on.

Where required, adjustments are made to the base rate of return to account for business-specific risks and opportunities. That is, the risks and opportunities attaching to a particular company that are not adequately reflected within the equity risk premium or industry risk adjustment. Further, to be consistent with the long-term financial objectives of corporate acquirers, an adjustment may be necessary to remove 'abnormalities' that might exist in the financial markets at a particular point in time, and which therefore may inappropriately be incorporated in the base rate. Finally, consistent with the 'risk-return tradeoff' principle, an adjustment to the base rate may be required where the cash flow projections are believed to be either aggressive or conservative, and those projections have not otherwise been 'probabilized' or 'normalized'.

The base rate- plus and minus adjustments thereto as required- yields the cost of unlevered equity. The cost of unlevered equity is then converted to a WACC based on what is believed to be an appropriate capital structure for the business. Like the determination of the cost of unlevered equity, the capital structure assumption should be consistent with a long-term investment horizon of a corporate acquirer. The estimation of an appropriate capital structure is a complex and subjective process that is a separate topic unto itself. However, due to the interrelationship between the cost of debt and the cost of equity, the WACC model is fairly inelastic. Hence, the computed WACC does not vary significantly with relatively minor changes in assumptions regarding capital structure.

The WACC discount rate may require further adjustments to be consistent with the cash flows to which it is applied (e.g.; the inclusion or exclusion of inflation). Finally, a corporate acquirer frequently anticipates that it will achieve post-acquisition synergies or 'strategic advantages' by combining the acquired company with its existing operations. To the extent that these benefits have not been quantified elsewhere, they often are reflected as a downward adjustment to the WACC discount rate otherwise determined.

Corporate hurdle rates

Rather than use a build-up approach in corporate acquisition analysis, many companies employ corporate 'hurdle rates' or 'threshold rates of return'. Hurdle rates-the minimum rates of return needed to justify an investment- are typically established at senior management levels within an organization, and tend to remain fairly static in the near term, although they can change over time to reflect changes in general economic conditions or industry trends. Most corporate acquirers have corporate hurdle rates in the range of 12% to 15%, expressed in terms of a nominal cost of unlevered equity, which typically converts to a nominal WACC in the range of 10% to 15%. Start-up companies and higher risk ventures typically command a premium over these rates, which may be (perhaps significantly) in excess of 20%, depending on the circumstances.

Hurdle rates of return represent target rates. As such, upward or downward adjustments may be required for such things as fact-specific risks and opportunities and internal consistency with the discretionary cash flows projections, and to reflect the 'strategic importance' of a particular acquisition candidate.

Managers employing corporate hurdle rates in their acquisition analysis often are not adequately informed on the basis by which the hurdle rates were established, and the underlying assumptions associated with them. This includes the extent to which inflation has been incorporated in the hurdle rate, what assumptions have been made regarding capital structure, and whether there have been any changes in the industry since the hurdle rate was established that should be reflected in the required risk premiums. To make informed decisions, management of corporate acquirers and their advisors must understand how the hurdle rate was derived to ensure that it is applied in a manner that is internally consistent, so that the resultant corporate acquisition analysis can be meaningfully interpreted.

Determining the cost of capital to utilize in an analysis of acquisition candidates necessarily involves an element of subjectivity. However, the discount rate and capitalization rate to apply can be better justified if it is based on a thorough analysis of economic conditions, industry risk factors, company-specific factors, and the assumptions underlying the projected discretionary cash flows. Further, companies can avoid making technical errors in their corporate acquisition analysis by adhering to the underlying principles of discount rate determination, and by understanding the basis by which corporate hurdle rates were developed.

About the author

Howard E. Johnson, CMA (hjohnson@cvpl.com) is a Partner with Campbell Valuation Partners Limited in Toronto (www.campbellvaluation.com), a consulting firm specializing in business valuations, business sales and acquisitions, financial litigation, and related matters.