

Determining the Cost of Capital for Corporate Acquisitions
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Overview

Determining the cost of capital to use in evaluating acquisition candidates is a complex and necessarily subjective exercise. Corporate acquirers have traditionally approached this issue in differing ways, which have included the use of stock market data, 'threshold' rates of return and rules of thumb.

This paper offers some guidance to corporate acquirers in determining and / or assessing the reasonableness of the cost of capital used in evaluating corporate acquisitions. The basic terms and principles of cost of capital determination are first addressed followed by a discussion of capital structure. As explained below, the capital structure decision is an integral part of cost of capital determination. Subsequently, a methodology for the derivation of discount and capitalization rates is presented and alternate methodologies are discussed. Finally, this paper provides some insight on current acquisition practices in the Canadian market place and frequently encountered differences between Canadian and U.S. experience.

The methodology and considerations for the cost of capital derivation presented herein have been prepared from the standpoint a of corporate acquirer purchasing either a controlling interest or 100% of the shares of a target company or the underlying net operating assets thereof. Further adjustments may be required in circumstances where the acquisition represents a non-controlling interest or where control of the investment is effectively fettered. In addition, it is assumed that corporate acquirer intends to retain the target company as a long term investment.

Terms and Definitions

Cost of capital is defined as the expected rate of return that the market requires in order to attract funds to a particular investment¹. It is a function of the risk in realizing a given series of cash flows to be generated from an investment. The cost of capital is also dependent upon a company's capital structure, that is, the mix of debt and equity used to finance a business. Although a company's cost of capital may change over time, it is generally relatively stable from period to period unless there has been some dramatic internal structural reasons or external economic events that dictate change.

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When applied in a corporate acquisition scenario, the cost of capital is frequently referred to as a discount rate or capitalization rate. The terms discount rate and capitalization rate are related, but they are not interchangeable. 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 a present value. Ultimately, the discount rate is a function of the perceived risk of whether the business being valued will achieve a projected level of discretionary cash flow in comparison to the after tax return on a benchmark 'risk-free' investment (e.g. government debt).

A capitalization rate is the rate of return used to convert estimated 'normalized' discretionary cash flow into value. There is an inherent assumption that the cash flow that is capitalized will be generated to perpetuity. The application of a capitalization rate to an assumed perpetual discretionary cash flow constitutes 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. Depending on company-specific and industry-specific circumstances, the growth factor is typically comprised of inflation and may in some circumstances appropriately include a real rate of growth. Finally, the capitalization rate may be adjusted from what one might consider a 'normalized' base rate (referred to as a 'threshold rate' or 'hurdle rate') downward or upward to reflect fact-specific time related business and industry risk. The inverse of the capitalization rate is referred to as a multiple.

The discount rate or capitalization rate can be expressed as a leveraged return on equity or a weighted average cost of capital. A leveraged return on equity is the rate of return required by shareholders given both the operating and financial risks of a company. A weighted average cost of capital is a function of the relative mix of debt and equity and the returns required on each. Regardless of whether a leveraged return on equity or a weighted average cost of capital is used, an assessment of the company's capital structure must be undertaken. The derivation and application of these rates is addressed under the section entitled 'Capital Structure'.

Therefore, under the discounted cash flow approach the 'en bloc' value of a target company's shares or net assets is the sum of:

- the present value of the forecasted discretionary cash flows discounted at the discount rate;

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- the present value of the 'terminal value' derived by dividing the estimated maintainable discretionary cash flows beyond the forecast period into the capitalization rate, and discounting that figure (a 'capitalized cash flow') to a present value using the discount rate;
- the present value of existing tax pools not specifically accounted for in the cash flow estimates (such as the existing balance of undepreciated capital cost);
- the net realizable value of redundant assets, if any; and
- either:
 - ✓ where the discount and capitalization rates represent leveraged rates of return, an adjustment, if any, to reflect an 'appropriate' amount of debt in the target company; or
 - ✓ where the discount and capitalization rates represent a weighted average cost of capital, a reduction for the amount of interest bearing debt and equivalent outstanding.

It is important to note that the 'value' for the outstanding shares or net assets of a target company determined in isolation from open market negotiation (a so-called 'notional' value) may be considerably different from the price paid for them. The ultimate price paid is influenced by numerous factors, including:

- the number of purchasers interested in a particular business and their respective perception of post-acquisition synergies;
- the form of consideration offered (e.g. cash, share exchange, vendor take-back, etc.); and
- the negotiating skills of the buyer, seller and their respective advisors.

Until such time as a company is listed for sale and negotiations are undertaken, it is not possible to determine whether or not a business will sell at a price which approximates its value as determined pursuant to any given valuation methodology.

Underlying Principles

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As noted above, the cost of capital can either represent a discount rate or a capitalization rate, and either of these may be expressed as a leveraged return on equity or a weighted average cost of capital. Regardless of how the cost of capital is determined there are certain underlying principles in the derivation and application of that rate which should always be adhered to, as discussed below.

Discounted discretionary cash flows

The discounted cash flow approach is the theoretically correct methodology by which to value the shares or net assets of a business. Empirical evidence has found a high degree of correlation between the market value of a company and its discounted cash flow². The world's richest investor, Warren Buffet has advocated the use of the discounted cash flow technique for the valuation of marketable securities³.

In compiling a discounted cash flow valuation, annual cash flows are typically forecast for a period of 5 to 10 years, with an estimate of maintainable cash flows thereafter (used to derive the terminal value component). There are many different definitions of cash flow. However, discretionary cash flow is the theoretically correct measure of the return on the investment. Discretionary cash flow represents cash available to shareholders that can be:

- withdrawn from the business as a return on investment (via dividend or bonus) without impairing the likelihood of achieving projected operating results;
- reinvested in growth capital assets beyond what is incorporated in the cash flow projections, thereby generating incremental value over time;
- retained as a redundant asset, thereby immediately enhancing the capital value of the business; or
- utilized for debt reduction, thereby enhancing the equity of the business.

Discretionary cash flow is normally defined as earnings before interest, taxes, depreciation and amortization (EBIT-DA), less income taxes, sustaining capital investment (net of the related tax shield), capital investment (net of the related tax shield) required to generate forecast results and incremental working capital required to generate forecast results. Capital investment and working capital required for growth are not deducted when developing the discretionary cash flow adopted

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for purposes of determining terminal value in circumstances where no real growth is built into the capitalization rate utilized in the terminal value calculation.

Where discretionary cash flows are determined before interest expense, the discount rate applied should represent a weighted average cost of capital. Conversely, where interest expense (net of tax) is deducted in deriving discretionary cash flows, the discount rate applied should represent a leveraged return on equity. The derivation and application of these rates is addressed as part of 'Capital Structure'.

Consistency

There must be consistency between the derivation of the discount / capitalization rates and the cash flow stream to which they are applied. For example:

- where inflation has been excluded from the forecast results, it should also be excluded from the discount rate;
- where expected real growth has been reflected in the estimate of maintainable discretionary cash flows (e.g. where the cash flows to be capitalized in the terminal value calculation include a growth factor), that same growth should not be accounted for again in the derivation of the capitalization rate; and
- in circumstances where the cost of capital is applied to pre-tax cash flows (even though, as noted above, after tax discretionary cash flow is the preferred definition), then the cost of capital should be determined on a pre-tax basis as well.

Risk / return tradeoff

The fundamental tradeoff between risk and return should always be considered in the derivation of a discount or capitalization rate. Stated differently, the going concern value of a business cannot be altered by an arithmetic exercise. Hence the combination of the discount rate(s) applied to forecasted discretionary cash flow and the capitalization rate applied to the assumed perpetual discretionary cash flow when developing terminal value are completely interdependent with the cash flow projected. In simple terms, the more aggressive the cash flow projections the higher should be the discount / capitalization rates, and vice versa.

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Commensurate with this principle is the segregation of cash flows between those intrinsic to the target company and those the corporate acquirer anticipates generating from post-acquisition synergies. There is usually a higher degree of risk as to the achievement of post-acquisition synergies, thereby necessitating a higher cost of capital applied to that component. Alternatively, anticipated post-acquisition synergies could be probablized based on their risk of achievement and discounted at more conventional rates. A key pricing tactic revolves around the amount of the total synergies a corporate acquirer wants to 'pay for', if at all. Where synergies are not 'paid for', they act as a buffer against unanticipated integration costs and shortfalls from cash flow projections. Therefore, segregation of discretionary cash flows between intrinsic and synergistic enables a more thorough analysis and evaluation of the two components.

Operating and financial risk

Total business risk is comprised of operating risk and financial risk. In the context of cost of capital, operating risk is the risk that a business will fail to generate net operating cash flows (discretionary cash flow excluding debt servicing costs) as projected. 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 cash flows and ultimately the net assets of a business. Financial risk is related to the capital structure of a business.

In determining a discount or capitalization rate, consideration must be afforded to both operating and financial risk, however the two components should be segregated and addressed sequentially. That is, the basic discount rate should first be derived through an assessment of operating risk (i.e. an unleveraged rate of return). Subsequently, the impact of financial risk (leverage) should be reflected on that rate. As a result, the capital structure decision forms an integral component of the cost of capital derivation.

Importance of the market

Ultimately, the market dictates the rate of return. Therefore, due consideration should always be afforded to prevailing economic factors including the risk free rate of return, general demand / supply of capital, stock and money market conditions and the like.

Although market returns fluctuate on a daily basis, investor expectations are typically influenced by the long term historic return in the public equity markets, both in absolute terms and in relation to returns on risk free investments.

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Capital Structure

The theory of capital structure

Capital structure has been the subject of considerable debate over the past many years. Like the cost of capital, the determination of an appropriate capital structure for any given company is complex and subjective. What's more, the degree of complexity has increased over the past few years with the introduction of innovative financing alternatives such as mezzanine financing instruments and derivative securities. For simplicity, this paper restricts the capital structure discussion to the basic trade-off between debt and equity.

The traditional view holds that there is an optimal capital structure for any company. Accordingly, an unleveraged firm can increase its total value (known as 'enterprise value') by employing an appropriate amount of debt in its capital structure. Mathematically, this can be expressed as follows⁴:

$$V_L = V_U + (T \times D)$$

Where:

- V_L = the value of a leveraged firm;
- V_U = the value of an unleveraged firm;
- T = the marginal corporate income tax rate; and
- D = the dollar amount of interest bearing debt.

An example can be used to illustrate this point. Assume that a company generates \$5 million per year in earnings before interest and taxes (EBIT), and that EBIT approximates pretax operating cash flow net of sustaining capital. Further assume that the company's income tax rate is 40% and an appropriate return on unleveraged equity (i.e. a debt-free capital structure) is 12%. The value of that company would be determined as:

EBIT (operating cash flow)	\$5,000,000
Less: interest expense	<u>\$0</u>
Equals: income before taxes	\$5,000,000
Less: income taxes at 40%	<u>\$2,000,000</u>
Equals: unleveraged net income (discretionary cash flow)	\$3,000,000
Divided by: unleveraged return on equity	12%
Equals: value of unleveraged business	<u>\$25,000,000</u>

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If it is assumed that the business can employ \$10 million of debt bearing an 8% interest rate in its capital structure, then the value of the company would increase to \$29 million. That is, using the formula presented above:

$$V_U (\$25,000,000) + T (40\%) \times D (\$10,000,000) = V_L (\$29,000,000)$$

The \$29 million represents the company's enterprise value. That is, the total value of its debt and equity components. The value of the equity in the business is equal to \$19 million, being the enterprise value of \$29 million less the value of the debt component of \$10 million. However, the implicit return on the (now leveraged) equity is no longer 12%. Rather, the rate has increased due to the additional risk as a result of employing financial leverage. The return on leveraged equity becomes 13.26%, illustrated as follows:

EBIT (operating cash flow)	\$5,000,000
Less: interest expense (8% x \$10 million)	<u>\$800,000</u>
Equals: income before taxes	\$4,200,000
Less: income taxes at 40%	<u>\$1,680,000</u>
Equals: leveraged net income (discretionary cash flow)	<u>\$2,520,000</u>
Value of leveraged business, above	\$29,000,000
Less: debt	<u>\$10,000,000</u>
Equals: value of equity	<u>\$19,000,000</u>
Implicit return on equity	<u>13.26%</u>

The return on leveraged equity can either be determined as leveraged net income (discretionary cash flow) divided by the value of equity, i.e.:

$$\$2,520,000 / \$19,000,000 = 13.26\%$$

Alternatively, the return on leveraged equity can be determined pursuant to the following formula:

$$\begin{aligned} K_L &= K_U + [(K_U - K_D) \times (1-T) \times (D/E)] \\ &= 12\% + [(12\% - 8\%) \times (1-40\%) \times (\$10,000,000 / \$19,000,000)] \\ &= 13.26\% \end{aligned}$$

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Where: K_L = the cost of leveraged equity;
 K_U = the cost of unleveraged equity (12%);
 K_D = the cost of debt (8%);
 T = the corporate tax rate (40%); and
 D/E = the ratio of interest bearing debt to equity at market rates.

Note that where the discount / capitalization rate represents a leveraged return on equity, it should be applied to discretionary cash flows computed net of an 'appropriate' level of interest expense (net of tax). The resulting value represents the value of the company's equity only (since debt has already been accounted for) subject to any further adjustments for the value of existing tax pools, redundant assets and, where applicable, a notional debt adjustment to derive 'appropriate' interest expense.

Weighted average cost of capital

The weighted average cost of capital (WACC) is a finance concept that reflects the blended cost of funds to a particular company. It is a function of the relative value of debt and equity financing and the respective cost thereof. In summary, the WACC is determined as:

$$WACC = K_D \times W_D + K_E \times W_E$$

Where: K_D = the after tax cost of debt;
 W_D = the relative weight of debt [i.e. debt / (debt + equity)];
 K_E = the cost of leveraged equity; and
 W_E = the relative weight of equity [i.e. equity / (debt + equity)].

In the example presented above the company's WACC would be determined as:

$$K_D [8\% \times (1-40\%)] \times W_D [\$10M/\$29M] + K_E (13.26\%) \times W_E [\$19M/\$29M] \\ = 10.34\%$$

Note that the cost of debt is the after tax cost thereof since interest expense is tax deductible. The WACC formula assumes that interest expense is fully deductible. In addition, the cost of equity is the cost of leveraged equity, reflecting both operating and financial risk. Further, note that the relative weights for both debt and equity are based on market values and not book values. Alternatively, the derivation of WACC can be simplified by applying the following formula:

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

Where: K_U = the cost of unleveraged equity;
 T = the corporate income tax rate; and
 $D/(D+E)$ = the proportion of debt used in a company's capital structure,
i.e. the ratio of debt to debt plus equity, at market rates.

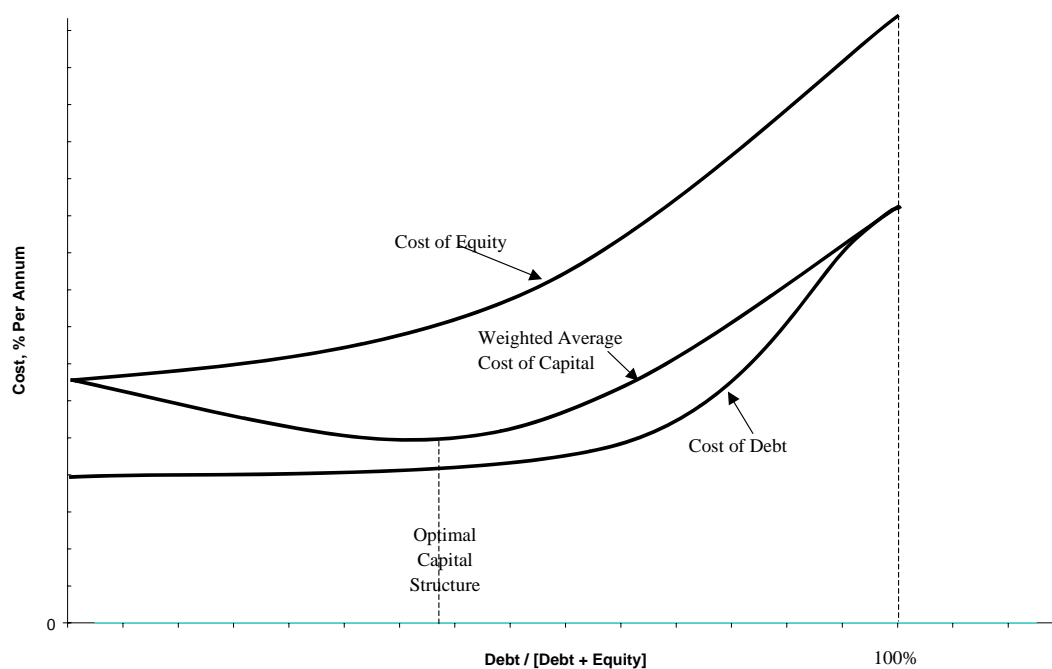
As a result, it is not necessary to estimate the cost of debt directly. Rather, the cost of debt is implicitly considered in the debt to equity ratio. Furthermore, this formula by-passes the interim step of calculating the cost of leveraged equity. The impact of leverage is effectively incorporated in the equation.

In the end, WACC represents the ratio of unleveraged net income (discretionary cash flow) to enterprise value, i.e. $\$3,000,000 / \$29,000,000 = 10.34\%$. Therefore, the enterprise value of the company can be determined by dividing the unleveraged net income (discretionary cash flow) into the WACC, i.e. $\$3,000,000 / 10.34\% = \$29,000,000$. The enterprise value would also take into account the value of existing tax pools and redundant assets, where applicable. The value of the company's equity is then determined by deducting the amount of existing interest bearing debt from the enterprise value.

In theory, the value of a company (and shareholder equity) is maximized where WACC is minimized. Graphically, this concept is illustrated as follows:

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As the use of debt increases, a firm's WACC decreases which, in turn, increases the firm's total value. However, as a company increases its leverage, its cost of equity and its cost of debt both increase because of the increase in financial risk. Beyond some point – which determines the optimal capital structure, the increase in the cost of equity capital more than offsets the savings resulting from substituting debt for equity. As a result, the determination of the 'appropriate' amount of debt is the essence of the capital structure decision.

Estimating an appropriate capital structure

Regardless of whether or how much debt is actually employed in the capital structure of a target company, an assessment of an appropriate capital structure for that company should be made. This is because corporate purchasers will normally reflect in their bid prices the ability to lever the underlying assets and cash flows of the target firm. In the context of capital structure, debt is defined to include interest bearing debt and equivalent, including short term operating loans, long term debt, capital leases and interest free loans from related parties.

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An important distinction should be made at this point. It is the appropriate capital structure for the target company, and not the acquirer that should first be evaluated. Where the acquirer has a significantly different (presumably more efficient) capital structure, that benefit should be separately considered as an element of post-acquisition synergies. As previously noted, the segregation of intrinsic value and post-acquisition synergies allows a more comprehensive analysis of each component and can assist in developing an appropriate pricing strategy.

In practice, there are no hard and fast rules for the determination of an appropriate capital structure. Due to the imprecise nature of the calculations and the ongoing volatility in the financial markets, most companies tend to define an appropriate capital structure in terms of a range of debt to equity. As a practical matter, most companies do not employ debt to their maximum capacity because managers want some reserve against contingencies.

Determining an appropriate range of debt to employ in the company's capital structure should take into account factors regarding the industry, the economy and the company itself. This might include, but would not be limited to, the following considerations:

- the quantum and nature of the company's underlying net tangible assets. Traditional asset-based lenders typically work on pre-determined lending ratios such as 75% of quality accounts receivable under 90 days;
- the estimated level of maintainable unleveraged cash flows and volatility thereof. Cash is required to make both interest and principal repayments. Generally, the use of debt decreases as cash flow volatility increases;
- the nature of the industry. Companies in non-cyclical industries generally have a greater level of debt capacity than do companies with greater susceptibility to economic cycles;
- the current and prospective cost of debt, both in terms of absolute amounts and in relation to the unleveraged cost of equity;
- the structure of the debt. Finance research has found that the optimal amount of leverage depends upon debt maturity and is markedly lower when the firm is financed by shorter term debt⁵;

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- the marginal corporate income tax rates. Since interest is tax deductible, companies with higher tax rates receive a greater overall benefit from the use of debt;
- the extent of investment opportunities. Companies with high growth potential tend to avoid contracting debt that might inhibit their ability to make investments⁶;
- existing banking agreements and debt covenants;
- the amount of leverage used in so-called 'comparable' public companies. As subsequently explained, truly 'comparable' companies seldom exist and any such analysis should be approached with caution. However, an analysis of similar publicly held companies in the same industry as the target firm might provide some indication as to 'normal' debt levels for a given industry; and
- where the target company is public, there may be other indications such as the reviews of debt rating agencies, comments by stock market analysts, and the level of investment banker interest in placing new debt.

Discount Rate Determination

As noted above, a discount rate is a rate of return used to convert a series of projected cash flows into a present value. The discount rate is applied to the discretionary cash flows projected for the forecast period utilized in a discounted cash flow valuation methodology – as contrasted to the terminal value component of that methodology which uses a 'capitalization rate'. Although the discount rate can either be a leveraged return on equity applied to discretionary cash flows net of after tax interest expense, a more practical approach is to derive the discount rate as a weighted average cost of capital and apply it to discretionary cash flows before interest expense.

Regardless of which methodology is chosen, the discount rate should reflect the risks of achieving the projected cash flows. As explained above in the section 'Underlying Principles', the discount rate should be derived through an assessment of the target company's operating risks (i.e. an unleveraged rate of return), followed by a financing (leveraging) adjustment.

In what is commonly referred to as a 'build-up' approach, the unleveraged discount rate is comprised of three principal components:

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- a base rate of return for equity investments;
- adjustments to the base rate of return related to the target company; and
- in some cases, a further adjustment for post-acquisition operating synergies that have not otherwise been incorporated into the projected discretionary cash flows.

Base rate of return

The base rate of return is the starting point for discount rate determination. The underlying factors effectively take into account prevailing economic conditions and market rates of return, which are always important to consider in any corporate acquisition exercise. Either implicitly or explicitly, the base rate of return should consider:

- prevailing risk free rates of return;
- an appropriate premium for an equity investment in general terms; and
- the underlying assumptions and basis upon which the discount rate is to be applied.

The risk free rate of return is generally interpreted as the yield on long term government bonds, which is consistent with the normal holding period of a corporate acquisition. However, long term bonds typically include a premium to reflect the risk that long term inflation will be greater than anticipated which will result in an erosion of real returns over the hold period, or price risk if the bonds are disposed of prior to maturity. Where it is likely that a business will be able to pass on the impact of inflationary costs to its customers over the long term, that business is not subject to inflationary risk. As a result, the risk free rate may be better represented by the rate on short term treasury bills.

The premium for an equity investment in general terms is typically defined as the excess of market rates of return over the risk free rate. In the U.S., the equity risk premium for public stocks is generally regarded as being between 4% and 6% over the long term⁷. Although Canadian data is not as extensive, return premiums appear to approximate those experienced in the U.S.⁸

The obvious advantage in using stock market data is that it reflects investor expectations, which are ultimately a concern for corporate acquirers, particularly those who are themselves publicly held companies. However, stock market premium data represents returns that are usually

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indicative of minority interest holdings in a diversified, liquid portfolio. In comparison to the market for corporate acquisitions, the following important differences might arise;

- minority shareholders are typically not in a position to influence control of a company, and publicly held stocks may trade at a discount as a result. Some practitioners advocate a 'control premium' in the order of 40% based on the average experienced in open market transactions involving publicly held companies⁹. However, the range of control premiums paid in the open market varies significantly. What's more, this data is distorted through the inability to segregate post-acquisition synergies from the purchase price and the fact that it pertains only to takeover transactions in circumstances where every public company is not 'taken over'. In the end, the quantification of a minority discount or premium for control is a subjective and fact-specific exercise;
- the acquisition of a specific company, particularly a company that operates in a single industry, lacks diversification. In theory, the average return on a particular investment should be greater than the return on the market as a whole, as a result of this lack of diversification. However, the quantification of this risk premium is highly subjective; and
- the acquisition of control in a company (whether public or private) usually constitutes a less marketable investment than what is implied in stock market data comprised of small minority interest trading. Corporate acquirers generally make such purchases with long term objectives in mind. As a result, the buyer cannot readily dispose of the acquired company if operating results fall short of expectations or the acquirer has a change in strategy (at least not without undue cost). There is currently some debate over whether marketability discounts should be applied to controlling interests. Some practitioners have suggested that a discount be applied to reflect time to sell, the risk of not selling and the costs involved¹⁰. Some studies have suggested discounts for lack of marketability in the order of 35% from the 'en bloc' value of a business otherwise determined¹¹. Others advocate that no discount for lack of marketability of controlling interests should be applied¹².

Finally, another issue that arises in adding a market risk premium to the risk free rate of return is the inherent inconsistency between the two rates. Specifically, interest income earned by a corporation on a risk-free investment is generally taxed at the top marginal corporate income tax rate (ignoring the integration rules in the Canadian Income Tax Act which apply to Canadian Controlled Private Corporations). Conversely, the market risk premium represents an after tax rate of return (i.e. after income taxes at the corporate level).

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To avoid the complexities of applying public market data and possible adjustments thereto, most corporate acquirers use target 'threshold' or 'hurdle' rates of return as their starting point. These rates most often incorporate both the prevailing risk free rate of return and a premium for equity investments. Corporate threshold rates of return are generally stable over the medium term, but may be adjusted for significant structural changes in economic factors (e.g. a large increase in inflation) or in the acquirers' industry (e.g. a dramatic change in the competitive landscape). Current practice on the derivation and application of corporate 'threshold' rates is addressed in the section 'Empirical Evidence in Canada'.

Irrespective of how the base rate is determined, again it is important that the underlying assumptions used in its derivation be consistent with the assumptions used in deriving the cash flows to which the discount rate will be applied. For example, where inflation has been excluded from the projections, it should also be deducted from the discount rate. The base rate should also consider the degree of optimism incorporated in the projections. A forecast prepared under optimistic assumptions is inherently subject to greater risk, which should be reflected in the discount rate.

Company specific risk factors

Every company faces a unique set of risks and opportunities. Where the projected cash flows or base discount rate do not fully reflect these risks, an adjustment should be made to the base rate of return. Upward or downward adjustments can result from either or both external (industry-specific) and internal (company-specific) factors. Among others, external risk factors include:

- susceptibility to general economic conditions. This can be viewed in terms of industry cyclicality and the number of bankruptcies normally experienced in the industry during economic downturns;
- the political environment. Where government intervention or control are featured in a particular industry, investors normally require greater returns to compensate for the risks and costs involved. Conversely, where said control effectively restricts competition, that factor may lead to a reduced level of risk for the industry as a whole;
- the concentration and stability of the industry's customers. Where there are a few buyers who account for a sizable portion of the market for any particular product or service, those buyers might be in a position to squeeze the margins of their suppliers. Furthermore, the suppliers as a whole are more susceptible to the failure of a major buyer;

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- the availability and stability of key inputs, such as raw materials, skilled labour, etc. Where limited sources of raw material supply are available, this affords suppliers greater bargaining power. Where key inputs have a high degree of price instability (e.g. certain commodities), there is a risk of erratic fluctuations in cash flows. Further, where the processing element of the goods produced or services provided relies on skilled labour, its availability of supply is a concern;
- size and number of competitors, including the ease of entry into the industry and substitute products. Industries characterized by highly fragmented competition are typically less risky than those dominated by one or more major corporations that have significant market clout;
- the impact of technological change. In certain industries, companies risk being 'leap-frogged' by competitors based on technological developments. As a result, most companies in such industries face increased uncertainty regarding their medium and long term cash flow prospects; and
- the rate of growth in the industry. An industry experiencing growth in demand for its products or services may allow competitors to increase their sales and profitability without relying on taking market share. Conversely, a mature or declining industry typically requires competitors to take market share in order to grow, which often increases the risk of price wars and reduced margins.

Company-specific internal risk factors to consider, among others, include:

- company size, both in absolute terms and in relation to other companies in the industry. Smaller companies generally have less market impact, less management depth, greater customer dependence, etc., all of which increases their level of risk;
- management depth and dependence on specific managers or other key personnel for business continuity. This is often the case in closely-held companies. Where adjusted for as part of the 'size' factor, such risks should not be double-counted;
- the nature and propriety of products and services offered. Where a company's products are protected by patent, or have strong brand name recognition, its risk is effectively diminished. Consideration should also be afforded to the diversification of the product line and stage of the life cycle that the products are in;

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- the market(s) serviced by the company, including geographic diversification, market niches and important demographic and psychographic trends;
- the business' research and development expertise and its traditional success with new product introductions;
- the capacity and condition of plant and operational facilities;
- marketing strengths, including distribution systems, market intelligence, etc.;
- skill and knowledge of the company's labour force, including degree of employee turnover and important provisions of any collective bargaining agreements;
- operating cost structure, including the degree of operating leverage (fixed costs) and whether the business is capital or labour intensive;
- whether the company is dependent on one or more key customers for a large portion of its revenues, and if so, the terms and conditions of any agreements with those customers;
- historical operating results & projections. Where a business has demonstrated a pattern of improved operating profits and cash flows, it is likely less risky than a company whose historical performance has been erratic; and
- underlying net tangible assets. All other things being equal, the level of risk declines with an increase in the quantum of net tangible assets.

Before making an adjustment for external or internal risk factors, it is important to understand the basis and underlying assumptions upon which the cash flow projection and base rate of return were prepared. Where certain risks are effectively incorporated in the cash flow projection (for example, the cost of compliance with anticipated changes in government regulations), those same risks should not be factored into the discount rate as a separate component. Further, where the acquirer employs a threshold rate that effectively incorporates the risks of its particular industry and the target company is within the same industry, many, and perhaps all, of the external risk factors will not have to be adjusted for separately.

Post-acquisition synergies

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There are two basic types of post-acquisition synergies from an operating standpoint:

- those that can be segregated and reasonably quantified. Examples include administrative headcount reductions, consolidation of facilities and revenue generation activities through effective cross-selling; and
- those that cannot be segregated and reasonably quantified. These synergies normally relate to overall operating risk reduction or long term growth opportunities. For example, an acquirer may deem a target company to be of strategic importance due to the target's ability to provide the acquirer with geographic diversification, or due to proprietary technological developments held by the target firm which might be applicable to other products of the acquirer.

Where post-acquisition synergies can be segregated and reasonably quantified, they should be valued separately. The value determined should be a function of the net incremental cash flows the acquirer anticipates to generate, the risk in achieving those cash flows, and the quantum of those benefits the acquirer believes it must 'pay for' in order to complete the transaction.

Those synergies pertaining to operating risk reduction or incremental growth opportunities should be quantified through a reduction in the discount rate. Effectively, this means that the acquirer believes there is a reduced level of risk in achieving the projected cash flows of the target company. The quantum of discount rate reduction will be a function of the reduction in the level of risk and the amount of those synergies the acquirer believes it must 'pay for' in order to consummate the transaction. Ideally, the value of the target company should be determined including and excluding a discount rate reduction for non-quantifiable synergies to assess the reasonableness of the value assigned thereto and the portion of the 'price' attributable to those benefits.

If additional post-acquisition synergies are available pursuant to a more efficient capital structure, this represents a change in the level of financial risk. Synergies related to financial risk should be evaluated separately after any adjustment for leverage (based on an appropriate capital structure for the target company) has been made.

Interpreting the result

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The discount rate determined pursuant to the above 'build-up' methodology should be reflective of an appropriate rate of return on the projected discretionary cash flows of the target company (calculated before interest expense), given the risks and underlying assumptions therein. If the rate is to be applied to projected accounting earnings (which is not recommended), a further adjustment to the discount rate may be necessary to effectively convert the cash flow discount rate to an earnings discount rate. This results in an increase in the discount rate where accounting earnings are greater than discretionary cash flows.

After determining the unleveraged discount rate, the implications of financial risk should be incorporated. This normally entails calculating the WACC based on an 'appropriate' capital structure, which is simpler than calculating the leveraged return on equity and adjusting prospective discretionary cash flows for an 'appropriate' amount of interest expense net of tax.

The discount rate as derived herein represents a 'year-end' rate. If the discretionary cash flows of the target company are expected to accrue more or less evenly throughout the year, it may be appropriate to adjust the exponential factor to reflect mid-year rates.

Capitalization Rate Determination

As noted above, a capitalization rate is derived by deducting a growth factor from (or adding a risk adjustment to) the unleveraged discount rate. The capitalization rate is applied in a discounted cash flow valuation methodology to determine the terminal value component or is applied to 'maintainable' discretionary cash flow in a capitalization of cash flow valuation methodology. Depending on fact-specific circumstances, the growth factor appropriately may include one or more of the following components, each of which is discussed below:

- an inflation adjustment;
- a real growth rate; and
- in some cases, a terminal value risk premium or discount to reflect fact-specific time related business and industry risk.

It is important to note that any adjustments are applied to the unleveraged discount rate and not the leveraged return on equity or WACC. The impact of growth and, where applicable, incremental risk, should relate to the operating cash flows of the business and accrue to the

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equity owners, not the debt holders. Therefore, the capitalization rate should first be derived as an unleveraged rate of return followed by an appropriate adjustment to reflect the impact of financial risk.

Inflation adjustment

Where the unleveraged discount rate is a nominal rate of return, inflation should be deducted therefrom. The nominal unleveraged discount rate less the inflation component is termed the 'real' unleveraged discount rate. If the discount rate was originally derived as a real rate of return (applied to a cash flow projection that excludes inflation), then no further adjustment is necessary.

The deduction for inflation implicitly assumes that over the long run, the target company will be able to pass along inflationary cost increases to its customers. The definition of inflation used should be consistent with the underlying assumptions used in the derivation of the discount rate. That is, where a short term risk free rate of return was used, inflation should be a current rate. Conversely, where a long term government bond or corporate threshold rate of return was used, the deduction for inflation should be reflective of expected longer term rates.

Real growth

The real rate of growth does not include growth due to inflation but rather due to sustained increases in the level of discretionary cash flows. The real growth rate should represent a long term geometric average growth rate. Therefore, a balanced and objective assessment as to the reasonableness of sustaining the real rate of growth over the long term is essential, and should take into account factors such as available operating capacity, industry cyclicality and the working capital and fixed asset requirements to generate that growth. Although a business may be able to leverage its fixed cost base and experience favourable cash flow growth in the near term, over the long term most costs are variable and incremental investment in fixed cost infrastructure becomes necessary.

As the real rate of growth approaches the real unleveraged discount rate, thereby generating a lower capitalization rate, the resulting capitalized cash flow becomes increasingly sensitive to small variations in the capitalization rate. Since the terminal value calculation in a discounted cash flow methodology frequently accounts for a large portion of the total value (often 75% or more), the real growth assumption (if any) plays a critical role in the valuation conclusion.

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Where real growth is expected to be high in the near and medium term (say 4% per annum or greater), the forecast period should be extended to ensure that all costs involved in achieving that level of growth are accounted for. Ideally, the forecast period should be extended to a point beyond which perpetual real growth rates are more modest (say 3% or, preferably, less). From a theoretical standpoint, in the long run, total growth (including the real and nominal components) cannot depart too far from inflation plus population growth¹³ and that growth rate would only be applied in instances where it was believed a business would parallel such growth to perpetuity without incremental risk.

Finally, deducting real growth from the real discount rate must be done only following careful analysis and with caution. Because a capitalization rate effectively is an assumption of a fixed rate of return in perpetuity, in general, a real growth component should only be considered in circumstances of large long-established businesses that are not believed susceptible to:

- significant technological change of either production facilities or products;
- materially altered future competitive pressures;
- changeable government regulation; and
- foreseeable developments in other non-controllable factors which would erode growth in discretionary cash flows.

Because none of these things are entirely predictable, as a general rule, real growth should only be reflected in capitalization rates where the forecast period is short (in the case of a discounted cash flow valuation methodology) or non-existent (in the case of a capitalization of cash flow valuation methodology).

Risk adjustment

The degree of uncertainty in a cash flow projection typically increases over time. Where the discretionary cash flows in a terminal value calculation are significantly riskier (or less risky) than those in the forecast period, a further upward (downward) adjustment to the unleveraged capitalization rate may be appropriate. For example, where a company has a license agreement to manufacture and distribute a product and said agreement terminates after the discount period and the likelihood of renewal is uncertain, an increase to the capitalization rate otherwise determined would likely be warranted.

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Other Approaches

In practice, corporate acquirers employ numerous approaches to determine the cost of capital to use in evaluating acquisition candidates, including variations to the build-up approach presented above. Other approaches include the Capital Asset Pricing Model, Comparative Analysis and Rules of Thumb.

The Capital Asset Pricing Model

Some practitioners and companies advocate the use of the Capital Asset Pricing Model (CAPM) to derive the discount rate. CAPM is a basic theory that relates risk and return for any asset. It is based on the concept that the required rate of return for an asset is directly related to the riskiness of the asset, as measured in terms of relative volatility.

The basic CAPM formula is as follows:

$$R_e = R_f + B (R_m - R_f)$$

Where: R_e is the rate of return on equity for a particular company;
 R_f is the risk free rate;
 B is beta, a measure of stock price volatility relative to the overall market; and
 R_m is the long term rate of return of the equity market.

The CAPM formula is essentially a variation of the build-up methodology discussed previously. That is, an equity risk premium is added to the risk free rate. However, in the case of CAPM, most industry risk factors are assumed to be incorporated through the use of the Beta factor. The Beta factor used typically represents an average of the Betas of so-called 'comparable' companies which are published in stock market reports.

Discount rates derived through the application of CAPM are net of debt values. That is, the Beta factor reflects the financial risk of the companies that were used in its derivation. Therefore, to obtain an unleveraged discount rate, the following adjustment is required to the Beta factor of each so called 'comparable' company that is used:¹⁴

$$\text{Beta (unleveraged)} = \text{Beta (leveraged)} / [1 + (1-T) D/E]$$

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Where: T is the corporate income tax rate; and
D/E is the market value of interest bearing debt to equity.

A detailed discussion of the applications and restrictions on the use of CAPM is beyond the scope of this paper. However, corporate acquirers who do employ the CAPM methodology in their determination of cost of capital for acquisitions should be wary of the following caveats:

- CAPM is principally a tool used by analysts of public company securities to compare near-term trading prices of those securities. It is dependent upon acceptance of the proposition of the 'efficient market theory'. This is questionably applied to full 'due diligence' private market or non-hostile bid public market transactions;
- CAPM makes certain restrictive assumptions, such as the assumption that an investor can avoid unsystematic (company-specific) risk by holding a diversified portfolio. This is not the case when a specific company is being valued. Therefore, additional risk factors might have to be incorporated;
- since market data is used, CAPM values are typically indicative of liquid minority interest trading. This may be quite different than a control position taken in a business from a long term perspective;
- the identification of so-called 'comparable' companies entails considerable judgement and must be approached with caution. In practice, truly comparable companies seldom exist, and each company faces a unique set of risks and opportunities which should be duly considered;
- the population of public 'comparable' companies is not as extensive in Canada as it is in the U.S. Although U.S. data might be considered, there are important differences between the two markets (such as tax rates, legislation, market size, etc.) which cannot be readily dismissed; and
- where the target company is a privately held firm, the discount rate derived pursuant to the CAPM may not be appropriate due to important differences between publicly held and privately held companies in general.

Comparable data

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Discount and / or capitalization rates are derived by some corporate acquirers through an analysis of public equity market data or transactions involving other companies in the industry.

Rates derived from public equity market analysis are commonly based on ratios such as price / earnings and price / cash flow. The inverse of these rates is the capitalization rate implicit in the valuation of the public company's stock price. As noted above, the capitalization rate represents the discount rate adjusted for growth and risk. However, the underlying components cannot be readily segregated.

It is seldom possible to meaningfully apply capitalization rates derived in public equity market analysis to a corporate acquisition scenario. These rates typically represent freely traded minority interests and are not reflective of a corporate acquisition scenario. In addition, public equity market data is subject to erratic fluctuations and are often influenced by limited amounts of information and high levels of speculation. Finally, where the target company is privately held, it must be recognized that there are important differences between the market for control of a privately held company and minority interest trading of a publicly held company. As a result, public equity market analysis is generally even less appropriate where the target company is privately held.

This is not to suggest that public market multiples are entirely irrelevant. As a general rule, at any given point in time public equity markets record public expectations of both general economic and specific industry conditions through broad and industry specific market indices. These general indications are important benchmarks in developing and assessing the cost of capital used in the acquisition of target companies. However, the real value or takeover value of the shares of any particular company traded on public markets may be significantly different (either higher or lower) from the price at which they trade at a given point in time.

Obviously, where the target company is a publicly held company itself, its stock price is an important consideration in setting a final acquisition price. However, the unconsidered application of multiples of companies in the same industry as the target organization for the purpose of deriving an ultimate price is typically a fruitless exercise and may even generate misleading results.

Some corporate acquirers base their discount and capitalization rates on an analysis of the implied returns in open market transactions involving similar companies (e.g. the target company's historical operating results divided by the price paid). However, the data accumulated from one or more open market transactions can seldom be meaningfully applied to any particular

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acquisition candidate. This is because, in the absence of direct involvement with the acquisition, it is not possible to assess key variables which may have had a significant impact on the price paid. This may include the negotiating strength of the buyer and seller, anticipated synergies, and important information about the target company which might only be available through due diligence.

Nonetheless, an analysis of industry transactions is important in understanding the demand for corporations in the industry, the most likely acquirers, and in estimating the price that competitors may bid for a particular acquisition candidate.

Rules of thumb

In practice, many corporate acquirers apply rules of thumb as a secondary technique to test valuation conclusions derived by other methodologies (such as discounted cash flow). Where used, rules of thumb are commonly based on some multiple of revenues or a multiple of earnings before interest and taxes (EBIT) or earnings before interest, taxes, depreciation and amortization (EBIT-DA).

Corporate acquirers that employ rules of thumb in their acquisition analysis should assess the implicit rate of return contained therein. In addition, it is important to understand the underlying assumptions incorporated in the rule of thumb. For example:

- does the value derived through the application of a rule of thumb represent the stand-alone value of the target business, or does it incorporate expected synergies;
- when and on what basis was the rule of thumb derived? Have there been structural changes to the industry or economy in the interim period which would render its application obsolete (e.g. industry consolidation or a significant decrease in inflation);
- does the resultant value derived through application of the rule of thumb represent a price for the shares or the underlying net assets of the target company; and
- is the rule of thumb applicable to target companies of all sizes or only those within a certain size range.

The application of rules of thumb should be restricted to assessing value conclusions derived from a cash based valuation approach. Every situation is unique and the use of rules of thumb

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without regard to the specifics of the target company might important fact-specific considerations such as:

- an exceptionally high or low level of net tangible assets;
- redundant assets held in a business;
- available tax losses or tax credits; and
- unique risks or opportunities faced by a particular target company.

Empirical Evidence in Canada

Campbell Valuation Partners Limited has recently undertaken a survey of Canadian acquirers with respect to the approaches they apply in the acquisition of privately held Canadian companies. At the time of writing, the survey is nearing completion. Some of the findings to date are as follows:

- transactions involving privately held companies are more often share deals than a purchase of the underlying net assets, although the difference is not significant. Payment terms are typically all cash, with share for share exchanges being next most common. Vendor take-backs and earn-outs are not frequently used;
- the discounted cash flow approach is by far the preferred valuation methodology. This is consistent with findings in the U.S. and Europe¹⁵. Those using the discounted cash flow approach typically have a discount period of 5 to 10 years;
- most corporate acquirers express their objectives in terms of an internal rate of return, typically after tax. Objectives stated in terms of a weighted average cost of capital or return on investment were also frequently cited. Several companies have a stated payback period as either a primary or secondary target;
- the target rates of return (IRR, WACC, ROI, etc.) are most commonly derived based on established corporate objectives (i.e. 'threshold' or 'hurdle' rates of return);

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- corporate acquirers are fairly evenly split between the use of real versus nominal rates of return. Many commented that this is not a major issue for them given that inflation rates are presently low;
- most companies who use nominal rates of return properly deduct the inflation component therefrom in determining the capitalization rate. Most companies do not incorporate a real growth factor in their capitalization rate figure;
- according to the data provided, most corporate acquirers currently adopt real unleveraged discount rates in the range of 10% to 15%;
- of those companies who used rules of thumb, a multiple of EBIT-DA was most common. Virtually all corporate acquirers using rules of thumb applied that methodology as a test approach against the conclusions derived from other approaches, such as discounted cash flows;
- most corporate acquirers do consider post-acquisition synergies in their valuation / pricing analysis, however the extent to which they are factored into the calculations varies considerably. Few companies incorporate most or all of the anticipated post-acquisition synergies, thereby effectively probabalizing their outcome;
- those corporate acquirers who incorporate a portion of the post-acquisition synergies into their valuation / pricing calculations typically use the same rate of return as that used in evaluating the target company's intrinsic cash flows (since the synergies are usually probablized); and
- most companies take into account the dilutive impact of the acquisition on their prospective net income stream, i.e. from the amortization of post-acquisition goodwill.

As a general observation, there is a wide variation in the acquisition practices employed by Canadian corporate acquirers, even for those in the same industry. This is to be expected. However, based on the findings of this survey, it would appear that many corporate acquirers do not have a firm grasp of the implicit assumptions underlying the derivation of their 'threshold' or 'hurdle' rates of return (e.g. whether or not inflation is included). Unfortunately, this may result in the misapplication of these rates, and potentially lead to either overpaying for corporate acquisitions or missing out on acquisition opportunities.

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Canadian and U.S. Differences

The underlying principles for determining the cost of capital as presented herein apply equally in the U.S., and for that matter, throughout the world. Campbell Valuation Partners Limited has not surveyed U.S. corporate acquirers to determine the approach they apply in their acquisitions. However, a U.S. survey of the practices used by U.S. appraisers and financial managers¹⁶ in the valuation of closely-held businesses found that:

- members of the American Society of Appraisers normally utilize the present value of cash flow after salary before interest and taxes and a multiple of income after salary before interest and taxes as the first and second choice valuation technique, respectively. By contrast, members of the Financial Management Association and accountants selected comparable firms as their first choice of a practical valuation method. Secondary choices from this group included techniques based on cash flows and book values;
- the risk free rate of interest plus risk premium is most often used for the discount / capitalization rate. Treasury bonds are the first choice as the proxy for the risk-free rate;
- the risk premium is normally determined by some proxy for the Beta value times the estimate of the market risk premium (i.e. CAPM). Beta estimates are based on comparable firm data, and the market risk premium from 'Stocks, Bonds, Bills and Inflation' published by Ibbotson Associates; and
- the lack of an active market for closely held firms affects the valuation process. Discounts frequently are adopted for small size, non-marketability and minority interests.

Importantly, the results of this survey indicate the approaches undertaken primarily for notional market valuations, which may not be indicative of the practice followed in open market transactions. In addition, from a notional market standpoint, there are numerous differences between the U.S. and Canada which have an impact on the approach used. For example:

- there is a larger base of public market data from which to select so-called 'comparable' companies in the U.S. as compared with Canada and an apparent bias in the U.S. to believe applicable adjustments can be made to derive meaningful information from companies selected as 'comparable';

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- the use of 'comparable firm' data in notional valuation exercises in the U.S. is encouraged pursuant to IRS Revenue Ruling 59-60; and
- important economic and structural differences such as prevailing legislation and income tax rates.

In the end, we believe the qualifications noted herein pertaining to the use of 'comparable data' and the CAPM apply to both notional market valuations and open market transactions in both Canada and the U.S.

Summary

Many corporate acquisitions do not experience the level of success anticipated, and some are outright failures. To increase the likelihood of a successful acquisition, the purchaser should perform a thorough due diligence investigation of the target company and objectively assess the anticipated benefits of a contemplated transaction and the risks in achieving the projected cash flows.

In the end, the cost of capital applied in evaluating corporate acquisition candidates relies on experience and judgement. In any event, the corporate acquirer should observe the underlying principles of utilizing a discounted discretionary cash flow or capitalized discretionary cash flow approach, ensuring consistency in discount / capitalization rate application, recognizing the trade-off between risk and return, evaluating both operating and financial risk and considering market expectations. In addition, the corporate acquirer should understand the underlying assumptions and the basis by which both the cost of capital and projected cash flows were derived (and the required internal consistency between them) to ensure that an appropriate acquisition analysis and due diligence is undertaken.

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¹ Shannon Pratt, Cost of Capital – Estimation and Applications, John Wiley & Sons, 1998.

² Source: McKinsey & Company.

³ Berkshire Hathaway 1996 annual report.

⁴ F. Modigliani and M. Miller, The Cost of Capital, Corporation Finance, and the Theory of Investment, American Economic Review, June 1958.

⁵ H.E. Leland and K.B. Toft, Optimal Capital Structure, Endogenous Bankruptcy and the Term Structure of Credit Spreads, Journal of Finance, July 1996.

⁶ M.J. Barclay, C.W. Smith and R.L. Watts, The Determinants of Corporate Leverage and Dividend Policies, Journal of Applied Corporate Finance, Winter 1995.

⁷ David King, The Equity Risk Premium for Cost of Capital Studies, Business Valuation Review, September, 1994.

⁸ See, for example, the Report on Canadian Economic Statistics, published annually by the Canadian Institute of Actuaries.

⁹ The average premium over market price is typically in the range of 40%, as reported by MERGERSTAT Review.

¹⁰ J.B. Abrams, Discount for Lack of Marketability: A Theoretical Model, Business Valuation Review, September, 1994.

¹¹ See, for example, J.D. Emory, The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, Business Valuation Review, December 1995.

¹² C. Mercer, Should Marketability Discounts be Applied to Controlling Interests of Private Companies, Business Valuation Review, June 1994.

¹³ G. Gilbert, Discount Rates and Capitalization Rates – Where are We?, Business Valuation Review, December, 1990.

¹⁴ R. Hamada, Portfolio Analysis, Market Equilibrium, and Corporation Finance, The Journal of Finance, March, 1969

¹⁵ Maggie Mullen, Critical Valuation Issues in International Mergers and Acquisitions, Journal of Business Valuation, 1997.

¹⁶ W.P. Dukes, D. B. Oswald, A Comparison of Valuation Techniques for Closely Held Firms, Business Valuation Review, June 1993.