

# Issues in Estimating

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## The Cost of Equity Capital (Part I of II)

This is the first of a two-part series article focused on issues that arise estimating the cost of equity capital. In most forensic-related valuation analyses, one procedure that affects most valuations is the measurement of the present value discount rate. This discount rate analysis may affect the forensic-related valuation of private companies, business ownership interests, securities, and intangible assets. This discussion summarizes three models that analysts typically apply to estimate the cost of equity capital component of the present value discount rate: (1) the capital asset pricing model, (2) the modified capital asset pricing model, and (3) the build-up model. This discussion focuses on the cost of equity capital inputs that are often subject to a contrarian review in the forensic-related valuation.



### Introduction

There are three generally accepted business valuation approaches: (1) the Income Approach, (2) the Market Approach, and (3) the Asset-based Approach. Each generally accepted business valuation approach encompasses several generally accepted business valuation methods.

An analyst should consider all generally accepted business valuation approaches and select the approaches and methods best suited for the analysis. This discussion focuses on the estimation of the present value discount rate (discount rate) in the application of the Income Approach.

The general principle of the Income Approach is that the value of the subject interest is the present value of future economic benefits (typically, some measure of income) associated with the ownership or operation of the business interest. In order to calculate the present value of the expected future income, the analyst typically applies a discount rate.

By definition, the discount rate is a rate of return used to convert a future monetary sum into a present value.<sup>1</sup> The discount rate is often considered to be the opportunity cost of the investor.

In other words, the discount rate is the required rate of return to the investor for assuming the risk associated with a certain investment. The discount rate reflects prevailing market conditions as of the valuation date, as well as the specific risk characteristics of the subject business interest.

If the income available to the company's total invested capital is the selected financial metric, then the discount rate is typically measured as the weighted average cost of capital (WACC). Typically, the WACC is comprised of the after-tax cost of debt capital and after-tax cost of equity capital. This discussion focuses on the cost of equity capital component of the WACC.

The cost of debt capital component of the WACC is generally based on either of the following:

1. The effective interest rate that the subject company pays on its actual debt
2. An assumed interest rate commensurate with a benchmark corporate bond rate

The selection of the corporate bond rate should be informed by the risk profile of the subject company.

In other words, if a subject company has low growth prospects and low profit margins, its risk profile may be compared to a bond that is not at investment grade (rather than to an investment grade bond).

The cost of equity capital is typically estimated based on the application of several financial models. A description of all available models to estimate the cost of equity capital is beyond the scope of this discussion. This discussion focuses on three models that analysts often consider when developing a cost of equity capital:

1. The capital asset pricing model (CAPM)

2. The modified capital asset pricing model (MCAPM)
3. The build-up model (BUM)

These models are described in the remaining discussion.

## **Cost of Equity Capital Estimation**

Estimating a private company discount rate may be a challenging aspect of the business valuation. To estimate the cost of equity capital for a private company, the analyst should be prepared to analyze the risk related to the subject company. This analysis includes the consideration of risk-based adjustments for size, industry, impact of economic factors, and company-specific (i.e., unsystematic) risk factors, such as markets served, management depth, product/service mix, succession planning, and projected risk.

## **Capital Asset Pricing Model**

The CAPM is a frequently applied model to estimate the equity cost of capital for the publicly traded stock of a public company. The following discussion summarizes the basic components of the CAPM. This discussion also provides insight as to the underlying assumptions in the CAPM.

The CAPM is generally defined as follows:

A model in which the cost of capital for any stock or portfolio of stocks equals a risk-free rate plus a risk premium that is proportionate to the systematic risk of the stock or portfolio.<sup>2</sup>

Simply stated, the CAPM reflects the relationship between (1) the risk of an asset and (2) its expected return. CAPM was originally developed for the analysis of publicly traded marketable securities. As described below, analysts have modified the CAPM to estimate the cost of equity capital applicable to securities that do not trade in a public market.

The application of the CAPM provides for a direct correlation between the cost of equity capital and the risk associated with a particular investment. The CAPM considers two primary components of risk:

1. Systematic risk
2. Unsystematic risk

Systematic risk, also referred to as “market risk,” is the risk associated with investing in the market as a whole and that cannot be eliminated through diversification.

Within the CAPM analysis, the systematic risk component is affected by the application of the “beta” component. The beta component of the CAPM measures the subject interest’s sensitivity or correlation to the public equity market—typically measured by using a broad

equity index. This variable measures the amount of systematic risk, or market risk, for the subject security.

The CAPM equation is typically expressed as follows:

$$E(R_i) = R_f + \beta \times (ERP)$$

where:

$E(R_i)$	=	Expected return for an individual security ( $i$ )
$R_f$	=	Rate of return available on a risk-free security
$\beta$	=	Beta
$ERP$	=	Market-derived equity risk premium

The rate of return available on a risk-free security, or risk-free rate, reflects the minimum return that investors expect to receive from their investment, based on the expected rate of inflation and expectations of the real rate of interest. Analysts often use the yield on long-term U.S. Treasury bonds as a proxy for the risk-free rate.

The ERP is the rate of return an investor could expect over the risk-free rate by investing in a diversified market portfolio. This diversified market portfolio is assumed to be perfectly liquid and the same for all investors.

These components of the CAPM, in part, compensate the investor for the level of risk assumed by investing in a particular security. Because the risk of the security, as measured by the CAPM, is based on its relationship to a diversified portfolio, CAPM assumes that the unsystematic risks (i.e., company-specific risks), are diversified away. Therefore, in the CAPM, the investor is only compensated for the systematic risk.

This CAPM assumption is probably reasonable with respect to the valuation of a publicly traded security within a well-diversified portfolio of publicly traded securities.

### **Modified Capital Asset Pricing Model**

The CAPM assumes that the only component of risk that investors care about is the risk of the market (i.e., systematic). One method of adjusting the CAPM to make it applicable to the valuation of private company securities is to add an alpha factor.

The CAPM formula is typically modified to reflect the additional risk associated with:

1. The size of the subject company and
2. Company-specific risk factors.

These modifications result in the modified capital asset pricing model (MCAPM). The MCAPM incorporates these risk premiums in the quantification of a required rate of return.

The MCAPM formula is typically expressed as follows:

$$E(R_i) = R_f + \beta \times ERP + RPs \pm RPs$$

where:

- $E(R_i)$  = Expected return for an individual security ( $i$ )
- $R_f$  = Rate of return available on a risk-free security
- $\beta$  = Beta
- $ERP$  = Market-derived equity risk premium
- $RPs$  = Risk premium for small size
- $RPs$  = Risk premium attributable to other company-specific risk factors<sup>3</sup>

The MCPAM is applicable to the valuation of private companies and private company securities.

### Build-Up Model

A third model often applied to estimate a cost of equity capital in private company valuations is the BUM. In the BUM, a discount rate is estimated by adding the analyst's quantified assessments of the systematic and unsystematic risks associated with a business or interest. The BUM considers five basic elements in the estimation of the cost of equity capital.

The BUM formula is typically expressed as follows:

$$E(R_i) = R_f + ERP + RPs \pm RPi \pm RPs$$

where:

- $E(R_i)$  = Expected (market required) rate of return on security ( $i$ )
- $R_f$  = Rate of return available on a risk-free security
- $ERP$  = Market-derived equity risk premium
- $RPs$  = Risk premium related to size
- $RPi$  = Risk premium attributable to the specific industry
- $RPs$  = Risk premium attributable to the specific company<sup>4</sup>

The fourth component of the BUM is an industry risk premium, which is somewhat analogous to the beta coefficient component used in the CAPM or the MCPAM. This risk premium is added to account for industry-specific risks that are diversified away in the market-derived equity risk premium.

In other words, the subject company's industry may have a greater, or lesser, risk than the risk of the market and the industry risk premium is an adjustment to reflect the difference in risk.

The company-specific risk premium is meant to encompass risk not attributable to the market, industry, or size of a company. This premium is often referred to as the "unsystematic risk premium" or the "idiosyncratic risk premium."

Factors that are often encompassed by this risk premium include: the private company's product/service diversification, geographical diversification, age of company management, private company's history of success, as well as a myriad of other factors.

Notes:

1. Business Valuation Standards, American Society of Appraisers, 2009.
2. Shannon P. Pratt, *Valuing a Business: The Analysis and Appraisal of Closely Held Companies*, 5th ed. (New York: McGraw-Hill, 2008), 247.
3. *Ibid.*, 197.
4. *Ibid.*, 180.

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