

## Commercial Litigation Insights

## THE USE OF EMPIRICAL DATA TO ESTIMATE DISCOUNT RATES FOR BUSINESS VALUATION AND/OR ECONOMIC DAMAGES ANALYSIS

Craig A. Jacobson

*The selection of the discount rate can have a significant impact on the calculation of (1) lost business value, (2) lost profits, or (3) other measures of economic damages. Often, inexperienced analysts merely “plug in” empirical data into a cost of capital formula, without understanding the (1) inputs to and (2) framework of the discount rate calculation. Such a naive application of discount rate analysis methodology can lead to an incorrect and/or unsupportable discount rate calculation.*

### INTRODUCTION

The process of estimating the present value discount rate is a deceptively simple process. However, a small change in the discount rate can often have a significant impact on (1) the valuation conclusion (for a business valuation engagement) or (2) a lost profits calculation (for an economic damages engagement).

Accordingly, it is important for the analyst to:

1. use defensible and consistent cost of capital inputs in calculating the discount rate and
2. ensure that the discount rate estimated is consistent with the other variables concluded and with the other financial analyses performed in the engagement.

The most common discount rate calculation involves estimating the subject company weighted average cost of capital (or WACC). The WACC estimates both the cost of equity capital and the cost of debt capital to the subject company.

### VALUE OF INVESTED CAPITAL OR VALUE OF EQUITY ONLY?

One fundamental decision the analyst should make is whether a WACC calculation is the proper measure of the cost of capital to the subject company. In some cases, all

or part of the subject company debt may be considered an operating expense component, and not a financing expense component, of the subject company.

For example, let's consider the case of a company in the leasing industry. The company generally borrows money as an operating expense for its ongoing business (i.e., to finance its leases) rather than to fund capital expenditures (such as fixed asset purchases). Therefore, it may be appropriate to treat the company's interest expense as an operating expense—rather than as a financing expense.

The appropriate discount rate to use in such a situation may be the company's equity cost of capital. And, the appropriate measure of income and/or cash flow may be after interest expense. This is because the company's debt is considered to be an operating item. In such an instance, the cost of this debt reflects the risk inherent in the assets leased by the company's customers, and not the risk of an investment in the subject company.

*“The most common discount rate calculation involves estimating the subject weighted average cost of capital.”*

### EQUITY DISCOUNT RATE

The equity discount rate is one of two components of a weighted cost of capital (WACC) calculation, along with the debt discount rate. However, there is often more judgment involved in the calculation of the equity discount rate than there is in the calculation of the debt discount rate. This is true for several reasons:

1. there are numerous components to an equity discount rate calculation, whereas a debt discount rate estimate is comparatively simple;
2. it is not possible to “observe” the cost of equity based on current market transactions, as can be done with debt transactions in order to estimate the cost of debt; and
3. it is more difficult to estimate the risk to owners of equity; this is because the equity of any company is “last in line” of all stakeholders in the company.

## THE CAPM V. THE BUILDUP MODEL

The two most common models for calculating the equity discount rate are:

1. the capital asset pricing model (CAPM) and
2. the build-up model.

The basic definition of the CAPM indicates that the cost of equity capital is equal to:

1. a risk-free rate, plus
2. a measure of beta, representing the systematic risk of the underlying investment, times
3. the equity risk premium, which represents the increased risk of a general investment in equities over the risk-free rate.

The basic definition of the build-up model indicates that the cost of equity capital is equal to:

1. a risk-free rate, plus
2. the equity risk premium, plus
3. a size risk premium based on the size of the subject company, plus
4. a specific risk premium, or unsystematic risk premium, representing the additional risk of the subject investment not considered in the other components of the discount rate calculation.

Many valuation analysts calculate the cost of equity capital using a combination of the two above-mentioned models. This calculation is sometimes called the “modified CAPM” model. This model is essentially the same as the build-up model, except that the equity risk premium is multiplied by beta in order to consider industry-specific risk.

The estimates of the various components of any discount rate calculation are based on empirical data. These empirical data relate to observations of actual marketplace returns that are deemed to be similar (or most similar) to the subject risk component.

However, it is important for the analyst to consider whether, in the aggregate, the components of a discount rate calculation accurately reflect the risk of:

1. the underlying investment or
2. the subject economic benefit stream.

One procedure in calculating the equity discount rate is to estimate the equity discount rate using all of the components of the “modified CAPM” model with the exception of the unsystematic risk premium. The analyst may then use professional judgment to estimate whether the risk inherent in this preliminary discount rate calculation accurately reflects the risk of the valuation subject. If the analyst determines that there is a risk differential, then the analyst should estimate the unsystematic risk premium (which can be positive or negative) to account for this difference.

In performing a discount rate calculation, there is not an absolutely right or an absolutely wrong answer to any single input. Rather, it is important for the analyst to make sure that:

1. the different cost of capital components are consistent with each other<sup>1</sup> and
2. the discount rate calculated is consistent with the risk inherent in the subject economic benefits stream.

## THE EQUITY RISK PREMIUM

A common measure of the equity risk premium is the long-term difference between (1) the returns on large company equities less (2) the risk-free rate as published in *Stocks, Bonds, Bills, and Inflation*, an annual data source published by Ibbotson Associates. In recent years, some analysts have also used other empirical indications of the equity risk premium.

Many of these other measures of the equity risk premium have been lower than the equity risk premium data published by Ibbotson Associates as of the same date. A differential of one or two percent in the equity discount rate can have a significant impact on a business valuation conclusion or an economic damages estimate. However, as is the case with many valuation variables, there is no absolutely right or absolutely wrong answer to this question.

## BETA

There may be more controversy associated with the selection of the appropriate beta than with the selection of other discount rate components. The beta measures the relationship between:

1. the risk of the underlying economic benefit stream and
2. the risk inherent in an investment in the market in general.

The controversy generally relates to whether the underlying data used to estimate the beta is truly relevant to the subject entity.

### Selection of an Appropriate Benchmark

The first procedure in selecting a beta is to determine the appropriate benchmark. The two typical benchmarks are:

1. a beta measure for an industry that is considered to be comparative to the valuation subject or
2. the betas for individual guideline companies that are considered to be similar to the valuation subject.

For many valuation subjects, it is difficult to find the perfect industry measure or the perfect group of similar companies. In this case, the analyst should select a beta that, out of all of the available data, is most similar to the valuation subject. Then, the analyst should adjust for any differences through the application of an unsystematic risk premium.

*“ . . . the analyst should select a beta that, out of all of the available data, is most similar to the valuation subject.”*

### Levered Beta v. Unlevered Beta

The next procedure in selecting a beta is the decision of whether to use a levered beta or an unlevered beta. The proper selection of beta may depend on factors such as:

1. the purpose and objective of the valuation/damages assignment or
2. the nature of the subject company and/or the subject industry.

For example, let's consider a valuation performed as part of a solvency analysis. The first procedure in performing the solvency analysis is for the analyst to estimate the value of the company's total (tangible and intangible) assets. This analysis may involve the use of an unlevered beta, also known as an “asset beta.”

By using an unlevered beta in the discount rate calculation, the resulting value estimate will not be distorted by the financial risk in the subject company's capital structure. On the other hand, in performing a valuation of a noncontrol-

ling ownership interest in a closely held company, the beta (and capital structure) should reflect both:

1. the business risk of the valuation subject and
2. the financial risk of the valuation subject.

### Selection of the Appropriate Observation Period

Two important factors in the beta calculation are:

1. the number of years of returns that are used in the analysis and
2. the frequency of observations of the returns (i.e., daily, weekly, or monthly returns).

The most common beta measurements use five years of monthly returns. When five years of data are considered, many analysts believe the returns that are used should be on a monthly basis, and not on a weekly basis.

This is because five years of weekly returns represent a large number of data points, and may introduce some “noise” into the beta calculation.

However, the analyst may determine that, in some cases, five years of data are too much data. For example, if one were to calculate a discount rate for a company in the airline industry as of December 31, 2003, using five years of data, one would improperly consider the period before September 11, 2001. This is because the airline industry had a very different level of industry risk before that date than it did after that date.

In this case, the analyst may decide to use a beta calculated with two years of data. When using a shorter period, the use of weekly returns, rather than monthly returns, may provide a more meaningful indication of industry risk.

The analyst should also consider whether the subject company changed significantly around the valuation date. For example, when performing a valuation in the context of a fairness opinion concerning a prospective transaction, the proper measure of risk should consider the risks in the company after the valuation date, and not before the valuation date.

A similar situation is a solvency opinion performed for the purpose of assessing a leveraged buyout transaction. Again, the relevant measure of risk is after the transaction date, when the subject company may have a higher level of risk than it did before the transaction date.

These are examples of when the analyst should assess the difference between (1) the risk inherent in the benchmark and (2) the risk inherent in the valuation subject.

## COST OF DEBT

Estimating the cost of debt is conceptually simpler than estimating the cost of equity. This is because it is possible to directly observe the cost of debt in many debt transactions—that is, as the expected yield on the investment. This analysis results in a market-based indication of the cost of the investment.

The best measure of the cost of debt to a company is the yield in any recent borrowings of that company. However, even if the subject company recently issued debt, the analyst should be careful that the prior debt transactions are representative of the company's debt profile in terms of factors such as: (1) the risk of the debt and (2) the term of the debt.

If there are no recent issuances of debt by the subject company, the analyst should determine whether any historical debt transactions can provide any meaningful guidance as to the current cost of debt.

For example, let's consider the case of a company that previously issued debt with a yield that was specified as the prime rate plus three percent. If the risk inherent in the company's debt has not changed in the interim as compared to the market, the analyst could estimate the current cost of debt as the current prime rate plus three percent.

In analyzing previous debt transactions, the analyst should consider:

1. whether the face yield truly reflected the market yield at the time or
2. whether the financial condition of the company has changed to the extent that the market yield would be significantly different from the face yield.

For example, the debt of a company that found itself in financial distress subsequent to a debt offering may have a significantly higher current cost of debt as compared to the yield at the time of original issuance.

The issue of benchmarking often comes into play in estimating the cost of debt capital. For example, if the analyst determines that a company's operating and financial strength are equivalent to those same characteristics of the publicly traded debt of companies with strong ratings, then the analyst could assume that the current yield on such debt is a reasonable estimate of the cost of debt for the subject company.

## Company-Specific Considerations

Sometimes a company will have access to debt capital that is less expensive than the market would price such debt. For example, in return for building a plant in a specific state,

the company may receive access to a significant amount of debt at below-market rates. In determining if any or all of the debt in the WACC calculation should use the cost of this debt, the analyst should consider factors such as:

1. the purpose and objective of the valuation and
2. whether the below-market financing is transferable to a new owner.

The failure to consider this type of debt could lead to a significant difference in the value conclusion. For example, if the valuation analyst didn't consider the low-cost debt available to the company, the value conclusion may significantly understate the value of the company's equity.

This is a common sense relationship. In most cases, the equity of a company that has access to below-market financing will be worth more than the equity of an otherwise identical company that does not have access to low-cost financing.

## THE IMPORTANCE OF MATCHING RISK TO THE SUBJECT INCOME OR CASH FLOW

In estimating the discount rate, the analyst should consider the economic income stream to which the discount rate will be applied. It is simply not appropriate to conclude that a subject company has one, and only one, discount rate.

The following discussion presents some examples of situations where there may be more than one correct cost of capital for a subject company.

### Different Income Projections

Any company can prepare numerous sets of operating income projections at the same time. The different projections may reflect different operating assumptions going forward, such as:

1. different growth assumptions,
2. different levels of investment,
3. different product mixes, and
4. projections prepared for different purposes.

### Different Measures of Current Earnings Capacity

In performing a valuation analysis using the direct capitalization method, the estimate of the appropriate measure of the company's normalized income and/or cash flow can affect the selection of the discount rate. For example, consider the case of either: (1) a fast growing company and/or

(2) a company in a cyclical industry that is near its cyclical peak.

If the analyst selects the most recent year as a measure of earnings capacity, there is far more risk in the income stream than if the analyst had selected a measure that incorporates results over a longer period, such as a five-year average or weighted average.

In that case, the normalized income level has less risk, and it may be appropriate to use a lower discount rate than for the most recent year. Similarly, the risk inherent in a five-year average may be lower than the risk inherent in a five-year weighted average. This is because that weighted average places more weight on recent years of high earnings.

Another reason that different projections for the same company on the same date can warrant different discount rates is that the projections may have been prepared for different purposes.

For example, if a company prepares projections for its outside auditor to use in assessing whether the company is a going concern, then the going-concern projections will often be prepared on a conservative basis. If such projections were used for a valuation analysis, it may be appropriate to use a discount rate with lower risk to account for the downward bias inherent in the projections.

### Business Valuation v. Lost Profits Analysis

If the calculation of a discount rate is for the purpose of performing a lost profits analysis in an economic damages case, the analyst should consider whether (1) the risk in the stream of projected lost income is the same as (2) the risk of an investment in the company's overall equity or capital. For example, if the lost profits relate to a new line of business that the subject company had proposed to enter, it may be appropriate to use a discount rate that reflects the higher level of risk inherent in such an income stream.

### Nature of the Underlying Assets

Every asset owned by a company has its own required rate of return. And, every asset (except for excess assets or non-operating assets) contributes to the earnings and value of the subject company. The weighted average return on all of the company's assets is conceptually equal to the weighted average cost of the company's capital.

Generally, tangible assets are considered to be of lower risk (and therefore warrant a lower discount rate) than intangible assets, including intellectual property. Intangible assets are generally considered to have higher risk (and therefore warrant a higher discount rate) than tangible assets.

However, the analyst should also consider the nature of the company's tangible assets. For example, if a company's

tangible assets consist largely of real estate, this indicates that the overall discount rate for the company may be relatively low.

This is because real estate is generally considered to be of lower risk than other tangible assets. This can be observed in the discount rates and capitalization rates used by real estate appraisers. For the most part, these rates are lower than the equivalent discount rates and capitalization rates used by business appraisers.

It is important to emphasize, that in many valuation situations, there is more than one correct way to calculate a discount rate. For discount rates, the accuracy of the conclusion matters more than the methodology used to reach the conclusion.

An important thing for the analyst to remember is that, whichever combination of methodology and inputs are used, the goal is to make a reasonable assessment of the risk inherent in the valuation subject.

### REALITY CHECK

The final reality check in any equity discount rate calculation is to determine if the estimated discount rate is consistent with real world returns. From one perspective, a "scale" of observable returns can be observed that ranges from (1) the safest investments at the low end to (2) the riskiest investments at the high end.

The safest investments are generally considered to be U.S. Treasury securities. The yield on 20-year Treasury securities (the term most often used in valuation analyses) is generally within a few percentage points of four to five percent. On the risky end of the scale, early stage venture capital investments are considered to be among the riskiest investments one can observe.

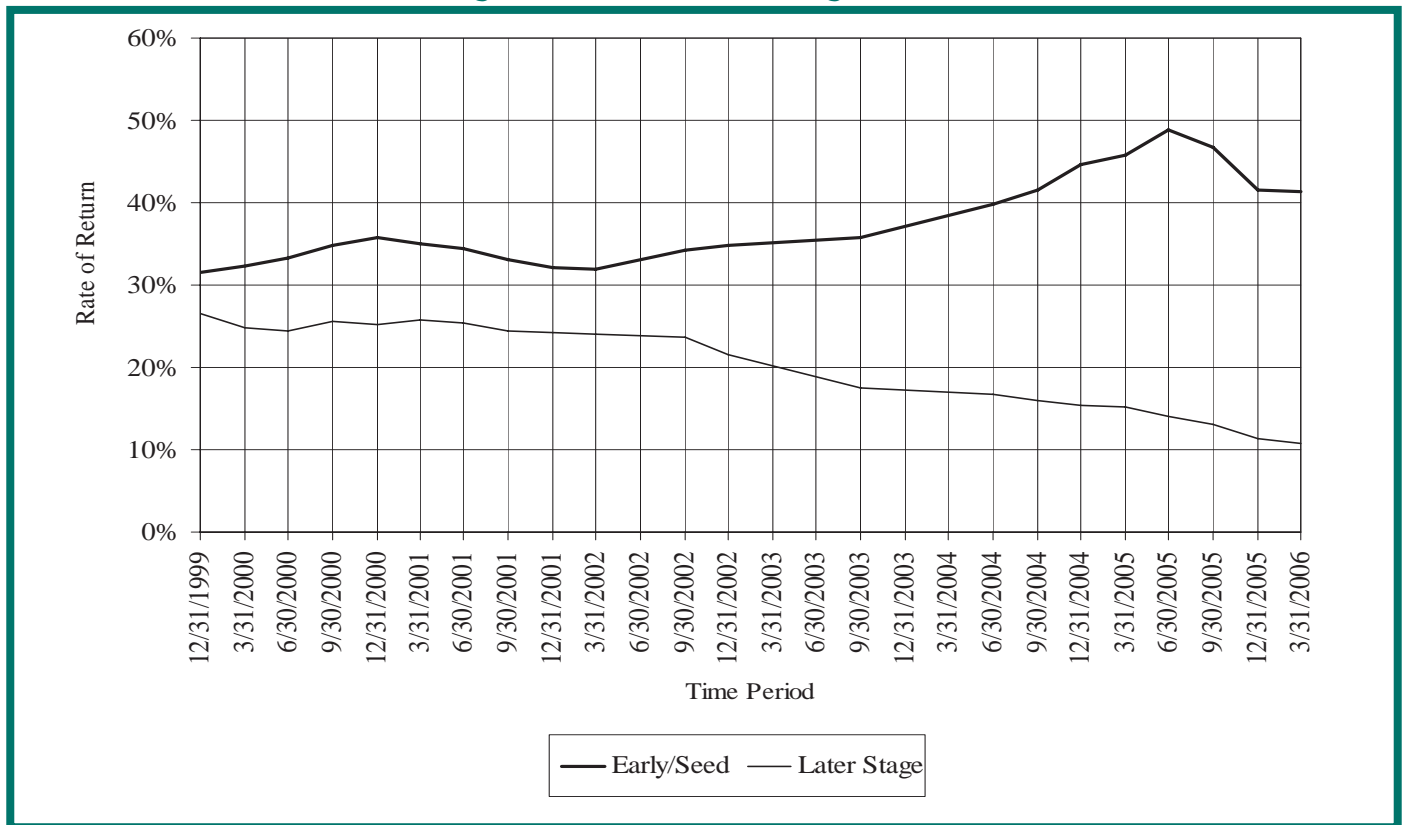
In between these two investment risk spectrum endpoints are:

1. the return on high-rated corporate debt,
2. the return on large company common stocks, and
3. the return on small company common stocks.

An interesting observation can be made regarding venture capital returns. Exhibit 1 presents 10-year venture capital returns published by the National Venture Capital Association. For the first few years of the observed period (representing quarterly returns data from December 31, 1999 through March 31, 2006), (1) early/seed returns were generally in the mid-twenties, and (2) later stage returns were generally in the mid-thirties.

Over the last few years, these lines have diverged, with (1) early stage returns rising to over forty percent and (2) later stage returns tumbling to just over ten percent.

**Exhibit 1**  
**Venture Capital Returns**  
**For the Rolling 10-Year Periods Through Each Indicated Date**



When using empirical data on venture capital returns to estimate discount rates, a ten-year investment horizon is often used because:

1. five years is not long enough for many venture capital investments to ultimately fail or succeed, and
2. twenty years is too long to consider the observed returns to represent a venture capital level of risk.

This trend apparently reflects the changes in venture capital investing in recent years. Venture capital investing (along with other forms of private equity investing) have become more popular with the investing public. This trend reflects the fact that more money has been chasing this type of investment. However, it is unrealistic to expect the number and quality of available investments to increase as fast as venture capital and private equity funds have increased.

While the increase in early stage returns suggests that many early stage investments have performed well, early stage returns have declined over the last three quarters. This fact suggests that, as more of the investments made in recent years come to fruition, returns may ultimately decline from the peak returns indicated by these data.

This decline is consistent with the sharp decline in later stage returns. And, this decline suggests that venture capital returns are proving that the quality and quantity of available investments cannot keep up with the larger pool of capital chasing these investments.

These trends are of interest to the valuation analyst. This is because many valuation subjects are considered to be equivalent in risk to either early stage or later stage venture capital investments.

Clearly, any analyst who uses current later stage venture capital returns as a benchmark for the discount rate to be used in the valuation of a later stage start-up company is probably significantly overestimating the value of the subject company. This is because the appropriate discount rate for such a valuation is likely going to be higher than is suggested by recent empirical data on venture capital returns.

This observation shows the importance, in performing a business valuation or lost profits analysis, of assuring that the benchmark is an accurate reflection of the risk inherent in the valuation subject.

*(Continued on page 48)*

## SUMMARY AND CONCLUSION

In commercial litigation cases, both (1) the interpretation of the term “value” and (2) the selection of the appropriate standard of value are important components of the business valuation analysis.

Because of the inconsistencies in defining and interpreting “value” in various jurisdictions, many attorneys and many other parties to the commercial litigation are left with an ambiguous (and even an erroneous) understanding with respect to the appropriate standard of value. The courts need to have a fundamental understanding of the different standards of value in the context of different valuation purposes and circumstances.

Whether (1) preparing a valuation analysis or (2) offering expert testimony in commercial litigation, the valuation analyst should be aware of these complexities. The valuation analysts should consider the different standards of value recognized for various types of commercial litigation. In this way, the analyst can apply the appropriate valuation approaches, methods, and procedures in order to conclude the appropriate standard of value.

### Notes:

1. American Society of Appraisers, *Business Valuation Standards—Definitions*.
2. *Model Business Corporation Act*, 3rd edition (Chicago: American Bar Association, 2002).
3. *Revised Model Business Corporation Act* (Chicago: American Bar Association).
4. Delaware Code Title 5, Chapter 20, Section 2009. Rights of Dissenting Shareholders (2006).
5. Oklahoma Code Statute Title Section 18-1091(H) (2006).
6. The term “fair cash value” is often used interchangeably with “fair market value.”
7. David Laro and Shannon P. Pratt, *Business Valuation and Taxes*. (New York: John Wiley & Sons, Inc., 2005), p. 13.
8. *The Dictionary of Real Estate Appraisal*, 3rd edition (Chicago: Appraisal Institute, 1993), p. 190.
9. George P. Roach, “Control Premiums and Strategic Mergers,” *Business Valuation Review*, June 1998, p. 42.
10. Intrinsic value or fundamental value represents an analytical judgment of value based on the perceived characteristics inherent in an investment. Source: Shannon P. Pratt, Robert F. Reilly, and Robert P. Schweih. *Valuing a Business*, 4th edition (New York: McGraw-Hill, 2000), p. 31.

*David Hong is an associate in the Chicago office. David can be reached at (773) 399-4348 or dshong@willamette.com.*

*Laurie Liu is a senior associate in the New York City office. Laurie can be reached at (646) 658-6225 or lhliu@willamette.com.*

## EMPIRICAL DATA

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## SUMMARY AND CONCLUSION

A properly performed discount rate analysis is an important component in performing an accurate and defensible business valuation or lost profits analysis. Therefore, it is important for the valuation analyst to understand not only the cost of capital variables that go into a discount rate calculation, but also: (1) the consistency between these cost of capital variables and (2) the risk factors related to the underlying valuation subject or economic damages subject.

The easiest way to make a mistake in calculating a discount rate is to merely plug numbers into a formula—without researching the “story” behind every empirical cost of capital data source that is used.

A well thought-out discount rate calculation can lend significant credibility to a business valuation or economic damages analysis report. Alternatively, a poorly thought-out and/or poorly presented discount rate calculation can hurt the credibility of the entire analysis.

### Note:

1. For example, if a size premium is used, it might be improper to consider size as one of the factors used to estimate the unsystematic risk premium.

*Craig A. Jacobson is a senior manager of the firm and works out of the Westport, Connecticut, and New York City offices. Craig can be reached at (203) 221-3412 in Westport, or (646) 658-6231 in New York City. Or, Craig may be reached at cajacobson@willamette.com.*

We are pleased to announce that

### Carolyn Armbrust

has joined the firm as a manager in our  
Westport, Connecticut, office

Carolyn will focus on financial advisory services that include fairness opinions, solvency opinions, adequate consideration opinions, and fair market valuations. In particular, Carolyn specializes in business brokerage, private placements of debt and equity, and other capital market transactions.

Before joining the firm, Carolyn had her own merger & acquisition advisory firm—The Axis Group International. Prior to that, she was affiliated with the investment banking firms The Compass Group International and DeSilva & Phillips.

Carolyn holds a BA in international business from North Central College and an MBA from the University of New Haven. She is an accredited senior appraiser (ASA), and she holds an accreditation in business appraisal (AIBA).