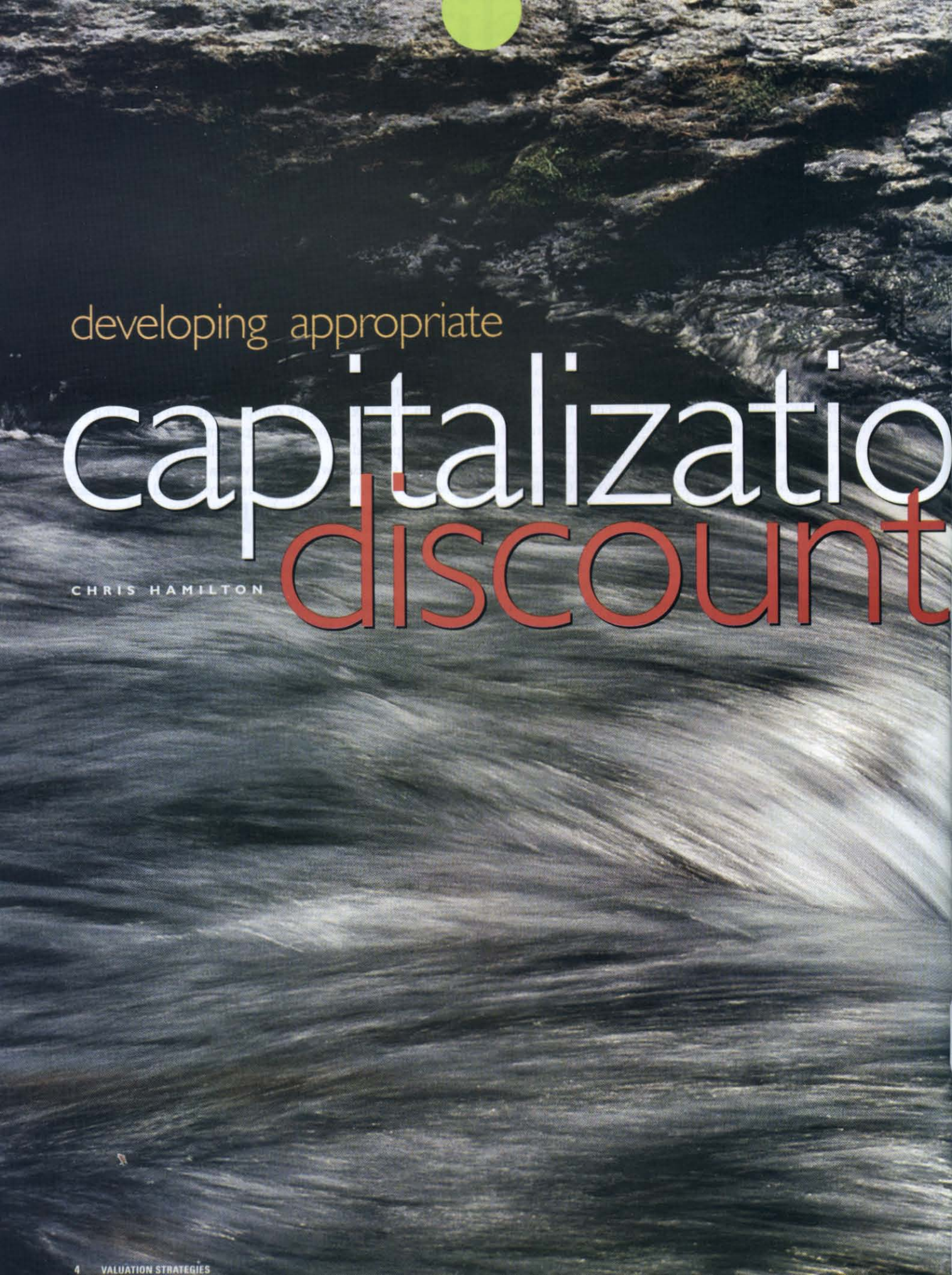
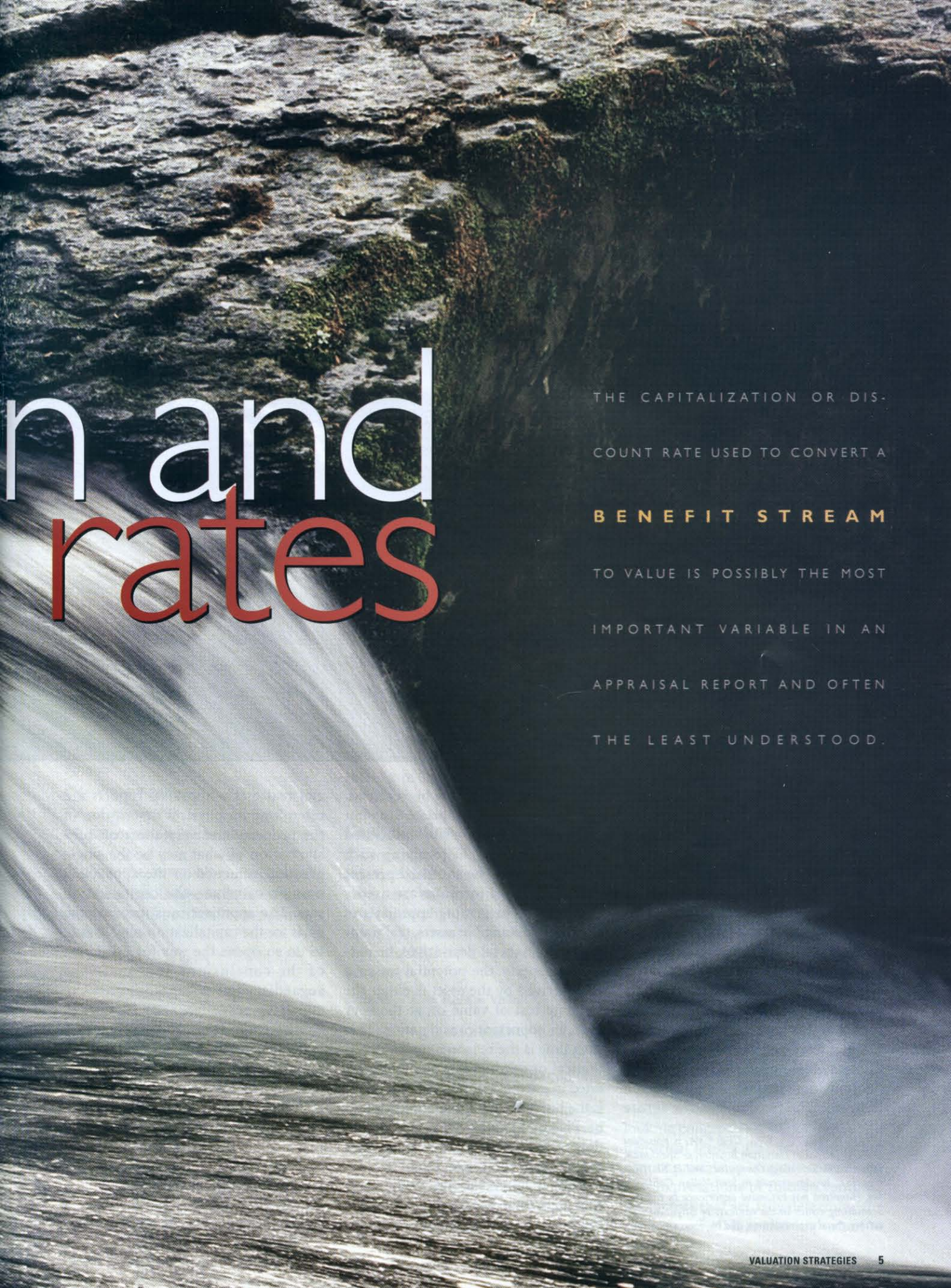


developing appropriate capitalization discount

CHRIS HAMILTON



n and rates

THE CAPITALIZATION OR DISCOUNT RATE USED TO CONVERT A **BENEFIT STREAM** TO VALUE IS POSSIBLY THE MOST IMPORTANT VARIABLE IN AN APPRAISAL REPORT AND OFTEN THE LEAST UNDERSTOOD.

What

is an appropriate capitalization or discount rate? The answer is important and central to the viability of the appraiser's opinion of value if any kind of income measure is used to appraise a business. The answer can also be elusive and highly controversial. The difference between a 15% discount rate and a 14% discount rate can mean a difference in value conclusion of hundreds of thousands of dollars—if not millions. As important as this issue is, it is vital to understand that there is no single "method" or "formula" leading to the "right" answer. Stated another way, setting the rate is an art, and not entirely a science.

There are certain fundamental facts and theories underlying the concept of discount and capitalization rates. When documenting the valuation work and conclusions, certain understandings should be reported. The reader of the report should, in other words, be able to understand the significance of the discount or capitalization rate and how it was developed by the appraiser.

The most fundamental formula in business appraisal is as follows:

Value = Income ÷ Capitalization Rate

The "capitalization of earnings" method of valuation is a means to value a fixed or historical adjusted earnings stream to determine its value. A capitalization rate is any divisor used to convert anticipated benefits into value.[1] The work of the appraiser is to determine the appropriate numerator (income) and the appropriate denominator (capitalization rate).

Future expected income or other benefit streams are used in discounted earnings methods and, as will be shown in this paper, are simply a variation of the formula presented above. The value of an interest in a closely held business is typically considered to be the present value of the future benefit stream that will be received, discounted at an appropriate discount rate to embody the risks associated with the certainty of receiving such future benefits. The standard present value tables and formulas are used.

Whether performing appraisals of businesses, intangible assets, real property, art, financial derivatives, or personal property, the potential for cash flow derived by the asset is either the ultimate test of value or, at the very least, an important consideration. That cash flow is the reason a buyer, hypothetical or otherwise, would be interested in purchasing the assets and likely is the buyer's basis for determining value. Placing a value on that asset comes down, significantly, to the appropriate discount/capitalization rate.

In such appraisals, it is common to find a cursory discussion of the capitalization rate. For example, commercial real estate appraisal reports are often long on physical description of the property and very short on substantiation of what may be the single greatest influence on the appraiser's opinion of value—the capitalization rate. The appraiser must provide the basis for the capitalization rate. Failure to do so opens the way for criticisms of the conclusions and questions regarding the competency of the appraiser.

The following are fundamental issues that have an impact on the determination of an appropriate capitalization and discount rate. Certainly the appraiser should have a solid understanding of these fundamentals, including the ability to explain what a capitalization/discount rate is and how the appraiser developed the rate. It is also important that users of the appraiser's report understand both aspects.

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This can be assured only by issuing a full and well-documented report.

Relationship of Capitalization Rate to Discount Rate

Often these two terms are seemingly interchangeable and appear to mean the same thing. This is, in almost every circumstance, a false assumption. A capitalization rate is used to value a static or historical benefit stream while a discount rate is used for projected future benefits and to account for future growth. The difference between the two can best be described, and remembered, as follows:

Capitalization Rate =
Discount Rate – Growth Rate

Discount Rate =
Capitalization Rate + Growth Rate

Exhibit 1 presents a hypothetical that illustrates, and proves, how the two rates are related. It is also a useful illustration to remember when explaining the difference to clients, attorneys, juries, judges, etc. It should be noted that implicit in this exhibit are the basic formulas for calculating present value. The following is the formula for a single sum that answers the question of how much must be invested currently to get a specific lump-sum payment:

$PV = FV \div (1+k)^n$

Where:

PV= Present value

FV = Future value

k = Discount/cost of capital rate

n = number of time intervals (e.g. months, years, etc.)

The formula to determine the current value of specific future payments is as follows:

$PV = \epsilon\ [FV_n \div (1+k)^n]$

When discounting expected future cash flows (CF) or income, the formula using "cost of capital" (K) is as follows:

$PV = [CF_1 \div (1+k)^1] + [CF_2 \div (1+k)^2] + \ldots + [CF_n \div (1+k)^n]$

Where:

PV = Present value of cash flows

CF = End-of-period cash flows

k = Discount/cost of capital rate

n = number of time intervals (e.g. months, years, etc.)

EXHIBIT 1
Discounted Earning Method

Assumptions: Year 1 normalized income is $100,000
Growth rate is 5%
Discount rate is 25%

	Forecasted Income	25% Value Factor	Present Value
Year 1	$100,000	0.8	$ 80,000
Year 2	$105,000	0.64	$ 67,200
Year 3	$110,250	0.512	$ 56,448
Year 4	$115,763	0.4096	$ 47,416
Year 5	$121,551	0.32768	$ 39,830
Terminal Value*	$638,141	0.32768	$209,106
Value Estimate			$500,000

		Terminal Value*
Year 5 income		$121,551
X growth factor		1.05
= Year 6 income		$127,628
÷ Cap rate	(25%-5%)	20%
Terminal value		$638,141

A review of these formulas reveals a very important relationship. If the capitalization/discount rate goes up (higher risk), the value decreases. If the capitalization/discount rate decreases (less risk), the value goes up. The same relationship exists in the capitalization of income formula.

Capitalization of Income Method

To complete the illustration of the relationship between the discount rate and the capitalization rate, consider the following calculations. The most basic formula in the valuation of a business, as noted above is:

Income ÷ Cap Rate = Value.

Applying that formula to the data in Exhibit 1 yields:

$100,000 ÷ (25% - 5%) = $500,000

The two methods result in the same conclusion of value. As noted above, the formula should make it easy to see a basic, yet important, relationship. As the capitalization/discount rate goes up (higher risk), the value decreases. As the capitalization/discount rate decreases (lower risk), the value increases.

What is a Capitalization/ Discount Rate?

"Cost of capital" is another term for discount rate. It is often interchangeable with "expected rate of return" and "required rate of return." Therefore, to understand discount rates requires a fundamental understanding of the cost of capital. The cost of capital can be viewed from three different perspectives. While these are different views of the cost of capital, they are all perspectives of the same number.[2]

1. Assets—the rate that should be used to discount to present value the future expected cash flows.
2. Liabilities—the economic cost of attracting and retaining capital.
3. Investor—the return one would expect/require from an investment in the firm's debt or capital.

The cost of capital is a forward-looking concept. Past performance and historical results are useful guides but cannot provide an accurate cost of capital. Expectations of future events are the factors that actually determine the cost of capital. It is also important to

note that the cost of capital is a function of the investment, not the investor—that is, it depends on how the capital is used.

Cost of capital is the expected rate of return that the market requires to attract funds to a particular investment.[3] It is based on expected returns relative to market prices. In economic terms, it is an opportunity cost—the cost of forgoing the next best alternative investment (equivalent risk at higher expected return or lowered risk at same expected return). This is otherwise known as the principle of substitution—an investor will not invest in a particular asset if there is a more attractive substitute.

The cost of capital is market driven: it is the competitive rate of return available in the market on a comparable investment. The most important component of comparability is risk. Risk is the degree of certainty, or lack of it, that the investor will realize the expected returns at the times specified. Because risk cannot be observed directly, analysts have developed several ways to estimate it using available market data (generally based on some past period).

Each component of a company's capital structure (e.g. debt and equity) has a cost of capital and represents the investor's expectations. Actual past returns, however, are relevant to an estimate of cost of capital only to the extent that there is reason to believe that they are representative of future expectations.

Cost of capital depends on the investment, not the investor. That is, it depends on how the capital is used. Cost of capital is based on expected returns relative to market prices.

There are three basic components of cost of capital:

1. Real rate of return—what investors expect in exchange for letting someone else use their money on a risk-free basis.
2. Expected inflation—the expected depreciation in purchasing power while the money is tied up in the proposed investment.
3. Risk—the uncertainty about when and how much cash flow or other economic income will be received.

The combination of the first two components is sometimes referred to as the time value of money, which is the same for all investments of the same expected duration. This expectation, the duration of the investment, could be different for different investors. The uncertainty component of returns determines the cost of capital for investments of varying levels of risk.

Real Rate vs. Nominal Rate

In most cases the cost of capital (discount rate) is stated as a nominal rate. This means that an inflation estimate is included.

The "nominal return" includes the real rate of return and the effects of inflation. The real rate represents the exchange rate between current and future purchasing power (inflation). It is important to note that the conversion of the nominal and real rates is not a process of adding; it is a geometric calculation. In other words, if the real rate is 5% and the inflation rate is 2.5%, the nominal rate is not 7.5%. The nominal rate is 7.625% ([1.025 x 1.05] - 1). In formula form, the calculations of nominal and real rates are as follows:

$$\text{Real Rate} = [(1 + \text{Nominal Rate}) \div (1 + \text{Inflation Rate})] - 1$$

$$\text{Nominal Rate} = [(1 + \text{Real Rate}) \times (1 + \text{Inflation Rate})] - 1$$

Real Rates as a Component of the Cost of Capital

The real rate and inflation forecast is the starting point for determining the cost of capital. A premium is added on for each additional risk the investor is willing to take. The process of adding on each premium is known as the build-up method. Ibbotson presents this concept in Exhibit 2.[4]

Build-up methods for determining capitalization/discount rates are variations of the table in Exhibit 2.

1 International Glossary of Business Valuation Terms.

2 Ibbotson Associates, Stocks Bonds Bills and Inflation Valuation Edition, 2003 Yearbook, p. 23.

3 Note 1, *supra*.

4 Note 2, *supra*, p.32.

5 Note 1, *supra*.

EXHIBIT 2
Ibbotson Build-up Methods

Instrument	Components
Treasury Bills	Real Rate + Inflation Forecast
Treasury Notes	Real Rate + Inflation Forecast + Intermediate Horizon Premium
Treasury Bonds	Real Rate + Inflation Forecast + Long Horizon Premium
Corporate Bonds	Real Rate + Inflation Forecast + Long Horizon Premium + Default Premium
Large Cap Stocks	Real Rate + Inflation Forecast + Equity Risk Premium
Small Cap Stocks	Real Rate + Inflation Forecast + Equity Risk Premium + Size Premium

They attempt to apply some measure of consistency to the practice of appraisal and valuation. Exhibit 2 provides a foundation for understanding the concept of build-up methodology. The following is a brief description of some of the more common build-up methods and is not intended as a comprehensive discussion of any of the methods.

Ibbotson Build-Up Method

This method is an additive approach in which the discount rate is the sum of a risk-free rate plus elements of risk assumed by the investor (risk premia). The cost of equity/discount rate is equal to the sum of the following:

Risk Free Rate
\+ Equity Risk Premium
+/- Industry Risk Premium
+/- Unsystematic (Company-Specific) Risk Premium
= Cost of Equity

Risk-Free Rate. This is the starting point of the build-up method because any investment should return at least as much as a risk-free asset. The assumption is that there is an investment asset perceived by all investors as having no risk. There is significant debate among economists regarding what that investment asset actually is, and even whether such an asset even exists. For purposes of this method, the appraiser must accept that such an asset does exist.

Equity Risk Premium. This may be the least controversial of the risk premia, although even this element of the build-up formula is subject to scrutiny, controversy, and interesting research. More will be presented on this topic later in this article.

Industry Risk Premium. This reflects the unique risks facing a particular industry. Many appraisers use their "professional" experience and knowledge to estimate this element. However, Ibbotson Associates has developed an industry premium methodology relying on "the full information beta estimation process." The process uses financial information from companies within each industry (separated by SIC codes) to evaluate the risk characteristics of that industry.

Chapter 6 of the Ibbotson Associates 2003 yearbook details the methodology for developing the industry risk premia. In short, the "full information approach" seeks to include industry beta (risk) data for all companies participating in a particular industry. It is a cross-sectional regression that solves for betas based on the exposure a given company has to that industry. Exposure to the industry can be determined using an asset-based or sales-based weighting scheme. The Ibbotson methodology uses exclusively a sales-weighted method.

Company-Specific Risk (Unsystematic) Premium. This is the area in which, for all the "science" applied to the process of the development of the cost of capital, the appraiser is left to his or her professional judgment. For some cynics, this is the area of the build-up method in which the difference between what the appraiser wants the answer to be and the first three elements is plugged in. Because there is little "science" to this element, it is often the most closely scrutinized component of the appraiser's report. Justification for this adjustment should be well documented in the report. All factors entering into the appraiser's opinion should be disclosed. Some tools will be provided below to assist the process of analyzing and documenting this risk.

The Capital Asset Pricing Model (CAPM)

CAPM is among the most widely used methods to estimate the cost of capital. The CAPM is a cornerstone of capital market theory, and consequently every valuation expert should have a thorough understanding of these concepts.The basic formula for CAPM is expressed as follows:

$K_S = R_f + \beta(ERP)$

where,

K_S = Cost of equity
R_f = Risk free rate
β = Company's beta coefficient
ERP = Equity risk premium

The formula above represents the basic elements of estimating risk and should look somewhat similar to the Ibbotson build-up method covered in the previous section.

There are two basic elements of the CAPM, and their effects are additive. The safe rate is added to the measure of systematic risk, which is the risk common to all risky securities and cannot be eliminated through diversification. A fundamental assumption of the CAPM is that the risk premium portion of the expected return of a security is a function of that security's systematic risk. Systematic risk in the CAPM is measured by a factor called beta (β). Beta is the measure of the relationship between the return on an individual security and the return on the "market," as measured by an index such as the S&P 500. An individual security that tracks perfectly with the market (goes up in value as the market goes up and vice-versa) has a beta of 1.0. If the difference between the stock's return and the risk-free return is less than the difference between the market return and the risk-free return, the stock's beta will be less than 1.0. The opposite results in a beta greater than 1.0. An investment that has a beta greater than 1.0 is considered more risky than the general market. Investments with betas less than 1.0 are considered to be defensive, with risk and volatility less than the broader market. Beta, therefore, measures the volatility of the excess return on an individual investment relative to the broader market.

Risk-Free Rate. There is latitude for the judgment of the appraiser regarding what investment represents a truly risk-free instrument. It is generally accepted that government obligations represent the closest there is to a risk-free return. Twenty-year, five-year, or 30-day Treasury obligations are often used.

Equity Risk Premium (ERP). The ERP is a rate of return in addition to a risk-free rate to compensate for investing in equity instruments because they have a higher degree of probable risk than risk-free instruments.[5] There is much research available on the ERP and the valuation expert should be familiar with current research on the matter and the appropriate estimation methods. The premium is developed from data available based on broad market index returns in excess of the safe rate. This factor is modified by beta, as already discussed. The historical ERP is calculated by subtracting the long-term average of the income return on risk-free assets from the long-term average stock market return. In order to use a historical ERP as an expected ERP, one must accept the assumption that the relationship between the two variables is steady.

The long-term stock market benchmark should be based on a broad index that reflects the market as a whole. Two common measures of the broad market are the S&P 500 and the New York Stock Exchange Composite Index (not the DJIA!). The appraiser should understand the measure being used and be prepared to defend it as a reasonable measure, as well as a measure that is commonly accepted.

More commonly, a "modified" CAPM is used and is often not presented as a modified formula. The modified CAPM adds the elements of a "size premium" and a company-specific (unsystematic) adjustment. These two additional elements are included to account for increased risk associated with small firms and unique risks present in individual firms.

Size Premium. This is an incremental increase in the discount rate to reflect the additional returns for stocks of companies smaller than the S&P 500. Research has shown that there is a relationship between firm size and return: smaller companies have higher returns on average than larger firms. This should result in higher risk and consequently, higher cap/discount rates. Many appraisers use their "professional judgment" to estimate the size premium. As already discussed, this could be a dangerous leap for a valuation expert. As noted with the equity risk premium, there are significant research and resources available to estimate and support a size premium.

Company-Specific Risk This is a matter of the appraiser's judgment. This adjustment may reflect ratio analysis, comparisons to industry, comparison to guideline companies, analysis of management, competitive position, financial strengths/weaknesses, etc. All too often this is used as the place to make the model say what the appraiser wants it to say. Be aware that this adjustment should be well documented and supported. When reviewing "opposing" expert reports, an appraiser should focus on an unsupported adjustment and the reasons for it. Unfortunately, it is not uncommon to see a report with pages of support for the other elements of the model and virtually none for this.

Risk

Risk is a central concept in the discussion of the cost of capital. Both the Ibbotson build-up and CAPM methods require a judgment call when quantifying the risk associated with the specific business being valued. To assist the valuation expert in arriving at a reasonable estimate of that risk and supporting the conclusions, widely accepted methods of analysis to measure that risk are presented below.

Identifying the commonly recognized risks facing a business and assessing their impact on the value of a company is one of the first steps necessary in the valuation process, and one of the trickier parts of estimating a cost of capital. Here, the focus is on the process of analyzing and quantifying risk through use and interpretation of financial ratios as a tool to tie all the concepts together.

In valuation theory, the discount rate represents the total expected return an investor would require on the monies invested in the particular investment given the level of risk in the ownership interest. Risk can be broken down into two categories: business risk and financial risk. Business risk is the uncertainty associated with the operations of the business and its industry environment. This component of risk is defined as the variability associated with the expected future

6 Trugman, "Using the Market Approach to Value Small and Medium Businesses," (Course materials from AICPA/IBA conferences, San Diego, CA and Orlando, FL, 1995-96) p. 5

7 TCM 1985-363.

8 A common source of industry ratios is the Risk Management Association Database (RMA) published by John Wiley & Sons, Inc.

operating income of a business. The second component, financial risk, relates to the business use of financial leverage in its capital structure.

An equity interest is like any other investment. Investors expect to receive a return on their investments to compensate them for the risk taken along with the return of their original investment. Risk can also be viewed as the degree of certainty or uncertainty as to the realization of expected returns.

In any contemplated transaction, each party has alternatives. A potential buyer may buy from some other seller, start a whole new business, invest his or her funds in some other equally desirable substitute, and so on. A potential seller can find another buyer, retain the business and continue to operate it, liquidate it, and so on. The single greatest factor when contemplating those choices is risk.

A list of risk factors follows.[6]

Economic Risk. This risk should be considered as part of the economic analysis performed by the appraiser. The appraiser must determine how the subject company will be affected by changes in the economic environment within which it operates. Economic conditions at the valuation date and how they affect the company must be considered.

Business Risk. Business risk involves analysis of the appraisal subject's business. The appraiser analyzes the company in terms of the risk associated with factors in the business such as sales volatility and the volatility of the company's growth.

Operating Risk. This risk assesses those "associated" factors such as the fixed versus variable cost structure of the appraisal subject. The appraiser must analyze the cost structure of the subject company to determine how much risk the company is exposed to as a result of the commitments and costs associated with the business operation.

Financial Risk. This pertains to the leverage the company uses and the company's ability to cover its debt payments. The appraiser must pay particular attention to the capital structure of similar companies within the same industry in order to analyze the appraisal subject.

Asset Risk. This relates to the age and condition of the company's assets. Older assets represent a higher degree of risk for a company in terms of higher maintenance costs, lower productivity capacity, and functional and technological differences in available production.

Product Risk. This relates to a company that has little diversification in its product line or a product line that may become extinct with the introduction of a newer product by a competing company. An example would be the effect fax machines had on teletype machines.

Market Risk. This relates to how well the company is geographically diversified. If the company operates within a local marketplace, it can be greatly affected by changes in the local area. A better diversified market reduces the risk.

Technological Risk. New technology can adversely affect a company if it does not have the ability to keep up with the other companies in the appraisal subject's industry. For example, if the company operates within the printing industry and owns four color printing presses, the presses provide a capability that does not exist for companies without these types of machines. A commercial printing operation that does not have a particular type of press is at a competitive disadvantage, which increases its risk.

Regulatory Risk. Regulatory agencies can adversely affect a business. Environmental regulations are probably some of the best examples of this risk. A chemical manufacturing company can be put out of business in a very short time by the Environmental Protection Agency.

Legal Risk. The cost of litigation in today's society can be the end of a suc-

cessful business. Even if unsuccessful, litigation can create a financial burden on a business, which exposes it to the risk of being put out of business.

Key Person Risk. One or two key employees who are the driving force in the company and are generating the benefits to the owners can result in a highly successful business, but also add tremendously to the risk the business faces. Could the key employee(s) be replaced in case of death or departure, and what would the effects be on the company's benefit stream? Is there an employment agreement with a non-compete agreement in place?

Risk Comparisons Can Be Risky. There are significant differences between the risks faced by public companies and those faced by smaller private companies. The appraiser must articulate the impact these differences have on the value of the subject company. Size alone can be a major factor in comparing risks. Adjustments need to be made for the additional risk associated with the smaller size.

In *Estate of Gallo*,[7] the Tax Court noted that among the factors that may come into play are "relative size, market share, financial security, brand loyalty, diversification, and dividend-paying capacity." This case presents an interesting paradigm in that the comparables used to value this privately held enterprise were smaller, less dominant, public companies.

Evaluation of Risk Through Financial Analysis. A time series analysis, also known as horizontal analysis, is simply a comparison of a ratio over time. A cross-sectional comparison allows a comparison of one company's ratios against the industry ratios.[8] Both standards should be used together to determine the risk associated with the subject company. This is accomplished by preparing a time series comparison for both the company and the industry. The analyst can then analyze the two comparisons to evaluate the company.

There are three basic types of problems that a financial statement analysis can identify: liquidity (working capital), leverage (debt), and profitability. By preparing a comprehensive ratio analysis, the appraiser can better understand the subject company. Further, by comparing the company ratios with industry ratios, the appraiser can better evaluate the risk associated with the subject company.

Liquidity

Liquidity is a short-term problem that affects the company's ability to meet its current obligations. There is a trade-off between profit and risk. The more liquidity a company has, generally the lower the profits will be, and its liquidity risk will be low. The less liquidity a company has, the greater the profits, and its liquidity risk will be high. This is the trade-off between liquidity risk (the probability of defaulting on current obligations) and profitability.

Current Ratio = Current Assets ÷ Current Liabilities. This measures the overall quantity of liquidity of the company. If the ratio is low, liquidity is low and the liquidity risks are probably high. If this ratio is high, liquidity risks are perceived to be low, but profits generally suffer. While a company may have sufficient quantity, liquidity trouble will be present if the quality is low. The analyst must carefully interpret this ratio because the types of assets on the balance sheet included in the ratio will affect the analysis. An "acid test" ratio that eliminates inventory may be of more use, and also may help in the analysis of the current ratio.

Receivables to Working Capital = Receivables ÷ Working Capital. This measures the relative weight of receivables within working capital. If the ratio is large, liquidity risks are high because the company may be hurt by receivable write-offs or slow payment by vendors, causing a cash shortage.

Inventory to Working Capital = Inventory ÷ Working Capital. This measures the relative weight of inventory within working capital. If the ratio is large, liquidity risks are high because the company may be hurt by inventory write-offs or slow turnover of inventory.

Collection Period = Accounts Receivable ÷ Average Sales per Day. This measures the average time it takes for the company to collect its credit sales. It measures the efficiency of the company's credit and collection procedures. It can also measure the probability that the company will have significant bad debt losses and serves as a way to compare the receivables position and policies to its industry. Collections can affect the company's profitability, net worth, and working capital. Slow collection reduces cash flow, increases the need for borrowing and may result in bad debt expense. A large collection period may signal that the company's receivables are overstated, which also would overstate the working capital.

Inventory Turnover = Cost of Sales ÷ Inventory. This indicates the job being done on controlling inventory. A low inventory turnover may mean that the company has excessive, obsolete, or inefficient inventory. It also measures the quality of the working capital. When the ratio is small, reduced liquidity, increased leverage, and reduced profitability may result. A low ratio may indicate that the company is having difficulty filling orders.

Leverage

Debt causes two kinds of risk. The most obvious is default risk. Generally, the more debt a company has, the greater its risk of not meeting its interest payments. The second type of risk is perhaps less obvious and can be described as an increase in earnings variability. This is

because interest expense is a fixed cost and cannot be controlled by management during abnormal economic times. When the company's debt ratio is large, the company's leverage risk is high.

Debt Ratio = Total Debt ÷ Total Assets. This measures the proportion of a company's assets that are financed with debt. It is also a measure of the assets provided by creditors for each dollar of assets being provided by stockholders. When leverage risks are said to be high, both default risk and company earnings variability risk could pose problems for the company. A low debt ratio could indicate that the company has not leveraged enough and is sacrificing profitability.

Profitability

Profitability may be the most important item for most owners (or potential owners) because it measures how much of each sales dollar the company is able to retain.

Return on Equity (ROE) = Net Income ÷ Equity. Profitability is directly affected by the company's ability to control costs, its ability to produce sales, and its reliance on debt. This ratio, and variations of the basic ROE ratio, can be used to analyze, on a time series basis, company and industry data, and then compare the data on a cross sectional basis to determine the company's strengths and weaknesses. This is a variation of the earnings per share calculation and can be modified to determine the return on whatever ownership interest is being valued. A comparison of the return on equity with the return on assets measures the extent to which leverage is being employed for or against stockholders.

Return on Assets = Net Income ÷ Average Assets. This measures how well assets have been employed by management. See the previous section for the analytical value of comparing this ratio with the ROE.

Profit Margin = Net Income ÷ Sales. The most basic formula that shows the income left from each dollar of sales. A small margin may suggest that cost control measures may be appropriate. This ratio is key to a company's survival. If this ratio is too low, the company's costs may be too high and net worth will not grow quickly enough. This can result in reduced liquidity and increased leverage. The larger the ratio, the greater the opportunities for financing growth.

Asset Turnover = Sales ÷ Total Assets. This shows the rate at which the company's assets produce sales. When the ratio is small, the company may be having trouble producing sufficient sales volume for its assets base. This ratio may help identify problems resulting from the lack of sales volume.

Equity Multiplier = Total Assets ÷ Total Equity. This measures the company's reliance on debt. When the company uses a large amount of debt, the equity multiplier will be large. This leverages up ROE. When the ratio is small, the company is using very little debt, thus potentially decreasing its ROE by not leveraging enough. Of course, debt usage creates risk.

Other Key Ratios

There are two other key ratios to track when determining a company's bottom line.

Fixed Assets to Net Worth = Fixed Assets ÷ Total Owner's Equity. This measures a company's investment in the assets that house its business and, in most instances, produces a company's profits. The formula shows the relative amount of capital invested in fixed assets. A by-product of this measure is that it shows the funds left over for investment in other types of assets.

This ratio will affect any of the traditional working capital ratios such as current ratio, sales- to-working-capital, inventory-to-working-capital and receivables-to-working-capital. If this ratio is large, the current ratio will be reduced and other ratios increased. This is because excess investment in fixed assets reduces the company's working capital. When the ratio is large, liquidity is decreased, leverage is increased, and reduced profitability may occur.

Trading Ratio = Net Sales ÷ Net Owner's Equity. This is a measure of the extent to which sales volume is supported by invested capital. If the ratio is too large, the company is stretching its invested dollar to its maximum capacity. This would be an over-trader. The over-trader is burdened by excessive debt. Its survival can easily depend on uncontrollable outside influences. An under-trader has excessive capacity for the volume of generated sales.

A company's net worth supports its sales. With insufficient net worth, the company must borrow, reduce its sales, or attract new capital. When the ratio is large, generally the company's growth is more rapid than it can handle. This reduces liquidity, increases leverage, and reduces profit.

Ratio analysis is critical to understanding the unique risk facing the company and supporting conclusions. This is particularly relevant when using a build-up method for calculating the appropriate discount rate. As noted in the two calculation methods above, a company-specific risk adjustment requires support and documentation.

Conclusion

The capitalization or discount rate used to convert a benefit stream to value is possibly the most important variable in appraisal reports and often the least understood. A well written appraisal report will define the terms and processes used to arrive at an estimate. The appraiser should understand the concepts and theories behind the development of such rates to prepare a report adequately and defend its value conclusions. ●