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Business Valuation

An Integrated Theory

Second Edition

Z. CHRISTOPHER MERCER

TRAVIS W. HARMS

Business Valuation

An Integrated Theory

Second Edition

The first book to show why business appraisers do what they do and *how* valuation concepts are interrelated, *Business Valuation: An Integrated Theory, Second Edition* provides a concise discussion of the most widely debated valuation topics. Fully revised and updated, it defines and explains valuation in the context of the discounted cash flow and Gordon models, providing the most unified and comprehensive framework for thinking about the sources of valuation premiums and discounts.

An excellent basis for understanding and correctly applying modern valuation theory, the *Second Edition* integrates various valuation concepts to reveal a complete and clear picture of business valuation. This edition includes a new chapter on the valuation of S corporations, as well as an expanded treatment of valuation from the perspective of nonmarketable minority shareholders. *Business Valuation: An Integrated Theory, Second Edition* helps readers:

- Understand the organizing principles of business valuation
- Examine the relationships between the Gordon Model and the DCF model of valuation
- Define the levels of value in the context of enterprise and shareholder cash flows
- Apply the Quantitative Marketability Discount Model (QMDM)
- Defend and explain the valuation of S corporations

(continued on back flap)

A variety of business, finance, valuation, legal, and accounting professionals will benefit from the comprehensive framework for applying sound financial reasoning to practical valuation problems presented in this book. Straightforward and well written, this is the essential guidebook for integrating valuation theory and practice.

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey.

Published simultaneously in Canada.

Wiley Bicentennial logo: Richard J. Pacifico.

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Library of Congress Cataloging-in-Publication Data:

Mercer, Z. Christopher.

Business valuation : an integrated theory / Z. Christopher Mercer,
Travis W. Harms, —2nd ed.
p. cm.

Rev. ed. of: Valuing enterprise and shareholder cash flows. Memphis :
Peabody Pub., 2004.

ISBN-13: 978-0-470-14816-7 (cloth)

1. Business enterprises—Valuation. 2. Corporations—Valuation. I.
Harms, Travis W. II. Mercer, Z. Christopher. Valuing enterprise and
shareholder cash flows. III. Title.
HG4028.V3M47 2008
658.15'5—dc22

2007008850

Printed in the United States of America.

10 9 8 7 6 5 4 3 2 1

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Developing Appropriate Discount Rates

INTRODUCTION

The three elements of the Gordon Model—cash flow, growth, and risk—define the value of any business enterprise or interest therein. In previous chapters, we have explored the cash flow and growth elements from the perspectives of both the enterprise and minority shareholders. In this chapter we turn our attention to the final element, risk.

The appraiser's assessment of the riskiness of a particular asset is manifest in the estimated discount rate. Appraisers use a variety of related techniques to derive appropriate discount rates. In this chapter, we consider the appropriate discount rate in the context of the Integrated Theory using one such technique, the Adjusted Capital Asset Pricing Model (or ACAPM). We use the term ACAPM because that name was used by Mercer in a 1989 article on developing capitalization rates.¹

Exhibit 6.1 recaps the conceptual math of the Integrated Theory to provide context for our discussion of the discount rate.

In this chapter, we assume a basic knowledge of the Capital Asset Pricing Model and related methods for estimating discount rates, focusing on practical concerns in discount rate development. Some of the more widely debated theoretical issues and controversies are rendered moot given the range of judgment exercised in discount rate development.

¹Z. Christopher Mercer, "The Adjusted Capital Asset Pricing Model for Developing Capitalization Rates: An Extension of Previous 'Build-Up' Methodologies Based Upon the Capital Asset Pricing Model," *Business Valuation Review*, Vol. 8, No. 4 (1989): pp. 147–156.

	Conceptual Math	Relationships	Value Implications
Strategic Control Value	$\frac{CF_{e(c,s)}}{R_s - [G_{mm} + G_s]}$	$CF_{e(c,s)} \geq CF_{e(c,f)}$ $G_s \geq 0$ $R_s \leq R_{mm}$	$V_{e(c,s)} \geq V_{e(c,f)}$
Financial Control Value	$\frac{CF_{e(c,f)}}{R_f - [G_{mm} + G_f]}$	$CF_{e(c,f)} \geq CF_{e(mm)}$ $G_f \geq 0$ $R_f = R_{mm} (+/- \text{ a little})$	$V_{e(c,f)} \geq V_{mm}$
Marketable Minority Value	$\frac{CF_{e(mm)}}{R_{mm} - G_{mm}}$	$G_v = R_{mm} - \text{Div Yld}$	V_{mm} is the benchmark for the other levels
Nonmarketable Minority Value	$\frac{CF_{sh}}{R_{hp} - G_v}$	$CF_{sh} \leq CF_{e(mm)}$ $G_v \leq R_{mm} - \text{Div Yld}$ $R_{hp} \geq R_{mm}$	$V_{sh} \leq V_{mm}$

EXHIBIT 6.1 The Integrated Theory of Business Valuation

COMMON QUESTIONS

1. What are the practical differences, if any, between the discount rates for strategic control investors (R_s) and financial control investors (R_f) and marketable minority investors (R_{mm})?
2. How can business appraisers test the reasonableness of their valuation assumptions and conclusions?
3. What is the conceptual relationship between the discount rates at the marketable minority (R_{mm}) and nonmarketable minority (R_{hp}) levels of value?

THE ADJUSTED CAPITAL ASSET PRICING MODEL

The Adjusted Capital Asset Pricing Model combines elements of the build up or summation methodologies, which have commonly been used to derive earnings capitalization rates for closely held securities, with those of the Capital Asset Pricing Model developed by W. F. Sharpe.² See Appendix 6-A for a brief overview of the Capital Asset Pricing Model.

²W. F. Sharpe, "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk," *Journal of Finance*, Vol. 19 (1964): pp. 425-442.

The CAPM assumes that specific, or unsystematic, risk associated with any given stock does not contribute to a higher expected return for the stock because of the opportunity for portfolio diversification. The restrictive assumption of adequate diversification is unrealistic when considering investments in closely held companies. For owners of controlling interests of closely held businesses, their interests typically account for major, undiversified portions of their wealth. This lack of diversification cannot normally be remedied by selling interests and diversifying, as there is no ready market for the subdivided minority interests. In addition, many purchasers of controlling interests invariably consider such specific risks, regardless of their degree of diversification elsewhere.

Similarly, both buyers and sellers of illiquid minority interests acknowledge the impact of nondiversifiable risks even if they are otherwise diversified in their portfolios.

The ACAPM includes an incremental return premium for company-specific risk factors because the CAPM assumption of complete diversification often fails with private business enterprises.³ The ACAPM discount rate, R_{ACAPM} , is developed from the theoretical base of the CAPM and practical experience. R_{ACAPM} is presented symbolically in Equation 6.1, with the symbolic notation discussed following that:

$$R_{ACAPM} = \underbrace{RFR + \beta \times (LSP - RFR)}_{\substack{\text{Systematic Risks} \\ \text{The CAPM Expected Return}}} + \underbrace{SSP + SCR}_{\substack{\text{Unsystematic Risks. The} \\ \text{nondiversifiable risks of private} \\ \text{company ownership in excess of} \\ \text{CAPM measure of unsystematic risk}}} \quad (6.1)$$

1. R_{ACAPM} is the discount rate derived from application of the ACAPM.
2. RFR is a risk-free rate, typically that available in the marketplace at or about the valuation date. An intermediate or long-term Treasury yield is most often used as a measure of the base opportunity cost of a long-term

³Prior to late 1989, there was not a clearly developed, published analysis of how the CAPM could be adjusted to develop discount rates and capitalization rates in the valuation of closely held businesses. See, however, the 1984 publication by Roger J. Grabowski, ASA (*Closely Held Corporations Valuation*, 1984, Steven C. Dille's Tax Workshops, Inc.) who wrote a precursor description of the ACAPM which, unfortunately, we did not see until 2004. We developed the ACAPM at Mercer Capital in the late 1980s because we had struggled with the concepts and because there was not a clear exposition of how to develop a capitalization rate using the CAPM as a base.

investment in a closely held business. However, some analysts have suggested using a shorter-term Treasury rate. Many analysts assume that the appropriate risk-free rate is the long-term (20-year) Treasury yield to maturity. Others argue for a composite long-term Treasury yield. For purposes of this discussion, RFR is a long-term risk-free rate considered appropriate by the analyst.

3. **beta** is an appropriate industry *beta*, if available. Otherwise it is assumed to be 1.0, or “the risk of the market.” *beta* is applied to the excess return of the market (and not to the small stock return).⁴ We use the market neutral assumption ($\text{beta} = 1.0$) most commonly in the valuation of small businesses or if no group of sufficiently comparable public companies is available. In such cases, there may be no objective basis to estimate a particular beta. However, use of an industry beta (or a related industry beta), when available, can be helpful in adjusting capitalization factors for certain industries with known risk profiles.
4. **LSP** is the expected return on large capitalization stocks over the risk-free return. Appraisers have traditionally estimated the LSP by reference to the long-run historical performance of large capitalization stocks and U.S. treasury bonds, most typically from 1926 through present. In recent years, financial researchers have begun to suggest that the realized historical return premiums overstate the expected return premium. The principal reason cited by these researchers is the contribution of expanding valuation multiples to the realized historical returns on large capitalization common stocks during the period. These researchers offer a variety of techniques for estimating the prospective return premium, with most concluding that the prospective return premium is between 3.0% and 6.0%, compared to the realized historical premiums on the order of 5.0% to 6.5%.⁵

The emphasis on prospective return premiums has blunted the perennial controversies regarding the choice of historical period analyzed and whether the geometric or arithmetic average returns should

⁴The 1989 ACAPM article was less than clear on this point. Thankfully, it is possible to grapple with issues, to learn in the process, and to grow professionally.

⁵Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation: 2006 Yearbook*, Ibbotson Associates, Inc., Chicago, IL, pp. 172–176. Grabowski, Roger J., “Equity Risk Premium: 2006 Update,” *Business Valuation Review*, Vol. 25, No. 2 (Summer 2006): pp. 64–68. Arnott, Robert D., and Bernstein, Peter L., “What Risk Premium is ‘Normal’?” *Financial Analysts Journal*, (March/April 2002), pp. 64–85. Ibbotson, Roger G., and Chen, Peng, “Long-Run Stock Returns: Participating in the Real Economy,” *Financial Analysts Journal*, (January/February 2003), pp. 88–98.

be used. Ibbotson Associates has begun to publish estimates of the prospective return premium in their annual yearbook of historical return data.

5. SSP is the expected return on small capitalization stocks over the return on large capitalization stocks. As with the LSP, appraisers have traditionally estimated the SSP by reference to the long-run historical performance of the two asset classes. With respect to prospective return premiums, the SSP has been the subject of less academic research than LSP. The strongest academic support for the existence of the SSP has come from the various papers by Fama and French exploring factors that predict stock returns as a function of factors in addition to beta.⁶

The realized historical premiums calculated by Ibbotson Associates are on the order of 2.0% to 5.0%, when small capitalization stocks are those with market capitalizations falling into the 9th and 10th size deciles of the New York Stock Exchange. Beginning with the *SBB* 1993 Yearbook, Ibbotson Associates has published data on the return characteristics of portfolios corresponding to each size decile. In more recent editions, the tenth (smallest) decile has been further segregated into two subgroups (referred to as 10a and 10b).

The most significant practitioner research regarding the magnitude of the SSP has been that published by Roger J. Grabowski, ASA and David W. King, CFA. Grabowski and King began publishing the annual results of their analysis of the relationship between company size and realized returns in 1995, and the research is now updated annually through Duff & Phelps, Inc. Using data from 1963 to the present, Grabowski and King sort public companies into 25 size-ranked portfolios. Importantly, rather than relying on market capitalization of equity alone, Grabowski and King also measure the SSP relative to seven other indications of company size: book value of equity, five-year average net income and EBITDA, the market value of invested capital, total assets, revenue, and number of employees. In addition to aggregate return premiums over the risk-free rate, the authors have also begun to present return premiums over the CAPM-predicted return, permitting appraisers to apply an appropriate beta to the subject business

⁶See in particular:

- "The Cross-Section of Expected Stock Returns," *Journal of Finance*, 47 (June 1992), pp. 427-465.
- "Size and Book-to-Market Factors in Earnings and Returns," *Journal of Finance*, 50 (March 1995), pp. 131-156.

enterprise. The Grabowski/King analysis suggests premiums over the CAPM-predicted return for companies in the five smallest portfolios (equity market capitalization less than approximately \$500 million) on the order of 4.5% to 5.5%.

Pratt's *Cost of Capital* (2nd ed.) provides a discussion of the "size effect" and provides citations to available studies.⁷ This Pratt text also provides a summary of the Grabowski and King study as part of its Chapter 11.

6. **SCR** is the incremental return over the LSP and the SSP that is appropriate for the valuation subject. This (specific company) risk premium is estimated conceptually by comparing the subject company with the universe of relatively small public companies. Direct comparative data for this universe of stocks is not available, so the analyst must be able to conceptualize the risk profile of the alternative investments.⁸ One of the factors often cited by appraisers in selecting a specific risk premium is the small size of a subject entity in relationship to the basket of public companies with which it is implicitly being compared. The size-related research helps appraisers quantify this aspect of specific company risk. Appraisers using information from the smallest deciles in Ibbotson's data, or the smallest of the categories from Grabowski and King must carefully relate their estimate of SCR to the measure of SSP used.

In the original ACAPM article, we enumerated several potential specific risk factors, including key personnel issues (or lack of management capability or depth), absolute size, financial structure (leverage), concentrations (related to products, geography, or customers), earnings (margins, stability, and predictability), and other risks associated with a particular company. For the private companies typically valued by appraisers, the total SCR typically runs from 0% to as high as 8%–10% or more. SCR may even be negative for closely held businesses that are larger than the smaller capitalization stocks considered in the development of SSP. Further research on the relationship between company size and return may help appraisers more precisely specify this factor. The selection of the total SCR for a specific valuation assignment requires experience, common sense, and judgment in the context of a detailed analysis of the subject company, as well as a general working knowledge of the public securities markets.

⁷Shannon P. Pratt, *Cost of Capital Estimation and Applications*, 2nd ed. (New York: John Wiley & Sons, Inc., 2002). See especially Chapter 11, "Size Effect," p. 90.

⁸SCR premiums in enterprise valuations are analogous to investor-specific risk premiums that must be estimated when valuing shareholder level cash flows.

The discount rate derived using the ACAPM is the sum of these components. This discount rate is consistent with R_{mm} in the conceptual framework of the Integrated Theory.⁹

Appraisers must specify both SSP and SCR when using the ACAPM to develop discount rates. Suppose we know the following:

$$SSP + SCR = 5.0\%$$

Appraiser #1 estimates this portion of the discount rate as:

$$SSP(3.0\%) + SCR(2.0\%) = 5.0\%$$

Appraiser #2 uses a refined size estimate based on the approximate market capitalization of the subject company as:

$$SSP(4.0\%) + SCR(1.0\%) = 5.0\%$$

Both achieved an appropriate result; however Appraisers #1 and #2 estimated SCR from a different base. Further refinements regarding the size premium as it relates to enterprises of differing sizes will force appraisers to focus carefully on SCR and ultimately, on proving the reasonableness of their conclusions. It should be apparent that the indicated refinement in the size effect in the preceding discussion of the ACAPM components should have no impact on the ultimate discount rate, but rather reflects an allocation of a total premium between the two categories (SSP and SCR). In the remainder of this chapter, we focus on assessing the reasonableness of the judgment exercised in estimating the discount rate.

DISCOUNT RATE SENSITIVITY AND JUDGMENT

The ACAPM differs from CAPM in that it attempts to develop a specific discount rate for a private company rather than an expected total return for a publicly traded security in the context of a diversified portfolio of investments. The expected return estimated using the Capital Asset Pricing Model relates the price of the security to expected future dividends

⁹The ACAPM was developed as a tool for the use of single period capitalization methods. Accordingly, the focus of the original ACAPM article was the development of appropriate capitalization rates (derived by deducting expected growth in cash flow/earnings from the discount rate).

Discount Rate Sensitivity		Low	Mid-Point	High
Discount Rate Components		Estimate	Estimate	Estimate
Risk-Free Rate	RFR	5.0%	5.0%	5.0%
Large Stock Premium	LSP	4.0%	5.0%	6.0%
Beta	β	0.9	1.0	1.1
Beta-Adjusted Large Stock Premium		3.6%	5.0%	6.6%
Small Stock Premium	SSP	2.0%	3.5%	5.0%
Specific Company Risk	SCR	2.0%	3.0%	4.0%
Estimated Discount Rate	R	12.6%	16.5%	20.6%
less: Estimated Core Earnings Growth	G_e	4.0%	4.0%	4.0%
Estimated Capitalization Rate		8.6%	12.5%	16.6%
Implied Earnings Multiple	P/E	11.6	8.0	6.0

EXHIBIT 6.2 Discount Rate Sensitivity

and capital appreciation. The discount rate derived using the ACAPM is applicable to the estimated future cash flows of the enterprise.

Use of the ACAPM or other build-up methods will result in a range of discount rates under differing, but reasonable, assumptions regarding the individual components. Consider Exhibit 6.2, which illustrates the impact of differing estimates, each individually reasonable, on the estimated discount rate. In the context of a single-period capitalization of earnings, the impact on value can be substantial.

JUDGMENT AND REASONABLENESS AND THE ACAPM

The discount rate sensitivity evident in Exhibit 6.2 highlights the informed judgment, common sense, and reasonableness that must be exercised by appraisers. The estimate components were each individually reasonable and defensible, yet $6.0\times$ and $11.6\times$ cannot be equally reasonable and defensible earnings multiples for the same subject enterprise. The resolution to this impasse is the application of informed judgment refined by the appraiser's experience exercised in the context of knowledge of relevant market evidence.¹⁰ Common sense and the intuitive sense of valuation reasonableness also accrue with experience.

Given the discount rate sensitivity illustrated in Exhibit 6.2, how can an appraiser know that he or she is "right" when coming to a conclusion

¹⁰Experience is valuable if it is good experience. There is a world of difference in the experience of two appraisers, where one had ten years of grappling and growing professionally and the other has the same year of experience repeated ten times.

with respect to a specific discount rate? As noted, experience and knowledge assist in the application of judgment. There is no substitute for informed experience and study of available market evidence regarding discount rates from observed pricing of real transactions.

There are now a number of sources providing valuation information regarding actual transactions in public and private companies. These sources include, among others, the following:

- Control Premium Study¹¹
- Mergerstat/Shannon Pratt's Control Premium Study¹²
- "Pratt's Stats"¹³
- Done Deals Online¹⁴
- BizComps¹⁵

Industry-specific databases provide transactional detail for industry group such as banks, media companies, printing companies, engineering companies, and the like. In addition to use in the market approach, appraisers should search for relevant transaction information as a basis to test the reasonableness of valuation indications from other methods.

Appraisers can also compare valuation conclusions with valuation evidence from guideline company groups selected for their appraisals, yields on similar investments, or, general pricing in the current mergers and acquisitions market.

In the final analysis, appraisers exercise informed judgment when assessing the reasonableness of estimated discount rates (and corresponding value indications) rather than focusing exclusively on the defensibility of individual discount rate components. In our practice, such tests of reasonableness are an integral part of any valuation analysis or report.

Many valuation reports conclude with statements similar to the following:

¹¹*Control Premium Study* (Santa Monica, CA: *Mergerstat*®). This reference provides certain valuation multiples from public company change of control transactions. For purposes of this discussion, we are referring to this information rather than the observed control premiums that give the study its name.

¹²*Mergerstat/Shannon Pratt's Control Premium Study*. Available at www.bvmarketdata.com.

¹³"Pratt's Stats," (Business Valuation Resources, LLC), www.bvmarketdata.com (accessed May 19, 2004).

¹⁴"Done Deals Online," (Thompson/Practitioners Publishing Company), www.donedeals.com/pDONHome.asp (accessed May 19, 2004).

¹⁵Jack R. Sanders, *BizComps* (San Diego, CA, Pacific Services, Inc.). Also available at www.bvmarketdata.com.

Based on our analysis of all the relevant factors related to American Soap Company, Inc., it is our opinion that the fair market value of American's common stock is \$100 per share. This conclusion is rendered in connection with (stated purpose), and is rendered on a controlling (or minority) interest basis as of December 31, 2003.

Such a conclusion, while technically proper, fails to help the reader understand the reasonableness of the conclusion. In our opinion, appraisal reports should explain why the concluded value is reasonable, using what we call "tests of reasonableness." The proof can consist of simple comparisons with comparative reference points, including:

- Median or average guideline company multiples across appropriate valuation parameters (sales, EBITDA, EBIT, pre-tax income, net income, book value, and so on).
- Transactions involving the subject company's own stock.
- Comparisons with transaction multiples from the sale of reasonably similar businesses.
- The financial feasibility of a change of control transaction at the appraised value. What financing terms, growth rates, and so on are necessary to provide appropriate debt coverage ratios and (leveraged) equity returns? This test is increasingly significant with the growing influence of private equity investors.
- Tests of the sensitivity of the conclusion to changes in key inputs.
- Other comparisons that can help readers understand the reasonableness of the conclusion, including the use of common sense.

Comparisons such as these help readers and appraisers place the valuation conclusion into perspective. If the valuation conclusion appears relatively high or low, the appraiser and readers should be comfortable that this relative comparison is reasonable in light of the total analysis of the report.

When appraisers provide recurring appraisals of the same company (e.g., for Employee Stock Ownership Plans, gift tax purposes, buy-sell agreements, or other corporate purposes), it is equally important to relate the current appraisal to prior conclusions.

The following quote from a brief article Mercer wrote for *Business Valuation Review* in 1988 describes such an analysis:

We believe a further procedure is necessary with recurring valuation assignments to: 1) insure the intellectual honesty of the analyst (and the firm); 2) allow the reader to understand the basis for significant methodological shifts; and 3) provide the perspective a reader needs

to anchor the reasonableness of the current conclusion, not only today, but in light of historical results.

The current methodology is summarized in a table in the report. The table includes all methodologies considered, valuation indicators derived, and weights assigned to each. All discounts or premiums to market multiples applied in the various methodologies are disclosed in the table, as are all marketability or minority interest discounts. The prior year conclusions (one or two years) are then displayed next to the current year data, and changes are noted. Finally, comparative data such as the effective price/earnings, price/sales or price/book value ratios implied by the conclusions, and relevant public market comparisons are included.¹⁶

Such comparisons are not intended to enforce slavish devotion to prior appraisal methods or assumptions, but rather to illustrate that the consequences of any such changes have been properly considered.

THE ACAPM AND SHAREHOLDER LEVEL VALUATIONS

The focus of this chapter has been the estimation of enterprise discount rates. Recalling the Integrated Theory presented in Chapter 3, the discount rate appropriate to the shareholder (nonmarketable minority) level of value is equal to or greater than the enterprise discount rate.

The enterprise discount rate is the appropriate base from which to develop the required holding period return at the shareholder level. The basis of comparison in the valuation of nonmarketable minority interests is the relevant universe of publicly traded securities. By beginning with the base enterprise discount rate and adding increments of return for shareholder level risks, the subject nonmarketable minority interest is related, from an investment viewpoint, to the relevant universe of alternative investments.

CONCLUSION

Appraisers estimate discount rates to reflect the risks of a particular asset. In Chapter 3, we demonstrated that a single enterprise discount rate is generally applicable at the marketable minority, financial control, and

¹⁶Z. Christopher Mercer, "Issues in Recurring Valuations: Methodological Comparisons from Year-to-Year," *Business Valuation Review*, Vol. 7, No. 4 (1988): pp. 171-173.

strategic control levels of value. In this chapter, we discussed the various assumptions required to estimate a discount rate using a build-up method such as the ACAPM.

Appraisers must exercise common sense, informed judgment, and reasonableness when developing the enterprise discount rate. And there is considerable room for the exercise of judgment. However, appraisers do not exercise judgment in a vacuum. Ken Patton, ASA, has observed many times: “It is quite possible to make the ‘right’ decisions every time and to achieve an absolutely wrong conclusion or result.” Given this possibility, appraisers must consistently demonstrate the overall reasonableness of their conclusions, rather than simply defend the specification of individual discount rate components.

Overview of the Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model describes the relationship between risk and expected returns in the public markets. The essence of the CAPM is expressed in the expected return for an individual security, as seen in Equation 6.2:

$$ER_i = RFR + \beta_i(MR - RFR) \quad (6.2)$$

In this equation:

1. ER_i is the expected return on an equity security_{*i*}.
2. RFR is the risk-free rate.
3. β_i is a measure of the systematic (or nondiversifiable) risk of a particular publicly traded security, considering both the correlation and volatility of the subject security relative to the broader market (the S&P 500, for example). In other words, *beta* attempts to measure the riskiness of a particular public security in relationship to the broader market.
4. MR is the expected return on an investment in the market portfolio (the S&P 500 is often used as a proxy), or the expected return of the market.
5. $(MR - RFR)$ is the expected premium in return from an investment in the market portfolio over and above the risk-free rate.

According to the security market line equation (discussed in every basic finance text), the expected return on any security is proportional to its systematic risk. In other words, as systematic risk (*beta*) increases, the expected return (the risk-free rate plus the product of *beta* and the market premium) also increases.

That portion of the security's volatility that is not related to market movements is called *unsystematic risk*. In theory, unsystematic risk can be diversified away by holding a sufficiently large number of assets whose

returns are not perfectly correlated with each other. In other words, the *alphas* in a diversified portfolio will sum to zero, with unexpected favorable events in some securities offsetting unexpected unfavorable events in others.¹⁷ CAPM, therefore, considers only that portion of a security's volatility that can be correlated with the volatility of the market.

Sensitivity to the market is called *systematic risk* and is measured in the CAPM by *beta*. A *beta* of 1.0 for a security means that inclusion of that security in a market portfolio neither increases nor decreases the overall risk of the portfolio. For a security with a *beta* of less than 1.0, inclusion of the security on a market portfolio reduces the overall riskiness of the portfolio.¹⁸

As with any theoretical model, there are several underlying assumptions of the CAPM. These are summarized in most finance texts and include:¹⁹

1. Investors are interested in maximizing terminal wealth over identical time horizons.
2. Investors are risk averse. They seek to hold diversified portfolios of securities (so that unsystematic risk can be diversified away).
3. Borrowing and lending costs are identical, and investors can borrow or lend at the risk-free rate of interest.
4. There are no investor-related taxes and no transactions costs.
5. Investor expectations are homogeneous with respect to the markets.
6. All assets are perfectly divisible and can be sold in perfectly liquid markets.
7. Investors are price-takers, and their market activities are assumed not to be able to influence the market prices of securities.

¹⁷Note that the CAPM equation expresses the *expected return* for the subject security. The *actual return* in any given period will, of course, differ from the expected return due to unforeseeable factors. This difference, known as *alpha*, may be positive, negative, or zero.

¹⁸This discussion should not be interpreted to suggest that company-specific risks do not exist for individual public securities. They do. Nor should it be interpreted to suggest that investors in public securities do not care about these risks. They do. The theory of diversification, for which there are logical and mathematical proofs, suggests that in a properly diversified portfolio of publicly traded stocks (in a reasonably efficient market), the adverse consequences of bad things happening to certain stocks in the portfolio will, on balance, be offset by good things happening to others, leaving the investor with the beta-adjusted expected return of the portfolio.

¹⁹Investment, corporate finance, and valuation texts too numerous to cite contain discussions of the underlying assumptions of the CAPM.

Clearly, not all of the CAPM assumptions hold when investors consider purchasing or selling interests of closely held companies. Time horizons differ, portfolios may not be diversified, borrowing costs can be substantial, and investor taxes and transaction costs are real elements of consideration. Investor expectations are not homogeneous, and no markets exist for the shares of most closely held businesses. Finally, investors may or may not be able to dictate price in real transactions. Nevertheless, the CAPM has been used as a basis for developing discount rates and capitalization rates for closely held businesses and business interests for many years.

This review of the CAPM suggests that there are at least two basic issues that must be addressed in using the model to develop discount rates for use in the valuation of private–public business enterprises.

1. *Specific Risk*. The CAPM assumes a diversified portfolio of investments such that unsystematic (or company-specific) risks are not relevant. When valuing the equity of closely held companies, it may not be appropriate to assume that the specific risks of the subject company are so easily diversified.
2. *beta*. Appraisers must consider the use of *beta* in practical application. One way that appraisers have dealt with the concept of *beta* is to assume that it is $1.0\times$ when building up discount rates. Because this assumption is not always appropriate, the use of *beta* must be carefully considered.

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ISBN 978-0-470-14816-7



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