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Issues in Valuation: Investment-Specific Risk when Developing Discount Rates

Roger J. Grabowski, FASA

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- Roger J. Grabowski, FASA, Managing Director (ret.) at Kroll LLC, in the Valuation Advisory Services practice

- Roger's testimony in the U.S. District Court was referenced in the Supreme Court's landmark Newark Morning Ledger opinion allowing amortization of customer-based intangible assets. His use of the discounted cash flow (DCF) method for valuing a closely held business and the modified Capital Asset Pricing Model (MCAPM) for estimating the cost of capital for operating businesses was accepted by the U.S. Tax Court in the Northern Trust Company decision; that was the first time that the Tax Court accepted the use of the DCF method and the MCAPM in valuing a closely held business.

- Roger has served as a member of The Appraisal Foundation Working Group developing VFR#5 – Valuation Advisory #5- *Company-Specific Risk Premium*.

- Roger is a co-developer of the annual *Risk Premium Report – Size and Risk Studies* for estimating cost of equity capital (available via the Kroll Cost of Capital Navigator).

- Roger was lead editor and contributing author of Shannon Pratt's *The Lawyer's Business Valuation Handbook* 3rd ed. (American Bar Associate, 2024), and co-editor and contributing author of Shannon Pratt's *Valuing a Business – The Analysis and Appraisal of Closely Held Companies* 6th ed. (McGraw-Hill, 2022). Roger is co-author of *Cost of Capital: Applications and Examples* 5th ed. (Wiley, 2014) and *The Lawyer's Guide to Cost of Capital* (ABA, 2014); co-author of *Valuation Handbook-International Guide to Cost of Capital*: 2021 Summary Edition (CFA Institute Research Foundation Books, 2021); contributing author to *The Art of Valuation: Reflections, Stories and Strategies from Business Appraisal* (The Appraisal Foundation, 2023), of Chapter 17, "Discounts Rates in Theory," in *Lost Profits Damages: Principles, Methods and Applications* 2nd ed. (Valuation Products and Services, 2022); and author of many articles, the most recent being "Comparing Growth Rates Used in Discounted Cash Flow Valuations" (*Business Valuation Review*, 40 (1) 2021).

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Company-Specific-Risk Premiums - Criticisms

Quantifying a company-specific risk premium is one of the most controversial and elusive areas of business valuation.

As Chancellor Strine of the Delaware Chancery Court stated:

> *Much more heretical to CAPM, however, the build-up method typically incorporates heavy dollops of what is called 'company-specific risk,' the very sort of unsystematic risk that the CAPM believes is not rewarded by the capital markets and should not be considered in calculating a cost of capital. The calculation of a company specific risk is highly subjective and often is justified as a way of taking into account competitive and other factors that endanger the subject company's ability to achieve its projected cash flows. In other words, it is often a back-door method of reducing estimated cash flows rather than adjusting them directly.*
>
> *To judges, the company specific risk premium often seems like the device experts employ to bring their final results into line with their clients' objectives, when other valuation inputs fail to do the trick.…[Petitioners' expert's] own analysis also contains a subjective specific risk premium of 2%, the quantification of which cannot be explained by reference to objective factors.…*

See Delaware Open MRI Radiology Associates, P.A. v. Howard B. Kessler et al. (Court of Chancery of State of Delaware, Cons C.A. No. 275-N).

Company-Specific-Risk Premiums - Criticisms (cont'd)

Chancellor Strine made clear that the Chancery Court views the application of a company-specific risk premium to be unreliable:

> *I do not believe that a company-specific risk premium should be used in a CAPM calculation of a discount rate, especially in a case like this.*
>
> *A company-specific risk premium is not an addition to the CAPM that is accepted by corporate finance scholars, but is sometimes added to the discount rate by practitioners valuing a company to reflect that the company has risk factors that they believe have not already been captured by the equity risk premium as modified by beta and (if applicable) the small company size premium. Pure proponents of the CAPM argue that only systematic risk as measured by beta is relevant to the cost of capital and that company-specific risks should be addressed by appropriate revisions in cash-flow estimates.*

Citing Union Ill. 1995 Inv. LP v. Union Financial Group Ltd., 847 A.2d 340, 354 n.28 (Del. Ch. 2003), Del. Open MRI Radiology Assocs. v. Kessler, 898 A.2d 290, 339 (Del. Ch. 2006), and Solar Cells Inc. v. True N. Partners LLC, 2002 WL 749163, at *6 n.11 (Del. Ch. Apr. 25, 2011)

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Company-Specific-Risk Premiums - Criticisms (cont'd)

While the appraiser may not be doing a valuation for Delaware Chancery Court, we all should be aware of the influence that court has on other courts, such as the U.S. Tax Court. Delaware Chancery Court hears more valuation related cases than any other court and many courts look, even informally, at the decisions of that court for guidance. Further, the tone of that court's skepticism concerning applying company-specific risk premium is mirrored by many.

For example, Brealey, Myers, and Allen critique the use of a company-specific risk premium as follows:

> *Be careful not to offset worries about a project's future performance by adding a fudge factor to the discount rate. Fudge factors don't work, and they may seriously undervalue long-lived projects.*
>
> See Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, 11th ed. (New York: McGraw-Hill/Irwin, 2014): 227.

Company-Specific-Risk Premiums - Criticisms (cont'd)

Aswath Damodaran's view:

- *Although there are many reasons that actual returns may differ from expected returns, we can group the reasons into two categories: firm-specific and market-wide. The risks that arise from firm-specific actions affect one or a few investments, while the risk arising from market-wide reasons affect many or all investments. This distinction is critical to the way we assess risk in finance….*
- *There are two reasons why diversification reduces or, at the limit, **eliminates firm specific risk**. The first is that each investment in a diversified portfolio is a much smaller percentage of that portfolio than would be the case if you were not diversified. Thus, any action that increases or decreases the value of only that investment or a small group of investments will have only a small impact on your overall portfolio, whereas undiversified investors are much more exposed to changes in the values of the investments in their portfolios. The second reason is that the effects of firm-specific actions on the prices of individual assets in a portfolio can be either positive or negative for each asset for any period. Thus, in very large portfolios, this risk will average out to zero and will not affect the overall value of the portfolio….*

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Company-Specific-Risk Premiums - Criticisms (cont'd)

Aswath Damodaran's view (continued):

- *We will assert that risk has to be measured from the perspective of not just any investor in the stock, but of the **marginal investor**, defined to be the investor most likely to be trading on the stock at any given point in time….The argument that diversification reduces an investor's exposure to risk is clear both intuitively and statistically, but risk and return models in finance go further. The models look at risk through the eyes of the investor most likely to be trading on the investment at any point in time, i.e. the marginal investor. They argue that this investor, who sets prices for investments, is well diversified; thus, the only risk that he or she cares about is the risk added on to a diversified portfolio or market risk.*

Investment-Specific Risk-What is It?

Source: VFR Valuation Advisory #5: Company-Specific Risk Premium, The Appraisal Foundation (forthcoming, 2026)

- Risk premiums are often added to discount rates to account for risks that are not accounted for in other discount rate components. The commonly used term among valuation practitioners is “company-specific risk premium (CSRP).”
- CSRPs are added to the cost of equity component in the Weighted Average Cost of Capital (WACC) calculation, which may be calculated under several methods, including the commonly used modified Capital Asset Pricing Model (MCAPM) and the Build-up method.
- While the term “company-specific risk premium” is often used to describe this element of a discount rate, other terms, including “alpha” and “additional risk premium,” are also often referenced to signify this factor.
- Regardless of the terminology used, the risk premium has been defined in accounting and valuation literature as a

  risk premium required by investors that is not sufficiently captured by the inputs to cost of equity capital (i.e., equity risk premium, beta, size premium, or country risk premium).

  Source: AICPA *Accounting and Valuation Guide: Testing Goodwill for Impairment*.

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Investment-Specific Risk-What is It? (cont'd)

- There is difference of opinion within the valuation community as to what the risk premium should account for, as well as diversity in practice in how to quantify the risk premium.
- Many appraises have applied these risk premiums based on qualitative rationale alone, accompanied by a subjective selection process – is this best practice?
- Appraisers have also frequently used CSRP as a "catch-all" to account for various factors within their discount rate conclusions.
- Application of such risk premiums without sufficient quantitative support can lead to significant variation in value estimates and result in estimates that may be difficult to support.

Investment-Specific Risk-What is It? (cont'd)

- Company-specific Risk Premiums are intended to address Investment-Specific Risks (ISR):
- ISR can be bifurcated into two perspectives:
    - *Entity-specific-risk* (ESR) – applicable to building discount rates for investments in securities and ownership of entities (e.g., the risk of the stock)*; and*
    - *Cash-flow-specific-risk* (CFSR) – applicable to building discount rates for valuing assets and liabilities.
        - CFSR can arise because of the variability of expected cash flows and/or
        - Differences between forecast cash flows and expected cash flows (forecast risk).

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Investment-Specific Risk-What is It? (cont'd)

- Best practice dictates that any adjustments to a discount rate should be limited to those that can be measured through quantitative means.

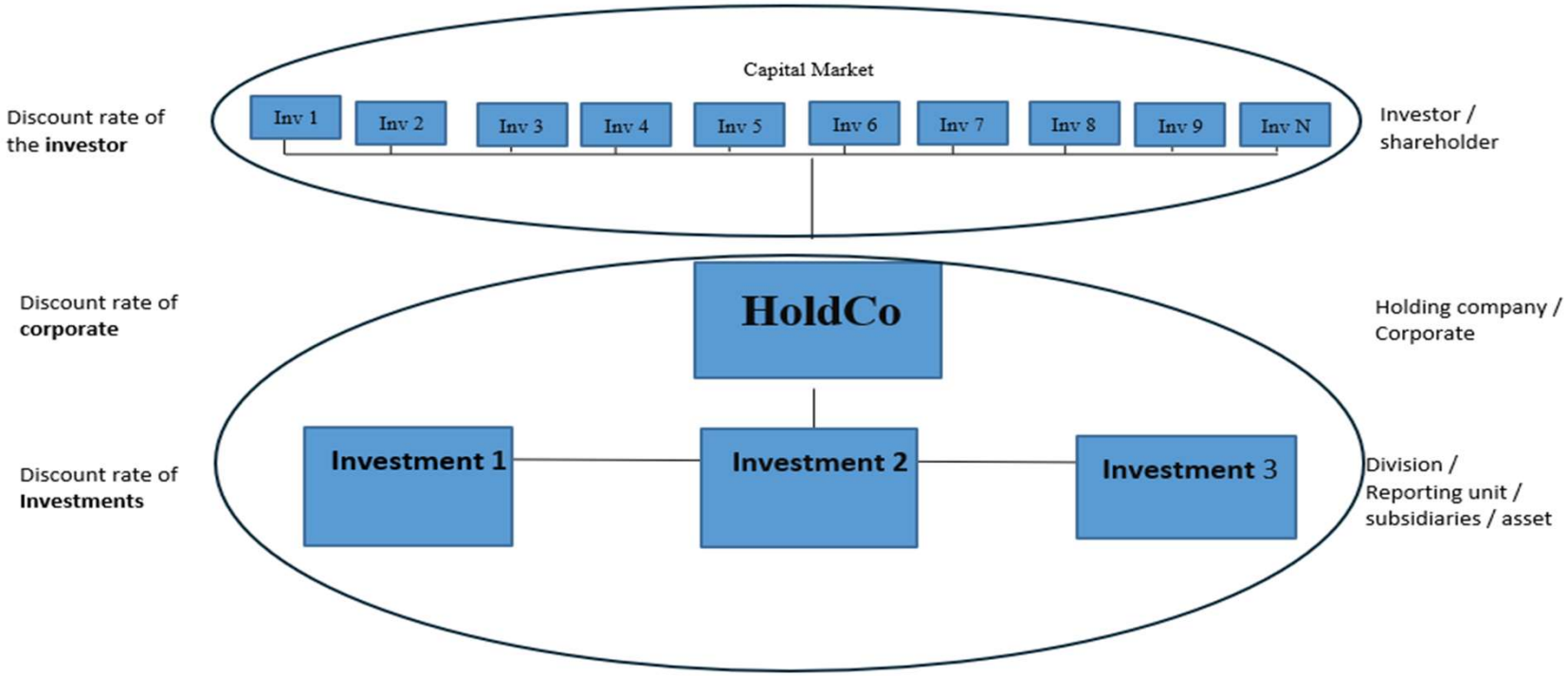
Source: ***Performance Framework –*** Formally known as the *Mandatory Performance Framework* for the Certified in Entity and Intangible Valuations Credential.

  - What is the quantitative evidence that risks have **not** been adequately captured in other inputs?
  - What is the quantitative evidence as to the direction and magnitude of a risk premium?

Investment-Specific Risk-What is It? (cont'd)

- TAF Working Group conducted a broad-based survey to understand how valuation specialists perceive, explain, and quantify company-specific risk. The survey demonstrated that while there was some variance in the approaches valuation specialists use for selecting discount rate inputs, the diversity in practice as it related to ISR was far more significant.
- According to the survey results, diversity in practice was pervasive across all aspects of ISR, including whether or not valuation specialists incorporated ISR into their discount rates, what risk factor(s) valuation specialists used ISR to account for, and the approach valuation specialists used to assess and support ISR assumptions.
- The diversity in practice observed around ISR is not surprising as, relative to other discount rate inputs, ISR lacks much empirical data for direct observation as well as an established framework for analysis.

External Capital Markets vs. Internal Capital Markets



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Developing Discount Rates from Perspective of Investors in Publicly Traded Securities

- The capital asset pricing model (CAPM) has served as the foundation for pricing risk for over fifty years. One commentator has summarized its acceptance this way:

  The workhorse (cost of capital) model for nearly half a century has been the Capital Asset Pricing Model, or CAPM. It dominates textbooks, teaching, and practice. Over 90 percent of all publicly-traded companies use it. Courts and appraisers also use it. In many contexts, it is even the only accredited model.

  Unfortunately—and I write this with a heavy heart—the CAPM is not just imperfect; it is so badly wrong that it is best ignored.

Source: Ivo Welch, "The Cost of Capital: If Not the CAPM, Then What? *Management and Business Review* (Winter, 2021), p. 188.

- Despite its many criticisms, the CAPM in its pure (or textbook) form is still one of the most widely used models for estimating the cost of equity capital, especially for larger companies, and is even used for smaller companies and closely held companies.

Developing Discount Rates from Perspective of Investors in Publicly Traded Securities (cont'd)

- CAPM is part of a larger body of economic theory known as *capital market theory* (CMT). CMT also includes security analysis and portfolio management theory, a *normative* theory that describes how investors *should* behave in selecting common stocks for their portfolios under a given set of assumptions. CAPM is a *positive* theory, meaning it describes the market relationships that *will* result if investors behave in the manner prescribed by portfolio theory.
- Sharpe, Lintner, and Mossin introduced simplifying assumptions with the resulting model, CAPM, and theory defining expected behavior by investors in accordance with the model can be thought of as "capital market theory of the two-parameter model," based upon Harry Markowitz's two-parameter portfolio analysis theory.
- CAPM divides risk into two components: *market* (or *systematic*) risk and *unique* (or *unsystematic*) risk and simplified measures of risk such that the only risk measure that mattered is market *beta*.
- For background, see, chapter 10, "Capital Asset Pricing Model" and chapter 11, "Criticisms of CAPM and Beta versus Other Risk Measures" in Shannon P. Pratt and Roger J. Grabowski, *Cost of Capital: Application and Examples,* 5th ed. (Wiley, 2014).

Developing Discount Rates from Perspective of Investors in Publicly Traded Securities (cont'd)

- A fundamental assumption of the textbook CAPM is that the risk premium portion of a security's expected return is a function of that security's market risk, because CMT assumes that investors hold, or have the ability to hold, common stocks in well-diversified portfolios. Under this assumption, investors will **not** require compensation (i.e., a higher return) for the unsystematic risk because they can **easily** diversify it away. Therefore, the only risk pertinent to a study of ***textbook* CAPM** is market or beta risk. This leads some to the conclusion that only beta risk is systematically priced by the market.
- According to the textbook CAPM, *unique* or *unsystematic risk* (also known as *diversifiable risk, residual risk, idiosyncratic* or *specific risk*) is a function of uncertainty of future returns due to the characteristics of the individual company, and the type of investment interest and is unrelated to variation of returns in the market as a whole.
- While total risk is the sum of systematic and unsystematic factors, under CAPM, it is assumed that investors hold investments that are well-diversified and, therefore, unsystematic risk can be ignored in estimating the cost of equity.

Developing Discount Rates from Perspective of Investors in Publicly Traded Securities (cont'd)

- Fama and French (F-F) published two studies critical of beta. F-F observed that the relation between market beta and average return is flat. The CAPM cost of equity estimates for high-beta stocks are too high and estimates for low-beta stocks are too low, relative to historical returns. In a follow-on study, they found that problems with CAPM using U.S. data show up in the same way in the stock returns of non-U.S. major markets.

Source: Eugene Fama and Kenneth French, "The Cross-Section of Expected Stock Returns," *The Journal of Finance* (June 1992), pp. 427–486 and "Value versus Growth: The International Evidence," *Journal of Finance* (December 1998), pp. 427–465.

- As authors of one book summarize the impact of F-F work:

  Fama and French significantly damaged the credibility of the CAPM and beta.

Source: Tim Koller, Marc Goedhart, and David Wessels, *Valuation – Measuring and Managing the Value of Companies* 5th ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2010), p. 256.

- Besides F-F's finding that the CAPM cost of equity estimates for high-beta stocks are too high and estimates for low-beta stocks are too low, relative to historical returns, CAPM cost of equity estimates for high book-value-to-market-value of equity stocks (so-called *value stocks*) are too low and estimates for low book-value-to-market-value of equity stocks (so-called *growth stocks*) are too high (compared to historical returns).
- The implications of F-F's work are that CAPM just does not work.

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Developing Discount Rates from Perspective of Investors in Publicly Traded Securities (cont'd)

- In the words of one commentator:

  All models are wrong—they are only models, after all. So why be so harsh to the CAPM? Because the CAPM is worse than just a little wrong. The data proves that the CAPM is worse than useless. The primary disagreement which remains among finance professors is whether it is merely worse than useless or statistically significantly worse than useless.

Source: Ivo Welch, "The Cost of Capital: If Not the CAPM, Then What?, p. 189.

- As a result, academic researchers and portfolio managers have generally adopted various multi-factor models in their research on asset pricing (i.e., rates of return for publicly traded securities). Researchers search for the factors that are priced by the market.
- One assumption which was often carried forward from the assumptions underlying CAPM is that if investors are diversified, the observed error term is assumed to be residual (idiosyncratic) risk and not priced by the market. In these multi-factor models, many inputs are not investment-specific risk factors, but rather investor risk factors (e.g., momentum, liquidity), applicable only to publicly traded securities.

How do Academics Estimate the Cost of Equity of Publicly Traded Stock– Multi-factor Models

- For example, R_i may be a function of various factors with $B_{i,j}$ being the sensitivity of observed returns to a particular factor:

$$R_i = R_f + B_{i,m} RP_m + B_{i,s} RP_{i,s} + B_{i,BV} RP_{i,BV} + \cdots + B_{i,c} RP_{i,c} + \cdots + \varepsilon_i$$

where:

R_i	=	Realized return for stock i
R_f	=	Risk-free rate of return
$B_{i,m}$	=	Sensitivity of return of stock i to the ERP
RP_m	=	ERP
$B_{i,s}$	=	Sensitivity of return of stock i to a measure of size, S, of company i
$RP_{i,s}$	=	Risk premium for size of company i
$B_{i,BV}$	=	Sensitivity of return of stock i to a measure of book value, BV_i (typically, measure of book value to market value) of stock of company i
$RP_{i,BV}$	=	Risk premium for book value of company i
$B_{i,c}$	=	Sensitivity of return of stock i to a measure of other risk factors of company i
$RP_{i,c}$	=	Risk premium for other risk factors of company i
...	=	Other factors
ε_i	=	Error term, difference between predicted return and realized return.

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Developing Discount Rates from Perspective of Investors in Publicly Traded Securities (cont'd)

- **But recent research has concluded different interpretations of the residual risk and has shown that, in fact, the market prices the so-called unsystematic or idiosyncratic risk** (i.e., stock returns are influenced by the residual risk in a systematic way) regardless of investor diversification. That is, **the so-called unsystematic risk is priced by the market**.
- **Implication: Adding an investment-specific risk premium to a discount rate to better match the risk of the expected cash flows to expected returns is consistent with current economic theory.**

See, for example, Amit Goyal and Pedro Santa-Clara, "Idiosyncratic Risk Matters!, *The Journal of Finance* (June 2003), pp. 975–1007; Massimo Dello Preite, Raman Uppal, Paolo Zaffaroni, and Irina Zviadadze, "What is Missing in Asset-Pricing Factor Models?" Working paper (February 6, 2024), available at https://ssrn.com/abstract=4135146; Yufeng Han and Weike Xu, "Is There is a Positive Risk Premium for Idiosyncratic Risk?" Working paper (November 19, 2014), available at https://ssrn.com/abstract=4311259; Paul Brockman, Tao Guo, Maria Gabriela Vivero and Wayne Yu, "Is Idiosyncratic Risk Priced? The International Evidence." *Journal of Empirical Finance* 66 (March 2022): 121-136. These authors find greater the residual (i.e., idiosyncratic) risk in multi-factor model, the greater the cost of capital.

Developing Discount Rates from Company Perspective – Company-Specific Approach to Valuing Assets and Liabilities

- Firms are often confronted with valuing assets and liabilities as part of their capital budgeting processes and valuing operating units for such purposes as property tax assessments.
- Capital budgeting theory as **was** taught in corporate finance texts explained that important information needed to evaluate an expected project was the expected rate of return and the standard deviation of the distribution of possible returns. The question that was asked then was "should the project be accepted or rejected" with the recommended measure of acceptance (and ranking) the expected present value of the expected cash flows minus the investment, adjusted for the standard deviation of the expected cash flows (i.e., coefficient of variation).
- Most theory started initially with the evaluation of a single proposal and later was extended to combinations of risk investments.
- Implied in this evaluation is that the total risk of the company as a result of the investments is what is important. This framework implies that proposed investment projects should be judged in relation to the projects total risk but also taking into account the correlation of the proposed projects being evaluated to expected cash flows being generated by existing company operations and expected cash flows from other investments under consideration (i.e., impact of total risk on the company as a whole).

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Developing Discount Rates from Company Perspective – Company-Specific Approach (cont'd)

- The investors' discount rate appropriate for a publicly traded security is dependent on beta as a risk measure in models such as CAPM and multi-factor models.
- The discount rate may differ from both the asset and the appropriate corporate discount rate of HoldCo for evaluating its investments because the volatility or beta coefficient **of a company** is a measure of the sensitivity of that company's returns to the various economic inputs that influence all risky assets' values, incorporating interest payments and inflation rates, economic growth, exchange rate impacts and other influences, as appropriate.
- Market beta estimates derived from the market exist with certain limitations, including that betas:
  - are derived from historical variances, which may not be accurate as forecasts, notably over the long term;
  - vary as the market varies and not independently of it;
  - indicate the volatility of a share price and not of a specific asset (so valuation specialists tend to use proxies to determine the betas for unlisted assets or for subsidiaries of listed companies);
  - are variable over time, and therefore CAPM will vary over time too.

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Developing Discount Rates from Company Perspective – Company-Specific Approach (cont'd)

- In addition,
  - assets and companies have much different liquidity compared to securities owned by investors in public securities;
  - though valuation theory assumes that the value of a stock is based on expected long-term cash flows, the liquidity of public stock allows investors to exit stock as expectations change and reallocate an investor's portfolio;
  - companies have a much different time horizon over which they expect their investments to realize profits compared to most investors in public securities;
  - assets and companies will typically be leveraged very differently from the way in which investors (shareholders) are leveraged, with the former offering more valuable security to lenders against any potential repayment default;
  - company income tax rates generally differ from an investor's income tax rate which is, to greater or lesser degrees, dependent on the investor circumstances; and
  - the returns expected from an investment in publicly traded securities by an investor are likely not the same as the required investment returns or hurdle rates demanded by a company (HoldCo) to make the investment or develop a new asset in the first place.

Developing Discount Rates from Company Perspective – Company-Specific Approach (cont'd)

- Even then, there will likely be differences in the appropriate discount rates among the company investments. For example, each asset's (division/reporting unit/subsidiary) discount rate will typically not be the same as the corporate discount rate for a number of reasons, including:
  - on which balance sheet the debt lies (divisional/subsidiary level) or company level and leverage differences yielding different costs of debt);
  - the different equity discount rates due to differing industry risks and leverage;
  - differing volatilities for each division/subsidiary (company-level cash flow risk versus divisional/subsidiary cash flow risk);
  - differing income tax rates (e.g., a subsidiary may have operations principally outside of the country where Holdco resides making it subject to income taxes in that country which may be greater than the overall income tax rate).

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Developing Discount Rates from Company Perspective –Capital Markets Approach

- Basic theory as taught in many textbooks today assumes that the discount rate a company should use in evaluating investments should reflect the rate of return expected by investors in the business as measured by the rate of return indicated in the capital markets as estimated using CAPM or some other multi-factor model (sometimes referred as the *financial cost of capital*).

  So even today, most business schools still teach the CAPM as their main model—even though nearly all finance professors know perfectly well that the model fails all evidentiary standards. Remarkably, we finance professors do not disagree about the evidence. We do, however, disagree about what we should teach instead. Most of us remain more comfortable teaching a beautiful toy model that we fully understand than teaching ad hoc prescriptions of which we understand only bits and pieces. The CAPM is the cozy bedtime story that tells students and practitioners that the world is in good order and that they have learned something which will allow them to understand it. But the real world isn't like that.

Source: Ivo Welch, "The Cost of Capital: If Not the CAPM, Then What?, p. 188.

Developing Discount Rates from Company Perspective –Capital Markets Approach (cont'd)

- Investment-specific-risks are not directly considered except for their impact on factor inputs (e.g., market betas) because the textbook CAPM assumes that all risks other than undiversifiable risk are diversified away by investors in their portfolio of stocks (and that underlying assumption often is carried forward in textbook discussions).
- A consequence of the assumption of investor diversification is that diversification by the company in its portfolio of businesses is not a thing of value. Therefore, efforts by a company to reduce its total risk diversification will not enhance its value. This framework implies that investment projects should be judged in relation to their systematic risks only, ignoring what might be considered investment-specific-risk.
- The same implication of the CAPM holds for valuing existing business operations (e.g., reporting units) and potential acquisitions.

• Integrating the Company-Specific and Capital Markets Approaches

- There are issues when extending capital market theory to evaluate company investments.
  - One basic issue is that the capital market approach assumes that there is one-to-one link between the expected return on a stock and the fundamental risk of the underlying assets (i.e., reflect the rate of return expected by investors in the business as measured by the rate of return indicated in the capital markets as estimated using CAPM or some other multi-factor model (*financial cost of capital*).
  - Second, the returns on a market index used in estimating market risk, beta, are not comparable with cash flow measures of profitability of an investment by a company. The return on investment for the market index involves changes in the capitalized value from the start of the period to the end. The cash flow measures of profitability for an investment project do not take into account changes in capitalized value period-to-period.

Integrating the Company-Specific and Capital Markets Approaches (cont'd)

- Third, the underlying assumptions of CAPM creating a theoretical construct of investor behavior may negate its applicability. Even then, CAPM and other factor models are considered single-period models. Investment projects can extend over a number of years during which time risk-free rates may change, equity risk premiums may change, and betas measuring market risks may change. Further, hedging strategies that work in the short term (e.g., hedging costs of raw materials) are simply unavailable at the valuation date for hedging risks throughout the expected life of an investment.
- Fourth, one assumption in using the CAPM is particularly crucial and that is the cost of insolvency or bankruptcy is zero. It is important to recognize that the probability of a firm becoming insolvent depends on the total risk, not just undiversifiable risk.

  This assumption has caused at least one commentator to criticize exclusive use of CAPM in evaluating investments in the capital budgeting process. He argues that the mainstream approach to capital budgeting focuses excessively on the special case where diversifiable risks do not affect the contribution of a project to the value of the firm. This approach ignores the impact of a new investment on the company's total risk and can lead to an inappropriate assessment of the value of an investment.

See, for example, James C. Van Horne, chapter 8, "The Evaluation of Risky Investments," section "Evaluation of Projects in a Firm-Risk Context" in *Financial Management and Policy* 3rd ed. (Englewood Cliffs, NJ: Prentice-Hall, 1968), pp. 189–197

Integrating the Company-Specific and Capital Markets Approaches (cont'd)

- Because other market imperfections are assumed away by CAPM, residual risk, as well as market risk, (i.e., total risk measuring the risk of variability of expected cash flows) is important in evaluating investment risk for the firm.
- Authors have proposed a dual approach as being more appropriate in evaluating and valuing investments. That is, capital budgeting hurdle rates should be examined relative to expected returns focused on expectations of outside investors *and* focused on the impact of the proposed investment on the total risk of the firm (i.e., based on management's estimate of the present value of the cash flows, a hurdle rate should reflect the fundamental risk of the assets in question, independent of outside investor bias).
- One author recognizes that while CAPM is a failure as an empirical description of actual stock returns,

  CAPM (or something quite like it) may still be quite useful from a prescriptive point of view in capital budgeting (i.e., asset valuation) decisions. This is because (market) β—if calculated properly—may continue to be a reasonable measure of fundamental economic risk of an asset, even if it has little or no predictive power for stock returns.

Source: Jeremy C. Stein, "Rational Capital Budgeting in an Irrational World," *Journal of Business* (1996), at 432.

Developing Discount Rates – Valuation Specialist Models

- Appraisers and corporate finance staffs do not typically employ the same multi-factor models as do academic researchers because many of the inputs into those models can only be derived for publicly traded securities. For example, the relationship of book value-to-market value (spread between high book value-to-market value stocks and low book value-to-market value stocks) is a factor in the Fama-French 5-factor model and is dependent on the market capitalization of publicly traded securities. Measures of momentum and liquidity relies on public stock prices trading information.
- CAPM is still the most widely used method of estimating financial cost of capital for companies, though larger companies also use some form of multi-factor model.

Source: John Graham, "Presidential Address: Corporate Finance and Reality," *NBER Working Paper* 29841, available at http://www.nber.org/papers/w29841.

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Developing Discount Rates – Appraiser Models (cont'd)

Most commonly used:

Modified CAPM

- $k_e = R_f + \beta \times RP_m + RP_s + RP_c + RP_{isr}$

Often used for smaller companies:

- *Build-up Method*
- $k_e = R_f + RP_m + RP_{ind} + RP_s + RP_C + RP_{isr}$
- In applying these models, appraisers recognize that there are significant risk differences due to the different time horizons over which investors in closely held companies and companies making investments compared to investors in publicly traded securities by typically incorporating long-term risk-free rates (e.g., 10-year or 20-year United States government bond yields), long-term estimates of equity risk premiums and size premia data derived over long periods in building their discount rates.

See Shannon Pratt's *Valuing a Business: An Analysis and Appraisal of Closely Held Businesses* (New York: McGraw-Hill, 2022), pp. 214–221 and pp. 233–246.

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Developing Discount Rates – Appraiser Models (cont'd)

- Referring to the figure on ppt 14, the same basic formulas (MCAPM and build-up) are used for estimating the discount rate when
  - valuing investments in securities of companies from the perspective of investors/shareholders of closely held businesses to reflect both
    - entity-specific risks (risks inherent in the entity, for example level-of-debt) and
    - cash-flow-specific risks of the entity
  - valuing assets and businesses from the perspective of investments made by the company to reflect cash-flow-specific risks.
- Cash-flow-specific-risks(CFSR) can arise because of
  - the variability of expected cash flows (CFSR due to Expected Cash Flow Variance)
  - and/or the differences between forecast cash flows and expected cash flows (CFSR due to Conditional Forecast Risk).

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Developing Discount Rates – Appraiser Models (cont'd)

Instead of simply using the term CSRP, the appraiser should identify the risks being considered:

- *Entity-specific risk* – when valuing an interest in an entity

  Entity-specific risk pertain to the characteristics of the entity.

  For example, some entity-specific-risks pertain to the risk of the current entity owning the assets or business (e.g., limited access to capital, legal/litigation issues) and may not be relevant when valuing those assets in the hands of another owner (as fair value is defined as an exit value).

  Other entity-specific risks pertain to the risks of the interest being valued (e.g., non-controlling interest; no established market for the interest)

  The entity or the interest being valued also is subject to the risks of the cash flows (i.e., *cash-flow-specific risk* due to expected variability of the expected cash flows of the entity).

- *Cash-flow-specific-risk* (CFSR) – when valuing an asset or liability owned by an entity:

  Cash-flow-specific risks can arise from the variability of expected cash flows (CFSR due to Expected Cash Flow Variance)

  and/or risk that the forecast cash flows differ from expected cash flows (CFSR due to Conditional Forecast Risk).

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Developing Discount Rates – Appraiser Models (cont'd)

- These are multi-factor models intended to incorporate both market risks (as is CAPM) and investment-specific-risks (as implied by traditional capital budgeting theory).
- While these are only models and

  All models are wrong—they are only models, after all

Source: Ivo Welch, "The Cost of Capital: If Not the CAPM, Then What?, *p. 189.*

these models have gained wide acceptance among appraisers as being reasonable tools for measuring risks of entities and business operations (e.g., divisions/subsidiaries).

- But there is often lack of clarity on the part of valuation specialists as to which application is intended as, for example, RP_{isr}, takes on different meanings in each of these uses and can be a source of confusion.

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Do Market Participant Companies Consider Cash-Flow-Specific Risk Factors Beyond Market Risk When Developing Discount Rates

- Several studies have examined discount rates used by market participants in making investment decisions compared to the same company's estimated financial cost of capital.
- One study estimated the cash-flow-specific risk premiums added by companies investing in onshore vertical natural gas wells. That study finds that company investors increase the discount rate used in capital budgeting decisions to account for cash-flow-specific risks. The adjustment is greater when the exposure of a proposed project to downside risk is greater.

Source: Paul H. De´caire, "Capital Budgeting and Idiosyncratic Risk" (January 24, 2024), available at https://ssrn.com/abstract=3480884

- In one study, the researchers used survey date from market participants to collect information on discount rates used in capital budgeting. They found that discount rates for evaluating proposed capital investments were generally set at rates that exceeded a firm's financial cost of capital.

Source: John Graham, "Presidential Address: Corporate Finance and Reality"

- In another study, the researchers used public company earnings conference calls to collect discount rates used in capital budgeting. They also found that discount rates for evaluating proposed capital investments were set at rates that exceeded a firm's financial cost of capital.

Source: Niels Joachim Christfort Gormsen and Kilian Huber, "Corporate Discount Rates," (March 6, 2025), available at https://ssrn.com/abstract=4160186 and Niels Joachim Gormsen and Kilian Huber, "Firms' Perceived Cost of Capital," (May 2, 2024), available at https://ssrn.com/abstract =3712699.

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Do Market Participant Companies Consider Cash-Flow-Specific Risk Factors Beyond Market Risk (Cont'd)

- In another study, the authors find that "we find that, although most firms use WACC as a basis for their discount rate, they almost always augment it before using it to evaluate projects….". They identify the largest premiums added by firms exposed to high levels of investment-specific (idiosyncratic) risk.

Source: Ravi Jagannathan, David A. Matsa, Iwan Meier and Vefa Tarhan, "Why do Firms Use High Discount Rates?" *Journal of Financial Economics* 120 (2016): 445-463.

- One can conclude that actual market participants when evaluating investments use discount rates for evaluating investments that consider other risk factors beyond market risk and that these discount rates exceed the textbook versions of companies' financial cost of capital.

Investment-Specific Risk Considerations in Estimating the Cost of Equity

- In applying a premium for Cash-Flow-Specific Risk in developing a discount rate, appraisers are focused on risk characteristics of the expected cash flows of the subject asset or business compared to the cash-flow risk characteristics of companies that are used in developing the discount rates.

For example, in application of the MCAPM, the practitioner is focused on developing a proxy beta for the subject business derived from Guideline Public Companies (GPCs) which have risk characteristics that closely parallel those of a subject business or asset (i.e., evidence of market risk). But oftentimes, there are few or no GPCs with risk characteristics comparable to those of the subject business or asset.

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Investment-Specific Risk Considerations in Estimating Cost of Equity (cont'd)

- Risks of the expected cash flows of a subject business or asset may vary over time as future events unfold.

For example, risks of investments in natural resource projects vary as the different stages of the natural resources project unfold, requiring the valuation specialist to match the risks of the project at the stage of development as of the valuation date. This can result in a mismatch with the risk measures derived from GPCs as the risks of their businesses are typically based on the conglomerate risks of the multitude of projects at various stages of development. This type of mismatch of risk characteristics can occur whenever there are no GPCs at the same stage of development as the subject business or asset.

See, Eric Lilford, "Natural Resources: Cost of Capital and Discounting — Risk and Uncertainty," *Resources Policy* 80 (2023), available at https://doi.org/10.1016/j.resourpol.2022.103242.

- Generally, in developing discount rates appraisers should consider risk factors that either considered by market participants but are not adequately captured by other discount rate model components (e.g., because of lack of sufficiently comparable GPCs) and/or represent a premium for the additional risk related to the use of conditional cash flows (i.e., forecast cash flows differ from expected cash flows).

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Investment-Specific Risk Considerations in Estimating Cost of Equity (cont'd)

- In developing discount rates, appraisers should consider risk factors that either considered by market participants but are not adequately captured by other discount rate model components (e.g., because of lack of sufficiently comparable GPCs) and/or represent a premium for the additional risk related to the use of conditional cash flows (i.e., the premium for cash-flow risk (CFSR Premium) due to conditional forecast risk).
- The investments in divisions/subsidiaries and investments in new projects made by a firm do not have the same liquidity as do the ownership interests in publicly traded securities.
- Common practice in valuing interests in non-public businesses where the indicated values are developed using publicly traded security information is to apply a discount for lack of liquidity (or lack of marketability).
- An alternative method is to incorporate a risk premium for illiquidity as part of RP_{isr}. It may be appropriate to recognize the illiquidity of investments made by a firm (compared to the liquidity of securities held by its investors) by adding an illiquidity risk premium or increasing the cost of equity.

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Investment-Specific-Risk Considerations in Cost of Equity - Illiquidity (cont'd)

- In one study, the authors estimate the risk premiums added to discount rates used by private equity investors to account for the illiquidity of the investments and investment-specific risks.

Source: Stan Feldman and Todd Feldman, "Understanding the Firm Specific Risk Premium," *Journal of Business Valuation and Economic Loss Analysis* 18 (1), pp. 1-22. The authors decompose the rate of return into its component parts: market risk premium, size premium, liquidity premium and an investment-specific risk premium;

- In another study, the authors explore private equity and venture capital markets. They demonstrate how and why what is considered diversifiable risk should be priced in venture capital "deals" even though investors might be fully diversified.

Source: Michael Ewens, Charles Jones and Mathhew Rhodes-Kropf, "The Price of Diversifiable Risk in Venture Capital and Private Equity," *Review of Financial Studies* 26(8) (Auguust 2013), pp. 1854—1889.

- In another study, the authors find that firms with real assets that are less liquid have a higher cost of capital than firms with more liquid real assets.

Source: Hern'an Ortiz-Molina and Gordon M. Phillips, "Real Asset Illiquidity and the Cost of Capital," (August 25, 2012), available at SSRN: https://ssrn.com/abstract=1413780.

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Market Participant Companies Consider Cash-Flow-Specific Risk Factors (cont'd)

- One can conclude that actual market participants when evaluating investments use discount rates for evaluating investments that consider other risk factors beyond market risk and that these discount rates exceed the textbook versions of companies' financial cost of capital.
- In actual practice among market participants making evaluations of potential investments by companies, managements use a form of a discount rate with more risk factors than simply market beta; their discount rates reflect fundamental cash-flow-specific risks of the proposed investments and that their practices are more consistent with capital budgeting theory for investments where the goal is to maximize management's perception of the present value of expected cash flows.
- Conclusion:
  - Adding an investment-specific-risk premium when building a discount rate is consistent with current theory and consistent with market participant practices.
  - Valuation specialists need to take care in developing supportable investment-specific-risk premiums, lest they be criticized for simply adding a made-up "fudge factor".

What to do before applying an Investment-Specific Risk Premium – MCAPM

- Any estimate of the correlation coefficient obtained by regressing realized returns, ρ, is only an estimate of the expected correlation ρ. Similarly, the standard deviations of realized returns on security *i* and the market, *m*, over a lookback period are only estimates of the expected standard deviations of returns. So any estimate of beta made using a regression over a lookback period is similarly only an estimate of the *true* beta and, as the research shows, this estimation process using historical data may cause estimation errors.
- Research has shown that volatility affects the accuracy of beta estimates. At times when the market is highly volatile, beta estimates are less reliable, as are the correlations of individual stock returns with returns on the market. Research further shows that even though correlations break down in times of high market volatility, volatilities generally move together. That is, when the market volatility increases, on the average, so does the volatility on individual stock returns. This means that estimating betas during periods of high volatility of market returns will generally provide less reliable estimates of beta than during periods of low volatility.

Source: Daniel Suh, "The Correlations and Volatilities of Stock Returns: The CAPM Beta and the Fama-French Factors," Working paper (March 21, 2009), available at https://ssrn.com/abstract=1364567.

- When reliable direct beta estimates are not available, it is reasonable to rely on a *proxy* market beta.

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What to do before applying an Investment-Specific Risk Premium – MCAPM (cont'd)

- Often appraisers refer to data services that publish beta estimates. It is best practice to use published beta estimates from a single service in any analysis, as data services use differing definitions in performing their beta estimate calculations.
- In instances where the appraiser cannot obtain published beta estimates from a single source, it is preferable for the appraiser to perform his/her own analysis.
- While published betas often are estimated by regressing stock returns to the returns of a market weighted stock index (e.g., the S&P 500), studies have shown that regressing five years of monthly return data to an equal-weighted stock index over the lookback period provides an improved beta estimate.

See, for example, Bartholdy, Jan and Paula Peare, "Estimation of Expected Return: CAPM vs. Fama and French," *International Review of Financial Analysis* 14 (4) (2005), pp. 407–427. See also, Ivo Welch, "Simpler Better Market Betas," National Bureau of Economic Research Working Paper w26105 (July 29, 2019).

What to do before applying an Investment-Specific Risk Premium – MCAPM (cont'd)

- In the ideal situation, the appraiser could identify "pure play" public companies (Guideline Public Companies, GPCs) in a single business line such that their business risks would mirror those of the subject business) with approximately the same leverage (such that the financial risk would mirror those of the subject business). The beta estimates would fall into a tight range and the measure of central tendency would be a good proxy beta estimate for the Subject Business.

- But finding "pure play" companies with the mix of business risks and financial risks that match those of the subject business is often difficult or sometimes impossible.

- What drives differences in betas?

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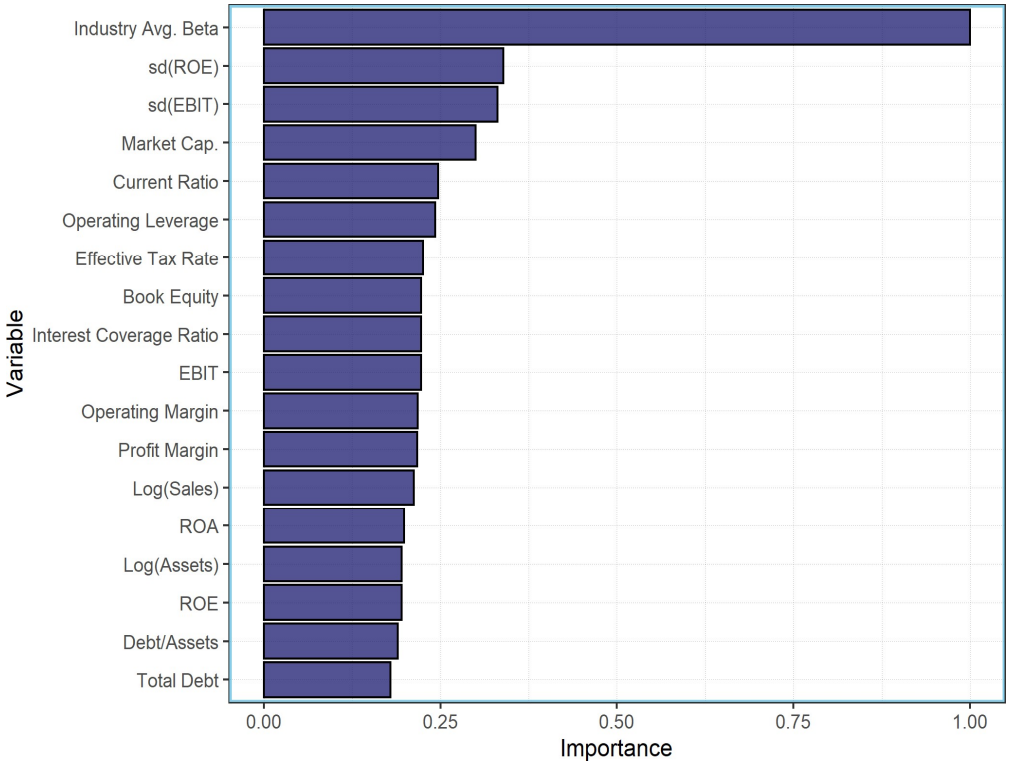
Quantitative Factors that Drive Differences in Beta



Source: "Forecasting Beta with Random Forests" by Emmanual Alanis, *Applied Economic Letters* 29 (12) (2022), pp 1134–1138.

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What to do before applying an Investment-Specific-Risk Premium – MCAPM (cont'd)

- Published (calculated by a data provider) betas for publicly traded stocks typically reflect the capital structure of each respective company at market values. These betas sometimes are referred to as *levered betas*, betas reflecting the leverage in the company's capital structure.
- Levered betas incorporate two risk factors that bear on risk: business (or operating) risk and financial (or capital structure) risk.
- Removing the effect of financial leverage (i.e., *unlevering* the beta) leaves the effect of business risk only. The unlevered beta is often called an *asset beta*. Asset beta is the beta that would be expected were the company financed only with equity capital.
- When a firm's beta estimate is measured based on observed historical total returns (as most beta estimates are), its measurement necessarily includes volatility related to the company's financial risk. In particular, the equity of companies with greater levels of debt is riskier than the equity of companies with less leverage (all else being equal).
- If the leverage of the operating business (i.e., division/subsidiary) differs significantly from the leverage of the GPCs selected for analysis, or if the debt levels of the GPCs differ significantly from one another, the appraiser should remove the effect that leverage has on the betas before using them as a proxy to estimate the beta of the subject business.

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What to do before applying an Investment-Specific-Risk Premium – MCAPM (cont'd)

- In determining whether adding an investment-specific risk-premium is appropriate to apply in the estimation of the equity discount rate, appraisers should initially evaluate all other elements of the discount rate estimate to ensure that an adjustment for investment-specific risk is required.
- Even after unlevering the estimated betas for the GPCs (to remove differences in financial risk due to differences in debt), beta estimates among GPCs may differ due to other factors priced by the market such as differences in

  (a) excess cash and investments in non-operating assets,

  (b) differences in operating leverage,

  (c) differences in business diversification,

  (d) differences in customer concentration, or

  (e) differences in expected growth rates.
- The concluded beta estimate for the subject business should be adjusted for these differences between the GPCs and the Subject Business before consideration of any investment-specific-risk-premium.

  Source: Pratt and Grabowski, *Cost of Capital* 5e: 331–371.

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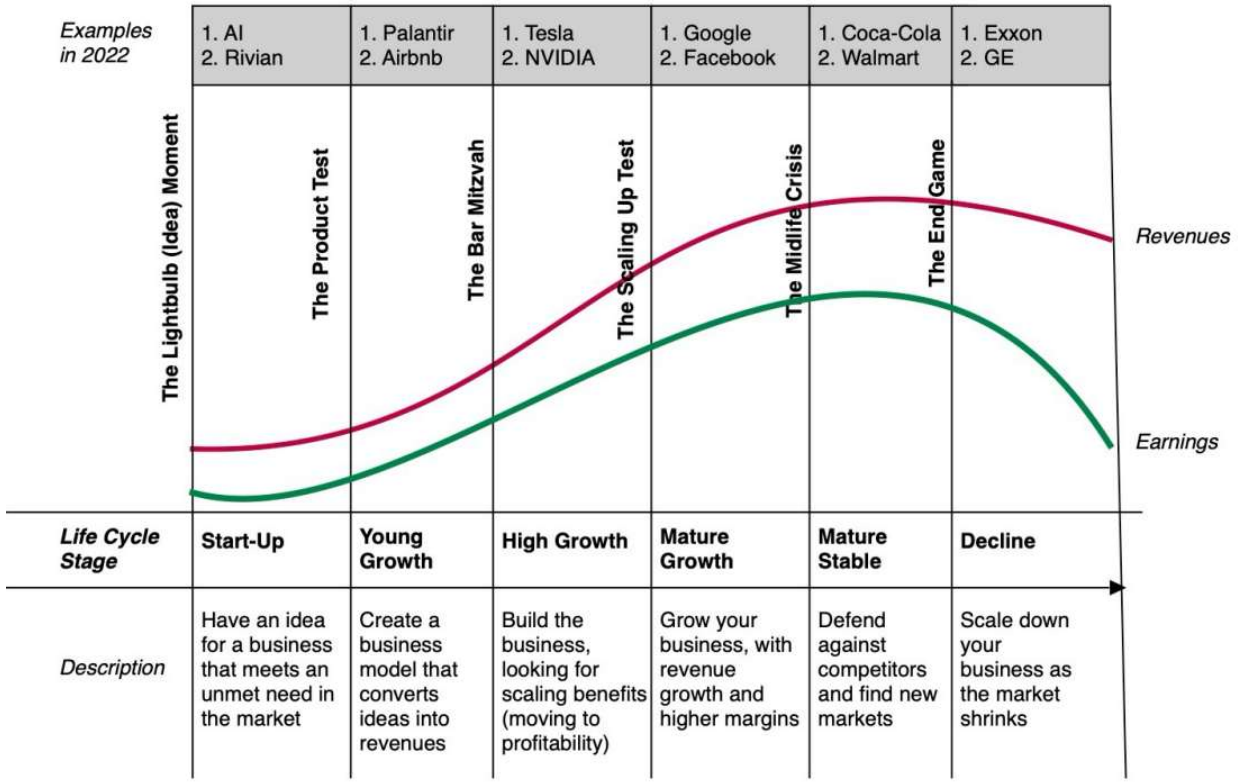
GPCs May Have Differences in Growth and Differences to Expected Growth of Subject Business

- Appraisers preparing a discounted cash flow (DCF) valuation typically analyze the core business and forecast the expected organic growth of that business.
  - The core business can be described as the *existing enterprise*, which is normally expected to grow at a growth rate consistent with the company's market position and management's capabilities (in the context of the relevant economy).
  - Growth is described as "organic" growth – growth that can be expected absent speculative acquisitions, the timing and pricing of which are unknown as of valuation date. The forecasted net cash flows for the core business reflect the investments in capital expenditures and net working capital required to support the projected revenues used in developing the projected net cash flows.

Source: Aswath Damodaran, *The Corporate Life Cycle* (Penguin Random House, 2024)

Understanding Growth: The Corporate Life Cycle



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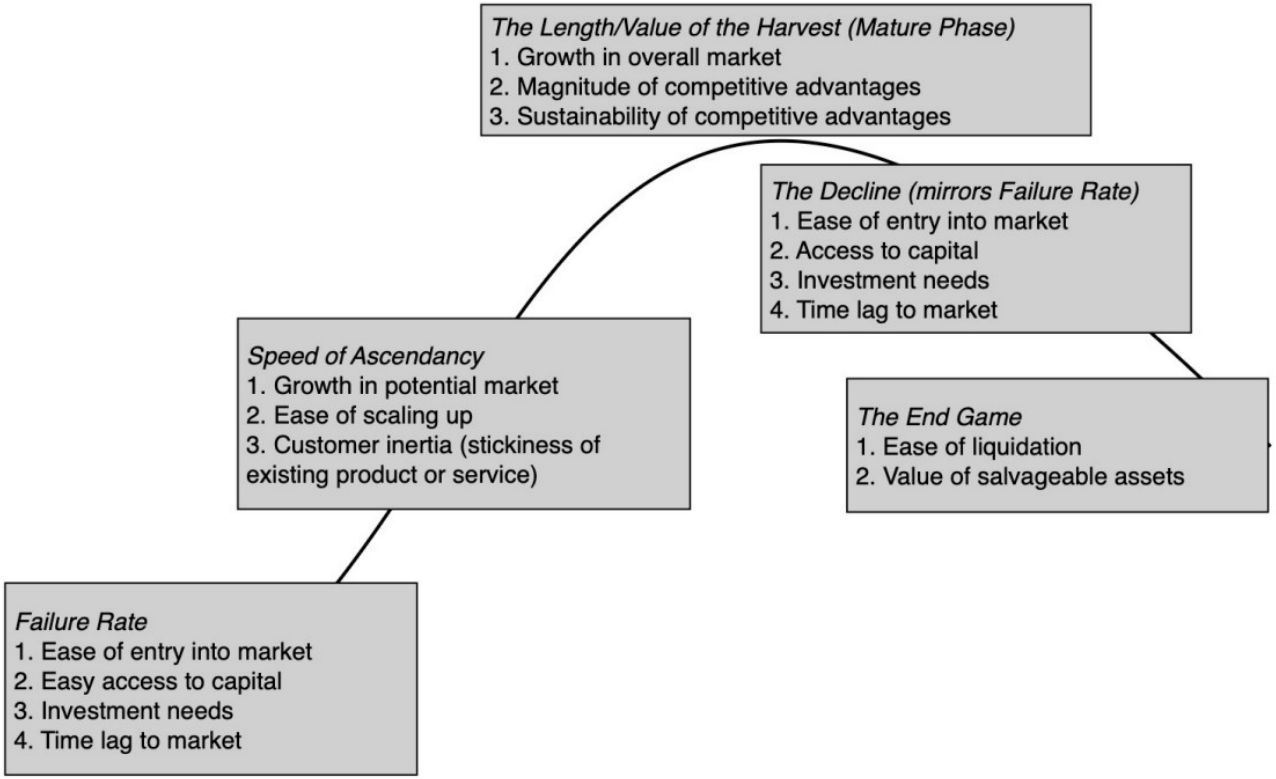
Corporate Life Cycle Determinants



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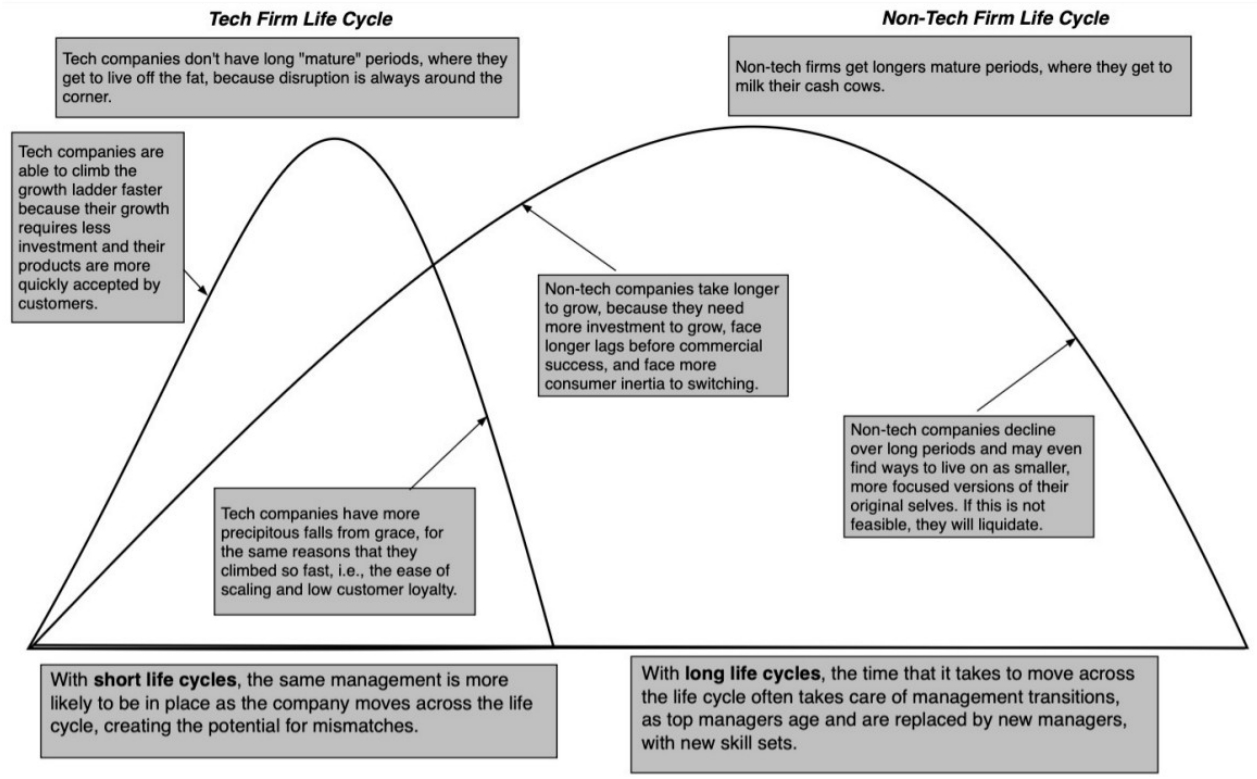
Aging through the Life Cycles



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Analyzing growth-DCF vs Security Analyst Estimates

- Theory of applying the DCF method to valuing organic growth is sound but is not necessarily consistent with the thought process used by security analysts in preparing their earnings projections for public companies.
- Security analysts typically estimate the portion of the core business's net cash flows that are retained and the expected returns on reinvesting those retained cash flows on the earnings of the business in future periods. For companies that they follow which have had a history of acquisitions, they speculate that acquisitions will continue with the retained cash flow and that these unknown acquisitions will add to the earnings in future years.
- To compare **analysts' earnings projections** for GPCs to the forecasts of organic growth, one needs to understand the basis for the analysts' earnings projections. That means obtaining copies and reading the security analysts' reports.
- One then needs to convert the net cash flows to the equivalent of the projected earnings consistent with the security analysts' methodology. For comparison purposes, we must mimic the forecast (or projection) process of the security analysts consistent with the data underlying the net cash flows.
- Source: Grabowski, "Comparing Growth Rates Used in Discounted Cash Flow Valuations" (*Business Valuation Review*, 40 (1) 2021)

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Analyzing growth-DCF vs Security Analyst Estimates (cont'd)

- When securities analysts project longer-term reported earnings growth estimates for public companies, their projections typically consider the use of leverage and the impact on future net income resulting from reinvestment in the retained net cash flows.
- Since it is rare for public companies to distribute all of their earnings or available cash flows, it is typically the case that future earnings growth rates will exceed projected growth in core earnings as estimated in a DCF.
- To project expected growth in total earnings, analysts must make assumptions regarding the future payout of earnings (i.e., paying dividends) versus reinvesting in the business.

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Measuring growth

- If the appraiser uses a constant growth model (i.e., Gordon Growth model) for imputing the expected growth embedded in the current stock price of a GPC, that embedded growth rate typically includes both the existing or core business as of the valuation date (the same basis as the typical projections used in a DCF valuation) plus new, but unspecified, business opportunities resulting from reinvestment of the portion of net cash flows retained.

- Similarly, if the appraiser is comparing the implied growth rate embedded in acquisition prices (either for public company acquisitions or acquisitions of closely held businesses), the expected growth may include both the expected net cash flows from the core business at the time of the acquisition as well as expected growth from new investment opportunities resulting from reinvestment of retained net cash flows. That is, the implied growth likely is a continuation of the historical growth which in prior years included both net cash flows from the then core business plus net cash flows from new business opportunities.

Measuring growth (cont'd)

The following illustrates the relationship between the expected growth in core earnings, g_e, and that of expected growth in reported earnings, g*, given differences in the expected retention ratio and highlights the relationship between reinvestment and reported earnings growth.

(A) Retention Ratio	(B) Discount Rate	(C) Product	(D) Payout Ratio	(E) g_e Core Earnings Growth	(F) (D-E) Product	(G) (C+F) g^* Reported Earnings Growth
0%	20%	0%	100%	10%	10%	10%
20%	20%	4%	80%	10%	8%	12%
40%	20%	8%	60%	10%	6%	14%
60%	20%	12%	40%	10%	4%	16%
80%	20%	16%	20%	10%	2%	18%
100%	20%	20%	0%	10%	0%	20%

Source: *Business Valuation - An Integrated Theory* , Second Edition, by Z. Christopher Mercer and Travis W. Harms, 2008, page 19.

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Forecasting Long-Term Growth Rates

- Some analysts default to long-term growth equal to long-term real GDP growth plus expected inflation (assuming net cash flows are in nominal dollars). For example, in the estimate of long-term growth in the Terminal Value.
- But GDP growth includes both growth in existing businesses and growth in newly formed companies
- Implication: an existing business will grow by an amount less than overall GDP growth
- Cornell estimates that real long-term growth in aggregate corporate earnings will be 3%, with 2% attributable to new companies >> long-term average real earnings for existing businesses = 1%
- Implication: use 1% real GDP plus expected inflation as long-term growth rate

Source: Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* 66 (2010) and Bradford Cornell and Richard Gerger, "Long-Run Growth Rates in Discounted Cash Flow Models," *Business Valuation Review* 41 (3) (2022)

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Measuring growth

Biases in Growth Rate Estimation- Firm Age

- Rate of growth is observed to be high in the early stage of a firm's life.
- Firms are launched when there is a perceived demand for their services/products.
- Early-stage growth rates are high as the base level is small.
- Market conditions evolve and competitors emerge.
- Growth rates decline substantially once the novelty factor wears off.
- Recent examples are Zoom and Instacart.
- Early valuation estimates based on the high rate of growth flame out.

Source: "Estimating Growth Rates and Valuation," Prof. Ashok Abbott & Roger J. Grabowski, *2023 ASA International Conference* (October 2023)

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Measuring growth (cont'd)

- Biases in Growth Rate Estimation-Merger Activity
  - Firms in several industry sectors grow through acquisitions and mergers.
  - This growth, if not identified and isolated, leads to wildly exaggerated estimates for the growth rate.
  - Impact of mergers and acquisitions are cumulative over time. Even if the annual non-merger/acquisition rates are comparable across sectors, the boost from a merger/acquisition can have long lasting impact.
- Biases in Growth Rate Estimation- Inflation
  - Inflation impact is not global.
  - Using the GDP growth rate including inflation as a proxy for the growth rate for individual firms assumes a universal inflation impact.
  - Industries vary in their ability to pass on the inflation impact on their input costs to their customers, especially if substitutes are available for their product.
  - For example, when inflation heats up, new car prices can not be raised as quickly as used car prices.

Observed Long-Term Growth

The following are are excerpts from that presentation. These show actual growth for firms with the impact of mergers removed.

- Growth includes base business plus impact of reinvestment of retained net cash flows
- These graphs (for three industries) demonstrate that real growth in revenues, gross profit and EBITDA decrease as companies move through the stages of their lives:
  - high growth ("out of the box"),
  - slowing growth as companies mature, and finally
  - long-term growth after they mature (measured as growth in the 20th year following going public)

The discount rate should differ for firms in the same industry depending on the subject firm's stage of growth

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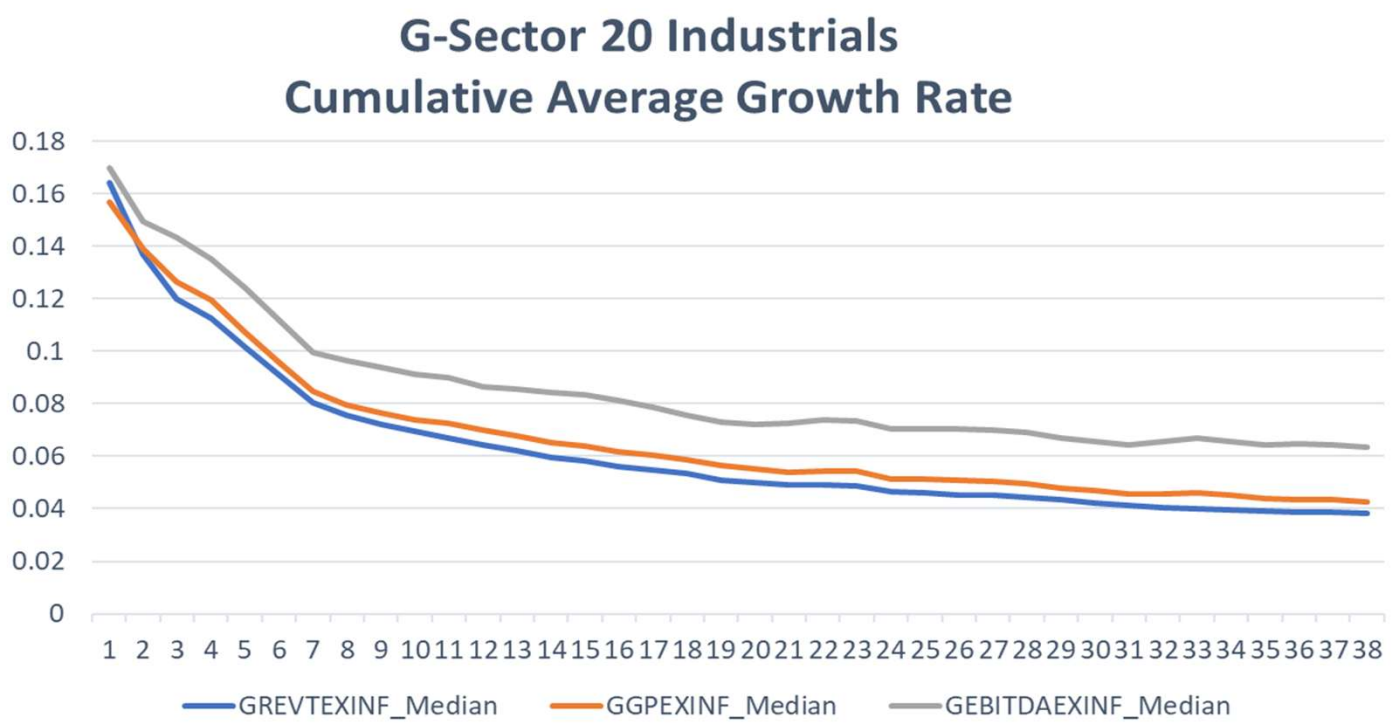
Real growth over time with mergers removed



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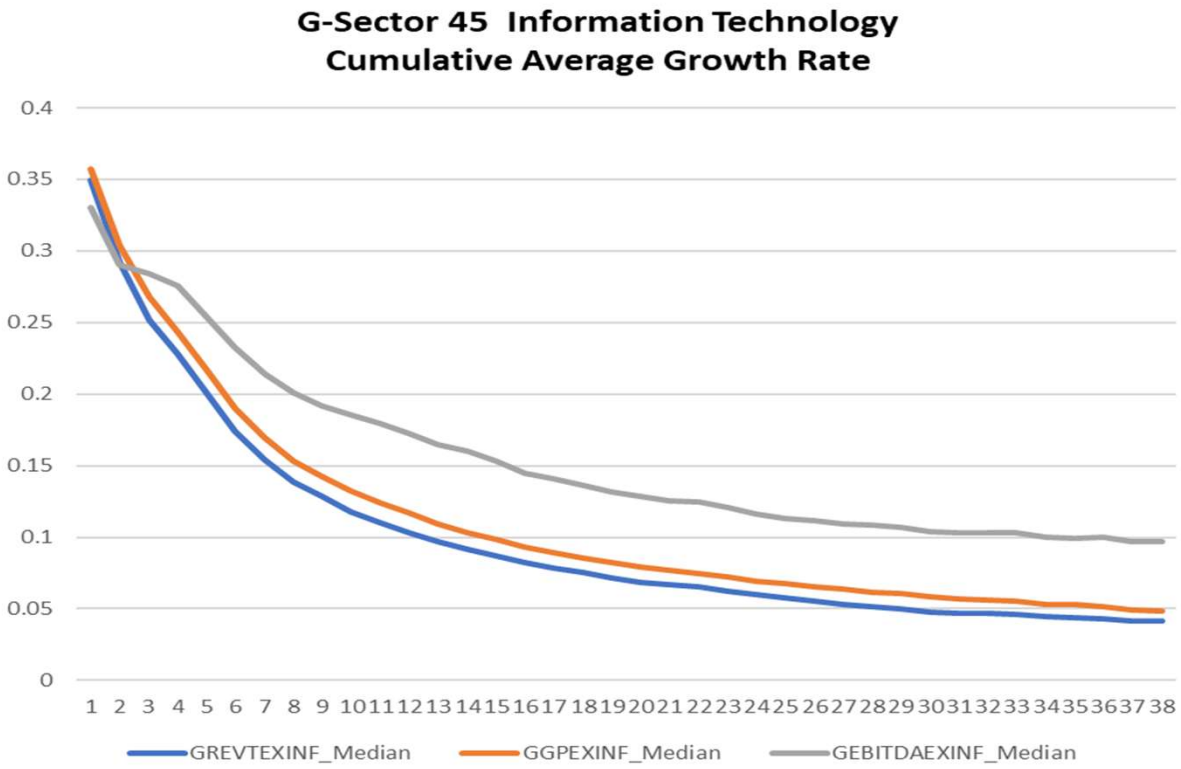
Real growth over time with mergers removed (cont'd)



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Real growth over time with mergers removed (cont'd)

Real growth rates: Average long-term (years 1-40) with impact of mergers removed

GICS	Revenue	Gross Profit	EBITDA
Industrials	3.8%	4.3%	6.4%
Info. Tech.	4.2	5.0	9.8

- Growth rates based on organic growth of base business plus growth through reinvestment of retained net cash flow.
- Why EBITDA? eliminates impacts of "financial engineering"

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Real growth of mature firms with mergers removed (cont'd)

Average of last three years (years 38-40)

Real growth rates: with impact of mergers removed

Margins

GICS	Revenue	Gross Profit	EBITDA	EBIT	EBITDA
Industrials	2.6%	2.8%	5.6%	.108	.153
Info. Tech.	1.2	1.6	3.5	.107	.159

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Select and Use Growth Rates Judiciously

- These growth rates can serve as basis of testing Terminal Value growth in DCF:

Real growth rate in revenues + inflation expected for company/industry revenues = nominal growth rate

X EBITA margin

minus: income taxes [(EBITDA – EBIT) x income tax rate]

minus: needed investment in NWC and CapX (% of revenue growth)

= Net cash flow (growing at revenue growth rate)

- If Terminal Value growth rate is growing at a greater rate, need to reexamine assumptions. Growth rates should be appropriate to the firm age and industry.
- Multi-stage discounted cash flow models are appropriate for valuation as growth rates change substantially across firm age intervals.
- Published industry average growth rates are likely to be biased upwards if they do not explicitly identify age and merger/acquisition activity factors and their impact on the reported growth rates.

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Investment-Specific Risk Premiums

Business valuation books and papers dealing with investment-specific risk often list characteristics that they believe an investment-specific risk should capture without providing market evidence as to the market's pricing of CSRP factors

Investment-specific risk is intended to account for differences in risk not accounted for by the GPCs beta or the size premium

Some suggested tools:

- GPC filings: read the business description and risk discussions – how different are each GPC from the subject business. Also read the segment reporting.
- *Risk Premium Report* provides actual average returns over time for size-based portfolios (non-beta adjusted)

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Risk Premium Report – Size v Risk

Risk Premium Report Size Study Supplementary Data - Data as of 12/31/2024

Summary Statistics | Size Characteristics of Companies that Comprise Portfolio's 23, 24, and 25

Export to Excel

Companies Ranked By: 5-year Average EBITDA

Portfolio	Low End Breakpoint ($M)	High End Breakpoint ($M)	Avg. Portfolio Size ($M)	Number of companies	Arithmetic Mean Return	Geometric Mean Return	Standard Deviation of Returns	Sum Beta (Since 1963)	Avg. Unleverd Beta	Avg. Debt/MVIC	Avg. Debt/Equity	Avg.Operating Margin	Avg.CV of Operating Margin	Avg.CV of ROE
12	766.15	871.56	809.36	29	16.22%	13.35%	20.15%	1.12	0.86	24.88%	33.12%	11.32%	15.29%	28.74%
13	669.90	766.15	722.93	28	15.45%	12.57%	20.80%	1.15	0.89	24.34%	32.17%	10.96%	16.38%	28.83%
14	572.89	669.90	616.87	35	16.72%	13.70%	20.36%	1.14	0.89	24.18%	31.89%	10.68%	16.03%	25.77%
15	497.15	572.89	528.91	33	16.54%	13.19%	23.52%	1.20	0.94	23.89%	31.39%	10.58%	16.74%	27.76%
16	438.91	497.15	465.40	30	15.80%	12.89%	20.63%	1.17	0.91	24.44%	32.34%	10.35%	18.08%	31.76%
17	374.85	438.91	412.43	42	14.28%	11.30%	21.67%	1.19	0.92	24.76%	32.91%	10.37%	17.50%	30.53%
18	304.58	374.85	337.28	49	16.52%	13.49%	20.81%	1.21	0.93	25.28%	33.83%	9.68%	19.81%	32.81%
19	251.32	304.58	271.87	39	16.68%	13.36%	22.53%	1.22	0.95	24.19%	31.92%	9.56%	19.21%	30.55%
20	212.01	251.32	230.78	40	17.41%	14.10%	23.66%	1.20	0.94	23.79%	31.21%	9.64%	20.44%	33.32%
21	169.42	212.01	193.24	57	17.87%	14.54%	22.49%	1.19	0.94	22.95%	29.78%	9.03%	22.48%	35.84%
22	124.65	169.42	145.59	57	17.07%	13.70%	22.60%	1.24	0.98	22.51%	29.04%	8.64%	25.10%	39.93%
23	84.18	124.65	103.71	78	17.38%	13.82%	23.86%	1.23	0.98	22.22%	28.57%	8.30%	27.76%	43.20%
24	43.96	84.18	64.65	65	17.89%	13.59%	28.90%	1.25	1.00	21.74%	27.78%	7.85%	29.71%	44.62%
25	<43.96	43.96	23.28	189	18.87%	14.59%	26.57%	1.26	1.02	20.36%	25.57%	6.63%	47.22%	65.69%

Which Method to Use- Build-up or MCAPM?

- Recommend that both the Build-up method and the MCAPM be used, remember: *"how the market prices risk" is a relative unknown*.
- Recommend you consider using the data published in the *Risk Premium Report – Risk Study*
  - Data for use in a Build-up method: ERP adjusted for risks

    (1) Operating Profit Margin

    how does subject compare to other similar size companies?

    how does subject compare to industry benchmarks?

    (2) Variability in operating profit margin (coefficient of variation)

    (3) Variability in return on book equity (coefficient of variation)
- Remember, *Risk Premium Report* data is for firms that are publicly traded

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Investment-Specific Risk: What to Do?

- Every publicly traded stock is priced based on its own discount rate (including its own CSRP) and its own expected cash flows
- We still know very little about how the market prices risk factors
- Before adding an arbitrary risk premium to your discount rate, investigate the characteristics of the GPCs and how the Subject Business characteristics differ from those of the GPCs. Read the public filings of the GPCs. Do not simply make assumptions.
- Even if you reject using the market approach, reading the public filings of possible GPCs can be very informative as to the risks firms in a particular industry face.
- Using textbook CAPM to develop discount rates is no longer consistent with current financial theory.
- Take care in applying investment-specific risk premiums – do not be arbitrary – pricing risk is difficult.

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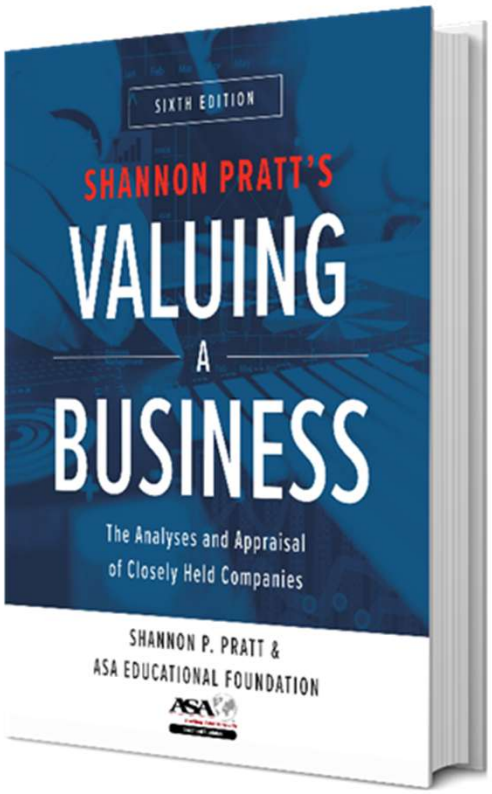
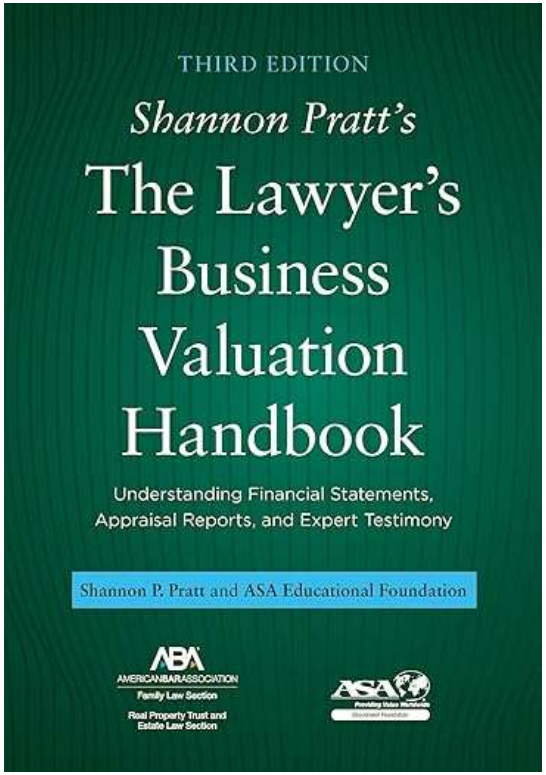
Resources





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Thank you!
Roger J. Grabowski, FASA

- rjg264@comcast.net
- Mobile: 312-961-2313

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