VSCPA
September 29, 2022
Richmond, VA

Best Practices in Business Valuation: The Income Approach "Greatest Hits"

Jim Hitchner, CPA/ABV/CFF

Financial Valuation Advisors

VPS Valuation Products and Services

FCG Financial Consulting Group

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James R. Hitchner, CPA/ABV/CFF

- Managing Director, Financial Valuation Advisors Inc.
- CEO, Valuation Products and Services LLC
- President, Financial Consulting Group LLC
- Editor in Chief, *Hardball with Hitchner* publication
- 42 years in valuation services
- Former member of the AICPA task force on BV standards
- Inductee in the AICPA BV Hall of Fame
- Two-time recipient – AICPA Volunteer of the Year award
- Coauthored over 20 courses; taught over 60 courses
- Published over 150 articles; made over 400 presentations

2

James R. Hitchner, CPA/ABV/CFF

- **Editor and/or coauthor of the books:**
  - *Discount for Lack of Marketability Guide and Toolkit*, 2017
  - *Financial Valuation Applications and Models*, 4th edition, 2017
  - *Financial Valuation Workbook*, 4th edition, 2017
  - *PPC's Guide to Business Valuations*, 18th through 31st editions
  - *Hitchner • Pratt • Fishman, A Consensus View, Q&A Guide to Financial Valuation*, 2016
  - *Valuation for Financial Reporting: Fair Value, Business Combinations, Intangible Assets, Goodwill, and Impairment Analysis*, 3rd edition, 2011

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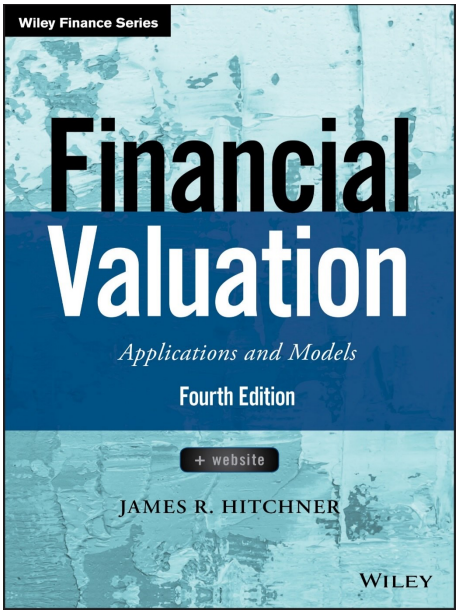

2017 (2023 in Process)

- **1300 pages**
- **Completely updated**
- **Coauthored by many of the top names in BV**

Jim Alerding	Jim Hitchner
Rosanne Aumiller	Vince Kickirillo
Jeff Balcombe	Mark Kucik
Neil Beaton	Eva Lang
Melissa Bizyak	Harold Martin
Marcie Bour	Ed Moran
Jim Budyak	Ray Moran
Carol Carden	Kate Morris
Stacy Collins	Shannon Pratt
Larry Cook	Ron Seigneur
Don Drysdale	Stacey Udell
Ed Dupke	Sam Wessinger
Jay Fishman	Richard Wise
Chris Hamilton	Don Wisehart
Tom Hilton	Kevin Yeanoplos

https://www.wiley.com/en-us/Financial+Valuation%3A+Applications+and+Models%2C+%2B+Website%2C+4th+Edition-p-9781119312314

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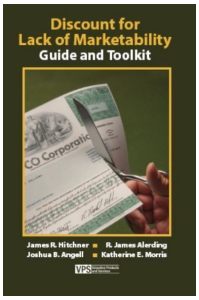
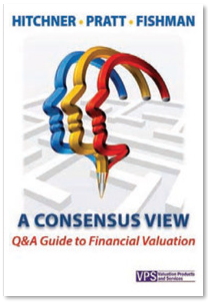
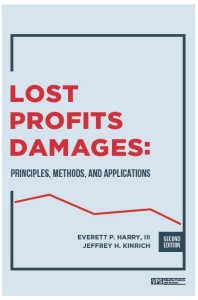


Discount for Lack of Marketability Guide and Toolkit
James R. Hitchner
R. James Alerding
Joshua B. Angell
Katherine E. Morris



A Consensus View Q&A Guide to Financial Valuation
James R. Hitchner
Shannon P. Pratt
Jay E. Fishman



Lost Profits Damages: Principles, Methods, and Applications, 2nd Edition
Edited by
Everett P. Harry III
Jeffrey H. Kinrich

www.valuationproducts.com/books

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Best Practices

The participant will learn about best practices in:

1) **Damodaran's very harsh criticisms**
2) **The capitalized cash flow method**
3) **The discounted cash flow method**
4) **The cost of capital and growth rates**

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Breaking News

Dr. Damodaran has been speaking this spring/summer about inflation and valuation and shared his strong opinions. Just in recent weeks he has said: (Business Valuation Resources webinar, "In Search of a Steady State: Inflation, Interest Rates and Value, The (inflation) Genie Escapes the Bottle," June 14, 2022, https://sub.bvresources.com/TrainingEventsPast.asp.)

- Historical equity risk premium? "I know many of you swear by the Duff & Phelps historical risk premiums. I haven't used a historical risk premium in valuation in almost 30 years, so I am not in your camp."
- A "normalized" risk-free rate? "It starts with the risk-free rate and none of this dancing around normalized risk-free rates. It is the actual risk-free rate. This is not something you can normalize because it's not yours to normalize."
- The size premium? "You know what I think about the size premium, right? It is this nice fiction that Duff & Phelps has fed into, and every analyst uses when there has been no size premium. It's the biggest bunch of crap I've seen in valuation that people keep doing over and over and over and over again."
- Company-specific risk premium? "Its absolute [expletive] and I won't mince words. It's nonsense."
- Total beta? "I mean, 30 years ago I concocted this measure that I'm sorry I concocted in hindsight called total beta. It's being sold by other people."

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Breaking News

Previously he has been quoted:

- Build-up models are "recipes for disaster."
- "Even if you believe that small cap companies are more exposed to market risk than large cap ones, this is a sloppy and lazy way of dealing with that risk …"
- "… it seems foolhardy to put your faith in mean reversion and past data …"
- "… a supply side premium has to come with all of the caveats that a conventional historical premium with the added noise created by the decomposition, i.e., in measuring inflation and real earnings."

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VPS Webinar Polls

7/21/22 VPS Webinar "Cost of Capital Dispute: Damodaran vs. Kroll Cost of Capital Navigator vs. BVResources Cost of Capital Professional: What Is Right and What Is Wrong?" Poll Results

1. What cost of equity data do you currently use? (pick all that apply)
   a. Kroll Navigator – 79%
   b. BVResources COC Pro – 23%
   c. Damodaran's data and analyses – 18%
   d. Pepperdine survey data – 11%
   e. Other or none of the above – 9%

2. Which of the following size risk premium data do you use? (pick all that apply)
   a. Kroll CRSP – 73%
   b. Kroll Risk Premium Report – 43%
   c. BVResources COC Pro CRSP – 18%
   d. I don't apply a size premium – 6%

Continued on next page

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VPS Webinar Polls

7/21/22 VPS Webinar "Cost of Capital Dispute: Damodaran vs. Kroll Cost of Capital Navigator vs. BVResources Cost of Capital Professional: What Is Right and What Is Wrong?" Poll Results

3. Where do you get your ERP? (pick all that apply)
   a. Kroll Navigator – 82%
   b. BVResources COC Pro – 20%
   c. Damodaran Implied – 11%
   d. Other – 9%

4. Which of the following models do you typically use for smaller businesses? (pick all that apply)
   a. MCAPM – 23%
   b. BUM – 59%
   c. Both – 27%
   d. Other – 7%

5. Do you apply a company-specific risk premium for small- to medium-size businesses?
   a. Yes – 91%
   b. No – 4%
   c. Not applicable – 5%

6. Do typically use giant industry conglomerate public companies to value very small niche businesses?
   a. Yes – 10%
   b. No – 84%
   c. Not applicable – 6%

7. Do you use total beta?
   a. Yes – 21%
   b. No – 67%
   c. Not applicable – 13%

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Webinar Polls

What cost of equity data do you currently use? (pick all that apply)

	3/1/22	2/2/22	11/17/21	1/26/21	2/25/20	1/21/20	7/16/19	6/18/19	1/8/19
Duff & Phelps Navigator	90%	86%	83%	86%	84%	92%	88%	91%	89%
BVResources COC Pro	22%	19%	19%	23%	24%	21%	21%	32%	20%
Damodaran's data and analyses	16%	14%	20%	12%	13%	12%	14%	17%	12%
Pepperdine survey data	14%	10%	12%	7%	8%	13%	8%	18%	9%
Other or none of the above	6%	5%	7%	6%	13%	7%	9%	11%	5%

	Mean Average	Median Average
Duff & Phelps Navigator	88%	88%
BVResources COC Pro	22%	21%
Damodaran's data and analyses	14%	14%
Pepperdine survey data	11%	10%
Other or none of the above	8%	7%

Hardball with Hitchner, Issue 20, June 2022, www.valuationproducts.com.

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Webinar Polls

Do you apply a size premium?

	11/17/2021	9/15/2020	7/16/2019	6/18/2019	1/8/2019	Mean Average	Median Average
Yes	87%	83%	80%	92%	90%	86%	87%
No	8%	13%	17%	8%	9%	11%	9%
Not applicable	4%	3%	3%	1%	1%	2%	3%

What CRSP size premiums do you use for smaller businesses? (pick all that apply)

	11/17/2021	11/15/2018	9/17/2018	4/26/2017	Mean Average	Median Average
Micro-cap	18%	18%	10%	21%	17%	18%
Decile 10	73%	71%	72%	70%	72%	72%
Subdecile 10b	18%	21%	6%	18%	16%	18%
Subdecile 10z	3%	12%	3%	12%	8%	8%
I do not use CRSP data	11%	8%	8%	13%	10%	10%

Hardball with Hitchner, Issue 20, June 2022, www.valuationproducts.com.

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Webinar Polls

Have you increased your ERP and/or company-specific risk with COVID known or knowable?

	3/2/2021	1/26/2021	10/29/2020	7/1/2020	6/9/2020	5/14/2020	Mean Average	Median Average
Both	19%	16%	31%	29%	28%	42%	28%	29%
Neither	9%	18%	5%	5%	6%	5%	8%	6%
ERP only	4%	4%	5%	3%	9%	11%	6%	5%
CSR only	54%	51%	38%	52%	43%	23%	44%	47%
Not applicable	13%	11%	21%	11%	14%	20%	15%	14%

When using Duff & Phelps data, which ERPs do you use? (pick all that apply)

	7/30/2020	11/15/2018	Mean Average	Median Average
CRSP historical (1926 forward)	41%	41%	41%	41%
CRSP supply-side (1926 forward)	37%	39%	38%	38%
Risk Premium Study (1963 forward)	35%	21%	28%	28%
D&P recommended ERP	46%	35%	41%	41%
I do not use D&P	6%	5%	6%	6%

Hardball with Hitchner, Issue 20, June 2022, www.valuationproducts.com.

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Webinar Polls

Which income approach methods are you now using most for small businesses with COVID?

	10/29/2020	5/14/2020	Mean Average	Median Average
Build-up Model	58%	66%	62%	62%
MCAPM	6%	7%	7%	7%
Both	24%	15%	20%	20%
Neither or other	2%	2%	2%	2%
Not applicable	10%	9%	10%	10%

Which of the following models do you typically use for smaller businesses? (pick all that apply)

	11/15/2018	3/29/2017	Mean Average	Median Average
BUM	50%	52%	51%	51%
MCAPM	21%	14%	18%	18%
Both	15%	19%	17%	17%
Other	13%	16%	15%	15%

Hardball with Hitchner, Issue 20, June 2022, www.valuationproducts.com.

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Build-up Model

The basic formula for the Build-up Model is/can be:

$$E(R_i)^* = R_F + RP_m + RP_s \pm RP_c \pm RP_i$$

Kroll

Where:

- $E(R_1)$ = Expected (market required) rate of return on a security
- R_f = Return for a risk-free security as of the valuation date
- RP_m = Equity risk premium (ERP) for the "market"
- RP_s = Risk premium for size
- RP_c = Company-specific risk premium
- RP_i = Risk premium for the industry

* Also known as k_e

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Modified Capital Asset Pricing Model

The basic formula for MCAPM is expressed as follows:

$$E(R_i)^* = R_f + \beta(RP_m) + RP_s \pm RP_c$$

Where:

$E(R_1)$ = Expected (market required) rate of return on a security

R_f = Return for a risk-free security as of the valuation date

β = Subject company's beta coefficient

RP_m = Equity risk premium for the "market"

RP_s = Risk premium for size

RP_c = Company-specific risk premium

* Also known as k_e

Models and Data Inputs

- Build up Model (BUM)
- Modified Capital Asset Pricing Model (MCAPM)
- Capital Asset Pricing Model (CAPM)
- Risk-Free rate
- Normalized Risk-Free Rate?
- Beta
- Total Beta?
- Historical Equity Risk Premium?
- Supply-Side Equity Risk Premium?
- Size Premium?
- Company-Specific Risk?

Dr. Aswath Damodaran's Views

- Build-up models are "recipes for disaster."[1]
- "The equity risk premium is the price of risk in equity markets, and it is not just a key input in estimating costs of equity and capital in both corporate finance and valuation, but it is also a key metric in assessing the overall market. **Given its importance, it is surprising how haphazard the estimation of equity risk premiums remains in practice.**"
- "The small cap premium is firmly entrenched in practice, with analysts generally adding on 3% to 5% to the conventional cost of equity for small companies, with the definition of small shifting from analyst to analyst. Even if you believe that small cap companies are more exposed to market risk than large cap ones, **this is a sloppy and lazy way of dealing with that risk**, since risk ultimately has to come from something fundamental (and size is not a fundamental factor)."[2]
- "The problem with any historical premium approach, even with substantial modifications, is that it is backward looking. Given that our objective is to estimate an updated, forward-looking premium, **it seems foolhardy to put your faith in mean reversion and past data**."[3]

[Emphasis added.]

1 Don Wisehart, "Boston's Battle of the Beta," *Financial Valuation and Litigation Expert,* Issue 22, December 2009/January 2010, Valuation Products and Services, LLC, p. 15.
2 "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2022 Edition" (March 23, 2022), http://pages.stern.nyu.edu/~adamodar/, pp. 53–54.
3 Ibid., p. 82.

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Damodaran – Estimating ERPs

- "There are three broad approaches used to estimate equity risk premiums. One is to **survey** subsets of investors and managers to get a sense of their expectations about equity returns in the future. The second is to assess the returns earned in the past on equities relative to riskless investments and use this **historical premium** as the expectation. The third is to attempt to estimate a forward-looking premium based on the market rates or prices on traded assets today; we will categorize these as **implied premiums**." [Emphasis added.] (p. 25)

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Damodaran – Survey Premiums
Investors, Managers, and Academics

Investors

- "While survey premiums have become more accessible, very few practitioners seem to be inclined to use the numbers from these surveys in computations …" (p. 27)
  - "Survey risk premiums are responsive to recent stock prices movements, with survey numbers generally increasing after bullish periods and decreasing after market decline.
  - Survey premiums are sensitive not only to whom the question is directed at but how the question is asked.
  - In keeping with other surveys that show differences across sub-groups, the premium seems to vary depending on who gets surveyed." (p. 27)

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Damodaran – Survey Premiums
Investors, Managers, and Academics

Investors (continued)

  - "Studies that have looked at the efficacy of survey premiums indicate that if they have any predictive power, it is in the wrong direction." (p. 28)

Managers

- "The hurdle rates used by companies – costs of equity and capital – are affected by the equity risk premiums that they use and have significant consequences for investment, financing and dividend decisions." (p. 28)

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Damodaran – Survey Premiums
Investors, Managers, and Academics

Academics

- "Most academics are neither big players in equity markets, nor do they make many major corporate finance decisions. Notwithstanding this lack of real-world impact, what they think about equity risk premiums may matter for two reasons. The first is that many of the portfolio managers and CFOs that were surveyed in the last two sub-sections received their first exposure to the equity risk premium debate in the classroom and may have been influenced by what was presented as the right risk premium in that setting. The second is that practitioners often offer academic work (textbooks and papers) as backing for the numbers that they use." (pp. 29–30)

Damodaran ERPs

- "We have looked at three different approaches to estimating risk premiums, the **survey approach, where the answer seems to depend on who you ask and what you ask them**, the **historical premium approach, with wildly different results depending on how you slice and dice historical data** and the **implied premium approach, where the final number is a function of the model you use and the assumptions you make about the future**. Ultimately, though, we have to choose a number to use in analysis and that number has consequences." [Emphasis added.] (p. 127)

Damodaran – Historical ERPs

- "While our task is to estimate equity risk premiums in the future, much of the data we use to make these estimates is in the past. Most investors and managers, when asked to estimate risk premiums, look at historical data. **In fact, the most widely used approach to estimating equity risk premiums is the historical premium approach**, where the actual returns earned on stocks over a long period is estimated and compared to the actual returns earned on a default-free (usually government security). The difference, on an annual basis, between the two returns is computed and represents the historical risk premium." [Emphasis added.] (p. 31)

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Damodaran

- "In effect, the equity risk premium is the premium that investors demand for the average risk investment, and by extension, the discount that they apply to expected cash flows with average risk." (p. 6)
- "While there are several competing risk and return models in finance, they all share some common assumptions about risk. First, they all define risk in terms of variance in actual returns around an expected return; thus, an investment is riskless when actual returns are always equal to the expected return. Second, they argue that **risk has to be measured from the perspective of the marginal investor in an asset, and that this marginal investor is well diversified.** Therefore, the argument goes, it is only the risk that an investment adds on to a diversified portfolio that should be measured and compensated. In fact, it is this view of risk that leads us to **break the risk in any investment into two components. There is a firm-specific component that measures risk that relates only to that investment or to a few investments like it, and a market component that contains risk that affects a large subset or all investments. It is the latter risk that is not diversifiable and should be rewarded."** [Emphasis added.] (pp. 6–7)

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Dr. Aswath Damodaran

"Equity Risk Premiums (ERP): Determinants, Estimation, and Implications – The 2020 Edition, Updated: March 2020."

http://pages.stern.nyu.edu/~adamodar/

Exhibit 2

Table 4: Historical Equity Risk Premiums (ERP) – Estimation Period, Riskfree Rate and Averaging Approach – 1928-2019

	Arithmetic Average		*Geometric Average*	
	Stocks – T. Bills	Stocks – T. Bonds	Stocks – T. Bills	Stocks – T. Bonds
1928-2019	8.18%	6.43%	6.35%	4.83%
Std Error	*2.08%*	*2.20%*		
1970-2019	7.26%	4.50%	5.93%	3.52%
Std Error	*2.38%*	*2.73%*		
2010-2019	13.51%	9.67%	12.93%	9.31%
Std Error	*3.85%*	*4.87%*		

Range = 3.5% to13.5%

Dr. Aswath Damodaran

"Equity Risk Premiums (ERP): Determinants, Estimation, and Implications – The 2022 Edition, Updated: March 23, 2022."

http://pages.stern.nyu.edu/~adamodar/

Table 4: Historical Equity Risk Premiums (ERP) –Estimation Period, Riskfree Rate and Averaging Approach – 1928-2021

	Arithmetic Average		*Geometric Average*	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2021	8.49%	6.71%	6.69%	5.13%
Std Error	*2.05%*	*2.17%*		
1971-2021	8.04%	5.47%	6.70%	4.47%
Std Error	*2.44%*	*2.76%*		
2011-2021	16.47%	14.39%	15.89%	14.00%
Std Error	*3.88%*	*4.59%*		

Range = 4.5% to 16.5%

Damodaran – Historical ERP Potential Problems

- "Given how widely the historical risk premium approach is used, it is surprising that the flaws in the approach have not drawn more attention. Consider first the underlying assumption that investors' risk premiums have not changed over time and that the average risk investment (in the market portfolio) has remained stable over the period examined. We would be hard pressed to find anyone who would be willing to sustain this argument with fervor." (p. 43)
- "The obvious fix for this problem, which is to use a more recent time period, runs directly into a second problem, which is the large noise associated with historical risk premium estimates. While these standard errors may be tolerable for very long time periods, they clearly are unacceptably high when shorter periods are used." (p. 43)

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Damodaran – Historical ERP Potential Problems

Supply-Side ERP

- "While there is some value in breaking down a historical risk premium, notice that none of these decompositions remove the basic problems with historical risk premiums, which is that they are **backward looking and noisy**. Thus, a supply side premium has to come with all of the caveats that a conventional historical premium with the added noise created by the decomposition, i.e., in measuring inflation and real earnings." [Emphasis added.] (p. 46)

Small Cap Premiums (Reasonableness of the CAPM?)

- "In computing an equity risk premium to apply to all investments in the capital asset pricing model, we are essentially assuming that betas carry the weight of measuring the risk in individual firms or assets, with riskier investments having higher betas than safer investments.

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Damodaran – Historical ERP
Potential Problems

Small Cap Premiums (Reasonableness of CAPM?) (continued)

- Studies of the efficacy of the capital asset pricing model over the last three decades have cast some doubt on whether this is a reasonable assumption, finding that the model understates the expected returns of stocks with specific characteristics; small market cap companies and companies with low price to book ratios, in particular, seem to earn much higher returns than predicted by the CAPM. **It is to counter this finding that many practitioners add an additional premium to the required returns (and costs of equity) of smaller market cap companies.**" [Emphasis added.] (pp. 47–48)

Small Cap Premiums (Mixed conclusions)

- "It exists globally, but it is more pronounced in developed markets
- There is a premium over a long history, but it is volatile and seems to have disappeared in recent decades

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Damodaran – Historical ERP
Potential Problems

Small Cap Premiums (Mixed conclusions) (continued)

- It is a January Premium
- It is stronger on an equally weighted basis than on a value weighted basis" (pp. 48–50)
- "Finally, a series of studies have argued that market capitalization, by itself, is not the reasonfor excess returns but that it is a proxy for other ignored risks such as illiquidity and poor information. In summary, while the empirical evidence over a very long period supports the notion that **small cap stocks have earned higher returns after adjusting for beta risk than large cap stocks, it is not as conclusive, nor as clean as it was initially thought to be. The argument that there is, in fact, no small cap premium and that we have observed over time is just an artifact of history should be given credence.**" [Emphasis added.] (p. 51)

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Damodaran – Historical ERP
Potential Problems

Small Cap Premiums Usage

- "The small cap premium is firmly entrenched in practice, with analysts generally adding on 3% to 5% to the conventional cost of equity for small companies, with the definition of small shifting from analyst to analyst. Even if you believe that small cap companies are more exposed to market risk than large cap ones, this is a sloppy and lazy way of dealing with that risk, since risk ultimately has to come from something fundamental (and size is not a fundamental factor).
- Thus, if you believe that small cap stocks are more prone to failure or distress, it behooves you to measure that risk directly and incorporate it into the cost of equity. If it is illiquidity that is at the heart of the small cap premium, then you should be measuring liquidity risk and incorporating it into the cost of equity and you certainly should not be double counting the risk by first incorporating a small cap premium into the discount rate and then applying an illiquidity discount to value." (pp. 53–54)

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Damodaran – Historical ERP
Potential Problems

Small Cap Premiums Usage

- "As the small cap premium has faded in the market, advocates of its usage have started grasping at straws. Asness, Frazzini, Israel, Moskowitz and Pedersen (2018) argue that there is a small cap premium, if you control for "junk", i.e., that the small cap premium is restricted to high quality companies, with high and stable earnings. Even if you accept the findings of this study at face value, it is not clear how this makes the case for adding a small cap premium to required returns and discount rates stronger. Specifically, it makes no intuitive sense to add the small cap premium and use higher discount rates for well run and profitable small companies, and dispense with the practice for troubled and unprofitable small cap companies." (p. 54)
- "The question of whether there is a small cap premium ultimately is not a theoretical one but a practical one. While those who incorporate a small cap premium justify the practice with the historical data, we will present a more forward-looking approach, where we use market pricing of small capitalization stocks to see if the market builds in a small cap premium, later in this paper." (p. 54)

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Damodaran – Historical ERP Potential Problems

Small Cap Premiums Usage (It's later)

Implied ERP example (pp. 119–120) as of January 1, 2022

- "Compute the implied equity risk premium for an index containing primarily or only small cap firms, such as the S&P 600 Small Cap Index.
- On January 1, 2022, the index was trading at 1416.86, with aggregated dividends and buybacks amounting to 3.10% (in index terms) of the index in the trailing 12 months.
- Using analyst estimates of growth for the next five years of 3.10% a year, and allowing for an increase in cash payout, as the growth rate decreases over time to 1.51%, yields the following equation:
- $1416.86 = 49.73/(1 + r) + 55.85/(1 + r)^2 + 62.30/(1 + r)^3 + 69.10/(1 + r)^4 + 76.26/(1 + r)^5 + 76.26(1.0151)/(r - .0151)(1 + r)^5$
- Solving for the expected return, we get:
- Expected return on small cap stocks = 6.41%
- Implied equity risk premium for small cap stocks = 6.41% -1.51% = 4.90%"
- Same as for the market as a whole (S&P 500) = 4.9%

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Damodaran – Historical ERP Potential Problems

Small Cap Premiums Usage (It's later)

Implied ERP example (pp. 119–120) as of January 1, 2022

- S&P 600 Small Cap Index
  - Must have market cap between $850 million to $3.6 billion
  - Median market cap at December 31, 2021, was $1.58 billion
  - Yeah, a small business is up to $3.6 billion in market cap
- S&P 500
  - Market cap range is $3.1 billion to $2.2 trillion
  - Need initial market cap of greater than or equal to $14.6 billion
  - At December 31, 2020, the S&P 500 was at more than $ trillion
  - At June 30, 2022, mean average market cap was $66.7 billion
  - At June 30, 2022, median average market cap was $27.2 billion

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Damodaran – Implied ERPs

- The implied ERP is based on a discounted cash flow model
- Solve for the cost of equity
- Subtract the risk-free rate
- Equals the impled ERP
- S&P 500 is current value
- Base year cash flow is dividends plus buybacks
- Interim growth rate is from analysts estimates
- Long-term growth rate is the risk-free rate

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Damodaran – Implied ERPs Assumptions

- Type of DCF model
- Selection of what is the “market”
- Risk-free rate
- The market 5-year interim growth rates (S&P)
- The market long-term growth rate
- Dividends (current or historical averages)
- Stock buybacks (current or historical averages)

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Damodaran Implied ERPs

Year 1-Jan	10-Year Treasury
2008	4.5%
2009	6.4%
2010	4.4%
2011	5.2%
2012	6.0%
2013	5.8%
2014	5.0%
2015	5.8%
2016	5.2%
2017	4.5%
2018	5.1%
2019	6.0%
2020	5.2%
2021	4.7%
2022	4.2%
Mean	5.2%
Std Dev	0.7%
Median	5.2%
Max	6.4%
Min	4.2%

Damodaran ERP Model

S&P 500 Beginning Level Date	1/1/2020							
S&P 500 Beginning Level	3230.78							
Prior Year Dividends & Buybacks	$ 150.50							
Rf	1.92%	*(10-year Treasury, like Damodaran)*						
Implied Discount Rate	**7.12%**	*(solve for this)*						
Implied ERP	**5.20%**							
		2020	**2021**	**2022**	**2023**	**2024**		**Rounded CAGR**
S&P 500 Forecast Earnings Growth (1)		3.96%	3.96%	3.96%	3.96%	3.96%		3.96%
Assumed Long-term Growth of S&P 500 Earnings (2)							1.92%	
S&P 500 Projected Dividends & Buybacks @ CAGR		$ 156.46	$ 162.66	$ 169.10	$ 175.79	$ 182.75	$ 186.26	
							$ 3,584.93	
Period		1	2	3	4	5	5	
Factor		0.9336	0.8716	0.8137	0.7596	0.7091	0.7091	
PV of Projected Dividends and Buybacks		$ 146.07	$ 141.76	$ 137.59	$ 133.53	$ 129.60	$ 2,542.23	
NPV of Projected Dividends and Buybacks	**3,230.78**							
CHECK: Difference between NPV & S&P 500 Beginning Level	**0.00**	*(iterate implied discount rate until this is zero)*						

(1) Damodaran applies the resulting CAGR to project future Dividends & Buybacks.
(2) Damodaran assumes long-term S&P 500 earnings growth equals long-term economic growth, and that both equal the risk-free rate
(10-year Treasury bond). In footnote 118 of his paper Damodaran writes: "The treasury bond rate is the sum of expected inflation and the expected real rate. If we assume that real growth is equal to the real interest rate, the long term stable growth rate should be equal to the treasury bond rate."

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Damodaran ERP Model

S&P 500 Beginning Level Date	1/1/2020							
S&P 500 Beginning Level	3230.78							
Prior Year Dividends & Buybacks	$ 150.50							
Rf	1.92%	*(10-year Treasury, like Damodaran)*						
Implied Discount Rate	**7.12%**	*(solve for this)*						
Implied ERP	**5.20%**							
		2020	**2021**	**2022**	**2023**	**2024**		**Rounded CAGR**
S&P 500 Forecast Earnings Growth (1)		3.96%	3.96%	3.96%	3.96%	3.96%		3.96%
Assumed Long-term Growth of S&P 500 Earnings (2)							1.92%	
S&P 500 Projected Dividends & Buybacks @ CAGR		$ 156.46	$ 162.66	$ 169.10	$ 175.79	$ 182.75	$ 186.26	
							$ 3,584.93	
Period		1	2	3	4	5	5	
Factor		0.9336	0.8716	0.8137	0.7596	0.7091	0.7091	
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CHECK: Difference between NPV & S&P 500 Beginning Level	**0.00**	*(iterate implied discount rate until this is zero)*						

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Damodaran ERP Model

S&P 500 Beginning Level Date	1/1/2020							
S&P 500 Beginning Level	3230.78							
Prior Year Dividends & Buybacks	$ 150.50							
Rf	2.25%	*(20-year Treasury, unlike Damodaran, for Illustration)*						
Implied Discount Rate	**7.39%**	*(solve for this)*						
Implied ERP	**5.14%**							**Rounded**
		2020	**2021**	**2022**	**2023**	**2024**		**CAGR**
S&P 500 Forecast Earnings Growth (1)		3.96%	3.96%	3.96%	3.96%	3.96%		3.96%
Assumed Long-term Growth of S&P 500 Earnings (2)							2.25%	
S&P 500 Projected Dividends & Buybacks @ CAGR		$ 156.46	$ 162.66	$ 169.10	$ 175.79	$ 182.75	$ 186.87	
							$3,635.53	
Period		1	2	3	4	5	5	
Factor		0.9312	0.8671	0.8074	0.7519	0.7001	0.7001	
PV of Projected Dividends and Buybacks		$ 145.69	$ 141.04	$ 136.53	$ 132.17	$ 127.95	$2,545.36	
NPV of Projected Dividends and Buybacks	**3,228.75**							
CHECK: Difference between NPV & S&P 500	**2.03**	*(iterate implied discount rate until this is zero)*						

(1) Damodaran applies the resulting CAGR to project future Dividends & Buybacks.
(2) Damodaran assumes long-term S&P 500 earnings growth equals long-term economic growth, and that both equal the risk-free rate (10-year Treasury bond). In footnote 118 of his paper Damodaran writes: "The treasury bond rate is the sum of expected inflation and the expected real rate. If we assume that real growth is equal to the real interest rate, the long term stable growth rate should be equal to the treasury bond rate." The 20-year treasury bond is used instead in this calculation.

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Damodaran Implied ERPs

Year 1-Jan	10-Year Treasury	20-Year Treasury
2008	4.5%	4.4%
2009	6.4%	6.3%
2010	4.4%	4.3%
2011	5.2%	5.1%
2012	6.0%	5.9%
2013	5.8%	5.6%
2014	5.0%	4.8%
2015	5.8%	5.7%
2016	5.2%	5.1%
2017	4.5%	4.5%
2018	5.1%	5.1%
2019	6.0%	5.9%
2020	5.2%	5.1%
2021	4.7%	4.8%
2022	4.2%	4.3%
Mean	5.2%	5.1%
Std Dev	0.7%	0.6%
Median	5.2%	5.1%
Max	6.4%	6.3%
Min	4.2%	4.3%

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Damodaran Equity Risk Premium Data and Return Analyses

Year (January 1)	Implied ERP 10-Year Treasury	Implied ERP 20-Year Treasury	Risk-free Rate 10-Year Treasury	Risk-free Rate 20-Year Treasury	Base Rate of Return 10-Year Treasury	Base Rate of Return 20-Year Treasury
2008	4.5%	4.4%	4.0%	4.5%	8.5%	8.9%
2009	6.4%	6.3%	2.3%	3.1%	8.7%	9.3%
2010	4.4%	4.3%	3.9%	4.6%	8.2%	8.8%
2011	5.2%	5.1%	3.3%	4.1%	8.5%	9.2%
2012	6.0%	5.9%	1.9%	2.6%	7.9%	8.4%
2013	5.8%	5.6%	1.8%	2.5%	7.6%	8.2%
2014	5.0%	4.8%	3.0%	3.7%	8.0%	8.6%
2015	5.8%	5.7%	2.2%	2.5%	8.0%	8.2%
2016	5.2%	5.1%	2.3%	2.7%	7.4%	7.8%
2017	4.5%	4.5%	2.5%	2.8%	7.0%	7.2%
2018	5.1%	5.1%	2.4%	2.6%	7.5%	7.6%
2019	6.0%	5.9%	2.7%	2.9%	8.7%	8.8%
2020	5.2%	5.1%	1.9%	2.3%	7.1%	7.4%
2021	4.7%	4.8%	0.9%	1.5%	5.7%	6.2%
2022	4.2%	4.3%	1.5%	1.9%	5.8%	6.2%
Mean	5.2%	5.1%			7.6%	8.1%
Std Dev	0.7%	0.6%			0.9%	0.9%
Median	5.2%	5.1%			7.9%	8.2%
Max	6.4%	6.3%			8.7%	9.3%
Min	4.2%	4.3%			5.7%	6.2%

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Kroll Equity Risk Premium Data and Return Analyses

Year 1-Jan	D&P Hist. ERP	D&P Hist. (SS) ERP	D&P Rec. ERP	1-Jan 20-Year Treasury	20-Year Treasury Norm.	Base Rate Hist.	Base Rate Hist. (SS)	Base Rate Rec./Norm.
2008	7.1%	6.2%	5.0%	4.5%	4.5%	11.6%	10.7%	9.5%
2009	6.5%	5.7%	6.0%	3.1%	4.5%	9.5%	8.8%	10.5%
2010	6.7%	5.2%	5.5%	4.6%	4.6%	11.3%	9.8%	10.1%
2011	6.7%	6.0%	5.5%	4.1%	4.1%	10.9%	10.1%	9.6%
2012	6.6%	6.1%	6.0%	2.6%	4.0%	9.2%	8.7%	10.0%
2013	6.7%	6.1%	5.5%	2.5%	4.0%	9.2%	8.7%	9.5%
2014	7.0%	6.2%	5.0%	3.7%	4.0%	10.7%	9.9%	9.0%
2015	7.0%	6.2%	5.0%	2.5%	4.0%	9.5%	8.7%	9.0%
2016	6.9%	6.0%	5.0%	2.7%	4.0%	9.6%	8.7%	9.0%
2017	6.9%	6.0%	5.5%	2.8%	3.5%	9.7%	8.8%	9.0%
2018	7.1%	6.0%	5.0%	2.6%	3.5%	9.7%	8.6%	8.5%
2019	6.9%	6.1%	5.5%	2.9%	3.5%	9.8%	9.0%	9.0%
2020	7.2%	6.2%	5.0%	2.3%	3.0%	9.4%	8.4%	8.0%
2021	7.3%	6.0%	5.5%	1.5%	2.5%	8.7%	7.5%	8.0%
2022	7.5%	6.2%	5.5%	1.9%	2.5%	9.4%	8.1%	8.0%
Mean	6.9%	6.0%	5.4%	2.9%	3.7%	9.9%	9.0%	9.1%
Std Dev	0.3%	0.3%	0.3%	0.9%	0.6%	0.8%	0.8%	0.7%
Median	6.9%	6.1%	5.5%	2.7%	4.0%	9.6%	8.7%	9.0%
Max	7.5%	6.2%	6.0%	4.6%	4.6%	11.6%	10.7%	10.5%
Min	6.5%	5.2%	5.0%	1.5%		8.7%	7.5%	8.0%

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Damodaran vs. Kroll ERPs

Year 1-Jan	Implied ERP 10-Year Treasury	Implied ERP 20-Year Treasury	D&P Hist. ERP	D&P Hist. (SS) ERP	D&P Rec. ERP
2008	4.5%	4.4%	7.1%	6.2%	5.0%
2009	6.4%	6.3%	6.5%	5.7%	6.0%
2010	4.4%	4.3%	6.7%	5.2%	5.5%
2011	5.2%	5.1%	6.7%	6.0%	5.5%
2012	6.0%	5.9%	6.6%	6.1%	6.0%
2013	5.8%	5.6%	6.7%	6.1%	5.5%
2014	5.0%	4.8%	7.0%	6.2%	5.0%
2015	5.8%	5.7%	7.0%	6.2%	5.0%
2016	5.2%	5.1%	6.9%	6.0%	5.0%
2017	4.5%	4.5%	6.9%	6.0%	5.5%
2018	5.1%	5.1%	7.1%	6.0%	5.0%
2019	6.0%	5.9%	6.9%	6.1%	5.5%
2020	5.2%	5.1%	7.2%	6.2%	5.0%
2021	4.7%	4.8%	7.3%	6.0%	5.5%
2022	4.2%	4.3%	7.5%	6.2%	5.5%
Mean	5.2%	5.1%	6.9%	6.0%	5.4%
Std Dev	0.7%	0.6%	0.3%	0.3%	0.3%
Median	5.2%	5.1%	6.9%	6.1%	5.5%
Max	6.4%	6.3%	7.5%	6.2%	6.0%
Min	4.2%	4.3%	6.5%	5.2%	5.0%

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Base Rates of Return Damodaran vs. Kroll

Year Beginning	Damodaran Implied ERP Base Rate of Return 10-Year Treasury	Damodaran Implied ERP Base Rate of Return 20-Year Treasury	Duff & Phelps Base Rate of Return 20-Year Treasury Hist.	Duff & Phelps Base Rate of Return 20-Year Treasury Hist. (SS)	Duff & Phelps Base Rate of Return 20-Year Treasury Rec./Norm.
2008	8.5%	8.9%	11.56%	10.73%	9.50%
2009	8.7%	9.3%	9.5%	8.8%	10.5%
2010	8.2%	8.8%	11.3%	9.8%	10.1%
2011	8.5%	9.2%	10.9%	10.1%	9.6%
2012	7.9%	8.4%	9.2%	8.7%	10.0%
2013	7.6%	8.2%	9.2%	8.7%	9.5%
2014	8.0%	8.6%	10.7%	9.9%	9.0%
2015	8.0%	8.2%	9.5%	8.7%	9.0%
2016	7.4%	7.8%	9.6%	8.7%	9.0%
2017	7.0%	7.2%	9.7%	8.8%	9.0%
2018	7.5%	7.6%	9.7%	8.6%	8.5%
2019	8.7%	8.8%	9.8%	9.0%	9.0%
2020	7.1%	7.4%	9.4%	8.4%	8.0%
2021	5.6%	6.3%	8.7%	7.5%	8.0%
2022	5.7%	6.2%	9.4%	8.1%	8.0%
Mean	7.6%	8.1%	9.9%	9.0%	9.1%
Std Dev	0.9%	0.9%	0.8%	0.8%	0.7%
Median	7.9%	8.2%	9.6%	8.7%	9.0%
Max	8.7%	9.3%	11.6%	10.7%	10.5%
Min	5.6%	6.2%	8.7%	7.5%	8.0%

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Damodaran's Five Myths about the ERP

1. Estimation services "know" the risk premium
2. There is no right risk premium
3. The equity risk premium does not change much over time
4. Using the same premium is more important than using the right premium
5. If you adjust the cash flows for risk, there is no need for a risk premium

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Best Practices: Greatest Hits

Capitalized Cash Flow Method

Financial Valuation Advisors

VPS Valuation Products and Services

FCG Financial Consulting Group

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Have you ever used both a discounted cash flow and a capitalized cash flow model in the same valuation?

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Using Both a Discounted Cash Flow and a Capitalized Cash Flow Model

- Some analysts will apply a CCF method as a base value and also present a DCF method
- They feel that the DCF method may not be viewed favorably, particularly in certain litigation
- The CCF method is really being used as support
- However, the CCF method value is not the value the analyst believes is appropriate
- The DCF method value is more appropriate

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Best Practices

1) **Okay to use the CCF method as a backstop to the DCF method**

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Have you ever adjusted a capitalized cash flow method for higher expected short-term growth rates?

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Adjusting a Capitalized Cash Flow Method for Higher Expected Short-term Growth Rates

- In some venues, especially in certain litigation settings, a DCF method is frowned upon
- The court may be wary of the management or analyst's ability to influence the projections and other related variables in a DCF method
- Those concerns can be valid
- A healthy level of scrutiny is common sense and part of good quality-control procedures

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Adjusting a Capitalized Cash Flow Method for Higher Expected Short-term Growth Rates

- Assume you are in a venue that discourages the use of the DCF method
- Let's also assume that you believe it is the only valid method under the income approach
  - A CCF method based on a long-term, stable growth rate will result in an incorrect value
  - It will not capture short-term expected growth
- This is quite the conundrum
- BV standards require that you consider and apply the most appropriate approaches and methods

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Adjusting a Capitalized Cash Flow Method for Higher Expected Short-term Growth Rates

- One way to address this conundrum is to
  - Prepare a DCF analysis and value
  - Calculate a CCF value based on the implied blended growth rate that reconciles with the DCF value
- We are not trying to trick anyone or hide anything
- In our report we would explain what we did
  - Solve for the appropriate growth rate in our CCF method
- We would also put the DCF analysis in the workpapers

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Adjusting a Capitalized Cash Flow Method for Higher Expected Short-term Growth Rates

Example

- The subject company's historical growth rates are not indicative of future growth rates
- The company is expected to grow by 15% for the next two years, 10% in the third year, and then level out to the historical growth rate of 4%
- Let's also assume that the discount rate is 20% and the cash flow last year was $1,000,000

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Adjusting a Capitalized Cash Flow Method for Higher Expected Short-term Growth Rates

- Straight-up capitalization method using historical cash flows
- $1,040,000 / (.20 - .04) = $6,500,000
- We know this is the wrong value

DCF

Year	1	2	3	4	Terminal Year
Cash Flow	$1,150,000	$1,322,500	$1,454,750	$1,512,940	$9,834,110
PV Factor	.8333	.6944	.5787	.4823	.4823
PV	$958,295	$918,344	$841,864	$729,691	$4,742,991

Value = $8,191,000 (rounded)

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Adjusting a Capitalized Cash Flow Method for Higher Expected Short-term Growth Rates

- Calculate the implied capitalization rate by comparing the CCF cash flow to the DCF value:
- $1,040,000 / $8,191,000 = .126969 = 12.6969% cap rate
- 20% discount rate – 12.6969% cap rate = **7.3031% blended growth rate**
- $1,040,000 ÷ .126929 = $8,191,000

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Best Practices

1) Okay to use the CCF method as a backstop to the DCF method
2) **Okay to determine a blended long-term growth rate in the CCF method**

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Have you ever averaged a CCF value and a DCF value in the same valuation?

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Improper Use of the Capitalized Cash Flow Method

- Unfortunately, some analysts will do this
- This happens when the two values are very different
- They will use a CCF method to obtain a higher or lower value when historical performance is expected to decline or improve

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Improper Use of the Capitalized Cash Flow Method

Example 1

- **Assume the DCF is the most reasonable method with higher interim growth**
- Calculate value under a DCF method and a CCF method and apply weights

DCF value = $10 million @ 50% weight = $5.0 million
CCF value = $ 7 million @ 50% weight = $3.5 million
$8.5 million

- So, what's the appropriate value, $8.5 million or $10 million?

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Best Practices

1) Okay to use the CCF method as a backstop to the DCF method
2) Okay to determine a blended long-term growth rate in the CCF method
3) **Do not present both a CCF and a DCF value and average them**

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Should depreciation equal capital expenditures in a CCF or the terminal year of a DCF?

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Capital Expenditures ≠ Depreciation

- Many analysts make depreciation and capital expenditures equal in a capitalized cash flow model
- It is a simplifying assumption that may be too simple
- If a business makes capital expenditures that increase in price each year (typically due to, at a minimum, inflation)
  - Then depreciates those capital expenditures in historical dollars
  - Capital expenditures will be larger each year than depreciation
- The article "The Ratio of Depreciation and Capital Expenditures in DCF Terminal Values," written by Mark Lee, CFA, ASA, concisely deals with this issue*

*M. Mark Lee, CFA, ASA, "The Ratio of Depreciation and Capital Expenditures in DCF Terminal Values," *Financial Valuation and Litigation Expert,* Issue 8, August/September 2007, Valuation Products and Services LLC, pp. 7–8, www.valuationproducts.com/pastFVLE.html.

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Best Practices

1) Okay to use the CCF method as a backstop to the DCF method
2) Okay to determine a blended long-term growth rate in the CCF method
3) Do not present both a CCF and a DCF value and average them
4) **Normally cap ex should be higher than depreciation**

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How do you weight historical performance in a CCF?

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Weighting Historical Earnings

- The essence of the income approach is to capture the future cash flow expectations of a business
- Averages of the past, regardless of how selected, may not be what is expected to occur
- History may not represent future performance
- Assuming that a CCF method is appropriate and that historical results are meaningful, let's take a look at some weighting options
- First, how far back do you go? Is it three years, five years, ten years, or something else?
- The theory is that you go back far enough to obtain a full business cycle and/or to obtain normalized earnings that are indicative of future performance

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Weighting Historical Earnings

- In practice, analysts typically go back five years
- Rev. Rul. 59-60 addresses this issue as well
- Obviously, there are exceptions to this, and longer periods are sometimes acceptable, but five years is often used
- Also, while you may analyze five years of historical financial performance, you may not use all those years

Weighting Historical Earnings

The simple-average method uses the arithmetic mean

ACE Corporation—Historical Cash Flow*

20X1	$100,000	
20X2	90,000	
20X3	160,000	Median
20X4	170,000	
20X5	180,000	
	700,000 ÷ 5 = $140,000 (simple average)	

*After normalization adjustments

Weighting Historical Earnings

Application of Weights
ACE Corporation—Historical Cash Flow

20X1	$100,000 × 1	=	$100,000
20X2	90,000 × 2	=	$180,000
20X3	160,000 × 3	=	$480,000
20X4	170,000 × 4	=	$680,000
20X5	180,000 × 5	=	$900,000
	15		$2,340,000

Weighted Average $2,340,000 ÷ 15 = $156,000

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Weighting Historical Earnings

Application of Weights
ACE Corporation—Historical Cash Flow

20X1	$100,000 × 0	=	$0
20X2	90,000 × 0	=	$0
20X3	160,000 × 1	=	$160,000
20X4	170,000 × 2	=	$340,000
20X5	180,000 × 3	=	$540,000
	6		$1,040,000

Weighted Average $1,040,000 ÷ 6 = $173,333

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Weighting Historical Earnings

- Mean $140,000
- Median $160,000
- Five-year Weighted Average $156,000
- Three-year Weighted Average **$173,333**
- Last Year **$180,000**

- Note: Company is growing at a lower rate
  - 20X4 6.2%
  - 20X5 5.9%

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Best Practices

1) Okay to use the CCF method as a backstop to the DCF method
2) Okay to determine a blended long-term growth rate in the CCF method
3) Do not present both a CCF and a DCF value and average them
4) Normally cap ex should be higher than depreciation
5) **Do not use the same weighting scheme all the time**

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Do you use control premium studies?

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Relevance of Mergerstat Control Premium Data

- Blind application of broad averages should be discouraged
- There is general consensus in the valuation community that the so-called control premium studies really reflect acquisition premiums
- As such, it is important to note that they contain elements of control, synergy, and other considerations
  - Not merely a premium for acquiring control

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Relevance of Mergerstat Control Premium Data

- Explain either quantitatively or qualitatively that there will be either enhanced cash flows, lower risk, or both
- Only use transactions involving financial buyers?
  - However, financial buyers can also enjoy synergies (cost cutting, management changes, etc.), and they also compete with industry buyers
- The elephant in the room is that all so-called control premiums are based on potential "hoped-for" synergies – not actual synergies
- There have been numerous studies showing that the majority of acquisitions fail, with failure defined as the inability to earn a return on capital that exceeds the cost of capital

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Control vs. Minority Cash Flows Discounts and Premiums

- Adding a control premium to a value that includes control cash flows
- Taking a minority discount to a value that includes minority cash flows
- Taking a minority discount when:
  - There is no control owner, and all minority owners are treated equally
  - There is a control owner, but the control owner and the minority owners are treated equally
    - One exception

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Minority/Control in the Cash Flows

- All of the U.S. business valuation groups (AICPA, ASA, IBA, and NACVA) teach that control and minority values depend on adjustments to the cash flows (or lack thereof)

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Best Practices

1) Okay to determine a blended long-term growth rate in the CCF method
2) Do not present both a CCF and a DCF valuation and average them
3) You can adjust for risk in both the discount rate and the cash flows – it doesn't have to be one or the other
4) Normally cap ex should be higher than depreciation
5) Do not use the same weighting scheme all the time
6) **Control premiums are very difficult to support – it's all about the cash flows**

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DFWC and RMA

	4/1/X8 - 3/31/X9 All
As a % of Total Assets	
Current Assets	63.7%
Less: Current Liabilities	32.1%
Working Capital	31.6%
Working Capital	31.6%
Plus: Notes Payable - Short-term	11.7%
Plus: Current Mat. - L.T.D.	3.3%
Debt-free Working Capital (DFWC)	46.6%
Debt-free Working Capital	46.6%
Times: Total Assets - $000	$ 2,102,480
Debt-free Working Capital - $000	$ 979,756
Debt-free Working Capital - $000	$ 979,756
Divided by: Total Sales - $000	$ 3,561,606
DFWC As a % of Sales	**27.5%**

81

Best Practices

1) Okay to use the CCF method as a backstop to the DCF method
2) Okay to determine a blended long-term growth rate in the CCF method
3) Do not present both a CCF and a DCF valuation and average them
4) Normally cap ex should be higher than depreciation
5) Do not use the same weighting scheme all the time
6) Control premiums are very difficult to support – It's all about the cash flows
7) **Make sure IC models use debt-free WC – RMA is debt inclusive**

82

Normalizing Debt

- In direct equity DCF, the cash flows are direct to equity
- Interest expense is left in and the cash flows include debt principal IN minus debt principal OUT
- If you do not normalize the IN and OUT or at least make them similar, you can undervalue or overvalue a company
- See Examples

83

1) Only New Debt In	
Cash flows before debt	$1,000,000
Plus: New debt in	$200,000
Less: Debt paid back	$0
Net cash flows to equity	$1,200,000
Assumed cap rate	15%
Terminal value	$8,000,000

2) Only Existing Debt Repaid	
Cash flows before debt	$1,000,000
Plus: New debt in	$0
Less: Debt paid back	$200,000
Net cash flows to equity	$800,000
Assumed cap rate	15%
Terminal value	$5,333,333

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3) Normalized Debt In and Out	
Cash flows before debt	$1,000,000
Plus: New debt in	$0
Less: Debt paid back	$0
Net cash flows to equity	$1,000,000
Assumed cap rate	15%
Terminal value	$6,666,667

NOTE: The assumption of zero debt in and zero paid back does not assume zero debt. It assumes the debt/equity structure in the normalized terminal year.

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Best Practices

1) Okay to use the CCF method as a backstop to the DCF method
2) Okay to determine a blended long-term growth rate in the CCF method
3) Do not present both a CCF and a DCF valuation and average them
4) Normally cap ex should be higher than depreciation
5) Do not use the same weighting scheme all the time
6) Control premiums are very difficult to support – It's all about the cash flows
7) Make sure IC models use debt-free WC – RMA is debt inclusive
8) **Normalize the debt in a direct-to-equity model**

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The Correct Mid-year Convention Application for the CCF Method

- The capitalization process brings a value back one full year whether end-of-year or mid-year conventions are used
- End-of-year
  - ($100 x 1.04)/(20% - 4%) = $650 **DONE**
- Mid-year
  - ($100 x 1.04)/(20% - 4%) = $650 **NOT DONE**
  - $650(1 + .20)$^{.5}$ = $650(1.095) = $712 **DONE**
  - **PV = $\frac{NCF_1 (1 + k)^{0.5}}{(k - g)}$** FVAM, 4th edition, 2017, Wiley, p. 136

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Best Practices

1) Okay to use the CCF method as a backstop to the DCF method
2) Okay to determine a blended long-term growth rate in the CCF method
3) Do not present both a CCF and a DCF valuation and average them
4) Normally cap ex should be higher than depreciation
5) Do not use the same weighting scheme all the time
6) Control premiums are very difficult to support – It's all about the cash flows
7) Make sure IC models use debt-free WC – RMA is debt inclusive
8) Normalize the debt in a direct-to-equity model
9) **The mid-year convention is often ignored in the CCF method**

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Best Practices: Greatest Hits

Discounted Cash Flow Method

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What percentage of the total value is the terminal year value in a DCF?

90

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Is the terminal year of a DCF based on a perpetuity model?

- The quick and easy answer is “yes”
- However, the long and complex answer is “not really”
- Most analysts value the going concern of a business into perpetuity, which again, is a “very long time”
- However, given the power of discounting and compounding, it really is not a “very long time”
- It’s a rather short time

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Terminal Year and Perpetuity

Percentage of Total Value at 3% Long-term Growth Rate

	Years			
Discount Rate	**5**	**10**	**15**	**20**
10%	28%	48%	63%	73%
12%	34%	57%	72%	81%
14%	40%	64%	78%	87%
16%	45%	70%	83%	91%
18%	49%	74%	87%	93%
20%	53%	78%	90%	95%
22%	57%	82%	92%	97%
24%	60%	84%	94%	98%

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Terminal Year and Perpetuity

Percentage of Total Value at 4% Long-term Growth Rate

	Years			
Discount Rate	**5**	**10**	**15**	**20**
10%	24%	43%	57%	67%
12%	31%	52%	67%	77%
14%	37%	60%	75%	84%
16%	42%	66%	81%	89%
18%	47%	72%	85%	92%
20%	51%	76%	88%	94%
22%	55%	80%	91%	96%
24%	59%	83%	93%	97%

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Best Practices

1) **Perpetuity may not be as long as you think**

94

What's better, the Gordon Growth Model or an exit multiple?

95

Gordon Growth Model vs. Exit Multiples

Improper use of exit multiples in the terminal year

- Assumptions
  - Five-year interim period
  - Discount rate is 20%
  - EBITDA in Year 5 of $1,000,000
  - Exit multiple is EBITDA multiple X $1,000,000
  - Net cash flow (NCF) in the terminal year (5th year here) of $500,000

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Gordon Growth Model vs. Exit Multiples

Improper use of exit multiples in the terminal year – Check the implied long-term (LT) growth rate

- LT Growth = [DR(Exit Value) – NCF]/(NCF + Exit Value)
- LT Growth = [.20($3,000) - $500]/($500 + $3,000)
- LT Growth = $100/$3,500
- LT Growth = .029 = 2.9%
- Exit multiple of **3** LT Growth rate = **2.9%**
- Exit multiple of **4** LT Growth rate = **6.7%**
- Exit multiple of **5** LT Growth rate = **9.1%**
- Exit multiple of **6** LT Growth rate = **10.8%**
- Exit multiple of **7** LT Growth rate = **12.0%**
- Exit multiple of **8** LT Growth rate = **12.9%**

97

Gordon Growth Model vs. Exit Multiples

Improper use of exit multiples in the terminal year – Check the implied long-term (LT) growth rate

- LT Growth = [DR(Exit Value) – NCF]/(NCF + Exit Value)
- LT Growth = [.15($3,000) - $500]/($500 + $3,000)
- LT Growth = -$50/$3,500
- LT Growth = -.014 = -1.4%
- Exit multiple of **3** LT Growth rate = **-1.4%**
- Exit multiple of **4** LT Growth rate = **2.2%**
- Exit multiple of **5** LT Growth rate = **4.5%**
- Exit multiple of **6** LT Growth rate = **6.2%**
- Exit multiple of **7** LT Growth rate = **7.3%**
- Exit multiple of **8** LT Growth rate = **8.2%**

98

Best Practices

1) Perpetuity may not be as long as you think
2) **Always check the implied growth rate in an exit multiple**

99

Is it 4.5 or 5 years in the terminal year of a 5-year DCF?

I have been answering this question for three decades, and the answer is the same!

100

Terminal Year Mid-year Convention

- In a five-year projection, the present value factor is based on 4.5 years, not 5 years
- As stated in *Financial Valuation Applications and Models,* "It is important to note that the terminal year begins at 4.5, *not* 5."*

* Fourth edition (Wiley, 2017), p. 142.

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EXHIBIT 5.10

Mid-year Convention DCF Model[4]

Present Value of NCF's during Explicit Period **Terminal Value**

$$PV = \frac{NCF_1}{(1+k)^{n=.5}} + \frac{NCF_2}{(1+k)^{n=1.5}} + \ldots + \frac{NCF_n}{(1+k)^{n=4.5}} + \frac{NCF_n \times (1+g)}{(k-g)} \Big/ (1+k)^{n=4.5}$$

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Discount Rate	20%					
Long-term Growth	4%					
	Year 1	Year 2	Year 3	Year 4	Year 5	Terminal Year*
Cash Flow	$1,000	$1,150	$1,228	$1,417	$1,516	$9,854
Period	0.5	1.5	2.5	3.5	4.5	4.5
PV Factor	0.9129	0.7607	0.6339	0.5283	0.4402	0.4402
PV of Cash Flow	$913	$875	$778	$749	$667	$4,338
Sum	**$8,320**					

*The terminal year value is (1,516 X 1.04)/(.20-.04) = 9,854.

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Discount Rate	20%					
Long-term Growth	4%					
	Year 1	Year 2	Year 3	Year 4	Year 5	Terminal Year
Cash Flow	$1,000	$1,150	$1,228	$1,417	$1,516	$9,854
Period	0.5	1.5	2.5	3.5	4.5	5.0
PV Factor	0.9129	0.7607	0.6339	0.5283	0.4402	0.4019
PV of Cash Flow	$913	$875	$778	$749	$667	$3,960
Sum	**$7,942**					

We have seen complex mathematical proofs confirming that the first formula is correct. However, we also like the simple proof, which is to take the cash flows out 75 years (it actually only takes 66 years here) at the mid-year convention and see what value we obtain (hint: it is $8,320, not $7,942).

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Best Practices

1) Perpetuity may not be as long as you think
2) Always check the implied growth rate in an exit multiple
3) **The terminal year value is at the mid-point, not year-end**

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What to Do with Undistributed Cash

- DCF and CCF use cash flow after company needs are met, e.g., working capital and net assets
- This is distributable cash
- Let's use an S-corp example
- Value = $\frac{\$5{,}000{,}000 \text{ cash flow after paying S/H taxes}}{20\% - 4\%}$
- Value = $31,250,000

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Best Practices

1) Perpetuity may not be as long as you think
2) Always check the implied growth rate in an exit multiple
3) The terminal year value is at the mid-point, not year-end
4) **Undistributed cash matters – a lot!**

107

What is the #1 Dirty Little Secret in BV?

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Discounted Cash Flow Method: Best Practices and Avoiding Mistakes

- Valuation's dirty little secret
  - No real meaningful due diligence on the use of client-provided projections
- Discount rate does not match the projected cash flows
- Tax depreciation vs. book depreciation plus deferred taxes

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Discounted Cash Flow Method: Best Practices and Avoiding Mistakes

- Using improperly prepared forecasts or projections
- Developing one's own forecasts or projections without knowing the facts
- Too high or too low a growth rate in the terminal year (Gordon Growth Model)
- Using the wrong cash flows for the conclusion to be reached (i.e., minority flows for a control valuation)

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Best Practices

1) Perpetuity may not be as long as you think
2) Always check the implied growth rate in an exit multiple
3) The terminal year value is at the mid-point, not year-end
4) Undistributed cash matters – a lot
5) **DCF projections need to be evaluated**

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Best Practices: Greatest Hits

Cost of Capital and Growth Rates

FVA Financial Valuation Advisors

VPS Valuation Products and Services

FCG Financial Consulting Group

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Build-up Model

The basic formula for the Build-up Model is/can be:

$$E(R_i)^* = R_F + RP_m + RP_s \pm RP_c \pm RP_i$$

D&P

Where:

$E(R_1)$ = Expected (market required) rate of return on a security
R_f = Return for a risk-free security as of the valuation date
RP_m = Equity risk premium (ERP) for the "market"
RP_s = Risk premium for size
RP_c = Company-specific risk premium
RP_i = Risk premium for the industry

* Also known as k_e

Modified Capital Asset Pricing Model

The basic formula for MCAPM is expressed as follows:

$$E(R_i)^* = R_f + \beta(RP_m) + RP_s \pm RP_c$$

Where:

$E(R_1)$ = Expected (market required) rate of return on a security
R_f = Return for a risk-free security as of the valuation date
β = Subject company's beta coefficient
RP_m = Equity risk premium for the "market"
RP_s = Risk premium for size
RP_c = Company-specific risk premium

* Also known as k_e

Criticisms of MCAPM and BUM

- There have been criticisms of both the CAPM and the MCAPM
- Also, the BUM
- Criticisms on a macro level and a micro level
- However, I have not seen any other method widely used, especially in litigation

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Are the build-up model and MCAPM no longer valid and supportable?

Shannon P. Pratt and Roger J. Grabowski, *Cost of Capital Applications and Examples*, 5th edition, Wiley, 2014.

- "**The two commonly used models** to estimate the cost of capital for discounting or capitalizing expected net cash flows for a closely held business **are the build-up method and the modified version of the capital asset pricing model (CAPM)**." (p. 693)
- "**For now, however, the build-up method and the expanded CAPM still remain the best tools available** for estimation of a cost of capital for a closely held business." (p. 709)

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Best Practice

1) **Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly**

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Modified Capital Asset Pricing Model vs. Build-Up Model

- We often apply both models and, depending on the valuation and the company, we may rely on both models
- The MCAPM can be a better model when you believe you have good guideline public company betas
- If there are no reliable betas, analysts will usually apply and rely upon the acceptable BUM
- Often happens in the valuation of small businesses

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Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) **The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas**

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Conditional ERP and Normalized Rf Comparisons

- Is this much ado about nothing?
- Let's look at CRSP historical and SS ERPs
- Let's use spot rates for Rf
- Compare to normalized Rf and recommended ERPs

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Period	Spot Rf	Norm. Rf	Hist. ERP	SS ERP	Recom. ERP	Hist. COEC	SS COEC	Recom. COEC
4/1/17	2.8	3.5	6.9	6.0	5.5	9.7	8.8	9.0
12/31/16	2.8	3.5	6.9	6.0	5.5	9.7	8.8	9.0
11/14/16	2.7	4.0	6.9	6.0	5.5	9.6	8.7	9.5
1/31/16	2.4	4.0	7.0	6.2	5.5	9.4	8.6	9.5
12/31/14	2.5	4.0	7.0	6.2	5.0	9.5	8.7	9.0
12/31/13	3.7	4.0	6.7	6.1	5.0	10.4	9.8	9.0
12/31/12	2.5	4.0	6.6	6.1	5.5	9.1	8.6	9.5
12/31/11	2.6	4.0	6.7	6.0	6.0	9.3	8.6	10.0
12/31/10	4.1	4.1	6.7	5.2	5.5	10.8	9.3	9.6
12/31/09	4.6	4.6	6.5	5.7	5.5	11.1	10.3	10.1
12/31/08	3.1	4.5	7.1	6.2	6.0	10.2	9.3	10.5
12/31/07	4.5	4.5	7.1	6.3	5.0	11.6	10.8	9.5

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Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas
3) **Use the conditional ERP as a separate data point or as a check – both methods are fine**

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Cost of Equity – Size Premium

"The Size Effect Continues to be Relevant
When Estimating the Cost of Capital"

Roger J. Grabowski, FASA, Duff & Phelps, LLC
October 30, 2018
American Society of Appraisers' Business Valuation

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3275366

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Cost of Equity – Size Premium

- The size premium is really a CAPM adjustment – **"In Excess of CAPM"**
- Size premium = Realized return – Estimated return
- Realized return equals the historical return in excess of the risk-free rate (calculated as the realized long-term arithmetic mean return of the subject portfolio of stocks minus the realized long-term arithmetic return of the risk-free rate)
- Estimated return equals the return expected from CAPM (calculated as beta for the subject portfolio of stocks multiplied by the realized equity risk premium, the expected return on the benchmark market portfolio of stocks in excess of the risk-free rate)

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Cost of Equity – Size Premium

- If the true beta is underestimated, SP will be observed, and the cost of equity capital estimated using the textbook CAPM will be underestimated
- SP can be seen as a correction for this underestimation
- The CRSP Decile Size Premia include all companies with no exclusion of speculative (e.g., start-up) or distressed companies whose market cap is small because of being speculative or distressed
- SP are a correction to a theory shown to be fraught with problems
- **In summary … one can conclude that the size effect can still be used today by valuation professionals**

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Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas
3) Use the conditional ERP as a separate data point or as a check – both methods are fine
4) **It is still okay to use the size premium – we have nothing else**

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Use of Duff & Phelps CRSP Subdeciles 10b, 10y, and 10z

Can the data in Duff & Phelps CRSP subdeciles 10b, 10y, and 10z size premiums be relied upon or do they produce incorrect discount rates?

- The selection of a size premium is up to each individual analyst
- Should be ready to defend that selection and understand how the size premium is calculated as well as the type of data
- Answer the following question: "Why didn't you use the other possible choices for the size premium?"
- Duff & Phelps publishes many types of size premiums for smaller companies, including the micro-cap, the 10th decile, subdeciles 10a and 10b, and subdeciles 10w, 10x, 10y, and 10z

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Use of Duff & Phelps CRSP Subdeciles 10b, 10y, and 10z

- 10z has a size premium about twice that of decile 10
- You can't always go by a gut feel, but these numbers seem too high to just reflect size risk
- For smaller to mid-size businesses, the majority of analyses we see use the CRSP 10th decile (some also use the micro-cap, which are deciles 9 and 10)
- When we believe a further adjustment for additional risk should be included in the subject company, we typically make that adjustment in the company-specific risk category

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Use of Duff & Phelps CRSP Subdeciles 10b, 10y, and 10z

- We also have to deal with history
- The Duff & Phelps CRSP data go back to 1926
- For data through the 1960s, the number of companies in the 10th decile was fairly small
- While currently 10z includes a significant number of companies, the sample size declines dramatically the farther back in time we go
- In March of 1926, the 10th decile includes only 49 companies*
- If the 10th decile has 49 companies, then 10z will have approximately 12 companies or even less
- The Duff & Phelps CRSP size subdecile 10z has many weaknesses, and its use would be subject to significant criticism

* Morningstar/Ibbotson *SBBI 2013 Valuation Yearbook*, p. 94.

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Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas
3) Use the conditional ERP as a separate data point or as a check – both methods are fine
4) It is still okay to use the size premium – we have nothing else
5) **It is very difficult to support subdeciles 10z and 10b – use decile 10 or micro-cap**

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Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas
3) Use the conditional ERP as a separate data point or as a check – both methods are fine
4) It is still okay to use the size premium – we have nothing else
5) It is very difficult to support subdeciles 10z and 10b – Use decile 10 or micro-cap
6) **For smaller businesses you can use both the CRSP 10th decile and the Risk Premium Report D&P 25th category**

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Industry Risk Premiums (RP_i)

- The formula for calculating an industry risk premium is:

$$RP_i = (FIB \times RP_m) - RP_m$$

Where:

RP_i = risk premium for the industry (i.e., industry risk premium)
FIB = the full information beta for the industry
RP_m = the risk premium for the market (ERP)

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Industry Risk Premiums (RP_i)

- In summary, (RP_i):
  - Now requires at least 10 companies
  - Based on 36 months of contiguous return data
  - Provides full information beta
  - Based on three different estimates of ERP:
    - Historical ERP
    - Supply-side ERP
    - D&P recommended ERP

Industry Risk Premiums

What is the best way to use industry risk premiums?

- IRPs were published for use with the BUM and are not applicable to the MCAPM
- Sometimes the valuation analyst will say, "Well, I'm not going to use the modified capital asset pricing model because I can't find any public companies that are comparable, so I can't find any betas"
- They dismiss the MCAPM because they can't find good public companies and comparable betas
- They also eliminate those public companies in the guideline public company method
- And then they go and use IRPs from Duff & Phelps

Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas
3) Use the conditional ERP as a separate data point or as a check – both methods are fine
4) It is still okay to use the size premium – we have nothing else
5) It is very difficult to support subdeciles 10z and 10b – Use decile 10 or micro-cap
6) For smaller businesses you can use both the CRSP 10th decile and the Risk Premium Report D&P 25th category
7) **Download the companies. You want at least a three-digit SIC code, with a preference for four-digit. Look at the differences in the IRPs year to year. Does it make sense?**

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Do you use the Hamada formula?

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Unlevering and Relevering Betas

What is the correct method to unlever and relever betas to account for differences in capital structures?

- For those of you who value very small companies, you probably don't run into this problem too often
- But if you value medium- to larger-sized companies, you end up using public company betas
- You have to adjust them to the capital structure of the subject company (whether existing or assumed)
- You take the capital structures of the public companies
  - Unlever the betas to see what the beta would be with 0% debt
  - Relever beta at the debt/equity of the subject company

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Unlevering and Relevering Betas

- For a number of years, analysts have used the Hamada formula, likely because it is the formula most commonly used in examples in finance texts
- But in *Cost of Capital: Applications and Examples,* 5th edition, Pratt and Grabowski point out that the Hamada formula actually assumes a constant dollar value level of debt
- This is also covered in *Financial Valuation Applications and Models,* 4th edition, 2017

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Unlevering and Relevering Betas

- There are two other formulas
  - Harris-Pringle and Miles-Ezzell
  - Assume the debt will change with increases in cash flow and equity value
- More complicated formulas
- In certain conditions, the Hamada formula will produce a number that's close to Harris-Pringle and Miles-Ezzell
- Some circumstances where you're going to get a different number, such as when the debt is high

Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas
3) Use the conditional ERP as a separate data point or as a check – both methods are fine
4) It is still okay to use the size premium – we have nothing else
5) It is very difficult to support subdeciles 10z and 10b – Use decile 10 or micro-cap
6) For smaller businesses you can use both the CRSP 10th decile and the Risk Premium Report D&P 25th category
7) Download the companies; you want at least a three-digit SIC code, with a preference for four-digit; look at the differences in the IRPs year to year; does it make sense?
8) **Hamada will usually get you close enough, but watch it**

What is company-specific risk?

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Company-specific Risk
Methods and Reliability

Is there an accurate way to estimate company-specific risk?

- The bottom line is that there is no real and generally acceptable algorithm to determine the company-specific risk in its entirety
- It is based on judgment
- There are various methods and levels of supportability
- Most analysts agree that company-specific risk does exist
- Company-specific risk can be negative or zero
- Often see a list of factors prepared for the subject company
- The analyst then picks one single company-specific risk premium

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Specific Company Risk (RPc)

- Subjective analysis
- Three types of presentations, each with strengths and weaknesses
  - Component Detail Method
  - Component Observation Method
  - Component Summary Method

Guess who?

COMPONENT DETAIL METHOD (ILLUSTRATIVE EXAMPLE)

Component	Specific Risk (%)
Small company	0.5
Management depth	1.0
Product or service diversification	0.5
Geographical distribution	1.0
Total RP_c	3.0%

COMPONENT OBSERVATION METHOD (ILLUSTRATIVE EXAMPLE)

Component	Specific Risk (%)
Small company	+
Management depth	+
Product or service diversification	+
Geographical distribution	+
Total RP_c	3%

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COMPONENT SUMMARY METHOD (ILLUSTRATIVE EXAMPLE)

Component	Specific Risk (%)
Small company	
Management depth	
Product or service diversification	
Geographical distribution	
Total RP_c	3%

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Comparing Methods

- The range of reasonableness implied (previous slide) **is 2.5% to 3.5%**
- In the Component Detail Method, the range of reasonableness implied is **1% to 5%**
- **Which method is more accurate?**
  - **All three have the same accuracy.** The first two methods may appear more accurate, but they really are **not significantly different**
- **What is easier to defend?**

  Component Summary Method is easier to defend, does not mislead as to accuracy, and is not more subjective than the other two methods

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Best Practices

1) Until another method gains acceptance, use the MCAPM and the BUM, which are widely used, widely accepted, and supportable – when applied properly
2) The BUM is better for very small companies where betas are not relevant; the MCAPM is better when there are meaningful betas
3) Use the conditional ERP as a separate data point or as a check – both methods are fine
4) It is still okay to use the size premium – we have nothing else
5) It is very difficult to support subdeciles 10z and 10b – Use decile 10 or micro-cap
6) For smaller businesses you can use both the CRSP 10th decile and the Risk Premium Report D&P 25th category
7) Download the companies; you want at least a three-digit SIC code, with a preference for four-digit; look at the differences in the IRPs year to year; does it make sense?
8) Hamada will usually get you close enough, but watch it
9) **Be careful of false accuracies in certain component methods (RPc)**

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Cost of Capital Benchmark Data – December 31, 2019, 2020, and 2021

		2019	2020	2021
• U.S. 30-day Treasury bill[1]		1.48%	0.08%	0.06%
• U.S. five-year Treasury note[2]		1.69%	0.36%	1.26%
• U.S. 20-year Treasury bond[3]		2.25%	1.45%	1.94%
• Aaa corporate bond[5]		3.04%	2.23%	2.71%
• 30-year conventional mortgage[6]		3.74%	2.67%	3.11%
• Baa corporate bond[7]		3.90%	3.11%	3.37%
• Prime rate[4]		4.75%	3.25%	3.25%
• Large-cap stock ($29 billion - $2 trillion)[8]	1	1.04%	11.25%	11.39%
• Micro-cap stock ($2.2 million - $452 million)[8]		17.67%	17.73%	12.92%
• Small-cap stock ($2.2 million - $190 million)[8]	1	9.80%	19.90%	20.04%
• Subdecile category 10b ($2.2 million - $95 million)[8]		22.67%	22.73%	22.98%
• D&P size category 25 ($9 million - $385 million)[9]		23.35%	22.98%	23.09%
• Subdecile category 10z ($2.2 million - $47 million)[8]		24.97%	25.02%	25.55%
• VC Bridge/IPO[10]			20%-35%	
• VC second stage/expansion[10]			30%-50%	
• VC first stage/early development[10]			40%-60%	

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1 https://fred.stlouisfed.org/series/TB4WK

2 https://fred.stlouisfed.org/series/DGS5

3 https://fred.stlouisfed.org/series/DGS20

4 https://fred.stlouisfed.org/series/DPRIME

5 https://fred.stlouisfed.org/series/DAAA

6 https://fred.stlouisfed.org/series/MORTGAGE30US

7 https://fred.stlouisfed.org/series/DBAA

8 Duff & Phelps *2021 Cost of Capital Navigator*, CRSP Deciles Size Study –Supplementary Data Exhibits, all data from 1926 to 2020, large cap is decile 1, micro-cap is deciles 9 and 10, small cap is decile 10.

9 Duff and Phelps *2021 Cost of Capital Navigator, CRSP Deciles Size Study and Risk Premium Report Study – Supplementary Data Exhibits*, Resource Library, all data from 1963 to 2020.

10 *Valuation of Privately-Held-Company Equity Securities Issued as Compensation, Accounting & Valuation Guide,* 2013, American Institute of Certified Public Accountants, p. 148. (2019, 2020, 2021)

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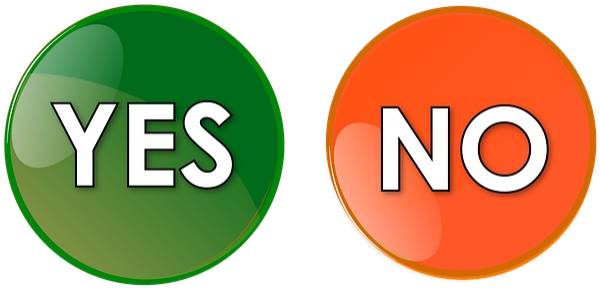
Does an "optimal" capital structure really exist?



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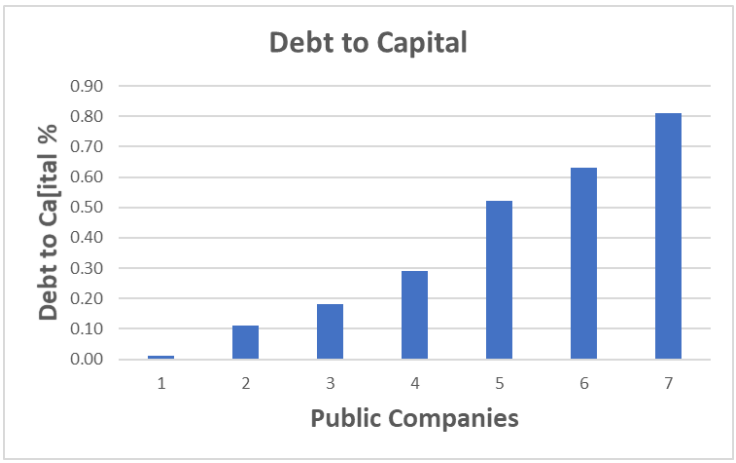
"Optimal" Capital Structure Yeah, right!



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The Misuse of the So-called "Optimal" Capital Structure

- The optimal capital structure of a firm is often defined as the proportion of debt and equity that result in the lowest weighted average cost of capital (WACC) for the firm.
- This technical definition is not always used in practice, and firms often have a strategic or philosophical view of what the structure should be.

https://corporatefinanceinstitute.com/resources/knowledge/finance/capital-structure-overview/

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The Misuse of the So-called "Optimal" Capital Structure

- Many valuation analysts (analysts) rely on **the capital structures of public companies** to select the so-called optimal capital structure for the valuation of a private subject company. This is an easy exercise, correct? Maybe not.
- Potential areas of concern are as follows:
  - Is the capital structure driven by acquisition debt vs. operating debt?
  - Is the capital structure driven by purchases of capital expenditures or stock buybacks?
  - Does the debt have equity kickers?
  - How are stock options handled?
  - To unlever and relever betas, what is the proper tax rate to use?
  - Is there really an optimal capital structure?

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Optimal Capital Structure
Yeah, right!

Guideline Companies	Levered Beta (1)	Interest-Bearing Debt	%
The Eastern Co.	0.33	35,225	17.7%
P & F Industries, Inc.	0.42	2,022	6.3%
The L.S. Starrett Co.	1.28	22,312	27.0%
Twin Disc, Inc.	1.73	4,684	1.5%
Visteon Corp.	0.79	19,650	9.2%
		Median	9.2%
		Mean	12.3%

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Optimal Capital Structure
Yeah, right!

- **The subject private company being valued had no debt as of the valuation date.** The reason is that the owners do not like debt. They said they wanted to sleep at night knowing they were not beholden to any banks. This is not an unusual situation with small- to medium-size private companies.
- **So, why isn't zero debt the optimal capital structure?** I think it is a consideration since they should be included within the world of hypothetical sellers. Also, **many buyers will apply acquisition leverage to the deal**. However, this is seldom at an operational level of debt. Most buyers want to pay down a high amount of acquisition debt.
- **The bottom line here and the dirty little secret may be that there is no "optimal" level of debt, at least on a practical vs. theoretical level.**

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Optimal Capital Structure
Yeah, right!

Guideline Companies	Levered Beta (1)	Interest-bearing Debt	%
Cogent Communications Holdings, Inc.	1.08	593,354	28.0%
Communications Sales & Leasing, Inc.	1.05	3,505,228	54.6%
Lumos Networks Corp.	1.10	466,700	64.5%
Level 3 Communications, Inc.	1.00	11,009,000	38.7%
Zayo Group Holdings, Inc.	0.50	3,702,200	37.3%
		Median	38.7%
		Mean	44.6%

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Best Practices

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7) Download the companies; you want at least a three-digit SIC code, with a preference for four-digit; look at the differences in the IRPs year to year; does it make sense?
8) Hamada will usually get you close enough, but watch it
9) Be careful of false accuracies in the component methods (RPc)
10) **Public company debt/equity weights are seldom good proxies for small- to medium-sized businesses**

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Evaluating Long-term Growth Rates for Reasonableness

- Let's stay in a normal valuation zone here
- The typical private company cannot grow at an average long-term growth rate that outpaces the U.S. economy **forever**, which an attorney once said, is **"a really long time"**
- Remember, we value the cash flows into perpetuity
- Too high or too low a growth rate
- Using a "real" growth rate thinking it is a "nominal" growth rate and vice versa
- Inflation only, real GDP only, or nominal GDP?

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Evaluating Long-term Growth Rates for Reasonableness (updated Dec. 2021)

- Some important U.S. economic benchmarks follow:

Exhibit 1 Summary Statistics

• Inflation (historical)[a]	2.9%
• Inflation (10-year projected)[b]	2.4%
• Real GDP (historical)[a]	3.1%
• Real GDP (10-year projected)[b]	2.1%
• Population (50-year projected)[c]	0.6%
• Nominal GDP (historical)[d]	6.1%
• Nominal GDP (10-year projected)[d]	4.6%
• Nominal population and inflation growth[d]	3.0%

[a] (1926-2021 inflation; 1926-2020 GDP), www.measuringworth.com.
[b] *Livingston Survey*, Federal Reserve Bank of Philadelphia, December 2021, p. 4.
[c] D'Vera Cohn, "Future immigration will change the face of America by 2065," Pew Research Center, October 5, 2015, http://www.pewresearch.org/fact-tank/2015/10/05/future-immigration-will-change-the-face-of-america-by-2065/.
[d] Based on combining the above data. Nominal GDP growth includes inflation and real growth.

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Evaluating Long-term Growth Rates for Reasonableness

- Historically, the 10-year consensus forecast of the nominal GDP average annual growth rate has also been around **4% to 5%***
- For the past 10 years, the long-term nominal GDP growth rate in the U.S. as measured from data since 1926 has been approximately 6% to 6.5% on a compound average basis
- Current end of year (2020), the long-term historical nominal GDP growth rate is 6.1%

* Consensus Median Average, *Livingston Survey,* Federal Reserve Bank of Philadelphia (December 2013 to December 2021)

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Evaluating Long-term Growth Rates for Reasonableness

Predicted Growth Rates

Livingston Survey 10-Year Forecast (%)			
Date	**REAL GDP**	**CPI**	**NOMINAL GDP**
Dec. 2021	2.1	2.4	4.6
June 2021	2.2	2.5	4.8
Dec. 2020	2.2	2.2	4.4
June 2020	2.2	2.0	4.2
Dec. 2019	2.0	2.2	4.2
June 2019	2.1	2.3	4.4
Dec. 2018	2.1	2.2	4.3
June 2018	2.2	2.3	4.6
Dec. 2017	2.2	2.3	4.6
June 2017	2.2	2.3	4.6
Dec. 2016	2.2	2.3	4.6

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Evaluating Long-term Growth Rates for Reasonableness

Predicted Growth Rates

Livingston Survey 10-Year Forecast (%)			
Date	**REAL GDP**	**CPI**	**NOMINAL GDP**
June 2016	2.2	2.3	4.6
Dec. 2015	2.3	2.3	4.7
June 2015	2.5	2.2	4.8
Dec. 2014	2.5	2.3	4.9
June 2014	2.5	2.3	4.9
Dec. 2013	2.6	2.3	5.0

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Evaluating Long-term Growth Rates for Reasonableness

- Also, the current (**December 2021**) predicted 10-year average growth rate is at **4.6%**
- The 10 previous six-month periods were at or below **4.8%**
- Note: These economic forecasts, while helpful, have not always been achieved
- **This is particularly true in times of economic instability**

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VPS Polls - What do you normally use in terms of a long-term growth rate?

	7/30/20	11/15/18	9/17/18	1/31/18
A. 3% or less	**46%**	**38%**	**42%**	**41%**
B. 3% to 5%	**46%**	**57%**	**54%**	**55%**
Total	**92%**	**95%**	**96%**	**96%**
C. 3% to 6%	4%	4%	3%	4%
D. 7% or higher	0%	0%	0%	0%
E. Not applicable	3%	1%	2%	1%

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Your Website Is a Dangerous Thing

First Firm

- Nationally recognized for its unparalleled expertise
- Possess industry-leading expertise
- A leading forensic accounting firm
- Provide our clients with the highest level of personal service

Second Firm

- Recognized internationally as leading authorities
- Most stringent and current training, experience, and judgment
- Recognized nationally as leading authorities in our field

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Your Website Is a Dangerous Thing

Third Firm

- Our premier expertise
- Unparalleled responsiveness on complex matters
- Relentless Excellence

Fourth Firm

- Nationally known
- Highly respected
- Recognized industry leader
- Thought leaders

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Your Website Is a Dangerous Thing

Fifth Firm

- Professionals have the expertise to get you the values you need in the time frame you need it
- Has deep expertise
- The full range of solutions we provide help enhance your strategy by illustrating the values you need to make an informed choice

Sixth Firm

- We employ the industry's best practices to provide the best services to our customers
- You are assured a valuation that is unquestionably reliable and highly respected in the financial community

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Your Website is a Dangerous Thing

Seventh Firm

- We are recognized as a preeminent accounting firm in the New York Metropolitan area
- Our valuation professionals have exceptional experience in valuing businesses and intangible assets
- Our people possess the highest levels of experience in their fields

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BV Standards

- AICPA
- ASA
- USPAP
- NACVA

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