

49th Annual Taxation Conference

APPRAISAL for AD VALOREM TAXATION

of Communications, Energy and
Transportation Properties
July 28 - August 1, 2019

Finding Alpha – Measuring Size
Risk Premium and Company-
Specific Risk Premium in the Unit
Principle Valuation Cost of Capital



Robert F. Reilly, CPA

Willamette Management Associates
Chicago, Illinois 60631
rfreilly@Willamette.com

Connor J. Thurman

Willamette Management Associates
Portland, Oregon 97204
cjthurman@Willamette.com

Moderators:

Rosella Schad, Missouri State Tax Commission
Joe Bolian, Taxography, Inc., St. Louis, Missouri

Robert F. Reilly, CPA

- Robert Reilly is a managing director of Willamette Management Associates.
- Robert has testified in both federal and state courts on unit valuation, intangible asset valuation, and other valuation matters.
- Robert is a chartered financial analyst, chartered global management accountant, certified management accountant, certified business appraiser, certified valuation analyst, certified valuation consultant, certified review appraiser, certified real estate appraiser, and state-certified general appraiser.
- Robert is the co-author of 12 valuation books including *Guide to Intangible Asset Valuation* (revised edition published in 2014 by the AICPA), *Practical Guide to Bankruptcy Valuation* (published in 2013 by the American Bankruptcy Institute), and *Guide to Property Tax Valuation*.

Connor J. Thurman

- Connor specializes in valuation analyses performed for property tax planning, compliance, and controversy purposes. In particular, Connor's practice focuses on unit principle valuations and intangible asset valuations of utility-type taxpayers.
- Connor has contributed thought leadership to the professional literature by authoring numerous journal articles, including:
 - "Damage Analyses in Claims regarding an Investment Management Trustee Breach of Fiduciary Duty." Willamette Management Associates *Insights*, Summer 2019.
 - "Practical Guidance to Identifying and Valuing Goodwill in a Family Law Context." Willamette Management Associates *Insights*, Winter 2019.
 - "Using the Cost Approach to Value Internally Developed Computer Software for Property Tax Purposes." *Journal of Multistate Taxation and Incentives*, September 2018.
 - "Application of the Cost Approach to Value Internally Developed Computer Software." Willamette Management Associates *Insights*, Summer 2018.

BEST PRACTICES



Thought Leadership
in Valuation, Damages, and
Transfer Price Analysis

ROBERT F. REILLY & ROBERT P. SCHWEIHS

Thought leadership overview

- The measurement of alpha as a component of the discount rate and the capitalization rate
- Industries subject to the unit principle of valuation
- The components of alpha in measuring the discount rate and the capitalization rate
 - What are they
 - Why use them
 - When to use them
 - How to use them
- How to measure the components of alpha
- Illustrative examples of the application of alpha in a unit principle valuation
- Issues related to the measurement/application of alpha

What is alpha?

- Alpha is recognized as the excess return of property above what is predicted by the capital asset pricing model (“CAPM”).
- The original CAPM did not include alpha when predicting returns of well-diversified portfolios of publicly traded securities.
- The original CAPM relied on unrealistic assumptions.

Alpha measurement is a component of the discount rate and the capitalization rate calculation

- Alpha includes two separate components of the cost of equity capital (“ K_e ”):
 - Size risk premium (“SRP”)
 - Company-specific risk premium (“CSRP”)
- Alpha affects the K_e component of the yield capitalization rate and the direct capitalization rate applied in unit principle valuations.

Industries and property types typically subject to the unit valuation principle

- The unit valuation principle is typically applied when valuing industrial or commercial properties that are physically, functionally, and economically integrated. For example:
 - Railroads
 - Pipelines
 - Telecommunication properties
 - Electric generation, transmission, and distribution properties
 - Airlines

Industries and property types typically subject to the unit valuation principle, cont.

- The unit valuation principle differs from summation valuation principle, in that:
 - Summation valuation methods value each of the subject taxpayer assets individually, as individual property components.
 - In applying summation valuation methods, the total value of the taxpayer operating assets is simply the “sum” of the values of the individual properties.
 - For property tax purposes, the summation valuation principle is used for many types of residential and commercial properties.
 - Unit valuation methods value all of the taxpayer operating assets collectively (as a single “unit”).
 - In applying unit valuation methods, the total bundle of taxpayer operating assets is valued in aggregate as one integrated unit of property.
 - For property tax purposes, the unit valuation principle is typically applied for certain types of properties when the summation valuation methods are impractical or impossible.

Locally assessed properties may also be subject to the unit valuation principle

- Analysts sometimes equate the unit valuation principle with central assessment.
- Many assessment authorities apply the unit valuation principle to value many types of locally assessed properties, including:
 - Hospitals, nursing homes, and other health care properties
 - Golf courses and country clubs
 - Sports stadiums and racetracks
 - Movie theaters and entertainment complexes
 - CATV systems
 - Gas delivery distribution systems
 - Water and wastewater systems
 - Many other types of properties

Alpha measurement typically does not impact summation principle valuations

- Why is this the case?
 - Summation principle valuations do not capitalize taxpayer business operating income.
 - Rather, summation principle valuations consider the “unit-by-unit” or “asset by asset” rental operating income.
 - Summation principle valuations extract discount rates and direct capitalization rates from the sale of comparable properties – not from the sale of debt and equity securities.
 - Summation principle valuations do not utilize capital market data.

What is the SRP component of alpha?

- The SRP sometimes represents the difference between actual historical excess return and the excess return predicted by beta.
- Beta is a measure of the volatility, or systematic risk, of an individual stock in comparison to the unsystematic risk of the entire market. Beta represents the slope of the line through a regression of data points from an individual stock's returns against those of the market.
- The “size effect” is based on the empirical observation that companies of smaller size are typically associated with greater risk and, therefore, have a higher K_e .
- The first comprehensive study of the size effect was performed by Rolf Banz in 1981. Banz examined and compared the returns of NYSE small-capitalized companies to that of NYSE large-capitalized companies. The study was performed from 1926 to 1975. Banz segments companies into 10 deciles – the 1st decile is the largest-capitalized companies and the 10th decile is the smallest-capitalized companies.

The SRP component of alpha, cont.

- There was an observable negative relationship between the size of a company and historical equity returns – as company size decreases, returns tend to increase and vice versa. The effect was not linear. It was most pronounced in the smallest-capitalized companies. As the holding period increased, small-capitalized companies tended to outperform large-capitalized companies.
- When measuring K_e , one of the factors that may be considered is the effect that company size has on value.^{1, 2}
 - In these circumstances, applying an SRP is appropriate to measure the risk associated with smaller-capitalized taxpayer.

¹ Richard J. Dowen and W. Scott Bauman, “A Fundamental Multifactor Asset Pricing Model,” *Financial Analysts Journal*, Vol 42, No. 4 (Jul. – Aug., 1986).

² 2017 *Valuation Handbook U.S. Guide to Cost of Capital*, Duff & Phelps.

What is the CSRP component of alpha?

- A CSRP is the risk premium associated with the level of unsystematic risk inherent in a particular taxpayer company. The CSRP can be positive or negative depending on the facts and circumstances of the taxpayer company.
- The CSRP represents the additional risk premium required to compensate an investor for the uncertainty of investing in a taxpayer company.
- The CSRP is the component of risk that makes an investment (1) unique and (2) different from other benchmark investments that may be used to measure capitalization rates, valuation pricing multiples, and/or other pricing metrics.

The CSRP component of alpha, cont.

- CSRP is also referred to as:
 - Investment-specific risk
 - Property-specific risk
 - Nonsystematic risk
 - Unsystematic risk
 - Nondiversifiable risk
 - Idiosyncratic risk

Alpha measurements impact all three generally accepted unit principle valuation approaches

- Impacts the income approach directly
 - Typically increases (but may decrease) the discount rate applicable to the taxpayer unit cash flow.
- Impacts the cost approach directly
 - Through economic obsolescence considerations.
- Impacts the market approach indirectly
 - Through the selection of the relevant pricing multiples.

Generally accepted K_e measurement methods

- CAPM
- Modified Capital Asset Pricing Model (“MCAPM”)
- Build-Up Model (“BUM”)
- Duff & Phelps Risk Premium Report
- Arbitrage Pricing Theory (“APT”) Model
- Dividend Yield Plus Capital Gains Yield Model, sometimes referred to as the “DCF” model
- All methods incorporate an SRP except the Duff & Phelps Risk Premium Report and CAPM.
- All methods (except CAPM) incorporate a CSRP.

Generally accepted K_e measurement methods, cont.

- CAPM

- $K_e = R_f + \beta \times (R_m - R_f) + \alpha$

- where:

- K_e = Cost of equity capital

- R_f = Risk-free rate of return

- $(R_m - R_f)$ = Long-term equity risk premium (measurement of overall ERP)

- β = Industry beta

- α = Unexplained alpha factor

- CAPM was “originally developed in the context of portfolio theory as a way to measure the risk an individual stock contributes to a well-diversified portfolio.”³

³ Gary Trugman, *Understanding Business Valuation*, 5th Ed., pg 546.

Assumptions of CAPM

- Financial markets are competitive and returns provide full range of investment opportunities.
- All investors plan to invest over the same time horizon.
- There are no distortionary taxes or transaction costs.
- All investors can borrow/lend at the same risk-free rate.
- Investments are infinitely divisible.
- Investors can access all information and are equally well informed.
- The risk measure used remains constant (non-varying beta). Essentially, the market portfolio that determines beta consists of all publicly traded securities.
- Variance of returns is an adequate measurement of risk. That is, CAPM implies that returns will be normally distributed.

Assumptions of CAPM, cont.

- None of the previously listed assumptions apply when valuing,
 - Operating assets of taxpayer properties.
 - Publicly trade companies (“PTCs”).
 - Illiquid properties.
- Further, the previously listed assumptions do not always apply to equity investments in the market because alpha is still measured.
- Michael C. Jensen tested CAPM in the 1970s and found an unidentified alpha factor in the market

Generally accepted K_e measurement methods, cont.

- MCAPM

- $K_e = R_f + \beta \times (R_m - R_f) + SRP + CSRP$

- where:

- K_e = Cost of equity capital

- R_f = Risk-free rate of return

- $(R_m - R_f)$ = Long-term equity risk premium (measurement of overall ERP)

- β = Industry beta

- SRP = Size risk premium

- CSRP = Company-specific risk premium (measurement of other risk factors)

- The MCAPM expands on the CAPM to be applicable for investments other than publicly traded stock. MCAPM includes the components of an SRP and a CSRP.

Generally accepted K_e measurement methods, cont.

- BUM
 - An additive model that incorporates the various risk factors of the K_e , including (1) an R_f , (2) an ERP, (3) an IRP, (4) an SRP, and (5) a CSRP.
 - Typically calculated as:
 - $K_e = R_f + ERP + IRP + SRP + CSRP$
 - where:
 - K_e = Equity risk premium
 - R_f = Risk-free rate of return
 - ERP = Equity risk premium
 - IRP = Industry risk premium
 - SRP = Size premium
 - CSRP = Company-specific risk premium

Generally accepted K_e measurement methods, cont.

- Duff & Phelps Risk Premium Report
 - Annually published calculation of the ERP based on factors included in the Risk Premium Report Study.
 - Designed to be used to develop K_e estimates for companies for which a “going-concern” assumption is appropriate. The Risk Premium Report Study provides estimates of the ERP based on eight size factors.
 - The Risk Premium Report Study also includes data to estimate the ERP based on three risk factors.
 - The Risk Premium Report Study provides regression formulas to estimate the ERP and the premiums are “smoothed” across 25 portfolios. To calculate the ERP, the analyst can use the regression equation or select the portfolio most closely resembling size or risk characteristic fundamental of the taxpayer company.

Generally accepted K_e measurement methods, cont.

- APT
 - Concept introduced in 1976⁴ but not commercially viable (due to lack of useable data) until 1988.
 - Considered a multivariate extension of the CAPM in that it recognizes multiple risk factors that may affect an investment's required rate of return, including "market timing" risk.

⁴ Stephen A. Ross, "The Arbitrage Theory of Capital Asset Pricing," *Journal of Economic Theory*, December 1976, pgs. 341-360; and Stephen A. Ross, "Return, Risk, and Arbitrage," in *Risk and Return in Finance*, Irwin I. Friend and J. Bicksler eds. (Cambridge, MA: Ballinger 1977), pgs. 189-218. See also Stephen A. Ross, Randolph W. Westerfield, and Jeffrey F. Jaffe, *Corporate Finance*, 3rd ed. (New York: McGraw-Hill, 1993), Chapter 11, "An Alternative View of Risk and Return: The Arbitrage Pricing Theory," pgs. 315-337.

Generally accepted K_e measurement methods, cont.

- APT is typically calculated as follows:
 - $E(R_i) = R_f + (B_{i1} K_1) + (B_{i2} K_2) + (B_{in} K_n)$
 - where:
 - $E(R_i)$ = Expected rate of return on the subject security
 - R_f = Risk-free rate of return
 - $K_1 \dots K_n$ = Risk premium associated with factor K for the average asset in the market
 - $B_{i1} \dots B_{in}$ = Sensitivity of each security to each risk factor relative to the market average sensitivity to that factor
 - The risk factors considered in current APT applications include (1) market timing, (2) confidence, (3) time horizon, (4) inflation, and (5) business cycle.
 - Like CAPM, APT ignores risk factors that are unique to a certain taxpayer, since investors theoretically could avoid such risks through diversification.

Generally accepted K_e measurement methods, cont.

- DCF Model

- Based on the theory that PTC stock prices reflect the present value of investors' discounted future expected earnings for the PTC stock.
- Relies on dividend yields and projected dividend growth from guideline publicly traded companies ("GPTCs").
- The DCF model relates the value of a PTC to (1) its expected future dividends in the next period, (2) the PTC's K_e , and (3) the expected growth rate of dividends into perpetuity for the PTC.
- Typically expressed as follows:
 - $K_e = [(DPS_1 / P_0) + g] + SRP + CSRP$
 - Where,
 - K_e = Required rate of return for equity investors
 - P_0 = Current market price per share of stock
 - DPS_1 = Expected dividend one year from now
 - g = Estimated long-term growth rate
 - SRP = Size risk premium
 - $CSRP$ = Company-specific risk premium

Conceptual differences between CAPM and MCAPM

CAPM (and other referenced models)

- Assumes that nonsystematic risk (i.e., nonbeta risk) can be diversified away. Taxpayers, however, face the nonsystematic investment risk that is assumed away by CAPM (and by other K_e models). To a taxpayer, nonsystematic investment risk cannot be diversified away.
- Nonsystematic investment risk may include (1) key person risk, (2) lack of management depth, (3) size risk, (4) customer concentration risk, and (5) more.
- These particular types of investment risk are intrinsic to these types of taxable operating property. Due to the very nature of these taxable operating properties, nonsystematic investment risk cannot be diversified away – and should not be assumed away – by the analyst.

Conceptual differences between CAPM and MCAPM, cont.

MCAPM

- Assumes that nonsystematic investment risk (i.e., nonbeta risk) cannot be diversified away.
 - E.g., provides an allowance for risk related to things such as customer risk, key person risk, lack of management depth, etc.
- Investors require an investment rate of return that is commensurate with nonsystematic investment risk. The SRP and CSRP adjust the CAPM (and the other cost of equity models) so as to produce such a risk-adjusted required rate of return.

Mathematical differences between CAPM and MCAPM

CAPM

- As previously discussed, the formula is:
 - $K_e = R_f + \beta \times (R_m - R_f) + \alpha$

MCAPM

- As previously discussed, the formula is:
 - $K_e = R_f + \beta \times (R_m - R_f) + SRP + CSRP$

- These two models are equivalent except for the inclusion of SRP and CSRP.

When and why to use CAPM or when and why to use MCAPM

- CAPM

- Useful for estimating the K_e of a well-diversified portfolio of perfectly liquid investments.
- Particularly appropriate when estimating the K_e of a publicly traded company.

- MCAPM

- Useful for estimating the K_e of a portfolio of nondiversified taxpayer property.
- Particularly appropriate when estimating the K_e of unit of operating assets.

Defining the bundle of property subject to unit principle valuation

- Affects selection of K_e method (e.g., CAPM vs. MCAPM).
 - For example, if the unit represents an assemblage of operating assets, CAPM may not be relevant due to the lack of diversification.
 - In this case, MCAPM (and thus, alpha) can capture the increased level of risk associated with the unit.
- Affects the selection of SRP and CSRP.
- Typically, the taxpayer unit is an assemblage of operating assets (tangible and intangible).
 - Not stock or a PTC.
 - Not a PTC business valuation (that includes intangible investments influences).

When is the alpha component of K_e not applicable to the unit principle valuation?

- The subject unit only includes the publicly traded stock and debt securities of a PTC.
- The subject unit is the average size of the selected GPTCs.
- The subject unit has no CSRP factors.
- The subject unit is perfectly comparable to the GPTCs.

When is the SRP component to K_e applicable to the unit valuation?

- When the subject unit is not a similar size to the relevant GPTCs.
- When the unit has an estimated market capitalization similar to those presented in the Duff & Phelps CRSP size deciles.

When is the CSRP component to K_e applicable to the unit valuation?

- When the subject unit is not the publicly traded stock and debt securities of a PTC.
- When the subject unit of operating assets is not perfectly diversified.
- When the subject unit of operating assets is not perfectly liquid.
- When the subject unit of operating assets is not a similar size to relevant GPTCs.

Methods and data sources for measuring the SRP

- Using the data produced by the University of Chicago Center for Research in Security Prices (“CRSP”), Roger Ibbotson and Rex Sinquefeld began publishing a size effect study in Morningstar/Ibbotson’s annual *Stocks, Bonds, Bills, and Inflation* (“SBBI”) *Valuation Yearbook*.
- The study is called the CRSP Deciles Size Premia Studies and was in the *SBBI Valuation Yearbook* from 1999 to 2016. In 2016, Morningstar announced it would no longer publish the CRSP Deciles Size Premia Study in the *Ibbotson SBBI Valuation Yearbook*.
- Starting with the 2016 edition, the annual study is produced by Duff & Phelps in the *U.S. Guide to Cost of Capital Valuation Handbook*.
 - Recently, Duff & Phelps ceased publishing their cost of capital information and data in book form. Duff & Phelps now offers an online database and calculator to users of their data.

Methods and data sources for measuring the SRP, cont.

- CRSP deciles size premium studies continue to segment the NYSE stock returns into deciles by size (as measured by market capitalization). The study includes the entire universe of NYSE/NYSE MKT/Nasdaq-listed securities rather than just the NYSE and are calculated from 1926 to the present year.
- CRSP deciles size premiums studies do not exclude financial services companies or high-financial-risk companies.
- Duff & Phelps calculates the CRSP deciles size premiums as follows:
 - Size premiums represent the difference between historical (observed) excess return and the excess return predicted by the CAPM.
 - Excess returns are defined here as portfolio returns over and above the risk-free assets returns.⁵

⁵ 2017 Valuation Handbook U.S. Guide to Cost of Capital, Duff & Phelps, pg. 8.

Methods and data sources for measuring the SRP, cont.

- Historically, market capitalization was used as a measure of size. Roger Grabowski began studying the size effect where size was measured by alternative accounting or fundamental risk measures.
- Grabowski and David King built a database that combined stock prices, number of shares, and dividend data from the CRSP database and accounting data from the S&P's *Compustat* database.
- Grabowski and King found that as size decreases, or as risk increases as measured by fundamental accounting data, returns increase, corroborating the findings of Banz.

Methods and data sources for measuring the SRP, cont.

- The Risk Premium Report utilizes eight size measures and 25 portfolios over the time horizon of 1963 to the present year.
- The breakpoints for the 25 portfolios are determined by total assets of companies traded on the NYSE. This set of companies is ranked from largest to smallest and divided equally. Portfolio one is the largest companies, while portfolio 25 is the smallest companies.
- The size measures include: Market Value of Equity, Book Value of Equity, 5-Year Average Net Income, Total Assets, etc.

Methods and data sources for measuring the SRP, cont.

- Once the breakpoints are determined, companies traded on the NYSE and the Nasdaq are added to the appropriate portfolios based on their total assets.
- The equity returns for each portfolio are derived by using an equal-weighted average of the companies in the respective portfolio, which is then used to calculate the size premiums and risk premiums of each portfolio.
- The Risk Premium Report can be used to calculate (1) the risk premium over CAPM, and (2) the risk premium over the R_f .
 - When calculating the risk premium over the R_f , the analyst applies an ERP adjustment to the risk premium calculation.

CRSP Deciles Size Premium³

Decile	Market Capitalization of Smallest Company (in millions)		Market Capitalization of Largest Company (in millions)	Size Premium (Return in Excess of CAPM)
Mid-Cap 3-5	\$2,392.689	—	\$10,711.194	1.02%
Low-Cap 6-8	569.279	—	2,390.899	1.75
Micro-Cap 9-10	2.516	—	567.843	3.67
Breakdown of CRSP Deciles 1-10				
1-Largest	\$24,361.659	—	\$609,163.498	-0.35%
2	10,784.101	—	24,233.747	0.61
3	5,683.991	—	10,711.194	0.89
4	3,520.566	—	5,676.716	0.98
5	2,392.689	—	3,512.913	1.51
6	1,571.193	—	2,390.899	1.66
7	1,033.341	—	1,569.984	1.72
8	569.279	—	1,030.426	2.08
9	263.715	—	567.843	2.68
10-Smallest	2.516	—	262.891	5.59
Breakdown of CRSP 10th Decile				
10a	\$127.296	—	\$262.891	4.09%
10w	190.553	—	262.891	3.10
10x	127.296	—	190.383	5.33
10b	\$2.516	—	\$127.279	8.64%
10y	73.561	—	127.279	7.21
10z	2.516	—	73.504	11.63

¹ See Chapter 3 for complete methodology.

² See Exhibit 3.19.

³ See Chapter 7 for complete methodology.

Note: Examples on how these variables can be used are found in Chapter 8.

Sources of underlying data: 1.) CRSP U.S. Stock Database and CRSP U.S. Indices Database © 2017 Center for Research in Security Prices (CRSP®), University of Chicago Booth School of Business. 2.) Morningstar *Direct* database. Used with permission. All rights reserved. Calculations performed by Duff & Phelps, LLC.

Duff & Phelps / Ibbotson data - CRSP deciles

Sourced from Duff & Phelps 2017 *Valuation Handbook: U.S. Guide to Cost of Capital*.

Duff & Phelps / Ibbotson data - CRSP deciles

DUFF & PHELPS

$$K_e = R_f + RP_m + RP_i + RP_s$$

COST OF EQUITY CAPITAL RISK-FREE RATE EQUITY RISK PREMIUM INDUSTRY RISK PREMIUM SIZE PREMIUM

SCENARIO 1 Rename

$$K_e = 3.50\% + 5.50\% + RP_i + 2.46\%$$

Market Value of Common Equity (\$USD in Millions)

CRSP Decile (Select a Size Premium)

Decile	Market Cap of Smallest Company (\$USD in millions)	Market Cap of Largest Company (\$USD in millions)	Size Premium (Return in Excess of CAPM)
8	730.047	1,292.224	
9	325.36	727.843	2.46%
10	2.455	321.578	

Deciles Size Grouping

Micro Cap	2.455	727.843	3.39%
-----------	-------	---------	-------

SIZE PREMIUM

2.46%

Cancel

Save

Sourced from Duff & Phelps Cost of Capital Navigator (as of December 31, 2018).

Companies Ranked by Total Assets

Data for Year Ending December 31, 2016

Comparative Risk Characteristics
Exhibit C-5

Data Smoothing with Regression Analysis

Dependent Variable: Average Unlevered Risk Premium

Independent Variable: Log of Average Total Assets

Constant 17.337%

X Coefficient(s) -2.694%

$$\text{Smoothed Unlevered Premium} = 17.337\% - 2.694\% * \text{Log(Assets)}$$

Portfolio Rank by Size	Average Total Assets (in \$Millions)	Log of Average Total Assets	Number of Firms	Arithmetic Average Risk Premium	Average Debt to MVIC	Average Debt to Market Value of Equity	Average Unlevered Risk Premium ¹	Smoothed Average Unlevered Risk Premium	Beta (Sum Beta) Since '63	Average Unlevered Beta	Average Operating Margin	Average CV(Operating Margin)	Average CV(ROE)
1	161,117	5.21	36	5.94%	29.09%	41.03%	4.91%	3.31%	0.80	0.60	14.27%	13.04%	22.98%
2	51,936	4.72	38	5.71%	34.00%	51.51%	4.46%	4.63%	0.84	0.59	14.01%	13.83%	25.11%
3	35,110	4.55	33	6.64%	31.15%	45.24%	5.36%	5.09%	0.92	0.67	12.53%	13.32%	24.74%
4	25,351	4.40	29	6.61%	31.09%	45.11%	5.36%	5.47%	0.90	0.65	12.50%	12.33%	24.41%
5	18,141	4.26	32	7.79%	30.07%	43.01%	6.51%	5.87%	0.95	0.69	11.39%	12.78%	26.78%
6	14,376	4.16	34	8.40%	28.55%	39.96%	7.17%	6.14%	0.96	0.71	12.56%	13.87%	28.42%
7	11,035	4.04	34	7.88%	27.67%	38.26%	6.57%	6.45%	1.04	0.78	11.47%	15.03%	29.70%
8	9,004	3.95	33	6.95%	27.85%	38.59%	5.63%	6.68%	1.04	0.78	11.76%	14.54%	25.96%
9	7,861	3.90	31	8.23%	28.11%	39.10%	6.82%	6.84%	1.10	0.82	11.34%	15.09%	27.90%
10	6,771	3.83	38	6.77%	27.35%	37.65%	5.40%	7.02%	1.10	0.83	11.58%	15.30%	28.73%
11	5,710	3.76	39	8.43%	27.88%	38.66%	6.99%	7.22%	1.12	0.84	11.51%	15.51%	27.37%
12	4,998	3.70	35	8.42%	26.33%	35.74%	7.10%	7.37%	1.10	0.83	10.83%	16.39%	27.53%
13	4,290	3.63	43	9.27%	26.18%	35.47%	7.90%	7.55%	1.14	0.87	11.13%	16.41%	28.13%
14	3,661	3.56	40	8.80%	25.17%	33.63%	7.49%	7.74%	1.14	0.88	10.53%	17.41%	29.97%
15	3,160	3.50	40	8.82%	25.77%	34.72%	7.46%	7.91%	1.15	0.88	9.88%	17.38%	30.47%
16	2,735	3.44	38	9.22%	24.55%	32.55%	7.88%	8.08%	1.19	0.92	9.54%	17.44%	31.67%
17	2,345	3.37	48	9.35%	24.95%	33.24%	8.01%	8.26%	1.17	0.90	10.28%	18.15%	30.02%
18	1,927	3.28	64	9.99%	25.03%	33.39%	8.60%	8.49%	1.20	0.93	9.71%	18.63%	31.71%
19	1,621	3.21	46	8.98%	25.22%	33.72%	7.56%	8.69%	1.22	0.94	9.71%	19.73%	33.05%
20	1,363	3.13	59	9.47%	24.46%	32.38%	8.07%	8.89%	1.24	0.96	9.48%	20.66%	34.62%
21	1,069	3.03	87	9.20%	23.56%	30.81%	7.87%	9.18%	1.22	0.96	8.86%	22.46%	36.94%
22	801	2.90	78	12.66%	23.24%	30.28%	11.32%	9.51%	1.25	0.98	8.59%	24.39%	39.50%
23	600	2.78	79	10.62%	22.19%	28.51%	9.35%	9.85%	1.25	0.99	8.37%	25.70%	41.12%
24	429	2.63	97	11.05%	21.56%	27.49%	9.80%	10.24%	1.26	1.01	8.10%	28.24%	44.58%
25	161	2.21	297	15.45%	19.50%	24.22%	14.30%	11.39%	1.28	1.05	7.31%	40.06%	56.49%

CV(X) = Standard deviation of X divided by mean of X, calculated over 5 fiscal years.

¹ Unlevered risk premiums and unlevered betas are calculated using methodology described in Chapter 10 with an average assumed debt beta = 0.1.

Sources of underlying data: 1.) © 201702 CRSP®, Center for Research in Security Prices, University of Chicago Booth School of Business used with permission. All rights reserved. 2.) Morningstar Direct database. Used with permission. All rights reserved. Calculations performed by Duff & Phelps LLC.

Duff & Phelps / Ibbotson data - risk premium study

Sourced from Duff & Phelps 2017 Valuation Handbook: U.S. Guide to Cost of Capital.

Duff & Phelps/Ibbotson data - comparison

Exhibit 7.4: Risk Premium Report Study and the CRSP Deciles Size Premia Study Comparison Table

	<u>CRSP Deciles Size Premia Study</u>	<u>Risk Premium Report Study</u>
Time horizon over which data is analyzed	1926–present year	1963–present year
Size study included	Yes	Yes
Size measures used	Market Cap	Market Cap + 7 alternative size measures
Premia over CAPM (i.e., size premia)	Yes	Yes
"Risk premia over the risk-free rate"	No	Yes
Unlevered premia (in addition to levered premia)	No	Yes
Risk Study (in addition to Size Study)	No	Yes
Risk measures used	NA	Operating Margin, CV Operating Margin, CV ROE
Can be used to estimate COE using build-up method	Yes	Yes
Can be used to estimate COE using CAPM model	Yes	Yes
Number of portfolios	10 Deciles + 10w, 10x, 10y, 10z	25

Sourced from
Duff & Phelps
*2017 Valuation
Handbook: U.S.
Guide to Cost of
Capital.*

Illustrative example of selecting and applying an SRP

- SRP selection is based on an estimated equity value.
- The analyst needs an estimate of equity from a non-income approach method to select the SRP.
 - This is due to the circular nature in the application of the SRP.
- Presented here is an example of how the analyst may estimate an equity value to determine a relevant SRP.

TAXPAYER COMPANY MARKET APPROACH – SALES COMPARISON METHOD AS OF DECEMBER 31, 2018											
Selected Sales Comparison Data											
Date	Target Company Name	Indicated Value \$MM	LTM Revenue \$MM	LTM EBITDA \$MM	LTM EBIT \$MM	EBITDA Return on Revenue	EBIT Return on Revenue	Pricing Multiples			
								Value / Revenue	Value / EBITDA	Value / EBIT	
10/25/2018	Omega Company	17,500	19,525	2,650	2,350	13.6%	12.0%	0.90	6.6	7.4	
4/24/2018	Tau Company	9,525	10,250	1,750	1,500	17.1%	14.6%	0.93	5.4	6.4	
11/11/2017	Beta Company	32,000	37,500	5,150	4,950	13.7%	13.2%	0.85	6.2	6.5	
1/6/2017	Gamma Company	7,500	7,800	1,120	995	14.4%	12.8%	0.96	6.7	7.5	
8/31/2015	Theta Company	61,500	52,450	9,555	6,750	18.2%	12.9%	1.17	6.4	9.1	
6/15/2015	Delta Company	10,750	12,000	1,850	1,550	15.4%	12.9%	0.90	5.8	6.9	
Low			7,800	1,120	995	13.6%	12.0%	0.85	5.4	6.4	
25th Percentile			10,688	1,775	1,513	13.9%	12.8%	0.90	5.9	6.6	
Median			15,763	2,250	1,950	14.9%	12.9%	0.91	6.3	7.2	
75th Percentile			33,006	4,525	4,300	16.7%	13.1%	0.95	6.6	7.5	
High			52,450	9,555	6,750	18.2%	14.6%	1.17	6.7	9.1	
Value Summary											
Taxpayer Company Normalized Operating Financial Fundamentals			30,951	4,016	3,228	13.0%	10.4%				
Selected Pricing Multiples			0.90	6.0	7.0						
Indicated Market Value of Debt and Equity			27,856	24,094	22,595						
Weight			33.3%	33.3%	33.3%						
Weighted Market Value of Debt and Equity			9,285	8,031	7,532						
Indicated Market Value of Debt and Equity			24,800								

Illustrative examples of selecting and applying an SRP, cont.

- Indicated taxpayer market value of debt and equity from the market approach, stock and debt method, is equal \$24.8 billion. Let's assume no debt.
- Provides an indication of size that the analyst can use to then apply to an SRP when creating the K_e estimate applicable to the income approach.
- The analyst could also rely on:
 - Cost approach methods
 - Other market approach methods

Illustrative examples of selecting and applying an SRP, cont.

- The analyst may now compare the taxpayer company estimated market capitalization to the size decile data presented by Duff & Phelps to select a reasonable SRP when calculating the K_e .
- Based on data from Duff & Phelps, the analyst may select the “micro-cap 9-10” size decile SRP of 3.39 percent

Illustrative examples of selecting and applying an SRP, cont.

DUFF & PHELPS

- Home
- My Cost of Capital Estimates
- Contact Us
- Resources

$K_e = R_f + RP_m + RP_i + RP_s$

COST OF EQUITY CAPITAL RISK-FREE RATE EQUITY RISK PREMIUM INDUSTRY RISK PREMIUM SIZE PREMIUM

SCENARIO 1 Rename

K_e
=
3.50%
+
5.50%
+
 RP_i
+

SIZE PREMIUM

2.46%

Cancel

Save

Market Value of Common Equity (\$USD in Millions)

CRSP Decile (Select a Size Premium)

Decile	Market Cap of Smallest Company (\$USD in millions)	Market Cap of Largest Company (\$USD in millions)	Size Premium (Return in Excess of CAPM)
8	730.047	1,292.224	
9	325.36	727.843	2.46%
10	2.455	321.578	

Deciles Size Grouping			
Micro Cap	2.455	727.843	3.39%

Sourced from Duff & Phelps Cost of Capital Navigator (as of December 31, 2018).

Description of factors that may indicate the application of CSRP to a taxpayer unit of assets

- Lack of diversification (e.g., single industry)
- Lack of liquidity
- Lack of management depth
- Key person dependence risk
- Customer concentration risk
- Key product dependence risk
- Key supplier dependence risk
- High regulatory risk

Data sources for measuring the CSRP

Quantum of risk in MCAPM

- Theoretically, this should represent the quantum of risk related to traditional market risk.

Quantum Level			Quanta of Risk (rounded)
(1)	Risk-Free Rate of Return	2.9%	3.0%
	$0.8 \times (5.5\%) =$		
(2)	Industry-Adjusted General Equity Risk Premium	4.4%	4.0%
	$\beta \times (R_m - R_f) =$		
(3)	Size Equity Risk Premium	<u>3.4%</u>	3.0%
		<u>10.7%</u>	
(4)	Company-Specific Equity Risk Premium	<u>3.0%</u>	about 3% - 4%
	Yield Capitalization Rate	<u>13.7%</u>	

Data sources for measuring the CSRP, cont.

Analysis of Duff & Phelps/Ibbotson 10th decile (quartiles)

- For example, subdecile 10y and subdecile 10z are populated by many large (but highly leverage) companies with small market capitalizations that probably do not match the characteristics of financially healthy but small companies.

Applicable Micro-Cap Decile 9-10 = 3.67%

Subdecile	Market Cap	Number of Companies	Market Cap	Percentage
10a	\$127.296	-	\$262.891	4.09%
10w	190.553	-	262.891	3.10
10x	127.296	-	190.383	5.33
10b	\$2.516	-	\$127.279	8.64%
10y	73.561	-	127.279	7.21
10z	2.516	-	73.504	11.63

Quantum of Risk

0.4%

(0.6)%

1.7%

5.0%

3.5%

8.0%

Above quanta of risk may indicate CSRP

Data sources for measuring the CSRP, cont.

Analysis of relative bond ratings and yields

- A high-yield bond is a bond with a credit rating below investment grade corporate bonds that pays a higher yield than investment grade bonds, typically because of some high-risk factors.
- The quanta of risk between the observed R_f , investment grade corporate bonds, and “junk bonds” may provide an indication of CSRP.

As of December 31, 2018	
6-Month U.S. Treasury bill	2.5%
10-Year U.S. Treasury bond	2.7%
Moody's Aaa Corporate Bond Index	4.0%
Moody's Aa Corporate Bond Index	4.2%
Moody's A Corporate Bond Index	4.3%
Moody's Baa Corporate Bond Index	5.1%
ICE BofAML BB U.S. High Yield Index	6.3%
ICE BofAML B U.S. High Yield Index	8.4%
ICE BofAML CCC & Below U.S. High Yield Index	13.7%

Sourced from Bloomberg and ICE BofAML.

1.1%

2.3%

4.4%

Data sources for measuring the CSRP, cont.

Analysis of illiquidity studies (pre-initial public offering (“IPO”) and restricted stocks)

- Pre-IPO Studies
 - Emory Studies
 - Valuation Advisors Studies
 - Matched-Pair Analysis
- Restricted Stock Studies

Data sources for measuring the CSRP, cont.

Analysis of illiquidity studies (pre-IPO and restricted stocks)

- Restricted Stock Studies
 - The studies of market prices of restricted stocks include transaction data dating back to the late 1960s. These studies indicate an average discount for the restricted stock of a PTC of,
 - Approximately 35 percent for transactions occurring in the 1968 to 1988 period and,
 - Approximately 20 percent to 25 percent for transactions occurring after 1990.
 - The decrease in the observed discounts is likely related to the shortened holding period for restricted stocks under Securities and Exchange Commission Rule 144.

Data sources for measuring the CSRP, cont.

Analysis of illiquidity studies (pre-IPO and restricted stocks)

- The analyst may use the DLOM estimates from the Restricted Stock Studies to adjust the K_e .
- Assume the analyst selects a 20 percent DLOM.
- The analyst would divide the K_e estimate by 1 minus 20 percent.

Restricted Stock Studies Analysis	
Risk-Free Rate of Return	2.9%
Industry-Adjusted General Equity Risk Premium	6.9%
Size Equity Risk Premium	<u>3.4%</u>
Indicated Cost of Equity	<u>13.2%</u>
Selected DLOM	20.0%
DLOM-Adjusted Cost of Equity	16.5%



3.3%

Illustrative example: Discount rate and direct capitalization rate (with alpha)

TAXPAYER COMPANY YIELD CAPITALIZATION RATE AND DIRECT CAPITALIZATION RATE AS OF DECEMBER 31, 2018		
Cost of Equity Capital:		
Modified Capital Asset Pricing Model (ex post equity risk premium)		Source
Risk-Free Rate of Return	2.9%	20-year U.S. Treasury bond
General Equity Risk Premium	6.9%	Duff & Phelps, Cost of Capital Navigator as of December 31, 2018
Multiplied by: Industry Beta	<u>1.00</u>	From selected guideline publicly traded companies
Industry-Adjusted General Equity Risk Premium	6.9%	
Size Equity Risk Premium	3.4%	Duff & Phelps, Cost of Capital Navigator as of December 31, 2018 [a]
Company-Specific Equity Risk Premium	3.0%	Based on risk factors that include: (1) regulatory risk, (2) lack of liquidity, and (3) lack of management depth
Indicated Cost of Equity Capital	<u>16.2%</u>	
Selected Cost of Equity Capital	<u>16.2%</u>	As presented above
Cost of Debt Capital:		
Before-Tax Cost of Debt Capital	4.5%	Taxpayer company cost of debt capital
Income Tax Rate	<u>28%</u>	Effective income tax rate
Selected Cost of Debt Capital	<u>3.2%</u>	

Illustrative example: Discount rate and direct capitalization rate (with alpha), cont.

TAXPAYER COMPANY		
YIELD CAPITALIZATION RATE AND DIRECT CAPITALIZATION RATE		
AS OF DECEMBER 31, 2018		
Yield Capitalization Rate Calculation:		
Selected Cost of Equity Capital	16.2%	
Multiplied by: Equity/Invested Capital	<u>70%</u>	From selected guideline publicly traded companies
Equals: Weighted Cost of Equity Capital		11.3%
Selected Cost of Debt Capital	3.2%	
Multiplied by: Debt/Invested Capital	<u>30%</u>	From selected guideline publicly traded companies
Equals: Weighted Cost of Debt Capital (rounded)		<u>1.0%</u>
Yield Capitalization Rate (rounded)		12%
Less: Expected Long-Term Growth Rate (rounded)		<u>2%</u> Expected long-term inflation rate
Direct Capitalization Rate (rounded)		<u>10%</u>
[a] Based on the Micro-Cap 9-10 CRSP Deciles Size Premium as presented in Duff & Phelps Cost of Capital Navigator as of December 31, 2018.		

Illustrative example: Discount rate and direct capitalization rate (without alpha)

TAXPAYER COMPANY YIELD CAPITALIZATION RATE AND DIRECT CAPITALIZATION RATE AS OF DECEMBER 31, 2018		
Cost of Equity Capital:		
Modified Capital Asset Pricing Model (ex post equity risk premium)		Source
Risk-Free Rate of Return	2.9%	20-year U.S. Treasury bond
General Equity Risk Premium	6.9%	Duff & Phelps, Cost of Capital Navigator as of December 31, 2018
Multiplied by: Industry Beta	<u>1.00</u>	From selected guideline publicly traded companies
Industry-Adjusted General Equity Risk Premium	6.9%	
Size Equity Risk Premium	-	Not Applicable
Company-Specific Equity Risk Premium	-	Not Applicable
Indicated Cost of Equity Capital	<u>9.8%</u>	
Selected Cost of Equity Capital	<u>9.8%</u>	As presented above
Cost of Debt Capital:		
Before-Tax Cost of Debt Capital	4.5%	Taxpayer company cost of debt capital
Income Tax Rate	<u>28%</u>	Effective income tax rate
Selected Cost of Debt Capital	<u>3.2%</u>	

Illustrative example: Discount rate and direct capitalization rate (without alpha), cont.

TAXPAYER COMPANY		
YIELD CAPITALIZATION RATE AND DIRECT CAPITALIZATION RATE		
AS OF DECEMBER 31, 2018		
Yield Capitalization Rate Calculation:		
Selected Cost of Equity Capital	9.8%	
Multiplied by: Equity/Invested Capital	<u>70%</u>	From selected guideline publicly traded companies
Equals: Weighted Cost of Equity Capital		6.8%
Selected Cost of Debt Capital	3.2%	
Multiplied by: Debt/Invested Capital	<u>30%</u>	From selected guideline publicly traded companies
Equals: Weighted Cost of Debt Capital (rounded)		<u>1.0%</u>
Yield Capitalization Rate (rounded)		8%
Less: Expected Long-Term Growth Rate (rounded)		<u>2%</u> Expected long-term inflation rate
Direct Capitalization Rate (rounded)		<u><u>6%</u></u>

Illustrative example: Direct capitalization method (with alpha)

TAXPAYER COMPANY TOTAL UNIT VALUATION INCOME APPROACH – DIRECT CAPITALIZATION METHOD AS OF DECEMBER 31, 2018	
	(\$MM)
Representative EBIT	3,008
Calculation of Net Cash Flow:	
Representative EBIT	3,008
Effective Income Tax Rate	<u>28%</u>
Tax-Affected EBIT	2,166
+ Noncash Charges (i.e., depreciation and amortization expense)	788
- Capital Expenditures	(788)
- Additions to Net Working Capital	<u>(12)</u>
= Normalized Net Cash Flow	2,153
÷ Direct Capitalization Rate	10%
Indicated Fair Market Value of Total Unit	<u>21,500</u>

EBIT = Earnings before
Interest and Taxes

Illustrative example: Direct capitalization method (without alpha)

TAXPAYER COMPANY TOTAL UNIT VALUATION INCOME APPROACH – DIRECT CAPITALIZATION METHOD AS OF DECEMBER 31, 2018	
	(\$MM)
Representative EBIT	3,008
Calculation of Net Cash Flow:	
Representative EBIT	3,008
Effective Income Tax Rate	<u>28%</u>
Tax-Affected EBIT	2,166
+ Noncash Charges (i.e., depreciation and amortization expense)	788
- Capital Expenditures	(788)
- Additions to Net Working Capital	<u>(12)</u>
= Normalized Net Cash Flow	2,153
÷ Direct Capitalization Rate	6%
Indicated Fair Market Value of Total Unit	<u>35,900</u>

TAXPAYER COMPANY
TOTAL UNIT VALUATION
INCOME APPROACH – YIELD CAPITALIZATION METHOD
AS OF DECEMBER 31, 2018

	Projected Fiscal Years Ended December 31,					Normalized 2023 \$MM
	2019 \$MM	2020 \$MM	2021 \$MM	2022 \$MM	2023 \$MM	
Present Value of Discrete Period Net Cash Flow:						
Tax-Affected Earnings before Interest and Taxes	2,203	2,225	2,247	2,270	2,315	2,315
Noncash Charges (i.e., depreciation and amortization expense)	796	773	750	728	707	
Capital Expenditures	(796)	(773)	(750)	(728)	(707)	
Additions to Net Working Capital	(15)	(15)	(15)	(15)	(16)	(16)
Net Cash Flow	<u>2,188</u>	<u>2,210</u>	<u>2,232</u>	<u>2,255</u>	<u>2,300</u>	<u>2,300</u>
Months Remaining in Initial Projected Year	<u>12.0</u>					
Adjusted Net Cash Flow to Invested Capital	2,187					
Discounting Periods	0.4997	1.4993	2.4993	3.4993	4.4993	
Present Value Factor @ 12 Percent	<u>0.9449</u>	<u>0.8437</u>	<u>0.7533</u>	<u>0.6726</u>	<u>0.6006</u>	
Present Value of Discrete Period Net Cash Flow	2,066	1,865	1,682	1,516	1,381	
Present Value of Discrete Period Net Cash Flow (rounded)	<u>\$ 8,510</u>					
Present Value of Terminal Period Net Cash Flow:						
Fiscal 2024 Net Cash Flow to Invested Capital	\$ 2,346					
Direct Capitalization Rate	10%					
Terminal Value	23,457					
Present Value Factor @ 12 Percent	<u>0.6006</u>					
Present Value of Terminal Period Net Cash Flow Value	<u>\$ 14,087</u>					
Value Summary:						
Discrete Period Net Cash Flow Value	8,510					
Terminal Period Net Cash Flow Value	<u>14,087</u>					
Indicated Fair Market Value of Total Unit	<u>23,000</u>					

**Illustrative example:
Yield capitalization
method (with alpha)**

TAXPAYER COMPANY
TOTAL UNIT VALUATION
INCOME APPROACH – YIELD CAPITALIZATION METHOD
AS OF DECEMBER 31, 2018

	Projected Fiscal Years Ended December 31,					Normalized 2023 \$MM
	2019 \$MM	2020 \$MM	2021 \$MM	2022 \$MM	2023 \$MM	
Present Value of Discrete Period Net Cash Flow:						
Tax-Affected Earnings before Interest and Taxes	2,203	2,225	2,247	2,270	2,315	2,315
Noncash Charges (i.e., depreciation and amortization expense)	796	773	750	728	707	
Capital Expenditures	(796)	(773)	(750)	(728)	(707)	
Additions to Net Working Capital	(15)	(15)	(15)	(15)	(16)	(16)
Net Cash Flow	<u>2,188</u>	<u>2,210</u>	<u>2,232</u>	<u>2,255</u>	<u>2,300</u>	<u>2,300</u>
Months Remaining in Initial Projected Year	12.0					
Adjusted Net Cash Flow to Invested Capital	2,187					
Discounting Periods	0.4997	1.4993	2.4993	3.4993	4.4993	
Present Value Factor @ 8 Percent	<u>0.9623</u>	<u>0.8910</u>	<u>0.8250</u>	<u>0.7639</u>	<u>0.7073</u>	
Present Value of Discrete Period Net Cash Flow	2,104	1,969	1,842	1,722	1,627	
Present Value of Discrete Period Net Cash Flow (rounded)	<u>\$ 9,264</u>					
Present Value of Terminal Period Net Cash Flow:						
Fiscal 2024 Net Cash Flow to Invested Capital	\$ 2,346					
Direct Capitalization Rate	6%					
Terminal Value	39,096					
Present Value Factor @ 8 Percent	<u>0.7073</u>					
Present Value of Terminal Period Net Cash Flow Value	<u>\$ 27,653</u>					
Value Summary:						
Discrete Period Net Cash Flow Value	9,264					
Terminal Period Net Cash Flow Value	<u>27,653</u>					
Indicated Fair Market Value of Total Unit	<u>37,000</u>					

**Illustrative example:
Yield capitalization
method (without alpha)**

Summary of Illustrative Examples

TAXPAYER COMPANY TOTAL UNIT VALUATION VALUATION SUMMARY AS OF DECEMBER 31, 2018	
Summary	Indicated Value \$MM
Income Approach—Direct Capitalization Method (with alpha)	21,500
Income Approach—Direct Capitalization Method (without alpha)	35,900
Income Approach—Yield Capitalization Method (with alpha)	23,000
Income Approach—Yield Capitalization Method (without alpha)	37,000
Market Approach—Sales Comparison Method	24,800
	<u>With alpha (Percent)</u>
Cost of Equity Estimate	16.2
Yield Capitalization Rate (rounded)	12.0
Direct Capitalization Rate (rounded)	10.0
	<u>Without alpha (Percent)</u>
Cost of Equity Estimate	9.8
Yield Capitalization Rate (rounded)	8.0
Direct Capitalization Rate (rounded)	6.0

Issues related to the measurement/application of the SRP

- The historical SRP is no longer valid.
- Circularity – the selection of the SRP impacts the value indication.
- SRP is not included in original CAPM.
- Investors can diversify away any SRP.

Issues related to the measurement/application of the CSRP

- Measurement of the CSRP is principally judgment-based.
- There is no database to objectively measure CSRP.
- Company-specific risk may already be included in the taxpayer unit financial projections.
- CSRP is not included in original CAPM.
- Investors can diversify away any CSRP.

Thought leadership summary and conclusion

- Important to define the unit of taxpayer property subject to valuation.
- When an alpha measurement is applicable.
- Why an alpha measurement is applicable.
- Alpha measurements impact all of the generally accepted unit valuation approaches.
- Summary of the SRP and CSRP measurement methods and data sources.
- Objective of the alpha measurement is to produce a credible and supportable unit principle valuation.

Questions and Discussion