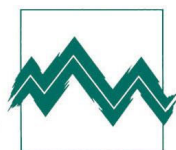


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Valuation Methodology Pitfalls,
Valuation Due Diligence Best Practices,
and
Estate of Aaron U. Jones v. Commissioner



Willamette Management Associates

Portland, Oregon

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Introduction

- Willamette Management Associates was founded in Portland, Oregon in 1969 by a group of five security analysts and finance professors. We opened our Chicago office in 1991. We opened our Atlanta office in 1995. We serve our clients from these three regional offices. This year is our 50th anniversary year.
- Willamette Management Associates is a national business valuation, forensic analysis, and financial advisory services firm. Our staff is comprised of approximately 50 valuation analysts.
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Introduction

- Generally Accepted Business Valuation Approaches and Methods
- Common Errors in the Generally Accepted Business Valuation Approaches and Methods
- Market Approach: Guideline Publicly Traded Company Method
- Market Approach: Guideline Merged and Acquired Company Method
- Income Approach – Discounted Cash Flow Method
- Income Approach – Analysis of Historical Performance
- Income Approach – Analysis of Prospective Financial Performance
- Income Approach – Cost of Capital Considerations – Beta Example and Discussion
- *Estate of Aaron U. Jones v. Commissioner* (T.C. Memo. 2019-101)
- Application of *Estate of Jones v. Commissioner*
- Questions and Discussion



Generally Accepted Business Valuation Approaches and Methods

Valuation Methodology and Valuation Methodology Pitfalls



Generally Accepted-Valuation Approaches and Methods

General Approaches	Specific Methods	Appropriate for...
Market-Based	Guideline Publicly Traded Company Method Guideline Merged and Acquired Company Method	Operating companies
Income-Based	Discounted Cash Flow Method Direct Capitalization Method or Single Period Direct Capitalization Method Three-Stage Method or Hybrid Methods	Operating companies Intangible assets
Asset-Based	Asset Accumulation Method Capitalized Excess Earnings Method	Holding companies Asset-intensive businesses



Market Approach—GPTCM Strengths

- Guideline Publicly Traded Company Method (“GPTCM”)
 - Premise and strengths
 - Essentially a shortcut to discounting future economic income, but not as dependent on financial projections
 - It generally includes the value of all business operating assets
 - The value of a business interest is equal to what rational investors are willing to pay for other similarly situated, but publicly traded, business interests
 - Generally results in an indication of value on a marketable, noncontrolling ownership interest basis, but this is subject to debate
 - From a theoretical perspective, a publicly traded company board of directors has a duty to maximize shareholder value and, therefore, the price of a public security may indicate pricing at a highest and best use level of value—not including acquisition synergies
 - Market data is generally available for many different industries and at any valuation date—assuming a stock is actively traded
 - Excellent quantity and quality of data for each publicly traded company because of SEC filings
 - Most investors and judges are familiar with the method



Market Approach—GPTCM Valuation Pitfalls

- Common Errors
 - Inappropriate selection of guideline publicly traded companies (many companies are not “pure play” companies)
 - Companies are either too large or not similar enough
 - Inappropriate selection of valuation multiples
 - Inappropriate selection/application of discounts and/or premiums
 - Invested capital vs. equity basis
 - Most of the common errors are subject to analyst judgement
 - Stock price below \$1 or \$2 per share or low volume
 - Lack of analyst coverage, when appropriate
 - Dissimilar growth pattern and profitability to subject company
- Selection and application of valuation multiples
 - Overemphasis on historical performance
 - Overemphasis on current performance
 - Ignoring projected performance in certain circumstances
 - Sole reliance on mean or median multiples
- Selection of appropriate entity-level discounts and/or premiums
 - Notion that concluded value is always on a noncontrolling basis or always on a controlling basis



Market Approach—GPTCM Valuation Pitfalls

- Why size matters:
 - As a means of eliminating guideline companies, the issue of size-related comparability is an important consideration in selecting guideline companies. One of the main reasons is that smaller companies typically have more business and financial risk than larger companies.
 - James R. Hitchner, *Financial Valuation, Applications and Models*, 4th edition (Hoboken, NJ; Wiley, 2017), 309.
 - Small company risk characteristics include (1) potential competition issues (it is easier to enter the market and compete with small companies while larger companies have resources to mitigate competitive challenges); (2) economic issues and concern (larger companies can better cope with economic downturn than small companies); (3) limited access to capital (small companies can find it difficult to obtain funding while larger companies typically have more options for funding); (4) management depth concerns (large companies do not have key employee concerns in the same way that smaller companies do); (5) customer concentration and product concentration risk (small companies are typically not as diversified in product offerings and are often beholden to a small group of customers); and (6) liquidity concerns and lack of market coverage (small companies do not enjoy the same level of analyst coverage and small company stock is typically less liquid than larger companies).
 - Roger J. Grabowski, “The size effect—it is still relevant,” *Business Valuation Review*, Volume 35, Number 2, (2016): 63.



Market Approach—GPTCM Valuation Pitfalls

- Assuming a guideline publicly traded company is sufficiently similar to a subject business, in terms of business operations based on its business description, there are methods by which publicly traded guideline company multiples can be adjusted for differences in size and in growth.
- In general, adjusting guideline publicly traded company pricing multiples for size and growth is not commonly applied in valuation analysis. It is generally more common for an analyst to use professional judgement and consider the size-related differences in the selection and application of pricing multiples.
- There are methods for size-adjusting pricing multiples, for earnings-related multiples such as the following method.

$$\text{Adjusted Multiple} = \frac{1}{\left(\frac{1}{\text{Multiple}}\right)^{+(\varepsilon\theta)}}$$

– James R. Hitchner, *Financial Valuation, Applications and Models*, 4th edition (Hoboken, NJ: Wiley, 2017), 340.

- Based on relative size, if a subject company is classified as a Subdecile 10z security, the previously provided equation can be used to adjust pricing multiples derived from larger guideline companies.



Market Approach—GPTCM Valuation Pitfalls

- Assuming a guideline publicly-traded company has a market capitalization of \$1.98 billion, it is classified as a Decile 6 security.
- Based on published studies by Duff & Phelps, the arithmetic average return for a Decile 6 security is 14.81 percent.
- The average return of a Decile 6 security is 10.73 percent lower than the average return for a Subdecile 10z security of 25.54 percent.
- The percent of equity capital in the guideline company capital structure is 86.9 percent.
- Based on the previously provided formula, the adjustment to an earnings before interest, taxes, depreciation, and amortization (“EBITDA”) to market value of invested capital (“MVIC”) market pricing multiple of 8.2 times is as follows:

$$\text{Adjusted EBITDA to MVIC Pricing Multiple: } 4.6 = \frac{1}{\left(\frac{1}{8.2}\right) + (86.9\% \times 10.73\%)}$$



Market Approach—GPTCM Valuation Pitfalls

- Why growth matters:
 - One of the most important determinants of stock price is growth—expected growth, not historical growth. Given how important this factor is in determining value, it is sometimes desirable to make adjustments to guideline companies whose growth might differ from the subject's growth to use their pricing multiples on a more objective basis.
 - James R. Hitchner, *Financial Valuation, Applications and Models*, 4th edition (Hoboken, NJ: Wiley, 2017), 333.
 - Adjusted Multiple = $1 / ((1 / \text{Original Multiple}) + \text{Guideline Company Growth} - \text{Subject Company Growth})$
 - James R. Hitchner, *Financial Valuation, Applications and Models*, 4th edition (Hoboken, NJ: Wiley, 2017), 335.



Market Approach—GPTCM Valuation Pitfalls

Growth Adjustment Result

Company Name	Unadjusted Pricing Multiples				Growth Assumptions [a]					Growth-Adjusted Pricing Multiples [b]			
	MVIC/EBIT		MVIC/EBITDA		2018-2022 Growth Rate	2023-2027 Growth Rate	Long-Term Growth Rate	25-Year Growth Rate	Growth Difference (GPTC-Subject)	MVIC/EBIT		MVIC/EBITDA	
	Pricing Multiples		Pricing Multiples							Pricing Multiples		Pricing Multiples	
	Proj. Year 2	Proj. Year 1	Proj. Year 2	Proj. Year 1	Proj. Year 2	Proj. Year 1	Proj. Year 2	Proj. Year 1	Proj. Year 2	Proj. Year 1	Proj. Year 2	Proj. Year 1	
Agilent Technologies, Inc.	15.9	17.4	14.6	15.9	11.0%	5.5%	4.0%	5.7%	1.3%	13.18	14.18	12.23	13.15
Bio-Rad Laboratories, Inc.	23.7	29.6	18.0	20.8	0.0%	0.0%	0.0%	0.0%	0.0%	23.74	29.64	17.99	20.76
Bio-Techne Corporation	20.9	23.1	20.5	22.6	11.0%	5.5%	4.0%	5.7%	1.3%	16.38	17.76	16.14	17.46
Luminex Corporation	NM	NM	16.5	17.4	15.0%	0.0%	4.0%	5.3%	0.9%	NM	NM	NM	NM
PerkinElmer, Inc.	16.5	18.2	15.1	16.5	15.0%	7.5%	4.0%	6.8%	2.5%	11.74	12.58	11.01	11.75
QIAGEN N.V.	18.7	20.8	14.7	16.3	8.8%	4.4%	4.0%	5.0%	0.7%	16.65	18.29	13.42	14.72
Thermo Fisher Scientific Inc.	17.4	18.7	15.6	17.0	11.3%	5.7%	4.0%	5.8%	1.4%	14.00	14.85	12.84	13.72
Subject Company	NM	NM	NM	NM	5.6%	4.2%	4.0%	4.4%	0.0%	NM	NM	NM	NM
Median	18.0	19.8	15.6	17.0						15.2	16.3	13.1	14.2

[a] The 2018 through 2022 growth rates for the GPTCs are based on median five-year analyst consensus estimates of earnings-per-share growth provided by S&P Capital IQ. The 2023 through 2027 growth rates for the GPTCs are assumed to be 50 percent of the growth rate for the 2018 through 2022 growth period to reflect declining growth as the companies reach a long-term steady state (with the exception of Luminex, which has negative projected growth between 2018 and 2022). The selected long-term growth rates for the GPTCs are equal to the selected long-term growth rate for subject company. The 25-year growth rate is the implied 25-year CAGR calculated based on the indicated assumed growth rates for the indicated periods.

[b] Calculated based on the formula presented in *Financial Valuation Applications and Models*, pages 335 and 336: Adjusted Multiple = 1 / ((1 / Original Multiple) + Guideline Company Growth - Subject Company Growth)

Sources: As indicated above and Willamette Management Associates calculations.

- For this example, the median pricing multiples were adjusted by approximately 16 to 17 percent.



Market Approach—GMACM Valuation Pitfalls

- Guideline Merged and Acquired Company Method—(“GMACM”)
 - Premise
 - The value of the subject business interest is estimated by comparing the subject company to transactions in guideline companies that have been bought or sold during a reasonably recent period of time.
 - This may result in fair market value or investment value—synergistic value.
 - This generally results in an indication of value on a marketable, controlling ownership interest basis.
 - This may be difficult to apply properly and not include synergistic value.
 - Common errors
 - Inappropriate selection of guideline transactions
 - Inappropriate selection of valuation multiples
 - Inappropriate application of discounts and/or premiums



Market Approach—GMACM Valuation Pitfalls

- Common Errors
 - Selection of guideline transactions
 - Too large or too small
 - Too old
 - Guideline companies are not similar enough to the subject company
 - Not enough information disclosed about the transaction (i.e., stock vs. asset deal, assumed liabilities)
 - Not enough information about the historical and projected financial performance of the acquired guideline companies
 - Using the appropriate database
 - IBA Market Database – generally small companies
 - BizComps – generally small companies
 - DoneDeals from Thomson Reuters – generally small companies
 - Deal States (formerly Pratt’s Stats) – generally a mixture of large and small companies
 - S&P Capital IQ – generally a mixture of large and small companies
 - FactSet Mergers (formerly Mergerstat) – generally large companies
 - Thomson ONE (formerly SDC) – generally large companies



Market Approach—GMACM Valuation Pitfalls

- Common Errors (continued)
 - Selection of valuation multiples
 - Overemphasis on historical performance, if available
 - Overemphasis on current performance
 - Ignoring projected performance
 - Sole reliance on mean or median multiple
 - Selection of appropriate adjustments
 - Does the concluded value include a premium for control, a premium for expected post-merger synergies, or both?
 - Understanding how each database calculates its indicated multiples



Valuation Pitfalls—Selection of Timeline for Market Pricing Multiples

- The analyst determines whether projected, trailing 12-month, or historical financial performance is most relevant.
- The selection of the other (i.e., less relevant) valuation multiples should correlate with the growth pattern of the company.
- Do not assume that the market pricing multiple based on projected financial performance should always be lower than the market pricing multiple based on historical financial performance.



Valuation Pitfalls—Selection of Timeline for Market Pricing Multiples

- Pricing Multiples Based on Projected Financial Performance
 - Aligns the market's perception of current value with the market's perception of future financial performance
 - Most meaningful with consensus earning estimates
 - Often provides the most consistent pricing evidence among the selected guideline publicly traded companies
- Pricing Multiples Based on Trailing 12-Month Financial Performance
 - May be a suitable alternative if the guideline companies do not have public analyst coverage
- Pricing Multiples Based on Historical Average Financial Performance
 - Most useful with companies that are cyclical in nature



Income Approach—Valuation Pitfalls

- Premise and strengths
 - The value of a business is equal to the present value of the expected future economic income of the business
 - Theoretically the most pure valuation method because it is based on future expectations of the subject business or asset
 - Widely used in the financial markets for pricing and decision making
 - Commonly accepted by the courts
 - May result in an indication of value on either a noncontrolling or a controlling ownership interest basis
- Common errors
 - Unreasonable or unsupported cash flow projections
 - Growth rates
 - Margins
 - Inappropriate present value discount rate
 - Incorrect terminal value estimation
 - Inappropriate application of valuation discounts and/or premiums



Income Approach – Valuation Pitfalls

- Common errors
 - Determination of net cash flow projection
 - Projections provided by company management
 - Projections developed by the valuation analyst
 - When to project invested capital net cash flow vs. equity net cash flow
 - Operating debt in the business—e.g., car dealer or lender
 - Determination of an appropriate present value discount rate
 - Levered cost of equity capital and unlevered cost of equity capital
 - Capital Asset Pricing Model (“CAPM”) or Modified CAPM (“MCAPM”)
 - Build-Up Rate Model
 - Duff & Phelps Risk Premium Report
 - Weighted average cost of capital (“WACC”)
 - Selection of the cost of debt
 - Selection of the appropriate capital structure
 - Determination of the terminal value or residual value
 - Treatment of depreciation expense and capital expenditures
 - Selection of the terminal growth rate
 - Selection of appropriate entity-level discounts and/or premiums
 - Was the cash flow adjusted for control-level adjustments?



Income Approach—Valuation Pitfalls, Failure to Engage in Adequate Fundamental Analysis and Normalization Adjustment Analysis

- Financial Review and Ratio Analysis
 - Trends in cash and other liquid assets
 - Trends in operating working capital vs. net working capital
 - Trends in fixed assets
 - Trends in leverage
 - Trends in revenue and expenses
 - Trends in dividends/distributions
 - Do not ignore the cash flow statement
- Normalization Adjustments
 - LIFO to FIFO conversion
 - Nonrecurring or extraordinary events
 - Discontinued operations
 - Above or below market officer/owner compensation and benefits
 - Financial impact of nonoperating assets
 - When to make control vs. noncontrol type adjustments



Valuation Due Diligence Best Practices

Certain Best Practices and a Few Considerations in the Application of
Generally Accepted Business Valuation Approaches and Methods



Valuation Due Diligence Best Practices: Analysts Must Use Skepticism

- Guidance provided by the Mandatory Performance Framework, a document that is primarily a fair value guide to best practices but provides meaningful best practice guidance that is relevant to fair market value analysis.
- Professional skepticism is an attitude that includes a questioning mind and critical assessment of valuation evidence.
 - The valuation professional uses the knowledge, skill, and ability called for by the valuation profession to diligently perform, in good faith and with integrity, the gathering and objective evaluation of evidence.
 - Every valuation professional must exercise professional skepticism during each engagement where the valuation professional is providing a conclusion of value that will be used to support management's assertions in financial statements issued for financial reporting purposes.



Valuation Due Diligence Best Practices: Evaluating Management Projections

- The valuation professional is responsible for evaluating whether the projected financial information (“PFI”) provided by management is properly supported.
- In circumstances in which the PFI is not properly supported, the valuation professional must determine the most appropriate way to align PFI with other valuation or market evidence.
- The valuation professional may elect to (note: not an all-inclusive list):
 - request management to revise its PFI,
 - adjust assumptions in PFI,
 - use either another present value method (for example, discount rate adjustment technique [“DRAT”], expected present value technique method 1 or 2 [“EPVT1”] or [“EPVT2”], respectively), or
 - use an entirely different approach from the income approach.



Valuation Due Diligence Best Practices: Evaluating Management Projections

- Since PFI represents future expectations, it is, by its very nature, imprecise. Therefore, the assumptions used in preparation of the PFI must be reasonable and supportable.
- In order to evaluate PFI for reasonableness, the valuation professional must use professional judgment to identify the most reliable objective information available.
- Valuation professionals should understand and document how the PFI was developed by management. Management may prepare PFI using a “top-down” method or a “bottom-up” method or some combination of the two.
- Evaluate the PFI provided by management for reasonableness. Procedures may include the following:
 - *Frequency of preparation.* If a designated group of management regularly prepares forecasts.
 - *Comparison of prior forecasts with actual results.*
 - *Mathematical and logic check.* It is important that valuation professionals test management’s PFI for accuracy.



Valuation Due Diligence Best Practices: Evaluating Management Projections

- *Comparison of entity PFI to historical trends.* The valuation professional should compare PFI to historical information and trends focusing on items such as revenue growth, decline, or variability; various levels of profitability; and levels of specific items (such as sales and marketing expense).
- *Comparison to industry expectations.* The valuation professional should complete an analysis of the PFI relative to the economy, industry, and other external data. This might include comparing key components of the entity's PFI to relevant industry data resources (for example, competitor disclosures, market or industry studies, analyst reports, government reports, or other sources).
- *Check for internal consistency.*



Valuation Due Diligence Best Practices: Recommended Documentation Procedures

- The valuation professional, at a minimum, must document the following in writing within the work file, if applicable:
 - The identification of the party or parties responsible for preparation of the PFI
 - The process used to develop the PFI from the perspective of market participants
 - The explanation of key underlying assumptions used in the PFI such as revenue forecasts, percentage of market share captured by the entity, or how the projected profit margins compare to those of other market participants
 - The steps used in, and results of, testing the PFI for reasonableness including, but not limited to:
 - a comparison of the PFI to expected cash flow,
 - a comparison of the PFI to historical performance,
 - a comparison and evaluation of prior year's PFI against actual historical results (when prior PFIs are available), and
 - an analysis of the forecast relative to economic and industry expectations.



Valuation Due Diligence Best Practices: Recommended Documentation Procedures

- An analysis of any evidence that contradicts management's assumptions or conclusions used in their PFI
- The rationale for any adjustments made to management's PFI
- Evidence that a mathematical and logic check was performed
- The components of the prospective balance sheet and cash flow statements, if available



Best Practices: Cost of Equity Example—MCAPM

Cost of Equity Capital:	
Modified Capital Asset Pricing Model:	
Risk-Free Rate of Return	2.31%
General Equity Risk Premium	5.97%
Multiplied by: Industry Beta (rounded)	<u>0.86</u>
Industry-Adjusted General Equity Risk Premium	5.16%
Size Equity Risk Premium	1.50%
Indicated Cost of Equity Capital	<u>8.97%</u>
Selected Cost of Equity Capital (rounded)	8.97%



Best Practices: Cost of Equity Example—Beta Explained

- Commercial beta sources may allow the user to choose different market indices to calculate beta. NYSE, S&P 500, Nasdaq, or other.
- Commercial beta sources may allow the user to use different time periods.
 - 60 months of data is the most commonly used.
 - Weekly or daily data can be used.
- Published and calculated betas for public stocks typically reflect the capital structure of each respective company at market value. These betas are referred to as levered betas.
- Levered betas incorporate two risk factors: (1) business (operating) risk and (2) financial (capital structure) risk.
- Unlevered betas (or asset betas) measure risk as if a company is financed with equity capital only.



Best Practices: Cost of Equity Example—Beta Lookback Period Analysis

Company	Relative Index	2-Year Daily	2-Year Daily						2-Year	2-Year	2-Year	3-Year	3-Year	3-Year	4-Year	4-Year	4-Year	5-Year	5-Year	5-Year	
			Raw Beta	R ²	Std. Error		P-Value	# of Observations	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg	Bloomberg
					of Beta	T-Test			Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta
Group 1:																					
Fidelity National Information Services, Inc.	NYSE:FIS	SPX	1.002	0.358	0.060	16.730	0.000	504	1.002	0.823	0.868	1.004	0.884	0.810	1.041	0.922	0.833	0.993	0.862	0.825	
Fiserv, Inc.	NasdaqGS:FISV	SPX	1.001	0.594	0.037	27.120	0.000	504	1.001	0.882	0.871	0.998	0.966	0.804	1.014	0.998	0.858	0.998	0.922	0.799	
Jack Henry & Associates, Inc.	NasdaqGS:JKHY	SPX	0.806	0.473	0.038	21.210	0.000	504	0.806	0.815	0.729	0.819	0.839	0.715	0.864	0.832	0.739	0.857	0.831	0.751	
Group 2:																					
Black Knight, Inc.	NYSE:BKI	SPX	0.760	0.152	0.080	9.474	0.000	504	0.760	0.683	0.888	0.703	0.695	0.739	0.731	0.695	0.739	0.731	0.695	0.739	
Broadridge Financial Solutions, Inc.	NYSE:BR	SPX	0.905	0.442	0.045	19.937	0.000	504	0.905	0.777	0.692	0.915	0.855	0.813	0.947	0.878	0.979	0.923	0.904	0.998	
Capita plc	LSE:CPI	UKX	0.843	0.126	0.099	8.506	0.000	506	0.843	0.406	0.381	0.846	0.465	0.481	0.840	0.529	0.760	0.811	0.549	0.744	
Computershare Limited	ASX:CPU	ASS1	0.913	0.268	0.067	13.590	0.000	506	0.913	0.865	1.181	0.885	0.835	1.110	0.910	0.888	1.028	0.894	0.942	0.879	
Conduent Incorporated	NYSE:CNDT	SPX	0.794	0.030	0.376	2.112	0.036	396	0.794	1.112	1.811	0.794	1.112	1.811	0.794	1.074	1.811	0.794	1.112	1.811	
ExlService Holdings, Inc.	NasdaqGS:EXLS	SPX	0.889	0.248	0.069	12.859	0.000	504	0.889	0.753	1.341	0.909	0.705	1.416	0.945	0.752	1.244	0.909	0.715	1.295	
Genpact Limited	NYSE:G	SPX	0.735	0.264	0.055	13.430	0.000	504	0.735	0.642	0.318	0.790	0.773	0.420	0.756	0.827	0.481	0.737	0.860	0.536	
Iron Mountain Incorporated	NYSE:IRM	SPX	0.878	0.261	0.066	13.300	0.000	504	0.878	0.797	0.541	0.892	0.890	0.557	0.870	0.959	0.830	0.849	0.965	0.929	
Open Text Corporation	NasdaqGS:OTEX	SPX	0.898	0.200	0.080	11.211	0.000	504	0.898	0.877	0.319	0.816	0.771	0.376	0.717	0.654	0.390	0.764	0.753	0.496	
Wipro Limited	BSE:507685	SENSEX	0.565	0.166	0.057	9.894	0.000	498	0.565	0.582	0.489	0.555	0.688	0.703	0.492	0.421	0.332	0.498	0.442	0.367	
WNS (Holdings) Limited	NYSE:WNS	SPX	0.852	0.186	0.080	10.695	0.000	504	0.852	0.645	1.342	0.728	0.598	0.919	0.739	0.663	0.850	0.641	0.654	0.973	
Group 3:																					
Global Payments Inc.	NYSE:GPN	SPX	1.244	0.337	0.078	15.985	0.000	504	1.244	1.087	1.290	1.209	1.100	1.240	1.171	1.074	1.146	1.126	1.052	1.085	
MicroStrategy Incorporated	NasdaqGS:MSTR	SPX	1.203	0.236	0.097	12.447	0.000	504	1.203	1.317	NM	1.202	1.233	0.398	1.246	1.246	0.701	1.204	1.216	0.926	
LOW			0.565	0.030	0.037	2.112	0.000	396	0.565	0.406	0.318	0.555	0.465	0.376	0.492	0.421	0.332	0.498	0.442	0.367	
HIGH			1.244	0.594	0.376	27.120	0.036	506	1.244	1.317	1.811	1.209	1.233	1.811	1.246	1.246	1.811	1.204	1.216	1.811	
MEAN			0.893	0.271	0.086	13.656	0.002	497	0.893	0.816	0.871	0.879	0.838	0.832	0.880	0.838	0.858	0.858	0.842	0.885	
MEDIAN			0.884	0.254	0.068	13.079	0.000	504	0.884	0.806	0.868	0.865	0.837	0.771	0.867	0.855	0.832	0.853	0.861	0.852	
Standard Deviation			0.161						0.161	0.213	0.429	0.164	0.192	0.384	0.180	0.208	0.343	0.170	0.197	0.326	
Coefficient of Variation			0.180						0.180	0.261	0.492	0.186	0.229	0.461	0.204	0.248	0.400	0.198	0.234	0.369	



Best Practices: Cost of Equity Example—Relevering Beta

- If an analyst is valuing a controlling ownership interest in an entity, then it may be appropriate to use an industry-based capital structure as a proxy for the entity's capital structure.
- If the subject company is valued on a noncontrolling ownership interest basis, then it may be appropriate to use the actual capital structure (market using an iterative approach).
- The primary difference in the various formulas for unlevering and Relevering betas is generally the risk of realizing tax savings. These tax savings result from tax deductions from the interest expense of the debt component of the capital structure.
 - Hamada Formula
 - Miles-Ezzell Formula
 - Harris-Pringle Formula
 - Fernandez Formula



Best Practices: Cost of Equity Example—Notations for Relevering Betas

- Notation for Formulas for Unlevering and Relevering Equity Betas:
 - β_L = levered beta of equity capital, equity beta
 - β_u = unlevered beta, asset beta
 - t = effective tax rate
 - W_d = Weight of debt in the capital structure
 - W_e = Weight of equity in the capital structure
 - M_e = Market value of equity capital
 - M_d = Market value of debt capital
 - β_d = Beta of debt
 - $k_{d(pt)}$ = Cost of debt prior to tax affect



Best Practices: Cost of Equity Example—Inputs to Unlever and Relever Beta

Company	Credit Rating	Estimated Debt Beta	Estimated					
			t	W _d	W _e	M _e	M _d	k _{d(pt)}
Group 1:								
Fidelity National Information Services, Inc.	Baa	0.22	19.7%	17.8%	82.2%	44,716,331	9,660,000	2.3%
Fiserv, Inc.	Baa	0.22	21.1%	16.5%	83.5%	71,644,107	14,157,000	3.4%
Jack Henry & Associates, Inc.	Baa	0.22	25.0%	0.3%	99.7%	10,785,350	35,000	0.0%
Group 2:								
Black Knight, Inc.	Ba	0.39	17.9%	20.9%	79.1%	6,447,641	1,705,500	3.7%
Broadridge Financial Solutions, Inc.	Baa	0.22	20.4%	7.4%	92.6%	14,763,577	1,174,400	3.6%
Capita plc	Baa	0.22	21.0%	44.2%	55.8%	1,930,728	1,526,600	2.8%
Computershare Limited	Baa	0.22	25.3%	18.8%	81.2%	8,600,421	1,988,030	3.8%
Conduent Incorporated	Ba	0.39	21.0%	52.1%	47.9%	1,914,695	2,085,000	4.1%
ExlService Holdings, Inc.	Baa	0.22	16.6%	13.2%	86.8%	2,350,889	357,017	6.3%
Genpact Limited	Baa	0.22	23.9%	17.9%	82.1%	7,551,510	1,646,593	3.5%
Iron Mountain Incorporated	Ba	0.39	11.2%	55.1%	44.9%	8,437,160	10,353,824	4.6%
Open Text Corporation	Ba	0.39	34.0%	18.6%	81.4%	11,468,653	2,616,283	5.3%
Wipro Limited	A	0.09	21.9%	7.0%	93.0%	1,598,425,166	120,840,000	4.8%
WNS (Holdings) Limited	Baa	0.22	19.6%	1.9%	98.1%	3,129,981	61,391	3.9%
Group 3:								
Global Payments Inc.	Ba	0.39	13.6%	19.1%	80.9%	26,309,387	6,211,699	4.1%
MicroStrategy Incorporated	Baa	0.22	12.7%	7.0%	93.0%	1,564,478	117,447	0.0%
LOW (all companies)		0.09	11.2%	0.3%	44.9%	1,564,478	35,000	0.0%
HIGH (all companies)		0.39	34.0%	55.1%	99.7%	1,598,425,166	120,840,000	6.3%
MEAN (all companies)		0.27	20.3%	19.9%	80.1%	113,752,505	10,908,487	3.5%
MEDIAN (all companies)		0.22	20.7%	17.8%	82.2%	8,518,790	1,846,765	3.7%



Best Practices: Cost of Equity Example—What Is Debt Beta?

- What Is a Debt Beta?
 - Public company debt beta – measures the risk of public company debt capital.
 - Measured in the same manner that public company equity beta is measured. This is done by regressing debt capital returns to stock market performance.
 - The beta/risk factor is a function of the amount of debt capital in the capital structure and the variability of income statement performance measures, such as EBITDA.
- The following two formulas are presented in *Financial Modeling, 2nd Edition*, Simon Benninga, page 414.
 - 1 A.
 - $\text{Implied Bond Beta} = (\text{Expected Return of the Bond} - \text{Return on Riskless Debt}) / \text{Market Risk Premium}$
 - 1 B.
 - Benninga-Sarig Tax-Adjusted SML
 - $\text{Implied Bond Beta} = (\text{Expected Return of the Bond} - \text{Return on Riskless Debt}) / (\text{Market Risk Premium} + \text{Return on Riskless Debt} * \text{Corporate Tax Rate})$



Best Practices: Cost of Equity Example—Debt Betas and Corporate Debt Yields

Moody's Rating	Debt Betas
Aaa	0.02
Aa	0.05
A	0.09
Baa	0.22
Ba	0.39
B	0.45
Ca	0.71

- Duff & Phelps, Cost of Capital Navigator, as of June 2019.

Corporate Debt Rates	Yield to Maturity
AAA	2.76
AA	2.66
A	2.93
BBB	3.53
BB	4.27
B	6.14
CCC or below	11.59

- Effective yield to maturity, *ICE BofAm US Corporate Debt*, as of July 31, 2019.



Best Practices: Cost of Equity Example—Cost of Debt Capital in the WACC

- Standard analysis of cost of debt capital, based on yield to maturity of a corporate bond index indication:

Cost of Debt Capital:	BBB	BB	B	CCC
Before-Tax Cost of Debt Capital	3.53%	4.27%	6.14%	11.59%
Income Tax Rate	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>
Selected Cost of Debt Capital (rounded)	<u><u>2.72%</u></u>	<u><u>3.29%</u></u>	<u><u>4.73%</u></u>	<u><u>8.92%</u></u>

- Newer theory in pricing debt capital, based on debt beta matched to a company that excludes expected default risk losses embedded in debt yields.

Cost of Debt Capital:	Baa	Ba	B	Ca
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Debt Beta	<u>0.22</u>	<u>0.39</u>	<u>0.45</u>	<u>0.71</u>
	1.31%	2.33%	2.69%	4.24%
Plus: Risk-Free Rate of Return	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>
Before-Tax Cost of Debt Capital	3.62%	4.64%	5.00%	6.55%
Income Tax Rate	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>
Selected Cost of Debt Capital (rounded)	<u><u>2.79%</u></u>	<u><u>3.57%</u></u>	<u><u>3.85%</u></u>	<u><u>5.04%</u></u>



Best Practices: Cost of Equity Example—Hamada Formulas

- Hamada Formulas:

- To Unlever Beta:

$$B_u = \frac{B_L}{1 + (1 - t)W_d / W_e}$$

- To Relever Beta:

$$B_L = B_u (1 + (1 - t)W_d / W_e)$$

- One of the most commonly cited formulas for unlevering and levering equity beta estimates.

- Hamada formulas are consistent with the theory that:

- the tax shield has the same risk as debt,

- debt capital has negligible risk that interest and principal payments will not be made (debt Beta of zero),

- it implies that tax deductions on interest expense will be realized in the period that interest is paid,

- value of tax shield is proportionate to market value of debt capital, and

- these formulas should not be used if the assumption is that debt will increase in proportion to equity increases.



Best Practices: Cost of Equity Example—Miles-Ezzell Formulas

- Miles-Ezzell Formulas:

- To Unlever Beta:

$$B_U = \frac{M_e \times B_L + M_d \times B_d [1 - (t \times k_{d(pt)}) / (1 + k_{d(pt)})]}{M_e + M_d [1 - (t \times k_{d(pt)}) / (1 + k_{d(pt)})]}$$

- To Relever Beta:

$$B_L = B_U + \frac{W_d}{W_e} (B_U - B_d) \left[1 - \frac{(t \times k_{d(pt)})}{(1 + k_{d(pt)})} \right]$$

- Alternative formulas assumes risk in the timely realization of the tax deductions for interest payments on debt capital (incorporation of debt beta).

- Miles-Ezzell formulas are consistent with the theory that:

- discount rate for tax shield = the cost of debt capital (same as Hamada) for the first year then to calculate the tax shield thereafter the discount rate equals the cost of equity (i.e., risk of tax shield is comparable to risk of operating cash flows),
 - tax deduction risk is greater than in the Hamada formulas,
 - considers interest payments and debt repayments may not be made when owed, and
 - assumes debt capital remains at a constant percentage of equity capital. Debt increases as equity increases.



Best Practices: Cost of Equity Example—Harris Pringle Formulas

- Harris-Pringle Formulas:

- To Unlever Beta:

$$B_U = \frac{B_L + B_d \frac{W_d}{W_e}}{\left(1 + \frac{W_d}{W_e}\right)}$$

- To Relever Beta:

$$B_L = B_U + (B_U - B_d) \times \left(\frac{W_d}{W_e}\right)$$

- Alternative formulas that assume greater risk of realizing tax shield.

- Harris-Pringle formulas are consistent with the theory that:

- the discount rate used to calculate the tax shield equals the cost of equity,
- debt capital bears the risk of variability of operating net cash flows, and
- market value of debt capital remains at a constant percentage of equity capital same as Miles Ezzell.



Best Practices: Cost of Equity Example—Fernandez Formulas

- Fernandez Formulas:

- To Unlever Beta:

$$B_u = \frac{B_L + \left(\frac{W_d}{W_e}\right) (1-t) B_d}{1 + \left(\frac{W_d}{W_e}\right) (1-t)}$$

- To Relever Beta:

$$B_L = B_U + \frac{W_d}{W_e} (1-t)(B_U - B_d)$$

- Alternative formulas used when the subject company is assumed to maintain a fixed book value leverage ratio.

- Fernandez formulas are consistent with the theory that:

- debt capital is proportionate to book value, and increases in assets are proportionate to increases in net cash flow, and
 - debt capital bears the risk of variability of operating net cash flow.



Best Practices: Cost of Equity Example—Levering and Unlevering Beta—2-Year Beta Lookback

Company	Daily Bloomberg Beta	Credit Rating	Estimated Debt Beta	Unlevered Betas									
				Hamada Unlevered	Harris-Pringle Unlevered	Miles-Ezzell Unlevered	Fernandez Unlevered						
Group 1:													
Fidelity National Information Services, Inc.	1.002	Baa	0.22	0.854	0.863	0.857	0.886						
Fiserv, Inc.	1.001	Baa	0.22	0.866	0.872	0.867	0.896						
Jack Henry & Associates, Inc.	0.806	Baa	0.22	0.804	0.804	0.804	0.805						
Group 2:													
Black Knight, Inc.	0.760	Ba	0.39	0.624	0.683	0.672	0.694						
Broadridge Financial Solutions, Inc.	0.905	Baa	0.22	0.851	0.855	0.852	0.864						
Capita plc	0.843	Baa	0.22	0.519	0.568	0.552	0.603						
Computershare Limited	0.913	Baa	0.22	0.779	0.783	0.776	0.811						
Conduent Incorporated	0.794	Ba	0.39	0.455	0.598	0.553	0.621						
ExlService Holdings, Inc.	0.889	Baa	0.22	0.789	0.801	0.799	0.814						
Genpact Limited	0.735	Baa	0.22	0.630	0.643	0.636	0.662						
Iron Mountain Incorporated	0.878	Ba	0.39	0.420	0.609	0.597	0.624						
Open Text Corporation	0.898	Ba	0.39	0.780	0.804	0.786	0.832						
Wipro Limited	0.565	A	0.09	0.533	0.532	0.531	0.539						
WNS (Holdings) Limited	0.852	Baa	0.22	0.839	0.840	0.839	0.842						
Group 3:													
Global Payments Inc.	1.244	Ba	0.39	1.033	1.081	1.075	1.099						
MicroStrategy Incorporated	1.203	Baa	0.22	1.129	1.134	1.132	1.143						
LOW (all companies)	0.565			0.420	0.532	0.531	0.539						
HIGH (all companies)	1.244			1.129	1.134	1.132	1.143						
MEAN (all companies)	0.893			0.744	0.779	0.771	0.796						
MEDIAN (all companies)	0.884			0.785	0.802	0.793	0.812						
MEDIAN (Group 1)	1.001			0.854	0.863	0.857	0.886						
MEDIAN (Group 2)	0.852			0.630	0.683	0.672	0.694						
MEDIAN (Group 3)	1.224			1.081	1.108	1.104	1.121						
	Selected Credit Rating	Estimated Debt Beta	Tax Rate	Capital Structure Debt Equity		Hamada Unlevered Relevered Beta Beta		Harris-Pringle Unlevered Relevered Beta Beta		Miles-Ezzell Unlevered Relevered Beta Beta		Fernandez Unlevered Relevered Beta Beta	
Actual Leverage, Based on an Iterative Process	Baa	0.22	23.0%	19.8%	80.2%	0.785	0.934	0.779	0.917	0.793	0.933	0.812	0.925
High Than Actual Leverage Example	Ba	0.39	23.0%	50.0%	50.0%	0.785	1.389	0.802	1.214	0.793	1.192	0.812	1.138



Best Practices: Cost of Equity Example—Levering and Unlevering Beta—5-Year Beta Lookback

Company	Daily Bloomberg Beta	Credit Rating	Estimated Debt Beta	Unlevered Betas									
				Hamada Unlevered	Harris-Pringle Unlevered	Miles-Ezzell Unlevered	Fernandez Unlevered						
Group 1:													
Fidelity National Information Services, Inc.	0.825	Baa	0.22	0.703	0.718	0.712	0.736						
Fiserv, Inc.	0.799	Baa	0.22	0.691	0.703	0.698	0.721						
Jack Henry & Associates, Inc.	0.751	Baa	0.22	0.749	0.749	0.749	0.750						
Group 2:													
Black Knight, Inc.	0.739	Ba	0.39	0.607	0.666	0.656	0.677						
Broadridge Financial Solutions, Inc.	0.998	Baa	0.22	0.938	0.941	0.938	0.952						
Capita plc	0.744	Baa	0.22	0.458	0.513	0.497	0.543						
Computershare Limited	0.879	Baa	0.22	0.750	0.756	0.748	0.782						
Conduent Incorporated	1.811	Ba	0.39	1.037	1.121	1.042	1.204						
ExlService Holdings, Inc.	1.295	Baa	0.22	1.150	1.153	1.152	1.174						
Genpact Limited	0.536	Baa	0.22	0.459	0.479	0.472	0.491						
Iron Mountain Incorporated	0.929	Ba	0.39	0.445	0.632	0.620	0.648						
Open Text Corporation	0.496	Ba	0.39	0.431	0.477	0.458	0.482						
Wipro Limited	0.367	A	0.09	0.347	0.348	0.347	0.352						
WNS (Holdings) Limited	0.973	Baa	0.22	0.957	0.958	0.958	0.961						
Group 3:													
Global Payments Inc.	1.085	Ba	0.39	0.901	0.952	0.946	0.967						
MicroStrategy Incorporated	0.926	Baa	0.22	0.869	0.876	0.874	0.882						
LOW (all companies)	0.367			0.347	0.348	0.347	0.352						
HIGH (all companies)	1.811			1.150	1.153	1.152	1.204						
MEAN (all companies)	0.885			0.718	0.753	0.742	0.770						
MEDIAN (all companies)	0.852			0.726	0.734	0.730	0.743						
MEDIAN (Group 1)	0.799			0.703	0.718	0.712	0.736						
MEDIAN (Group 2)	0.879			0.607	0.666	0.656	0.677						
MEDIAN (Group 3)	1.005			0.885	0.914	0.910	0.925						
	Selected Credit Rating	Estimated Debt Beta	Tax Rate	Capital Structure		Hamada		Harris-Pringle		Miles-Ezzell		Fernandez	
				Debt	Equity	Unlevered Beta	Relevered Beta	Unlevered Beta	Relevered Beta	Unlevered Beta	Relevered Beta	Unlevered Beta	Relevered Beta
Actual Leverage, Based on an Iterative Process	Baa	0.22	23.0%	18.8%	81.2%	0.726	0.856	0.753	0.876	0.730	0.847	0.743	0.836
High Than Actual Leverage Example	Ba	0.39	23.0%	50.0%	50.0%	0.726	1.285	0.734	1.077	0.730	1.067	0.743	1.014



Best Practices: Cost of Equity Example—Iterative Based, 2-Year Lookback Period

Cost of Equity Capital:				
Modified Capital Asset Pricing Model:	Hamada	Harris-Pringle	Miles-Ezzell	Fernandez
Risk-Free Rate of Return	2.31%	2.31%	2.31%	2.31%
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Multiplied by: Industry Beta (rounded)	<u>0.93</u>	<u>0.92</u>	<u>0.93</u>	<u>0.92</u>
Industry-Adjusted General Equity Risk Premium	5.58%	5.48%	5.57%	5.52%
Size Equity Risk Premium	<u>1.50%</u>	<u>1.50%</u>	<u>1.50%</u>	<u>1.50%</u>
Indicated Cost of Equity Capital	<u>9.39%</u>	<u>9.29%</u>	<u>9.38%</u>	<u>9.33%</u>
Selected Cost of Equity Capital (rounded)	<u>9.39%</u>	<u>9.29%</u>	<u>9.38%</u>	<u>9.33%</u>
Cost of Debt Capital:				
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Debt Beta (Baa rating)	<u>0.22</u>	<u>0.22</u>	<u>0.22</u>	<u>0.22</u>
	1.31%	1.31%	1.31%	1.31%
Plus: Risk-Free Rate of Return	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>
Before-Tax Cost of Debt Capital	3.62%	3.62%	3.62%	3.62%
Income Tax Rate	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>
Selected Cost of Debt Capital (rounded)	<u>2.79%</u>	<u>2.79%</u>	<u>2.79%</u>	<u>2.79%</u>
Weighted Average Cost of Capital Calculation:				
Selected Cost of Equity Capital	9.39%	9.29%	9.38%	9.33%
Multiplied by: Equity/Invested Capital (rounded)	<u>80.20%</u>	<u>80.20%</u>	<u>80.20%</u>	<u>80.20%</u>
Equals: Weighted Cost of Equity Capital	7.53%	7.45%	7.52%	7.48%
Selected Cost of Debt Capital	2.79%	2.79%	2.79%	2.79%
Multiplied by: Debt/Invested Capital (rounded)	<u>19.80%</u>	<u>19.80%</u>	<u>19.80%</u>	<u>19.80%</u>
Equals: Weighted Cost of Debt Capital	0.55%	0.55%	0.55%	0.55%
Weighted Average Cost of Capital (rounded)	8.08%	8.00%	8.08%	8.04%



Best Practices: Cost of Equity Example—Higher Debt than Average Based, 2-Year Lookback Period

Cost of Equity Capital:				
Modified Capital Asset Pricing Model:	Hamada	Harris-Pringle	Miles-Ezzell	Fernandez
Risk-Free Rate of Return	2.31%	2.31%	2.31%	2.31%
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Multiplied by: Industry Beta (rounded)	<u>1.39</u>	<u>1.21</u>	<u>1.19</u>	<u>1.14</u>
Industry-Adjusted General Equity Risk Premium	8.29%	7.25%	7.11%	6.79%
Size Equity Risk Premium	1.50%	1.50%	1.50%	1.50%
Indicated Cost of Equity Capital	<u>12.10%</u>	<u>11.06%</u>	<u>10.92%</u>	<u>10.60%</u>
Selected Cost of Equity Capital (rounded)	<u>12.10%</u>	<u>11.06%</u>	<u>10.92%</u>	<u>10.60%</u>
Cost of Debt Capital:				
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Debt Beta (B rating)	<u>0.39</u>	<u>0.39</u>	<u>0.39</u>	<u>0.39</u>
	2.33%	2.33%	2.33%	2.33%
Plus: Risk-Free Rate of Return	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>
Before-Tax Cost of Debt Capital	4.27%	4.27%	4.27%	4.27%
Income Tax Rate	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>
Selected Cost of Debt Capital (rounded)	<u>3.29%</u>	<u>3.29%</u>	<u>3.29%</u>	<u>3.29%</u>
Weighted Average Cost of Capital Calculation:				
Selected Cost of Equity Capital	12.10%	11.06%	10.92%	10.60%
Multiplied by: Equity/Invested Capital (rounded)	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>
Equals: Weighted Cost of Equity Capital	6.05%	5.53%	5.46%	5.30%
Selected Cost of Debt Capital	3.29%	3.29%	3.29%	3.29%
Multiplied by: Debt/Invested Capital (rounded)	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>
Equals: Weighted Cost of Debt Capital	1.65%	1.65%	1.65%	1.65%
Weighted Average Cost of Capital (rounded)	7.70%	7.18%	7.11%	6.95%



Best Practices: Cost of Equity Example—Iterative Based, 5-Year Lookback Period

Modified Capital Asset Pricing Model:	Hamada	Harris-Pringle	Miles-Ezzell	Fernandez
Risk-Free Rate of Return	2.31%	2.31%	2.31%	2.31%
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Multiplied by: Industry Beta (rounded)	<u>0.86</u>	<u>0.88</u>	<u>0.85</u>	<u>0.84</u>
Industry-Adjusted General Equity Risk Premium	5.11%	5.23%	5.06%	4.99%
Size Equity Risk Premium	<u>1.50%</u>	<u>1.50%</u>	<u>1.50%</u>	<u>1.50%</u>
Indicated Cost of Equity Capital	<u><u>8.92%</u></u>	<u><u>9.04%</u></u>	<u><u>8.87%</u></u>	<u><u>8.80%</u></u>
Selected Cost of Equity Capital (rounded)	<u><u>8.92%</u></u>	<u><u>9.04%</u></u>	<u><u>8.87%</u></u>	<u><u>8.80%</u></u>
Cost of Debt Capital:				
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Debt Beta (Baa rating)	<u>0.22</u>	<u>0.22</u>	<u>0.22</u>	<u>0.22</u>
	1.31%	1.31%	1.31%	1.31%
Plus: Risk-Free Rate of Return	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>
Before-Tax Cost of Debt Capital	3.62%	3.62%	3.62%	3.62%
Income Tax Rate	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>
Selected Cost of Debt Capital (rounded)	<u><u>2.79%</u></u>	<u><u>2.79%</u></u>	<u><u>2.79%</u></u>	<u><u>2.79%</u></u>
Weighted Average Cost of Capital Calculation:				
Selected Cost of Equity Capital	8.92%	9.04%	8.87%	8.80%
Multiplied by: Equity/Invested Capital (rounded)	<u>81.20%</u>	<u>81.20%</u>	<u>81.20%</u>	<u>81.20%</u>
Equals: Weighted Cost of Equity Capital	7.24%	7.34%	7.20%	7.15%
Selected Cost of Debt Capital	2.79%	2.79%	2.79%	2.79%
Multiplied by: Debt/Invested Capital (rounded)	<u>18.80%</u>	<u>18.80%</u>	<u>18.80%</u>	<u>18.80%</u>
Equals: Weighted Cost of Debt Capital	0.52%	0.52%	0.52%	0.52%
Weighted Average Cost of Capital (rounded)	7.77%	7.87%	7.73%	7.67%



Best Practices: Cost of Equity Example—Higher Debt than Average Based, 5-Year Lookback Period

Cost of Equity Capital:				
Modified Capital Asset Pricing Model:	Hamada	Harris-Pringle	Miles-Ezzell	Fernandez
Risk-Free Rate of Return	2.31%	2.31%	2.31%	2.31%
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Multiplied by: Industry Beta (rounded)	<u>1.29</u>	<u>1.08</u>	<u>1.07</u>	<u>1.01</u>
Industry-Adjusted General Equity Risk Premium	7.67%	6.43%	6.37%	6.06%
Size Equity Risk Premium	<u>1.50%</u>	<u>1.50%</u>	<u>1.50%</u>	<u>1.50%</u>
Indicated Cost of Equity Capital	<u>11.48%</u>	<u>10.24%</u>	<u>10.18%</u>	<u>9.87%</u>
Selected Cost of Equity Capital (rounded)	<u>11.48%</u>	<u>10.24%</u>	<u>10.18%</u>	<u>9.87%</u>
Cost of Debt Capital:				
General Equity Risk Premium	5.97%	5.97%	5.97%	5.97%
Debt Beta (Ba rating)	<u>0.39</u>	<u>0.39</u>	<u>0.39</u>	<u>0.39</u>
	2.33%	2.33%	2.33%	2.33%
Plus: Risk-Free Rate of Return	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>	<u>2.31%</u>
Before-Tax Cost of Debt Capital	4.27%	4.27%	4.27%	4.27%
Income Tax Rate	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>	<u>23.0%</u>
Selected Cost of Debt Capital (rounded)	<u>3.29%</u>	<u>3.29%</u>	<u>3.29%</u>	<u>3.29%</u>
Weighted Average Cost of Capital Calculation:				
Selected Cost of Equity Capital	11.48%	10.24%	10.18%	9.87%
Multiplied by: Equity/Invested Capital (rounded)	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>
Equals: Weighted Cost of Equity Capital	5.74%	5.12%	5.09%	4.94%
Selected Cost of Debt Capital	3.29%	3.29%	3.29%	3.29%
Multiplied by: Debt/Invested Capital (rounded)	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>	<u>50.00%</u>
Equals: Weighted Cost of Debt Capital	1.65%	1.65%	1.65%	1.65%
Weighted Average Cost of Capital (rounded)	7.39%	6.77%	6.74%	6.58%



Best Practices: Cost of Equity Example—DCF, Hamada Formula, 2-Year Beta Lookback

	YTD	Projected	5 Mos.	Projected Fiscal Years Ending December 31,						Normalized
	7/31/2019	FYE 12/31/2019	Ending 12/31/2019	2020	2021	2022	2023	2024	2025	2025
Present Value of Discrete Period Net Cash Flow to Invested Capital:	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Revenue	250,000	920,000	670,000	975,000	1,100,000	1,125,000	1,160,000	1,200,000	1,235,000	
Adjusted EBITDA	81,137	267,720	186,583	283,725	320,100	327,375	337,560	349,200	359,385	359,385
<i>Growth</i>				6.0%	12.8%	2.3%	3.1%	3.4%	2.9%	
Depreciation and Amortization Expense	33,311	133,244	99,933	127,432	115,394	113,966	119,186	107,582	114,812	56,338
Normalized Adjusted EBIT	47,826	134,476	86,650	156,293	204,706	213,409	218,374	241,618	244,573	303,047
<i>Growth</i>				16.2%	31.0%	4.3%	2.3%	10.6%	1.2%	
Income Tax Rate	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%
Tax-Affected EBIT	36,826	103,546	66,720	120,346	157,624	164,325	168,148	186,046	188,322	233,347
Noncash Charges (i.e., depreciation and amortization expense)	33,311	133,244	99,933	127,432	115,394	113,966	119,186	107,582	114,812	56,338
Capital Expenditures	(8,562)	(43,240)	(34,678)	(45,825)	(51,700)	(52,875)	(54,520)	(54,396)	(53,975)	(75,670)
Additions to Net Working Capital	(425)	(6,273)	(5,848)	(6,408)	(6,971)	(5,909)	(6,105)	(6,328)	(6,525)	(3,909)
Net Cash Flow to Invested Capital	61,150	187,278	126,127	195,544	214,347	219,507	226,710	232,904	242,633	210,105
Months from Valuation Date to the Initial Projected Year End			5.0							
Discounting Periods			0.2083	0.9167	1.9167	2.9167	3.9167	4.9167	5.9167	
Present Value Factor @ 8.0 Percent			0.9840	0.9316	0.8622	0.7981	0.7387	0.6837	0.6328	
Present Value Interim Net Cash Flow to Invested Capital			124,112	182,163	184,819	175,184	167,467	159,240	153,547	
Present Value of Discrete Net Cash Flow (rounded)			\$ 1,146,532							
Present Value of Terminal Period Cash Flow to Invested Capital:										
Fiscal 2026 Net Cash Flow to Invested Capital			\$ 216,408							
Direct Capitalization Rate			5.0%							
Terminal Value			4,302,346							
Present Value Factor @ 8.0 Percent			0.6328							
Present Value of Terminal Net Cash Flow Value			\$ 2,722,680							
Value Summary:										
Discrete Period Cash Flow Value (\$000)			1,146,532							
Terminal Period Cash Flow Value (\$000)			2,722,680							
Business Enterprise Value (rounded)			3,869,000							



Best Practices: Cost of Equity Example—Summary and Conclusion

Not too different on an iterative basis, however, more leverage and the difference is more pronounced.

Iterative-WACC	2-Year	5-Year	Difference
Hamada	8.03%	7.73%	0.30%
Harris-Pringle	7.95%	7.82%	0.13%
Miles-Ezzell	8.02%	7.68%	0.34%
Fernandez	7.96%	7.61%	0.35%
High/Low Difference	0.08%	0.21%	0.13%
<u>50-50 Assumption-WACC</u>			
Hamada	7.70%	7.39%	-0.31%
Harris-Pringle	7.18%	6.77%	-0.41%
Miles-Ezzell	7.11%	6.74%	-0.37%
Fernandez	6.95%	6.58%	-0.37%
High/Low Difference	0.75%	0.81%	0.06%

The Lookback provides some differentiation in value, and the Beta relevering models incorporating debt beta provide similar valuation indications as leverage increases.

Iterative	2-Year	5-Year	Difference
Hamada	3,869,000	4,101,000	232,000
Harris-Pringle	3,928,000	4,029,000	101,000
Miles-Ezzell	3,876,000	4,143,000	267,000
Fernandez	3,919,000	4,202,000	283,000
High/Low Difference	59,000	173,000	114,000
<u>50-50 Assumption</u>			
Hamada	4,126,000	4,400,000	274,000
Harris-Pringle	4,609,000	5,084,000	475,000
Miles-Ezzell	4,684,000	5,122,000	438,000
Fernandez	4,863,000	5,340,000	477,000
High/Low Difference	737,000	940,000	203,000



Estate of Jones v. Commissioner

- Recent U.S. Tax Court Decision Demonstrating Willamette Management Associates Ability to Defend our Analysis



Estate of Jones v. Commissioner

- In the matter of *Estate of Aaron U. Jones v. Commissioner* (T.C. Memo. 2019-101), the U.S. Tax Court adopted in full the value conclusion of the Willamette Management Associates report.
- In 2009, Aaron Jones gifted ownership interests in two companies: (1) Seneca Jones Timber Company (“SJTC”), a limited partnership that owned and harvested timberland, and (2) Seneca Sawmill Company (“SSC”), an S corporation that operated sawmills.
- In 2013, the IRS issued a notice of deficiency in gift tax of approximately \$45 million. The Estate brought this matter to the U.S. Tax Court.



Estate of Jones v. Commissioner

- The Tax Court accepted the Willamette method of tax affecting the earnings for pass-through entities SSC and SJTC as more credible than the IRS position of a zero income tax assumption.
- Additionally, the Tax Court accepted the Willamette position that the income approach was more appropriate for valuing the limited partnership units of SJTC and did not accept the IRS expert's asset-based approach valuation analysis.
- The subject business interests consisted of noncontrolling ownership interests in a timber company operation located in Eugene, Oregon.



Estate of Jones v. Commissioner

- The differences in value indications of the four primary security interests in this taxation dispute included the following:

	Form 709 2009 Tax Year	IRS Notice of Deficiency	Willamette Report	Respondent Expert	Jones Tax Court Decision
SSC Class A	\$ 325	\$ 1,395	\$ 390	\$ 1,395	\$ 390
SSC Class B	\$ 315	\$ 1,325	\$ 380	\$ 1,325	\$ 380
SSC Class B	\$ 315	\$ 1,325	\$ 380	\$ 1,325	\$ 380
SJTC Limited Partnership	\$ 350	\$ 2,511	\$ 380	\$ 2,530	\$ 380

- The Court cited the decisions in *Gross v. Commissioner*, the *Estate of Gallagher v. Commissioner*, and the *Estate of Giustina v. Commissioner* in its decision that “[Willamette] has more accurately taken into account the tax consequences of SJTC’s flow-through status for purposes of estimating what a willing buyer and willing seller might conclude regarding its value.”



Estate of Jones v. Commissioner

- Although in *Gross*, *Gallagher*, and *Giustina* the court concluded not to tax-affect the S corporation earnings, primarily due to the lack of justification for tax-affecting, the Court in *Jones* found the Willamette report to be more convincing than applying the respondent's zero income tax rate.



Benefits of Owning a Pass-Through Entity

- There are several benefits of pass-through entity ownership. According to Business Valuation and Federal Taxes: Procedure, Law and Perspective, a few of the major benefits of owning a pass-through ownership interest include the following:
 - Income is subject to only one level of taxation at the individual shareholder level, with no double taxation. C corporations can accumulate earnings, paying income tax only at the corporate level, and undistributed earnings are not subject to shareholder-level taxation.
 - Owners of the pass-through entity receive an increase in the basis of the shares to the extent that taxable income exceeds distributions to shareholders. In other words, income retained by the S corporation adds to the tax basis of the shareholder stock, reducing the shareholder's capital gain upon sale. This requires some analysis of the investment horizon of buyers.



Benefits of Owning a Pass-Through Entity-continued

- A buyer may pay more for the increased tax savings available to S corporations if he can receive a step-up in basis. For example, the sale of the entire business may be treated as an asset sale under [Internal Revenue Code] section 338, which increases the buyer's basis.
- The buyer of C corporation stock generally realizes future depreciation and amortization based on the tax basis of the underlying assets. However, all else being equal, the buyer will be willing to pay more for an S corporation business in which assets receive a step-up in basis, because the buyer's effective future income taxes will be reduced.



Benefits of Owning a Pass-Through Entity-continued

- There are many theoretical models and methods that can be used to quantify a pass-through entity benefit.
- A study conducted by Merle Erickson and Shiing-wu Wang titled “The effect of organizational form on acquisition price,” indicates that S corporations do recognize taxation value benefit in an acquisition. The study indicates that the “average tax benefits in S corporation acquisition are equal to approximately 12 percent to 17 percent of deal values.” (Merle Erickson and Shiing-wu Wang, “The effect of organizational form on acquisition price” (May 7, 2002), 4.)
- However, because the *Tax Cuts and Jobs Act of 2017* (“TCJA”) provides that personal income tax rates will revert back to pre-2018 levels after 2025, the taxation benefits of owning pass-through entity are not as beneficial as before the TCJA.



Benefits of Owning a Pass-Through Entity-continued

- One method that can be used to account for S corporation taxation benefits is the S corporation economic adjustment (“SEA”)
- Because of the TCJA, there is a two-step calculation involved in the application of the SEA method.
- The SEA is based on both the (1) income tax rate regime that existed as of the valuation date and (2) income tax rate regime that is expected to exist after 2025.



Benefits of Owning a Pass-Through Entity—S Corporation Tax Benefit Example—Post-TCJA

	Current Tax Rates	Estimated Tax Rates after 2025
C Corporation Effective Income Tax Rate (t_c)	23.0% [a]	23.0% [a]
Personal Capital Gains Tax Rate (t_{cg})	29.3% [b]	28.2% [e]
Personal Ordinary Income Tax Rate (t_i)	38.9% [c]	46.7% [f]
Personal Income Tax Rate on Dividends (t_d)	29.3% [b]	28.2% [e]
Dividend Payout Ratio (D_p)	0.0% [d]	0.0% [d]
Calculated S Corporation Equity Adjustment Multiple	1.12	1.00 [g]
Weight	27% [h]	73% [h]
Selected S Corporation Equity Adjustment Multiple	1.03	

$$SEAM = 1 + \frac{(t_c + t_{cg} - t_i - t_c t_{cg} + D_p t_d - D_p t_{cg} - D_p t_c t_d + D_p t_c t_{cg})}{(1 - t_c - t_{cg} + t_c t_{cg} - D_p t_d + D_p t_{cg} + D_p t_c t_d - D_p t_c t_{cg})}$$

$$1 + \frac{(0.230 + 0.293 - 0.389 - (0.230 \times 0.293) + (0.000 \times 0.293) - (0.000 \times 0.293) - (0.000 \times 0.230 \times 0.293) + (0.000 \times 0.230 \times 0.293))}{(1 - 0.230 - 0.293 + (0.230 \times 0.293) - (0.000 \times 0.293) + (0.000 \times 0.293) + (0.000 \times 0.230 \times 0.293) - (0.000 \times 0.230 \times 0.293))}$$

Definitions are presented in Schedule A.

[a] Based on a federal rate of 21.0 percent and a state rate of 2.5 percent.

[b] Based on a federal rate of 20.0 percent, a state rate of 5.5 percent, and a Medicare and other tax of 3.8 percent.

[c] Based on a federal rate of 37.0 percent, a state rate of 5.5 percent, and a Medicare and other tax of 3.8 percent. Also considers a deduction of 20.0 percent of qualified business income.

[d] Dividend payout is set to 0 percent. The dividend payout ratio does not affect the SEAM because the tax rates on dividends and capital gains are the same.

[e] Based on a federal rate of 20.0 percent, a state rate of 5.5 percent, and a Medicare and other tax of 3.8 percent.

[f] Based on a federal rate of 39.6 percent, a state rate of 5.5 percent, and a Medicare and other tax of 3.8 percent.

[g] The calculated S corporation equity adjustment multiple concluded a discount after 2025. Assumes that, rather than accept an S corporation discount, the Company would convert to a C corporation after 2025.

[h] Weights consider the portion of the discounted cash flow indicated value that is earned prior to 2026 and after 2025.



Questions and Discussion

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