

# The Elephant in the Room: The Great Debate Around Appropriate Discount Rates in TP Analyses

National Association for Business Economics  
Transfer Pricing Roundtable

1 February 2011

# Panelists

- **Paul Clark**, Director and Certified Financial Analyst, Ceteris' valuation practice. Mr. Clark has advised businesses and business owners on mergers and acquisitions, recapitalizations, leveraged buyouts, ESOPs and corporate planning matters. Additionally, Mr. Clark has provided numerous business enterprise, equity and intangible asset valuations for financial reporting and tax compliance purposes.
- **John Wills**, Ph.D. economist and retired partner in Ernst & Young's San Jose, California office. John's practice was heavily oriented toward technology companies. He has worked with large numbers of companies in computer software and hardware, semiconductors, biotechnology, and pharmaceuticals; with particular focus on transactions in intellectual property and intangibles. He is especially experienced in the design and implementation of R&D cost sharing arrangements.
- **Russell Kwiat**, the Economist Manager at the IRS's Advance Pricing Agreement Program (APA). In his role, Mr. Kwiat oversees all economic analyses within APA, serves as the principal APA economist for many cost sharing cases, and participates in various regulation committees such as those focused on cost sharing and 367(d) issues.

**PAUL CLARK**

# What's the Appropriate Discount Rate?

In business valuation, most discount unlevered (debt-free) cash flows at the WACC.

– Cost of Equity is usually estimated using the modified CAPM:

$$K_e = R_f + \text{Beta} \times (R_m - R_f) + \text{Alpha}$$

- $R_f$ , Risk-Free Rate of Return: Rate of return on a virtually riskless asset (usually T-bond rate).
- Beta: A forward looking (non-measurable) estimate of the future volatility of a company's returns relative to the future volatility of returns on the overall market over the same period.
- $R_m$ , Market Return: Total required rate of return on the equity market as a whole (diversified, systematic risk only). The term  $(R_m - R_f)$  is known as the market or equity risk premium (ERP).
- Alpha, Non-systematic Risk: Alpha is the non-systematic risk(s) that is (are) inherent in a particular investment.

Note: The Cost of Equity estimated using CAPM is an after-tax return applicable to nominal, after-tax cash flows. An adjustment for expected inflation is required if you are analyzing cash flows that are stated in real dollars.

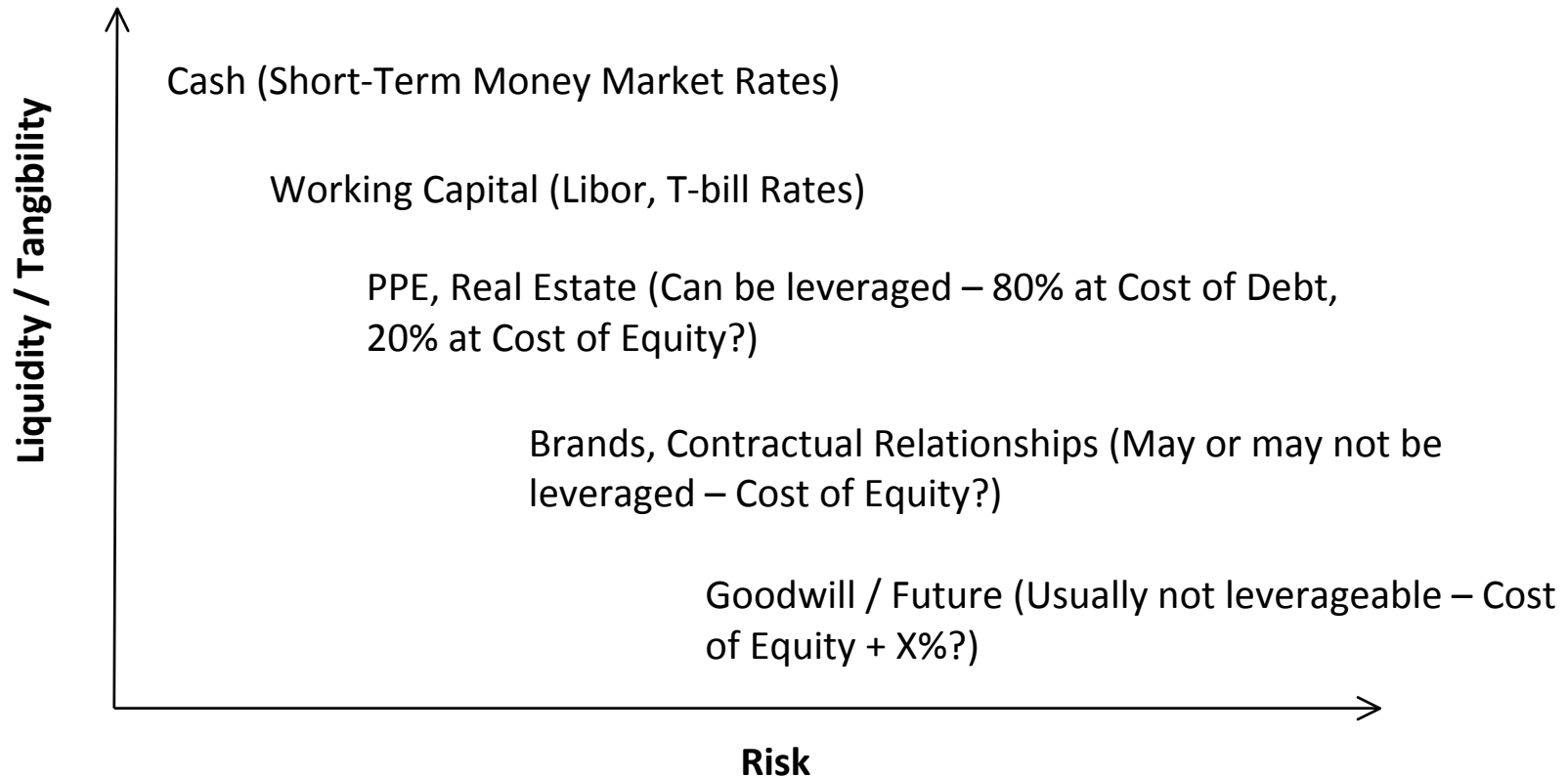
# Rates of Return for Intangible Assets

- For valuation of individual assets, the WACC may provide a starting point.
- Note, the value of a business can be considered as the earning power of the assets employed in the business, where such assets include both tangible and intangible assets.

Invested Capital																
Weighted Average Return on Assets (WARA)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Cash</td> <td rowspan="4" style="width: 50%; text-align: center; vertical-align: middle;">Debt</td> </tr> <tr> <td style="padding: 5px;">Net Receivables</td> </tr> <tr> <td style="padding: 5px;">Inventory</td> </tr> <tr> <td style="padding: 5px;">Net Current Assets</td> </tr> <tr> <td style="padding: 5px;">Vehicles</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">Equity</td> </tr> <tr> <td style="padding: 5px;">Equipment</td> </tr> <tr> <td style="padding: 5px;">Building &amp; Land</td> </tr> <tr> <td style="padding: 5px;">Fixed Assets</td> </tr> <tr> <td style="padding: 5px;">Trade Name (Brand)</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">Equity</td> </tr> <tr> <td style="padding: 5px;">Technology</td> </tr> <tr> <td style="padding: 5px;">Customers</td> </tr> <tr> <td style="padding: 5px;">Intangible Assets</td> </tr> </table>	Cash	Debt	Net Receivables	Inventory	Net Current Assets	Vehicles	Equity	Equipment	Building & Land	Fixed Assets	Trade Name (Brand)	Equity	Technology	Customers	Intangible Assets
Cash	Debt															
Net Receivables																
Inventory																
Net Current Assets																
Vehicles	Equity															
Equipment																
Building & Land																
Fixed Assets																
Trade Name (Brand)	Equity															
Technology																
Customers																
Intangible Assets																
	Weighted Average Cost of Capital (WACC)															

# Rates of Return for Intangible Assets

Tangible assets such as working capital and fixed assets tend to have required rates of return below a company's WACC. Therefore, intangible assets may require returns in excess of a company's WACC.



# Rates of Return for Intangible Assets (WARA = WACC)

<b>Asset</b>	<b>Fair Value</b>	<b>After-Tax Rate of Return</b>	<b>Source</b>
Working Capital	\$10,000	0.33%	1-Year US Treasury
Fixed Assets	50,000	9.56%	80% Cost of Debt, 20% Cost of Equity
Brands	5,000	15.00%	Cost of Equity
Contractual Relationships	7,500	15.00%	Cost of Equity
Goodwill	25,000	22.00%	Cost of Equity + Small Stock Premium
<b>TOTAL</b>	<b>\$97,500</b>	<b>12.5%</b>	<b>WARA</b>
		<b>12.5%</b>	<b>WACC</b>

# Cost of Capital for Divisions and Functions

- For multi division businesses, the cost of capital for the company may not be the appropriate cost of capital for each (any) division.
  - The multi division business is a portfolio of businesses, each potentially with a different cost of capital.
  - Reconciliation to the overall cost of capital may be difficult / impossible.
    - Example: Application of different small size premia to individual divisions
- Similarly, each function within a business may have a different risk profile.
- If the risk profile of a particular division/function is different from the firm as a whole, a separate analysis of the appropriate discount rate should be performed.
  - Identify “pure play” peer companies with business risk and growth profiles most comparable to the division/function.
  - Consider the subject company as a “peer” only if the division/function comprises a large percentage of total operations.

# Cash Flow vs. Operating Income

- Income approach valuation typically requires cash flow forecasts
  - Step 1 EBIT
  - Step 2 Deduct Taxes:  $EBIT \times (1 - \text{tax rate})$
  - Step 3 Add back non-cash charges: *Depreciation, amortization, changes in reserves, changes in deferred taxes*
  - Step 4 Deduct required reinvestment in business: *Capital expenditures, change in net working capital*
  - Step 5 Deduct change in other long-term assets,  
Add special tax provisions, investment tax credits
- Cash flow forecasts may be difficult to obtain from taxpayers for their non-US markets
- Operating income to IP under various methods can serve as a proxy for pre-tax cash flow
- Important to sense check this assumption to see if it is reasonable
  - Does cash flow grow at similar rates as operating income?
  - Can depreciation serve as a proxy for CAPEX?
  - Do working capital adjustments to the comparables help account for levels and changes in working capital over time?

# Recent Court Cases

- Recent Court Cases have focused on key elements of discount rates:
  - Global GT vs. Golden Telecom (2010) – Beta, ERP
    - Selected a Beta that gave 2/3 weight to the Bloomberg historic raw beta for the target company and 1/3 weight to the relevant industry beta.
    - Selected ERP of 6.0% based on the Ibbotson supply side estimate.
  - Veritas vs. Commissioner (2009) – Rf, Beta, ERP
    - Selected Rf based on the 30-day T-bill rate.
    - Selected Beta based on the subject company's historical estimate, based in part, because the specific company Beta had been stable over time.
    - The Court sided with petitioner's expert that relied upon the historical average risk premium as reported by Ibbotson (and referenced it as "the best available data").
- The rulings do not necessarily bind us, but these cases highlight the need for valuation practitioners and experts to have well reasoned support for their positions.

**JOHN WILLS**

# Some helpful sources

- Most corporate finance books address the subject. One good example is: Ross, Stephen A., Randolph A. Westerfield, and Jeffrey F. Jaffe, *Corporate Finance*, Homewood, IL., Irwin, various editions.
- A book from a valuation perspective that is strong on addressing practical problems practitioners face: Pratt, Shannon and Roger Grabowski, *Cost of Capital: Applications and Examples*, various editions [some had subtitle *Estimation and Applications*]
- An economic analysis that goes into more depth on the subject than general corporate finance texts: Bierman, Harold Jr. and Seymour Smidt, *The Capital Budgeting Decision: Economic Analysis of Investment Projects*, New York, MacMillan, 6<sup>th</sup> ed., 1984.
- An article that offers one practical method for measuring and making adjustments for risk in the discount rate in a transfer pricing context: Horst, Thomas, "Using Discount Rates to Adjust Transfer Prices Under Long Term Agreements for Differences in Risk," Tax Management Transfer Pricing Report 13 No. 878 (December 22, 2004).
- A government publication focusing on the special subject of discount rates for public projects, but also contains a good bibliography and discussion of basics: US General Accounting Office, Office of the Chief Economist, *Discount Rate Policy*, May 1991.

# There appears to be agreement on the following propositions:

1. For investments by public companies, the weighted average cost of capital where the cost of equity is measured by the CAPM (capital asset pricing model) [or one of its close cousins, Arbitrage Pricing Theory or the 3-factor formula] is the presumptively correct discount rate (assuming that the investment in question has a similar risk profile to the company as a whole).
2. If the investment in question has a very different risk or timing profile from the firm's core investments, then analysts should use the cost of capital *for the investment in question*, and not simply the firm's weighted average cost of capital.
3. In either case, the cost of capital (and hence discount rate) is based on an investment's expected *net cash flows*.

# But there are real questions, including (but not limited to) the following:

1. The CAPM (and its cousins) rely on the distinction between systematic and unsystematic risk, and imply that cost of capital depends only on systematic risk. How should we measure the riskiness of an investment opportunity, and can we really ignore unsystematic risk?
2. Can an investment opportunity be “unbundled” into its revenues and costs (or perhaps in other ways), and different discount rates applied to different elements of the bundle?
3. Should a different discount rate be applied to pre-tax cash flows vs. after-tax cash flows?
4. In the world of valuation, asset values are frequently adjusted for factors such as illiquidity or minority interest discounts. Should discount rates be similarly adjusted?
5. When using the CAPM approach to cost of capital, are the elements of cost of capital most accurately measured:
  - on a firm-specific basis
  - for an industry
  - for the economy as a whole?

These slides, and the opinions expressed on the panel, are the views of Russell Kwiat alone and do not necessarily represent the views of the Internal Revenue Service or its Office of Chief Counsel.

**RUSSELL KWIAT**

# Cost of Equity

- Capital Asset Pricing Model (CAPM)
  - Preference of 75% of finance professors<sup>1</sup>
- Fama-French
  - Preference of 10% of finance professors<sup>1</sup>
- Arbitrage Pricing Theory
  - Preference of 5% of finance professors<sup>1</sup>

<sup>1</sup> Welch, Ivo, “The Consensus Estimate for the Equity Premium by Academic Financial Economists in December 2007” (January 18, 2008). Available at SSRN: <http://ssrn.com/abstract=1084918>.

# Beta

Commercial Beta Sources					
Source: Ibbotson Associates					
	Market Proxy	Time Period	Frequency of Data	Adjustment Factors	Bristol Meyers Squibb
Bloomberg	Over 20 domestic series	Adjustable	Daily, weekly, monthly, annually	$(0.67 \times \text{unadjusted beta}) + (0.33 \times 1.0)$	0.62
Compustat	S&P 500	5 years	Monthly	None	0.5
Ibbotson	S&P 500	5 years	Monthly	Adjusted toward peer group beta weighted by statistical significance	0.5
Value Line	NYSE Composite Series	5 years	Weekly	$0.35 + 0.67 \times (\text{unadjusted beta})$	1.05

# Equity Risk Premium

- Value assigned to equity risk premium
  - Ibbotson / Morningstar
    - Historical
      - Arithmetic vs. geometric
      - Time frame
    - Supply side
    - Discounted cash flow model
  - Global CFO Outlook Survey
  - Investment analysts per “Investext” database
  - Ivo Welch Survey
  - Pablo Fernandez Survey

## Equity Risk Premium Values Assigned by Investment Analysts to U.S. Companies

Database: Investext PDF Index on Westlaw

Search Term: "Equity Risk Premium"

Date of Search: 5/30/07

Investment Company	Equity Risk Premium	Report in Which Equity Risk Premium Mentioned	
		Company / Industry	Date
A.G Edwards & Sons, Inc.	3.30%	MDU Resources	4/23/2007
HSBC	3.50%	Precious Metals	5/9/2007
Fox-Pitt, Kelton	4.00%	US Banks	5/22/2007
Stanford Group Company	4.00%	MetroPCS Communications, Inc.	5/16/2007
New Constructs	4.20%	Partners Trust Financial Group	5/19/2007
Cantor Fitzgerald	4.50%	Salesforce.com	5/17/2007
Jefferies & Company, Inc.	4.90%	Adobe Systems	5/22/2007
Credit Suisse	5.00%	Motorola	5/16/2007
Baird	5.00%	Mobile Mini	5/3/2007
Cowen and Company	5.00%	Texas Roadhouse	4/23/2007
SMH Capital	5.26%	Lamar Advertising	5/11/2007
Bear Stearns	5.40%	TiVo	5/16/2007
Ferris, Baker Watts	5.45%	Taleo	5/16/2007
Stifel Nicolaus	5.50%	Lamar Advertising	5/10/2007
William Blair & Company	5.50%	Salesforce.com	3/27/2007
Deutsche Bank Securities	6.00%	Sara Lee	5/10/2007
Prudential Equity Group	6.00%	Textron Inc.	5/22/2007
CIBC	6.50%	Wynn Resorts, Ltd.	5/8/2007
Deutsche Bank Securities	7.20%	McKesson	5/7/2007
Maximum	7.20%		
Upper Quartile	5.50%		
Median	5.00%		
Lower Quartile	4.20%		
Minimum	3.30%		
Observations	19		

# Size Adjustment to CAPM

- A survey of CFOs revealed that less than 28% of CFOs “always or almost always” adjust for size risk<sup>1</sup>
- Investment firms identified in APA analysis (19) did not include size premiums
- Maybe the size effects are simply chance results that stem from data snooping<sup>2</sup>
  - In the past 20 years, small-firm stocks and value stocks have underperformed just about as often as they overperformed
- Delisting bias

<sup>1</sup> John R. Graham and Campbell R. Harvey, “The Theory and Practice of Corporate Finance: Evidence from the Field”, *Journal of Financial Economics* 60 (2001) pp. 187-243.

<sup>2</sup> R. Brealey, S. Myers, and F. Allen, *Corporate Finance*, Eighth Edition, (McGraw-Hill/Irwin:, 2006), pp. 194-197.