

Thinking Outside the Box: Using the Market Approach to Develop a Cost of Capital



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Learning Objectives:

- The reference points
- Discount rate theory
- Problems with traditional factor models
- Total Beta theory
- Brief tutorial on the Calculator
 - Secondary Choices: Empowerment
- Impeach inferior cost of capital estimates
- The Choice

“Determination of the proper capitalization rate presents one of the most difficult problems in valuation” – RR 59-60

Let's Get Some Things Out of the Way First

- You can do all of these calculations yourself.
 - You do not need the BPC
- Total Beta and the BPC violate the CAPM!
 - So does every single privately-held company!
 - The size premium violates the CAPM.
 - The CSRP violates the CAPM.
 - Total Beta and the BPC do not, however, violate financial theory for individual assets.
- Total Beta assumes a completely undiversified investor (or pool of completely undiversified investors)
- Not asking you to abandon other cost of capital models, BUT:

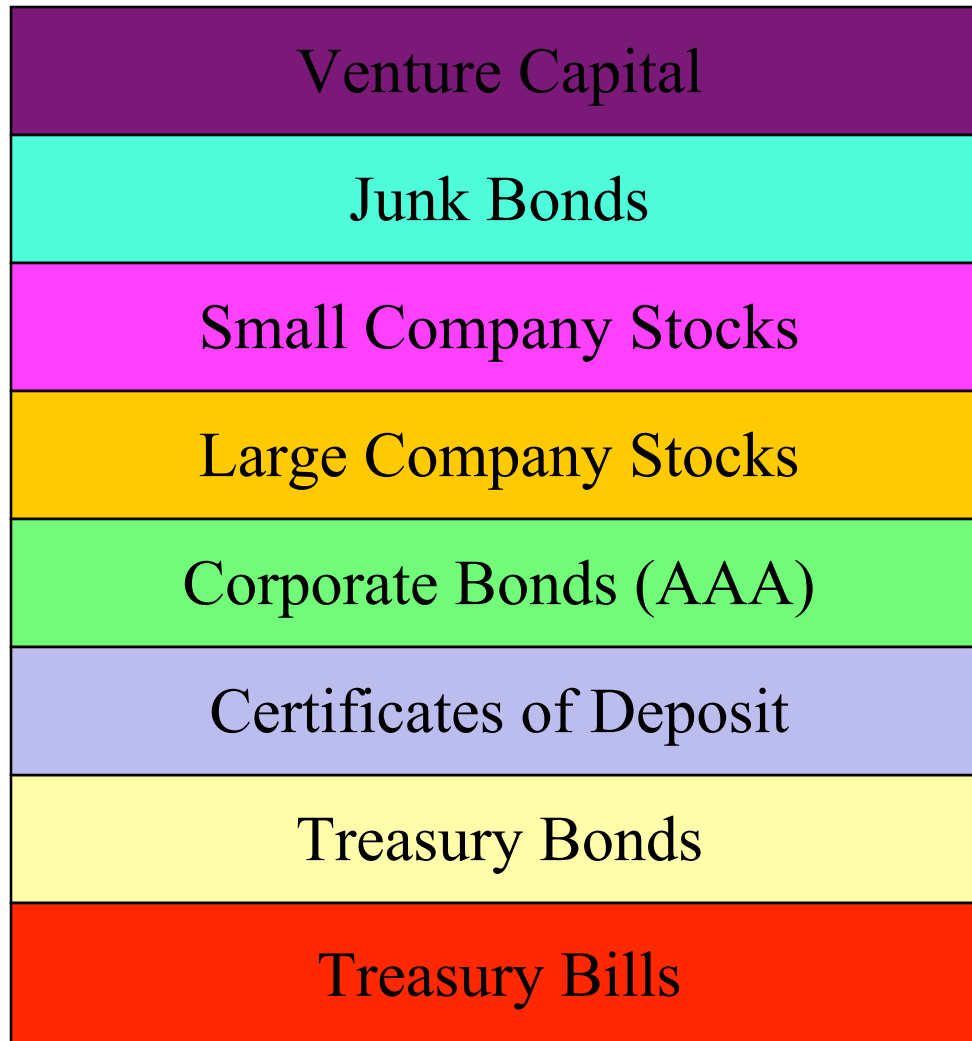
The BUM is Problematic

- Double counting size risk and industry risk?
 - Both based on actual returns compared to expected returns based on beta
- Size risk and CSR risk are next to impossible to separate
 - Is a company *risky* because it is *small* or is it *small* because it is *risky*?
 - Yes and Yes!
- Is there a liquidity premium in the size premium?
 - Highly likely
- Is there a liquidity premium in the industry risk premium?
 - Likely

The BUM is Problematic (continued)

- Industry risk premium may include questionable guidelines.
- How do you handle leverage in the build-up approach?
- How much different would the data look if another day of the month had been selected?
- After you get through the gauntlet above; You still have to completely guess at the CSRP!

What is the Theory?



Traditional Factor Models: Use at Own Peril!

Negative risk factors	+/-	Numeric	Listing
Operating history, volatility of rev & earn.	+++	3.5	X
Lack of management depth	++	1.0	X
Lack of access to capital resources	+	0.5	X
Over reliance on key persons	++	1.0	X
Lack of size and geographic diversification	+	0.5	X
Lack of customer diversification		0.0	
Lack of marketing resources	+	0.5	X
Lack of purchasing power		0.0	
Lack of product/market. dev. resources	+	0.5	X
Over reliance on vendors/suppliers		0.0	
Limitations on distribution system		0.0	
Limitations on fin. reporting/controls	+	0.5	X
Positive risk factors			
Long term contracts, unique product		0.0	
Patents, copyrights, franchise rights	=	(1.0)	X
Net increase to Cost of Equity	7.0	7.0	7.0

Where is the empirical data?

The Problem: What Do the Courts Want?

➤ Gesoff v. IIC Industries

- *“This court has also explained that we have been understandably . . . **suspicious of expert valuations** offered at trial that incorporate subjective measures of company-specific risk premia, **as subjective measures may easily be employed as a means to smuggle improper risk assumptions into the discount rate so as to affect dramatically the expert’s ultimate opinion on value.**”*

The Courts Want Empirical Data!

- Delaware Open MRI Radiology Associates v. Howard B. Kessler, et al
 - *“To judges, **the company specific risk premium often seems like the device experts employ to bring their final results into line with their clients’ objectives, when other valuation inputs fail to do the trick.**”*

Summary of Factor Models

- Excellent models to understand CSR
- But, they do not provide what the courts want:
 - Empirical data on **Total Risk** and/or **CSR**
 - *If you want to make enemies, try to change something.*

Woodrow Wilson, 28th President of the United States

Financial Theory

- $\beta = \sigma_{s,m} / \sigma_m^2$
- $\beta = \sigma_{s,m} / (\sigma_m * \sigma_m)$
- $\beta = (\sigma_{s,m} / \sigma_s * \sigma_m) * (\sigma_s / \sigma_m)$

Note: we have merely multiplied the right hand side of the equation by 1
or σ_s / σ_s

- $R = \sigma_{s,m} / (\sigma_s * \sigma_m)$
- $\beta = R * (\sigma_s / \sigma_m)$
- $\beta / R = \sigma_s / \sigma_m$
- **Total Beta = $T\beta = \beta / R = \sigma_s / \sigma_m$**



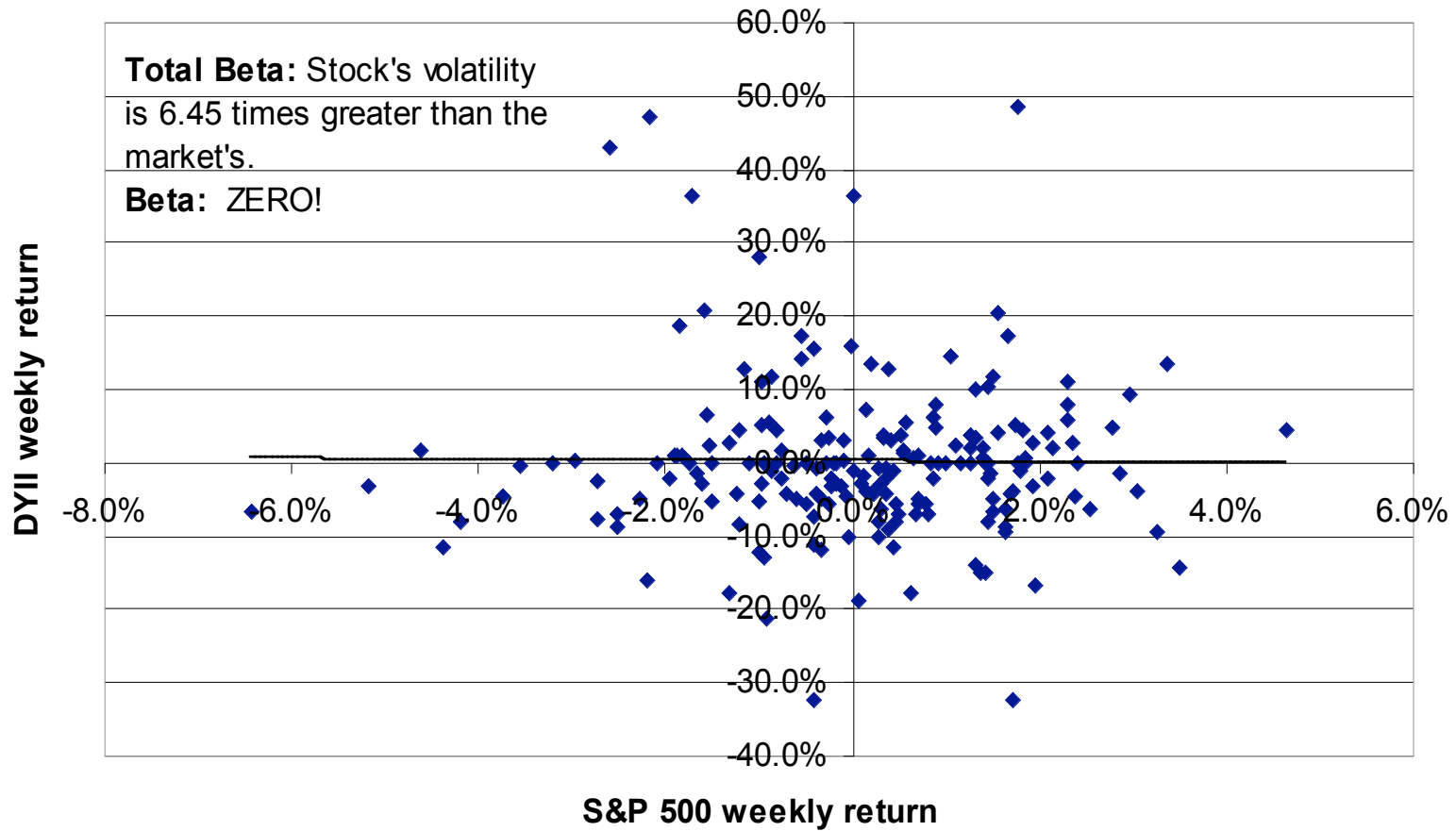
Total Beta

- $T\beta$ measures the total risk, or volatility, of an individual stock (σ_s) relative to the total risk, or volatility, of the market (σ_m)
- The total risk premium must include the risk-free rate, Beta*ERP, the size premium (SP) AND any CSR
- σ_s is the appropriate measure of total risk if it is the only stock in your portfolio
- σ_m is the appropriate measure of total risk if the S&P 500 index is the only security in your portfolio



Total Beta v. Beta in Pictures

DYII Scattergram (4/26/04 - 1/21/08)



Total Beta

- $T\beta$ **almost always** will be greater than 1.0
- $T\beta$ (total risk) **will always** be greater than β (systematic risk)
 - All data points, or observations, will never fall on the best-fit linear regression line
- $T\beta$ **trumps** all other betas
 - Captures 100% of disclosed risks
 - Same reference point we use for private companies (most of the time)
 - Much more stable than beta

The Solution: Total Beta and the BPC

Solving for the only unknown in the two equations, CSRP:

$$\begin{array}{c} \xrightarrow{\text{Damodaran}} \\ \text{TCOE} = R_f + T\beta * \text{ERP} = \underbrace{R_f + \beta * \text{ERP} + \text{SP}}_{\text{Modified CAPM}} + \text{CSRP} \\ \xrightarrow{\text{BPC}} \end{array}$$

Finance professors and many appraisers

Investment banks and HBS

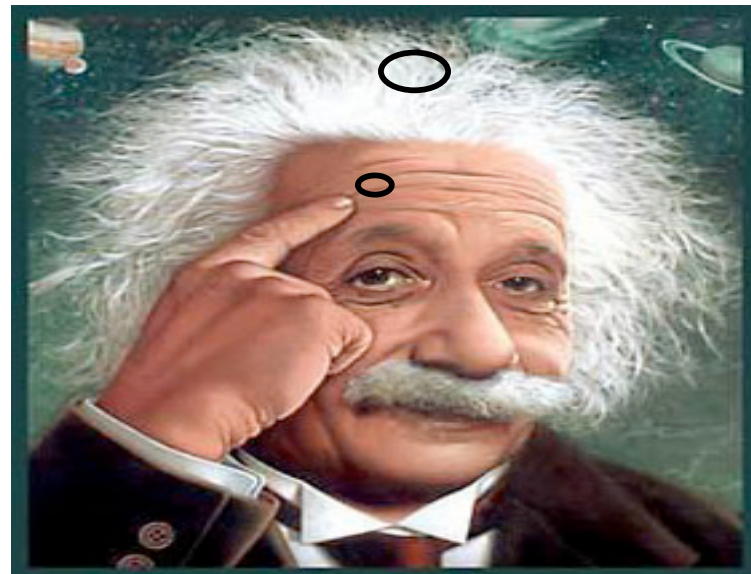
Risk Allocation:

- **Combined Size: CSRP = (Tβ−β)*ERP**
- **CSRP = (Tβ−β)*ERP − SP**

“Market approach twist to developing a discount rate.”

Choices: Empowerment

- Different ERPs
- Confidence/Statistical significance
- Day of the week
- Look-back period
- Market proxy



Total Cost of Equity and Public Company Specific Risk Calculator™

Calculate total cost of equity and public company-specific risk as benchmarks for private company valuations




Butler Pinkerton Calculator™

Enter parameter values below that describe the company-specific risk analysis you wish to perform. When finished, click "next" to specify comparable companies and enter their size premiums.

Risk Free Rate: (2.00% to 9.00%) [Help in selecting a Risk Free Rate.](#)

Equity Risk Premium: (3.00% to 10.00%) [Help in selecting an Equity Risk Premium.](#)

Effective Date:  (8/4/1999 to 8/4/2009) [Guidance on the importance of running the Calculator for each day of the week.](#)

Number of Weeks: (1 to 261)

Proxy for the Market:

- Dow Jones Industrial Average NASDAQ Composite Russell 3000
 Dow Jones Wilshire 5000 NYSE Composite S&P 500
 I will enter weekly closing values for the market proxy and comparable companies.

Total Cost of Equity and Public Company Specific Risk Calculator™

Calculate total cost of equity and public company-specific risk as benchmarks for private company valuations



Add up to 12 comparable companies and their size premiums below. For each company, after you enter its appropriate size premium, click "save". This will populate the look-back period with closing stock prices. To analyze another company, click "add comparable company". If manually providing values, first save the market proxy after entering or pasting a sufficient number of weekly closing values.

[← back](#) [next →](#)

Risk Free Rate:	4.50%
Equity Risk Premium:	6.00%
Effective Date:	8/4/2009 (261 weeks)

Search Tools:

- Find Comparable Companies by SIC code
- Find 10Ks of Comparable Companies
- Find Comparable Companies by Industry
- Find Comparable Company Ticker Symbols

[add comparable company →](#)

[remove](#)

Ticker	Proxy for the Market	DCAI
	S&P 500	Dialysis Corporation of America
Size Premium		0.00%
08/04/2009	1,005.65	5.75
07/28/2009	979.62	5.50
07/21/2009	954.58	5.20
07/14/2009	905.84	5.09
07/07/2009	881.03	5.13
06/30/2009	919.32	5.01
06/23/2009	895.10	4.99
06/16/2009	911.97	5.05
06/09/2009	942.43	5.60
06/02/2009	944.74	5.46
05/26/2009	910.33	4.65
05/19/2009	908.13	4.58
05/12/2009	908.35	4.83
05/05/2009	903.80	5.18
04/28/2009	855.16	5.01
04/21/2009	850.08	5.18
04/14/2009	841.50	5.01
04/07/2009	815.55	4.42
03/31/2009	797.87	5.11
03/24/2009	806.12	4.79
03/17/2009	778.12	5.12
03/10/2009	719.60	5.11
03/03/2009	696.33	5.06
02/24/2009	773.14	5.72
02/17/2009	789.17	5.65
02/10/2009	827.16	6.10
02/03/2009	838.51	6.85
01/27/2009	845.71	5.63
01/20/2009	805.22	5.95
01/13/2009	871.79	6.77
01/06/2009	934.70	6.59
12/30/2008	890.64	6.50
12/23/2008	863.16	6.05

Total Cost of Equity and Public Company Specific Risk Calculator™

Calculate total cost of equity and public company-specific risk as benchmarks for private company valuations



Butler Pinkerton Calculator™

Below are the results of your calculation. You may print a copy for your records, click "download" to save a Microsoft Excel-compatible version, or click "email" to send yourself an electronic copy of the calculation in both HTML and Microsoft Excel-compatible formats.

[← back](#) [new calculation](#) [download](#) [email](#)

Risk Free Rate:	4.50%
Equity Risk Premium:	6.00%
Effective Date:	8/4/2009 (261 weeks)

Ticker	DCAI
Company Name	Dialysis Corporation of America
Size Premium	0.00%
Weekly Standard Deviation	9.55%
Levered Beta	1.06
Correlation Coefficient (R)	0.28
Total Beta	3.81
Total Cost of Equity	27.37%
Company Specific Risk Premium	16.50%

Additional Regression Statistics:

Constant	0.005
Coefficient of Determination (R ²)	0.08
T-Stat	4.65
Level of Statistical Significance	99.0%
Degrees of Freedom	258

The Calculator is:

- 1) Empirical,
- 2) Transparent,
- 3) Real-time (or as close as possible),
- 4) The only database (that appraisers typically rely upon) that captures total risk, and
- 5) Empowering

Impeach Your Opponent's Cost of Capital: SIC Code 8742 (Management Consulting Services: Subset- **Litigation Consulting Services**)

- ACCESS WORLDWIDE CMMNCTNS
- ADVISORY BOARD CO
- AON CORP
- BEARINGPOINT INC
- BUTLER NATIONAL CORP
- CIRTRAN CORP
- COMFORCE CORP
- CORPORATE EXECUTIVE BRD CO
- CROSS COUNTRY HEALTHCARE INC
- DIAMOND MANAGEMENT & TECHN
- ELOYALTY CORP
- EMCOR GROUP INC
- EXPONENT INC
- **FTI CONSULTING INC**
- GARTNER INC
- HALLWOOD GROUP INC
- HEWITT ASSOCIATES INC
- **HURON CONSULTING GROUP INC**
- INVENTIV HEALTH INC
- **LECG CORP**
- MANAGEMENT NETWORK GROUP INC
- MAXIMUS INC
- **NAVIGANT CONSULTING INC**
- **OCEANIC EXPLORATION CO**
- PAREXEL INTERNATIONAL CORP
- PDI INC
- PHC INC/MA -CL A
- QUANTUM GROUP INC
- RAHAXI INC
- REHABCARE GROUP INC
- **SOUTHWEST CASINO CORP**
- SPHERIX INC
- SUNRISE SENIOR LIVING INC
- TALEO CORP
- TETRA TECH INC
- THOMAS GROUP INC
- TRI-ISTHMUS GROUP INC
- TURNAROUND PARTNERS INC
- **TYSON FOODS INC -CL A**
- UNITEDHEALTH GROUP INC
- VERSAR INC
- WATSON WYATT WORLDWIDE INC

BPC Screenshot: Valuation/Litigation Consulting

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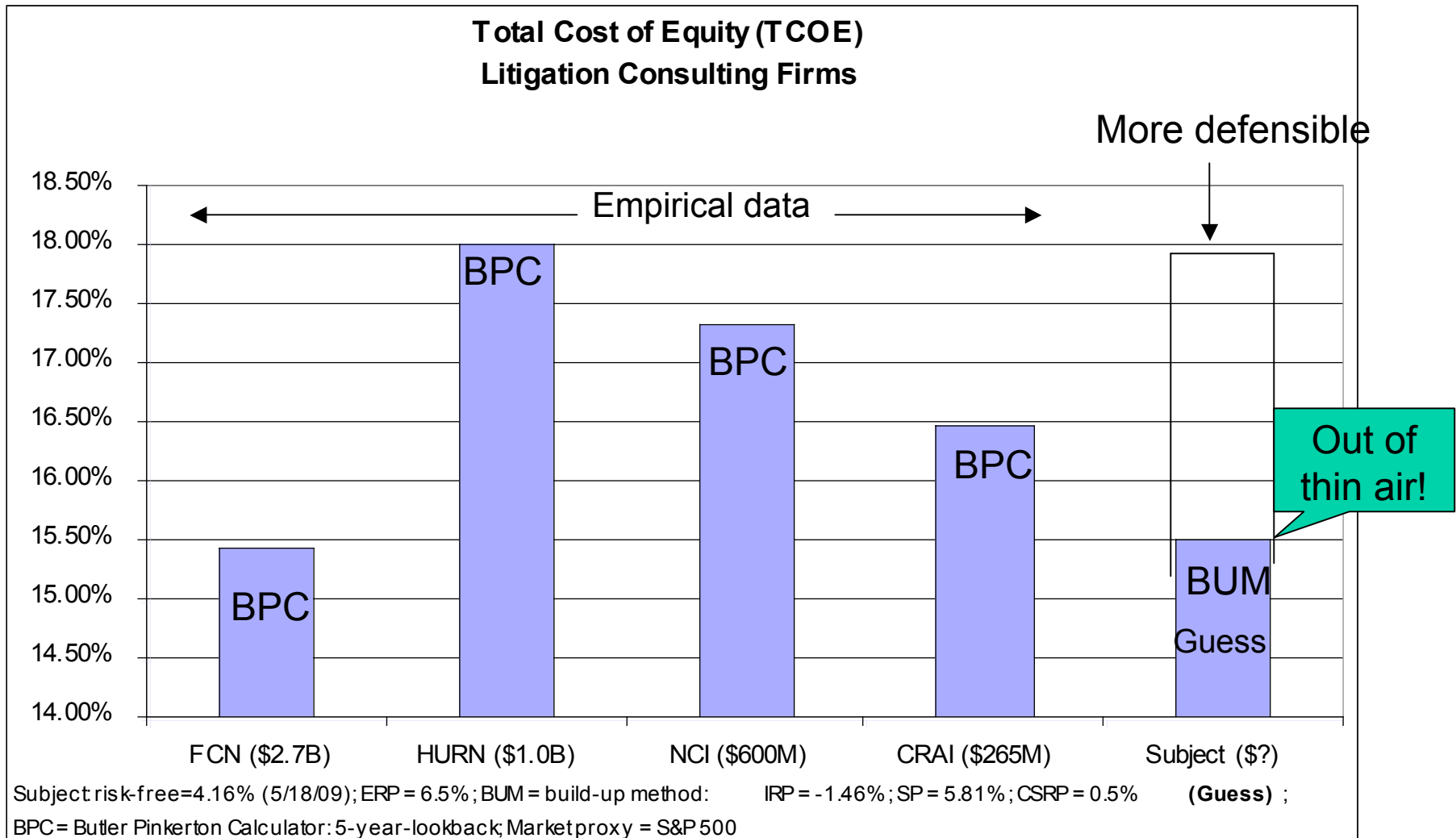
Risk Free Rate:	3.70%
Equity Risk Premium:	6.30%
Effective Date:	4/22/2009 (157 weeks)

Ticker	FCN	HURN	CRAI	XPRT	NCI
Company Name	FTI Consulting, Inc.	Huron Consulting Group Inc.	CRA International, Inc.	LECG Corporation	Navigant Consulting, Inc.
Size Premium	0.00%	0.00%	0.00%	0.00%	0.00%
Weekly Standard Deviation	5.75%	6.34%	5.59%	9.06%	6.82%
Levered Beta	0.43	0.81	0.49	1.39	0.90
Correlation Coefficient (R)	0.22	0.38	0.26	0.45	0.39
Total Beta	1.95	2.15	1.90	3.07	2.31
Total Cost of Equity	15.98%	17.24%	15.64%	23.06%	18.26%
Company Specific Risk Premium	9.57%	8.41%	8.85%	10.59%	8.92%

Faced with the choice between changing one's mind and proving that there is not need to do so, almost everyone gets busy on the proof.

– John Kenneth Galbraith, Canadian-American economist

Impeach Inferior Estimates of the Cost of Capital



The “Battle” of the Experts is Over Before it Even Started: Subject’s TCOE Much Closer to HURN than FCN

		Most risk ←				→ Least risk
Revenue generating professionals		45	610	1,931	2,129	3,378
		SUBJ	CRAI	NCI	HURN	FCN
Customer concentration (Top 10)		45.0%	21.4%	18.0%	14.0%	?
		SUBJ	HURN	CRAI	NCI	FCN
Operating segments				3	4	5
				SUBJ	HURN, NCI, CRAI	FCN
Debt/equity		36.2%	30.0%	25.4%	24.5%	16.7%
		HURN	SUBJ	CRAI	NCI	FCN
Operating income		\$1 M	\$21 M	\$88 M	\$92 M	\$239 M
		SUBJ	CRAI	NCI	HURN	FCN
Litigation exposure		\$200 M				Unpredictable
		Believes no merit				NCI, CRAI, FCN, SUBJ
		HURN				

Let's Look at Reality!

Build Up Method by The IRS

Appraisal Date Long-Term Treasury Bond Yield	5.33%
ERP (plus Small Company Risk Premium)	11.70%
Specific Company Risk	<u>1.00%</u>
Discount Rate	18.00%

What Did The BPC Produce?

Ticker	SCHN	CMC	MM
Size Premium	2.03%	2.03%	2.66%
Weekly Standard Deviation	6.07%	4.64%	14.85%
Levered Beta	0.41	0.65	0.36
Correlation Coefficient	0.18	0.38	0.06
Total Beta	2.26	1.72	6.47
Total Cost of Equity	21.47%	17.64%	51.83%
CSRP	11.28%	5.70%	41.37%

Faced with the choice between changing one's mind and proving that there is not need to do so, almost everyone gets busy on the proof.

– John Kenneth Galbraith, Canadian-American economist

Total Beta and The BPC: Why Not Now?

- Subjective Factor Models Provide **NO** empirical data for **Total Risk** or **CSRP!**
 - Any other database is subject to harsh criticism from the courts
 - BPC is not a solution in search of a problem
- BPC provides (moderately subjective) **EMPIRICAL** data:
 - Defend/support all assumptions/inputs
 - No different than any other cost of capital input
 - Except the BPC provides real-time, transparency for **specific guidelines** (as opposed to an average of the 25th portfolio, for example)

Questions to Consider:

- If Total Beta/BPC (**which empirically capture total risk**) were developed first, would you abandon them to rely upon other databases (**which only capture partial risk**)?
- If Total Beta/BPC were developed first, would you abandon them to rely upon the purely subjective factor models (**which require a complete guess for a CSRP**)?

Questions



An important scientific innovation rarely makes its way rapidly winning over and converting its opponents; it rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out and the growing generation is familiarized with the idea from the beginning.

– Max Planck, German physicist, founder of quantum theory