The Butler Pinkerton Model™: A New Approach to Company-Specific Risk

Rhode Island Society of CPAs

Providence, Rhode Island

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Hooper Cornell, PLLC
Learning Objectives

• Answer the “Who, What, Why, Where and How” of company-specific risk (CSR)

• Compare and contrast traditional (and newer) techniques with the Butler Pinkerton Model™ (BPM)

• Understand the theory, assumptions and key conclusions behind total beta and the BPM

• Address others’ observations of the BPM

• Illustrate practical applications of the BPM to properly assess subject company total risk as well as CSR

• Understand the need to move from “Mostly Art” to “Part Art/Much More Science” on total cost of equity (TCOE) and CSR
Introduction: Serendipity

Motivation to understand risk and return better:

• Professor Damodaran’s website and Total Beta
  – http://pages.stern.nyu.edu/~adamodar/
  – Investment Valuation (2nd Edition); Chapter 24
• “Aha” moment
Who’s on First?: Other Names for CSR

- Investment-specific risk
- Property-specific risk
- Nonsystematic risk
- Unsystematic risk
- Diversifiable risk
- Unique risk
- Idiosyncratic risk
- Residual risk
- Non-synchronous risk
- Alpha risk
- Non-beta risk

The Fudge Factor

Part of TCOE
What is CSR?

- The portion of total risk specific to an individual security that can be avoided through diversification.
- It is the last component of total risk that makes the investment unique.
- Uncertainty of expected returns arising from factors other than the market itself.
Why is CSR Important?

• How many business owners have you met who are properly diversified?
• How many buyers and potential buyers have you met who are properly diversified?
• Are you properly diversified?
• CSR compensates investors for risk that cannot be diversified away.
Where Do We Use CSR?

• Directly in every income approach
  – Cost of equity
  – Weighted Average Cost of Capital (WACC)

• Indirectly in the market approach
  – Selecting subject-specific pricing multiples from guideline companies/transactions
Where: In Modified CAPM

- Total Cost of Equity (TCOE) =
  » Risk-free rate ($R_f$)
  » + Equity risk premium (ERP) x Beta
  » + Size premium (SP)
  » + CSRP
Where: In Build-Up Method (BUM)

- Total Cost of Equity (TCOE) =
  » Risk-free rate (R_f)
  » + Equity risk premium (ERP)
  » + Industry premium
  » + Size premium (SP)
  » + CSRP
How to Analyze CSR: Traditional Methods

- Black/Green Factors
- Warren Miller/SPARC Factors
- Mercer Factors
- Finison/Dailey Factors
Porter’s Five Forces

- Customer Power
- Substitutes
- Competition/Rivalry
- Supplier Power
- New entrants
## CSR Analyses

<table>
<thead>
<tr>
<th>Negative risk factors</th>
<th>+/-</th>
<th>Numeric</th>
<th>Listing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating history, volatility of rev &amp; earn.</td>
<td>+++</td>
<td>3.5</td>
<td>X</td>
</tr>
<tr>
<td>Lack of management depth</td>
<td>++</td>
<td>1.0</td>
<td>X</td>
</tr>
<tr>
<td>Lack of access to capital resources</td>
<td>+</td>
<td>0.5</td>
<td>X</td>
</tr>
<tr>
<td>Over reliance on key persons</td>
<td>++</td>
<td>1.0</td>
<td>X</td>
</tr>
<tr>
<td>Lack of size and geographic diversification</td>
<td>+</td>
<td>0.5</td>
<td>X</td>
</tr>
<tr>
<td>Lack of customer diversification</td>
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<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Lack of marketing resources</td>
<td>+</td>
<td>0.5</td>
<td>X</td>
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<tr>
<td>Lack of purchasing power</td>
<td></td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Lack of product/ market dev. resources</td>
<td>+</td>
<td>0.5</td>
<td>X</td>
</tr>
<tr>
<td>Over reliance on vendors/suppliers</td>
<td></td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Limitations on distribution system</td>
<td></td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Limitations on fin. reporting/controls</td>
<td>+</td>
<td>0.5</td>
<td>X</td>
</tr>
</tbody>
</table>

**Positive risk factors**

<table>
<thead>
<tr>
<th>Positive risk factors</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term contracts, unique product</td>
<td></td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Patents, copyrights, franchise rights</td>
<td>-</td>
<td>(1.0)</td>
<td>X</td>
</tr>
</tbody>
</table>

**Net increase to Cost of Equity**

| Net increase to Cost of Equity | 7.0 | 7.0     | 7.0     |

BPM: A New Approach to CSR
CSR – Subjective Adjustment


<table>
<thead>
<tr>
<th>Specific Risk</th>
<th>Premium Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Man, Management</td>
<td>0% - 5%</td>
</tr>
<tr>
<td>Absolute Size</td>
<td>0% - 5%</td>
</tr>
<tr>
<td>Financial Structure</td>
<td>0% - 5%</td>
</tr>
<tr>
<td>Product/Geographical Diversification</td>
<td>0% - 5%</td>
</tr>
<tr>
<td>Customer Diversification</td>
<td>0% - 5%</td>
</tr>
<tr>
<td>Earnings: Margins and Historical Predictability</td>
<td>0% - 5%</td>
</tr>
<tr>
<td>Other Specific Risks</td>
<td>0% - 5%</td>
</tr>
</tbody>
</table>
Finison/Dailey Model™

SWOT

• Strengths/Weaknesses
  • 5-point scale
    – -2: Critical weakness
    – -1: Weak
    – 0: Neutral
    – +1: Strong
    – +2: Core competence

• Opportunities/Threats
  • 5-point scale
    – - 2: Critical weakness
    – - 1: Weak
    – 0: Neutral
    – +1: Opportunistic
    – +2: Very opportunistic

Grid: -3% to +15%
Summary of Factor Models

- Excellent models to understand CSR
- Unfortunately, they offer little support to quantify a CSRP
  - No empirical data
  - No market-derived evidence
  - Almost completely subjective
  - Why –3% to 15% in Finison/Dailey Model™?

If you want to make enemies, try to change something.

Woodrow Wilson
Other Methods: Study of Stock Price Reactions

- “The Impact of Management Depth on Valuation”
  (Steven E. Bolton, PhD, ASA, CBA and Yan Wang, Business Valuation Review, September 1997)
  - “We observe increasingly larger average declines in the stock prices of public firms accompanying significant management changes as the number of persons on the management team decreases.”
  - “The stock price decline averages about 9.43% for firms with fewer than six on the management team and probably should be extrapolated higher for smaller firms, although public data was not available for testing.”
New Thought on Private Company Discount

• “Owner’s Lack of Diversification and the Cost of Equity Capital for a Closely Held Firm” (Business Valuation Review (Winter 2007) – Daniel L. McConaughy, PhD and Vincent Covrig, PhD

− Certainty-Equivalent Approach: Adjusts the risky cash flows to their “certainty equivalents” and then discounts them at their risk-free rate
− Risk-adjusts the risky cash flows in the numerator
− \[ PV = \frac{(\text{Most Probable Cash Flow} - \frac{\text{standard deviation of cash flows}}{\text{standard deviation of market}})*\text{ERP}}{1+\text{risk-free rate}} \]
− Uses Monte Carlo simulations to estimate the most probable value for total cash flow as well as its volatility.
− Example results in a lack of diversification discount equal to 28.5%.
Cost to Cure: Adjustments to Cash Flows

- Key salesperson: CSRP may be represented by cost of buying life insurance sufficient to reimburse the company for the possible loss of services.
- Potential environmental cleanup costs: Estimate the probability weighted costs of remediation.

Cost of Capital: Applications and Examples, Third Edition, by Pratt and Grabowski
Fundamental or Accounting Measures

- Duff & Phelps *Risk Study*
  - Operating margin
  - Coefficient of variation in operating margin
  - Coefficient of variation in return on equity

- \( TCOE = R_f + RP_{m+s+u} \)

<table>
<thead>
<tr>
<th>Accounting Measure</th>
<th>%</th>
<th>( RP_{m+s+u} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating margin</td>
<td>14.6%</td>
<td>8.6%</td>
</tr>
<tr>
<td>CV (Operating margin)</td>
<td>15.8%</td>
<td>9.3%</td>
</tr>
<tr>
<td>CV (ROE)</td>
<td>34.7%</td>
<td>8.7%</td>
</tr>
</tbody>
</table>
Fundamental or Accounting Measures

- Observations:
  - Based on averages within the 25 different portfolios
  - $R^2$ squared for accounting metric:
    » Operating margin = 77%
    » CV (Operating margin) = 84%
    » CV (ROE) = 75%
  - Accounting metrics can hide risk
  - Rates of return earned in a well-diversified portfolio perspective.
  - “The Risk Study data should not be used in isolation from other considerations about the subject company, its industry, or the general economic environment.”

  Cost of Capital, Third Edition, Pratt and Grabowski
BPM: Challenging Conventional Wisdom

• Traditional Thought:
  – There are recognized data sources for all elements of risk in the cost of equity (risk-free rate, beta, industry risk premium, equity risk premium, and size premium), **EXCEPT** the company-specific risk premium (CSRP).
  – Thus, **we do not have any data sources that capture all components of TCOE.**
BPM: Challenging Conventional Wisdom

• Unfortunately, despite the widespread use by analysts and appraisers of a company-specific risk premium in a build-up (or CAPM) model, I am not aware of any academic research on the subject, and it remains the realm of the analyst’s judgment. (Cost of Capital, 2nd edition, Pratt)

• Not true anymore!
BPM: Challenging Conventional Wisdom

• Previous articles
  – “Quantifying Company-Specific Risk: The Authors Answer Your Questions” published in the May and June 2007 editions of Business Valuation Update
Previous Articles (continued)

• “Company-Specific Risk: The Dow 30 v. Private Company USA” published in the September/October 2007 edition of The Value Examiner

• “Comparing the Butler-Pinkerton Model to Traditional Methods Under Four Daubert Criteria” published in the November 2007 edition of Business Valuation Update

• “Butler Pinkerton Model™ Finds Another Application in SFAS 123R Engagements” published in the March 2008 edition of Business Valuation Update
Previous Articles (continued)

• “Two Ways to Use the Butler Pinkerton Model™: Total Cost of Equity or Company-Specific Risk?” published in the April 2008 edition of Business Valuation Update

• Quantifying Company-Specific Risk—Regardless of Your Faith in Beta” published in 2008 Winter Edition of Business Appraisal Practice


• Frequently Asked Questions on www.bvmarketdata.com
Background

Question: Is it possible that a company can have a negative (less than zero) CSRP?

- Exxon Mobil (Ticker: XOM) exhibited a CSRP = 4.13%
- General Electric (Ticker: GE) exhibited a CSRP = 3.40%
- If these companies have positive CSRPs, can you think of a time when any company should have a negative CSRP?
XOM

BPM: A New Approach to CSR

XOM v. S&P 500
12/24/01 - 10/2/06

Beta = .85
Total beta = 1.45
T-stat = 11.39
R-square = 0.34 (66% non-market forces)
TCOE = 13.96%
CSR = 4.13%
BPM: A New Approach to CSR

GE v. S&P 500
12/24/01 - 10/2/06

- Beta = 1.06
- Total-beta = 1.56
- T-stat = 14.72
- R-square = 0.47 (53% non-market forces)
- TCOE = 14.55%
- CSR = 3.40%
**Observations**

Compare GE with XOM:

- Market risk (XOM beta = 0.85; GE = 1.06) and CSR (XOM CSRP = 4.13%; GE = 3.40%) are not related

- Traditional method of starting at 0% (artificial and low) as a reference point for CSRP is incorrect – **Key Conclusion**

- If XOM and GE have positive CSRP, then all other companies also have positive CSRP – **Key Conclusion**

- TCOE benchmarks – **Key Conclusion**

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*Quote by Charles Kettering*

The world hates change, yet it is the only thing that has brought progress.
Support for These “Controversial” Conclusions:

• ... when discussing large portfolios, “the weighted average of the unsystematic risk approaches zero as the number of equally weighted securities in a portfolio approaches infinity”
KDE v. S&P 500
12/24/01 - 10/2/06

Beta = 1.04
Total beta = 3.03
T-stat = 5.75
R-square = .12 (88% non-market forces)
TCOE = 23.89%
CSR = 6.14%

Ouch!
EMR v. S&P 500
12/24/01 - 10/2/06

Beta = .96
Total beta = 1.54
T-stat = 12.51
R-square = 0.39 (61% non-market forces)
TCOE = 14.43%
CSR = 4%

Ouch!
A Closer Look at the Financial Theory
Financial Theory

- \[ \beta = \sigma_{s,m} / \sigma^2_m \]
- \[ \beta = \sigma_{s,m} / (\sigma_m * \sigma_m) \]
- \[ \beta = (\sigma_{s,m} / \sigma_s * \sigma_m) * (\sigma_s / \sigma_m) \]

Note: we have merely multiplied the right hand side of the equation by 1 or \( \sigma_s / \sigma_s \)

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

- $T\beta$ measures the total risk, or volatility, of an individual stock ($\sigma_s$) relative to the total risk, or volatility, of the market ($\sigma_m$)

- The total risk premium must include the risk-free rate, Beta*ERP, the size premium (SP) AND any CSRPs

- $\sigma_s$ is the appropriate measure of total risk if it is the only stock in your portfolio

- $\sigma_m$ is the appropriate measure of total risk if the S&P 500 index is the only security in your portfolio
Total Beta (continued)

• $T\beta$ **almost always** will be greater than 1.0

• $T\beta$ (total risk) **will always** be greater than $\beta$ (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
  
  • Much more stable than beta
Other Uses of Total Beta

• Goldman/Bank of America Model:
  - Standard deviation Canada = 15.17%
  - Standard deviation U.S. = 12.64%
  - Relative standard deviation Canada = 15.17/12.64 = 1.2 = \textbf{Total Beta}
  - Assume ERP_{US} = 5.0%
  - ERP_{Canada} = ERP_{US} \times \text{Total Beta} = 5.0\% \times 1.2 = 6.0\%

• Duff & Phelps Model:
  - Cost of equity_{emerging market} = R_f + ERP_{US} \times \left( \frac{\text{Standard deviation}_{emerging market}}{\text{Standard deviation}_{US}} \right) + \text{Political Risk Adjustment (optional)}

Source - ASA: Center for Advanced Valuation Studies: Roger J. Grabowski, ASA (October 2007)
Modified CAPM and Total Cost of Equity (TCOE)
TCOE (using Tβ)

$$TCOE = R_f + T\beta \times ERP$$

Risk and Return Among Various Assets: 1926-2004 with Linear Trendline
Tβ and β versus Return

TCOE = Modified CAPM = \( R_f + \beta \times ERP + SP + CSRP \)

BPM: A New Approach to CSR
The Quantification of CSR!

Solving for the only unknown in the two equations:

- \( \text{TCOE} = R_f + T\beta \times \text{ERP} = R_f + \beta \times \text{ERP} + \text{SP} + \text{CSRP} \)

Modified CAPM

- \( \text{CSRP} = (T\beta - \beta) \times \text{ERP} - \text{SP} \)
Is CSR Priced in the Public Markets?

  - To the extent that undiversified investors have impact in the market, this should be reflected in pricing of the overall stock market.
  - Found significant positive relation between average stock variance and return on the market.
  - Conclude that total risk, including idiosyncratic risk, drives forecastability of the stock market.
Is CSR Priced in the Public Markets? (continued)

• The debate is not important for the valuation of private companies (at least for the income approach)
  — It is typically priced for private companies
  — Use publicly-traded benchmarks for guidance
Indirect Observation of the BPM

• “Owner’s Lack of Diversification and the Cost of Equity Capital” written by McConaughy and Covrig (Business Valuation Review – Winter 2007)
  
  – “… the use of larger and more established public companies, which are not exactly comparable, may understate significantly the volatility of the private companies’ cash flows and, thus, understate the risks facing the undiversified entrepreneurial-investor.”
Indirect Observation of the BPM (continued)

− “Second, the entrepreneurial investor faces cash-flow risks that may not be represented well by stock price volatilities. Public companies’ stock price volatilities many not represent the cash-flow risks faced by the entrepreneurial investor. These companies may experience wild stock price fluctuations. Volatilities estimated from these companies’ stock prices may be excessive …”

− “Another benefit of our model is that it does not use a risk measure based on the stock price volatility of market-comparable companies. This avoids the possibly problematic volatility measurements due to excess volatility or inappropriate comparables.”
Answer

• Are privately-held companies more, or less, volatile than public companies, or is it very much company-specific?

• Use BPM to “bracket” your privately-held company, if possible.

• CSR is just that - company-specific.
  – Do not need perfect comparables.
  – You need good guidelines. Good is relative and open to interpretation.

• Why ignore the data, if it exists?
  – It is better than essentially guessing
Indirect Observation of the BPM

• Public and private capital markets are just different. Therefore, appraisers cannot use public market data to help determine valuation in private markets.

• Answer:
  — “It seems likely that the return expectations in both markets are driven, at least in part, by the same economic variables, such as the level of interest rates, economic growth, inflation and oil prices.”
Answer (continued)

• Principles of Alternatives/Substitution also contradicts

• Other publicly-traded stock data we rely upon:
  – Pre-IPO studies
  – Restricted stock studies
  – Closed-end fund data
  – Merger data
  – Other cost of capital components (beta, IRP, SP, ERP)

• “Given the state of private capital market theory and practice, I am reluctant to discard valuation methods simply because they rely on public market data.” Source: Are the Public and Private Capital Markets Worlds Apart?, Business Appraisal Practice, Winter 2007/2008, M. Mark Walker, PhD, CFA, CBA
Answer (continued)

• Revenue Ruling 59 – 60; Section 4.01 (h):
  – The market price of stocks of corporations engaged in the same or a similar line of business having their stocks actively traded in a free and open market, either on an exchange or over-the-counter. (Emphasis added)
Indirect Observation of the BPM

• CAPM is subject to many unrealistic/impractical assumptions:
  -- No taxes
  -- No transaction costs
  -- All securities are properly priced: The market is perfectly efficient
  -- Market: All investable assets (real estate, art, intellectual property, comic books, etc.)
  -- Rates of return are normally distributed
  -- Others
Indirect Observation of the BPM

  - Total Beta, a measure of total risk, is a much better alternative to classify stocks as either aggressive or defensive.
  - Market Beta is inherently unstable over time.
  - Thus, one cannot separate total risk into its components – market risk, company-specific and size – as it is too subjective to do so.
**Answer**

- All aware of CAPM/Beta’s “warts” – Yet, Nobel-prize winning theory.

- BPM Measures **historical** market beta – not any better (or worse) to project a **forward-looking** market beta
  - Over look-back period, beta is what it was, so-to-speak
  - Two benefits of the BPM Calculator:
    1) Give careful consideration to the look-back period as well as to the day of the week
    2) T-stat and statistical significance greater than 80%

- Believe it is important to know why (to the best of our ability) total risk is what it is.

- By definition: Total Beta = Beta/R

- Corrected Total Beta using Sum Beta/R?
Direct (and Incorrect) Criticism of BPM

• “The Emperor’s New Clothes: Quantifying Risk in the Private Company” (January/February edition of The Value Examiner) by William H. McAfee, Jr., CFP, AVA.

  – “BPM does not provide anything that was not previously available to an analyst using the guideline public company method with multiples since the inverse of the multiple shows the relative risk of the examined company.”
Answer

• Statement is not correct.

• Inputs to BPM: XOM
  – Risk-free rate = 5.00%
  – ERP = 5.00%
  – Market proxy: S&P 500
  – Look-back period: 5 years
  – Effective date: 3/7/08
  – Size premium = -0.27%

• Outputs:
  – TCOE = 12.79%
  – CSRP = 3.59%
Answer (continued)

- Dividend discount model: $P_0/E_1 = D_1/E_1/(k - g)$

- Inputs:
  - $P_0 = $82.49/share (As of 3/7/08)
  - $E_1 = $8.07/share (YE 12/08 – Yahoo!Finance)
  - $P_0/E_1 = 10.22$
  - $D_1 = $1.40/share (last year) * 7% growth = $1.50/share
  - $D_1/E_1 = 0.1856$
  - $g = growth rate of dividends = 7$

- Solve for the only unknown: $k$
  - $k = 8.80\%$

- Compare to BPM
  - $k = 12.79\%$
  - Difference due to CSR!
  - The inverse of the P/E ratio does not capture TCOE or CSR.
Direct Criticism: Application and Answer

- VPS Webinar: *Cost of Capital: A Consensus View?*

- While generally complimentary ("Slick Tool"), the following comment was made (words to the effect):
  - From a practical perspective, you must be careful with the BPM relative to the market approach.

- This has always been the case:
  - "The best estimate of (beta) may be derived from the guideline companies used in the market approach, or may be derived from Ibbotson’s *Cost of Capital Quarterly.*"  
    Source: Editor’s Column – *Business Valuation Update* September 1998
Answer (continued)

- Another indication of value
  - Good thing
  - Different perspective
  - May want to use more **guidelines** in the income approach
  - Have used the BPM and excluded the market approach: the publicly-traded company method
  - CSR is just that – company-specific
Answer (continued)

• As shown, public market multiples do not fully incorporate CSR.

• Total beta and BPM fully capture CSR!

• Must consider in the market approach:
  — Market multiple may incorporate some, but definitely not all, of CSR.
Direct Criticism: Too Much Rigor

• Letter to the editor of The Value Examiner written by Warren Miller:
  – “They appear to be trying to impose rigor on something that is inherently a matter of professional judgment: unsystematic risk.”
  – “Messrs. Butler and Pinkerton seem to believe that numbers = rigor. The question, it seems to me, is the one we so often face in this field: would we rather be precisely wrong or approximately right? The latter choice is inherently difficult for those with little, if any, tolerance for ambiguity. Yet, that is what professional judgment is all about.”
Answer

• Numbers most certainly improve rigor!

• Professional judgment is alive and well with the BPM.

• Old way = approximately wrong or right – who really knows?

• BPM: Approximately right
Direct Criticism: Robotic Technique and Answer

“Monkeys do formulas, appraisers use judgment”

Comment made in the VPS Webinar “Cost of Capital: A Consensus View?” February 27, 2008

No, they don’t. Monkeys just aren’t that smart….

Practical example
Criticisms of CAPM or BPM?

- Pratt/Grabowski at Cost of Capital Conference in New York on 10/17/08
- “(BPM) assumes that beta estimate is accurate. If not, then CSRP is not really the CSRP, but includes elements of beta correction plus CSRP”
  - This is a CAPM criticism. If you accept CAPM, BPM’s math is irrefutable.
  - True observation, but is it a material observation?
  - No one knows the “true” beta.
  - No need to perform beta “correction” (unless stock traded in an inefficient market) in search of “true” beta.
### Extreme Example: Low (and very unstable) Beta

<table>
<thead>
<tr>
<th></th>
<th>Systematic Risk</th>
<th>Total Beta</th>
<th>TCOE</th>
<th>CSRPl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td>0.34</td>
<td>1.70%</td>
<td>10.72</td>
<td>57.92%</td>
</tr>
<tr>
<td>Tuesday</td>
<td>1.18</td>
<td>5.90%</td>
<td>11.60</td>
<td>62.32%</td>
</tr>
<tr>
<td>Wednesday</td>
<td>0.60</td>
<td>3.00%</td>
<td>12.05</td>
<td>64.56%</td>
</tr>
<tr>
<td>Thursday</td>
<td>0.60</td>
<td>3.00%</td>
<td>12.93</td>
<td>68.95%</td>
</tr>
<tr>
<td>Friday</td>
<td>-0.47</td>
<td>-2.35%</td>
<td>11.92</td>
<td>63.88%</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>-0.47</td>
<td>-2.35%</td>
<td>10.72</td>
<td>57.92%</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>1.18</td>
<td>5.90%</td>
<td>12.93</td>
<td>68.95%</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>1.65</td>
<td>8.25%</td>
<td>2.21</td>
<td>11.03%</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>0.45</td>
<td>2.25%</td>
<td>11.84</td>
<td>63.53%</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>0.60</td>
<td>3.00%</td>
<td>11.92</td>
<td>63.88%</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>0.60</td>
<td>3.00%</td>
<td>0.80</td>
<td>3.98%</td>
</tr>
<tr>
<td><strong>CV</strong></td>
<td>1.33</td>
<td>133.17%</td>
<td>0.07</td>
<td>6.27%</td>
</tr>
</tbody>
</table>

For low beta stocks, how important is it to get beta correct? (Not very important!)  
You better get the TCOE and CSRPl correct though!
Total Risk = TCOE = 64.58%

If the pie is the pie, do we necessarily care how the pie is sliced-up?
I like to try (the BPM). If I am wrong on the slices, I am still right on the pie!

- \( r_f = 4.3\% \)
- \( \text{Beta*ERP} = 3.0\% \)
- \( \text{SP} = 6.93\% \)
- \( \text{CSR} = 50.35\% \)

Even if beta is “incorrect”, total beta captures 100% of disclosed risks. CSR picks up beta’s “slack” for a stock that traded in an efficient market.

BPM: A risk allocator; If do not want to allocate, just key in on TCOE
## Extreme Example: High Beta

### Dryships (DRYS)

<table>
<thead>
<tr>
<th>Day</th>
<th>Beta</th>
<th>Risk</th>
<th>Total Beta</th>
<th>TCOE</th>
<th>CSRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>2.88</td>
<td>17.28%</td>
<td>4.33</td>
<td>31.00%</td>
<td>6.16%</td>
</tr>
<tr>
<td>Tuesday</td>
<td>2.52</td>
<td>15.12%</td>
<td>4.70</td>
<td>33.19%</td>
<td>10.48%</td>
</tr>
<tr>
<td>Wednesday</td>
<td>2.41</td>
<td>14.46%</td>
<td>4.39</td>
<td>31.33%</td>
<td>9.30%</td>
</tr>
<tr>
<td>Thursday</td>
<td>2.31</td>
<td>13.86%</td>
<td>4.25</td>
<td>30.49%</td>
<td>9.10%</td>
</tr>
<tr>
<td>Friday</td>
<td>2.18</td>
<td>13.08%</td>
<td>3.93</td>
<td>28.56%</td>
<td>7.94%</td>
</tr>
<tr>
<td>Min</td>
<td>2.18</td>
<td>13.08%</td>
<td>3.93</td>
<td>28.56%</td>
<td>6.16%</td>
</tr>
<tr>
<td>Max</td>
<td>2.88</td>
<td>17.28%</td>
<td>4.70</td>
<td>33.19%</td>
<td>10.48%</td>
</tr>
<tr>
<td>Range</td>
<td>0.70</td>
<td>4.20%</td>
<td>0.77</td>
<td>4.63%</td>
<td>4.32%</td>
</tr>
<tr>
<td>Mean</td>
<td>2.46</td>
<td>14.76%</td>
<td>4.32</td>
<td>30.91%</td>
<td>8.60%</td>
</tr>
<tr>
<td>Median</td>
<td>2.41</td>
<td>14.46%</td>
<td>4.33</td>
<td>31.00%</td>
<td>9.10%</td>
</tr>
<tr>
<td>SD</td>
<td>0.27</td>
<td>1.60%</td>
<td>0.28</td>
<td>1.66%</td>
<td>1.63%</td>
</tr>
<tr>
<td>CV</td>
<td>0.11</td>
<td>10.82%</td>
<td>0.06</td>
<td>5.38%</td>
<td>18.99%</td>
</tr>
</tbody>
</table>

For high beta stocks, how important is it to get beta correct? (More important, but not as important as TCOE!)
Total Risk = TCOE = 31.12%

If the pie is the pie, do we necessarily care how the pie is sliced-up? I like to try (the BPM). If I am wrong on the slices, I am still right on the pie!

Even if beta is "incorrect", total beta captures 100% of disclosed risks. CSR picks up beta’s “slack” for a stock that traded in an efficient market.

BPM: A risk allocator; If do not want to allocate, just key in on TCOE
Direct Criticism: Alleged “Subjectivity” of the BPM

- Total Beta = $\beta/R = 1.89/0.374 = 5.05$; if 1.89 is “true” beta?
- Beta standard error = 0.62
- Beta range: $1.89 \pm (2\times0.62) = 0.65 – 3.13$
  - Why would you ever pick a beta +/- 2 standard deviations from the mean as the “true beta”?
Alleged “Subjectivity” of the BPM (continued)

- Total beta range = 0.65/.374 = 1.74 (Low); 3.13/.374 = 8.40 (High)
  - Does this make any sense?
  - Total beta = 1.74 is less than the best-fit beta = 1.89
  - Given the stability of total beta, 1.74 – 8.40, is simply not realistic
  - Beta = R*standard deviation_s/standard deviation_m
  - Since we know Total beta is relatively stable, the “true beta’s” R most likely will not be 0.374. Each beta, whether “true” or not, has its own theoretical R rather than a constant 0.374, for example.
  - Otherwise, you implicitly assume that the stock’s historical volatility was too little or too much. To make this assumption, you must assume the market for the stock was inefficient. Just ignore, if inefficient.
Direct Criticism: Double Counting?

• Pratt/Grabowski at Cost of Capital Conference in New York on 10/17/08

• “Does the BPM double count financial risk”?
  — No, financial risk impacts both systematic as well as CSR risk.
  — Review capital structures of guidelines as well as subject company.
  — Do not consider much differently than analyzing customer concentration risk and supplier concentration risk, for example.
New Application: 123R

- Output of Calculator
  - Total Beta of comparable = 2.57
  - Weekly standard deviation = 0.0431

- $T\beta = \sigma_s / \sigma_m$

- $\sigma_m = 0.0431 / 2.57 = 0.0168$ = weekly standard deviation

- $\sigma_m = 0.0168 \times 52.5 = 12.09\%$ = annual standard deviation

- $TCOE_{private} = R_f + T\beta \times ERP$

- $28.7\% = 4.7\% + (\sigma_s / 12.09\%) \times 5\%$

- $24.0\% = \sigma_s \times 0.4136$

- $58.0\% = \sigma_s$

BPM: A New Approach to CSR
Case Study: Microbreweries

As highlighted in February 2007 *BVU* article entitled, “Quantifying Company-Specific Risk: A New Empirical Framework With Practical Applications:”
Brewery No. 1: SAM (Boston Beer)

SAM v. S&P 500
12/24/01 - 10/2/06

Beta = 0.73
Total beta = 2.38
T-stat = 5.03
R-square = 0.09 (91% non-market forces)
TCOE = 19.78%
CSR = 7.62%

Ouch!
Brewery No. 2: HOOK (Red Hook)

HOOK v. S&P 500
12/24/01 - 10/2/06

- Beta = 0.36
- Total beta = 3.55
- T-stat = 1.62
- R-square = 0.01 (99% non-market forces)
- TCOE = 27.13%
- CSR = 13.65%

Ouch!
Brewery No. 3: PMID (Pyramid Breweries)

PMID v. S&P 500
12/24/01 - 10/2/06

- Beta = 0.19
- Total beta = 1.99
- T-stat = 1.53
- TCOE = 17.33%
- CSR = 4.93%
- R-square = 0.01 (99% non-market forces)

Ouch!
Inputs to Calculate CSR

• Risk-free rate = 4.84%

• ERP = 6.28%

• Size premium:
  – SAM = 2.76%
  – HOOK = 6.36%
  – PMID = 6.36%
  – Subject: Boise Brewery = 6.36%

• Market proxy: S&P 500

• Look-back period: 12/24/01 – 10/2/06
Identifiable Company-Specific Risk Factors

• Eliminate factors more highly correlated with size
  — While the size premium captures many risks, the appraiser must be careful to capture total risk and at the same time avoid double-counting

• Ignore macro-economic and industry factors since the $\beta$ (systematic risk) captures these factors
## Ranking of Company Specific Risk Factors

<table>
<thead>
<tr>
<th>Factors affecting risk premium:</th>
<th>Most Risk</th>
<th>Moderate Risk</th>
<th>Less risk</th>
<th>Least Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product line diversification</td>
<td>BB</td>
<td>HOOK</td>
<td>SAM</td>
<td>PMID</td>
</tr>
<tr>
<td>Brewery location (company owned)</td>
<td>BB</td>
<td>HOOK</td>
<td>PMID</td>
<td>SAM</td>
</tr>
<tr>
<td>Brewery location (under contract)</td>
<td>BB/HOOK</td>
<td>PMID</td>
<td>SAM</td>
<td></td>
</tr>
<tr>
<td>Distributors</td>
<td>HOOK</td>
<td>BB</td>
<td>PMID</td>
<td>SAM</td>
</tr>
<tr>
<td>Location of sales</td>
<td>BB</td>
<td>PMID</td>
<td>HOOK</td>
<td>SAM</td>
</tr>
<tr>
<td>Supplier</td>
<td></td>
<td></td>
<td></td>
<td>No meaningful differences</td>
</tr>
</tbody>
</table>

BPM: A New Approach to CSR
## Ranking of Company Specific Risk Factors (continued)

<table>
<thead>
<tr>
<th>Factors affecting risk premium:</th>
<th>Most Risk</th>
<th>Moderate Risk</th>
<th>Less Risk</th>
<th>Least Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign currency exposure</td>
<td>SAM</td>
<td>PMID</td>
<td>BB/HOOK</td>
<td></td>
</tr>
<tr>
<td>Trademarks</td>
<td></td>
<td>No meaningful differences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Litigation</td>
<td>SAM</td>
<td>HOOK/PMID</td>
<td>BB</td>
<td></td>
</tr>
<tr>
<td>Management depth</td>
<td>BB</td>
<td>SAM</td>
<td>PMID/HOOK</td>
<td></td>
</tr>
<tr>
<td>Quality and stability of earnings</td>
<td>BB</td>
<td>HOOK</td>
<td>PMID</td>
<td>SAM</td>
</tr>
<tr>
<td>Access to capital</td>
<td>BB</td>
<td>HOOK</td>
<td>PMID</td>
<td>SAM</td>
</tr>
</tbody>
</table>

BPM: A New Approach to CSR
Ranking of Company Specific Risk Factors (continued)

<table>
<thead>
<tr>
<th>Factors affecting risk premium:</th>
<th>Most Risky</th>
<th>Moderate Risk</th>
<th>Less Risk</th>
<th>Least Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to variable rate debt</td>
<td>HOOK</td>
<td>PMID</td>
<td>BB</td>
<td>SAM</td>
</tr>
<tr>
<td>Subject to dilution from options</td>
<td>SAM</td>
<td>HOOK/PMID</td>
<td>BB</td>
<td></td>
</tr>
<tr>
<td>Unique Regulation</td>
<td>HOOK</td>
<td>PMID</td>
<td>BB</td>
<td>SAM</td>
</tr>
<tr>
<td>Subject to paying earn-out</td>
<td>PMID</td>
<td></td>
<td>BB/SAM/HOOK</td>
<td></td>
</tr>
<tr>
<td>Net operating loss carry forwards</td>
<td>HOOK</td>
<td>PMID</td>
<td>SAM</td>
<td>BB</td>
</tr>
<tr>
<td>Controls and procedures</td>
<td>PMID</td>
<td>BB</td>
<td>SAM/HOOK</td>
<td></td>
</tr>
</tbody>
</table>
## Summary of Company Specific Risk Factors

<table>
<thead>
<tr>
<th>Company</th>
<th>Most Risk</th>
<th>Moderate Risk</th>
<th>Less Risk</th>
<th>Risk</th>
<th>Least Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>HOOK</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PMID</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SAM</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

### Summary Distribution of Rankings

<table>
<thead>
<tr>
<th>Company</th>
<th>BB</th>
<th>HOOK</th>
<th>PMID</th>
<th>SAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>(??%)</td>
<td>7%</td>
<td>13.7%</td>
<td>4.9%</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

BPM: A New Approach to CSR
Output: Determination of TCOE and CSR for Guidelines and Subject

<table>
<thead>
<tr>
<th>Ticker</th>
<th>$\beta_L$</th>
<th>Debt</th>
<th>Equity</th>
<th>$\beta_U$</th>
<th>$T\beta$</th>
<th>TCOE</th>
<th>CSRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAM</td>
<td>0.73</td>
<td>$0 m$</td>
<td>$458 m$</td>
<td>0.73</td>
<td>2.38</td>
<td>19.8%</td>
<td>7.6%</td>
</tr>
<tr>
<td>HOOK</td>
<td>0.36</td>
<td>$5.0 m$</td>
<td>$32 m$</td>
<td>0.33</td>
<td>3.55</td>
<td>27.1%</td>
<td>13.7%</td>
</tr>
<tr>
<td>PMID</td>
<td>0.19</td>
<td>$8.2 m$</td>
<td>$23 m$</td>
<td>0.16</td>
<td>1.99</td>
<td>17.3%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Subject</td>
<td>0.51</td>
<td></td>
<td></td>
<td>0.41</td>
<td></td>
<td>25.4%</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

BPM: A New Approach to CSR
Another Look at Breweries: Including BUD

<table>
<thead>
<tr>
<th>Ticker</th>
<th>Beta&lt;sub&gt;L&lt;/sub&gt;</th>
<th>Tβ</th>
<th>TCOE</th>
<th>CSRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAM</td>
<td>1.03</td>
<td>2.57</td>
<td>17.9%</td>
<td>5.0%</td>
</tr>
<tr>
<td>HOOK</td>
<td>0.09</td>
<td>3.63</td>
<td>23.2%</td>
<td>11.4%</td>
</tr>
<tr>
<td>PMID</td>
<td>0.21</td>
<td>3.00</td>
<td>20.0%</td>
<td>7.6%</td>
</tr>
<tr>
<td>BUD</td>
<td>0.51</td>
<td>1.09</td>
<td>10.4%</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Risk-free rate = 5.0%; ERP = 5.0%; Market proxy = S&P 500; SP = 2.76% (SAM), 6.36% (PMID and HOOK), and -.36% (BUD), 5-year look-back as of 12/10/07; Non-dividend adjusted
Observations, Issues & Thoughts
TCOE v. CSRP

- Systematic/Industry risk factors’ effect on each company:
  - General economic conditions
  - General trend in alcohol consumption
  - Increased competition from wine and spirit companies
  - Impact of growth of less-filling beers versus traditional beers
  - Craft beers versus “blue collar” beers
  - Quantity and quality of all hop varieties/barley varieties
  - Glass and aluminum pricing
  - Alcoholic beverage regulation and taxation
TCOE v. CSRP (continued)

- Systematic/Industry risk factors’ effect on each company:
  - Environmental regulation
  - Potential for increased energy costs (higher transportation, freight and operating costs)
  - Impact of seasonality of operations
  - Dram shop laws
  - Impact from foreign competition
  - Others
Use with BUM: SIC code 3564

BUM

• Total Cost of Equity (TCOE) =
  » Risk-free rate ($R_f$) = 4.66%
  » + Equity risk premium (ERP) = 5.00%
  » + Industry premium = -0.85%
  » + Size premium (SP) = 5.82%
  » \[= 14.63\%
  » + CSRP = ?
  » \[= ?

BPM: A New Approach to CSR
Use with CAPM: SIC code 3564

CAPM

• Total Cost of Equity (TCOE) =

Risk-free rate \( (R_f) \) = 4.66%

» + Equity risk premium (ERP) x Beta = 5.00% x 0.86

» + Size premium (SP) = 5.82%

» ____________________________ 14.78%

» + CSRP = ?%

Wouldn’t you like to know the CSRPs for each of the guideline companies used in either the BUM or modified CAPM methods?

BPM provides the answers!
Company-Specific Risk Premiums
SIC Code: 3564

Subject Company

Negative adjustment

Positive adjustment

BPM: A New Approach to CSR
Reasonableness Check or Direct Observation?

Total Cost of Equity
SIC Code 3564

Subject Company

Negative adjustment

Positive adjustment

BPM: A New Approach to CSR
Use with BUM versus CAPM

- If you go through the process of selecting guidelines, why not use their betas (measure of central tendency or some other logical selection)?
- Industry risk premium is affected by leverage
- SBBI comes out annually; One can calculate TCOE and CSRP as of the date of value for specific benchmarks
Good Comparables or Good Guidelines?

- This is the Income Approach to valuation – not the Market Approach
  - Have you ever not performed the income approach because you could not find any guidelines?

- “Bad” comparables may be “good” guidelines – Key Conclusion
  - Company-specific risk is just that – Company-specific
  - Search for customer concentration risk
  - Does BUD give guidance for a private brewery CSRP? (Maybe)

- Potential issue with the market approach?
  - Market multiples (well-diversified perspective)
  - Total Beta (stand-alone perspective)
Court Decisions

- Estate of James Waldo Hendrickson v. Comm of Internal Revenue, TCM 1999-278
  - The Court commented that CAPM was not appropriate for the valuation of small closely held companies and found that CAPM does not address unsystematic risk.
The Courts Want Empirical Data

  – “Petitioners’ expert’s own analysis also contains a subjective specific risk premium of 2%, the quantification of which cannot be explained by reference to objective factors. I will not quibble with including the factor, which reinforces the conservatism of (petitioners’ expert’s) final cost of capital.”

• Bankruptcy case decided January 18, 2007
  – One expert used zero company-specific risk, one expert used about 2%, and one expert used 6%. The court case cut the 6% to 4%, stating that “(the witness) could provide little explanation of the basis for making such a significant adjustment to the discount rate.”
The Courts Want Empirical Data (continued)

• Estate of Deputy v. Comm. (TCM 2003-176)
  — “The taxpayer’s expert’s figures are without empirical support or explanation and appear to be purely subjective.” (Emphasis added)

  — “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.” (Emphasis added)
<table>
<thead>
<tr>
<th>Criteria</th>
<th>BPM</th>
<th>Factor Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject to testing?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Peer Review/Publication?</td>
<td>Yes: 1) Referenced in new <em>Cost of Capital, Third Edition</em>; 2) CAVS seminar; 3) Writing an e-book in collaboration with Morningstar/Ibbotson; 4) Others speaking and writing about it (Generally, very positive)</td>
<td>Yes, but what is to peer review?</td>
</tr>
<tr>
<td>Known or potential rate of error?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Widespread acceptance?</td>
<td>Working on it; Use of Calculator</td>
<td>Yes</td>
</tr>
</tbody>
</table>
“Many analysts are able to express qualitative reasons for company-specific risk adjustments but rarely can provide data relating those qualitative factors to actual measurements in expected return.” (Emphasis added)

“In this chapter, we discuss approaches to better quantify the total risk and the related market returns of guideline public companies. When you use total risk and the related return, you are including company-specific risk.” (Emphasis added)
Does such a measure (the BPM) capture the factors that cause company-specific risk? If you thoroughly analyze the risk factors of guideline public companies, the estimate of company-specific risk premium should reflect the market’s pricing of these risks. (Emphasis added)

This quantitative approach (the BPM) complements a qualitative assessment of the strengths, weaknesses, opportunities, and threats of the subject company compared to its peers by matching the subject company to the guideline public companies with comparable (not identical) strengths, weaknesses, opportunities, and threats relative to their peers. (Emphasis added)
Issues & Thoughts

• This technique depends upon beta and CAPM (Note: $T\beta = \beta/R$)
  – If $T\beta$ is quite large due to the inability of CAPM to describe a particular company’s stock price movements (high volatility), then
  – CSRP will be relatively high

• Does it make sense?
  – There may be very good reasons for the volatility
  – If not – exclude from additional analysis
    Statistical confidence less than 80%
Issues & Thoughts (continued)

• Are some stocks more efficiently priced than others?
  – There might be some unexplained randomness to returns
  – Our calculation of CSRPs assumes either:
    • There is no unexplained randomness to returns
    • Unexplained randomness (to the extent that it exists) is part of CSR
Issues & Thoughts [continued]

• Appraisers should be aware of how well CAPM and beta describe stock price returns

• Could you use some type of decision rule and compare historical risk and cash flow of guidelines with future projections of cash flow of your private company?
Issues & Thoughts [continued]

• Some appraisers, unfortunately, fall back on “rules of thumb” for privately-held companies
  — They might feel comfortable with a 20% - 25% discount rate, so they may force the CSR to fit their pre-conceived conclusion
  — The fudge factor

• While intuition is good, and possibly a sanity check - it is not market-driven
  — This technique is market-driven
  — As appraisers, we believe we observe the market - not set it
Application Choices

Since valuation is all about the future, we point out a few other things:

- It is possible to calculate a forward-looking $T\beta$ (at least for some stocks, remember that $T\beta = \sigma_s/\sigma_m$)

- In our research, we calculated a forward-looking $T\beta$ for Procter and Gamble
  - We were curious to see what the market projected for PG since we calculated a historical $T\beta$ very close to 1.0 at 1.02
  - We calculated a forward-looking $T\beta$ equal to 1.42
Application Choices [continued]

- This is further evidence that the pricing of CSR changes over time
- This forward-looking $T\beta$ approach might be better suited for use with a forward-looking ERP and a forward-looking $\beta = (\beta \times .67 + .33)$
- In any event, a forward-looking $T\beta$ would address the potential mismatch in timing where we use the last 5 years or so to calculate $\beta$ (and $T\beta$) and only look at the firm’s latest Form 10-K to analyze CSR factors
Choices

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

Hmmm... all companies in the S&P 500 have CSR!
### Equity Risk Premiums

<table>
<thead>
<tr>
<th>Risk Free Rate:</th>
<th>4.50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity Risk Premium:</td>
<td>7.20%</td>
</tr>
<tr>
<td>Effective Date:</td>
<td>7/14/2008 (261 weeks)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ticker</th>
<th>Company Name</th>
<th>MSFT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Company Name</td>
<td>Microsoft Corporation</td>
</tr>
<tr>
<td>Size Premium</td>
<td>-0.34%</td>
<td></td>
</tr>
<tr>
<td>Weekly Standard Deviation</td>
<td>2.91%</td>
<td></td>
</tr>
<tr>
<td>Levered Beta</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient (R)</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Total Beta</td>
<td>1.64</td>
<td></td>
</tr>
<tr>
<td><strong>Total Cost of Equity</strong></td>
<td><strong>16.28%</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Company Specific Risk Premium</strong></td>
<td><strong>5.85%</strong></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Ticker</th>
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<td></td>
</tr>
<tr>
<td>Correlation Coefficient (R)</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Total Beta</td>
<td>1.64</td>
<td></td>
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<tr>
<td><strong>Total Cost of Equity</strong></td>
<td><strong>12.68%</strong></td>
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</tr>
<tr>
<td><strong>Company Specific Risk Premium</strong></td>
<td><strong>4.16%</strong></td>
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</table>

**BPM: A New Approach to CSR**
## Statistical Significance

<table>
<thead>
<tr>
<th>Ticker</th>
<th>TCOE</th>
<th>CSRP</th>
<th>Stat. Significance</th>
<th>Trading</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIQ</td>
<td>31.53%</td>
<td>18.87%</td>
<td>99.00%</td>
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<tr>
<td>RDNT</td>
<td>51.36%</td>
<td>38.13%</td>
<td>50.00%</td>
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</tr>
<tr>
<td>MRDG.PK</td>
<td>43.04%</td>
<td>29.82%</td>
<td>50.00%</td>
<td>Thinly</td>
</tr>
<tr>
<td>SCKO.OB</td>
<td>35.96%</td>
<td>23.28%</td>
<td>50.00%</td>
<td>Thinly</td>
</tr>
</tbody>
</table>
Day of the Week

Remember—it’s not just 1 trading day—it’s 1 trading day over five years...

BPM: A New Approach to CSR
The Importance of the Look

Things Change Over Time...
Things Change Over Time…

<table>
<thead>
<tr>
<th>Ticker</th>
<th>ETFC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name</td>
<td>E*TRADE Financial Corporation</td>
</tr>
<tr>
<td>Size Premium</td>
<td>2.20%</td>
</tr>
<tr>
<td>Weekly Standard Deviation</td>
<td>8.03%</td>
</tr>
<tr>
<td>Levered Beta</td>
<td>2.63</td>
</tr>
<tr>
<td>Correlation Coefficient (R)</td>
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<tr>
<td>Total Cost of Equity</td>
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</tr>
<tr>
<td>Company Specific Risk Premium</td>
<td>9.72%</td>
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</table>

<table>
<thead>
<tr>
<th>Ticker</th>
<th>ETFC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name</td>
<td>E*TRADE Financial Corporation</td>
</tr>
<tr>
<td>Size Premium</td>
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<tr>
<td>Weekly Standard Deviation</td>
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<td>Levered Beta</td>
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<td>Total Beta</td>
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<td>Total Cost of Equity</td>
<td>36.77%</td>
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<tr>
<td>Company Specific Risk Premium</td>
<td>11.86%</td>
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</tbody>
</table>
E-Trade (ETFC)

BPM: A New Approach to CSR
Countrywide Financial (CFC)

Country Wide Financial:
Sub-Prime Debacle

Risk-free rate = 5%, ERP = 6%, S&P 500, 5-year look back as of 12/19

BPM: A New Approach to CSR
### Market Proxy

<table>
<thead>
<tr>
<th>Risk Free Rate:</th>
<th>4.50%</th>
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</thead>
<tbody>
<tr>
<td>Equity Risk Premium:</td>
<td>6.30%</td>
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<tr>
<td>Effective Date:</td>
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</table>

<table>
<thead>
<tr>
<th>Ticker</th>
<th>Company Name</th>
<th>AAAPL</th>
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<tbody>
<tr>
<td></td>
<td>Company Name</td>
<td>Apple Inc.</td>
</tr>
<tr>
<td></td>
<td>Size Premium</td>
<td>-0.34%</td>
</tr>
<tr>
<td></td>
<td>Weekly Standard Deviation</td>
<td>5.46%</td>
</tr>
<tr>
<td></td>
<td>Levered Beta</td>
<td>1.41</td>
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<tr>
<td></td>
<td>Correlation Coefficient (R)</td>
<td>0.44</td>
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<td></td>
<td>Total Beta</td>
<td>3.18</td>
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<tr>
<td></td>
<td>Total Cost of Equity</td>
<td>24.53%</td>
</tr>
<tr>
<td></td>
<td>Company Specific Risk Premium</td>
<td>11.50%</td>
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</table>

<table>
<thead>
<tr>
<th>Ticker</th>
<th>Company Name</th>
<th>AAAPL</th>
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<tbody>
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<td>Company Name</td>
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</tr>
<tr>
<td></td>
<td>Size Premium</td>
<td>-0.34%</td>
</tr>
<tr>
<td></td>
<td>Weekly Standard Deviation</td>
<td>5.46%</td>
</tr>
<tr>
<td></td>
<td>Levered Beta</td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient (R)</td>
<td>0.49</td>
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<td></td>
<td>Total Beta</td>
<td>2.42</td>
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<td></td>
<td>Total Cost of Equity</td>
<td>19.75%</td>
</tr>
<tr>
<td></td>
<td>Company Specific Risk Premium</td>
<td>8.11%</td>
</tr>
</tbody>
</table>

Using the S&P 500

Using the NASDAQ Composite

BPM: A New Approach to CSR
Marilyn Ferguson: It's not so much that we're afraid of change or so in love with the old ways, but it's that place in between that we fear . . . .
Practical Exercise

• Subject company: Beeswax, Inc. (BW)

• Guideline companies:
  – CCA Industries (CAW)
  – Scott’s Liquid Gold (SLGD)
  – The Stephan Company (TSC)
  – United Guardian (UG)
## Guidelines

<table>
<thead>
<tr>
<th>Risk-free rate</th>
<th>4.50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity Risk Premium</td>
<td>5.00%</td>
</tr>
<tr>
<td>Effective Date</td>
<td>1/15/2007</td>
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</table>

<table>
<thead>
<tr>
<th>Ticker</th>
<th>CAW</th>
<th>SLGD</th>
<th>TSC</th>
<th>UG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company name</td>
<td>CCA Ind.</td>
<td>Scotts Liquid Gold</td>
<td>Stephan Co.</td>
<td>United-Guardian</td>
</tr>
<tr>
<td>Size Premium</td>
<td>5.80%</td>
<td>5.80%</td>
<td>5.80%</td>
<td>5.80%</td>
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<tr>
<td>Levered Beta</td>
<td>0.38</td>
<td>0.33</td>
<td>-0.03</td>
<td>0.37</td>
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<tr>
<td>R</td>
<td>0.13</td>
<td>0.09</td>
<td>0.01</td>
<td>0.17</td>
</tr>
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<td>R-square</td>
<td>0.02</td>
<td>0.01</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>T-stat</td>
<td>2.03</td>
<td>1.49</td>
<td>0.22</td>
<td>2.75</td>
</tr>
<tr>
<td>Statistical Significance</td>
<td>95.0%</td>
<td>86.0%</td>
<td>17.0%</td>
<td>99.0%</td>
</tr>
<tr>
<td>Total Beta</td>
<td>3.07</td>
<td>3.54</td>
<td>2.17</td>
<td>2.18</td>
</tr>
<tr>
<td>TCOE</td>
<td>19.85%</td>
<td>22.20%</td>
<td>15.30%</td>
<td>15.41%</td>
</tr>
<tr>
<td>CSRP</td>
<td>7.63%</td>
<td>10.27%</td>
<td>5.18%</td>
<td>3.27%</td>
</tr>
</tbody>
</table>
Beeswax’ CSRP = ?

- Review excerpts from 2006 Forms 10-K and information on Beeswax.
- Review excerpts from Yahoo!Finance.com
- Group discussion
The “Takeaways”

• All companies have company-specific risk (CSR).
  – Do not start your build-up of CSR at 0%.
  – Never go negative. 0% is an artificially low starting point.

• **Total beta trumps all other betas** – Little, if any, need to “correct”
total beta or beta
  – Captures 100% of disclosed risks
  – Relatively stable
  – Same reference point we use to value private companies
  – Empirical benchmarks for TCOE!

• **Empirical evidence/support:**
  - TCOE = Risk-free rate + Total Beta*ERP
  - CSRP = (Total Beta – Beta)*ERP – SP.

• **New Approach:** Combination BPM and Factor Models empowers
  the appraiser!
Additional Questions?