Risk Premium Analyzer

Sample Report

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A Word from Duff & Phelps

"ValuSource has done a terrific job creating the Risk Premium Analyzer, which makes the Risk Premium Report an even more valuable resource."

Roger J. Grabowski, ASA | Managing Director | DUFF & PHELPS

Risk Premium Analyzer

The ValuSource Risk Premium Analyzer calculates an equity risk premium, based on the Duff & Phelps Risk Premium Report, for use in the income approach in business valuations. The Duff & Phelps Risk premium report defines company size using the following characteristics:

- market value of equity
- book value of equity
- 5-year average net income
- market value of invested capital
- total assets
- 5-year average EBITDA
- sales
- number of employees
- operating margins
- returns on book value of equity

The Risk Premium Analyzer uses these size characteristics and the data collected in the Duff & Phelps Risk Premium Report to calculate an appropriate equity risk premium for a valuation engagement. The Risk Premium Analyzer automates four functions that are difficult and time consuming to duplicate:

- Exhibits from the Duff & Phelps Risk Premium Report are duplicated in Excel.
- Automatically determines the equity risk premium in a build up model.
- Automatically determines the additional premium in a CAPM model.

§ Automatically determines the risk premium based on fundamental statistics about the subject company profit margin, variability of profit margin and return on equity.

Duff & Phelps Exhibits Duplicated in Excel

The Risk Premium Analyzer duplicates the exhibits from the Duff & Phelps Risk Premium Report in Microsoft® Excel. Having these exhibits in Excel makes it easier to include the information in your working papers, and easier to utilize the information in your work process.

Entering the Subject Company Data

The Risk Premium Analyzer provides a clear, easy-to-use input form for entering the subject company data, with sample data provided to guide you through the process.

Duff & Phelps Exhibit Duplicated in Excel

Companies Ranked by Market Value of Equity — **Exhibit A-1**

Historical Equity Risk Premium: Average Since 1963 — Data for Year Ending December 31, 2007

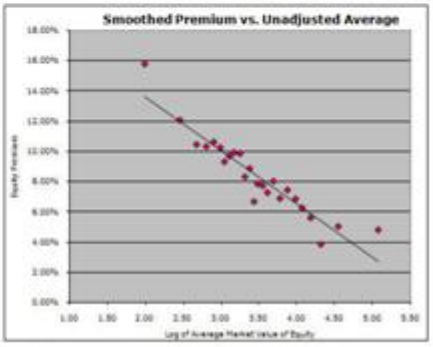
Portfolio Rank by Size	Average Mkt Value ($mils.)	Log of Average Mkt Value	Number as of 2007	Beta (SumBeta) Since '63	Standard Deviation of Returns	Geometric Average Return	Arithmetic Average Return	Arithmetic Equity Risk Premium	Smoothed Average Equity Risk Premium	Average Debt/ MVSC
1	120,872	5.08	42	0.90	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	35,743	4.55	32	0.93	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	21,062	4.32	36	0.97	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	15,402	4.19	36	0.98	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	11,845	4.07	38	0.96	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	9,748	3.99	39	1.02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	7,607	3.88	44	1.01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	6,040	3.78	40	1.09	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	4,966	3.70	41	1.09	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	4,138	3.62	41	1.10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	3,585	3.55	45	1.10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	3,061	3.49	43	1.11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	2,741	3.44	39	1.10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14	2,412	3.38	46	1.14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	2,080	3.32	43	1.14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	1,792	3.25	45	1.14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	1,498	3.18	57	1.21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	1,289	3.11	55	1.21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	1,113	3.05	48	1.24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	983	2.99	61	1.28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
21	807	2.91	77	1.27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22	640	2.81	67	1.28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
23	476	2.68	97	1.24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24	287	2.46	164	1.28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
25	99	1.99	280	1.30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
High financial risk			603	1.62	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

Equity Risk Premium Study: Data Through December 31, 2007
Data Smoothing with Regression Analysis
Dependent Variable: Average Premium
Independent Variable: Log of Average Market Value of Equity

Regression Output

Constant	[illegible]
Std Err of Y Est	[illegible]
R Squared	[illegible]
No. Observations	[illegible]
Degrees of Freedom	[illegible]
X Coefficient(s)	[illegible]
Std Err of Coef.	[illegible]
t-Statistic	[illegible]

Smoothed Premium = 20.591% - 3.515% * Log(Market Value)



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Subject Company Data Input Schedule

Subject Company

Market Value of Equity						million
Book Value of Equity						million
5-year Average Net Income						million
Market Value of Invested Capital						million
Total Assets						million
5-year Average EBITDA						million
Sales						million
Number of Employees						
Risk Free Rate at Date of Valuation						
CAPM Beta						
CAPM Market Risk Premium Estimate						
Year						
Net Sales (millions)						
Operating Income (millions)						
Book Value (millions)						
Net Income b4 Extraordinary Items (millions)						

Sample Input Data

Sample Input

Market Value of Equity		120				million
Book Value of Equity		100				million
5-year Average Net Income		10				million
Market Value of Invested Capital		180				million
Total Assets		300				million
5-year Average EBITDA		30				million
Sales		250				million
Number of Employees		200				
Risk Free Rate at Date of Valuation		4.90%				
CAPM Beta		1.25				
CAPM Market Risk Premium Estimate*		4.85%				
Year	2007	2006	2005	2004	2003	
Net Sales (millions)	900	800	850	750	900	
Operating Income (millions)	150	120	130	80	140	
Book Value (millions)	820	710	630	540	500	
Net Income b4 Extraordinary Items (millions)	110	80	90	40	100	

* The CAPM market risk premium of 4.85% as shown in the example is the historical market risk premium from 1963 through 2007 that is consistent with the equity risk premiums included in Exhibits A-1 through A-8 and D-1 through D-3.

Determines the Equity Risk Premium in Build Up Model

From the subject company data, the Risk Premium Analyzer calculates the equity risk premium in a build up model. The first methodology uses the portfolio sizing for the eight characteristics in the exhibits A-1 through A-8. You choose the portfolio size and the workbook automatically selects the associated equity risk premium.

Build Up Model — First Methodology

Risk Premiums (Market plus Size) over Risk-free rate: Using Guideline Portfolios

	Company Size		Relevant Exhibit	Guideline Portfolio	Premium over Risk-free	Risk-free Rate	Indicated Equity Dsct. Rate
Market Value of Equity	$120	million	A-1	25	[illegible]	[illegible]	[illegible]
Book Value of Equity	$100	million	A-2	25	[illegible]	[illegible]	[illegible]
5-year Average Net Income	$10	million	A-3	25	[illegible]	[illegible]	[illegible]
Market Value of Invested Capital	$180	million	A-4	25	[illegible]	[illegible]	[illegible]
Total Assets	$300	million	A-5	25	[illegible]	[illegible]	[illegible]
5-year Average EBITDA	$30	million	A-6	25	[illegible]	[illegible]	[illegible]
Sales	$250	million	A-7	25	[illegible]	[illegible]	[illegible]
Number of Employees	200		A-8	25	[illegible]	[illegible]	[illegible]
Mean premium					[illegible]		[illegible]
Median premium					[illegible]		[illegible]

The second methodology uses the regression lines in the exhibits A-1 through A-8 to extend the equity risk premium to the subject company size.

Build Up Model — Second Methodology

Risk Premiums (Market plus Size) over Risk-free rate: Using Regression Equations

	Company Size		Relevant Exhibit	Constant term	Slope term	log(Size)	Premium over Risk-free	Risk-free Rate	Indicated Equity Dsct. Rate
Market Value of Equity	$120	million	A-1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Book Value of Equity	$100	million	A-2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5-year Average Net Income	$10	million	A-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Market Value of Invested Capital	$180	million	A-4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Assets	$300	million	A-5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5-year Average EBITDA	$30	million	A-6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sales	$250	million	A-7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number of Employees	200		A-8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean premium							[illegible]		[illegible]
Median premium							[illegible]		[illegible]

Determines the Additional Premium in CAPM Model

From the subject company data, the Risk Premium Analyzer calculates the additional premium in a CAPM model. The first methodology uses the portfolio sizing for the eight characteristics in the

exhibits B-1 through B-8. You choose a portfolio size and the workbook automatically selects the associated premium over CAPM.

CAPM Model — First Methodology

Risk Premiums over CAPM: Using Guideline Portfolios

	Company Size		Relevant Exhibit	Guideline Portfolio	Premium over CAPM	Risk-free Rate	CAPM Market Premium	Indicated Equity Dsct. Rate
Market Value of Equity	$120	million	B-1	25	[illegible]	[illegible]	[illegible]	[illegible]
Book Value of Equity	$100	million	B-2	25	[illegible]	[illegible]	[illegible]	[illegible]
5-year Average Net Income	$10	million	B-3	25	[illegible]	[illegible]	[illegible]	[illegible]
Market Value of Invested Capital	$180	million	B-4	25	[illegible]	[illegible]	[illegible]	[illegible]
Total Assets	$300	million	B-5	25	[illegible]	[illegible]	[illegible]	[illegible]
5-year Average EBITDA	$30	million	B-6	25	[illegible]	[illegible]	[illegible]	[illegible]
Sales	$250	million	B-7	25	[illegible]	[illegible]	[illegible]	[illegible]
Number of Employees	200		B-8	25	[illegible]	[illegible]	[illegible]	[illegible]
Mean Premium					[illegible]			[illegible]
Median Premium					[illegible]			[illegible]

The second methodology uses the regression lines in the exhibits B-1 through B-8 to extend the premium over CAPM to the subject company size.

CAPM Model — Second Methodology

Risk Premiums over CAPM: Using Regression Equations

	Company Size		Relevant Exhibit	Constant term	Slope term	log(Size)	Premium over CAPM	Risk-free Rate	CAPM Equity Premium	Indicated Equity Dsct. Rate
Market Value of Equity	$120	million	B-1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Book Value of Equity	$100	million	B-2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5-year Average Net Income	$10	million	B-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Market Value of Invested Capital	$180	million	B-4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Assets	$300	million	B-5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5-year Average EBITDA	$30	million	B-6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sales	$250	million	B-7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number of Employees	200		B-8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean Premium							[illegible]			[illegible]
Median Premium							[illegible]			[illegible]

Determines the Risk Premium Based On Fundamental Statistics

From the subject company data, the Risk Premium Analyzer calculates the risk premium based on fundamental statistics about the subject company profit margin, variability of profit margin and return on equity. The first methodology uses the portfolio sizing for the characteristics in the exhibits D-1 through D-3. You input a portfolio matching the fundamental statistics about your subject company profit margin, variability of profit margin and return on equity and the workbook automatically selects the associated risk premium.

Fundamental Statistics — First Methodology

Equity Risk Premiums over Risk-free Rate: Using Guideline Portfolios	Company Indicator	Relevant Exhibit	Guideline Portfolio	Premium over Riskless	Risk-free Rate	Indicated Equity Dsct. Rate
Operating Margin	14.6%	D-1	25	[illegible]	[illegible]	[illegible]
CV(Operating Margin)	15.8%	D-2	25	[illegible]	[illegible]	[illegible]
CV(ROE)	34.7%	D-3	25	[illegible]	[illegible]	[illegible]
Mean Premium				[illegible]		[illegible]
Median Premium				[illegible]		[illegible]

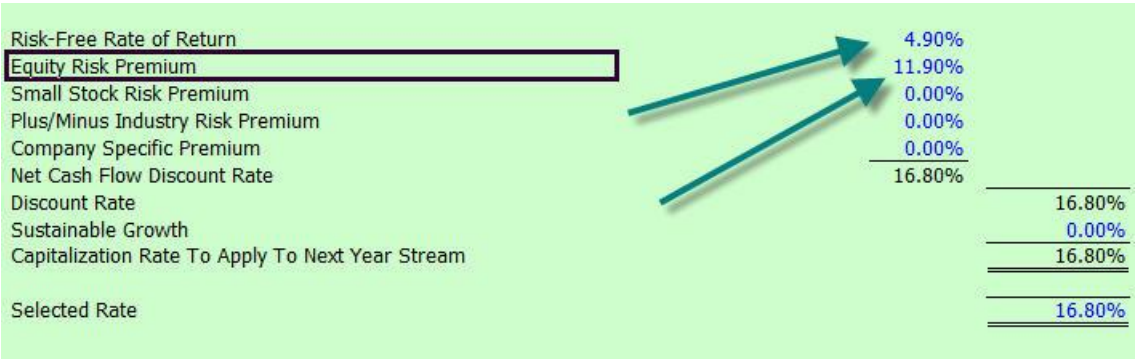
The second methodology uses the regression lines in the exhibits D-1 through D-3 to extend the risk premium to the subject company fundamental statistics.

Fundamental Statistics — Second Methodology

Equity Risk Premiums over Risk-free Rate: Using Regression Equations	Company Indicator	Relevant Exhibit	Constant term	Slope term	log(Size)	Premium over Risk-free	Risk-free Rate	Indicated Equity Dsct. Rate
Operating Margin	14.6%	D-1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CV(Operating Margin)	15.8%	D-2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CV(ROE)	34.7%	D-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean Premium						[illegible]		[illegible]
Median Premium						[illegible]		[illegible]

Using the Risk Premium in ValuSource Valuation Applications

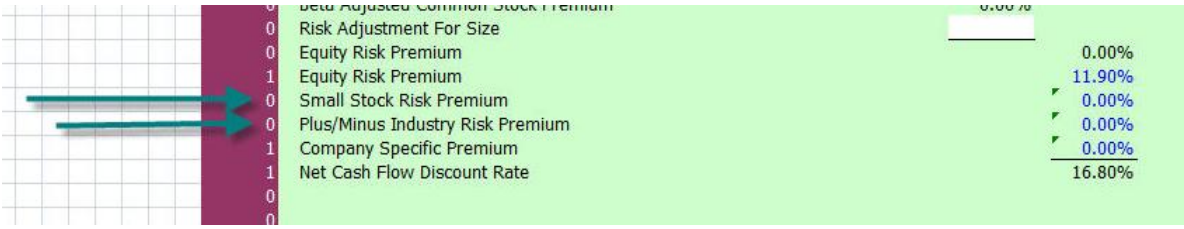
To use the risk premium in a ValuSource valuation application—ValuSource Pro, BVM Pro or EBV—the most common approach is to use the Build Up model. Select the appropriate rate schedule, type in the risk free rate of return that you entered in the Risk Premium Analyzer, and type in the equity risk premium. In the example below, the risk free rate is 4.9% and the equity risk premium is 11.9%.



Risk-Free Rate of Return	4.90%	
Equity Risk Premium	11.90%	
Small Stock Risk Premium	0.00%	
Plus/Minus Industry Risk Premium	0.00%	
Company Specific Premium	0.00%	
Net Cash Flow Discount Rate	16.80%	
Discount Rate		16.80%
Sustainable Growth		0.00%
Capitalization Rate To Apply To Next Year Stream		16.80%
Selected Rate		16.80%

Next, hide the rows for the Small Stock Risk Premium and the Plus/Minus Industry Risk Premium. Note that if the Industry Premium is used, read the Duff and Phelps Risk Premium Report that is

included as a PDF file for the cautions and instructions and do not hide the row. To hide the rows, you go out to Excel (see your valuation application's help for instructions) and enter a zero in column J on the rows that you want to hide.



When you return to your ValuSource valuation application, the rows will be hidden.

Full Duff & Phelps Risk Premium Report Included as PDF

The full Duff & Phelps Risk Premium Report is included as a PDF file.

Please Note: To understand the risk premiums calculated by the ValuSource Risk Premium Analyzer, and to effectively apply them in a valuation engagement, it is essential to first read the full Duff & Phelps Risk Premium Report.