

BEFORE THE
SURFACE TRANSPORTATION BOARD

ENTERED
Office of Proceedings
May 11, 2017
Part of
Public Record

RAILROAD COST OF CAPITAL --	)	EP 558 (Sub-No. 20)
2016	)	

REPLY STATEMENT OF THE WESTERN COAL TRAFFIC LEAGUE

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Dated: May 11, 2017

Its Attorneys

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RAILROAD COST OF CAPITAL --) EP 558 (Sub-No. 20)
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REPLY STATEMENT OF THE WESTERN COAL TRAFFIC LEAGUE

Pursuant to notice that the Surface Transportation Board (“STB” or “Board”) served in EP 558 (Sub-No. 20) on February 28, 2017, the Western Coal Traffic League (“WCTL”)¹ submits its reply statement in response to the opening statement that the Association of American Railroads (“AAR” or “Railroads”) filed on April 20, 2017.

The AAR appears to have followed the Board’s established methodology for estimating the cost of capital (“COC”) for the railroad industry for 2016 at 8.86%. However, that is not, or at least should not be, the end of the matter for two reasons.

First, the AAR omitted data on individual bond prices from its cost of debt (“COD”) calculations on the grounds that the data is proprietary to Bloomberg. The more appropriate approach, standard in other Board proceedings, is to submit such data under motion for protective order, to allow review by the Board and other parties.

¹ WCTL is a voluntary association, whose regular membership consists entirely of shippers of coal mined west of the Mississippi River that is transported by rail. WCTL members currently ship and receive in excess of 125 million tons of coal by rail each year. WCTL’s members are: Ameren Missouri, Arizona Electric Power Cooperative, Inc., Austin Energy (City of Austin, Texas), CLECO Corporation, CPS Energy, Entergy Services, Inc., Kansas City Power & Light Company, Lower Colorado River Authority, MidAmerican Energy Company, Minnesota Power, Nebraska Public Power District, Omaha Public Power District, Western Fuels Association, Inc., and Wisconsin Public Service Corporation.

Second, and more importantly, there is value in continuing to consider what COC would apply under alternative approaches. In that regard, WCTL is separately submitting a second petition for reconsideration in EP 664 (Sub-No. 2) that explains that the Board still has not meaningfully addressed the buyback problem under its Multi-Stage Discounted Cash Flow model (“MSDCF”) for calculating the cost of equity (“COE”). The petition also explains how the Board’s failure to make an adjustment for buybacks under the MSDCF is contrary to agency precedent where an adjustment was made for the dilution in earnings per share (“EPS”) resulting from new issuances.

The Board should be aware of what the financial and investment community considers to be a reasonable estimate for the COC and how that community would calculate the COE using the standard model, the Capital Asset Pricing Model (“CAPM”), and standard inputs.

2. 7.47% REPRESENTS THE COC USED BY THE FINANCIAL AND INVESTMENT COMMUNITY

Morgan Stanley, a respected investment bank, regularly addresses the weighted average cost of capital (“WACC”) of railroads. Morgan Stanley issued such information as part of *Freight Transportation, 4Q16 Preview & 2017 Debates: The Kitchen Sink Quarter* (January 9, 2017), excerpt included as Exhibit A. The report was issued very shortly after the end of calendar year 2016, which is the period covered by the 2016 COC determination, and before the railroads released their financial data for 4Q16 and full-year 2016 or had their earnings calls. The report thus considers the same information utilized in the Board’s cost of capital analysis for 2016 and provides an

appropriate benchmark for the cost of capital for 2016. See, e.g., the Verified Statement of AAR witness John Gray (“Gray VS”) at 40, citing *Railroad Cost of Capital–2008*, EP 558 (Sub-No. 12) (STB served Sept. 25, 2008).

Table 1 below² presents the WACC calculated by Morgan Stanley data for each of the four carriers included in the Board’s composite sample and weights them according to the market capitalization utilized by the AAR (Gray VS at 24, Table 10)³ in order to develop an industry average WACC:

Table 1 Calculation of Industry Average Cost of Capital Using Morgan Stanley Weighted Average Cost of Capital and AAR Market Capitalization			
Carrier	Morgan Stanley Cost of Capital	AAR Market Capitalization	Weighted Cost of Capital
CSX	7.3%	19.62%	1.43%
KSU	7.2%	6.97%	0.50%
NSC	7.4%	19.09%	1.41%
UNP	7.1%	54.32%	3.86%
Total		100%	7.20%
Sources: Morgan Stanley Report and Gray VS at 24.			

The Morgan Stanley figures may incorporate an income tax shield for debt. The impact of such a debt shield can be estimated by multiplying the AAR’s percentage of debt (21.09%) times the AAR’s cost of debt (3.64%) times the corporate tax rate (35%), which amounts to 0.27% or 27 basis points. Increasing the 7.20% figure derived in Table 1 by 27 basis points results in an industry average COC of 7.47%.

² The tables are included in the accompanying e-workpapers and will be made available to any party upon request

³ The COC values for the four carriers are so close that the weighting has little impact on the average, e.g., the median and simple average values are both 7.25%. Their closeness further indicates that the wider dispersion in the MSDCF COE values (Gray VS at 47) is suspect and the supposed precision of the hybrid methodology is illusory.

The 7.47% is 139 basis points less than the AAR's figure of 8.86%. Stated differently, the AAR overstates the COC by 18.6% relative to the Morgan Stanley values ($1.39\% \div 7.47\% = 18.6\%$). An 18.6% difference represents a very major disparity. While the 8.86% figure calculated by the AAR for 2016 may represent a very significant reduction from the 2015 value, the proposed 2016 value remains substantially overstated.

Furthermore, the Board assigns great importance to achieving stability in the COC.⁴ It is thus appropriate to note in that regard that the Morgan Stanley 7.47% figure for the 2016 COC is nearly identical to the 7.5% benchmark that WCTL derived in the comments it submitted concerning the 2015 COC (WCTL Reply, EP 558 (Sub-No. 19), filed May 11, 2016, at 4), based on an early 2016 Morgan Stanley report. In the case of the 2016 calculation, it is the Board's "hybrid" methodology that results in far greater volatility.

3. A PROPER CAPM ANALYSIS AND MARKET RISK PREMIUM CONFIRMS THE SOUNDNESS OF A 7.47% COC

The AAR CAPM analysis uses an historical market risk premium ("MRP") of 6.94%, as compiled by Duff & Phelps based on data starting from 1926. Gray VS at 30. However, Duff & Phelps itself recommends use of a 5.5% MRP as of January 31, 2016. See <http://www.duffandphelps.com/insights/publications/cost-of-capital/duff->

⁴ See, e.g., Decision in EP 664 (Sub-No. 2) (STB served Apr. 28, 2017), at 4 ("combining the CAPM and MSDCF reduces variability, leading to a more stable overall result—a legitimate interest for regulators such as the Board"), n.3 ("the regulatory interest in limiting volatility is an appropriate consideration"), and 12 ("it is not error to prefer our existing approach to one that will result in ... higher volatility").

phelps-increases-recommended-us-equity-risk-premium-from-5-0-to-5-5. Professor Damodaran recommends an implied premium for the end of 2016 that is very similar.⁵

Table 2 below derives a CAPM COE of 8.52% utilizing the Duff & Phelps recommended MRP of 5.5% and the AAR's other inputs for beta and the risk-free rate:

Table 2 Calculation of CAPM Cost of Equity Using Duff & Phelps MRP and AAR Inputs for Beta and Risk-Free Rate			
Calculation of CAPM Cost of Equity			
MRP	Beta	Risk-Free Rate	Cost of Equity
5.5%	1.1467	2.22%	6.31% + 2.22% = 8.53%
Sources: Duff & Phelps Market Risk Premium and Gray VS at 36.			

The 8.53% is considerably lower than the COEs calculated by the AAR using both the CAPM (10.18%) and MSDCF (10.44%).

Table 3 below derives an overall COC of 7.50% using the COE in Table 2 and the other inputs (cost of debt and component weights⁶) from the AAR's filing:

Table 3 Calculation of Cost of Capital Based on CAPM COE Using Duff & Phelps MRP and Other Inputs from AAR			
	Value	Weight	Weighted Value
Cost of Equity	8.53%	78.91%	6.73%
Cost of Debt	3.64%	21.09%	0.77%
Weighted Average Cost of Capital			7.50%
Sources: Cost of Equity from Table 2, and Cost of Debt and Weight of Equity and Debt from Gray VS at 54.			

⁵ Professor Damodaran derives an implied MRP of 5.69% for the end of 2016, but the value rests on a 10-year Treasury bond as the risk-free rate. A. Damodaran, *Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2017 Edition* (Updated: March 2017), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2947861, at 35 n.65, 141 (excerpts included as Exhibit B).

⁶ The analysis disregards KCS's preferred equity because its impact is insignificant, as shown by Table No. 20 of Gray VS at 53.

The 7.50% figure based on the CAPM analysis using the MRP recommended by Duff & Phelps is extremely close to the 7.47% derived in Table 1 using the Morgan Stanley figures. The closeness of the two figures (within 0.4%) confirms the reasonableness of the Morgan Stanley figures, the soundness of the CAPM methodology and the MRP recommended by Duff & Phelps for approximating the values used by the financial and investment community, and the unreasonableness of the results generated by using the Board's hybrid COE methodology with its specified inputs.

Furthermore, the equivalent calculation for the 2015 COC was 7.70%.⁷ The annual change in the CAPM-only figure using the Duff & Phelps MRP and other AAR inputs (2.6%)⁸ is far less than the annual change under the AAR's calculations. Again, the Board's hybrid methodology should not be presumed to be superior in furthering the Board's objectives of maintaining stability and avoiding volatility.

CONCLUSION

While there might not be a single, correct way to estimate the COE and COC, whatever good might potentially be gained by relying on two COE methodologies is lost when both methodologies consistently fail to approximate the COE and COC as perceived by the financial and investment community. The inaccuracy might be more tolerable if the inaccuracies balanced out, *i.e.*, the values were too high in some years and too low in others, but the MSDCF and even the CAPM values have been overstated since

⁷ WCTL Reply Statement in *Railroad Cost of Capital–2015*, EP 558 (Sub-No. 19), filed May 11, 2016, at 9.

⁸ $7.5\% \div 7.7\% = 0.974$, and $1.000 - 0.974 = 0.026$.

the Board started using the hybrid methodology for 2008. The need for stability does not begin to justify such a sacrifice of accuracy in ascertaining the opportunity cost of capital, *i.e.*, the return needed to attract and retain capital.

The problems persist in 2016. The 2016 COC, while lower than the 2015 value, remains substantially overstated – by 18.6% compared to the figures compiled by Morgan Stanley, a respected investment bank. Moreover, the Morgan Stanley-based 7.47% COC can be easily replicated by using the AAR’s CAPM calculations and simply substituting the MRP recommended by Duff & Phelps. Again, no evidence has been presented that the financial and investment community considers the values derived under the Board’s hybrid methodology to have any credibility. Furthermore, the COCs calculated in 2016 using either Morgan Stanley figures or those resulting from using a more representative MRP are very close to the 2015 values, far more so than the COC calculated under the Board’s methodology, and thus provide greater stability.

Accordingly, the Board should adopt a railroad COC for 2016 of 7.47%.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on this 11th day of May 2017, I have caused true and accurate copies of the foregoing Reply Statement of the Western Coal Traffic League to be served upon all parties on the service list in EP 558 (Sub-No. 20) by first class mail, postage prepaid, or by more expeditious means.

/s/ Robert D. Rosenberg

EXHIBIT A

Excerpt from

Freight Transportation, 4Q16 Preview & 2017 Debates: The Kitchen Sink Quarter

(Morgan Stanley, January 9, 2017)

January 9, 2017 10:00 AM GMT

Freight Transportation

4Q16 Preview & 2017 Debates:
The Kitchen Sink Quarter?

Investors seem to be willing to shrug off bad news with all eyes on policy changes in 2017. This distraction + uncertainty ahead of key inflection points in mid 2017 could keep FY guide in check for now.

Do stocks have a hall pass this quarter? With the group trading close to record valuations (20x TMF P/E vs prior peak of 24x and hist. avg. of 17.5x) reflecting the market's optimism on policy tailwinds to come, we believe it will take severely bad news to break a stock here. Consider SWFT, which guided to 1H17 EPS approx 25% lower than consensus but saw the stock give up <10% of its YTD gains for the year. Or FDX reporting a ~10% core miss in F2Q vs. expectations but saw the stock fall 3% the next day. **Investors appear to be in a forgiving mood holding out for tailwinds to come. We would not be surprised if management teams take advantage of this by kitchen sinking 4Q and sand bagging 2017 guidance.** Indeed, macro and policy uncertainty may also leave them with no other choice.

We expect a relatively uneventful 4Q earnings season with the odd beats and a handful of misses where expectations have not reset enough. The bigger focus is likely to be on any evidence providing direction to several inflection points facing the sector around mid 2017. We believe the uncertainty around those inflection points together with policy opacity could result in 2017 guidance being a tale of two halves (like SWFT) or generally conservative as mgmt teams keep their powder dry.

Here is what we will be looking for by sector in 4Q:

(1) Rails – Beats at Volume/RTM Outperformers (CSX, NSC, UNP and CNR); Forward Guidance May Be Vague/Qualitative Given End Market Uncertainty. We expect modest beats at NSC, UNP, and CNR, that all saw carloads/RTM trends inline or stronger than mgmt's expectations. **CSX is likely to be the highlight of the Rail season, however, as we believe cons. is mis-modeling the benefit of an extra week in 4Q, resulting in 4Q vols +4.5% vs. guidance of flat to slightly up YoY.** On the other hand, we expect a miss at CP as RTMs fell below mgmt's expectations and note that while 2017 core guidance is likely to be fine (if conservative, given new mgmt), EPS guidance may disappoint as it may exclude share buybacks (unlike MSe/cons.). We also expect KSU to miss cons. driven by difficult YoY expense comps and additional costs from operational inefficiencies. We are not optimistic that KSU's forward commentary will be particularly encouraging given recent Mexico news and an anti-trade political backdrop.

(2) TLs – Inlines (SWFT, KNX) and Misses (HTLD, WERN) in 4Q; Tale of Two Halves in 2017. TL industry fundamentals held up in 4Q as the spot market saw

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In-Line

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For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

Appendix: MS Valuation Case Summary

Exhibit 36: Morgan Stanley Transportation Coverage Universe: MS Valuation Case Summary

1/6/2017 Ticker	MS Rating	Current Price	Price Target	TMF Upside %	Rank	PT Multiples MSe TMF P/E	Valuation Methodology
Rails - Analyst: Ravi Shanker							
CNR	OW	\$91.45	\$92	1%	6	16.5	We use a 10-year DCF assuming 6.8% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 10.0x). Our DCF valuation implies a fwd P/E of 16.5x, which is relatively inline with CNR's 5-year average given our cautious outlook on the rail industry.
CP	OW	\$196.74	\$208	6%	4	14.9	We use a 10-year DCF assuming 6.9% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 10.0x). Our DCF valuation implies a fwd P/E of 14.9x, which is below CP's 5-year average given our cautious outlook on the rail industry.
CSX	UW	\$37.52	\$24	-36%	22	11.4	We use a 10-year DCF assuming 7.3% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 7.0x). Our DCF valuation implies a fwd P/E of 11.4x, which is below CSX's historical 5-yr. average reflecting secular pressures.
GWR	EW	\$72.54	\$70	-4%	7	17.3	We apply a 17.3x multiple to our January 2018e TMF EPS est. to generate our PT of \$70. Our January 2018e TMF P/E multiple is inline with GWR's historical trading range. Our valuation is supported by our DCF which assumes a 7.5% WACC and 2% perpetual growth rate.
KSU	EW	\$83.81	\$88	5%	5	15.6	We use a 10-year DCF assuming 7.2% WACC and terminal cash flow perpetual growth rate of 3.0% (implying an exit EBITDA multiple of 8.0x). Our DCF valuation implies a fwd P/E of 15.6x, which is below KSU's historical avg. given our cautious outlook on rails.
NSC	UW	\$111.66	\$73	-35%	21	11.2	We use a 10-year DCF assuming 7.4% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 6.0x). Our DCF valuation implies a fwd P/E of 11.2x, which is below NSC's historical avg. given our cautious outlook on rails.
UNP	OW	\$103.19	\$97	-6%	10	15.2	We use a 10-year DCF assuming 7.1% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 9.0x). Our DCF valuation implies a fwd P/E of 15.2x, which is below UNP's historical 5-year avg. reflecting secular growth headwinds.
Average				-10%		14.6	
Parcel/Airfreight - Analyst: Ravi Shanker							
FDX	EW	\$190.25	\$135	-29%	19	10.6	We use a 10-year DCF assuming 7.3% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 6.0x). Our DCF valuation implies December 2018e TMF PE of 10.6x, which is below historical average given competitive secular threats.
UPS	UW	\$115.40	\$87	-25%	17	13.9	We use a 10-year DCF assuming 7.2% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 8.0x). Our DCF valuation implies July 2018e TMF PE of 13.9x, which is below historical average given competitive secular threats.
Average				-27%		12.2	
Logistics - Analyst: Ravi, Shanker							
CHRW	UW	\$74.15	\$59	-20%	15	16.0	We use a 10-year DCF assuming 6.5% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 11.0x). Our DCF valuation implies January 2018e TMF PE of 16.0x, which is below CHRW's historical avg. given structural headwinds.
ECHO	OW	\$24.90	\$29	16%	3	16.7	We apply a 16.7x multiple to our January 2018 TMF EPS est. to generate a price target of \$29. Our January 2018 TMF P/E multiple is in-line with ECHO's historical trading range. Our valuation is supported by our DCF which assumes a 10.2% WACC and 2.5% perpetual growth rate.
EXPD	EW	\$53.13	\$48	-10%	11	17.5	We apply a 17.5x multiple to our January 2018 TMF EPS est. to generate a price target of \$48. Our January 2018 TMF P/E multiple is below EXPD's historical trading range. Our valuation is supported by our DCF which assumes a 8% WACC and 1.5% perpetual growth rate.
HUBG	EW	\$43.85	\$42	-4%	9	16.8	We apply a 16.8x multiple to our January 2018 TMF EPS est. to generate a price target of \$42. Our January 2018 TMF P/E multiple is in-line with HUBG's historical trading range. Our valuation is supported by our DCF which assumes a 8% WACC and 2% perpetual growth rate.
JBHT	EW	\$97.69	\$82	-16%	14	18.1	We apply a 18.1x multiple to our January 2018 TMF EPS est. to generate a price target of \$82. Our January 2018 TMF P/E multiple is in-line with JBHT's historical trading range. Our valuation is supported by our DCF which assumes a 6.7% WACC and 2% perpetual growth rate.
LSTR	UW	\$84.80	\$63	-26%	18	16.8	We apply a 16.8x multiple to our January 2018 TMF EPS est. to generate a price target of \$63. Our January 2018 TMF P/E multiple is in-line with LSTR's historical trading range. Our valuation is supported by our DCF which assumes a 8.2% WACC and 1.5% perpetual growth rate.
XPO	OW	\$43.68	\$51	17%	2	NM	We use a 10-year DCF assuming 10.2% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 6.0x). Our DCF valuation implies January 2018e TMF EV/EBITDA of 8.0x, which is the average of asset-light and asset-heavy transport multiples as XPO generates half of its EBITDA from asset-heavy business and half from asset-light.
Average				-6%		15.7	
Truckload - Analyst: Ravi Shanker							
HTLD	UW	\$20.12	\$16	-20%	16	22.3	We use a 10-year DCF assuming 8.5% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 6.0x). Our DCF valuation implies January 2018 TMF PE of 22.3x, which is inline with historical trading range
KNX	OW	\$32.60	\$28	-14%	13	18.0	We use a 10-year DCF assuming 8.2% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 6.0x). Our DCF valuation implies January 2018 TMF PE of 18.0x, which is inline with historical average
SWFT	OW	\$23.91	\$29	21%	1	16.5	We use a 10-year DCF assuming 8.3% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 7.0x). Our DCF valuation implies January 2018 TMF PE of 16.5x, which trades at a discount vs. peers
WERN	OW	\$26.95	\$26	-4%	8	17.0	We use a 10-year DCF assuming 7.8% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 5.0x). Our DCF valuation implies a fwd P/E of 17.0x, which is inline with historical average.
Average				-4%		18.4	
Less-Than-Truckload - Analyst: Ravi Shanker							
ARCB	EW	\$28.40	\$20	-30%	20	10.1	We use a 10-year DCF assuming 10.0% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 3.0x). Our DCF implies January 2018e TMF PE of 10.1x, which is below ARCB's historical avg. given its size and lagging operating metrics.
ODFL	OW	\$86.10	\$77	-11%	12	16.0	We use a 10-year DCF assuming 6.9% WACC and terminal cash flow perpetual growth rate of 2.5% (implying an exit EBITDA multiple of 6.0x). Our DCF valuation implies January 2018e TMF PE of 16.0x, which is inline with ODFL's historical average.
SAIA	UW	\$44.88	\$28	-38%	23	11.9	We use a 10-year DCF assuming 7.0% WACC and terminal cash flow perpetual growth rate of 2.0% (implying an exit EBITDA multiple of 5.0x). Our DCF implies January 2018e TMF PE of 11.9x, which is below SAIA's historical avg. reflecting its mid-pack status among peers.
Average				-26%		12.7	

Source: Company data, Thomson Reuters, Morgan Stanley Research.

EXHIBIT B

Excerpts from Aswath Damodaran

*Equity Risk Premiums (ERP): Determinants, Estimation and Implications –
The 2017 Edition*

(Updated: March 2017)

**Equity Risk Premiums (ERP): Determinants, Estimation and
Implications – The 2017 Edition**

Updated: March 2017

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In closing, the averaging approach used clearly matters. Arithmetic averages will be yield higher risk premiums than geometric averages, but using these arithmetic average premiums to obtain discount rates, which are then compounded over time, seems internally inconsistent. In corporate finance and valuation, at least, the argument for using geometric average premiums as estimates is strong.

Estimates for the United States

The questions of how far back in time to go, what risk free rate to use and how to average returns (arithmetic or geometric) may seem trivial until you see the effect that the choices you make have on your equity risk premium. Rather than rely on the summary values that are provided by data services, we will use raw return data on stocks, treasury bills and treasury bonds from 1928 to 2016 to make this assessment.⁶⁵ In figure 3, we begin with a chart of the annual returns on stock, treasury bills and bonds for each year:

⁶⁵ The raw data for treasury rates is obtained from the Federal Reserve data archive (<http://research.stlouisfed.org/fred2/>) at the Fed site in St. Louis, with the 3-month treasury bill rate used for treasury bill returns and the 10-year treasury bond rate used to compute the returns on a constant maturity 10-year treasury bond. The stock returns represent the returns on the S&P 500. Appendix 1 provides the returns by year on stocks, bonds and bills, by year, from 1928 through the current year.

Appendix 6: Year-end Implied Equity Risk Premiums: 1961-2015

These estimates of equity risk premium for the S&P 500 are forward looking and are computed based on the index level at the end of each year and the expected cash flows on the index for the future. The cash flows are computed as dividends plus stock buybacks in each year.

<i>Year</i>	<i>S&P 500</i>	<i>Earnings^a</i>	<i>Dividends^a</i>	<i>T.Bond Rate</i>	<i>Estimated Growth</i>	<i>Implied Premium</i>
1961	71.55	3.37	2.04	2.35%	2.41%	2.92%
1962	63.1	3.67	2.15	3.85%	4.05%	3.56%
1963	75.02	4.13	2.35	4.14%	4.96%	3.38%
1964	84.75	4.76	2.58	4.21%	5.13%	3.31%
1965	92.43	5.30	2.83	4.65%	5.46%	3.32%
1966	80.33	5.41	2.88	4.64%	4.19%	3.68%
1967	96.47	5.46	2.98	5.70%	5.25%	3.20%
1968	103.86	5.72	3.04	6.16%	5.32%	3.00%
1969	92.06	6.10	3.24	7.88%	7.55%	3.74%
1970	92.15	5.51	3.19	6.50%	4.78%	3.41%
1971	102.09	5.57	3.16	5.89%	4.57%	3.09%
1972	118.05	6.17	3.19	6.41%	5.21%	2.72%
1973	97.55	7.96	3.61	6.90%	8.30%	4.30%
1974	68.56	9.35	3.72	7.40%	6.42%	5.59%
1975	90.19	7.71	3.73	7.76%	5.99%	4.13%
1976	107.46	9.75	4.22	6.81%	8.19%	4.55%
1977	95.1	10.87	4.86	7.78%	9.52%	5.92%
1978	96.11	11.64	5.18	9.15%	8.48%	5.72%
1979	107.94	14.55	5.97	10.33%	11.70%	6.45%
1980	135.76	14.99	6.44	12.43%	11.01%	5.03%
1981	122.55	15.18	6.83	13.98%	11.42%	5.73%
1982	140.64	13.82	6.93	10.47%	7.96%	4.90%
1983	164.93	13.29	7.12	11.80%	9.09%	4.31%
1984	167.24	16.84	7.83	11.51%	11.02%	5.11%
1985	211.28	15.68	8.20	8.99%	6.75%	3.84%
1986	242.17	14.43	8.19	7.22%	6.96%	3.58%
1987	247.08	16.04	9.17	8.86%	8.58%	3.99%
1988	277.72	24.12	10.22	9.14%	7.67%	3.77%
1989	353.4	24.32	11.73	7.93%	7.46%	3.51%
1990	330.22	22.65	12.35	8.07%	7.19%	3.89%
1991	417.09	19.30	12.97	6.70%	7.81%	3.48%
1992	435.71	20.87	12.64	6.68%	9.83%	3.55%
1993	466.45	26.90	12.69	5.79%	8.00%	3.17%
1994	459.27	31.75	13.36	7.82%	7.17%	3.55%

1995	615.93	37.70	14.17	5.57%	6.50%	3.29%
1996	740.74	40.63	14.89	6.41%	7.92%	3.20%
1997	970.43	44.09	15.52	5.74%	8.00%	2.73%
1998	1229.23	44.27	16.20	4.65%	7.20%	2.26%
1999	1469.25	51.68	16.71	6.44%	12.50%	2.05%
2000	1320.28	56.13	16.27	5.11%	12.00%	2.87%
2001	1148.09	38.85	15.74	5.05%	10.30%	3.62%
2002	879.82	46.04	16.08	3.81%	8.00%	4.10%
2003	1111.91	54.69	17.88	4.25%	11.00%	3.69%
2004	1211.92	67.68	19.407	4.22%	8.50%	3.65%
2005	1248.29	76.45	22.38	4.39%	8.00%	4.08%
2006	1418.3	87.72	25.05	4.70%	12.50%	4.16%
2007	1468.36	82.54	27.73	4.02%	5.00%	4.37%
2008	903.25	65.39	28.05	2.21%	4.00%	6.43%
2009	1115.10	59.65	22.31	3.84%	7.20%	4.36%
2010	1257.64	83.66	23.12	3.29%	6.95%	5.20%
2011	1257.60	97.05	26.02	1.87%	7.18%	6.01%
2012	1426.19	102.47	30.44	1.76%	5.27%	5.78%
2013	1848.36	107.45	36.28	3.04%	4.28%	4.96%
2014	2058.90	114.74	38.57	2.17%	5.58%	5.78%
2015	2043.90	106.32	43.16	2.27%	5.51%	6.12%
2016	2238.83	108.86	45.03	2.45%	5.54%	5.69%

^a The earnings and dividend numbers for the S&P 500 represent the estimates that would have been available at the start of each of the years and thus may not match up to the actual numbers for the year. For instance, in January 2011, the estimated earnings for the S&P 500 index included actual earnings for three quarters of 2011 and the estimated earnings for the last quarter of 2011. The actual earnings for the last quarter would not have been available until March of 2011.

Table 2 Calculation of CAPM Cost of Equity Using Duff & Phelps MRP and AAR Inputs for Beta and Risk-Free Rate			
Calculation of CAPM Cost of Equity			
MRP	Beta	Risk-Free Rate	Cost of Equity
5.50%	1.1467	6.31%	8.53%
or (6.31% + 2.22%)			
Sources: Duff & Phelps Market Risk Premium and Gray VS at 36.			