BEFORE THE WASHINGTON

UTILITIES & TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,

Complainant,

v.

PUGET SOUND ENERGY, INC.

Respondent.

DOCKETS UE-240004 & UG-240005 (*Consolidated*)

J. R. WOOLRIDGE
ON BEHALF OF THE
WASHINGTON STATE OFFICE OF THE ATTORNEY GENERAL
PUBLIC COUNSEL UNIT

EXHIBIT JRW-8

Capital Asset Pricing Model Study

August 6, 2024

Exhibit JRW-8

Puget Sound Energy
Capital Asset Pricing Model

Panel A
Electric Proxy Group***

Risk-Free Interest Rate	4.25%
Beta*	0.81
Ex Ante Market Risk Premium**	5.00%
CAPM Cost of Equity	8.30%

* See page 3 of Exhibit JRW-8
** See pages 5 and 6 of Exhibit JRW-8
*** CAPM ROE rounded to nearest 0.05%.

Panel B
Bulkley Proxy Group***

Risk-Free Interest Rate	4.25%
Beta*	0.80
Ex Ante Market Risk Premium**	5.00%
CAPM Cost of Equity	8.25%

* See page 3 of Exhibit JRW-8
** See pages 5 and 6 of Exhibit JRW-8
*** CAPM ROE rounded to nearest 0.05%.

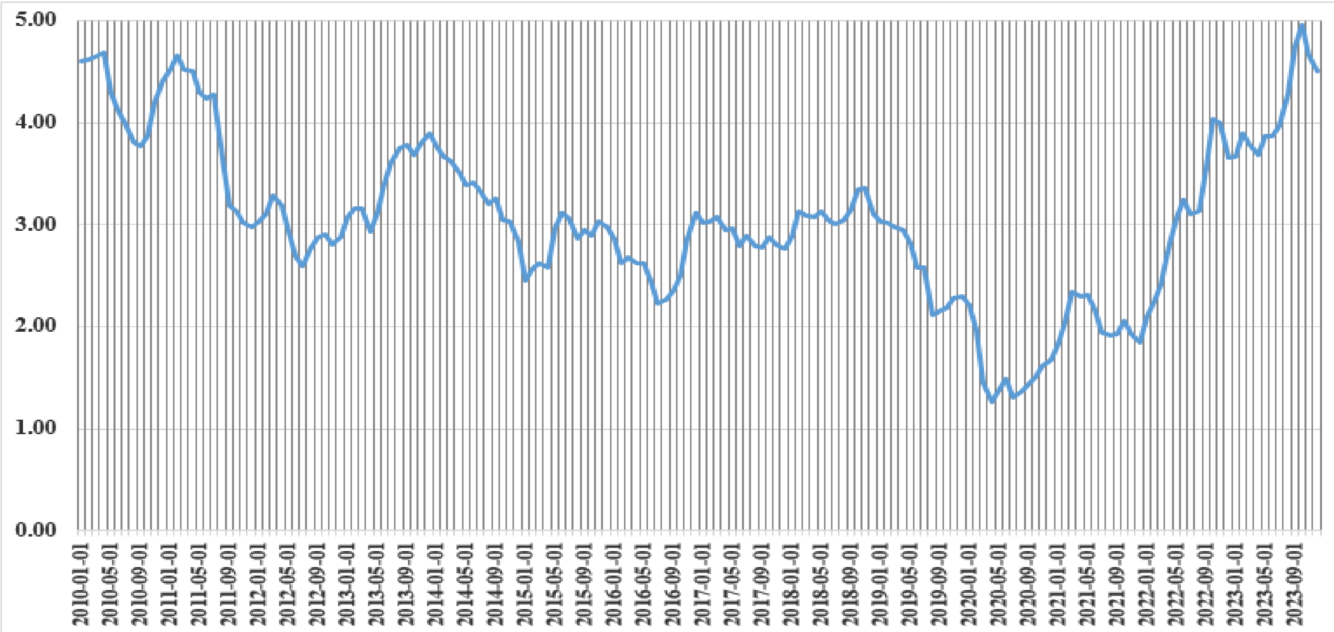
Panel C
Gas Proxy Group***

Risk-Free Interest Rate	4.25%
Beta*	0.81
Ex Ante Market Risk Premium**	5.00%
CAPM Cost of Equity	8.29%

* See page 3 of Exhibit JRW-8
** See pages 5 and 6 of Exhibit JRW-8
*** CAPM ROE rounded to nearest 0.05%.

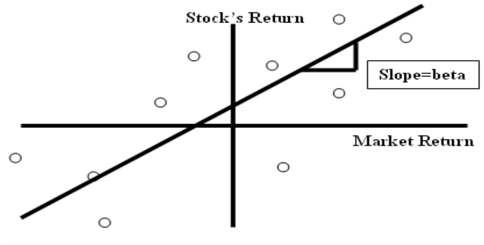
Exhibit JRW-8

Thirty-Year U.S. Treasury Yields
2010-2023



Source: Federal Reserve Bank of St. Louis, FRED Database.

Calculation of Beta



Panel A

Electric Proxy Group			
Company	**V-Line Beta**	**Cap IQ Beta**	**Average Beta**
Alliant Energy Corporation (NYSE-LNT)	0.90	0.86	0.88
Ameren Corporation (NYSE-AEE)	0.90	0.70	0.80
American Electric Power Co. (NYSE-AEP)	0.85	0.63	0.74
Avista Corporation (NYSE-AVA)	0.95	0.68	0.82
CMS Energy Corporation (NYSE-CMS)	0.85	0.64	0.74
Consolidated Edison, Inc. (NYSE-ED)	0.75	0.59	0.67
Duke Energy Corporation (NYSE-DUK)	0.90	0.56	0.73
Edison International (NYSE-EIX)	1.00	0.63	0.81
Entergy Corporation (NYSE-ETR)	1.00	0.95	0.97
Evergy, Inc. (NYSE-EVRG)	0.95	0.80	0.88
Eversource Energy (NYSE-ES)	0.95	0.72	0.84
Exelon Corporation (NDW-EXC)	NMF	0.73	0.73
IDACORP, Inc. (NYSE-IDA)	0.85	0.72	0.79
MGE Energy, Inc. (NYSE-MGEE)	0.80	0.72	0.76
NextEra Energy, Inc. (NYSE-NEE)	1.05	0.79	0.92
NorthWestern Corporation (NYSE-NWE)	0.95	0.69	0.82
OGE Energy Corp. (NYSE-OGE)	1.05	0.64	0.85
Pinnacle West Capital Corp. (NYSE-PNW)	0.95	0.82	0.88
Portland General Electric Company (NYSE-POR)	0.95	0.67	0.81
PPL Corporation (NYSE-PPL)	1.15	0.73	0.94
Public Service Enterprise Group Incorporated (NYSE	0.95	0.89	0.92
Southern Company (NYSE-SO)	0.95	0.74	0.84
WEC Energy Group (NYSE-WEC)	0.85	0.67	0.76
Xcel Energy Inc. (NYSE-XEL)	0.85	0.60	0.73
Mean	0.94	0.72	0.82
Median	0.95	0.72	0.81

Data Source: *Value Line Investment Survey*, 2024; S&P Cap IQ, 2024.

Panel B

Bulkley Proxy Group			
Company	**V-Line Beta**	**Cap IQ Beta**	**Average Beta**
Alliant Energy Corporation (NYSE-LNT)	0.90	0.70	0.80
Ameren Corporation (NYSE-AEE)	0.90	0.63	0.77
American Electric Power Co. (NYSE-AEP)	0.85	0.68	0.77
Avista Corporation (NYSE-AVA)	0.95	0.64	0.79
Black Hills Corporation (NYSE-BKH)	1.05	0.78	0.92
CMS Energy Corporation (NYSE-CMS)	0.85	0.59	0.72
Duke Energy Corporation (NYSE-DUK)	0.90	0.63	0.76
Entergy Corporation (NYSE-ETR)	1.00	0.80	0.90
Evergy, Inc. (NYSE-EVRG)	0.95	0.72	0.84
IDACORP, Inc. (NYSE-IDA)	0.85	0.72	0.78
MGE Energy, Inc. (NYSE-MGEE)	0.80	0.79	0.80
NextEra Energy, Inc. (NYSE-NEE)	1.05	0.69	0.87
NiSource Inc (NYSE-NI)	0.95	0.66	0.81
NorthWestern Corporation (NYSE-NWE)	0.95	0.64	0.80
OGE Energy Corp. (NYSE-OGE)	1.05	0.82	0.93
Pinnacle West Capital Corp. (NYSE-PNW)	0.95	0.67	0.81
Portland General Electric Company (NYSE-POR)	0.95	0.73	0.84
Southern Company (NYSE-SO)	0.95	0.67	0.81
WEC Energy Group (NYSE-WEC)	0.85	0.60	0.73
Xcel Energy Inc. (NYSE-XEL)	0.85	0.58	0.72
Mean	0.91	0.69	0.81
Median	0.90	0.70	0.80

Data Source: *Value Line Investment Survey*, 2024; S&P Cap IQ, 2024.

Panel C

Gas Proxy Group			
Company	**V-Line Beta**	**Cap IQ Beta**	**Average Beta**
Atmos Energy Company (NYSE-ATO)	0.85	0.78	0.81
Chesapeake Utilities (NYSE-CPK)	0.90	0.74	0.82
New Jersey Resources Corp. (NYSE-NJR)	1.00	0.75	0.87
NiSource Inc (NYSE-NI)	0.95	0.66	0.81
Northwest Natural Gas Co. (NYSE-NWN)	0.85	0.71	0.78
ONE Gas, Inc. (NYSE-OGS)	0.85	0.77	0.81
Southwest Gas Corporation (NYSE-SWX)	0.90	0.57	0.74
Spire (NYSE-SR)	0.85	0.68	0.77
Mean	0.89	0.71	0.80
Median	0.88	0.72	0.81

Data Source: *Value Line Investment Survey*, 2024; S&P Cap IQ, 2024.

Exhibit JRW-8
Risk Premium Approaches

	Historical Ex Post Returns	Surveys	Expected Return Models and Market Data
Means of Assessing The Market Risk Premium	Historical Average Stock Minus Bond Returns	Surveys of CFOs, Financial Forecasters, Companies, Analysts on Expected Returns and Market Risk Premiums	Use Market Prices and Market Fundamentals (such as Growth Rates) to Compute Expected Returns and Market Risk Premiums
Problems/Debated Issues	Time Variation in Required Returns, Measurement and Time Period Issues, and Biases such as Market and Company Survivorship Bias	Questions Regarding Survey Histories, Responses, and Representativeness Surveys may be Subject to Biases, such as Extrapolation	Assumptions Regarding Expectations, Especially Growth

Source: Adapted from Antti Ilmanen, Expected Returns on Stocks and Bonds,"*Journal of Portfolio Management* , (Winter 2003).

Market Risk Premium - 2000-2024

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
					Geometric				5.23%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
					Geometric				4.60%	
	Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
	Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.50%	
	Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
					Geometric				4.60%	
	Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
	Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
	Median									5.50%
Ex Ante Models (Puzzle Research)										
	Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
	Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
	Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
	Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
	Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
	Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
	Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
	McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
	Siegel	2005	1802-2001	Historical Earnings Yield					2.50%	
	Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
	Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
	Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
	Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
	Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns,, & Volatility		3.00%	4.00%	3.50%	3.50%	
	Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
	Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2024	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.00%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
	Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
	KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
	Damodaran 6-1-24	2024	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.12%	
	John Campbell	2001	1860-2000	Historical & Projections (D/P & Earnings Growth)	Arithmetic	3.00%	4.00%	3.50%	3.50%	
			Projected for 75 Years		Geometric	1.50%	2.50%	2.00%	2.00%	
	Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	Median									4.06%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
	Duke - CFO Magazine Survey	2024	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.1% and Risk-Free Rate of 5.5%					4.60%	
	Fernandez - Academics, Analysts, and Compani	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
	Median									5.05%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.67%**
Median										**4.56%**

CAPM Study

Market Risk Premium Results - 2010-2024

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
					Geometric				5.23%	
	Dimson, Marsh, Staunton _Credit Suisse Repo	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
					Geometric				4.60%	
	Median									5.57%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2024	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.00%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
	Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
	KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
	Damodaran 6-1-24	2024	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.12%	
	Median									5.00%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
	Duke - CFO Magazine Survey	2024	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.1% and Risk-Free Rate of 5.5%					4.60%	
	Fernandez - Academics, Analysts, and Compa	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
	Median									5.05%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.92%**
Median										**5.03%**

CAPM Study
Kroll (Duff & Phelps) and KPMG Equity Risk Premium Estimates

KROLL

Kroll Recommended U.S. Equity Risk Premium (ERP) and Corresponding Risk-free Rates (R_f); January 2008–Present

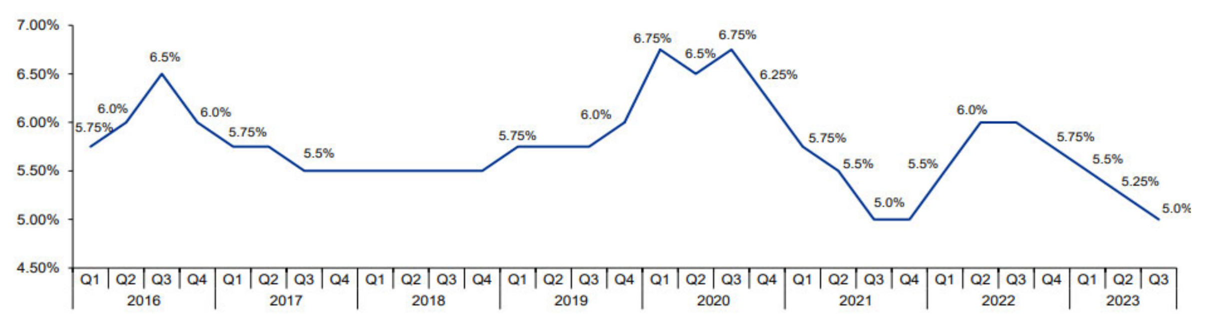
For additional information, please vis
kroll.com/cost-of-capital-resource-cen

Date	Risk-free Rate (R_f)	R_f (%)	Kroll Recommended U.S. ERP (%)	What Changed
Current Guidance:				
June 5, 2024 – UNTIL FURTHER NOTICE*	Normalized 20-year U.S. Treasury yield*	3.50*	5.00	ERP
June 8, 2023 – June 4, 2024*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	ERP
October 18, 2022 – June 7, 2023*	Normalized 20-year U.S. Treasury yield*	3.50*	6.00	ERP
June 16, 2022 – October 17, 2022*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	Rf
April 7, 2022 – June 15, 2022	Normalized 20-year U.S. Treasury yield	3.00	5.50	Rf
December 7, 2020 – April 6, 2022	Normalized 20-year U.S. Treasury yield	2.50	5.50	ERP
June 30, 2020 – December 6, 2020	Normalized 20-year U.S. Treasury yield	2.50	6.00	Rf
March 25, 2020 – June 29, 2020	Normalized 20-year U.S. Treasury yield	3.00	6.00	ERP
December 19, 2019 – March 24, 2020	Normalized 20-year U.S. Treasury yield	3.00	5.00	ERP
September 30, 2019 – December 18, 2019	Normalized 20-year U.S. Treasury yield	3.00	5.50	R_f
December 31, 2018 – September 29, 2019	Normalized 20-year U.S. Treasury yield	3.50	5.50	ERP
September 5, 2017 – December 30, 2018	Normalized 20-year U.S. Treasury yield	3.50	5.00	ERP
November 15, 2016 – September 4, 2017	Normalized 20-year U.S. Treasury yield	3.50	5.50	R_f
January 31, 2016 – November 14, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.50	ERP
December 31, 2015	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2014	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.00	
February 28, 2013 – January 30, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.00	ERP
December 31, 2012	Normalized 20-year U.S. Treasury yield	4.00	5.50	
January 15, 2012 – February 27, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.50	ERP
December 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	6.00	
September 30, 2011 – January 14, 2012	Normalized 20-year U.S. Treasury yield	4.00	6.00	ERP
July 1 2011 – September 29, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
June 1, 2011 – June 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
May 1, 2011 – May 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2010 – April 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
June 1, 2010 – November 30, 2010	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2009	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2009 – May 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	ERP
June 1, 2009 – November 30, 2009	Spot 20-year U.S. Treasury yield	Spot	6.00	R_f
December 31, 2008	Normalized 20-year U.S. Treasury yield	4.50	6.00	
November 1, 2008 – May 31, 2009	Normalized 20-year U.S. Treasury yield	4.50	6.00	R_f
October 27, 2008 – October 31, 2008	Spot 20-year U.S. Treasury yield	Spot	6.00	ERP
January 1, 2008 – October 26, 2008	Spot 20-year U.S. Treasury yield	Spot	5.00	Initialized

* We recommend using the spot 20-year U.S. Treasury yield as the proxy for the risk-free rate, if the prevailing yield as of the valuation date is higher than our recommended U.S. normalized risk-free rate of 3.5%. This guidance is effective when developing USD-denominated discount rates as of June 16, 2022 and thereafter.

. Source: https://www.kroll.com/-/media/cost-of-capital/kroll-us-erp-rf-table-2023.pdf

KPMG Equity Risk Premium



KPMG

Document Classification: KPMG Public | 8

Source: https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da63386db2894649a7ef5