

COST OF CAPITAL STUDY

YIELD CAPITALIZATION
2023 Assessment Year

APPENDIX C

Pipeline Industry

EQUITY RATE						10.75%	
CAPITAL ASSET PRICING MODEL							PAGE
	CAPM Ex Ante		10.29%				4
DIVIDEND GROWTH MODELS Single Stage							
	Value Line, based on Dividends Growth		10.75%				5
	Value Line, based on Earnings Growth		18.00%				6
	Value Line, based on Return on Equity		6.00%				7
DIVIDEND GROWTH MODELS Sustainable Growth							
	Value Line, based on Dividends Growth		10.50%				5a
	Value Line, based on Earnings Growth		11.00%				6a
FCFE GROWTH MODEL Multi Stage							8
					RANGE	6% - 18.00%	
DEBT RATE						6.00%	9
MARKET CAPITAL STRUCTURE							
	Equity	60%	x	10.75%	=	6.45%	3
	Debt	40%	x	6.00%	=	2.40%	3
	Marginal Tax Rate	24%	=	(1-.24)	x	2.40%	<u>1.82%</u>
WEIGHTED AVERAGE COST OF CAPITAL						8.27%	

SUPPORT FOR GUIDELINE COMPANIES

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Enbridge Inc	enb.to	0.85	B++	19.4	7.1%	59,879,250,000	40.4%	7,747,000,000	5.2%	80,647,000,000	54.4%	148,273,250,000
Kinder Morgan Inc	kmi	1.10	B	16.4	7.0%	30,748,536,000	52.0%			28,400,000,000	48.0%	59,148,536,000
ONEOK Inc	oke	1.45	B+	19.4	6.5%	6,463,600,000	35.1%			11,950,700,000	64.9%	18,414,300,000
Pembina Pipeline Corp	ppl.to	1.05	B++	9.8	6.7%	15,373,500,000	52.7%	2,424,000,000	8.3%	11,400,000,000	39.0%	29,197,500,000
TC Energy Corp	trp	1.05	B++	16.7	5.2%	25,175,140,000	37.3%	2,818,000,000	4.2%	39,441,000,000	58.5%	67,434,140,000
The Williams Cos Inc	wmb	1.15	B	18.9	6.5%	13,122,000,000	36.8%			22,530,000,000	63.2%	35,652,000,000
Mean		1.11		16.8	6.5%	25,127,004,333	42.4%		5.9%	32,394,783,333	54.7%	
Harmonic Mean		1.08					41.3%		5.4%		53.0%	
Weighted Mean						150,762,026,000	42.1%	12,989,000,000	3.6%	194,368,700,000	54.3%	358,119,726,000
Median		1.08			6.6%		38.9%		5.2%		56.4%	

SUPPORT FOR CAPITAL STRUCTURE Market Value

Washington State Department of Revenue

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Pipeline Industry

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Enbridge Inc	enb.to	48.65	2,025,000,000	98,516,250,000	61.3%	7,747,000,000	4.8%	54,390,000,000	33.9%	160,653,250,000
Kinder Morgan Inc	kmi	15.62	2,247,700,000	35,109,074,000	54.1%	-		29,756,000,000	45.9%	64,865,074,000
ONEOK Inc	oke	57.85	452,000,000	26,148,200,000	67.3%	-		12,700,000,000	32.7%	38,848,200,000
Pembina Pipeline Cor	ppl.to	37.97	555,000,000	21,073,350,000	68.2%	2,424,000,000	7.8%	7,400,000,000	24.0%	30,897,350,000
TC Energy Corp	trp	46.54	1,018,000,000	47,377,720,000	59.6%	2,818,000,000	3.5%	29,233,700,000	36.8%	79,429,420,000
The Williams Cos Inc	wmb	26.04	1,215,000,000	31,638,600,000	59.5%	-		21,569,000,000	40.5%	53,207,600,000
Mean					61.7%		5.4%		35.6%	
Harmonic Mean					61.3%		4.9%		34.2%	
Weighted Mean				259,863,194,000	60.7%	12,989,000,000	3.0%	155,048,700,000	36.2%	427,900,894,000
Median					60.5%		4.8%		35.3%	
Std Dev					5.3%		2.2%		7.5%	
Coefficient of Variation					8.6%		40.8%		21.0%	
Target					60%				40%	100%

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT CAPITAL ASSET PRICING MODEL

2023 Assessment Year

Ex Ante
Ke = Rf + B (Rp)

Ke = Cost of Equity		10.29%
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Rm =	rate of return	9.82%
Rf =	risk free rate	3.97%
Rp =	risk premium	5.85%
B =	Beta	1.08

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Rp = Risk Premium		5.85%
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Shannon Pratt and Roger Grabowski	3.50% - 6.00%	
Cost of Capital, App and Exam, 5th Ed, 2014		
Dr. Aswath Damodaran	5.94%	chart page 15
http://pages.stern.nyu.edu/~adamodar/	5.85%	adjusted for Rf
2022 Implied Premium		

Rf = Risk Free Rate		3.97%
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Value Line Investment Survey, Selected Yields January 6, 2023, page 1465

as of 12-27-22	US Treasury Securities year end data	
	5 year	3.94%
	10 year	3.84%
	30 year	3.93%
	30 year Zero	3.81%

Federal Reserve Statistical Release (<http://www.federalreserve.gov/Releases/H15/Current/>)

As of 12-30-22	Treasury Constant Maturities	
	5 year	3.99%
	10 year	3.88%
	20 year	4.14%
	30 year	3.97%
	20 year TIPS	<u>1.62%</u>
	30 year TIPS	<u>1.67%</u>

Inflation		2.30%
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The Livingston Survey December 16, 2022, page 4, 8		
Inflation median (measured by the Consumer Price Index) over next 10 years		2.50%

Gross Domestic Product (GDP) Nominal		4.10%
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real GDP + inflation est

Federal Reserve Projected Long Run Real GDP Growth		
Median Projection Value From Dec 14, 2022 Report		1.80%
https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20221214.pdf		

Congressional Budget Office Real GDP Economic Projections		
The Budget and Economic Outlook 2023-2033		Table 2.3, pg 49
Average Percentage Change Year To Year	2023-2027	1.80%
https://www.cbo.gov/system/files/2023-02/58848-	2028-2033	1.80%

Federal Reserve Bank of Philadelphia		
The Livingston Survey, December 16, 2022, page 8		
Average Real GDP Growth Rate for Next 10 Years		1.97%

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT
DIVIDEND GROWTH MODEL**

Washington State Department of Revenue
2023 Assessment Year
Pipeline Industry

Based on Dividend Growth

$$K_e = (D_1 / P_0) + G$$

Ke = Cost of Equity
D1 = Expected Dividends
Po = Current Price
G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Dividend Growth (G)	Ke with Short Term Growth
Enbridge Inc	enb.to	48.650	3.55	7.30%	3.00%	10.30%
Kinder Morgan Inc	kmi	15.620	1.15	7.36%	6.50%	13.86%
ONEOK Inc	oke	57.850	3.82	6.60%	3.50%	10.10%
Pembina Pipeline Corp	ppl.to	37.970	2.70	7.11%	3.50%	10.61%
TC Energy Corp	trp	46.540	2.80	6.02%	3.50%	9.52%
The Williams Cos Inc	wmb	26.040	1.79	6.87%	4.00%	10.87%
Mean Range						10.88%
Harmonic Mean Range						10.72%
Median Range						10.45%
Max						13.86%
Min						9.52%
Std Dev Range						1.53%
Coefficient of Variation						14.11%
Say						10.75%

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

Based on Dividend Growth

$$K_e = (D_1 / P_o) + G$$

Ke = Cost of Equity
 D1 = Expected Dividends
 Po = Current Price
 G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Dividend Growth (G)	Dividend Growth LT	Ke Sustainable
Enbridge Inc	enb.to	48.65	3.55	7.30%	3.00%	3.00%	10.30%
Kinder Morgan Inc	kmi	15.62	1.15	7.36%	6.50%	4.10%	11.46%
ONEOK Inc	oke	57.85	3.82	6.60%	3.50%	3.50%	10.10%
Pembina Pipeline Corp	ppl.to	37.97	2.70	7.11%	3.50%	3.50%	10.61%
TC Energy Corp	trp	46.54	2.80	6.02%	3.50%	3.50%	9.52%
The Williams Cos Inc	wmb	26.04	1.79	6.87%	4.00%	4.00%	10.87%
Mean Range							10.48%
Harmonic Mean Range							10.44%
Median Range							10.45%
Max							11.46%
Min							9.52%
Std Dev Range							0.67%
Coefficient of Variation							6.39%
Say							10.50%

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT
DIVIDEND GROWTH MODEL**

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

Based on Earnings Growth

$$K_e = (D_1 / P_0) + G$$

Ke = Cost of Equity
 D1 = Expected Dividends
 Po = Current Price
 G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Earnings Growth (G)	Ke with Short Term Growth
Enbridge Inc	enb.to	48.650	3.55	7.30%	10.00%	17.30%
Kinder Morgan Inc	kmi	15.620	1.15	7.36%	18.50%	25.86%
ONEOK Inc	oke	57.850	3.82	6.60%	11.50%	18.10%
Pembina Pipeline Corp	ppl.to	37.970	2.70	7.11%	17.50%	24.61%
TC Energy Corp	trp	46.540	2.80	6.02%	7.00%	13.02%
The Williams Cos Inc	wmb	26.040	1.79	6.87%	11.00%	17.87%
Mean Range						19.46%
Harmonic Mean Range						18.45%
Median Range						17.99%
Max						25.86%
Min						13.02%
Std Dev						4.86%
Coefficient of Variation						24.97%
Say						18.00%

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

Washington State Department of Revenue
2023 Assessment Year
Pipeline Industry

Based on Dividend Growth

$$K_e = (D_1 / P_o) + G$$

Ke = Cost of Equity
D1 = Expected Dividends
Po = Current Price
G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Earnings Growth (G)	Dividend Growth LT	Ke Sustainable
Enbridge Inc	enb.to	48.65	3.55	7.30%	10.00%	4.10%	11.40%
Kinder Morgan Inc	kmi	15.62	1.15	7.36%	18.50%	4.10%	11.46%
ONEOK Inc	oke	57.85	3.82	6.60%	11.50%	4.10%	10.70%
Pembina Pipeline Corp	ppl.to	37.97	2.70	7.11%	17.50%	4.10%	11.21%
TC Energy Corp	trp	46.54	2.80	6.02%	7.00%	4.10%	10.12%
The Williams Cos Inc	wmb	26.04	1.79	6.87%	11.00%	4.10%	10.97%
Mean Range							10.98%
Harmonic Mean Range							10.96%
Median Range							11.09%
Max							11.46%
Min							10.12%
Std Dev Range							0.51%
Coefficient of Variation							4.61%
Say							11.00%

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

Based on Return on Equity $K_e = (D1 / P_o) + G$

- Ke** = Cost of Equity
- D1** = Expected Dividends
- E1** = Expected Earnings
- Po** = Current Price
- G** = Sustainable Growth
- b** = Retained Earnings % = (1 - Payout Ratio)
- ROE** = Return on Equity = (E1 / Po)

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Expected Earnings (E1)	Dividend Yield (D1/Po)	Retained Earnings (b)	ROE (E1/Po)	Growth (b*ROE)	Ke Dividends	Ke Earnings
Enbridge Inc	enb.to	48.650	3.55	3.00	7.30%	-22.0%	6.17%	-1.36%	5.94%	4.81%
Kinder Morgan Inc	kmi	15.620	1.15	1.25	7.36%	NMF	8.00%	NMF	NMF	NMF
ONEOK Inc	oke	57.850	3.82	4.70	6.60%	NMF	8.12%	NMF	NMF	NMF
Pembina Pipeline Corp	ppl.to	37.970	2.70	3.25	7.11%	54.0%	8.56%	4.62%	11.73%	13.18%
TC Energy Corp	trp	46.540	2.80	2.90	6.02%	-11.0%	6.23%	-0.69%	5.33%	5.55%
The Williams Cos Inc	wmb	26.040	1.79	1.85	6.87%	NMF	7.10%	NMF	NMF	NMF
Mean									7.67%	7.85%
Harmonic Mean									6.80%	6.46%
Median									5.94%	5.55%
Std Dev									3.53%	4.64%
Coefficient of Variation									46.08%	59.08%

say **6.00%**

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT
FREE CASH FLOW TO EQUITY MODEL MULTI STAGE**

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

Company	Ticker	Stock Price	Expected Earnings	P/E	Payout Ratio	ROE	Ke
Enbridge Inc	enb.to	48.65	3.00	16.22	110.00%	9.50%	7.97%
Kinder Morgan Inc	kmi	15.62	1.25	12.50	93.00%	8.50%	10.69%
ONEOK Inc	oke	57.85	4.70	12.31	81.00%	30.50%	10.67%
Pembina Pipeline Corp	ppl.to	37.97	3.25	11.68	83.00%	11.50%	10.68%
TC Energy Corp	trp	46.54	2.90	16.05	98.00%	11.50%	8.52%
The Williams Cos Inc	wmb	26.04	1.85	14.08	97.00%	17.00%	8.60%
Mean				13.80	93.67%	14.75%	9.52%
Harmonic Mean				13.58	92.66%	12.28%	9.38%
Median				13.29	95.00%	11.50%	9.64%
Industry Summary				13.50	93.00%	12.00%	

Say 9.50%

SUPPORT FOR DEBT RATING AND DEBT YIELD

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

Company	Ticker	Mergent's Ratings	S&P Ratings
Enbridge Inc	enb.to	Baa1	BBB+
Kinder Morgan Inc	kmi	Baa2	BBB
ONEOK Inc	oke	Baa3	BBB
Pembina Pipeline Corp	ppl.to		BBB
TC Energy Corp	trp	Baa2	BBB+
The Williams Cos Inc	wmb	Baa2	BBB
Overall Average Debt Rating		Baa2	BBB

Mergent's Bond Record January 2023, page 81

Corporate	Aaa	Aa	A	Baa
October	5.10%	5.40%	5.74%	6.26%
November	4.90%	5.23%	5.58%	6.07%
December	4.43%	4.77%	5.12%	5.59%
4th Qtr Average	4.81%	5.13%	5.48%	5.97%

Public Utilities	Aaa	Aa	A	Baa
October		5.68%	5.88%	6.18%
November		5.54%	5.75%	6.05%
December		5.06%	5.28%	5.57%
4th Qtr Average		5.43%	5.64%	5.93%

Industrials	Aaa	Aa	A	Baa
October	5.10%	5.11%	5.59%	6.33%
November	4.90%	4.92%	5.40%	6.08%
December	4.43%	4.48%	4.94%	5.61%
4th Qtr Average	4.81%	4.84%	5.31%	6.01%

	20Y	25Y	30Y
Bloomberg S&P Bond Yields			
December 2022: BBB	6.19%	6.10%	6.11%

Debt Yield Rate **6.00%**

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SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

2023 Assessment Year

Pipeline Industry

Company	Ticker	Stock Price	2022		2023		2022		2023	
			Actual Earnings Ratio (EPS/P)		Projected Earnings Ratio (PEPS/P)		Cash Flow Ratio (CF/P)		Projected Cash Flow Ratio	
Enbridge Inc	enb.to	48.650	2.81	5.8%	3.00	6.2%	4.95	10.2%	5.45	11.2%
Kinder Morgan Inc	kmi	15.620	0.78	5.0%	1.25	8.0%	2.11	13.5%	2.35	15.0%
ONEOK Inc	oke	57.850	3.80	6.6%	4.70	8.1%	5.30	9.2%	6.35	11.0%
Pembina Pipeline Corp	ppl.to	37.970	5.50	14.5%	3.25	8.6%	7.30	19.2%	4.85	12.8%
TC Energy Corp	trp	46.540	2.44	5.2%	2.90	6.2%	4.26	9.2%	4.90	10.5%
The Williams Cos Inc	wmb	26.040	1.70	6.5%	1.85	7.1%	3.65	14.0%	3.95	15.2%
		Mean		7.3%		7.4%		12.5%		12.6%
		Harmonic Mean		6.4%		7.2%		11.7%		12.3%
		Median		6.2%		7.6%		11.8%		12.0%
		Max		14.5%		8.6%		19.2%		15.2%
		Min		5.0%		6.2%		9.2%		10.5%
		Std Dev		3.6%		1.0%		3.9%		2.1%
		Coefficient of Variation		49.5%		13.8%		31.2%		16.4%
		Say		6.5%		7.3%		11.7%		12.0%

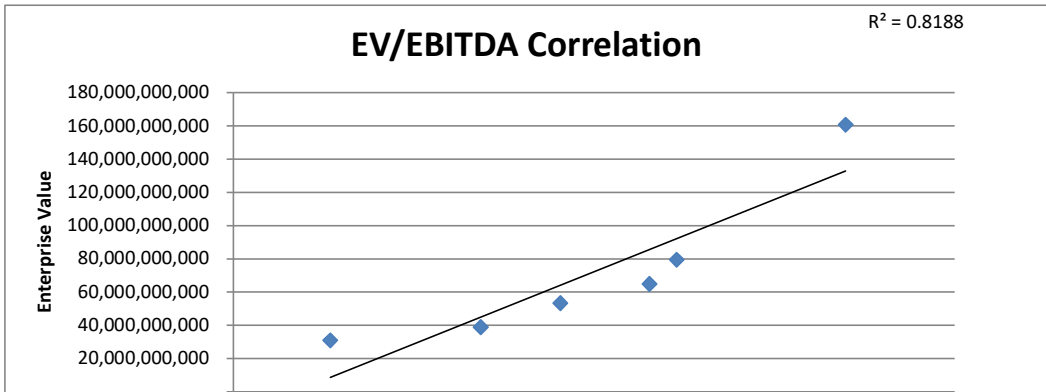
Source: VL/Year End Stock Price

SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

2023 Assessment Year

Company	Ticker	Stock Price	Enterprise Value	EBITDA Historical	Annual Change VL	EBITDA Forecast	EV / EBITDA Forecast	Revenue Forecast	EV / Sales Forecast	Cashflow Forecast	Debt Service	EV / CF Forecast	
Enbridge Inc	enb.to	48.650	160,653,250,000	9,250,740,000	10.10%	10,185,158,182	15.77	53,865,000,000	2.98	11,036,250,000	3,263,400,000	11.23	
Kinder Morgan Inc	kmi	15.620	64,865,074,000	6,212,000,000	11.37%	6,918,578,199	9.38	18,880,680,000	3.44	5,282,095,000	1,785,360,000	9.18	
ONEOK Inc	oke	57.850	38,848,200,000	3,433,551,000	19.81%	4,113,782,802	9.44	24,498,400,000	1.59	2,870,200,000	762,000,000	10.70	
Pembina Pipeline Corp	ppl.to	37.970	30,897,350,000	2,425,720,000	-33.56%	1,611,608,493	19.17	10,989,000,000	2.81	2,691,750,000	444,000,000	9.85	
TC Energy Corp	trp	46.540	79,429,420,000	6,410,620,000	15.02%	7,373,717,840	10.77	11,910,600,000	6.67	4,988,200,000	1,754,022,000	11.78	
The Williams Cos Inc	wmb	26.040	53,207,600,000	5,027,000,000	8.22%	5,440,178,082	9.78	12,028,500,000	4.42	4,799,250,000	1,294,140,000	8.73	
							12.39		3.65				10.25
Harmonic Mean							11.47		3.02				10.13
Median							10.28		3.21				10.27
Std Dev							4.11		1.74				1.19

Source: **Say** **11.50** **3.25** **10.25**
 Value Line & Morning Star



Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast	Summary
Kinder Morgan Inc	9.38	9.53 Low Harmonic mean 9.53 Low Average 9.44 Low Median
ONEOK Inc	9.44	
The Williams Cos Inc	9.78	
TC Energy Corp	10.77	9.50 Say
Enbridge Inc	15.77	15.24 High Average 15.77 High Median 14.40 High Harmonic mean 15.00 Say
Pembina Pipeline Corp	19.17	

SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

2023 Assessment Year

Pipeline Industry

Company	Ticker	Stock Price	Revenues		Cash Flow		Earnings		Book Value	
				Multiple		Multiple		Multiple		Multiple
Enbridge Inc	enb.to	48.650	26.33	1.85	4.95	9.83	2.81	17.31	29.57	1.65
Kinder Morgan Inc	kmi	15.620	8.54	1.83	2.11	7.40	0.78	20.03	13.68	1.14
ONEOK Inc	oke	57.850	51.90	1.11	5.30	10.92	3.80	15.22	14.30	4.05
Pembina Pipeline Corp	ppl.to	37.970	21.10	1.80	7.30	5.20	5.50	6.90	27.70	1.37
TC Energy Corp	trp	46.540	11.17	4.17	4.26	10.92	2.44	19.07	24.73	1.88
The Williams Cos Inc	wmb	26.040	9.30	2.80	3.65	7.13	1.70	15.32	10.80	2.41
Mean			2.26		8.57		15.64		2.08	
Harmonic Mean			1.91		7.97		13.76		1.76	
Median			1.84		8.62		16.32		1.76	
Max			4.17		10.92		20.03		4.05	
Min			1.11		5.20		6.90		1.14	
Say			2.00		8.00		15.00		2.00	

Source: VL/Year End Stock Price

STOCK PRICE

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

42.15
2022 Year End

Enbridge Inc	enb.to								
Date	Open	High	Low	Close	Adj. Close*	Volume			
12/30/2022	52.94	53.24	52.87	52.92	52.06	2,097,800			52.06
Kinder Morgan Energy	kmi								
Date	Open	High	Low	Close	Adj. Close*	Volume			
12/30/2022	18.08	18.2	17.95	18.08	17.81	7,385,700			17.81
ONEOK Inc	oke								
Date	Open	High	Low	Close	Adj. Close*	Volume			
12/30/2022	65.55	65.93	65.21	65.7	64.8	1,921,600			64.80
Pembina Pipeline Corp	ppl.to								
Date	Open	High	Low	Close	Adj. Close*	Volume			
12/30/2022	45.78	46.18	45.78	45.96	45.96	800,400			45.96
TransCanada Corp	trp								
Date	Open	High	Low	Close	Adj. Close*	Volume			
12/30/2022	39.45	40	39.4	39.86	39.86	1,422,700			39.86
Williams Cos	wmb								
Date	Open	High	Low	Close	Adj. Close*	Volume			
12/30/2022	32.85	33.03	32.65	32.9	32.41	3,479,200			32.41

Source:

finance.yahoo.com

Historical Stock Quotes

DATA INPUT

Washington State Department of Revenue

2023 Assessment Year

Pipeline Industry

Guideline Companies		Stock Price 12/30/22	Historic Figures (2022)												
			Beta Levered	Fin'I Strength	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Bk Value Per Share	Common Shares	LTD (BV)	Trailing P/E Ratio	Div Yield	Operating Margin	Calculated Debt
Name	Ticker	Yahoo	V L	V L	V L	V L	V L	V L	V L	V L	V L	V L	V L	V L	Formula
Enbridge Inc	enb.to	48.65	0.85	B++	26.33	4.95	2.81	3.44	29.57	2,025,000,000	80,647,000,000	19.4	6.5%	9.7%	92.69%
Kinder Morgan Inc	kmi	15.62	1.10	B	8.54	2.11	0.78	1.10	13.68	2,247,700,000	28,400,000,000	16.4	6.0%	34.7%	94.54%
ONEOK Inc	oke	57.85	1.45	B+	51.90	5.30	3.80	3.74	14.30	452,000,000	11,950,700,000	19.4	4.2%	18.0%	93.38%
Pembina Pipeline Corp	ppl.to	37.97	1.05	B++	21.10	7.30	5.50	2.54	27.70	555,000,000	11,400,000,000	9.8	5.6%	32.0%	95.64%
TC Energy Corp	trp	46.54	1.05	B++	11.17	4.26	2.44	2.44	24.73	1,018,000,000	39,441,000,000	16.7	6.8%	21.4%	95.09%
The Williams Cos Inc	wmb	26.04	1.15	B	9.30	3.65	1.70	1.70	10.80	1,215,000,000	22,530,000,000	18.9	5.6%	54.3%	95.63%
											average	16.8		28.4%	
Average											harmonic mean	15.8		21.1%	
Harmonic Mean											median	17.8		26.7%	
Median															

		Projected (Next Year) 2023									Longer Term Forecasts		Income Statement		
All DIV's to Net Profits	Rtn on Shrhldrs Equity	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Bk Value Per Share	All DIV's to Net Profits	Rtn on Shrhldrs Equity	CF Projection 26-28	Earnings Projection 26-28	Earnings Growth 26-28	Dividend Growth 26-28	Operating Income	Current Assets	PP & E Gross
V L	V L	V L	V L	V L	V L	V L	VL	V L	V L	V L	VL	VL	Yahoo	Yahoo	Yahoo
122%	9.5%	26.60	5.45	3.00	3.55	36.35	110%	9.50%	6.55	4.60	10.0%	3.0%	6,056,160,000	8,988,780,000	99,160,000,000
98%	8.30%	8.40	2.35	1.25	1.15	14.95	93%	8.50%	3.25	1.80	18.5%	6.5%	4,026,000,000	3,803,000,000	56,011,000,000
99%	26.5%	54.20	6.35	4.70	3.82	15.50	81%	30.50%	8.75	6.50	11.5%	3.5%	2,807,419,000	2,547,775,000	25,015,135,000
46%	20.0%	19.80	4.85	3.25	2.70	28.37	83%	11.50%	5.35	3.95	17.5%	3.5%	1,920,300,000	1,007,880,000	14,669,760,000
111%	9.5%	11.70	4.90	2.90	2.80	25.35	98%	11.50%	7.35	4.75	7.0%	3.5%	4,498,460,000	5,425,680,000	83,296,620,000
100%	15.5%	9.90	3.95	1.85	1.79	10.95	97%	17.00%	4.80	2.40	11.0%	4.0%	3,018,000,000	3,797,000,000	47,057,000,000
96%	14.9%						average		94%	6.01					
	12.4%						Median		93%	5.95					
	12.5%						Harmonic mean		95%	5.43					

Balance Sheet			Cash Flow Statement	Other Financials	
Intangibles (excl. GW)	Current Liabilities	Long Term Debt Less Current Maturities	Depreciation & Amortization	Carrying Value Debt	Fair Value Debt
Yahoo	Yahoo	Yahoo	Yahoo	10-K	10-K
2,973,320,000	15,022,740,000	53,974,860,000	3,194,580,000	58,682,000,000	54,390,000,000
1,809,000,000	6,930,000,000	28,294,000,000	2,186,000,000	31,474,000,000	29,756,000,000
225,275,000	3,051,627,000	12,695,834,000	626,132,000	13,600,000,000	12,700,000,000
1,679,606,824	1,514,040,000	7,400,000,000	505,420,000	7,420,000,000	7,096,600,000
-	12,511,180,000	37,103,600,000	1,912,160,000	30,741,820,000	29,233,700,000
7,363,000,000	4,890,000,000	21,927,000,000	2,009,000,000	22,554,000,000	21,569,000,000

IMPLIED PREMIUMS FOR US MARKET

Updated January 2023

These implied premiums are calculated using the S&P 500.

Year	Earnings Yield	Dividend Yield	S&P 500	Earnings*	Dividends*	Trends + Buyback	Change in Earnings	Change in Dividends	T.Bill Rate	T.Bond Rate	Bond-Bill	Boothed Growth	Premium	Real Growth	Real Premium	Implied Premium	ERP/Riskfree
1980	11.04%	4.74%	135.76	14.99	6.44		3.01%	7.81%	11.24%	12.43%	1.19%	11.01%	5.03%		5.03%		0.40
1981	12.39%	5.57%	122.55	15.18	6.83		1.31%	6.08%	14.71%	13.98%	-0.73%	11.42%	5.73%		5.73%		0.41
1982	9.83%	4.93%	140.64	13.82	6.93		-8.95%	1.58%	10.54%	10.47%	-0.07%	7.96%	4.90%		4.90%		0.47
1983	8.06%	4.32%	164.93	13.29	7.12		-3.84%	2.76%	8.80%	11.80%	3.00%	9.09%	4.31%		4.31%		0.37
1984	10.07%	4.68%	167.24	16.84	7.83		26.69%	9.85%	9.85%	11.51%	1.66%	11.02%	5.11%		5.11%		0.44
1985	7.42%	3.88%	211.28	15.68	8.20		-6.91%	4.74%	7.72%	8.99%	1.27%	7.89%	4.03%	6.75%	3.84%		0.43
1986	5.96%	3.38%	242.17	14.43	8.19		-7.93%	-0.15%	6.16%	7.22%	1.06%	5.54%	3.36%	6.96%	3.58%		0.50
1987	6.49%	3.71%	247.08	16.04	9.17		11.10%	11.99%	5.47%	8.86%	3.39%	9.66%	4.18%	8.58%	3.99%		0.45
1988	8.20%	3.68%	277.72	24.12	10.22		50.42%	11.49%	6.35%	9.14%	2.79%	9.76%	4.12%	7.67%	3.77%		0.41
1989	6.80%	3.32%	353.4	24.32	11.73		0.83%	14.80%	8.37%	7.93%	-0.44%	9.58%	3.85%	7.46%	3.51%		0.44
1990	6.58%	3.74%	330.22	22.65	12.35		-6.87%	5.26%	7.81%	8.07%	0.26%	7.39%	3.92%	7.19%	3.89%		0.48
1991	4.58%	3.11%	417.09	19.30	12.97		-14.79%	5.03%	7.00%	6.70%	-0.30%	6.34%	3.27%	7.81%	3.48%		0.52
1992	4.16%	2.90%	435.71	20.87	12.64		8.13%	-2.59%	5.30%	6.68%	1.38%	4.67%	2.83%	9.83%	3.55%		0.53
1993	4.25%	2.72%	466.45	26.90	12.69		28.89%	0.41%	3.50%	5.79%	2.29%	4.73%	2.74%	8.00%	3.17%		0.55
1994	5.89%	2.91%	459.27	31.75	13.36		18.03%	5.34%	5.00%	7.82%	2.82%	7.23%	3.06%	7.17%	3.55%		0.45
1995	5.74%	2.30%	615.93	37.70	14.17		18.74%	6.00%	3.50%	5.57%	2.07%	5.65%	2.44%	6.50%	3.29%		0.59
1996	4.83%	2.01%	740.74	40.63	14.89		7.77%	5.10%	5.00%	6.41%	1.41%	6.13%	2.11%	7.92%	3.20%		0.50
1997	4.08%	1.60%	970.43	44.09	15.52		8.52%	4.25%	5.35%	5.74%	0.39%	5.45%	1.67%	8.00%	2.73%		0.48
1998	3.11%	1.32%	1229.23	44.27	16.20		0.41%	4.37%	4.33%	4.65%	0.32%	4.60%	1.38%	7.20%	2.26%		0.49
1999	3.07%	1.14%	1469.25	51.68	16.71		16.74%	3.16%	5.37%	6.44%	1.07%	5.75%	1.20%	12.50%	2.05%		0.32
2000	3.94%	1.23%	1320.28	56.13	16.27		8.61%	-2.65%	5.73%	5.11%	-0.62%	3.71%	1.65%	12.00%	2.87%		0.56
2001	3.85%	1.37%	1148.09	38.85	15.74	30.08	-30.79%	-3.24%	1.80%	5.05%	3.25%	3.56%	1.73%	10.30%	3.62%	2.91%	0.72
2002	5.23%	1.83%	879.82	46.04	16.08	29.83	18.51%	2.15%	1.20%	3.81%	2.61%	3.57%	2.29%	8.00%	4.10%	4.73%	1.08
2003	4.87%	1.61%	1111.91	54.69	17.88	31.58	18.79%	11.19%	1.00%	4.25%	3.25%	5.35%	2.12%	11.00%	3.69%	4.74%	0.87
2004	5.58%	1.60%	1211.92	67.68	19.407	40.60	23.75%	8.54%	2.18%	4.22%	2.04%	4.90%	2.02%	8.50%	3.65%	4.86%	0.86
2005	5.47%	1.79%	1248.29	76.45	22.38	61.17	12.96%	15.32%	4.31%	4.39%	0.08%	6.16%	2.20%	8.00%	4.08%	5.22%	0.93
2006	6.18%	1.77%	1418.3	87.72	25.05	73.16	14.74%	11.93%	4.88%	4.70%	-0.18%	5.93%	1.97%	12.50%	4.16%	6.12%	0.89
2007	5.62%	1.89%	1468.36	82.54	27.73	95.36	-5.91%	10.70%	3.31%	4.02%	0.71%	5.03%	2.06%	5.00%	4.37%	4.59%	1.09
2008	7.24%	3.11%	903.25	65.39	28.05	67.52	-20.78%	1.15%	1.59%	2.21%	0.62%	2.11%	4.05%	4.00%	6.43%	6.92%	2.91
2009	5.35%	2.00%	1115.10	59.65	22.31	37.43	-8.78%	-20.46%	0.14%	3.84%	3.70%	0.28%	2.60%	7.20%	4.36%	4.64%	1.14
2010	6.65%	1.84%	1257.64	83.66	23.12	55.53	40.25%	3.63%	0.13%	3.29%	3.16%	3.33%	2.24%	6.95%	5.20%	6.09%	1.58
2011	7.72%	2.07%	1257.60	97.05	26.02	71.28	16.01%	12.54%	0.03%	1.88%	1.85%	2.75%	2.71%	7.18%	6.01%	8.34%	3.20
2012	7.18%	2.13%	1426.19	102.47	30.44	75.90	5.58%	16.99%	0.05%	1.76%	1.71%	2.93%	2.47%	5.27%	5.78%	7.30%	3.28
2013	5.81%	1.96%	1848.36	107.45	36.28	88.13	4.86%	19.19%	0.07%	3.04%	2.97%	5.01%	2.03%	4.28%	4.96%	4.99%	1.63
2014	5.49%	1.92%	2058.90	113.01	39.44	101.98	5.17%	8.71%	0.05%	2.17%	2.12%	2.77%	2.24%	5.58%	5.78%	5.48%	2.66
2015	5.20%	2.11%	2043.94	106.32	43.16	106.10	-5.92%	9.43%	0.21%	2.27%	2.06%	2.96%	2.46%	5.51%	6.12%	5.16%	2.70
2016	4.86%	2.01%	2238.83	108.86	45.03	108.67	2.39%	4.33%	0.51%	2.45%	1.94%	2.64%	2.41%	5.54%	5.69%	4.50%	2.32
2017	4.67%	1.86%	2673.61	124.94	49.73	108.28	14.77%	10.44%	1.39%	2.41%	1.02%	3.22%	2.36%	7.05%	5.08%	4.75%	2.11
2018	5.92%	2.14%	2506.85	148.34	53.61	136.65	18.73%	7.80%	2.37%	2.68%	0.31%	3.24%	2.50%	4.12%	5.96%	5.55%	2.22
2019	5.03%	1.82%	3230.78	162.35	58.80	150.50	9.44%	9.68%	1.55%	1.92%	0.37%	2.57%		3.96%	5.20%	5.06%	2.71
2020	3.68%	0.02	3756.07	138.12	56.70	12778.00%	-14.92%	-3.57%	0.09%	0.93%	0.84%	0.74%	1.65%	5.42%	4.72%	4.94%	5.08
2021	4.33%	1.24%	4766.18	206.38	59.20	147.24	47.67%	4.41%	0.06%	1.51%	1.45%	1.71%	1.72%	6.47%	4.24%	4.90%	2.81
2022	5.72%	1.78%	3839.50	219.49	68.34	181.99	6.35%	15.44%	4.42%	3.88%	-0.54%	5.59%	2.16%	6.41%	5.94%	5.11%	1.53

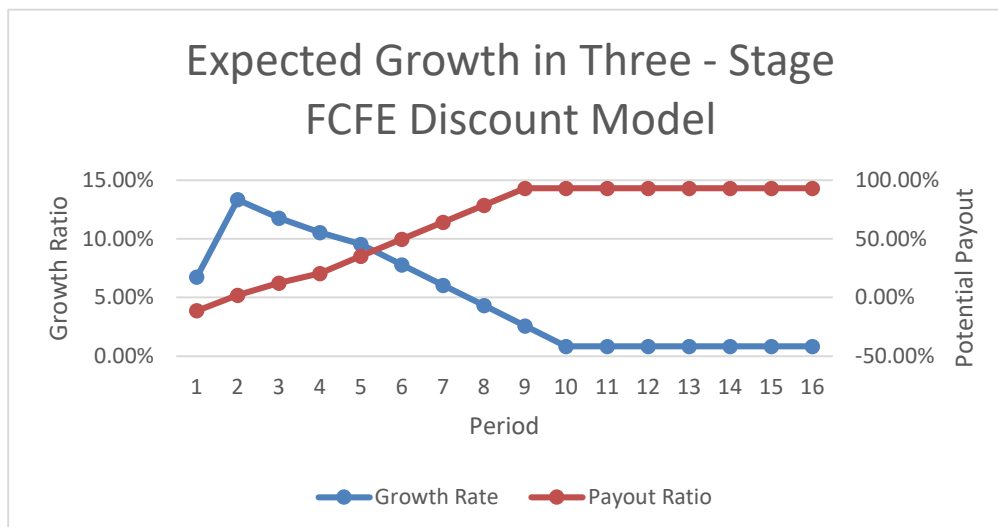
<http://pages.stern.nyu.edu/~adamodar/>

Three Stage Free Cash Flow to Equity Discount Model

Company **Enbridge Inc** 4.10% GDP
 Ticker **enb.to** 13.5 Industry P/E use median
 93.0% Target Dividend Payout Ratio
 12.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		56.35%	43.65%	2.81			(48.65)
	1	6.76%	111.11%	-11.11%	3.00	(0.33)		-0.33
	2	13.33%	98.04%	1.96%	3.40	0.07		0.07
Stage 1	3	11.76%	87.72%	12.28%	3.80	0.47		0.47
	4	10.53%	79.37%	20.63%	4.20	0.87		0.87
	5	9.52%	64.89%	35.11%	4.60	1.61		1.61
	6	7.79%	50.42%	49.58%	4.96	2.46		2.46
	7	6.05%	35.95%	64.05%	5.26	3.37		3.37
Stage 2	8	4.31%	21.47%	78.53%	5.49	4.31		4.31
	9	2.58%	7.00%	93.00%	5.63	5.23		5.23
	10	0.84%	7.00%	93.00%	5.67	5.28	77.24	82.51
Stage 3	11+	0.84%	7.00%	93.00%	5.72	5.32		

$K_e = 7.97%$

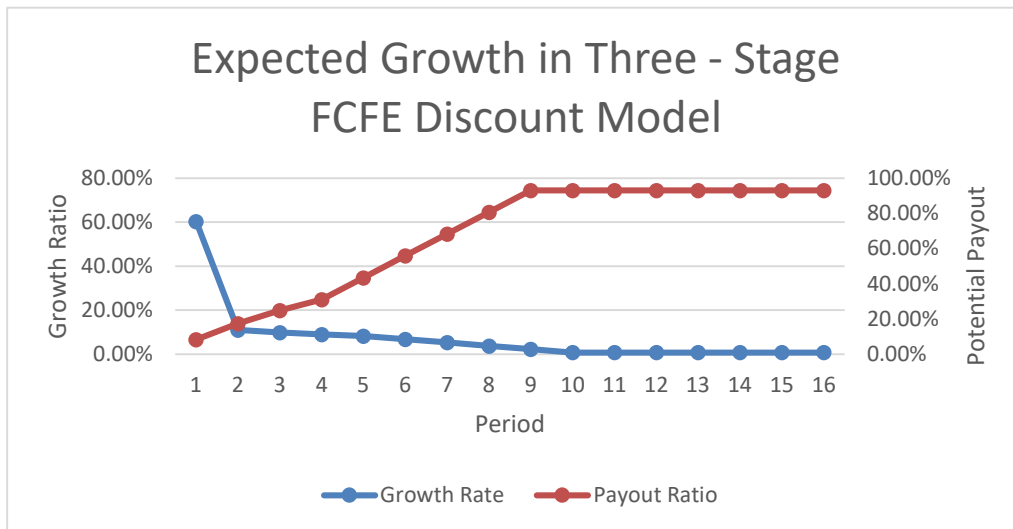


Three Stage Free Cash Flow to Equity Discount Model

Company **Kinder Morgan** 4.10% GDP
 Ticker **kmi** 13.5 Industry P/E use median
 93.0% Target Dividend Payout Ratio
 12.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		502.14%	-402.14%	0.78			(15.62)
Stage 1	1	60.26%	91.67%	8.33%	1.25	0.10		0.10
	2	11.00%	82.58%	17.42%	1.39	0.24		0.24
	3	9.91%	75.14%	24.86%	1.53	0.38		0.38
	4	9.02%	68.92%	31.08%	1.66	0.52		0.52
	5	8.27%	56.54%	43.46%	1.80	0.78		0.78
Stage 2	6	6.78%	44.15%	55.85%	1.92	1.07		1.07
	7	5.30%	31.77%	68.23%	2.02	1.38		1.38
	8	3.81%	19.38%	80.62%	2.10	1.69		1.69
	9	2.33%	7.00%	93.00%	2.15	2.00		2.00
	10	0.84%	7.00%	93.00%	2.17	2.02	29.51	31.53
Stage 3	11+	0.84%	7.00%	93.00%	2.19	2.03		

Ke = 10.69%

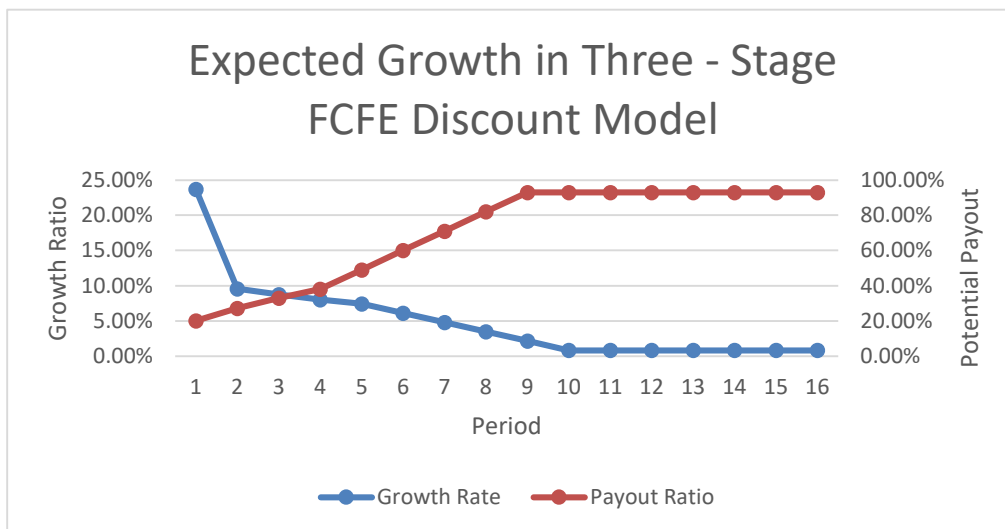


Three Stage Free Cash Flow to Equity Discount Model

Company **ONEOK Inc** 4.10% GDP
 Ticker **oke** 13.5 Industry P/E use median
 93.0% Target Dividend Payout Ratio
 12.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		197.37%	-97.37%	3.80			(57.85)
Stage 1	1	23.68%	79.79%	20.21%	4.70	0.95		0.95
	2	9.57%	72.82%	27.18%	5.15	1.40		1.40
	3	8.74%	66.96%	33.04%	5.60	1.85		1.85
	4	8.04%	61.98%	38.02%	6.05	2.30		2.30
	5	7.44%	50.99%	49.01%	6.50	3.19		3.19
Stage 2	6	6.12%	39.99%	60.01%	6.90	4.14		4.14
	7	4.80%	28.99%	71.01%	7.23	5.13		5.13
	8	3.48%	18.00%	82.00%	7.48	6.13		6.13
	9	2.16%	7.00%	93.00%	7.64	7.11		7.11
	10	0.84%	7.00%	93.00%	7.71	7.17	104.90	112.07
Stage 3	11+	0.84%	7.00%	93.00%	7.77	7.23		

K_e = 10.67%

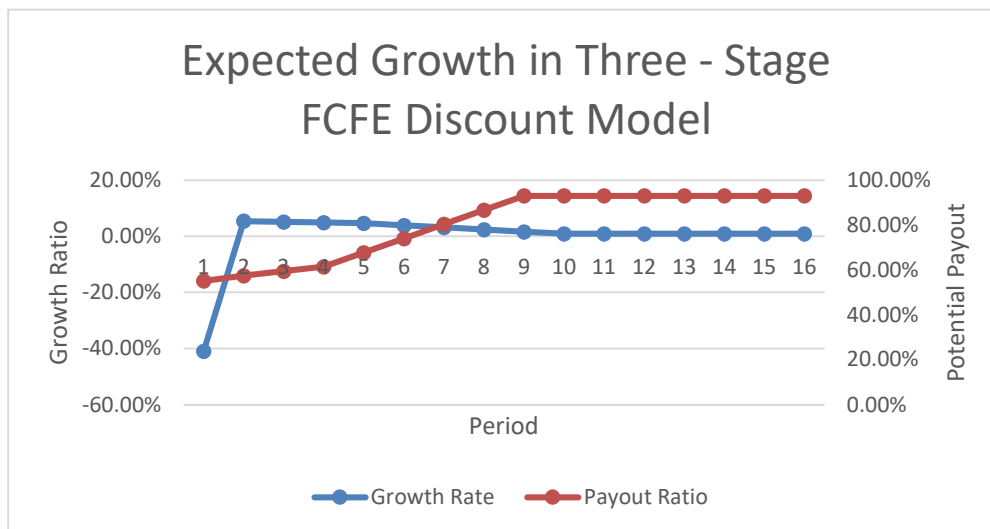


Three Stage Free Cash Flow to Equity Discount Model

Company **Pembina Pipelin** 4.10% GDP
 Ticker **ppl.to** 13.5 Industry P/E use median
 93.0% Target Dividend Payout Ratio
 12.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		-340.91%	440.91%	5.50			(37.97)
Stage 1	1	-40.91%	44.87%	55.13%	3.25	1.79		1.79
	2	5.38%	42.58%	57.42%	3.43	1.97		1.97
	3	5.11%	40.51%	59.49%	3.60	2.14		2.14
	4	4.86%	38.63%	61.37%	3.78	2.32		2.32
	5	4.64%	32.31%	67.69%	3.95	2.67		2.67
Stage 2	6	3.88%	25.98%	74.02%	4.10	3.04		3.04
	7	3.12%	19.65%	80.35%	4.23	3.40		3.40
	8	2.36%	13.33%	86.67%	4.33	3.75		3.75
	9	1.60%	7.00%	93.00%	4.40	4.09		4.09
	10	0.84%	7.00%	93.00%	4.44	4.13	60.40	64.53
Stage 3	11+	0.84%	7.00%	93.00%	4.47	4.16		

$K_e = 10.68\%$

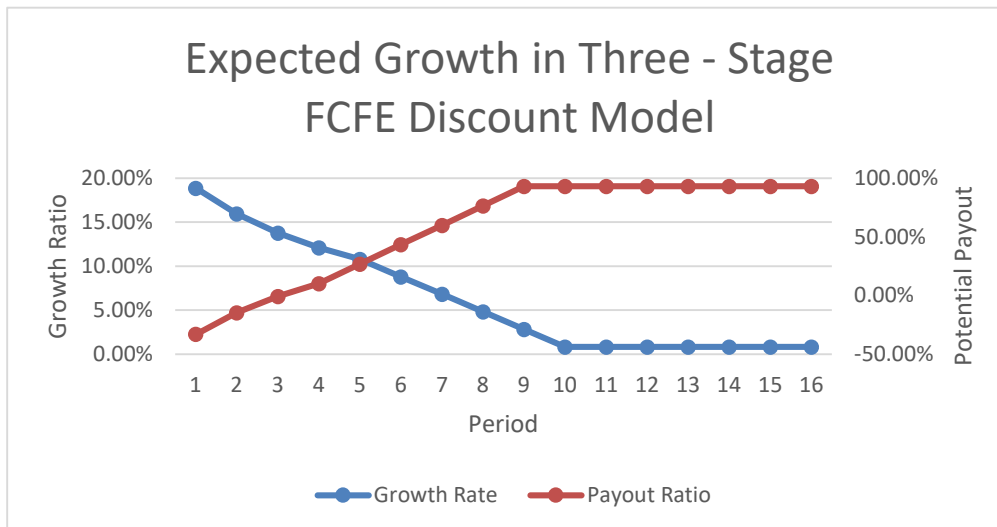


Three Stage Free Cash Flow to Equity Discount Model

Company **TC Energy Corp** **4.10%** GDP
 Ticker **trp** **13.5** Industry P/E use median
93.0% Target Dividend Payout Ratio
12.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		157.10%	-57.10%	2.44			(46.54)
Stage 1	1	18.85%	132.90%	-32.90%	2.90	(0.95)		-0.95
	2	15.95%	114.62%	-14.62%	3.36	(0.49)		-0.49
	3	13.75%	100.76%	-0.76%	3.83	(0.03)		-0.03
	4	12.09%	89.89%	10.11%	4.29	0.43		0.43
	5	10.79%	73.31%	26.69%	4.75	1.27		1.27
Stage 2	6	8.80%	56.74%	43.26%	5.17	2.24		2.24
	7	6.81%	40.16%	59.84%	5.52	3.30		3.30
	8	4.82%	23.58%	76.42%	5.79	4.42		4.42
	9	2.83%	7.00%	93.00%	5.95	5.53		5.53
	10	0.84%	7.00%	93.00%	6.00	5.58	81.67	87.25
Stage 3	11+	0.84%	7.00%	93.00%	6.05	5.63		

K_e = 8.52%



Three Stage Free Cash Flow to Equity Discount Model

Company **The Williams Co** 4.10% GDP
 Ticker **wmb** 13.5 Industry P/E use median
 93.0% Target Dividend Payout Ratio
 12.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		73.53%	26.47%	1.70			(26.04)
Stage 1	1	8.82%	61.94%	38.06%	1.85	0.70		0.70
	2	7.43%	57.65%	42.35%	1.99	0.84		0.84
	3	6.92%	53.92%	46.08%	2.13	0.98		0.98
	4	6.47%	50.64%	49.36%	2.26	1.12		1.12
	5	6.08%	41.92%	58.08%	2.40	1.39		1.39
Stage 2	6	5.03%	33.19%	66.81%	2.52	1.68		1.68
	7	3.98%	24.46%	75.54%	2.62	1.98		1.98
	8	2.93%	15.73%	84.27%	2.70	2.27		2.27
	9	1.89%	7.00%	93.00%	2.75	2.56		2.56
	10	0.84%	7.00%	93.00%	2.77	2.58	37.74	40.31
Stage 3	11+	0.84%	7.00%	93.00%	2.80	2.60		

$K_e = 8.60\%$

