

# COST OF CAPITAL STUDY

## YIELD CAPITALIZATION

**2017 ASSESSMENT YEAR** 

APPENDIX C

## Railroads

EQUITY RATE						11.75%	
CAPITAL ASSET PRICING MODEL							PAGE
CAPM Ex Ante			9.04%				6
DIVIDEND GROWTH MODELS							
Value Line, based on Dividends Gr	rowth		11.25%				7
Value Line, based on Earnings Gro	owth		12.25%				8
Value Line, based on Return on Ec	quity		9.50%				9
					RANGE	9.0375% - 12.25%	
					RANGE	9.0375% - 12.25% 4.75% 4.00%	10 10
SECURED DEBT (LEASE) RATE					RANGE	4.75%	
DEBT RATE SECURED DEBT (LEASE) RATE MARKET CAPITAL STRUCTURE	77%		11.75%		RANGE	4.75%	
SECURED DEBT (LEASE) RATE	77% 23%	X				4.75% 4.00%	10
SECURED DEBT (LEASE) RATE				=		4.75% 4.00%	10

## WEIGHTED AVERAGE COST OF CAPITAL

9.7%

rounded

## SUPPORT FOR GUIDELINE COMPANIES

WASHINGTON STATE DEPARTMENT OF REVENUE

2017 ASSESSMENT YEAR

RAILROADS

Company	Ticker	Beta	Fin'l Strength	Operating Margin	P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Union Pacific Corp.	UNP	1.05	A++	44.0%	18.7	2.31%	19,861,099,200	58.2%	-	0.0%	14,249,000,000	41.8%	34,110,099,200
Norfolk Southern Corp.	NSC	1.15	Α	37.5%	17.4	2.26%	12,436,729,200	56.5%	-	0.0%	9,562,000,000	43.5%	21,998,729,200
CSX Corp.	CSX	1.25	B++	41.5%	18.0	2.12%	11,888,470,000	52.0%	-	0.0%	10,962,000,000	48.0%	22,850,470,000
Kansas City Southern	KSU	1.15	Α	41.0%	16.5	1.70%	4,373,086,350	65.8%	-	0.0%	2,271,500,000	34.2%	6,644,586,350
Genesee & Wyoming	GWR	1.45	B+	29.0%	18.3	0.00%	2,675,551,800	53.7%	-	0.0%	2,306,915,000	46.3%	4,982,466,800
Canadian National	CNI	1.05	A	54.0%	18.5	1.85%	11,686,075,000	63.4%	-	0.0%	6,738,750,000	36.6%	18,424,825,000
Canadian Pacific	CP	1.20	B++	51.5%	15.7	1.05%	3,781,855,000	36.8%	-	0.0%	6,494,250,000	63.2%	10,276,105,000
	Mean	1.19	Α	42.6%	17.6	1.61%	9,528,980,936	55.2%		0.0%	7,512,059,286	44.8%	
Weight	ed Mean						66,702,866,550	55.9%	-	0.00%	52,584,415,000	44.1%	119,287,281,550
	Median	1.15			18.0	1.85%		56.5%		0.0%		43.5%	
	Std Dev	0.14			1.11	0.8%		9.5%		-		9.5%	
	Coeff Var	0.12			0.06	0.52		17.2%		-		21.2%	
Harmo	onic Mean	1.17			17.50	#NUM!		53.5%		-		43.3%	
	Max	1.45			18.68	2.31%		65.8%		0.0%		63.2%	
	Min	1.05			15.69	0.00%		36.8%		0.0%		34.2%	

Say 1.15

Capital Structure at Book Value

### SUPPORT FOR CAPITAL STRUCTURE MARKET VALUE

WASHINGTON STATE DEPARTMENT OF REVENUE 2017 ASSESSMENT YEAR

RAILROADS

											Capital St	ructure at Market Value
Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Operating Lease	%	Long Term Debt	%	Total Debt & Equity
Union Pacific Corp.	UNP	103.68	824,112,000	85,443,932,160	78.4%	-	0.0%	7,696,576,478	7.1%	15,900,000,000	14.6%	109,040,508,638
Norfolk Southern Corp.	NSC	108.07	291,942,000	31,550,171,940	68.9%	-	0.0%	2,637,811,952	5.8%	11,626,000,000	25.4%	45,813,983,892
CSX Corp.	CSX	35.93	936,100,000	33,634,073,000	72.4%	-	0.0%	713,297,999	1.5%	12,096,000,000	26.0%	46,443,370,999
Kansas City Southern	KSU	84.85	107,579,000	9,128,078,150	73.4%	129,400,000	1.0%	882,093,295	7.1%	2,303,800,000	18.5%	12,443,371,445
Genesee & Wyoming	GWR	69.41	58,038,000	4,028,417,580	61.6%	-	0.0%	205,582,163	3.1%	2,303,531,000	35.2%	6,537,530,743
Canadian National	CNI	67.40	766,300,000	51,648,620,000	82.0%	-	0.0%	2,249,963,292	3.6%	9,063,000,000	14.4%	62,961,583,292
Canadian Pacific	CP	142.77	146,300,000	20,887,251,000	70.1%	-	0.0%	1,424,652,574	4.8%	7,485,750,000	25.1%	29,797,653,574
	·		Mean Veighted Mean Median larmonic Mean Std Dev Coeff Var Max Min	236,320,543,830	72.4% 75.5% 72.4% 71.9% 6.6% 10.93 82.0% 61.6%	129,400,000	0.1% 0.04% 0.00% #NUM! 0.4% 0.38 1.0% 0.0%	15,809,977,753	4.7% 5.05% 4.78% 3.7% 2.1% 2.26 7.1% 1.5%	60,778,081,000	22.8% 19.4% 25.1% 20.7% 7.5% 3.05 35.2% 14.4%	313,038,002,583
Source:			Target		77%		0%		5%		18%	100%

Stock Price: Yahoo

Market Value Debt: Bond Analysis

## SUPPORT FOR MARKET MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE 2017 ASSESSMENT YEAR RAILROADS

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
Union Pacific Corp.	UNP	103.68	24.20	4.3	7.60	13.6	4.90	21.2	24.10	4.3
Norfolk Southern Corp.	NSC	108.07	33.85	3.2	9.15	11.8	5.55	19.5	42.60	2.5
CSX Corp.	CSX	35.93	11.55	3.1	3.20	11.2	1.79	20.1	12.70	2.83
Kansas City Southern	KSU	84.85	21.35	3.97	7.20	11.8	4.45	19.1	40.65	2.1
Genesee & Wyoming	GWR	69.41	34.75	2.0	7.15	9.7	3.60	19.3	46.10	1.51
Canadian National	CNI	67.40	11.70	5.8	4.65	14.5	3.37	20.0	15.25	4.42
Canadian Pacific	CP	142.77	31.95	4.5	11.35	12.6	7.90	18.1	25.85	5.52
		Mean		3.8		12.2		19.6		3.3
		Median		4.0		11.8		19.5		2.8
	Harm	nonic Mean		3.5		12.0		19.5		2.8
		Max		5.8		14.5		21.2		5.5
		Min		2.0		9.7		18.1		1.51
		Std Dev		1.2		1.6		1.0		1.5
Co	efficient o	f Variation		0.3		0.1		0.0		0.4
	Per	centile .25		3.2		11.5		19.2		2.3
	Per	centile .75		4.4		13.1		20.0		4.4
		Say		3.75		12.00		19.25		3.00

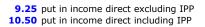
## **ENTERPRISE VALUE MULTIPLES**

WASHINGTON STATE DEPARTMENT OF REVENUE

#### 2017 ASSESSMENT YEAR

RAILROADS

Guideline Companies	Ticker	EV+OL	EBITDA + OL	EV / EBITDA	Annual Cash Flow Rate Change VL	EBITDA	EV / EBITDA	Revenue	EV/Sales	Cash Flow	Debt Service	EV / CF
			historic	historic	forecast	forecast	forecast	Forecast	Forecast	Forecast	Forecast	
Union Pacific Corp.	UNP	\$109,040,508,638	9,845,000,000	11.08	7.24%	10,557,467,105	10.33	20,684,800,000	5.27	6,585,200,000	755,250,000	14.85
Norfolk Southern Corp.	NSC	\$ 45,813,983,892	4,275,000,000	10.72	7.65%	4,602,049,180	9.96	10,346,200,000	4.43	2,846,650,000	552,235,000	13.48
CSX Corp.	CSX	\$ 45,996,370,999	4,740,000,000	9.70	7.81%	5,110,312,500	9.00	11,113,500,000	4.14	3,208,500,000	574,560,000	12.16
Kansas City Southern	KSU	\$ 12,443,371,445	1,184,500,000	10.51	13.89%	1,349,013,889	9.22	2,498,450,000	4.98	877,400,000	109,430,500	12.61
Genesee & Wyoming	GWR	\$ 6,531,302,743	509,091,000	12.83	9.79%	558,932,077	11.69	2,079,300,000	3.14	455,300,000	109,417,723	11.57
Canadian National	CNI	\$ 62,961,583,292	5,000,250,000	12.59	7.53%	5,376,612,903	11.71	9,312,500,000	6.76	3,725,000,000	430,492,500	15.15
Canadian Pacific	CP	\$ 29,797,653,574	2,508,750,000	11.88	10.57%	2,773,992,291	10.74	4,971,300,000	5.99	1,832,300,000	355,573,125	13.62
Mean Median							10.38 10.33		4.96 4.98	2,790,050,000 2,846,650,000		13.35 13.48
Max Min							11.71 9.00					
Std Dev fficient of Variation							1.08 0.10					
Harmonic Mean							10.28		4.69	1,409,834,578		13.23
Say							10.50		4.75			13.25



# EV/EBITDA Correlation

#### Forecast EV/EBITDA By Rank

	EV/EBITDA		
Guideline Companies	forecast		
CSX Corp.	9.00	9.63	Low Average
Kansas City Southern	9.22	9.22	Low Median
Norfolk Southern Corp.	9.96	9.25	Say
Union Pacific Corp.	10.33	10.38	Average
Canadian Pacific	10.74	10.33	Median
Genesee & Wyoming	11.69	10.50	Say
Canadian National	11.71		

#### SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT CAPITAL ASSET PRICING MODEL

Ex Ante

WASHINGTON STATE DEPARTMENT OF REVENUE 2017 ASSESSMENT YEAR RAILROADS

		Ke = Rf + B (Rp)	)	
Ke =	Cost of Equity			9.04%
				to page 1
			3.25%	
			3.00% 5.25%	
			1.15	page 7
				F-5
<b>.</b>	Diele Duraniana			5.25%
Rp =	Risk Premium			5.25% to above
	Shannon Pratt a	und Roger Grabowski	3.5 - 6	
	Shannon Frate	Cost of Capital, Applications and Examples, T		70
		Edition, 2008, Page 113		
	Dr. Aswath Dan		5.69%	
		http://pages.stern.nyu.edu/~adamodar/	5.14%	o adjusted for Rf
	John Graham av	2016 Implied Premium Id Campbell Harvey	5.70%	6 10 year expected real return
	John Granalli al	Duke CFO magazine Global Business Outlook		, ,
		4th Qtr 2016	4.93%	
	Dick Free Date			2 000/
Rf =	Risk Free Rate			3.00% to above
		of the Tressure		
	US Department	of the Treasury		
		Long Term (20 years) US Treasury Bond Yield	d 2.79%	
	as of 12-30-16	Long Term (20 years) 05 measury bond here	2.75/6	5
	as of 12-50-10			
	Value Line Inve as of 12-28-16	stment Survey, Selected Yields January 6,	2017, page 3197	
		US Treasury Securities year end data		
		5 year	2.00%	, ,
		10 year	2.51%	
		30 year	3.09%	
		30 year Zero	3.17%	
		Statistical Release (http://www.federal	reserve.gov/Rele	ases/H15/Current/)
	January 4, 2017 as	Treasury Constant Maturities		
		5 year	1.93%	
		10 year	2.45%	
		20 year	2.79%	
		30 year	3.06%	
		20 year TIPS	0.82%	
		30 year TIPS	0.99%	
				TIPS inflation indication
Inflat	ion			2.00%
				to appraisal template
	value Line Inve	stment Survey, Economic Series January 6		
	Enderal Becorv	Consumer Price Index Annual Rate of Change Bank of Philadelphia	2019-2021	2.50%
	reueral Reserve	The Livingston Survey, December 9, 2016		Table 3
		Inflation median (measured by the CPI) over	nevt 10 years	2.30%
		https://www.philadelphiafed.org/research-and-data	,	
Troce	Domestic Prod			3.80%
11033	Domestic Frod			5.00 /0
	Federal Reserve	Projected Long Run Real GDP Growth Median Projection Value From Dec 14, 2016 R http://www.federalreserve.gov/monetarypolicy/fom	•	1.80%
	Congressional	udget Office Real GDP Economic Projectio	ns	
	Congressional E	The Budget and Economic Outlook 2017-2027		Table C-1, pg 126
		Average Percentage Change From Year To Year	2017-20	
		http://www.cbo.gov/publication/52370	2022-20	
	Federal Reserve	Bank of Philadelphia		
		The Livingston Survey, December 9, 2016		pg 4
		Average Annual Real GDP Growth Rate for Ne		2.20%
		https://www.philadelphiafed.org/research-and-data	/real-time-center/livin	gston-survey
		Page 6		

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

WASHINGTON STATE DEPARTMENT OF REVENUE 2017 ASSESSMENT YEAR RAILROADS

**Based on Dividend Growth** 

 $K_e = (D_1 / P_o) + G_D$ 

Ke =

Cost of Equity Expected Dividends D1 =

P0 = Current Stock Price

GD = Sustainable Growth -- Dividend

assumption Sustainable growth can not exceed inflation plus real GDP

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Dividend Growth (GD) VL	K <sub>e</sub>	Forecast Dividend Growth	K <sub>e</sub> Forecast Growth	Sustainable Dividend Growth	K <sub>e</sub> Sustainable Growth	K <sub>e</sub> Multistage
Union Pacific Corp.	UNP	103.68	2.40	2.31%	9.50%	11.81%	12.06%	14.38%	3.80%	6.11%	10.65%
Norfolk Southern Corp.	NSC	108.07	2.44	2.26%	4.00%	6.26%	4.42%	6.68%	3.80%	6.06%	6.28%
CSX Corp.	CSX	35.93	0.76	2.12%	9.50%	11.62%	12.06%	14.18%	3.80%	5.92%	10.58%
Kansas City Southern	KSU	84.85	1.44	1.70%	10.50%	12.20%	13.67%	15.37%	3.80%	5.50%	10.78%
Genesee & Wyoming	GWR	69.41	0.00						3.80%		
Canadian National	CNI	67.40	1.25	1.85%	13.50%	15.35%	18.96%	20.82%	3.80%	5.65%	13.48%
Canadian Pacific	CP	142.77	1.50	1.05%	14.00%	15.05%	19.92%	20.97%	3.80%	4.85%	12.94%
			Mean			12.05%				5.68%	10.78%
			Median			12.01%				5.78%	10.71%
		Ha	rmonic Mean			11.03%				5.65%	10.14%
			Std Dev			3.28%				0.47%	2.54%
			Coeff Var			27.21%				8.29%	23.56%
			Мах			15.35%				6.11%	13.48%
			Min			6.26%				4.85%	6.28%
Source: Value Line Projections 13-15	5 to 19-21					<b>12.00%</b>				5.50%	10.75%

Say

11.25% to page 1

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

WASHINGTON STATE DEPARTMENT OF REVENUE 2017 ASSESSMENT YEAR RAILROADS

**Based on Earnings Growth** 

 $K_e = (D_1 / P_o) + G$ 

Ke =

Cost of Equity Expected Dividends D1 =

P0 = Current Stock Price

Sustainable Growth -- Earnings G =

assumption Sustainable growth can not exceed inflation plus real GDP

must be hic

Company	Ticker	Stock Price (Po)	Expected Earnings (D1)	Yield (D1/Po)	Earnings Growth (G) VL	K <sub>e</sub>	Forecast Earnings Growth	K <sub>e</sub> Forecast Growth	Sustainable Earnings Growth	K <sub>e</sub> Sustainable Growth	K <sub>e</sub> Multistage *
Union Pacific Corp.	UNP	103.680	5.55	5.35%	7.00%	12.35%	8.35%	13.70%	3.80%	9.15%	10.60%
Norfolk Southern Corp.	NSC	108.070	6.20	5.74%	6.50%	12.24%	7.65%	13.39%	3.80%	9.54%	10.95%
CSX Corp.	CSX	35.930	2.00	5.57%	8.00%	13.57%	9.78%	15.35%	3.80%	9.37%	10.97%
Kansas City Southern	KSU	84.850	5.15	6.07%	9.00%	15.07%	11.29%	17.35%	3.80%	9.87%	12.14%
Genesee & Wyoming	GWR	69.410	3.80	5.47%	6.50%	11.97%	7.65%	13.13%	3.80%	9.27%	11.10%
Canadian National	CNI	67.400	3.65	5.42%	9.50%	14.92%	12.06%	17.48%	3.80%	9.22%	10.01%
Canadian Pacific	СР	142.770	9.10	6.37%	12.50%	18.87%	17.12%	23.50%	3.80%	10.17%	12.31%
			Mean	5.71%		14.14%				9.51%	
		На	Median rmonic Mean Std Dev Coeff Var	5.57% 5.69% 0.38% 6.63%		13.57% 13.83% 2.44% 17.25%				9.37% 9.50% 0.38% 3.98%	11.10% 0.82%
Source: Value Line Projections 13-	15 to 19-21		Max Min	6.37% 5.35%		18.87% 11.97% 13,50%				10.17% 9.15% 9.50%	

Say

12.25% to page 1

\*please contact me if you would like to see the multi-stage calculations

## SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE 2017 ASSESSMENT YEAR RAILROADS

#### Based on Return on Equity

$$Ke = (D1 / Po) + G$$

- Ke=(D1 / PD1=Expected DividendsE1=Expected EarningsPo=Current Price

- G=Sustainable Growthb=Retained Earnings % (plowback)ROE =Return on Equity

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	b (1-payout ratio)	ROE	Growth (b*ROE) (G)	K <sub>e</sub> Dividends	Expected Earnings (E1)	K <sub>e</sub> Earnings
Union Pacific Corp.	UNP	103.68	2.40	2.31%	57.0%	5.35%	3.05%	5.37%	5.55	8.40%
Norfolk Southern Corp.	NSC	108.07	2.44	2.26%	59.0%	5.74%	3.38%	5.64%	6.20	9.12%
CSX Corp.	CSX	35.93	0.76	2.12%	59.0%	5.57%	3.28%	5.40%	2.00	8.85%
Kansas City Southern	KSU	84.85	1.44	1.70%	72.0%	6.07%	4.37%	6.07%	5.15	10.44%
Genesee & Wyoming	GWR	69.41	0.00		100.0%	5.47%	5.47%		3.80	10.95%
Canadian National	CNI	67.40	1.25	1.85%	66.0%	5.42%	3.57%	5.43%	3.65	8.99%
Canadian Pacific	СР	142.77	1.50	1.05%	84.0%	6.37%	5.35%	6.40%	9.10	11.73%
							Mean			9.78%
						I	Median Harmonic Mean Std Dev	5.69% 0.43%		9.12% 9.65% 1.25%
							Coeff Var Max Min	6.40%		12.80% 11.73% 8.40%
								5.75%		9.50%

9.50% Say to page 1

## SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

WASHINGTON STATE DEPARTMENT OF REVENUE

Cost of Secured Debt (Operating Lease ) Rate

2017 ASSESSMENT YEAR

RAILROADS

Company	Ticker	Mergent's Ratings	S&P Ratings	WAYTM	S&P YTM (avg)	Mergent's Ratings	S&P Ratings	Mergent's	S&P
Jnion Pacific Corp.	UNP	A3	А	2.99%	2.94%	9	8	Aaa1	AAA+
Norfolk Southern Corp.	NSC	A3	BBB+	2.40%	3.58%	10	10	Aaa2	AAA
CSX Corp.	CSX	Baa1	BBB+	3.20%	3.27%	10	10	Aaa3	AAA-
Canadian Pacific	СР		BBB+	2.71%	5.62%		10	Aa1	AA+
Kansas City Southern	KSU	Baa3	BBB-	5.13%		12	12	Aa2	AA
Canadian National	CNI	A2	А	1.21%	3.08%	8	8	Aa3	AA-
	GWR		BB				14	A1	A+
Overall Average Debt Rating		Baa1	BBB+	2.94% alysis, A-BBB bonds	3.29%	9.8	10.3	A2 A3	A A-
			All issues	20+ year maturities				Baa1 Baa2	BBB+ BBB
Guideline Companies, All Ra	tinas		2.75%	4.50%				Baa3	BBB-
	lings			nd analysis page 12					
								Ba1	BB+
									DD.
								Ba2	BB
Mergent's Bond Record Janu	uary 2017, p	age 201						Ba2 Ba3	BB-
	uary 2017, p Aaa	age 201 Aa	A	Baa					
Corporate			<b>A</b> 3.78%	<b>Baa</b> 4.38%				Ba3	BB-
Corporate October	<b>Aaa</b> 3.51%	<b>Aa</b> 3.61%		4.38%				Ba3 B1 B2	вв- в+
Corporate October November	<b>Aaa</b> 3.51% 3.86%	Aa 3.61% 3.94%	3.78% 4.11%	4.38% 4.71%				Ba3 B1 B2 B3	BB- B+ B-
Corporate October November	<b>Aaa</b> 3.51%	<b>Aa</b> 3.61%	3.78%	4.38%				Ba3 B1 B2	BB- B+ B
Corporate October November December 4th Qtr Average	Aaa 3.51% 3.86% 4.06%	Aa           3.61%           3.94%           4.12%	3.78% 4.11% 4.28%	4.38% 4.71% 4.83%				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Corporate October November December 4th Qtr Average Public Utilities	Aaa 3.51% 3.86% 4.06% 3.81%	Aa           3.61%           3.94%           4.12%           3.89%	3.78% 4.11% 4.28% <b>4.06%</b>	4.38% 4.71% 4.83% <b>4.64%</b>				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Corporate October November December 4th Qtr Average Public Utilities October	Aaa 3.51% 3.86% 4.06% 3.81%	Aa           3.61%           3.94%           4.12%           3.89%	3.78% 4.11% 4.28% 4.06%	4.38% 4.71% 4.83% 4.64% Baa				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Corporate October November December 4th Qtr Average Public Utilities October November	Aaa 3.51% 3.86% 4.06% 3.81%	Aa           3.61%           3.94%           4.12%           3.89%           Aa           3.59%           3.91%	3.78% 4.11% 4.28% 4.06% A 3.77% 4.08%	4.38% 4.71% 4.83% 4.64% Baa 4.34% 4.64%				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Corporate October November December 4th Qtr Average Public Utilities October November	Aaa 3.51% 3.86% 4.06% 3.81%	Aa           3.61%           3.94%           4.12%           3.89%	3.78% 4.11% 4.28% 4.06% A 3.77%	4.38% 4.71% 4.83% 4.64% Baa 4.34%				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Corporate October November December 4th Qtr Average Public Utilities October November December 4th Qtr Average	Aaa 3.51% 3.86% 4.06% 3.81%	Aa           3.61%           3.94%           4.12%           3.89%           Aa           3.59%           3.91%           4.11%	3.78% 4.11% 4.28% 4.06% 3.77% 4.08% 4.27%	4.38% 4.71% 4.83% 4.64% Baa 4.34% 4.64% 4.64% 4.79%				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Corporate October November December 4th Qtr Average Public Utilities October November December 4th Qtr Average Industrials	Aaa 3.51% 3.86% 4.06% 3.81% Aaa	Aa           3.61%           3.94%           4.12%           3.89%           Aa           3.59%           3.91%           4.11%           3.87%	3.78% 4.11% 4.28% 4.06% 3.77% 4.08% 4.27% 4.04%	4.38% 4.71% 4.83% 4.64% 4.64% 4.34% 4.64% 4.64% 4.79% 4.59%				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Corporate October November December Public Utilities October November December Ath Qtr Average 4th Qtr Average Industrials October	Aaa 3.51% 3.86% 4.06% 3.81% Aaa	Aa         3.61%         3.94%         4.12%         3.89%         Aa         3.59%         3.91%         4.11%         3.87%	3.78% 4.11% 4.28% 4.06% 3.77% 4.08% 4.08% 4.27% 4.04%	4.38% 4.71% 4.83% 4.64% 4.64% 4.34% 4.64% 4.79% 4.59% Baa				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+
Public Utilities October November December	Aaa 3.51% 3.86% 4.06% 3.81% Aaa Aaa 3.51%	Aa           3.61%           3.94%           4.12%           3.89%           Aa           3.59%           3.91%           4.11%           3.87%	3.78% 4.11% 4.28% 4.06% 3.77% 4.08% 4.27% 4.08% 4.27% 4.04%	4.38% 4.71% 4.83% 4.64% 4.64% 4.34% 4.64% 4.79% 4.59% Baa 4.40%				Ba3 B1 B2 B3 Caa1	BB- B+ B- CCC+

to page 1

4.00%

# 12/31/2016 Railroad Bond Analysis

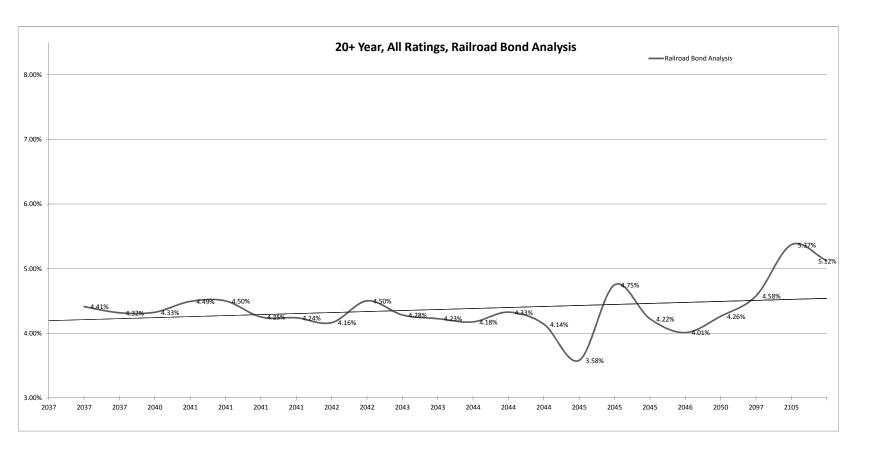
#### 2017.5

Company	type	Call	coupon	maturity	Price 12/1/15	Issued / Book	current vield	ΥТΜ	Weighted A	Rating	Mkt Val	Mkt : Book	Embedde d Rate	Debt Service	WAYTM	WAYTM	S&P YTM
Burlington Northern R.R		NC	3.800	2020	102.63 \$	1.000.000.000	3.703%	2.70%	0.06%	BBB+	\$ 1.026.300.000			38.000.000	0.000613795	0.002948633	2.90
Burlington Northern R.R		NC	6.550	2020	108.86 \$	2.000.000.000	6.017%	2.83%	0.13%	BBB+	\$ 2.177.200.000			131.000.000	0.001287334	0.006184268	3.39
Burlington Northern R.R		NC	6.550	2020	108.86 \$	1,150,000,000	6.017%	2.83%	0.13%	BBB+	\$ 1,251,890,000			75,325,000	0.000740217	0.003555954	3.39
Burlington Northern RR		NC	8.150	2020	115.50 \$	2,500,000,000	7.056%	1.76%	0.10%	BBB+	\$ 2,887,500,000			203,750,000	0.001000082	0.004804328	2.71
Burlington Northern R.R		NC	8.150	2020	115.50 \$	1,000,000,000	7.056%	1.76%	0.04%	BBB+	\$ 1,155,000,000			81,500,000	0.000400033	0.001921731	2.71
Burlington Northern R.R		NC	3.200	2045	76.48 \$	1,500,000,000	4.184%	4.75%	0.16%	BBB+	\$ 1,147,200,000			48,000,000	0.001620831	0.007786363	4.73
Banington Hortinon Thirt	6 Book Val	60		sum	627.83 \$			104.64%	0.57%	0001	\$ 9,645,090,000				0.001020001	2.720%	
						-,,,								, ,, ,, ,, ,,			
Canadian National Ry	Notes (frgn	)Z100	6.800	2018	107.53 \$	200,000,000	6.32%	-7.42%	-0.03%	Α	\$ 215,060,000	107.53%		13,600,000	-0.000337469	-0.008357052	2.87
Canadian National Ry	Notes		5.550	2019	107.63 \$	550,000,000	5.16%	0.44%	0.01%	Α	\$ 591,965,000	107.63%	,	30,525,000	5.45076E-05	0.001349823	1.63
Canadian National Ry	Deb (frgn)	NC	7.625	2023	123.49 \$	300,000,000	6.17%	2.94%	0.02%	Α	\$ 370,470,000	123.49%	5	22,875,000	0.000200485	0.004964793	3.24
Canadian National Ry	Notes (frgn	)Z100	6.900	2028	132.84 \$	475,000,000	5.19%	3.17%	0.03%	Α	\$ 630,990,000	132.84%	,	32,775,000	0.000342935	0.00849243	3.5
Canadian National Ry	Secured (fr	rçPut-able	6.712	2036	134.34 \$	250,000,000	5.00%	4.04%	0.02%	Α	\$ 335,850,000	134.34%	,	16,780,000	0.000229818	0.005691188	4.15
	5	50	0	sum	605.83 \$	1,775,000,000	Percent of book	121.17%	0.05%		\$ 2,144,335,000	120.81%	6.57% \$	\$ 116,555,000		1.214%	
CSX Corp	NOTES	Z100	5.600	2017	102.14 \$	300,000,000	5.48%	9.98%	0.07%	BBB+	\$ 306,420,000	102.14%	,	16,800,000	0.00068142852	0.002720515	0
CSX Corp	Notes		6.250	2018	106.80 \$	600,000,000	5.85%	-6.67%	-0.09%	BBB+	\$ 640,800,000	106.80%	,	37,500,000	-0.00090992966	-0.003632776	0.02
CSX Corp	Notes		7.375	2019	112.42 \$	500,000,000	6.56%	-0.82%	-0.01%	BBB+	\$ 562,100,000			36,875,000	-0.00009329450	-0.000372466	0
CSX Corp	Fixed Rt		3.700	2020	103.76 \$	500,000,000	3.57%	2.14%	0.02%	BBB+	\$ 518,800,000			18,500,000	0.00024335622	0.000971568	2.7
CSX Corp	Deb	NC	8.100	2022	121.87 \$	250,000,000	6.65%	2.85%	0.02%	BBB+	\$ 304,675,000			20,250,000	0.00016223661	0.000647709	3.93
CSX Corp	Deb	NC	8.625	2022	125.17 \$	200,000,000	6.89%	2.62%	0.01%		\$ 250,340,000			17,250,000	0.00011931179	0.000476337	3.11
CSX Corp	Fixed Rt		3.700	2023	103.52 \$	500,000,000	3.57%	3.00%	0.03%	BBB+	\$ 517,600,000			18,500,000	0.000340829	0.001360716	3.12
CSX Corp	Fixed Rt		3.400	2024	101.58 \$	550,000,000	3.35%	3.13%	0.04%		\$ 558,690,000			18,700,000	0.000391343	0.001562384	3.17
CSX Corp	Fixed Rt		3.350	2025	99.77 \$	600,000,000	3.36%	3.39%	0.05%	NR	\$ 598,620,000			20,100,000	0.000462085	0.001844816	3.39
CSX Corp	Deb		7.250	2027	128.86 \$	2,500,000,000	5.63%	3.61%	0.21%	BBB+	\$ 3,221,500,000	128.86%		181,250,000	0.002051969	0.00819222	3.73
CSX Corp	MTN Ser C		6.800	2028	123.84 \$	200,000,000	5.49%	3.98%	0.02%	BBB+	\$ 247,680,000			13,600,000	0.000181007	0.000722647	4.22
CSX Corp		Z100	6.000	2036	119.01 \$	400,000,000	5.04%	4.47%	0.04%		\$ 476,040,000	119.01%	<b>b</b>	24,000,000	0.000406616	0.001623361	4.54
CSX Corp		Z100	6.150	2037	122.39 \$	700,000,000	5.02%	4.41%	0.07%		\$ 856,730,000			43,050,000	0.00070292	0.002806318	4.44
CSX Corp	Fixed Rt nt	s	6.220	2040	124.14 \$	660,000,000	5.01%	4.49%	0.07%	BBB+	\$ 819,324,000			41,052,000	0.000674615	0.002693313	4.51
CSX Corp	NOTES		5.500	2041	114.31 \$	550,000,000	4.81%	4.50%	0.06%	BBB+	\$ 628,705,000			30,250,000	0.000563171	0.002248386	4.51
CSX Corp	NOTES		4.750	2042	103.63 \$	600,000,000	4.58%	4.50%	0.06%	BBB+	\$ 621,780,000			28,500,000	0.000614577	0.002453618	4.58
CSX Corp	NOTES		4.100	2044	96.46 \$	800,000,000	4.25%	4.33%	0.08%	BBB+	\$ 771,680,000			32,800,000	0.00078753	0.00314411	4.32
CSX Corp	FR SR Not		3.950	2050	89.46 \$	600,000,000	4.42%	4.58%	0.06%	BBB+	\$ 536,760,000			23,700,000	0.000625115	0.002495691	4.57
	18	180	D	sum	1999.13 \$	11,010,000,000	Percent of book	111.06%	0.80%		\$ 12,438,244,000	) 112.97%	5.66%	622,677,000		3.196%	
Norfolk Southern	Natas	7100	7 700	2017	100.00	FF0 000 000	7.500/	12.40%	0.100/	BBB+	\$ 562 540 000	102.28%		40.050.000	0.00155100	0.00550050	0.00
Norfolk Southern	Notes	Z100	7.700		102.28 \$	550,000,000	7.53%		0.16%		φ σσΞ,στσ,σσσ			42,350,000	0.00155120	0.00552953	
	SR NTS		5.750	2018	104.99 \$	600,000,000	5.48%	-3.93%	-0.05%	BBB+	\$ 629,940,000			34,500,000	-0.0005370620	-0.00191445	0.69
Norfolk Southern	SR NTS		5.750	2018	117.49 \$	600,000,000	4.89%	-23.05%	-0.31%	BBB+	\$ 704,940,000			34,500,000	-0.003146434	-0.01121601	0.71
Norfolk Southern	SR NTS	1100	5.900 3.250	2019	108.76 \$	500,000,000	5.42%	0.06%	0.00%	BBB+ BBB+	\$ 543,800,000 \$ 513,500,000			29,500,000	6.36066E-06	0.00002267	2.71 2.76
Norfolk Southern Norfolk Southern	Global Sr N SR Notes		9.000	2021 2021	102.70 \$ 118.79 \$	500,000,000 250,000,000	3.16% 7.58%	2.44%	0.03%	NR	\$ 296,975,000			16,250,000 22,500,000	0.00027708 0.000184015	0.00098770	3.88
Norfolk Southern	SR NTS	NG	3.000	2021	101.11 \$	600,000,000	2.97%	2.73%	0.02%	BBB+	\$ 606,660,000			18,000,000	0.000373259	0.00133055	2.79
Norfolk Southern	Notes		2.903	2022	99.38 \$	586,000,000	2.97%	3.03%	0.04%	BBB+	\$ 582,366,800			17,011,580	0.000403554	0.00133055	3.06
Norfolk Southern	Notes		2.903	2023	99.38 \$	586.000.000	2.92%	3.03%	0.04%	BBB+	\$ 582,366,800			17,011,580	0.000403554	0.00143854	3.06
Norfolk Southern	Notes	Z100	5.590	2025	114.38 \$	367,000,000	4.89%	3.39%	0.04%	BBB+	\$ 419,774,600			20,515,300	0.000282768	0.00143834	3.54
Norfolk Southern		Z100	7.800	2023	133.95 \$	800,000,000	5.82%	3.53%	0.05%	BBB+	\$ 1,071,600,000			62,400,000	0.000642692	0.00229099	3.73
Norfolk Southern		Z100	5.640	2029	114.86 \$	350,000,000	4.91%	4.00%	0.00%	BBB+	\$ 402,010,000			19,740,000	0.000318696	0.00113605	4.10
Norfolk Southern		Z100	7.250	2029	134.34 \$	1,000,000,000	5.40%	3.92%	0.03%	BBB+	\$ 1,343,400,000			72,500,000	0.000892874	0.00318281	4.10
Norfolk Southern	Notes	Z100	7.050	2031	135.52 \$	750,000,000	5.20%	4.32%	0.03%	BBB+	\$ 1,016,400,000			52,875,000	0.000736808	0.00262648	4.03
Norfolk Southern	Notes	_100	4.837	2037	108.58 \$	596,000,000	4.45%	4.32 %	0.07 %	BBB+	\$ 647,136,800			28,828,520	0.000576592	0.00205536	4.39
Norfolk Southern	Notes		4.837	2041	108.78 \$	596,000,000	4.45%	4.24%	0.06%	BBB+	\$ 648,328,800			28,828,520	0.000574848	0.002049146	4.29
Norfolk Southern	SR NTS		3.950	2042	94.99 \$	600,000,000	4.16%	4.28%	0.06%	BBB+	\$ 569,940,000			23,700,000	0.000584798	0.002084613	4.34
Norfolk Southern	SR NTS		4.800	2042	108.85 \$	500,000,000	4.41%	4.23%	0.05%	BBB+	\$ 544,250,000			24,000,000	0.000480746	0.001713704	4.29
Norfolk Southern	FR SR Not	e	4.450	2045	103.64 \$	500,000,000	4.29%	4.22%	0.05%	BBB+	\$ 518,200,000			22,250,000	0.000480448	0.001712642	4.29
Norfolk Southern	FR SR Not		4.650	2045	106.32 \$	600.000.000	4.37%	4.26%	0.05%	NR	\$ 637,920,000			27.900.000	0.000581866	0.002074162	4.29
Norfolk Southern		Z100	7.900	2097	146.37 \$	350.000.000	5.40%	5.37%	0.00%	BBB+	\$ 512.295.000			27,650,000	0.000427608	0.001524284	5.49
Norfolk Southern	FR SR Not		6.000	2105	116.92 \$	550,000,000	5.13%	5.12%	0.04%	BBB+	\$ 643,060,000			33,000,000	0.000640919	0.002284668	5.20
	22	2200		sum	2482.38 \$		Percent of book		0.67%	0007	\$ 13,997,403,800				0.00000000	2.402%	0.20
	_		-			,,,,,			5.0.70					,010,000			
Union Pacific Corp	NOTES		5.650	2017	101.51 \$	250,000,000	5.57%	8.73%	0.05%	А	\$ 253,775,000	) 101.51%		14,125,000	0.00049678	0.002348002	0.00
Union Pacific Corp	NOTES		5.750	2017	103.83 \$	500,000,000	5.54%	13.66%	0.16%	Α	\$ 519,150,000	103.83%	s	28,750,000	0.00155420	0.007345848	1.84
Union Pacific Corp	NOTES		5.700	2018	106.46 \$	750,000,000	5.35%	-6.58%	-0.11%	А	\$ 798,450,000			42,750,000	(0.00112252)	-0.005305557	2.34
Union Pacific Corp	NOTES		7.875	2019	111.57 \$	750,000,000	7.06%	0.15%	0.00%	А	\$ 836,775,000			59,062,500	0.00002516	0.00011891	1.94
	NOTES		4.000	2021	105.97 \$	500,000,000	3.77%	2.21%	0.03%	А	\$ 529,850,000	105.97%		20,000,000	0.00025125	0.001187498	2.45
Union Pacific Corp			4.163	2022	109.15 \$	750,000,000	3.81%	2.02%	0.03%	Α	\$ 818,625,000	109.15%	,	31,222,500	0.00034392	0.001625521	2.99
Union Pacific Corp Union Pacific Corp	NOTES		4.103	2022	τουττο φ												
	NOTES NOTES		4.163	2022	107.76 \$	750,000,000	3.86%	2.33%	0.04%	A	\$ 808,200,000			31,222,500	0.00039700	0.0018764	2.76
Union Pacific Corp								2.33% 3.02%	0.04% 0.03%			107.76%					2.76 3.10

			1014	· •	10,000,000,000					÷	,,		••••••		term. For 20+ year maturi		
																	3.293
			Tota	ı e	42 956 000 000				Total	¢	40 090 047 900	111 60%	5 70% ¢	2 512 200 500	2 75%	2 00.9%	3.293
Book Value	e 20	00	sum	211.36 \$	290,000,000	Percent of book	105.68%	0.02%		\$	347,800,000	119.93%	8.70%	25,225,000		2.709%	
Deb (foreigr		4.000	2022	86.00 \$	40,000,000	4.65%	7.81%	0.01%	A+	\$	34,400,000	86.00%		1,600,000	7.10566E-05	0.010770213	7.45
Deb (foreigr	NC	9.450	2021	125.36 \$	250,000,000	7.54%	1.89%	0.01%	BBB+	\$	313,400,000	125.36%		23,625,000	0.000107677	0.016320899	3.78
Book Value	E 100		sum	111.41 \$	100,000,000	Percent of book	111.41%	0.01%		\$	111,410,000	111.41%	7.00% \$	7,000,000		5.129%	
	Z100	7.000	2025	111.41 \$	100,000,000	6.28%	5.13%	0.01%	NR	\$	111,410,000	111.41%		7,000,000	0.00011669	0.051291082	0.00
DOOK VAIUE	1700		sum	1907.45 \$	9,300,000,000	Percent of DOOK	112.20%	0.03%		Þ	10,404,765,000	111.88%	J.∠5% \$	400,007,000		2.990%	
		4.050							INR	\$			E 050/ Ø		0.00045627		4.05
									A	\$							0.00
									A	\$				, ,			4.17
									A	\$							4.22
					500,000,000				Α	\$					0.00047371		4.22
									Α	\$							4.39
	Z100				250,000,000				Α	\$				15,625,000			4.12
					600,000,000				Α	\$				39,750,000			3.54
	Deb SR NOTES Fixed Rate Fixed Rate FR 144a Fixed Rate Book Value Deb Book Value Deb (foreig Deb (foreig	SR NOTES Z100 Deb SR NOTES Fixed Rate Fixed Rate Fixed Rate Book Value 1700 Deb Z100 Book Value 100 Deb (foreig: NC Deb (foreig: NC	SR NOTES         2100         6.250           Deb         6.150           SR NOTES         4.750           Fixed Rate         4.750           Fixed Rate         4.821           FR 144a         4.820           Book Value         1700           Deb         Z100         7.000           Book Value         100	SR NOTES         Z100         6.250         2034           Deb         6.150         2037           SR NOTES         4.750         2043           Fixed Rate         4.750         2044           Fixed Rate         4.821         2044           Fixed Rate         4.820         2044           Fixed Rate         4.050         2045           Book Value         100         sum           Deb         Z100         7.000         2025           Book Value         100         sum         sum           Deb         Groep RNC         9.450         2021           Deb (foreigr NC         9.450         2022         sum           Book Value         200         sum         sum	SR NOTES         2100         6.250         2034         126.18         \$           Deb         6.150         2037         123.70         \$           SR NOTES         4.750         2041         108.67         \$           Fixed Rate         4.750         2043         108.89         \$           Fixed Rate         4.821         2044         110.81         \$           FR 144a         4.820         2044         120.95         \$           Fixed Rate         4.050         2045         100.64         \$           Book Value 1700         sum         1907.45         \$           Deb         Z100         7.000         2025         111.41         \$           Deb (foreigr NC         9.450         2021         125.36         \$           Deb (foreigr NC         4.000         2022         86.00         \$	SR NOTES         Z100         6.250         2034         126.18         \$         250,000,000           Deb         6.150         2037         123.70         \$         250,000,000           SR NOTES         4.750         2041         108.67         \$         500,000,000           Fixed Rate         4.750         2043         108.89         \$         500,000,000           Fixed Rate         4.821         2044         110.81         \$         700,000,000           Fixed Rate         4.820         2044         120.95         \$         700,000,000           Fixed Rate         4.050         2045         100.64         \$         500,000,000           Book Value         700         2025         111.41         \$         100,000,000           Deb         Z100         7.000         2025         111.41         \$         100,000,000           Deb (foreign NC         9.450         2021         125.36         \$         250,000,000           Deb (foreign NC         9.450         2022         86.00         \$         40,000,000           Book Value         200         sum         211.36         \$         290,000,000	SR NOTES         Z100         6.250         2034         126.18         \$         250,000,000         4.95%           Deb         6.150         2037         123.70         \$         250,000,000         4.97%           SR NOTES         4.750         2041         108.67         \$         500,000,000         4.37%           SR NOTES         4.750         2043         108.89         \$         500,000,000         4.36%           Fixed Rate         4.821         2044         110.81         \$         700,000,000         4.35%           FR 144a         4.820         2044         120.95         \$         700,000,000         4.35%           Fixed Rate         4.050         2045         100.64         \$         500,000,000         4.02%           Book Value         1700         sum         1907.45         \$         9,300,000,000         Percent of book           Deb         Z100         7.000         2025         111.41         \$         100,000,000         6.28%           Book Value         100         sum         111.41         \$         100,000,000         7.54%           Deb (foreign NC         9.450         2021         125.36         \$         250	SR NOTES         Z100         6.250         2034         126.18         \$         250,000,000         4.95%         4.04%           Deb         6.150         2037         123.70         \$         250,000,000         4.97%         4.33%           SR NOTES         4.750         2041         108.67         \$         500,000,000         4.37%         4.16%           Fixed Rate         4.750         2043         108.89         \$         500,000,000         4.35%         4.18%           Fixed Rate         4.821         2044         110.81         \$         700,000,000         4.35%         4.14%           FR 144a         4.820         2044         120.95         \$         700,000,000         4.35%         4.14%           Fixed Rate         4.050         2045         100.64         \$         500,000,000         4.02%         4.01%           Book Value         1700         sum         1907.45         \$         9,300,000,000         4.02%         5.13%           Book Value         100         sum         111.41         \$         100,000,000         6.28%         5.13%           Deb (foreigr NC         9.450         2021         125.36         250,000,000	SR NOTES         Z100         6.250         2034         126.18         \$         250,000,000         4.95%         4.04%         0.02%           Deb         6.150         2037         123.70         \$         250,000,000         4.97%         4.33%         0.02%           SR NOTES         4.750         2041         108.67         \$         500,000,000         4.37%         4.16%         0.05%           Fixed Rate         4.750         2043         108.89         \$         500,000,000         4.37%         4.16%         0.05%           Fixed Rate         4.821         2044         110.81         \$         700,000,000         4.35%         4.14%         0.07%           Fixed Rate         4.820         2044         120.95         \$         700,000,000         4.35%         4.14%         0.07%           Book Value         1700         Sum         1907.45         \$         9,300,000,000         4.02%         0.01%         0.05%           Book Value         100         7.000         2025         111.41         \$         100,000,000         6.28%         5.13%         0.01%           Deb (foreigr NC         9.450         2021         125.36         250,000,000	SR NOTES         Z100         6.250         2034         126.18         \$ 250,000,000         4.95%         4.04%         0.02%         A           Deb         6.150         2037         123.70         \$ 250,000,000         4.97%         4.33%         0.02%         A           SR NOTES         4.750         2041         108.67         \$ 500,000,000         4.37%         4.16%         0.05%         A           Fixed Rate         4.750         2043         108.89         \$ 500,000,000         4.35%         4.14%         0.05%         A           Fixed Rate         4.821         2044         110.81         \$ 700,000,000         4.35%         4.14%         0.05%         A           Fixed Rate         4.820         2044         120.95         \$ 700,000,000         4.09%         0.05%         A           Fixed Rate         4.050         2045         100.64         \$ 500,000,000         4.02%         0.05%         A           Book Value         1700         sum         1907.45         \$ 9,300,000,000         Percent of book         112.20%         0.63%           Deb         Z100         7.000         2025         111.41         \$ 100,000,000         6.28%         5.13%	SR NOTES Z100       6.250       2034       126.18       \$       250,000,000       4.95%       4.04%       0.02%       A       \$         Deb       6.150       2037       123.70       \$       250,000,000       4.95%       4.04%       0.02%       A       \$         SR NOTES       4.750       2041       108.67       \$       500,000,000       4.37%       4.16%       0.05%       A       \$         Fixed Rate       4.750       2043       108.89       \$       500,000,000       4.36%       4.18%       0.05%       A       \$         Fixed Rate       4.821       2044       110.81       \$       700,000,000       4.36%       4.18%       0.05%       A       \$         Fixed Rate       4.820       2044       120.95       \$       700,000,000       4.02%       4.01%       0.05%       A       \$         Book Value       1000       2045       100.64       \$       500,000,000       4.02%       4.01%       0.05%       NR       \$         Book Value       100       7.000       2025       111.41       \$       100,000,000       6.28%       5.13%       0.01%       \$         Deb (foreigr/NC	SR NOTES       2100       6.250       2034       126.18       \$ 250,000,000       4.95%       4.04%       0.02%       A       \$ 315,450,000         Deb       6.150       2037       123.70       \$ 250,000,000       4.97%       4.33%       0.02%       A       \$ 309,250,000         SR NOTES       4.750       2041       108.67       \$ 500,000,000       4.37%       4.16%       0.05%       A       \$ 543,350,000         Fixed Rate       4.750       2043       108.89       \$ 500,000,000       4.36%       4.18%       0.05%       A       \$ 543,350,000         Fixed Rate       4.821       2044       110.81       \$ 700,000,000       4.35%       4.14%       0.05%       A       \$ 566,650,000         Fixed Rate       4.820       2044       120.95       \$ 700,000,000       3.99%       3.58%       0.06%       A       \$ 846,650,000         Fixed Rate       4.050       2045       100.64       \$ 500,000,000       4.02%       4.01%       0.05%       NR       \$ 10,404,765,000         Book Value       100       .000       .0225       111.41       \$ 100,000,000       6.28%       5.13%       0.01%       \$ 111,410,000         Deb (foreigr NC       9	SR NOTES       Z100       6.250       2034       126.18       \$       250,000,000       4.95%       4.04%       0.02%       A       \$       315,450,000       126.18%         Deb       6.150       2037       123.70       \$       250,000,000       4.97%       4.33%       0.02%       A       \$       309,250,000       123.70%         SR NOTES       4.750       2041       108.67       \$       500,000,000       4.37%       4.16%       0.05%       A       \$       543,350,000       108.67%         Fixed Rate       4.750       2043       108.89       \$       500,000,000       4.35%       4.18%       0.05%       A       \$       543,350,000       108.89%         Fixed Rate       4.821       2044       110.81       \$       700,000,000       4.35%       4.18%       0.05%       A       \$       846,650,000       120.89%         Fixed Rate       4.050       2044       120.95       \$       700,000,000       4.02%       4.01%       0.05%       NR       \$       846,650,000       120.89%         Book Value       1700       sum       1907.45       \$       9,300,000,000       Percent of book       112.20%       0.63%       \$<	SR NOTES       2100       6.250       2034       126.18       \$\$       250,000,000       4.95%       4.04%       0.02%       A       \$\$       315,450,000       126.18%       Deb         Deb       6.150       2037       123.70       \$       250,000,000       4.97%       4.33%       0.02%       A       \$\$       309,250,000       123.70%       Deb         SR NOTES       4.750       2041       108.67       \$       500,000,000       4.37%       4.16%       0.05%       A       \$\$       543,350,000       108.67%       Exed Rate       4.15%       0.05%       A       \$\$       543,350,000       108.67%       Exed Rate       4.820       2044       110.81       \$       700,000,000       4.35%       4.18%       0.05%       A       \$\$       846,650,000       100.88%       Exed Rate       4.820       2044       120.95       \$       700,000,000       4.02%       4.01%       0.05%       A       \$\$       846,650,000       100.64%       Exed Rate       4.050       2045       100.64       \$       500,000,000       4.02%       4.01%       0.05%       NR       \$\$       104,4765,000       111.88%       5.25%       \$       Deb       2100       7.00	SR NOTES       2100       6.250       2034       126.18       \$       250,000,000       4.95%       4.04%       0.02%       A       \$       315,450,000       126.18%       15,625,000         Deb       6.150       2037       123.70       \$       250,000,000       4.97%       4.33%       0.02%       A       \$       309,250,000       128.70%       15,375,000         SR NOTES       4.750       2041       108.67       \$       500,000,000       4.37%       4.16%       0.05%       A       \$       543,350,000       128.70%       23,750,000         Fixed Rate       4.821       2044       110.81       \$       700,000,000       4.35%       4.14%       0.05%       A       \$       544,450,000       108.89%       23,750,000         Fixed Rate       4.820       2044       120.95       \$       700,000,000       4.02%       4.14%       0.05%       A       \$       846,650,000       120.95%       23,740,000         Fixed Rate       4.050       2045       100.64       \$       500,000,000       4.02%       4.01%       0.05%       NR       \$       104,4765,000       111.88%       5.25%       \$       488,557,000       20,250,000       100.64%<	SR NOTES       Z100       6.250       2034       126.18       \$       250,000,000       4.95%       4.04%       0.02%       A       \$       315,450,000       126.18%       15,625,000       0.00023004         Deb       6.150       2037       123.70       \$       250,000,000       4.97%       4.33%       0.02%       A       \$       339,250,000       123.70%       15,625,000       0.00023004         SR NOTES       4.750       2041       108.67       \$       500,000,000       4.37%       4.16%       0.05%       A       \$       543,350,000       108.67%       23,750,000       0.00024605         SR NOTES       4.750       2043       108.88       \$       500,000,000       4.35%       4.14%       0.05%       A       \$       544,450,000       108.89%       23,750,000       0.00047511         Fixed Rate       4.820       2044       110.81       700,000,000       4.35%       4.14%       0.07%       A       \$       775,670,000       110.81%       33,74,000       0.00065953       33,74,000       0.00065953       33,74,000       0.00065953       35,80%       0.06%       A       \$       864,655,000       110.81%       7,000,000       0.000552       S	SR NOTES       2100       6.250       2034       126.18       \$       250,000,000       4.95%       4.04%       0.02%       A       \$       315,450,000       126.18%       15,625,000       0.00023004       0.001087281         Deb       6.150       2037       123.70       \$       250,000,000       4.97%       4.33%       0.02%       A       \$       309,250,000       123.70%       15,375,000       0.0002405       0.0002405       0.0010828971         Fixed Rate       4.750       2043       108.89       \$       500,000,000       4.37%       4.16%       0.05%       A       \$       543,350,000       108.89%       23,750,000       0.00047511       0.002245574         Fixed Rate       4.821       2044       110.81       700,000,000       4.35%       4.14%       0.07%       A       \$       775,670,000       110.81%       33,74,000       0.000552       0.002245574         Fixed Rate       4.050       2044       110.81       \$       700,000,00       4.02%       4.01%       0.06%       A       \$       364,650,000       110.81%       23,74,000       0.00047511       0.00224557       0.00215658       50,000       0.0001565       0.00011659       0.02%       10.66%

Source: Standard & Poor's Bond Guide, January 2017, 2016 Yr End Prices

Total	Ψ	43,003,047,000	111.00 /8	J.1 Z /0	Ψ	2,313,333,300	2.15/0
						This includes short ter	m. For 20+ year maturities see b
	Embe	dded debt rate				5.7180%	
	Weigh	ted average yield to	maturity			2.7515%	
	Debt s	service / Market value				5.1201%	



# 01/31/2017 Railroad Bond Analysis

Company	type	Call	coupon	maturity	Price 12/12	Issued / Book	current yield	yield to maturity	Weighted Aver F	ating	Mkt Val		Mkt : Book	Embedded F Debt Service	WAYTM	WAYTM	S&P YTM
CSX Corp	NOTES	Z100	6.150	2037	122.39	\$ 700,00	0,000 5	5.02% 4.41%	% 0.07%	BBB+	\$	856,730,000	122.39%	43,050,000	0.00070292	0.00280631	8 4.44
Norfolk Southern	Notes	Z100	7.050	2037	135.52	2 \$ 750,00	0,000 5	5.20% 4.32%	% 0.07%	BBB+	\$	1,016,400,000	135.52%	41,052,000	0.000674615	0.00269331	3 4.51
Union Pacific Corp	Deb		6.150	2037	123.70	\$ 250,00	,000 4.	972% 4.33%	% 0.02%	Α	\$	309,250,000	123.70%	30,250,000	0.000563171	0.00224838	36 4.51
CSX Corp	Fixed Rt n	ts	6.220	2040	124.14	\$ 660,00	0,000 5	5.01% 4.49%	% 0.07%	BBB+	\$	819,324,000	124.14%	28,500,000	0.000614577	0.00245361	8 4.58
CSX Corp	NOTES		5.500	2041	114.31	\$ 550,00	0,000 4	4.81% 4.50%	% 0.06%	BBB+	\$	628,705,000	114.31%	32,800,000	0.00078753	0.0031441	1 4.32
Norfolk Southern	Notes		4.837	2041	108.58	\$ \$ 596,00	0,000 4	4.45% 4.25%	% 0.06%	BBB+	\$	647,136,800	108.58%	23,700,000	0.000625115	0.00249569	4.57
Norfolk Southern	Notes		4.837	2041	108.78	\$ \$ 596,00	0,000 4	4.45% 4.24%	% 0.06%	BBB+	\$	648,328,800	108.78%	52,875,000	0.000736808	0.00262647	79 4.39
Union Pacific Corp	SR NOTE	S	4.750	2041	108.67	\$ 500,00	),000 4	4.37% 4.16%	% 0.05%	Α	\$	543,350,000	108.67%	28,828,520	0.000576592	0.00205536	62 4.29
CSX Corp	NOTES		4.750	2042	103.63	\$ \$ 600,00	0,000 4	4.58% 4.50%	% 0.06%	BBB+	\$	621,780,000	103.63%	28,828,520	0.000574848	0.00204914	4.29
Norfolk Southern	SR NTS		3.950	2042	94.99	\$ 600,00	),000 4	4.16% 4.28%	% 0.06%	BBB+	\$	569,940,000	94.99%	23,700,000	0.000584798	0.00208461	3 4.34
Norfolk Southern	SR NTS		4.800	2043	108.85	5 \$ 500,00	0,000 4	4.41% 4.23%	% 0.05%	BBB+	\$	544,250,000	108.85%	24,000,000	0.000480746	0.00171370	4.29
Union Pacific Corp	Fixed Rate	Э	4.750	2043	108.89	\$ 500,00	0,000 4	4.36% 4.18%	% 0.05%	Α	\$	544,450,000	108.89%	22,250,000	0.000480448	0.00171264	4.29
CSX Corp	NOTES		4.100	2044	96.46	\$ \$ 800,00	0,000 4	4.25% 4.33%	% 0.08%	BBB+	\$	771,680,000	96.46%	27,900,000	0.000581866	0.00207416	62 4.29
Union Pacific Corp	Fixed Rate	Э	4.821	2044	110.81	\$ 700,00	0,000 4	4.35% 4.14%	% 0.07%	Α	\$	775,670,000	110.81%	27,650,000	0.000427608	0.00152428	34 5.49
																7	

Union Pacific Corp	FR 144a		4.820	2044	120.95 \$	700,000,000	3.99%	3.58%	0.06% A	\$	846,650,000	120.95%		33,000,000	0.000640919	0.002284668	5.20
Burlington Northern R.R.	Mtg M	NC	3.200	2045	76.48 \$	1,500,000,000	4.18%	4.75%	0.16% BBB-	+ \$	1,147,200,000	76.48%		48,000,000	0.001620831	0.007786363	4.73
Norfolk Southern	FR SR No	te	4.450	2045	103.64 \$	500,000,000	4.29%	4.22%	0.05% BBB-	+ \$	518,200,000	103.64%		15,375,000	0.000246047	0.001162929	4.39
Union Pacific Corp	Fixed Rate	е	4.050	2045	100.64 \$	500,000,000	4.02%	4.01%	0.05% NR	\$	503,200,000	100.64%		23,750,000	0.000473711	0.002238971	4.22
Norfolk Southern	FR SR No	te	4.650	2046	106.32 \$	600,000,000	4.37%	4.26%	0.06% NR	\$	637,920,000	106.32%		23,750,000	0.000475108	0.002245574	4.22
CSX Corp	FR SR No	te	3.950	2050	89.46 \$	600,000,000	4.42%	4.58%	0.06% BBB-	+ \$	536,760,000	89.46%		33,747,000	0.00065953	0.003117237	4.17
Norfolk Southern	Notes	Z100	7.900	2097	146.37 \$	350,000,000	5.40%	5.37%	0.04% BBB-	+ \$	512,295,000	146.37%		33,740,000	0.000570525	0.002696558	0.00
Norfolk Southern	FR SR No	teZ100	6.000	2105	116.92 \$	550,000,000	5.13%	5.12%	0.06% BBB-	+ \$	643,060,000	116.92%		20,250,000	0.00045627	0.002156537	4.05
1				Total	\$	13,602,000,000			Total	\$	14,642,279,600	107.65%	4.90% \$	666,996,040	1.36%	0.252%	4.254
Source: Standard & Poor's Bond	Guide, January	y 2017, 2016 Y	Yr End Prices							Weight	lded debt rate ted average yield to maturit ervice / Market value TM			4.9037% 1.3555% 4.5553% 4.25%			
4												SA	Y	4.50%			

## DATA INPUT

#### WASHINGTON STATE DEPARTMENT OF REVENUE

#### 2017 ASSESSMENT YEAR

#### RAILROADS

Instructions: Data entered on this page will flow to the applicable worksheets.

				Curi	rent Yea	ar									Curi	rent Year		
Guideline Companies		Stock Price	Beta	Re	evenues	Cas	sh Flow	Ea	arnings	Div	vidends	Bk Value	Common	Long-Term Debt	Spe	Capital Inding per share	Trailing P/E Ratio	Average Annual Dividend Yield
Name	Ticker	(Adj YE Close)		Pe	r Share	Per	Share	Ре	r Share	Pe	r Share	Stock	Shares		p	er share	VL	VL
Union Pacific Corp.	UNP	\$103.68	1.05	\$	24.20	\$	7.60	\$	4.90	\$	2.20	24.10	824,112	\$ 15,205,000,000	\$	4.45	19.80	-
Norfolk Southern Corp.	NSC	\$108.07	1.15	\$	33.85	\$	9.15	\$	5.55	\$	2.36	42.60	291,942	\$ 9,555,000,000	\$	6.50	19.40	-
CSX Corp.	CSX	\$35.93	1.25	\$	11.55	\$	3.20	\$	1.79	\$	0.72	12.70	936,100	\$ 9,888,000,000	\$	2.90	19.20	-
Kansas City Southern	KSU	\$84.85	1.15	\$	21.35	\$	7.20	\$	4.45	\$	1.32	40.65	107,579	\$ 2,275,700,000	\$	5.40	19.10	-
Genesee & Wyoming	GWR	\$69.41	1.45	\$	34.75	\$	7.15	\$	3.60	\$	-	46.10	58,038	\$ 1,977,600,000	\$	3.85	21.90	-
Canadian National	CNI	\$67.40	1.05	\$	11.70	\$	4.65	\$	3.37	\$	1.12	15.25	766,300	\$ 7,517,000,000	\$	2.70	18.50	-
Canadian Pacific	CP	\$142.77	1.20	\$	31.95	\$	11.35	\$	7.90	\$	1.27	25.85	146,300	\$ 6,366,000,000	\$	5.60	19.20	-

Value Line February 24, 2017 Yahoo Value Line Value Lin

high data points are given greater weights than low data points.

The harmonic mean, on the other hand, gives equal weight to each data point

#### Note:

Canadian Exchange Rate per Value Line is .75 for 2016.

Value Line figures are all values in US dollars.

			Projected (N	ext Year)					Projected (Next Yea	ar)				Forecast	Dividend	s % Chan	ge
	Income Tax Rate	% Return on Shareholders' Equity	Revenues	Cash Flow	Earnings	Dividends	Bk Value	Common Shares	Capital Spending per share	% Return on Shareholders' Equity	% Retained to Common Equity	All Dividends to Net Profits	Market to Book	2017	2018	2019	2020
VL	VL	V L	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	Calc Debt	VL	VL	VL	VL
44.0%	37.5%	21.0%	\$ 25.60	\$ 8.15	\$ 5.55	\$ 2.40	25.85	808,000	4.50	21.5%	12.5%	43.0%	106.0%	9.50	9.50	9.50	9.50
37.5%	38.0%	13.0%	\$ 35.80	\$ 9.85	\$ 6.20	\$ 2.44	45.00	289,000	6.50	13.5%	8.0%	41.0%	115.0%	4.00	4.00	4.00	4.00
41.5%	37.0%	14.0%	\$ 11.95	\$ 3.45	\$ 2.00	\$ 0.76	13.55	930,000	2.15	15.0%	9.0%	41.0%	107.1%	9.50	9.50	9.50	9.50
41.0%	33.0%	11.0%	\$ 23.35	\$ 8.20	\$ 5.15	\$ 1.44	45.35	107,000	5.50	11.5%	8.0%	28.0%	100.3%	10.50	10.50	10.50	10.50
29.0%	29.0%	8.0%	\$ 35.85	\$ 7.85	\$ 3.80	\$ -	48.30	58,000	3.50	8.0%	8.0%	0.0%	101.3%	0.00	0.00	0.00	0.00
54.0%	26.5%	22.5%	\$ 12.50	\$ 5.00	\$ 3.65	\$ 1.25	16.40	745,000	2.55	22.5%	15.0%	34.0%	110.5%	13.50	13.50	13.50	13.50
51.5%	26.0%	31.5%	\$ 34.05	\$ 12.55	\$ 9.10	\$ 1.50	32.70	146,000	5.50	28.0%	26.5%	16.0%	114.9%	14.00	14.00	14.00	14.00

17.3%

29.0%

		Forecast	Earnings	% Chang	e			Forecast	Cash Flo	w % Cha	inge			Forecas	t Reven	ue % C	hange			Income	Balance Sheet
2021	2022	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022	Operating Income	Current Assets
VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	M*	М*
9.50	9.50	7.00	7.00	7.00	7.00	7.00	7.00	6.50	6.50	6.50	6.50	6.50	6.50	4.50	4.50	4.50	4.50	4.50	4.50	\$ 7,272,000,000	\$ 3,596,000,000
4.00	4.00	6.50	6.50	6.50	6.50	6.50	6.50	6.00	6.00	6.00	6.00	6.00	6.00	3.00	3.00	3.00	3.00	3.00	3.00	\$ 3,074,000,000	\$ 2,291,000,000
9.50	9.50	8.00	8.00	8.00	8.00	8.00	8.00	7.50	7.50	7.50	7.50	7.50	7.50	4.00	4.00	4.00	4.00	4.00	4.00	\$ 3,389,000,000	\$ 2,487,000,000
10.50	10.50	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	5.50	5.50	5.50	5.50	5.50	5.50	\$ 818,500,000	\$ 648,000,000
0.00	0.00	6.50	6.50	6.50	6.50	6.50	6.50	7.50	7.50	7.50	7.50	7.50	7.50	7.00	7.00	7.00	7.00	7.00	7.00	\$ 289,612,000	\$ 485,338,000
13.50	13.50	9.50	9.50	9.50	9.50	9.50	9.50	8.50	8.50	8.50	8.50	8.50	8.50	5.50	5.50	5.50	5.50	5.50	5.50	\$ 3,984,000,000	\$ 1,614,750,000
14.00	14.00	12.50	12.50	12.50	12.50	12.50	12.50	11.50	11.50	11.50	11.50	11.50	11.50	7.00	7.00	7.00	7.00	7.00	7.00	\$ 1,933,500,000	\$ 756,750,000

						Cas	h Flow	Fair	Value	Car	rying Value	Оре	erating Lease	Bala	ince Sheet
PP	& E Gross	Cur	rent Liabilities	Lon		•	preciation & ortization	Deb	t	Deb	t	Ren	t		ingibles cluding Goodwill)
м*		М*		М*		М*		10-l	k	10-	k	10-	k	М*	
\$	69,058,000,000	\$	3,640,000,000	\$	14,249,000,000	\$	2,038,000,000	\$	15,900,000,000	\$	15,000,000,000	\$	535,000,000	\$	-
\$	41,488,000,000	\$	2,339,000,000	\$	9,562,000,000	\$	1,030,000,000	\$	11,626,000,000	\$	10,112,000,000	\$	171,000,000	\$	-
\$	43,227,000,000	\$	2,040,000,000	\$	10,962,000,000	\$	1,301,000,000	\$	12,096,000,000	\$	11,293,000,000	\$	50,000,000	\$	-
\$	10,461,800,000	\$	744,400,000	\$	2,271,500,000	\$	305,000,000	\$	2,303,800,000	\$	2,296,900,000	\$	61,000,000	\$	-
\$	5,479,665,000	\$	479,110,000	\$	2,306,915,000	\$	205,188,000	\$	2,303,531,000	\$	2,273,058,000	\$	14,291,000	\$	1,472,376,000
\$	33,620,250,000	\$	2,248,500,000	\$	6,738,750,000	\$	868,500,000	\$	9,063,000,000	\$	8,202,750,000	\$	147,750,000	\$	216,000,000
\$	17,860,500,000	\$	1,010,250,000	\$	6,494,250,000	\$	480,000,000	\$	7,485,750,000	\$	6,513,000,000	\$	95,250,000	\$	11,000,000

## SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

WASHINGTON STATE DEPARTMENT OF REVENUE 2017 ASSESSMENT YEAR RAILROADS

			2	016	2	017	20	016	20	017
Company	Ticker	Stock Price		Earnings (EPS/P)		d Earnings PEPS/P)		ow Ratio <sup>=</sup> /P)	Flow	ted Cash Ratio F/P)
Union Pacific Corp.	UNP	103.68	4.90	4.73%	5.55	5.35%	7.60	7.33%	8.15	7.86%
Norfolk Southern Corp.	NSC	108.07	5.55	5.14%	6.20	5.74%	9.15	8.47%	9.85	9.11%
CSX Corp.	CSX	35.93	1.79	4.98%	2.00	5.57%	3.20	8.91%	3.45	9.60%
Kansas City Southern	KSU	84.85	4.45	5.24%	5.15	6.07%	7.20	8.49%	8.20	9.66%
Genesee & Wyoming	GWR	69.41	3.60	5.19%	3.80	5.47%	7.15	10.30%	7.85	11.31%
Canadian National	CNI	67.40	3.37	5.00%	3.65	5.42%	4.65	6.90%	5.00	7.42%
Canadian Pacific	CP	142.77	7.90	5.53%	9.10	6.37%	11.35	7.95%	12.55	8.79%
		Mean		5.12%		5.71%		8.33%		9.11%
		Median		5.14%		5.57%		8.47%		9.11%
		Max		5.53%		6.07%		10.30%		11.31%
		Min		4.73%		5.35%		6.90%		7.42%
		stdev		0.00		0.00		0.01		0.01
		cov		0.05		0.07		0.13		0.14
		harmean		5.10%		5.69%		8.21%		8.96%
Source:		Say		5.25%		5.50%		<b>8.50%</b>		9.00%

Actual earnings: Value Line / Q4 average stock price Estimated Earnings: Value Line / Q4 average stock price Actual Cash Flow: Value Line / Q4 average stock price Estimated Cash Flow: Value Line / Q4 average stock price

## IMPLIED PREMIUMS FOR US MARKET

Updated January 5, 2016.

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

#### Source: http://pages.stern.nyu.edu/~adamodar/

Year	arnings Yield	ividend Yield	S&P 500	Earnings*	Dividends*	ınge in Earni	nge in Divide	T.Bill Rate	T.Bond Rate	Bond-Bill	oothed Grov	d Premium (	t Growth Est	Implied Premium (FCFE)	ERP/Riskfree Rate	ee Rate
1960	5.34%	3.41%	58.11	3.10	1.98			0.0266	2.76%	0.10%	2.45%					2.76%
1961	4.71%	2.85%	71.55	3.37	2.04	8.60%	2.91%	2.13%	2.35%	0.22%	2.41%	2.92%		2.92%	1.24	5.27%
1962	5.81%	3.40%	63.1	3.67	2.15	8.79%	5.21%	2.73%	3.85%	1.12%	4.05%	3.56%		3.56%	0.92	7.41%
1963	5.51%	3.13%	75.02	4.13	2.35	12.75%	9.45%	3.12%	4.14%	1.02%	4.96%	3.38%		3.38%	0.82	7.52%
1964	5.62%	3.05%	84.75	4.76	2.58	15.23%	10.08%	3.54%	4.21%	0.67%	5.13%	3.31%		3.31%	0.79	7.52%
1965	5.73%	3.06%	92.43	5.30	2.83	11.20%	9.42%	3.93%	4.65%	0.72%	5.46%	3.32%		3.32%	0.71	7.97%
1966	6.74%	3.59%	80.33	5.41	2.88	2.23%	1.96%	4.76%	4.64%	-0.12%	4.19%	3.68%		3.68%	0.79	8.32%
1967	5.66%	3.09%	96.47	5.46	2.98	0.85%	3.37%	4.21%	5.70%	1.49%	5.25%	3.20%		3.20%	0.56	8.90%
1968	5.51%	2.93%	103.86	5.72	3.04	4.81%	2.09%	5.21%	6.16%	0.95%	5.32%	3.00%		3.00%	0.49	9.16%
1969	6.63%	3.52%	92.06	6.10	3.24	6.66%	6.49%	6.58%	7.88%	1.30%	7.55%	3.74%		3.74%	0.47	11.62%
1970	5.98%	3.46%	92.15	5.51	3.19	-9.72%	-1.61%	6.53%	6.50%	-0.03%	4.78%	3.41%		3.41%	0.52	9.91%
1971	5.46%	3.10%	102.09	5.57	3.16	1.15%	-0.74%	4.39%	5.89%	1.50%	4.57%	3.09%		3.09%	0.52	8.98%
1972	5.23%	2.70%	118.05	6.17	3.19	10.76%	0.71%	3.84%	6.41%	2.57%	5.21%	2.72%		2.72%	0.42	9.13%
1973	8.16%	3.70%	97.55	7.96	3.61	28.93%	13.24%	6.93%	6.90%	-0.03%	8.30%	4.30%		4.30%	0.62	11.20%
1974	13.64%	5.43%	68.56	9.35	3.72	17.48%	3.14%	8.00%	7.40%	-0.60%	6.42%	5.59%		5.59%	0.76	12.99%
1975	8.55%	4.14%	90.19	7.71	3.73	-17.54%	0.30%	5.80%	7.76%	1.96%	5.99%	4.13%		4.13%	0.53	11.89%
1976	9.07%	3.93%	107.46	9.75	4.22	26.39%	13.10%	5.08%	6.81%	1.73%	8.19%	4.55%		4.55%	0.67	11.36%
1977	11.43%	5.11%	95.1	10.87	4.86	11.53%	15.07%	5.12%	7.78%	2.66%	9.52%	5.92%		5.92%	0.76	13.70%
1978	12.11%	5.39%	96.11	11.64	5.18	7.07%	6.60%	7.18%	9.15%	1.97%	8.48%	5.72%		5.72%	0.63	14.87%
1979	13.48%	5.53%	107.94	14.55	5.97	25.01%	15.23%	10.38%	10.33%	-0.05%	11.70%	6.45%		6.45%	0.62	16.78%
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	17.46%
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	19.71%
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	15.37%
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	16.11%
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	16.62%
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	12.83%
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	10.80%
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	12.85%
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	12.91%
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	11.44%
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	11.96%
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	10.18%
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	10.23%
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	8.96%
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	11.37%
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	8.86%
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	9.61%
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	8.47%
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	6.91%
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	8.49%
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	7.98%
2001	3.85%	1.37%	1148.09	38.85	15.74	-30.79%	-3.24%	1.80%	5.05%	3.25%	3.56%	1.73%	10.30%	3.62%	0.72	8.67%
2002	5.23%	1.83%	879.82	46.04	16.08	18.51%	2.15%	1.20%	3.81%	2.61%	3.57%	2.29%	8.00%	4.10%	1.08	7.91%
2003	4.87%	1.61%	1111.91	54.69	17.88	18.79%	11.19%	1.00%	4.25%	3.25%	5.35%	2.12%	11.00%	3.69%	0.87	7.94%
2004	5.58%	1.60%	1211.92	67.68	19.407	23.75%	8.54%	2.18%	4.22%	2.04%	4.90%	2.02%	8.50%	3.65%	0.86	7.87%
2005	5.47%	1.79%	1248.29	76.45	22.38	12.96%	15.32%	4.31%	4.39%	0.08%	6.16%	2.20%	8.00%	4.08%	0.93	8.47%
2006	6.18%	1.77%	1418.3	87.72	25.05	14.74%	11.93%	4.88%	4.70%	-0.18%	5.93%	1.97%	12.50%	4.16%	0.89	-8.86%

2007	5.62%	1.89%	1468.36	82.54	27.73	-5.91%	10.70%	3.31%	4.02%	0.71%	5.03%	2.06%	5.00%	4.37%	1.09	8.39%
2008	7.24%	3.11%	903.25	65.39	28.05	-20.78%	1.15%	1.59%	2.21%	0.62%	2.11%	4.05%	4.00%	6.43%	2.91	8.64%
2009	5.35%	2.00%	1115.10	59.65	22.31	-8.78%	-20.46%	0.14%	3.84%	3.70%	0.28%	2.60%	7.20%	4.36%	1.14	8.20%
2010	6.65%	1.84%	1257.64	83.66	23.12	40.25%	3.63%	0.13%	3.29%	3.16%	3.33%	2.24%	6.95%	5.20%	1.58	8.49%
2011	7.72%	2.07%	1257.60	97.05	26.02	16.01%	12.54%	0.03%	1.88%	1.85%	2.75%	2.71%	7.18%	6.01%	3.20	7.89%
2012	7.18%	2.13%	1426.19	102.47	30.44	5.58%	16.99%	0.05%	1.76%	1.71%	2.93%	2.47%	5.27%	5.78%	3.28	7.54%
2013	5.81%	1.96%	1848.36	107.45	36.28	4.86%	19.19%	0.07%	3.04%	2.97%	5.01%	2.03%	4.28%	4.96%	1.63	8.00%
2014	5.49%	1.92%	2058.90	113.01	39.44	5.17%	8.71%	0.05%	2.17%	2.12%	2.77%	2.24%	5.58%	5.78%	2.66	7.95%
2015	5.20%	2.11%	2043.94	106.32	43.16	-5.92%	9.43%	0.21%	2.27%	2.06%	2.96%	2.46%	5.51%	6.12%	2.70	8.39%
2016	4.86%	2.01%	2238.83	108.86	45.03	2.39%	4.33%	0.51%	2.45%	1.94%	2.64%	2.41%	5.54%	5.69%	2.32	8.14%