



# COST OF CAPITAL STUDY

**YIELD CAPITALIZATION  
2021 ASSESSMENT YEAR**

APPENDIX C

## WIRELESS

<b>EQUITY RATE</b>						<b>8.75%</b>	
<b>CAPITAL ASSET PRICING MODEL</b>							PAGE
	CAPM Ex Ante		4.65%				6
<b>DIVIDEND GROWTH MODELS (Single Stage)</b>							
	Value Line, based on Dividends Growth		8.25%				7
	Value Line, based on Earnings Growth		11.00%				8
	Value Line, based on Return on Equity		11.25%				9
<b>FCFE GROWTH MODEL (Multi Stage)</b>							10
			7.00%				
				<b>RANGE</b>	4.65% - 11.25%		
<b>DEBT RATE</b>						<b>3.50%</b>	11
<b>SECURED DEBT (LEASE) RATE</b>						<b>2.50%</b>	11
<b>MARKET CAPITAL STRUCTURE</b>							
	Equity	60%	x	8.75%	=	5.25%	3
	Debt	40%	x	3.50%	=	1.40%	3
	Marginal Tax Rate	24%	=	(1-.24)	x	1.40%	3
						<u>1.06%</u>	

**WEIGHTED AVERAGE COST OF CAPITAL** **6.3%**

rounded

## SUPPORT FOR GUIDELINE COMPANIES

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	Operting Margin	Trailing P/E	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
AT&T Inc	T	0.85	A++	n/a	8.8	7.36%	182,425,600,000	54.3%	-	0.0%	153,775,000,000	45.7%	336,200,600,000
Verizon	VZ	0.65	A++	n/a	11.3	4.42%	64,348,201,400	34.3%	-	0.0%	123,173,000,000	65.7%	187,521,201,400
US Cellular	USM	0.75	B+	18.5%	11.3	0.00%	4,558,518,450	64.7%	-	0.0%	2,489,000,000	35.3%	7,047,518,450
T-Mobile	TMUS	0.80	B+	35.6%	33.2	0.00%	74,568,240,000	51.2%	-	0.0%	71,018,000,000	48.8%	145,586,240,000
<b>Mean</b>		<b>0.76</b>	<b>A</b>	<b>27%</b>	<b>16.2</b>	<b>2.95%</b>	<b>81,475,139,963</b>	<b>51.1%</b>		<b>0.0%</b>	<b>87,613,750,000</b>	<b>48.9%</b>	
<b>Weighted Mean</b>							<b>325,900,559,850</b>	<b>48.2%</b>	<b>-</b>	<b>0.00%</b>	<b>350,455,000,000</b>	<b>51.8%</b>	<b>676,355,559,850</b>
<b>Median</b>		<b>0.78</b>			<b>11.3</b>	<b>2.21%</b>				<b>0.0%</b>			
<b>Std Dev</b>		<b>0.09</b>				<b>3.61%</b>				<b>0.0%</b>			
<b>Coeff Var</b>		<b>0.11</b>				<b>122.45%</b>				<b>0.0%</b>			
<b>Max</b>		<b>0.85</b>				<b>7.36%</b>				<b>0.0%</b>			
<b>Min</b>		<b>0.65</b>				<b>0.00%</b>				<b>0.0%</b>			
<b>Harmonic Mean</b>		<b>0.75</b>						<b>48.45%</b>		<b>0.0%</b>		<b>46.56%</b>	

Say **0.75**

**SUPPORT FOR CAPITAL STRUCTURE  
MARKET VALUE**

WASHINGTON STATE DEPARTMENT OF REVENUE  
2021 ASSESSMENT YEAR  
WIRELESS

Capital Structure at Market Value

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	0	%	Total Debt & Equity
AT&T Inc	T	28.26	7,126,000,000	201,380,760,000	51.4%	-	0.0%	190,473,000,000	48.6%	391,853,760,000
Verizon	VZ	58.13	4,138,148,000	240,550,543,240	60.5%	-	0.0%	156,752,000,000	39.5%	397,302,543,240
US Cellular	USM	30.69	86,091,000	2,642,132,790	39.5%	242,170	0.0%	4,049,000,000	60.5%	6,691,374,960
T-Mobile	TMUS	134.85	1,242,804,000	167,592,119,400	68.3%		0.000%	77,960,000,000	31.7%	245,552,119,400
			<b>Mean</b>		<b>54.9%</b>		<b>0.0%</b>		<b>45.1%</b>	
			<b>Weighted Mean</b>	<b>612,165,555,430</b>	<b>58.8%</b>	<b>242,170</b>	<b>0.00%</b>	<b>429,234,000,000</b>	<b>41.2%</b>	<b>1,041,399,797,600</b>
			<b>Median</b>		<b>56.0%</b>		<b>0.00%</b>		<b>44.0%</b>	
			<b>Harmonic Mean</b>		<b>52.7%</b>		<b>5%</b>		<b>42.6%</b>	
			<b>Std Dev</b>		<b>12.4%</b>		<b>0.00%</b>		<b>12.4%</b>	
			<b>Coeff Var</b>		<b>22.5%</b>		<b>200.00%</b>		<b>27.5%</b>	
			<b>Max</b>		<b>68.3%</b>		<b>0.0%</b>		<b>60.5%</b>	
			<b>Min</b>		<b>39.5%</b>		<b>0.0%</b>		<b>31.7%</b>	

Source:

Stock Price: Yahoo

Market Value Debt: Bond Analysis

**Say**

**60%**

**0%**

**40%**

# SUPPORT FOR MARKET MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
AT&T Inc	T	28.26	24.35	1.2	7.25	3.9	3.20	8.8	25.60	1.1
Verizon	VZ	58.13	32.15	1.8	9.05	6.4	5.10	11.4	15.55	3.7
US Cellular	USM	30.69	48.05	0.64	9.85	3.1	1.60	19.2	52.95	0.6
T-Mobile	TMUS	134.85	63.70	2.1	18.75	7.2	3.95	34.1	60.00	2.25
		<b>Mean</b>		<b>1.4</b>		<b>5.2</b>		<b>18.4</b>		<b>1.9</b>
		<b>Median</b>		<b>1.5</b>		<b>5.2</b>		<b>15.3</b>		<b>1.7</b>
		<b>Harmonic Mean</b>		<b>1.2</b>		<b>4.6</b>		<b>14.2</b>		<b>1.2</b>
		<b>Max</b>		<b>2.1</b>		<b>7.2</b>		<b>34.1</b>		<b>3.7</b>
		<b>Min</b>		<b>0.64</b>		<b>3.1</b>		<b>8.8</b>		<b>0.58</b>
		<b>Std Dev</b>		<b>0.7</b>		<b>2.0</b>		<b>11.4</b>		<b>1.4</b>
		<b>Coefficient of Variation</b>		<b>0.5</b>		<b>0.4</b>		<b>0.6</b>		<b>0.7</b>
		<b>Harmonic Mean</b>		<b>1.2</b>		<b>4.6</b>		<b>14.2</b>		<b>1.2</b>
		<b>Percentile .25</b>		<b>1.0</b>		<b>3.7</b>		<b>10.8</b>		<b>1.0</b>
		<b>Percentile .75</b>		<b>1.9</b>		<b>6.6</b>		<b>22.9</b>		<b>2.6</b>
		<b>Say</b>		<b>1.50</b>		<b>5.25</b>		<b>15.00</b>		<b>1.75</b>

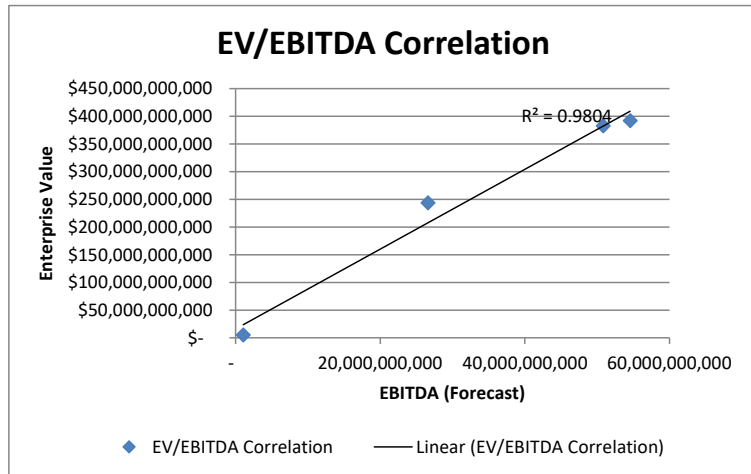
# ENTERPRISE VALUE MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

Guideline Companies	Ticker	Enterprise Value	EBITDA	EV / EBITDA	One Year Cash Flow Rate Change VL	EBITDA	EV / EBITDA	Revenue	EV/Sales	Cash Flow	Debt Service	EV / CF
AT&T Inc	T	\$ 391,853,760,000	53,801,000,000	7.28	1.4%	54,543,082,759	7.18	174,918,750,000	2.24	52,368,750,000	6,666,555,000	6.64
Verizon	VZ	\$ 382,368,543,240	50,534,000,000	7.57	0.6%	50,813,193,370	7.52	135,731,254,400	2.82	37,719,500,000	5,486,320,000	8.85
US Cellular	USM	\$ 4,939,374,960	1,047,000,000	4.72	1.0%	1,057,629,442	4.67	4,196,936,250	1.18	845,750,000	141,715,000	5.00
T-Mobile	TMUS	\$ 243,370,119,400	25,643,000,000	9.49	3.7%	26,600,338,667	9.15	81,279,381,600	2.99	24,312,500,000	2,728,600,000	9.00
	<b>Mean</b>						<b>7.13</b>		<b>2.31</b>			<b>7.37</b>
	<b>Median</b>						<b>7.35</b>		<b>2.53</b>			<b>7.74</b>
	<b>Max</b>						<b>9.15</b>		<b>2.99</b>			<b>9.00</b>
	<b>Min</b>						<b>4.67</b>		<b>1.18</b>			<b>5.00</b>
	<b>Std Dev</b>						<b>1.85</b>		<b>0.82</b>			<b>1.91</b>
	<b>Coefficient of Variation</b>						<b>0.26</b>		<b>0.36</b>			<b>0.26</b>
	<b>Harmonic Mean</b>						<b>6.72</b>		<b>2.02</b>			<b>6.96</b>
	<b>Say</b>						<b>7.25</b>		<b>2.50</b>			<b>7.75</b>



6.00 put in income direct excluding IPP  
8.50 put in income direct including IPP

### Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast	
US Cellular	4.67	5.93 Low Average
AT&T Inc	7.18	5.93 Low Median
Verizon	7.52	6.00 Say
T-Mobile	9.15	8.34 Average
		8.34 Median
		8.50 Say

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

WASHINGTON STATE DEPARTMENT OF REVENUE  
2021 ASSESSMENT YEAR  
WIRELESS

**Ex Ante**  
**Ke = Rf + B (Rp)**

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**Ke = Cost of Equity** **4.65%**

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Rm =	rate of return	5.65%	
Rf =	risk free rate	1.65%	
Rp =	risk premium	4.00%	
B =	Beta	0.75	

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**Rp = Risk Premium** **4.00%**

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<b>Shannon Pratt and Roger Grabowski</b>	3.5 - 6%	
Cost of Capital, Applications and Examples, Fifth Edition, 2014		
<b>Dr. Aswath Damodaran</b>	4.72%	chart page 15
http://pages.stern.nyu.edu/~adamodar/ 2020 Implied Premium	4.00%	adjusted for Rf
<b>John Graham and Campbell Harvey</b>	6.20%	10 year expected real return
Duke CFO magazine Global Business Outlook survey	5.48%	adjusted for Rf
4th Qtr 2020	0.93%	Rf rate adjusted by 10 yr-est

to above

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**Rf = Risk Free Rate** **1.65%**

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**Value Line Investment Survey, Selected Yields January 8, 2021, page 689**  
as of 12-28-20

US Treasury Securities year end data		
	5 year	0.37%
	10 year	0.94%
	30 year	1.67%
	30 year Zero	NA

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

As of 12-31-20

Treasury Constant Maturities		
	5 year	0.36%
	10 year	0.93%
	20 year	1.45%
	30 year	1.65%
	20 year TIPS	-0.61%
	30 year TIPS	-0.37%
		2.06%
		2.02%
		TIPS inflation indication

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**Inflation** **2.00%**

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**Value Line Investment Survey, Economic Series January 1, 2021, page 1500**

Consumer Price Index Annual Rate of Change 2023-2025	2.30%
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**The Livingston Survey December 18, 2020, page 4, 10**

Inflation median (measured by CPI) over next 10 years	2.23%
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**Gross Domestic Product (GDP)** **3.80%**

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**Federal Reserve Projected Long Run Real GDP Growth**

Median Projection Value From Dec 16, 2020 Report	1.80%
<a href="https://www.federalreserve.gov/monetarypolicy/files/fomcproptabl20201216.pdf">https://www.federalreserve.gov/monetarypolicy/files/fomcproptabl20201216.pdf</a>	

**Congressional Budget Office Real GDP Economic Projections**

The Budget and Economic Outlook 2021-2031		
Average Percentage Change Year To Year	2021-2025	Table 2.3, pg 15
<a href="https://www.cbo.gov/system/files/2021-02/56970-Outl">https://www.cbo.gov/system/files/2021-02/56970-Outl</a>	2026-2031	1.90%
		1.70%

**Federal Reserve Bank of Philadelphia**

The Livingston Survey, December 18, 2020, page 4, 10	
Average Annual Real GDP Growth Rate for Next 10 Years	2.20%
<a href="https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey">https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey</a>	

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

WASHINGTON STATE DEPARTMENT OF REVENUE  
2021 ASSESSMENT YEAR  
WIRELESS

**Based on Dividend Growth**

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

Ke = Cost of Equity  
D1 = Expected Dividends  
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	Ke	Forecast Dividend Growth	Ke Forecast Growth	Sustainable Dividend Growth	Ke Sustainable Growth
AT&T Inc	T	28.26	2.08	7.36%	2.50%	9.86%	2.66%	10.02%	2.66%	10.02%
Verizon	VZ	58.13	2.57	4.42%	2.00%	6.42%	2.10%	6.52%	2.10%	6.52%
US Cellular	USM	30.69	0.00		0.00%				3.80%	
T-Mobile	TMUS	134.85	0.00		0.00%				3.80%	
			<b>Mean</b>	<b>5.89%</b>		<b>8.14%</b>				<b>8.27%</b>
			<b>Median</b>	<b>5.89%</b>		<b>8.14%</b>				<b>8.27%</b>
			<b>Harmonic Mean</b>	<b>5.52%</b>		<b>7.78%</b>				<b>7.90%</b>
			<b>Std Dev</b>	<b>2.08%</b>		<b>2.43%</b>				<b>2.47%</b>
			<b>Coeff Var</b>	<b>35.28%</b>		<b>29.87%</b>				<b>29.90%</b>
			<b>Max</b>	<b>7.36%</b>		<b>9.86%</b>				<b>10.02%</b>
			<b>Min</b>	<b>4.42%</b>		<b>6.42%</b>				<b>6.52%</b>

Source: Value Line Projections 18-20 to 24-26

**8.00%**

**8.25%**

Say

**8.25%**

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

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

**Based on Earnings Growth**

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

- Ke = Cost of Equity
- D1 = Expected Dividends
- P0 = Current Stock Price
- G = Sustainable Growth -- Earnings

assumption: Sustainable growth can not exceed inflation plus real GDP

Company	Ticker	Stock Price (Po)	Expected Earnings (D1)	Yield (D1/Po)	Earnings Growth (G) VL	Ke	Forecast Earnings Growth	Ke Forecast Growth	Sustainable Earnings Growth	Ke Sustainable Growth
AT&T Inc	T	28.26	3.30	11.68%	2.50%	14.18%	2.66%	14.34%	2.66%	14.34%
Verizon	VZ	58.13	5.20	8.95%	3.50%	12.45%	3.82%	12.77%	3.80%	12.75%
US Cellular	USM	30.69	1.70	5.54%	9.00%	14.54%	11.29%	16.82%	3.80%	9.34%
T-Mobile	TMUS	134.85	4.55	3.37%	8.50%	11.87%	10.52%	13.90%	3.80%	7.17%
<b>Mean</b>						<b>13.26%</b>				<b>10.90%</b>
<b>Median</b>						<b>13.31%</b>				<b>11.04%</b>
<b>Harmonic Mean</b>						<b>13.16%</b>				<b>10.14%</b>
<b>Std Dev</b>						<b>1.30%</b>				<b>3.24%</b>
<b>Coeff Var</b>						<b>9.80%</b>				<b>29.75%</b>
<b>Max</b>						<b>14.54%</b>				<b>14.34%</b>
<b>Min</b>						<b>11.87%</b>				<b>7.17%</b>

Source: Value Line Projections 18-20 to 24-26

**13.25%**

**11.00%**

**Say**

**11.00%**

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# SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

## Based on Return on Equity

**$K_e = (D1 / P_o) + G$**

**$K_e$**  = Cost of Equity  
 **$D1$**  = Expected Dividends  
 **$E1$**  = Expected Earnings  
 **$P_o$**  = Current Price  
 **$G$**  = Sustainable Growth  
 **$b$**  = 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 (G) (b*ROE)	$K_e$ Dividends	Expected Earnings (E1)	$K_e$ Earnings
AT&T Inc	T	28.26	2.08	7.36%	37.0%	11.68%	4.321%	11.68%	3.30	16.00%
Verizon	VZ	58.13	2.57	4.42%	51.0%	8.95%	4.562%	8.98%	5.20	13.51%
US Cellular	USM	30.69	0.00		100.0%	5.54%	5.539%		1.70	11.08%
T-Mobile	TMUS	134.85	0.00		100.0%	3.37%	3.374%		4.55	6.75%
<b>Mean</b>								<b>10.33%</b>		<b>11.83%</b>
<b>Median</b>								<b>10.33%</b>		<b>12.29%</b>
<b>Harmonic Mean</b>								<b>10.16%</b>		<b>10.67%</b>
<b>Std Dev</b>								<b>1.91%</b>		<b>3.94%</b>
<b>Coeff Var</b>								<b>18.46%</b>		<b>33.30%</b>
<b>Max</b>								<b>11.68%</b>		<b>16.00%</b>
<b>Min</b>								<b>8.98%</b>		<b>6.75%</b>
								<b>10.25%</b>		<b>12.25%</b>

Say

**11.25%**

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## SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Mergent's Ratings	S&P Ratings	WAYTM	S&P YTM (avg)	Mergent's Ratings	S&P Ratings	Mergent's	S&P	
AT&T Inc	T	Baa2	BBB	2.32%	2.67%	11	11	Aaa1	AAA+	1
Verizon	VZ	Baa1	BBB+	1.63%	2.37%	10	10	Aaa2	AAA	2
US Cellular	USM	Ba1	BB	6.70%	3.76%	13	14	Aaa3	AAA-	3
T-Mobile	TMUS		BB	4.27%	2.04%		14	Aa1	AA+	4
<b>Overall Average Debt Rating</b>		<b>Baa2</b>	<b>BBB-</b>	<b>3.73%</b>		<b>11.3</b>	<b>12.3</b>	Aa2	AA	5

2.57%

All issues 20+ year maturities

### Guideline Companies, All Ratings

2.07% 3.50%

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### Mergent's Bond Record January 2020

Corporate	Aaa	Aa	A	Baa
October	2.35%	2.55%	2.88%	3.44%
November	2.30%	2.47%	2.79%	3.30%
December	2.26%	2.44%	2.72%	3.16%
<b>4th Qtr Average</b>	<b>2.30%</b>	<b>2.49%</b>	<b>2.80%</b>	<b>3.30%</b>
<b>2019 Average</b>	<b>3.03%</b>	<b>3.13%</b>	<b>3.38%</b>	<b>3.92%</b>
Public Utilities	Aaa	Aa	A	Baa
October		2.72%	2.95%	3.27%
November		2.63%	2.85%	3.17%
December		2.57%	2.77%	3.05%
<b>4th Qtr Average</b>		<b>2.64%</b>	<b>2.86%</b>	<b>3.16%</b>
<b>2019 Average</b>		<b>3.24%</b>	<b>3.41%</b>	<b>3.74%</b>
Industrials	Aaa	Aa	A	Baa
October	2.35%	2.37%	2.81%	3.60%
November	2.30%	2.30%	2.72%	3.41%
December	2.26%	2.31%	2.66%	3.27%
<b>4th Qtr Average</b>	<b>2.30%</b>	<b>2.33%</b>	<b>2.73%</b>	<b>3.43%</b>
<b>2019 Average</b>	<b>3.03%</b>	<b>3.02%</b>	<b>3.35%</b>	<b>4.09%</b>

**Debt Yield Rate** 3.50%

**Cost of Secured Debt (Operating Lease ) Rate** 2.50%

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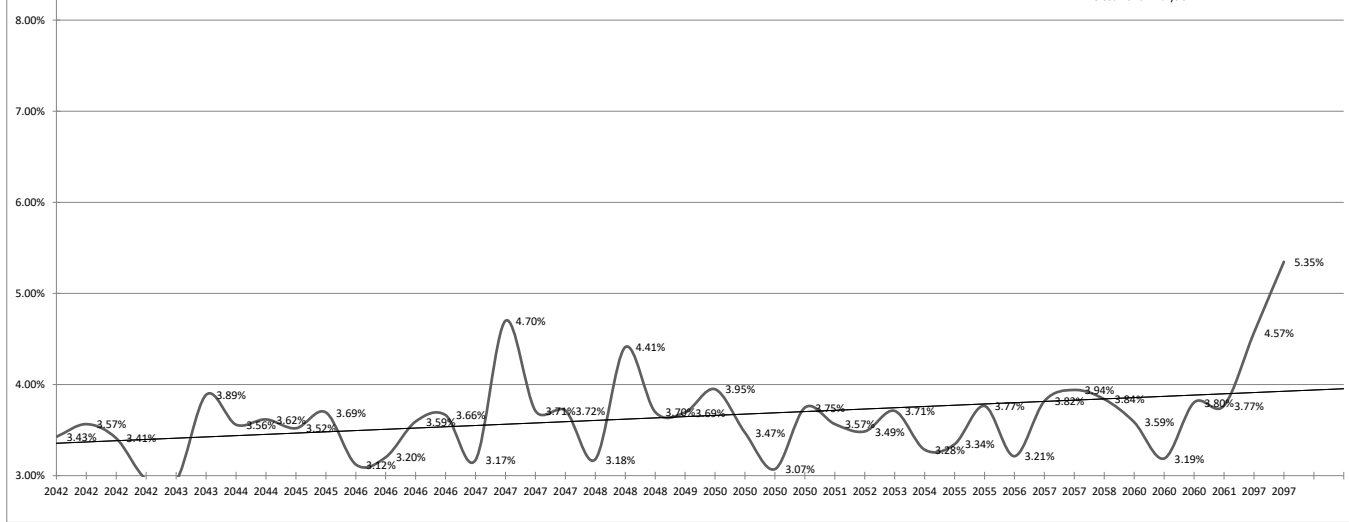
Aa3	AA-	6
A1	A+	7
A2	A	8
A3	A-	9
Baa1	BBB+	10
Baa2	BBB	11
Baa3	BBB-	12
Ba1	BB+	13
Ba2	BB	14
Ba3	BB-	15
B1	B+	16
B2	B	17
B3	B-	18
Caa1	CCC+	19
Caa2	CCC	20

# Wireless Bond Analysis

Company	type	Call	coupon	maturity	Price	Issued / Book	current yield	YTM	Weighted # Rating	\$	Mkt Val	Mkt : Book	Embedded Rate	Debt Service	WAYTM	WAYTM	Finra YTM
AT&T Inc	Global Notes		3.800	2022	105.31	1,414,801,000	3.608%	-6.31%	-0.03%	BBB	\$ 1,489,926,933	105.31%		53,762,438	(0.00031676)	-0.0640%	0.552
AT&T Inc	Global Notes		2.625	2022	103.62	1,500,000,000	2.533%	-4.38%	-0.02%	BBB	\$ 1,554,300,000	103.62%		39,375,000	(0.00023277)	-0.0470%	0.32
AT&T Inc	Fix Rt Sr Note		3.000	2022	103.33	2,750,000,000	2.903%	-3.49%	-0.03%	BBB	\$ 2,841,575,000	103.33%		82,500,000	(0.00033985)	-0.0687%	0.307
AT&T Inc	FR Global Notes		3.000	2022	104.01	1,850,000,000	2.884%	-4.73%	-0.03%	BBB	\$ 1,924,185,000	104.01%		55,500,000	(0.00031054)	-0.0627%	0.423
AT&T Inc	FR Sr Gbl Nt		3.200	2022	104.14	1,250,000,000	3.073%	-4.78%	-0.02%	BBB	\$ 1,301,750,000	104.14%		40,000,000	(0.00021194)	-0.0428%	0.446
AT&T Inc	Global Notes		3.400	2022	105.25	402,692,000	3.240%	-6.58%	-0.01%	BBB	\$ 423,893,330	105.25%		13,991,538	(0.00032394)	-0.0190%	0.478
AT&T Inc	Global Notes		4.000	2022	105.36	422,100,000	3.272%	-6.22%	-0.01%	BBB	\$ 444,720,000	105.36%		16,884,000	(0.0003305)	-0.0188%	0.509
AT&T Inc	Global Notes		3.600	2023	107.04	2,600,000,000	3.363%	-1.03%	-0.01%	BBB	\$ 2,783,040,000	107.04%		93,600,000	(0.0009521)	-0.0192%	0.474
AT&T Inc	Global Notes		4.050	2023	110.39	411,287,000	3.669%	-2.65%	0.00%	BBB	\$ 454,019,719	110.39%		16,657,124	(0.0003861)	-0.0078%	0.402
AT&T Inc	Global Notes		3.550	2024	108.61	589,548,000	3.269%	0.10%	0.00%	BBB	\$ 640,308,083	108.61%		20,928,954	(0.0002029)	0.0004%	0.716
AT&T Inc	Fix Rt Nt		4.450	2024	111.16	1,208,000,000	4.003%	-0.01%	0.00%	BBB	\$ 1,342,812,800	111.16%		53,756,000	(0.0000056)	-0.0001%	0.574
AT&T Inc	Gbl FR Sr Nt		3.800	2024	108.79	750,000,000	3.493%	0.27%	0.00%	BBB	\$ 815,925,000	108.79%		28,500,000	(0.00000711)	0.0014%	0.74
AT&T Inc	Fix Rt Nt		3.900	2024	109.45	1,000,000,000	3.563%	0.11%	0.00%	BBB	\$ 1,094,500,000	109.45%		39,000,000	(0.00000399)	0.0008%	0.557
AT&T Inc	Global Notes		3.600	2025	111.86	1,329,996,000	3.218%	0.20%	0.00%	BBB	\$ 1,487,733,526	111.86%		47,879,856	(0.00000926)	0.0019%	0.729
AT&T Inc	Fix Rt Sr Nt		3.950	2025	111.83	1,161,000,000	3.532%	0.53%	0.00%	BBB	\$ 1,298,346,300	111.83%		45,859,500	(0.00002180)	0.0004%	0.703
AT&T Inc	Fix Rt Nt		3.400	2025	110.45	5,000,000,000	3.078%	0.39%	0.01%	BBB	\$ 5,522,500,000	110.45%		170,000,000	(0.00006882)	0.0139%	0.762
AT&T Inc	Global Notes		2.950	2026	110.00	707,275,000	2.682%	0.69%	0.00%	BBB	\$ 778,002,500	110.00%		20,864,613	(0.00001720)	0.0035%	0.974
AT&T Inc	Global Notes		3.875	2026	113.74	541,159,000	3.407%	0.79%	0.00%	BBB	\$ 615,514,247	113.74%		20,969,911	(0.00001454)	0.0029%	0.885
AT&T Inc	Fix Rt Sr Nt		4.125	2026	114.89	2,650,000,000	3.590%	0.75%	0.01%	BBB	\$ 3,044,585,000	114.89%		109,312,500	(0.00007026)	0.0142%	0.937
AT&T Inc	Global Notes		3.800	2027	114.28	1,329,216,000	3.325%	1.11%	0.01%	BBB	\$ 1,519,028,045	114.28%		50,510,208	(0.0005228)	0.0106%	1.233
AT&T Inc	Fix Rt Gbl Nt		4.250	2027	116.20	2,000,000,000	3.657%	1.19%	0.01%	BBB	\$ 2,324,000,000	116.20%		85,000,000	(0.0008436)	0.0170%	1.349
AT&T Corp	Global Notes		4.100	2028	112.66	2,449,011,000	3.639%	2.00%	0.02%	BBB	\$ 2,759,055,793	112.66%		100,409,451	(0.00017396)	0.0351%	2.16
AT&T Corp	Global Notes		6.375	2028	129.08	95,103,000	4.939%	1.62%	0.00%	BBB	\$ 122,758,952	129.08%		6,062,816	(0.0000548)	0.0011%	2.083
AT&T Corp	Fix Rt Nt	z100	6.625	2029	132.83	190,404,000	4.988%	1.89%	0.00%	BBB	\$ 252,913,635	132.83%		12,614,265	(0.00001275)	0.0026%	2.257
AT&T Corp	Fix Rt Nt	z100	4.350	2029	117.80	3,000,000,000	3.693%	1.79%	0.02%	BBB	\$ 3,534,000,000	117.80%		130,500,000	(0.00019066)	0.0385%	1.892
AT&T Corp	Fix Rt Nt	z100	6.500	2029	127.29	3,000,000,000	5.106%	2.47%	0.03%	BBB	\$ 3,818,700,000	127.29%		195,000,000	(0.00026267)	0.0531%	2.728
AT&T Corp	Global Notes		4.300	2030	113.50	3,156,272,000	3.789%	2.52%	0.03%	BBB	\$ 3,582,368,720	113.50%		135,719,696	(0.00028158)	0.0569%	2.641
AT&T Corp	Usd Sr Nt	100	7.875	2030	141.09	201,852,000	5.582%	2.46%	0.00%	BBB	\$ 284,792,987	141.09%		15,895,845	(0.00001760)	0.0036%	2.715
AT&T Corp	Usd Sr Nt	100	6.875	2031	134.00	169,287,000	5.131%	2.76%	0.00%	BBB	\$ 226,844,580	134.00%		11,638,481	(0.00001655)	0.0033%	3.129
AT&T Corp	Usd Sr Nt	100	7.625	2031	141.50	188,038,000	5.389%	2.63%	0.00%	BBB	\$ 266,073,770	141.50%		14,337,898	(0.00001754)	0.0035%	3.292
AT&T Corp	sr notes	z100	8.750	2031	155.05	217,788,000	5.643%	2.25%	0.00%	BBB	\$ 337,677,193	155.05%		19,956,275	(0.00001737)	0.0035%	2.795
AT&T Wireless	sr notes	z100	8.750	2031	151.77	2,500,000,000	5.565%	2.55%	0.02%	BBB	\$ 3,034,160,000	151.77%		218,750,000	(0.00022970)	0.0456%	2.814
AT&T Inc	sr notes		7.375	2032	136.00	500,000,000	5.423%	3.27%	0.01%	BBB	\$ 680,000,000	136.00%		36,875,000	(0.00005796)	0.0117%	3.458
AT&T Inc	sr notes		7.750	2032	150.71	400,000,000	5.142%	2.27%	0.00%	BBB	\$ 602,840,000	150.71%		31,000,000	(0.00003217)	0.0065%	3.579
AT&T Inc	sr notes		5.125	2033	117.88	350,000,000	4.348%	3.24%	0.00%	BBB	\$ 412,580,000	117.88%		17,937,500	(0.00004018)	0.0081%	2.549
AT&T Inc	sr notes		4.500	2035	118.02	2,500,000,000	3.813%	2.87%	0.03%	BBB	\$ 2,950,500,000	118.02%		112,500,000	(0.00025449)	0.0514%	2.904
AT&T Inc	sr notes		5.850	2035	139.46	1,000,000,000	4.195%	2.39%	0.01%	BBB	\$ 1,394,600,000	139.46%		58,500,000	(0.00008491)	0.0172%	2.592
AT&T Inc	Fix Rt Nt	z100	6.800	2036	139.10	600,000,000	4.889%	3.35%	0.01%	BBB	\$ 834,600,000	139.10%		40,800,000	(0.00007130)	0.0144%	3.482
AT&T Inc	Fxd Rt Gbl Nt		5.250	2037	126.23	3,000,000,000	4.159%	3.09%	0.03%	BBB	\$ 3,786,900,000	126.23%		157,500,000	(0.00032912)	0.0665%	3.112
AT&T Inc	Global Notr	z100	6.500	2037	137.26	2,000,000,000	4.736%	3.37%	0.02%	BBB	\$ 2,745,200,000	137.26%		130,000,000	(0.00023924)	0.0483%	3.515
AT&T Inc	Global Notr	z100	6.300	2038	137.03	2,000,000,000	4.598%	3.34%	0.02%	BBB	\$ 2,740,600,000	137.03%		126,000,000	(0.00023711)	0.0479%	3.406
AT&T Inc	Global Notr	z100	6.400	2038	136.96	1,250,000,000	4.673%	3.43%	0.02%	BBB	\$ 1,712,000,000	136.96%		80,000,000	(0.00015200)	0.0307%	3.527
AT&T Inc	Global Notes		4.850	2039	120.66	2,000,000,000	4.020%	3.28%	0.02%	BBB	\$ 2,413,200,000	120.66%		97,000,000	(0.00023558)	0.0470%	3.292
AT&T Inc	Global Notes		6.035	2039	139.25	2,330,000,000	6.056%	3.51%	0.02%	BBB	\$ 2,950,000,000	139.25%		147,375,000	(0.00022504)	0.0504%	3.690
AT&T Inc	Global Notes		5.350	2040	127.94	3,499,738,000	4.182%	3.31%	0.04%	BBB	\$ 4,777,564,797	127.94%		187,235,983	(0.00041035)	0.0829%	3.386
AT&T Inc	Global Notes		6.100	2040	137.17	382,704,000	4.447%	3.37%	0.00%	BBB	\$ 524,955,077	137.17%		23,344,944	(0.00004570)	0.0092%	3.467
AT&T Inc	Global Notes		6.200	2040	138.07	329,267,000	4.490%	3.40%	0.00%	BBB	\$ 454,618,947	138.07%		20,414,554	(0.00003964)	0.0080%	3.463
AT&T Inc	Global Notes		6.350	2040	138.10	490,483,000	4.598%	3.51%	0.01%	BBB	\$ 677,357,023	138.10%		31,145,671	(0.00006112)	0.0123%	3.568
AT&T Inc	Global Notes		6.000	2040	137.23	1,234,000,000	4.372%	3.28%	0.01%	BBB	\$ 1,693,418,200	137.23%		74,040,000	(0.00014365)	0.0290%	3.361
AT&T Inc	Fix Rt Sr Nt		6.375	2041	142.15	984,000,000	4.485%	3.39%	0.01%	BBB	\$ 1,398,756,000	142.15%		62,730,000	(0.00011816)	0.0239%	3.448
AT&T Inc	Fix Rt Nt		5.375	2041	126.03	447,305,000	4.265%	3.51%	0.01%	BBB	\$ 563,738,492	126.03%		24,042,644	(0.00005666)	0.0112%	3.583
AT&T Inc	Fix Rt Nt		5.550	2041	129.57	2,000,000,000	4.283%	3.44%	0.02%	BBB	\$ 2,591,400,000	129.57%		111,000,000	(0.00024416)	0.0493%	3.516
AT&T Inc	Fix Rt Nt		6.250	2041	138.45	521,724,000	4.514%	3.50%	0.01%	BBB	\$ 722,326,878	138.45%		32,607,750	(0.00006469)	0.0131%	3.562
AT&T Inc	Fix Rt Sr Nt		4.900	2042	122.16	394,320,000	4.011%	3.38%	0.00%	BBB	\$ 481,701,312	122.16%		19,321,680	(0.00004731)	0.0096%	3.428
AT&T Inc	Fix Rt Sr Nt		5.150	2042	123.52	1,209,000,000	4.169%	3.52%	0.02%	BBB	\$ 1,493,356,800	123.52%		62,263,500	(0.00015090)	0.0305%	3.556
AT&T Inc	FR partially		4.300	2042	113.41	1,955,000,000	4.308%	3.38%	0.02%	BBB	\$ 2,217,165,500	113.41%		84,000,000	(0.00014118)	0.0247%	3.411
AT&T Inc	FR Global Notes		5.350	2043	121.68	436,339,000	4.409%	3.85%	0.01%	BBB	\$ 530,937,295	121.68%		23,344,137	(0.00005955)	0.0120%	3.908
AT&T Inc	FR Global Notes		4.650	2044	117.17	470,656,000	3.97%	3.53%	0.01%	BBB	\$ 551,467,635	117.17%		21,885,504	(0.00005893)	0.0119%	3.546
AT&T Inc	FR Global Notes		4.800	2044	118.51	2,000,000,000	4.05%	3.59%	0.03%	BBB	\$ 2,370,200,000	118.51%		96,000,000	(0.00025439)	0.0514%	3.605
AT&T Inc	FR Global Notes		4.350	2045	113.48	3,044,000,000	3.83%	3.50%	0.04%	BBB	\$ 3,454,331,200	113.48%		132,414,000	(0.00037767)	0.0763%	3.511
AT&T Inc	FR Global Notes		4.850	2045	118.42	795,686,000	4.10%	3.67%	0.01%	BBB	\$ 942,251,361	118.42%		38,590,771	(0.00010346)	0.0209%	3.885
AT&T Inc	FR Global Notes		4.750	2046	119.08	3,500,000,000	3.99%	3.57%	0.04%	BBB	\$ 4,167,800,000	119.08%		166,250,000	(0.00044289)	0.0895%	3.582
AT&T Inc	FR Global Notes		5.150	2046	124.35	1,749,602,000	4.14%	3.63%	0.02%	BBB	\$						



20+ Year, All Ratings, Wireless Bond Analysis



12/31/2020

Wireless Bond Analysis

Company	type	Call	coupon	maturity	Price 12/16	Issued / Book	current yield	yield to maturity	Weighted Ave Rating	Mkt Val	Mkt : Book	Embedded Rat	Debt Service	WAYTM	WAYTM	Finra YTM	
AT&T Inc	Fix Rt Sr Nt		4.900	2042	122.16	394,320,000	4.011%	3.43%	0.00%	BBB	\$ 481,701,312	122.16%		19,321,680	0.00004235	0.0086%	3.428
AT&T Inc	Fix Rt Sr Nt		5.150	2042	123.52	1,209,000,000	4.17%	3.57%	0.01%	BBB	\$ 1,493,356,800	123.52%		62,263,500	0.00013511	0.0275%	3.556
AT&T Inc	FR partially		4.300	2042	113.41	1,955,000,000	3.792%	3.41%	0.02%	BBB	\$ 2,217,165,500	113.41%		84,065,000	0.00020896	0.0426%	3.411
Verizon Communications	Notes		3.850	2042	113.53	1,250,000,000	3.39%	2.96%	0.01%	BBB+	\$ 1,419,125,000	113.53%		48,125,000	0.00013120	0.0342%	2.985
Verizon Communications	Fix Rt Nt		6.550	2043	156.82	15,000,000,000	4.18%	2.95%	0.16%	BBB+	\$ 23,523,000,000	156.82%		982,500,000	0.00156646	0.4078%	3.052
AT&T Inc	Fix Rt Nt		5.350	2043	121.65	436,339,000	4.397%	3.89%	0.01%	BBB	\$ 530,937,295	121.65%		23,344,137	0.00005316	0.0108%	3.908
AT&T Inc	Fix Rt Nt		4.650	2044	117.17	470,656,000	3.969%	3.56%	0.01%	BBB	\$ 551,467,635	117.17%		21,885,504	0.00005251	0.0107%	3.546
AT&T Inc	Fix Rt Nt		4.800	2044	118.51	2,000,000,000	4.05%	3.62%	0.02%	BBB	\$ 2,370,200,000	118.51%		96,000,000	0.00022678	0.0462%	3.605
AT&T Inc	Fix Rt Nt		4.350	2045	113.48	3,044,000,000	3.83%	3.52%	0.03%	BBB	\$ 3,454,331,200	113.48%		132,414,000	0.00033585	0.0684%	3.511
AT&T Inc	Fix Rt Nt		4.850	2045	118.42	795,686,000	4.10%	3.69%	0.01%	BBB	\$ 942,251,361	118.42%		38,590,771	0.00009214	0.0188%	3.685
Verizon Communications	Fix Rt Nt		4.125	2046	116.98	1,500,000,000	3.53%	3.12%	0.02%	BBB+	\$ 1,754,700,000	116.98%		61,875,000	0.00016610	0.0432%	3.151
Verizon Communications	Notes		4.862	2046	127.89	4,500,000,000	3.80%	3.20%	0.05%	BBB+	\$ 5,755,050,000	127.89%		218,790,000	0.00051091	0.1330%	3.246
AT&T Inc	Fix Rt Nt		4.750	2046	119.08	3,500,000,000	3.99%	3.59%	0.04%	BBB	\$ 4,167,800,000	119.08%		166,250,000	0.00039437	0.0804%	3.582
AT&T Inc	Fix Rt Nt		5.150	2046	124.35	1,749,602,000	4.14%	3.66%	0.02%	BBB	\$ 2,175,630,087	124.35%		90,104,503	0.00020096	0.0410%	3.665
Verizon Communications	FR Sr Nt		5.500	2047	140.29	1,500,000,000	3.92%	3.17%	0.02%	BBB+	\$ 2,104,350,000	140.29%		82,500,000	0.00016871	0.0439%	3.209
AT&T Inc	Fix Rt Gbl Nt		4.900	2047	103.00	207,017,000	4.76%	4.70%	0.00%	BBB	\$ 213,227,510	103.00%		10,143,833	0.00003050	0.0062%	1.938
AT&T Inc	Fix Rt Gbl Nt		5.450	2047	129.01	2,000,000,000	4.22%	3.71%	0.02%	BBB	\$ 2,580,200,000	129.01%		109,000,000	0.00023268	0.0474%	3.668
AT&T Inc	Fix Rt Sr Nt		5.650	2047	132.26	1,500,000,000	4.27%	3.72%	0.02%	BBB	\$ 1,983,900,000	132.26%		84,750,000	0.00017471	0.0356%	3.689
Verizon Communications	Sr Notes		4.522	2048	123.81	5,000,000,000	3.65%	3.18%	0.06%	BBB+	\$ 6,190,500,000	123.81%		226,100,000	0.00056361	0.1467%	3.214
Verizon Communications	Sr Notes		5.000	2048	109.10	51,593,000	4.58%	4.41%	0.00%	BBB+	\$ 56,287,963	109.10%		2,579,650	0.00008007	0.0021%	1.065
AT&T Inc	Fix Rt Sr Nt		4.500	2048	113.69	4,498,000,000	3.96%	3.70%	0.05%	BBB	\$ 5,113,776,200	113.69%		202,410,000	0.00052145	0.1063%	3.888
AT&T Inc	FR Global Notes		4.550	2049	114.92	2,494,000,000	3.96%	3.69%	0.03%	BBB	\$ 2,866,104,800	114.92%		113,477,000	0.00028883	0.0589%	3.684
AT&T Inc	FR Global Notes		4.250	2050	105.20	1,265,000,000	4.04%	3.95%	0.02%	BBB	\$ 1,330,780,000	105.20%		53,762,500	0.00015657	0.0319%	flat
T-Mobile			4.500	2050	118.43	3,000,000,000	3.80%	3.47%	0.04%	BBB-	\$ 3,552,900,000	118.43%		135,000,000	0.00036924	1.4265%	3.479
Verizon Global Funding	Sr Notes		2.875	2050	96.30	2,750,000,000	2.99%	3.07%	0.03%	BBB+	\$ 2,648,250,000	96.30%		79,062,500	0.00029951	0.0780%	3.065
AT&T Inc	FR Global Notes		5.150	2050	124.80	1,694,666,000	4.13%	3.75%	0.02%	BBB	\$ 2,114,943,168	124.80%		87,275,299	0.00019903	0.0406%	3.73
AT&T Inc	SR Notes		3.650	2051	101.55	3,000,000,000	3.59%	3.57%	0.03%	BBB	\$ 3,046,500,000	101.55%		109,500,000	0.00033532	0.0683%	3.565
AT&T Inc	SR Notes		3.300	2052	96.49	2,250,000,000	3.42%	3.49%	0.02%	BBB	\$ 2,171,025,000	96.49%		74,250,000	0.00024581	0.0501%	3.486
AT&T Inc	SR Notes		3.500	2053	96.06	7,500,000,000	3.64%	3.71%	0.09%	BBB	\$ 7,204,500,000	96.06%		262,500,000	0.00087236	0.1778%	3.709
Verizon Communications	Fix Rt Nt		5.012	2054	134.19	5,500,000,000	3.74%	3.28%	0.06%	BBB+	\$ 7,380,450,000	134.19%		275,860,000	0.00064087	0.1668%	3.315
Verizon Communications	Fix Rt Notes		4.672	2055	126.50	5,500,000,000	3.69%	3.34%	0.07%	BBB+	\$ 6,957,500,000	126.50%		256,960,000	0.00065228	0.1688%	3.36
AT&T Inc	SR Notes		3.550	2055	95.88	7,500,001,000	3.70%	3.77%	0.09%	BBB	\$ 7,191,000,959	95.88%		266,250,036	0.00088519	0.1804%	3.764
Verizon Global Funding	Sr Notes		2.987	2056	95.32	4,499,992,000	3.13%	3.21%	0.05%	BBB+	\$ 4,289,392,374	95.32%		134,414,761	0.00051272	0.1335%	3.208
AT&T Inc	SR Notes		3.800	2057	99.64	5,923,400,000	3.81%	3.82%	0.07%	BBB	\$ 5,902,075,760	99.64%		225,089,200	0.00070899	0.1445%	3.818
AT&T Inc	FR Global Notes		5.700	2057	133.75	1,000,000,000	4.26%	3.94%	0.01%	BBB	\$ 1,337,500,000	133.75%		57,000,000	0.00012353	0.0252%	3.93
AT&T Inc	FR Global Notes		5.300	2058	128.78	643,706,000	4.12%	3.84%	0.01%	BBB	\$ 828,964,587	128.78%		34,116,418	0.00007747	0.0158%	3.83
T-Mobile			3.600	2060	100.27	1,000,000,000	3.59%	3.59%	0.01%	BBB-	\$ 1,002,700,000	100.27%		36,000,000	0.00012718	0.4914%	3.587
Verizon Global Funding	Sr Notes		3.000	2060	95.86	2,000,000,000	3.13%	3.19%	0.02%	BBB+	\$ 1,917,200,000	95.86%		60,000,000	0.00022609	0.0589%	3.184
AT&T Inc	SR Notes		3.850	2060	100.94	1,500,000,000	3.81%	3.80%	0.02%	BBB	\$ 1,514,100,000	100.94%		57,750,000	0.00017884	0.0364%	3.803
AT&T Inc	SR Notes		3.500	2061	94.47	1,500,000,000	3.70%	3.77%	0.02%	BBB	\$ 1,417,050,000	94.47%		52,500,000	0.00017719	0.0361%	3.769
AT&T Inc	FR Global Notes		7.120	2097	154.00	85,856,000	4.62%	4.57%	0.00%	BBB	\$ 132,218,240	154.00%		6,112,947	0.00001230	0.0025%	4.571
Bell South Capital Funding	deb	Z100	7.120	2097	132.52	500,000,000	5.37%	5.35%	0.01%	BBB	\$ 662,600,000	132.52%		35,600,000	0.00009479	0.0192%	5.35
Total						113,667,834,000				Total	\$ 134,546,712,752	118.37%	4.55%	\$ 5,175,293,238	2.07%	2.820%	3.49

Source: FINRA

Embedded debt rate	4.5530%
Weighted average yield to maturity	2.0673%
Debt service / Market value	3.8465%
Finra YTM	3.49%
	3.50%

SAY

## DATA INPUT

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

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

Guideline Companies			Current Year												
			Stock Price 12/31/2020	Beta levered	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Book Value	Common Shares	Long-Term Debt	Capital Spending per share	Trailing P/E Ratio	Average Annual Dividend Yield	Operating Margin
Name	Ticker	Yahoo	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL
AT&T Inc	T	\$28.26	0.85	\$ 24.35	\$ 7.25	\$ 3.20	\$ 2.08	\$ 25.60	7,126,000	\$ 153,775,000,000	\$ 2.95	8.80	n/a	n/a	19.0%
Verizon	VZ	\$58.13	0.65	\$ 32.15	\$ 9.05	\$ 5.10	\$ 2.52	\$ 15.55	4,138,148	\$ 123,173,000,000	\$ 4.40	11.30	n/a	n/a	24.0%
US Cellular	USM	\$30.69	0.75	\$ 48.05	\$ 9.85	\$ 1.60	\$ -	\$ 52.95	86,091	\$ 2,489,000,000	\$ 9.75	11.30	n/a	18.5%	24.0%
T-Mobile	TMUS	\$134.85	0.80	\$ 63.70	\$ 18.75	\$ 3.95	\$ -	\$ 60.00	1,242,804	\$ 71,018,000,000	\$ 9.35	33.20	n/a	35.6%	24.0%

Value Line March 12, 2021

The harmonic mean is the preferable method for averaging multiples, such as the price/earning ratio, in which price is in the numerator. If these ratios are averaged using an arithmetic mean (a common error), 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:

Value Line figures are all values in US dollars.

Forecast % Change

% Return on Shareholders' Equity	Projected (Next Year)											Dividends	Earnings	Cash Flow	Revenue	Income
	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	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	2021-2025	2021-2025	2021-2025	2021-2025	Operating Income
VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	M*
12.5%	\$ 24.55	\$ 7.35	\$ 3.30	\$ 2.08	26.40	7,125,000	3.05	12.5%	4.5%	63.0%	120.2%	2.50	2.50	2.00	1.50	\$25,285,000,000
38.0%	\$ 32.80	\$ 9.10	\$ 5.20	\$ 2.57	15.85	4,145,000	4.45	38.0%	38.0%	49.0%	122.7%	2.00	3.50	1.00	1.50	\$28,798,000,000
3.0%	\$ 48.75	\$ 9.95	\$ 1.70	\$ -	54.10	85,000	9.80	3.0%	3.0%	0.0%	105.7%	0.00	9.00	1.00	2.00	\$ 193,000,000
6.5%	\$ 65.40	\$19.45	\$ 4.55	\$ -	72.00	1,250,000	9.20	6.5%	6.5%	0.0%	110.0%	0.00	8.50	9.50	5.00	\$ 7,054,000,000



Balance Sheet					Cash Flow	Fair Value	Carrying Value	Current Maturity	ROE	All Div'ds to Net Prof
Current Assets	PP & E Gross	Current Liabilities	Long Term Debt	Intangibles (excl. Goodwill)	Depreciation & Amortization	Debt	Debt	Rent expense	5 yr	5 yr
M*	M*	M*	M*	M*	M*	10-K	10-k	10-K	VL	VL
\$ 52,008,000,000	\$ 352,465,000,000	\$ 63,438,000,000	\$ 151,928,000,000	\$ 146,316,000,000	\$ 28,516,000,000	\$ 190,473,000,000	\$ 158,458,000,000	\$ 5,896,000,000	13.0%	60%
\$ 54,594,000,000	\$ 302,268,000,000	\$ 39,660,000,000	\$ 123,173,000,000	\$ 105,510,000,000	\$ 16,720,000,000	\$ 156,752,000,000	\$ 127,778,000,000	\$ 5,016,000,000	40.0%	48%
\$ 2,623,000,000	\$ 9,709,000,000	\$ 871,000,000	\$ 2,489,000,000	\$ 2,629,000,000	\$ 683,000,000	\$ 4,049,000,000	\$ 3,832,000,000	\$ 171,000,000	3.5%	
\$ 23,885,000,000	\$ 114,619,000,000	\$ 21,703,000,000	\$ 66,546,000,000	\$ 88,126,000,000	\$ 14,151,000,000	\$ 77,960,000,000	\$ 70,886,000,000	\$ 4,438,000,000	5.5%	

15.5%	54.0%
7.0%	53.3%
9.3%	54.0%

# SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

WASHINGTON STATE DEPARTMENT OF REVENUE

2021 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Stock Price	2019		2020		2019		2020	
			Actual Earnings Ratio (EPS/P)		Projected Earnings Ratio (PEPS/P)		Cash Flow Ratio (CF/P)		Projected Cash Flow Ratio (PCF/P)	
AT&T Inc	T	28.26	3.20	11.32%	3.30	11.68%	7.25	25.65%	7.35	26.01%
Verizon	VZ	58.13	5.10	8.77%	5.20	8.95%	9.05	15.57%	9.10	15.65%
US Cellular	USM	30.69	1.60	5.21%	1.70	5.54%	9.85	32.10%	9.95	32.42%
T-Mobile	TMUS	134.85	3.95	2.93%	4.55	3.37%	18.75	13.90%	19.45	14.42%
		<b>Mean</b>		<b>7.06%</b>		<b>7.38%</b>		<b>21.81%</b>		<b>22.13%</b>
		<b>Median</b>		<b>6.99%</b>		<b>7.24%</b>		<b>20.61%</b>		<b>20.83%</b>
		<b>Max</b>		<b>11.32%</b>		<b>11.68%</b>		<b>32.10%</b>		<b>32.42%</b>
		<b>Min</b>		<b>2.93%</b>		<b>3.37%</b>		<b>13.90%</b>		<b>14.42%</b>
		<b>stdev</b>		<b>3.72%</b>		<b>3.67%</b>		<b>8.60%</b>		<b>8.61%</b>
		<b>cov</b>		<b>52.74%</b>		<b>49.67%</b>		<b>39.45%</b>		<b>38.90%</b>
		<b>harmean</b>		<b>5.44%</b>		<b>5.93%</b>		<b>19.39%</b>		<b>19.75%</b>
		<b>Say</b>		<b>7.00%</b>		<b>7.25%</b>		<b>20.50%</b>		<b>20.75%</b>

Source:  
 Actual earnings: Value Line  
 Estimated Earnings: Value Line  
 Actual Cash Flow: Value Line  
 Estimated Cash Flow: Value Line

# IMPLIED PREMIUMS FOR US MARKET

Updated January 5, 2020

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

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

Year	Earnings Yield	Dividend Yield	S&P 500	Earnings*	Dividends*	Dividends + Buybacks	Change in Earnings	Change in Dividends	T.Bill Rate	T.Bond Rate	Bond-Bill	Smoothed Growth	Implied Premium	Analyst Growth Estimate	Implied Premium (FCFE)	Implied Premium	ERP/Riskfree Rate
1960	5.34%	3.41%	58.11	3.10	1.98				2.66%	2.76%	0.10%	2.45%					
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%				1.24
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%				0.92
1963	5.51%	3.13%	75.02	4.13	2.35		12.75%	9.00%	3.12%	4.14%	1.02%	4.96%	3.38%				0.82
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%				0.79
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%				0.71
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%				0.79
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%				0.56
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%				0.49
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%				0.47
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%				0.52
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%				0.52
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%				0.42
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%				0.62
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%				0.76
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%				0.53
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%				0.67
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%				0.76
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%				0.63
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%				0.62
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%				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%				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%				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%				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%				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%			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%			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%			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%			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%			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%			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%			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%			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%			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%			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%			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%			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%			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%			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%			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%			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%		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%	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%	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%		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%	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%	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%	12.50%		4.37%	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%	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%	2.06%	2.60%	7.20%		4.36%	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%	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%	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%	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%	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%	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%	2.76%	6.12%		5.51%	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%	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%	2.36%	2.36%	7.05%		5.08%	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%	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%	2.71
2020	3.68%	1.51%	3756.07	138.12	56.70	127.78	-14.92%	-3.57%	0.09%	0.93%	0.84%	0.74%	1.65%	5.42%	4.72%	4.94%	5.08

\* Earnings and dividends numbers each year reflect the estimated numbers as of the end of the year. These numbers get updated later in the year but I do not update the numbers in this spreadsheet, since I would not have had access to them at

## 2021 Multi Stage Earnings Growth Model

Wireless Industry

3.80% GDP

11.3 Median Trailing Industry P/E

54.0% Average Target Dividend Payout Ratio (All dividends to net profit)

9.3% Average Target ROE

AT&T

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		33.78%	66.22%	<b>3.20</b>		stock price =	-28.26
1	3.12%	110.57%	-10.57%	<b>3.30</b>	-0.35		-0.35
2	10.23%	100.31%	-0.31%	3.64	-0.01		-0.01
3	9.28%	91.79%	8.21%	3.98	0.33		0.33
4	8.49%	84.61%	15.39%	4.31	0.66		0.66
5	7.83%	75.90%	24.10%	<b>4.65</b>	1.12		1.12
6	7.02%	67.20%	32.80%	4.98	1.63		1.63
7	6.22%	58.49%	41.51%	5.29	2.19		2.19
8	5.41%	49.79%	50.21%	5.57	2.80		2.80
9	4.61%	41.08%	58.92%	5.83	3.43		3.43
10	3.80%	41.08%	58.92%	6.05	3.56	70.96	74.53
11+	3.80%	41.08%	58.92%	6.28	3.70		

Value Line Earnings Growth Rate  $K_e = 12.37\%$

Verizon

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		21.20%	78.80%	<b>5.10</b>		stock price =	-58.13
1	1.96%	18.19%	81.81%	<b>5.20</b>	4.25		4.25
2	1.68%	17.89%	82.11%	5.29	4.34		4.34
3	1.65%	17.60%	82.40%	5.38	4.43		4.43
4	1.63%	17.32%	82.68%	5.46	4.52		4.52
5	1.60%	22.07%	77.93%	<b>5.55</b>	4.33		4.33
6	2.04%	26.82%	73.18%	5.66	4.14		4.14
7	2.48%	31.58%	68.42%	5.80	3.97		3.97
8	2.92%	36.33%	63.67%	5.97	3.80		3.80
9	3.36%	41.08%	58.92%	6.17	3.64		3.64
10	3.80%	41.08%	58.92%	6.41	3.78	75.17	78.95
11+	3.80%	41.08%	58.92%	6.65	3.92		

Value Line Earnings Growth Rate  $K_e = 9.11\%$

US Cellular

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		0.68%	99.32%	<b>1.60</b>		stock price =	-30.69
1	6.25%	0.32%	99.68%	<b>1.70</b>	1.69		1.69
2	2.94%	0.31%	99.69%	1.75	1.74		1.74
3	2.86%	0.30%	99.70%	1.80	1.79		1.79
4	2.78%	0.29%	99.71%	1.85	1.84		1.84
5	2.70%	0.32%	99.68%	<b>1.90</b>	1.89		1.89
6	2.92%	0.34%	99.66%	1.96	1.95		1.95
7	3.14%	0.36%	99.64%	2.02	2.01		2.01
8	3.36%	0.39%	99.61%	2.08	2.08		2.08
9	3.58%	41.08%	58.92%	2.16	1.27		1.27
10	3.80%	41.08%	58.92%	2.24	1.32	26.29	27.61
11+	3.80%	41.08%	58.92%	2.33	1.37		

Value Line Earnings Growth Rate  $K_e = 4.60\%$

T-Mobile

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		1.64%	98.36%	<b>3.95</b>		stock price =	-134.85
1	15.19%	1.46%	98.54%	<b>4.55</b>	4.48		4.48
2	13.46%	1.28%	98.72%	5.16	5.10		5.10
3	11.86%	1.15%	98.85%	5.78	5.71		5.71
4	10.61%	1.04%	98.96%	6.39	6.32		6.32
5	9.59%	0.91%	99.09%	<b>7.00</b>	6.94		6.94
6	8.43%	0.79%	99.21%	7.59	7.53		7.53
7	7.27%	0.66%	99.34%	8.14	8.09		8.09
8	6.12%	0.54%	99.46%	8.64	8.59		8.59
9	4.96%	41.08%	58.92%	9.07	5.34		5.34
10	3.80%	41.08%	58.92%	9.41	5.55	110.41	115.96
11+	3.80%	41.08%	58.92%	9.77	5.76		

Value Line Earnings Growth Rate Ke = 3.11%

Average 7.30%  
**Median** 6.86%