

COST OF CAPITAL STUDY

YIELD CAPITALIZATION
 2019 ASSESSMENT YEAR

APPENDIX C

WIRELESS

EQUITY RATE		9.25%			
CAPITAL ASSET PRICING MODEL			PAGE		
CAPM Ex Ante	8.65%		6		
DIVIDEND GROWTH MODELS (Single Stage)					
Value Line, based on Dividends Growth	8.50%		7		
Value Line, based on Earnings Growth	11.50%		8		
Value Line, based on Return on Equity	11.75%		9		
FCFE GROWTH MODEL (Multi Stage)	17.00%		10		
		RANGE 8.5% - 17%			
DEBT RATE		5.25%	11		
SECURED DEBT (LEASE) RATE		4.25%	11		
MARKET CAPITAL STRUCTURE					
Equity	60%	x 9.25%	= 5.55%	3	
Debt	40%	x 5.25%	= 2.10%	3	
Marginal Tax Rate	24%	= (1-.24)	x 2.10%	<u>1.60%</u>	3
WEIGHTED AVERAGE COST OF CAPITAL		7.1%			

rounded

SUPPORT FOR GUIDELINE COMPANIES

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 ASSESSMENT YEAR

WIRELESS

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	Operting Margin	Trailing P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
AT&T Inc	T	0.80	A++	n/a	8.5	7.27%	184,164,800,000	52.6%	-	0.0%	166,250,000,000	47.4%	350,414,800,000
Verizon	VZ	0.75	A++	n/a	11.9	4.26%	54,708,275,800	34.1%	-	0.0%	105,873,000,000	65.9%	160,581,275,800
Sprint Corp	S	1.20	C++	36.8%	79.9	0.00%	28,351,246,200	43.9%	-	0.0%	36,288,000,000	56.1%	64,639,246,200
US Cellular	USM	1.05	B+	17.5%	26.8	0.00%	4,056,335,000	71.6%	-	0.0%	1,605,000,000	28.4%	5,661,335,000
T-Mobile	TMUS	0.95	B+	27.2%	21.1	0.00%	24,715,924,470	45.8%	20,000,000	0.0%	29,263,000,000	54.2%	53,998,924,470
	Mean	0.95	B++	27%	29.6	2.31%	59,199,316,294	49.6%		0.0%	67,855,800,000	50.4%	
	Weighted Mean						295,996,581,470	46.6%	20,000,000	0.00%	339,279,000,000	53.4%	635,295,581,470
	Median	0.95			21.1	0.00%		45.8%		0.0%		54.2%	
	Std Dev	0.18				3.33%		14.0%		0.0%		14.0%	
	Coeff Var	0.19				144.49%		28.2%		2.236068		27.8%	
	Max	1.20				7.27%		71.6%		0.0%		65.9%	
	Min	0.75				0.00%		34.1%		0.0%		28.4%	
	Harmonic Mean	0.92						46.74%				46.39%	

Say **1.00**

**SUPPORT FOR CAPITAL STRUCTURE
MARKET VALUE**

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 ASSESSMENT YEAR

WIRELESS

Capital Structure at Market Value

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
AT&T Inc	T	28.07	7,285,000,000	204,489,950,000	53.1%	-	0.0%	180,659,000,000	46.9%	385,148,950,000
Verizon	VZ	55.64	4,132,045,000	229,906,983,800	66.0%	-	0.0%	118,535,000,000	34.0%	348,441,983,800
Sprint Corp	S	5.82	4,079,316,000	23,741,619,120	36.5%	-	0.0%	41,286,000,000	63.5%	65,027,619,120
US Cellular	USM	51.97	86,305,000	4,485,270,850	74.2%	-	0.0%	1,561,000,000	25.8%	6,046,270,850
T-Mobile	TMUS	63.61	850,221,000	54,082,557,810	67.3%	20,000,000	0.025%	26,277,000,000	32.7%	80,379,557,810
			Mean		59.4%		0.0%		40.6%	
			Weighted Mean	516,706,381,580	58.4%	20,000,000	0.00%	368,318,000,000	41.6%	885,044,381,580
			Median		66.0%		0.00%		34.0%	
			Harmonic Mean		55.7%		7%		36.8%	
			Std Dev		14.9%		0.01%		14.9%	
			Coeff Var		25.1%		223.61%		36.7%	
			Max		74.2%		0.0%		63.5%	
			Min		36.5%		0.0%		25.8%	

Source:

Stock Price: Yahoo

Market Value Debt: Bond Analysis

Say

60%

0%

40%

SUPPORT FOR MARKET MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
AT&T Inc	T	28.07	23.45	1.2	7.19	3.9	3.52	8.0	25.28	1.1
Verizon	VZ	55.64	31.67	1.8	6.10	9.1	4.71	11.8	13.24	4.2
Sprint Corp	S	5.82	8.30	0.7	2.45	2.4	0.10	58.2	6.95	0.84
US Cellular	USM	51.97	45.97	1.13	9.30	5.6	1.72	30.2	47.00	1.1
T-Mobile	TMUS	63.61	50.94	1.2	11.03	5.8	3.36	18.9	29.07	2.19
		Mean		1.2		5.4		25.4		1.9
		Median		1.2		5.6		18.9		1.1
		Harmonic Mean		1.1		4.4		16.0		1.4
		Max		1.8		9.1		58.2		4.2
		Min		0.70		2.4		8.0		0.84
		Std Dev		0.4		2.5		20.2		1.4
		Coefficient of Variation		0.3		0.5		0.8		0.7
		Harmonic Mean		1.1		4.4		16.0		1.4
		Percentile .25		1.1		3.9		11.8		1.1
		Percentile .75		1.2		5.8		30.2		2.2
		Say		1.25		5.50				1.50

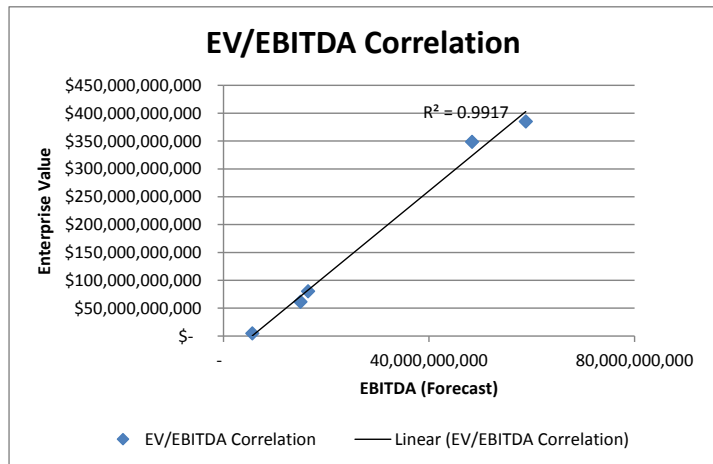
ENTERPRISE VALUE MULTIPLES

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 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	\$ 385,148,950,000	54,572,000,000	7.06	7.8%	58,822,392,211	6.55	184,674,750,000	2.09	56,458,750,000	9,484,597,500	5.84
Verizon	VZ	\$ 348,441,983,800	48,372,000,000	7.20	0.0%	48,372,000,000	7.20	132,018,837,750	2.64	25,284,500,000	6,223,087,500	11.06
Sprint Corp	S	\$ 61,574,619,120	14,087,000,000	4.37	6.1%	14,949,469,388	4.12	34,266,254,400	1.80	10,595,000,000	2,167,515,000	4.82
US Cellular	USM	\$ 4,925,270,850	5,899,000,000	0.83	-5.4%	5,581,849,462	0.88	4,112,433,250	1.20	756,800,000	81,952,500	5.87
T-Mobile	TMUS	\$ 80,379,557,810	14,795,000,000	5.43	11.1%	16,431,436,990	4.89	45,444,312,450	1.77	10,351,250,000	1,379,542,500	6.85
	Mean						4.73		1.90			6.89
	Median						4.89		1.80			5.87
	Max						7.20		2.64			11.06
	Min						0.88		1.20			4.82
	Std Dev						2.48		0.52			2.44
	Coefficient of Variation						0.52		0.28			0.35
	Harmonic Mean						2.67		1.78			6.37
	Say						5.00		2.00			7.00



4.00 put in income direct excluding IPP
6.50 put in income direct including IPP

Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast	
US Cellular	0.88	3.30 Low Average
Sprint Corp	4.12	4.12 Low Median
T-Mobile	4.89	4.00 Say
AT&T Inc	6.55	6.21 Average
Verizon	7.20	6.55 Median
		6.50 Say

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

WASHINGTON STATE DEPARTMENT OF REVENUE
2019 ASSESSMENT YEAR
WIRELESS

Ex Ante
Ke = Rf + B (Rp)

Ke = Cost of Equity **8.65%**

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Rm =	rate of return	8.65%	
Rf =	risk free rate	3.00%	
Rp =	risk premium	5.65%	
B =	Beta	1.00	

Rp = Risk Premium **5.65%**

to above

Shannon Pratt and Roger Grabowski	3.5 - 6%	
Cost of Capital, Applications and Examples, Fifth Edition, 2014		
Dr. Aswath Damodaran	5.96%	chart page 15
http://pages.stern.nyu.edu/~adamodar/	5.65%	adjusted for Rf
2018 Implied Premium		
John Graham and Campbell Harvey	6.21%	10 year expected return
Duke CFO magazine Global Business Outlook	5.89%-6.54%	95% Interval 10 year expected
4th Qtr	6.27%	adjusted for Rf
	3.06%	Rf rate used in survey

Rf = Risk Free Rate **3.00%**

Value Line Investment Survey, Selected Yields January 4, 2019, page 1949
as of 12-26-18

US Treasury Securities year end data		
5 year	2.65%	
10 year	2.81%	
30 year	3.06%	
30 year Zero	3.10%	

Federal Reserve Statistical Release (http://www.federalreserve.gov/Releases/H15/Current/)
January 2, 2019 as of 12-31-18

Treasury Constant Maturities		
5 year	2.51%	
10 year	2.69%	
20 year	2.87%	
30 year	3.02%	
20 year TIPS	1.09%	1.78%
30 year TIPS	1.21%	1.81%

TIPS inflation indication

Inflation **2.00%**

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Value Line Investment Survey, Economic Series January 4, 2019, page 1500	
Consumer Price Index Annual Rate of Change 2021-2023	2.30%
The Livingston Survey December 21, 2018, page 4, 10	
Inflation median (measured by the Consumer Price Index) over next 10 years	2.23%

Gross Domestic Product (GDP) **3.90%**

Federal Reserve Projected Long Run Real GDP Growth	
Median Projection Value From Dec 19, 2018 Report	1.90%
https://www.federalreserve.gov/monetarypolicy/files/fomcprotabl20181219.pdf	
Congressional Budget Office Real GDP Economic Projections	
The Budget and Economic Outlook 2019-2029	Table E-1, pg 147
Average Percentage Change Year To Year	2019-2023 1.90%
http://www.cbo.gov/publication/54918	2024-2029 1.78%
Federal Reserve Bank of Philadelphia	
The Livingston Survey, December 21, 2018, page 4, 10	
Average Annual Real GDP Growth Rate for Next 10 Years	2.07%
https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey	

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

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 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	28.07	2.04	7.27%	4.50%	11.77%	5.04%	12.31%	3.90%	11.17%
Verizon	VZ	55.64	2.37	4.26%	1.50%	5.76%	1.56%	5.82%	1.56%	5.82%
Sprint Corp	S	5.82	0.00		0.00%				3.90%	
US Cellular	USM	51.97	0.00		0.00%				3.90%	
T-Mobile	TMUS	63.61	0.00		0.00%				3.90%	
			Mean	5.76%		8.76%				8.49%
			Median	5.76%		8.76%				8.49%
			Harmonic Mean	5.37%		7.73%				7.65%
			Std Dev	2.13%		4.25%				3.78%
			Coeff Var	36.90%		48.48%				44.55%
			Max	7.27%		11.77%				11.17%
			Min	4.26%		5.76%				5.82%

Source: Value Line Projections 15-17 to 21-23

8.75%

8.50%

Say

8.50%

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

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 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	28.07	3.65	13.00%	5.50%	18.50%	6.31%	19.32%	3.90%	16.90%
Verizon	VZ	55.64	4.65	8.36%	4.00%	12.36%	4.42%	12.78%	3.90%	12.26%
Sprint Corp	S	5.82	0.25	4.30%	0.00%	4.30%	0.00%	4.30%	0.00%	
US Cellular	USM	51.97	1.25	2.41%	6.50%	8.91%	7.65%	10.06%	3.90%	6.31%
T-Mobile	TMUS	63.61	4.20	6.60%	18.00%	24.60%	28.33%	34.93%	3.90%	10.50%
Mean						13.73%				11.49%
Median						12.36%				11.38%
Harmonic Mean						9.60%				10.14%
Std Dev						7.99%				4.39%
Coeff Var						58.16%				38.18%
Max						24.60%				16.90%
Min						4.30%				6.31%

Source: Value Line Projections 15-17 to 21-23

12.50%

11.50%

Say

11.50%
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SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 ASSESSMENT YEAR

WIRELESS

Based on Return on Equity

Ke = (D1 / Po) + G
Ke = Cost of Equity
D1 = Expected Dividends
E1 = Expected Earnings
Po = 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)	Ke Dividends	Expected Earnings (E1)	Ke Earnings
AT&T Inc	T	28.07	2.04	7.27%	44.0%	13.00%	5.721%	12.99%	3.65	18.72%
Verizon	VZ	55.64	2.37	4.26%	49.0%	8.36%	4.095%	8.35%	4.65	12.45%
Sprint Corp	S	5.82	0.00		100.0%	4.30%	4.296%		0.25	8.59%
US Cellular	USM	51.97	0.00		100.0%	2.41%	2.405%		1.25	4.81%
T-Mobile	TMUS	63.61	0.00		100.0%	6.60%	6.603%		4.20	13.21%
Mean								10.67%		11.56%
Median								10.67%		12.45%
Harmonic Mean								10.17%		9.37%
Std Dev								3.28%		5.23%
Coeff Var								30.71%		45.21%
Max								12.99%		18.72%
Min								8.35%		4.81%
								10.75%		11.75%

Say **11.75%**
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SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT FREE CASH FLOW TO EQUITY MODEL

Washington State Department of Revenue
2019 ASSESSMENT YEAR

Based on Earnings Growth

$$K_e = (FCFE / P) + G$$

K_e = Cost of Equity
 $FCFE$ = Free Cash Flow to Equity
 P = Current Price
 G = Sustainable Growth

Company	Ticker	Stock Price	Expected Earnings	P/E	Payout Ratio	ROE	Ke
AT&T Inc	T	28.07	3.65	7.69	56.00%	13.50%	21.52%
Verizon	VZ	55.64	4.65	11.97	51.00%	37.00%	14.16%
Sprint Corp	S	5.82	0.25	23.28	0.00%	3.50%	18.53%
US Cellular	USM	51.97	1.25	41.58	0.00%	2.50%	nmf
T-Mobile	TMUS	63.61	4.20	15.15	0.00%	13.00%	15.20%
Mean				19.93	21.40%	13.90%	17.35%
Harmonic Mean				14.42		5.79%	16.89%
Median				15.15	0.00%	13.00%	16.87%
Max				41.58	56.00%	37.00%	21.52%
Min				7.69	0.00%	2.50%	14.16%
Std Dev				13.38	29.36%	13.90%	3.34%
Coefficient of Variation				0.67	137.18%	99.99%	19.26%

Say

17.00%

SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 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	5.12%	4.86%	11	11	Aaa1	AAA+	1
Verizon	VZ	Baa1	BBB+	4.42%	4.37%	10	10	Aaa2	AAA	2
Sprint Corp	S	B3	B	5.91%	6.09%	18	17	Aaa3	AAA-	3
US Cellular	USM		BB	6.70%	6.98%		14	Aa1	AA+	4
T-Mobile	TMUS	Ba2	BB+			14	13	Aa2	AA	5
Overall Average Debt Rating		Baa3	BB+	5.54%		13.3	13.0	Aa3	AA-	6

4.80%

All issues 20+ year maturities

Guideline Companies, All Ratings

4.86%

5.25%

bond analysis page 12

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

Mergent's Bond Record January 2019, page 13

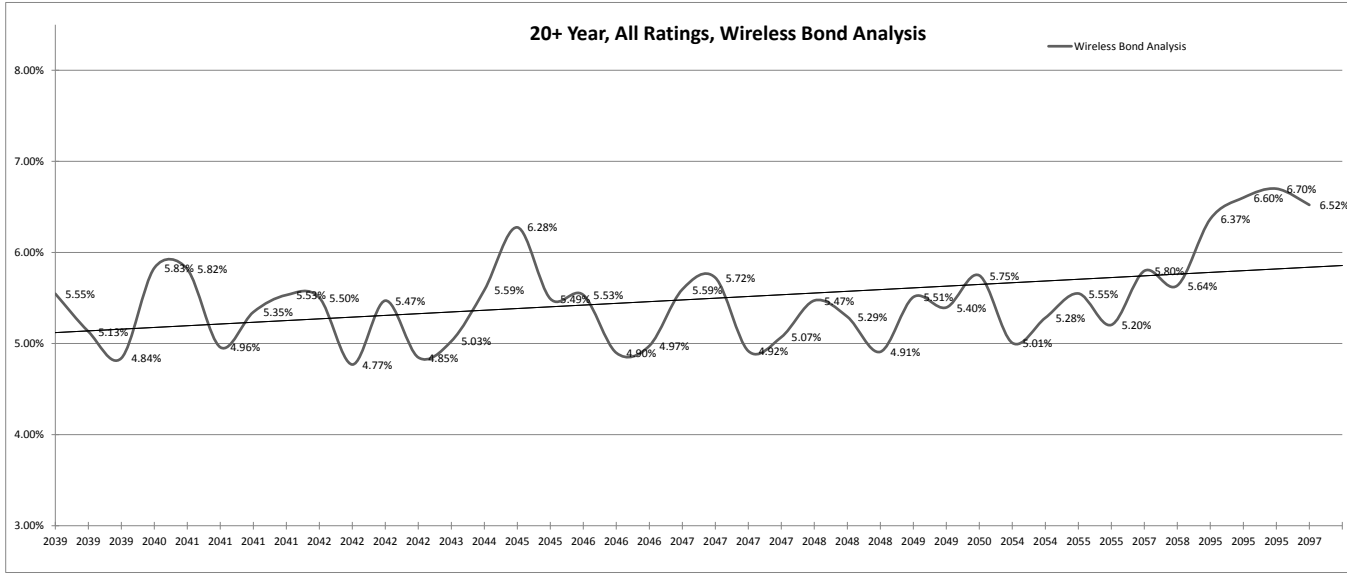
Corporate	Aaa	Aa	A	Baa
October	4.14%	4.28%	4.46%	5.07%
November	4.22%	4.37%	4.53%	5.22%
December	4.02%	4.20%	4.37%	5.13%
4th Qtr Average	4.13%	4.28%	4.45%	5.14%
Public Utilities	Aaa	Aa	A	Baa
October		4.31%	4.45%	4.91%
November		4.40%	4.52%	5.03%
December		4.24%	4.37%	4.92%
4th Qtr Average		4.32%	4.45%	4.95%
Industrials	Aaa	Aa	A	Baa
October	4.14%	4.24%	4.45%	5.22%
November	4.22%	4.34%	4.53%	5.42%
December	4.02%	4.16%	4.36%	5.34%
4th Qtr Average	4.13%	4.25%	4.45%	5.33%
Debt Yield Rate	5.25%			
Cost of Secured Debt (Operating Lease) Rate	4.25%			

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Wireless Bond Analysis

Company	type	Call	coupon	maturity	Price	Issued / Book	current yield	yield to maturity	Weighted / Rating	Mkt Val	Mkt : Book	Embedded	Debt Service	WAYTM	WAYTM	Finra YTM
AT&T Inc	Global Notes		2.300	2019	100.36	1,850,000,000	2.292%	3.02%	0.02%	BBB	\$ 1,856,623,000	100.36%	42,550,000	0.00019784	0.0424%	3.46
AT&T Inc	Global Notes		5.875	2019	102.83	942,000,000	5.713%	11.70%	0.04%	BBB	\$ 968,686,860	102.83%	55,342,500	0.00039016	0.0836%	3.03
AT&T Inc	Global Notes		5.800	2019	100.36	2,250,000,000	5.779%	6.53%	0.05%	BBB	\$ 2,258,055,000	100.36%	130,500,000	0.00051983	0.1114%	3.46
AT&T Inc	Global Notes		5.200	2020	102.27	1,154,000,000	5.085%	0.65%	0.00%	BBB	\$ 1,180,149,640	102.27%	60,008,000	0.0002639	0.0057%	3.26
AT&T Inc	Global Notes		2.450	2020	98.66	3,000,000,000	2.483%	5.23%	0.06%	BBB	\$ 2,959,800,000	98.66%	73,500,000	0.00055584	0.1191%	3.38
AT&T Inc	Global Notes		2.800	2021	98.81	2,000,000,000	2.834%	3.63%	0.03%	BBB	\$ 1,976,280,000	98.81%	56,000,000	0.00025672	0.0505%	3.383
AT&T Inc	Global Notes		4.600	2021	102.42	928,000,000	4.491%	2.92%	0.01%	BBB	\$ 950,484,720	102.42%	42,688,000	0.0009607	0.0206%	3.252
AT&T Inc	Global Notes		5.000	2021	103.45	1,430,000,000	4.833%	2.62%	0.01%	BBB	\$ 1,479,392,200	103.45%	71,500,000	0.00013269	0.0284%	3.328
AT&T Inc	Global Notes		3.875	2021	101.13	1,500,000,000	3.832%	3.09%	0.02%	BBB	\$ 1,516,980,000	101.13%	58,125,000	0.00016411	0.0352%	3.418
AT&T Inc	Fix Rt Nt		4.450	2021	101.92	1,250,000,000	4.366%	3.12%	0.01%	BBB	\$ 1,274,000,000	101.92%	55,625,000	0.00013803	0.0296%	3.595
AT&T Inc	Global Notes		3.800	2022	101.67	1,415,000,000	3.737%	3.09%	0.02%	BBB	\$ 1,438,672,950	101.67%	53,770,000	0.00015497	0.0332%	3.244
AT&T Inc	0 cpn sr note		-	2022	86.01	1,030,000,000	0.000%	6.21%	0.02%	BBB	\$ 885,923,600	86.01%	-	0.00022649	0.0485%	0
AT&T Inc	Global Notes		2.625	2022	95.80	1,500,000,000	2.740%	4.44%	0.02%	BBB	\$ 1,437,000,000	95.80%	39,375,000	0.00023556	0.0505%	3.79
AT&T Inc	Fix Rt Sr Note		3.000	2022	97.37	2,750,000,000	3.081%	4.13%	0.04%	BBB	\$ 2,677,565,000	97.37%	82,500,000	0.00042024	0.0861%	3.13
AT&T Inc	FR Global Notes		3.000	2022	97.97	1,850,000,000	3.062%	3.87%	0.03%	BBB	\$ 1,812,463,500	97.97%	55,500,000	0.00025321	0.0542%	3.694
AT&T Inc	FR Sr Gbl Nt		3.200	2022	99.55	1,250,000,000	3.215%	3.39%	0.02%	BBB	\$ 1,244,337,500	99.55%	40,000,000	0.00015007	0.0321%	3.351
AT&T Inc	Global Notes		3.600	2023	98.83	2,600,000,000	3.643%	3.97%	0.04%	BBB	\$ 2,569,528,000	98.83%	93,600,000	0.00036490	0.0782%	3.91
AT&T Inc	Fix Rt Nt		4.450	2024	102.02	1,208,000,000	4.362%	3.95%	0.02%	BBB	\$ 1,232,365,360	102.02%	53,756,000	0.00016897	0.0362%	4
AT&T Inc	Gbl FR Sr Nt		3.800	2024	99.03	750,000,000	3.837%	4.04%	0.01%	BBB	\$ 742,725,000	99.03%	28,500,000	0.00010725	0.0230%	4.009
AT&T Inc	Fix Rt Nt		3.900	2024	99.56	1,000,000,000	3.917%	4.01%	0.01%	BBB	\$ 995,600,000	99.56%	39,000,000	0.00014189	0.0304%	3.994
AT&T Inc	Fix Rt Sr Nt		3.950	2025	98.48	1,161,000,000	4.011%	4.27%	0.02%	BBB	\$ 1,143,387,630	98.48%	45,859,500	0.00017527	0.0375%	3.73
AT&T Inc	Fix Rt Nt		3.400	2025	94.65	5,000,000,000	3.592%	4.52%	0.08%	BBB	\$ 4,732,400,000	94.65%	170,000,000	0.00080005	0.1714%	4.371
AT&T Inc	Fix Rt Sr Nt		4.125	2026	97.88	2,650,000,000	4.214%	4.51%	0.04%	BBB	\$ 2,593,740,500	97.88%	109,312,500	0.00042292	0.0906%	4.476
AT&T Inc	Fix Rt Gbl Nt		4.250	2027	98.14	2,000,000,000	4.331%	4.55%	0.03%	BBB	\$ 1,962,820,000	98.14%	85,000,000	0.00032195	0.0690%	4.524
AT&T Corp	Fix Rt Nt z100		6.500	2029	109.44	3,000,000,000	5.939%	5.21%	0.06%	BBB	\$ 3,283,290,000	109.44%	195,000,000	0.00055367	0.1186%	5.29
AT&T Corp	Usd Sr Nt 100		8.250	2031	129.12	2,750,000,000	6.390%	4.88%	0.05%	BBB	\$ 3,550,662,500	129.12%	226,875,000	0.00047515	0.1018%	5.178
AT&T Corp	sr notes		8.250	2031	126.28	2,750,000,000	6.533%	5.16%	0.05%	BBB	\$ 3,472,782,500	126.28%	226,875,000	0.00050248	0.1076%	4.685
AT&T Wireless	sr notes	z100	8.750	2031	129.41	2,500,000,000	6.761%	5.27%	0.05%	BBB	\$ 3,235,275,000	129.41%	218,750,000	0.00046668	0.1000%	5.415
AT&T Inc	sr notes		4.500	2035	91.38	2,500,000,000	4.924%	5.33%	0.05%	BBB	\$ 2,284,500,000	91.38%	112,500,000	0.00047172	0.1010%	5.293
AT&T Inc	Fix Rt Nt z100		6.800	2036	112.08	1,500,000,000	6.067%	5.65%	0.03%	BBB	\$ 1,681,200,000	112.08%	102,000,000	0.00030022	0.0643%	5.695
AT&T Inc	Fxd Rt Gbl Nt		4.900	2037	93.38	4,500,000,000	5.248%	5.50%	0.09%	NR	\$ 4,201,875,000	93.38%	220,500,000	0.00087585	0.1876%	5.47
AT&T Inc	Fxd Rt Gbl Nt		5.250	2037	99.17	3,000,000,000	5.294%	5.32%	0.06%	BBB	\$ 2,974,950,000	99.17%	157,500,000	0.00096537	0.1211%	5.322
AT&T Inc	Global Note z100		6.500	2037	111.07	2,000,000,000	6.502%	5.50%	0.04%	BBB	\$ 2,221,400,000	111.07%	130,000,000	0.00038926	0.0834%	5.54
AT&T Inc	Global Note z100		6.300	2038	103.37	2,750,000,000	6.095%	5.99%	0.06%	BBB	\$ 2,842,620,000	103.37%	173,250,000	0.00058340	0.1250%	5.58
AT&T Inc	Global Note z100		6.400	2038	110.99	1,250,000,000	5.766%	5.44%	0.02%	BBB	\$ 1,387,325,000	110.99%	80,000,000	0.00024081	0.0516%	5.472
AT+48:67&T Inc	Global Notes		6.550	2039	111.78	2,250,000,000	5.860%	5.55%	0.04%	BBB	\$ 2,514,982,500	111.78%	147,375,000	0.00044171	0.0946%	5.569
AT&T Inc	Global Notes		6.000	2040	102.01	1,234,000,000	5.822%	5.83%	0.03%	BBB	\$ 1,258,778,720	102.01%	74,040,000	0.00025461	0.0545%	5.834
AT&T Inc	Fix Rt Sr Nt		6.375	2041	106.77	984,000,000	5.971%	5.82%	0.02%	BBB	\$ 1,050,636,480	106.77%	62,730,000	0.00020253	0.0434%	5.83
AT&T Inc	Fix Rt Nt		5.550	2041	100.22	2,000,000,000	5.538%	5.53%	0.04%	BBB	\$ 2,004,300,000	100.22%	111,000,000	0.00039165	0.0839%	5.533
AT&T Inc	Fix Rt Sr Nt		5.150	2042	95.49	1,209,000,000	5.393%	5.50%	0.02%	BBB	\$ 1,154,510,370	95.49%	62,263,500	0.00023553	0.0505%	5.495
AT&T Inc	Fix Rt Nt		4.300	2042	93.60	1,834,000,000	4.594%	4.77%	0.03%	BBB	\$ 1,716,679,020	93.60%	78,862,000	0.00030962	0.0663%	4.724
AT&T Inc	FR partially		4.300	2042	85.05	1,955,000,000	5.056%	5.47%	0.04%	BBB	\$ 1,662,747,050	85.05%	84,065,000	0.00037858	0.0811%	5.422
AT&T Inc	Fix Rt Nt		4.800	2044	89.64	2,500,000,000	5.59%	5.59%	0.05%	BBB	\$ 2,240,950,000	89.64%	120,000,000	0.00049432	0.1059%	5.566
AT&T Inc	Fix Rt Nt		4.350	2045	84.53	3,044,000,000	5.15%	5.49%	0.06%	BBB	\$ 2,573,123,640	84.53%	132,414,000	0.00059165	0.1267%	5.462
AT&T Inc	Fix Rt Nt		4.750	2046	89.24	3,500,000,000	5.32%	5.53%	0.07%	BBB	\$ 3,123,365,000	89.24%	166,250,000	0.00068548	0.1468%	5.516
AT&T Inc	Fix Rt Gbl Nt		5.450	2047	98.00	2,000,000,000	5.56%	5.59%	0.04%	BBB	\$ 1,900,000,000	98.00%	109,000,000	0.00039600	0.0848%	5.591
AT&T Inc	Fix Rt Sr Nt		5.650	2047	99.00	1,500,000,000	5.71%	5.72%	0.03%	BBB	\$ 1,485,030,000	99.00%	84,750,000	0.00030383	0.0651%	5.721
AT&T Inc	Fix Rt Sr Nt		4.500	2048	86.13	4,498,000,000	5.22%	5.47%	0.09%	NR	\$ 3,873,947,480	86.13%	202,410,000	0.00087118	0.1866%	5.455
AT&T Inc	FR Global Notes		4.500	2048	88.44	4,500,000,000	5.09%	5.29%	0.08%	BBB	\$ 3,979,800,000	88.44%	202,500,000	0.00084331	0.1806%	5
AT&T Inc	FR Global Notes		4.550	2049	86.16	2,494,000,000	5.28%	5.51%	0.05%	NR	\$ 2,148,730,640	86.16%	113,477,000	0.00048639	0.1042%	5.494
AT&T Inc	FR Global Notes		4.550	2049	87.65	2,500,000,000	5.19%	5.40%	0.05%	BBB	\$ 2,191,250,000	87.65%	113,750,000	0.00047745	0.1023%	5.378
AT&T Inc	FR Global Notes		5.150	2050	91.50	5,000,000,000	5.63%	5.75%	0.10%	NR	\$ 4,574,800,000	91.50%	257,500,000	0.00101712	0.2179%	5.739
AT&T Inc	FR Global Notes		5.700	2057	98.52	1,000,000,000	5.79%	5.80%	0.02%	BBB	\$ 985,200,000	98.52%	57,000,000	0.00020520	0.0440%	5.796
AT&T Inc	FR Global Notes		5.300	2058	94.75	2,500,000,000	5.59%	5.64%	0.05%	NR	\$ 2,368,750,000	94.75%	132,500,000	0.00049876	0.1068%	5.632
AT&T Inc	SR Note		6.650	2095	104.40	2,500,000,000	6.37%	6.37%	0.06%	NR	\$ 2,609,925,000	104.40%	166,250,000	0.00056341	0.1207%	6.632
Bell South Capital Funding	deb	NC	6.040	2026	103.23	300,000,000	5.85%	5.44%	0.01%	BBB	\$ 309,696,000	103.23%	18,120,000	0.00005773	0.0124%	5.552
Bell South Capital Funding	deb	100	7.875	2030	117.75	1,000,000,000	6.69%	5.59%	0.02%	BBB	\$ 1,177,530,000	117.75%	78,750,000	0.00019799	0.0424%	5.70
Bell South Capital Funding	deb	Z100	7.120	2097	109.10	500,000,000	6.53%	6.52%	0.01%	BBB	\$ 545,500,000	109.10%	35,600,000</			

20+ Year, All Ratings, Wireless Bond Analysis



01/31/2019

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 Ra Debt Service	WAYTM	WAYTM	Finra YTM		
AT&T Inc	Global Notes		6.550	2039	111.78	2,250,000,000	5.860%	5.55%	0.04%	BBB	\$ 2,514,982,500	111.78%	147,375,000	0.00041636	0.0837%	5.569	
Verizon Communications	Notes		7.350	2039	126.93	1,000,000,000	5.79%	5.13%	0.02%	BBB+	\$ 1,269,270,000	126.93%	73,500,000	0.00017123	0.0394%	5.186	
Verizon Communications	Notes		8.950	2039	151.15	1,250,000,000	5.92%	4.84%	0.02%	BBB+	\$ 1,889,375,000	151.15%	111,875,000	0.00020180	0.0465%	4.932	
AT&T Inc	Global Notes		6.000	2040	102.01	1,234,000,000	5.882%	5.83%	0.02%	BBB	\$ 1,258,778,720	102.01%	74,040,000	0.00024000	0.0482%	5.834	
AT&T Inc	Fix Rt Sr Nt		6.375	2041	106.77	984,000,000	5.971%	5.82%	0.02%	BBB	\$ 1,050,636,480	106.77%	62,730,000	0.00019091	0.0384%	5.83	
Verizon Communications	Notes		4.750	2041	97.27	750,000,000	4.88%	4.96%	0.01%	BBB+	\$ 729,540,000	97.27%	35,625,000	0.00012409	0.0286%	4.95	
Verizon Communications	Notes		6.000	2041	108.25	1,000,000,000	5.54%	5.35%	0.02%	BBB+	\$ 1,082,500,000	108.25%	60,000,000	0.00017834	0.0411%	5.36	
AT&T Inc	Fix Rt Nt		5.550	2041	100.22	2,000,000,000	5.53%	5.53%	0.04%	BBB	\$ 2,004,300,000	100.22%	111,000,000	0.00036917	0.0742%	5.533	
AT&T Inc	Fix Rt Sr Nt		5.150	2042	95.49	1,209,000,000	5.383%	5.50%	0.02%	BBB	\$ 1,154,510,370	95.49%	62,263,500	0.00022201	0.0446%	5.495	
AT&T Inc	Fix Rt Nt		4.300	2042	93.60	1,834,000,000	4.594%	4.77%	0.03%	BBB	\$ 1,716,679,020	93.60%	78,862,000	0.00029185	0.0587%	4.724	
AT&T Inc	FR partially		4.300	2042	85.05	1,955,000,000	5.056%	5.47%	0.04%	BBB	\$ 1,662,747,050	85.05%	84,065,000	0.00035685	0.0717%	5.422	
Verizon Communications	Notes		3.850	2042	86.52	1,250,000,000	4.45%	4.85%	0.02%	BBB+	\$ 1,081,475,000	86.52%	48,125,000	0.00020215	0.0466%	4.806	
Verizon Communications	Fix Rt Nt		6.550	2043	120.76	15,000,000,000	5.42%	5.03%	0.25%	BBB+	\$ 18,113,400,000	120.76%	982,500,000	0.00251485	0.5793%	5.067	
AT&T Inc	Fix Rt Nt		4.800	2044	89.64	2,500,000,000	5.35%	5.59%	0.05%	BBB	\$ 2,240,950,000	89.64%	120,000,000	0.00046596	0.0937%	5.566	
Bell South	Telecommunications	deb	NC	5.850	2045	94.66	300,000,000	6.18%	6.28%	0.01%	BBB	\$ 283,971,000	94.66%	17,550,000	0.00006281	0.0126%	6.263
AT&T Inc	Fix Rt Nt		4.350	2045	84.53	3,044,000,000	5.15%	5.49%	0.06%	BBB	\$ 2,573,123,640	84.53%	132,414,000	0.00055770	0.1121%	5.462	
AT&T Inc	Fix Rt Nt		4.750	2046	89.24	3,500,000,000	5.32%	5.53%	0.06%	BBB	\$ 3,123,365,000	89.24%	166,250,000	0.00064614	0.1299%	5.516	
Verizon Communications	Fix Rt Nt		4.125	2046	88.67	1,500,000,000	4.65%	4.90%	0.02%	NR	\$ 1,329,975,000	88.67%	61,875,000	0.00024511	0.0565%	4.876	
Verizon Communications	Notes		4.862	2046	98.37	4,500,000,000	4.94%	4.97%	0.07%	NR	\$ 4,426,470,000	98.37%	218,790,000	0.00074681	0.1720%	3.98	
AT&T Inc	Fix Rt Gbl Nt		5.450	2047	98.00	2,000,000,000	5.58%	5.59%	0.04%	BBB	\$ 1,960,000,000	98.00%	109,000,000	0.00037327	0.0750%	5.591	
AT&T Inc	Fix Rt Sr Nt		5.650	2047	99.00	1,500,000,000	5.71%	5.72%	0.03%	BBB	\$ 1,485,030,000	99.00%	84,750,000	0.00028640	0.0576%	5.721	
Verizon Communications	FR Nt		4.950	2047	100.48	1,475,000,000	4.93%	4.92%	0.02%	BBB+	\$ 1,482,080,000	100.48%	73,012,500	0.00024201	0.0557%	4.93	
Verizon Communications	FR Sr Nt		5.500	2047	106.30	1,500,000,000	5.17%	5.07%	0.03%	BBB+	\$ 1,594,470,000	106.30%	82,500,000	0.00025375	0.0585%	5.077	
AT&T Inc	Fix Rt Sr Nt		4.500	2048	86.13	4,498,000,000	5.22%	5.47%	0.08%	NR	\$ 3,873,947,480	86.13%	202,410,000	0.00082119	0.1651%	5.455	
AT&T Inc	FR Global Notes		4.500	2048	88.44	4,500,000,000	5.09%	5.29%	0.08%	BBB	\$ 3,979,800,000	88.44%	202,500,000	0.00079491	0.1598%	5	
Verizon Communications	Sr Notes		4.522	2048	94.13	5,000,000,000	4.80%	4.91%	0.08%	NR	\$ 4,706,300,000	94.13%	226,100,000	0.00081892	0.1886%	4.899	
AT&T Inc	FR Global Notes		4.550	2049	86.16	2,494,000,000	5.28%	5.51%	0.05%	NR	\$ 2,148,730,640	86.16%	113,477,000	0.00045848	0.0922%	5.494	
AT&T Inc	FR Global Notes		4.550	2049	87.65	2,500,000,000	5.19%	5.40%	0.05%	BBB	\$ 2,191,250,000	87.65%	113,750,000	0.00045005	0.0905%	5.378	
AT&T Inc	FR Global Notes		5.150	2050	91.50	5,000,000,000	5.63%	5.75%	0.10%	NR	\$ 4,574,800,000	91.50%	257,500,000	0.00095875	0.1927%	5.739	
Verizon Communications	Fix Rt Sr Nt		5.012	2054	100.08	5,474,000,000	5.01%	5.01%	0.09%	NR	\$ 5,478,214,980	100.08%	274,356,880	0.00091447	0.2107%	5.007	
Verizon Communications	Fix Rt Nt		5.012	2054	95.75	5,500,000,000	5.23%	5.28%	0.10%	NR	\$ 5,266,250,000	95.75%	275,660,000	0.00096927	0.2233%	5.277	
Verizon Communications	Notes		4.672	2055	86.51	5,500,000,000	5.40%	5.55%	0.10%	BBB+	\$ 4,758,050,000	86.51%	256,960,000	0.00101834	0.2346%	5.198	
Verizon Communications	Fix Rt Notes		4.672	2055	91.45	5,500,000,000	5.11%	5.20%	0.10%	NR	\$ 5,029,915,000	91.45%	256,960,000	0.00095506	0.2200%	5.198	
AT&T Inc	FR Global Notes		5.700	2057	98.52	1,000,000,000	5.79%	5.80%	0.02%	BBB	\$ 985,200,000	98.52%	57,000,000	0.00019342	0.0389%	5.796	
AT&T Inc	FR Global Notes		5.300	2058	94.75	2,500,000,000	5.59%	5.64%	0.05%	NR	\$ 2,368,750,000	94.75%	132,500,000	0.00047014	0.0945%	5.632	
AT&T Inc	SR Note		6.650	2095	104.40	2,500,000,000	6.37%	6.37%	0.05%	NR	\$ 2,609,925,000	104.40%	166,250,000	0.00053108	0.1068%	6.632	
Bell South	Telecommunications	deb	NC	6.650	2095	100.73	500,000,000	6.60%	6.60%	0.01%	\$	\$ 503,650,000	100.73%	33,250,000	0.00011012	0.0221%	flat
Bell South	Telecommunications	deb	NC	7.000	2095	104.44	500,000,000	6.70%	6.70%	0.01%	BBB	\$ 522,205,000	104.44%	35,000,000	0.00011177	0.0225%	6.67
Bell South Capital Funding	deb	Z100	7.120	2097	109.10	500,000,000	6.53%	6.52%	0.01%	BBB	\$ 545,500,000	109.10%	35,600,000	0.00010880	0.0219%	6.522	
Total						107,001,000,000				Total	\$ 105,570,116,880	98.66%	\$ 5,637,375,880	0.01904361	0.1054%	5.42	

Source: Standard & Poor's Bond Guide, January 2018, 2017 Yr End Prices

Embedded debt rate 5.2685%
 Weighted average yield to maturity 5.3994%
 Debt service / Market value 5.3399%
 Finra YTM 5.42%
 S&P 5.25%

SAY

DATA INPUT

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 ASSESSMENT YEAR

WIRELESS

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

Guideline Companies		Stock Price 12/31/2018	Current Year												
			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	Income Tax Rate
Name	Ticker	Yahoo	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL
AT&T Inc	T	\$28.07	0.80	\$ 23.45	\$ 7.19	\$ 3.52	\$ 2.00	\$ 25.28	7,285,000	\$ 166,250,000,000	\$ 2.92	8.50	6.00	n/a	19.7%
Verizon	VZ	\$55.64	0.75	\$ 31.67	\$ 6.10	\$ 4.71	\$ 2.37	\$ 13.24	4,132,045	\$ 105,873,000,000	\$ 4.03	11.90	4.50	n/a	25.0%
Sprint Corp	S	\$5.82	1.20	\$ 8.30	\$ 2.45	\$ 0.10	\$ -	\$ 6.95	4,079,316	\$ 36,288,000,000	\$ 1.30	79.90	n/a	36.8%	10.0%
US Cellular	USM	\$51.97	1.05	\$ 45.97	\$ 9.30	\$ 1.72	\$ -	\$ 47.00	86,305	\$ 1,605,000,000	\$ 5.93	26.80	n/a	17.5%	23.7%
T-Mobile	TMUS	\$63.61	0.95	\$ 50.94	\$ 11.03	\$ 3.36	\$ -	\$ 29.07	850,221	\$ 29,263,000,000	\$ 6.52	21.10	n/a	27.2%	26.3%

Value Line March 15, 2019

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) 2018											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	2019-2023	2019-2023	2019-2023	2019-2023	Operating Income	
VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	M*	
13.0%	\$ 25.35	\$ 7.75	\$ 3.65	\$ 2.04	27.05	7,285,000	3.15	13.5%	6.0%	56.0%	100.4%	4.50	5.50	4.50	1.00	\$26,142,000,000	
37.0%	\$ 31.95	\$ 6.10	\$ 4.65	\$ 2.37	13.25	4,145,000	4.25	37.0%	37.0%	51.0%	105.7%	1.50	4.00	-3.00	1.50	\$26,869,000,000	
1.5%	\$ 8.40	\$ 2.60	\$ 0.25	\$ -	7.10	4,075,000	1.75	3.5%	3.5%	0.0%	101.1%	0.00	0.00	8.50	2.00	\$ 2,807,000,000	
4.0%	\$ 47.65	\$ 8.80	\$ 1.25	\$ -	47.65	86,000	5.95	2.5%	2.5%	0.0%	95.7%	0.00	6.50	1.50	2.00	\$ 150,000,000	
11.7%	\$ 53.45	\$12.25	\$ 4.20	\$ -	32.80	845,000	7.10	13.0%	13.0%	0.0%	102.6%	0.00	18.00	7.00	3.00	\$ 5,309,000,000	

ave 13.9%
 med 13.0%
 har mean 6%

13.4%

53.5%

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
\$ 51,427,000,000	\$ 330,690,000,000	\$ 64,420,000,000	\$ 166,250,000,000	\$ 163,827,000,000	\$ 28,430,000,000	\$ 180,659,000,000	\$ 179,901,000,000	\$ 5,296,000,000	14.0%	58%
\$ 34,636,000,000	\$ 252,835,000,000	\$ 37,930,000,000	\$ 105,873,000,000	\$ 103,905,000,000	\$ 17,403,000,000	\$ 118,535,000,000	\$ 112,159,000,000	\$ 4,100,000,000	40.0%	50%
\$ 14,253,000,000	\$ 37,348,000,000	\$ 10,800,000,000	\$ 37,463,000,000	\$ 43,774,000,000	\$ 8,580,000,000	\$ 41,286,000,000	\$ 40,820,000,000	\$ 2,700,000,000	8.5%	
\$ 1,812,000,000	\$ 7,778,000,000	\$ 691,000,000	\$ 1,605,000,000	\$ 2,186,000,000	\$ 5,576,000,000	\$ 1,561,000,000	\$ 1,631,000,000	\$ 173,000,000	3.5%	
\$ 8,281,000,000	\$ 54,656,000,000	\$ 10,267,000,000	\$ 26,706,000,000	\$ 35,757,000,000	\$ 6,486,000,000	\$ 26,277,000,000	\$ 25,605,000,000	\$ 3,000,000,000	14.5%	

16.1% 54.0%
8.8% 53.7%
14.0% 54.0%

SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

WASHINGTON STATE DEPARTMENT OF REVENUE

2019 ASSESSMENT YEAR

WIRELESS

Company	Ticker	Stock Price	2018		2019		2018		2019	
			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	28.07	3.52	12.54%	3.65	13.00%	7.19	25.61%	7.75	27.61%
Verizon	VZ	55.64	4.71	8.47%	4.65	8.36%	6.10	10.96%	6.10	10.96%
Sprint Corp	S	5.82	0.10	1.72%	0.25	4.30%	2.45	42.10%	2.60	44.67%
US Cellular	USM	51.97	1.72	3.31%	1.25	2.41%	9.30	17.89%	8.80	16.93%
T-Mobile	TMUS	63.61	3.36	5.28%	4.20	6.60%	11.03	17.34%	12.25	19.26%
		Mean		6.26%		6.93%		22.78%		23.89%
		Median		5.28%		6.60%		17.89%		19.26%
		Max		12.54%		13.00%		42.10%		44.67%
		Min		1.72%		2.41%		10.96%		10.96%
		stdev		4.32%		4.08%		11.98%		13.06%
		cov		68.95%		58.79%		52.59%		54.69%
		harmean		3.93%		5.02%		18.69%		19.17%
		Say		6.00%		7.00%		19.00%		21.00%

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 4, 2019

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

Year	Earnings Yield	Dividend Yield	S&P 500	Earnings*	Dividends*	Change in Earnings	Change in Dividends	T.Bill Rate	T.Bond Rate	Bond-Bill	bothed Growth	Implied Premium (DDM)	Implied Growth Es	Implied Premium (FCFE)	ERP/Riskfree Rate
1960	5.34%	3.41%	58.11	3.10	1.98			0.0266	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%		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%		3.56%	0.92
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
1980	11.04%	4.74%	135.76	14.99	6.44	3.01%	7.81%	11.24%	12.43%	1.19%	11.01%	5.03%		5.03%	0.40
1981	12.39%	5.57%	122.55	15.18	6.83	1.31%	6.08%	14.71%	13.98%	-0.73%	11.42%	5.73%		5.73%	0.41
1982	9.83%	4.93%	140.64	13.82	6.93	-8.95%	1.58%	10.54%	10.47%	-0.07%	7.96%	4.90%		4.90%	0.47
1983	8.06%	4.32%	164.93	13.29	7.12	-3.84%	2.76%	8.80%	11.80%	3.00%	9.09%	4.31%		4.31%	0.37
1984	10.07%	4.68%	167.24	16.84	7.83	26.69%	9.85%	9.85%	11.51%	1.66%	11.02%	5.11%		5.11%	0.44
1985	7.42%	3.88%	211.28	15.68	8.20	-6.91%	4.74%	7.72%	8.99%	1.27%	7.89%	4.03%	6.75%	3.84%	0.43
1986	5.96%	3.38%	242.17	14.43	8.19	-7.93%	-0.15%	6.16%	7.22%	1.06%	5.54%	3.36%	6.96%	3.58%	0.50
1987	6.49%	3.71%	247.08	16.04	9.17	11.10%	11.99%	5.47%	8.86%	3.39%	9.66%	4.18%	8.58%	3.99%	0.45
1988	8.20%	3.68%	277.72	24.12	10.22	50.42%	11.49%	6.35%	9.14%	2.79%	9.76%	4.12%	7.67%	3.77%	0.41
1989	6.80%	3.32%	353.4	24.32	11.73	0.83%	14.80%	8.37%	7.93%	-0.44%	9.58%	3.85%	7.46%	3.51%	0.44
1990	6.58%	3.74%	330.22	22.65	12.35	-6.87%	5.26%	7.81%	8.07%	0.26%	7.39%	3.92%	7.19%	3.89%	0.48
1991	4.58%	3.11%	417.09	19.30	12.97	-14.79%	5.03%	7.00%	6.70%	-0.30%	6.34%	3.27%	7.81%	3.48%	0.52
1992	4.16%	2.90%	435.71	20.87	12.64	8.13%	-2.59%	5.30%	6.68%	1.38%	4.67%	2.83%	9.83%	3.55%	0.53
1993	4.25%	2.72%	466.45	26.90	12.69	28.89%	0.41%	5.30%	5.79%	2.29%	4.73%	2.74%	8.00%	3.17%	0.55
1994	5.89%	2.91%	459.27	31.75	13.36	18.03%	5.34%	5.00%	7.82%	2.82%	7.23%	3.06%	7.17%	3.55%	0.45
1995	5.74%	2.30%	615.93	37.70	14.17	18.74%	6.00%	3.50%	5.57%	2.07%	5.65%	2.44%	6.50%	3.29%	0.59
1996	4.83%	2.01%	740.74	40.63	14.89	7.77%	5.10%	5.00%	6.41%	1.41%	6.13%	2.11%	7.92%	3.20%	0.50
1997	4.08%	1.60%	970.43	44.09	15.52	8.52%	4.25%	5.35%	5.74%	0.39%	5.45%	1.67%	8.00%	2.73%	0.48
1998	3.11%	1.32%	1229.23	44.27	16.20	0.41%	4.37%	4.33%	4.65%	0.32%	4.60%	1.38%	7.20%	2.26%	0.49
1999	3.07%	1.14%	1469.25	51.68	16.71	16.74%	3.16%	5.37%	6.44%	1.07%	5.75%	1.20%	12.50%	2.05%	0.32
2000	3.94%	1.23%	1320.28	56.13	16.27	8.61%	-2.65%	5.73%	5.11%	-0.62%	3.71%	1.65%	12.00%	2.87%	0.56
2001	3.85%	1.37%	1148.09	38.85	15.74	-30.79%	-3.24%	1.80%	5.05%	3.25%	3.56%	1.73%	10.30%	3.62%	0.72
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
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
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
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
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
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
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
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
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
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
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
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
2014	5.57%	1.87%	2058.90	114.74	38.57	6.78%	6.31%	0.05%	2.17%	2.12%	2.55%	2.24%	5.58%	5.78%	2.66
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
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
2017	4.67%	1.86%	2673.61	124.94	49.73	14.77%	10.44%	1.39%	2.41%	1.02%	3.22%	2.36%	7.05%	5.08%	2.11

2018 Multi Stage Earnings Growth Model

Wireless Industry

3.90% GDP

21.1 Median Trailing Industry P/E

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

14.0% Average Target ROE

AT&T
T

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		26.38%	73.62%	3.52		stock price =	-28.07
1	3.69%	34.25%	65.75%	3.65	2.40		2.40
2	4.79%	32.68%	67.32%	3.83	2.58		2.58
3	4.58%	31.25%	68.75%	4.00	2.75		2.75
4	4.38%	29.94%	70.06%	4.18	2.93		2.93
5	4.19%	29.52%	70.48%	4.35	3.07		3.07
6	4.13%	29.11%	70.89%	4.53	3.21		3.21
7	4.07%	28.69%	71.31%	4.71	3.36		3.36
8	4.02%	28.27%	71.73%	4.90	3.52		3.52
9	3.96%	27.86%	72.14%	5.10	3.68		3.68
10	3.90%	27.86%	72.14%	5.30	3.82	116.12	119.94
11+	3.90%	27.86%	72.14%	5.50	3.97		

Value Line Earnings Growth Rate Ke = 21.52%

Verizon

VZ

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		-9.10%	109.10%	4.71		stock price =	-55.64
1	-1.27%	15.36%	84.64%	4.65	3.94		3.94
2	2.15%	15.04%	84.96%	4.75	4.04		4.04
3	2.11%	14.73%	85.27%	4.85	4.14		4.14
4	2.06%	14.43%	85.57%	4.95	4.24		4.24
5	2.02%	17.12%	82.88%	5.05	4.19		4.19
6	2.40%	19.80%	80.20%	5.17	4.15		4.15
7	2.77%	22.49%	77.51%	5.31	4.12		4.12
8	3.15%	25.17%	74.83%	5.48	4.10		4.10
9	3.52%	27.86%	72.14%	5.67	4.09		4.09
10	3.90%	27.86%	72.14%	5.90	4.25	129.26	133.51
11+	3.90%	27.86%	72.14%	6.13	4.42		

Value Line Earnings Growth Rate Ke = 14.16%

Sprint

S

Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
0		1071.43%	-971.43%	0.10		stock price =	-5.82
1	150.00%	285.71%	-185.71%	0.25	-0.46		-0.46
2	40.00%	2.04%	97.96%	0.35	0.34		0.34
3	28.57%	1.59%	98.41%	0.45	0.44		0.44
4	22.22%	1.30%	98.70%	0.55	0.54		0.54
5	18.18%	1.09%	98.91%	0.65	0.64		0.64
6	15.33%	0.89%	99.11%	0.75	0.74		0.74
7	12.47%	0.69%	99.31%	0.84	0.84		0.84
8	9.61%	0.48%	99.52%	0.92	0.92		0.92
9	6.76%	27.86%	72.14%	0.99	0.71		0.71
10	3.90%	27.86%	72.14%	1.03	0.74	22.47	23.21
11+	3.90%	27.86%	72.14%	1.07	0.77		

Value Line Earnings Growth Rate Ke = 18.53%

