



Charter Communications Analyst Report

Student Managed Fund
2018- 2019

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Report Highlights

Charter Communications, Inc. (NYSE: CHTR)

Sector: Telecommunications

| Purchase Price | Current Price | Target Price | 52-Week Range | Market Cap | P/E | Dividend Yield | Beta |
|----------------|---------------|--------------|----------------|------------|------|----------------|------|
| \$353.54 | \$366.76 | \$415.48 | \$370-\$250.10 | \$92.74 B | 57.5 | N/A | 1.10 |

Figure 1: CHTR vs. SPX Return

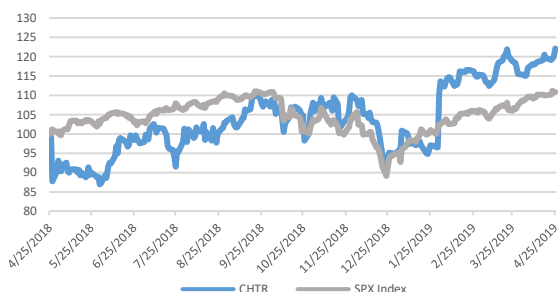


Figure 2: Revenue by Segment

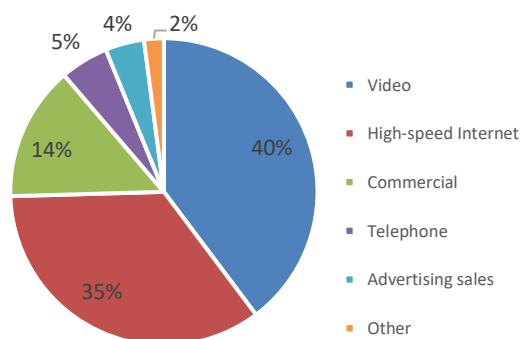
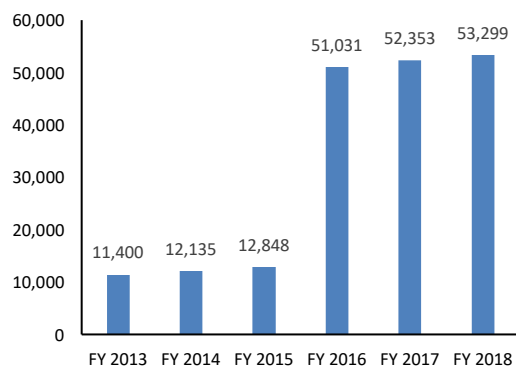


Figure 3: Number of Subscribers



BASIS FOR RECOMMENDATION

We recommend a **Buy** rating for Charter (CHTR) based on a price target of \$415.48, resulting in a margin of safety of 16.8% given April 26, 2019's share price of \$100.36. In addition to some key catalysts, our recommendation is driven by three long-term factors:

- Broadband & Subscriber Superiority** – Charter should be able to maintain market-share gains and revenue growth on its superior broadband speeds compared with telecom, as well as a shift of Time Warner Cable and Bright House subscribers to its Spectrum-brand pricing and packaging. Moreover, while cord-cutting is a long-term industry threat, a boost in data subscriptions helps offset video losses.
- Mobile Growth & 5G Networks**– Over the longer term, Charter expects consumer savings from their mobile offering to drive incremental cable become a more powerful retention tool. In addition, Charter has the capacity critical to the success of 5G, which relies heavily on fiber networks.
- Increasing Synergy Among Acquisitions**– With the integration of its most recent acquisitions (Time Warner Cable/Bright House Networks) well underway, we believe Charter stands to benefit from increased scale and significant cost synergies, driving strong free cash flow growth and shareholder value.

BUSINESS DESCRIPTION

Charter is the second largest cable operator in the United States and a leading broadband communications services company providing video, Internet and voice services to approximately 28.1 million residential and small and medium business customers. Charter recently launched the Spectrum mobile service to residential customers. In addition, they sell video and online advertising inventory to local, regional and national advertising customers and fiber-delivered communications and managed information technology ("IT") solutions to large enterprise customers. Charter also owns and operates regional sports networks and local sports, news and community channels.

Figure 6: Subscribers by Geography

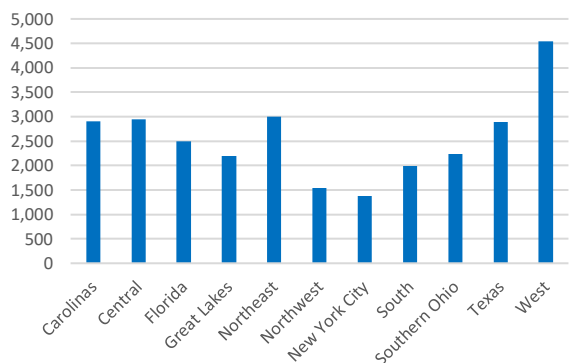


Figure 5: Video Revenue (Billions)

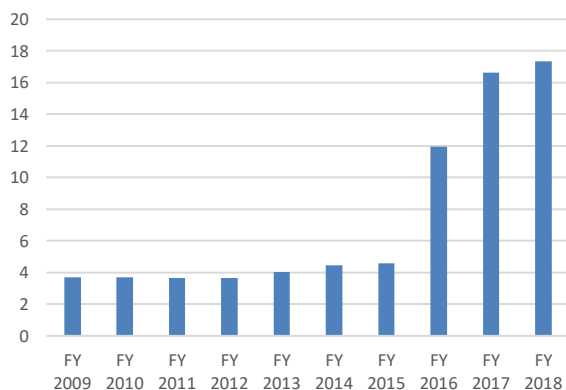


Figure 5: Internet Revenue (Billions)

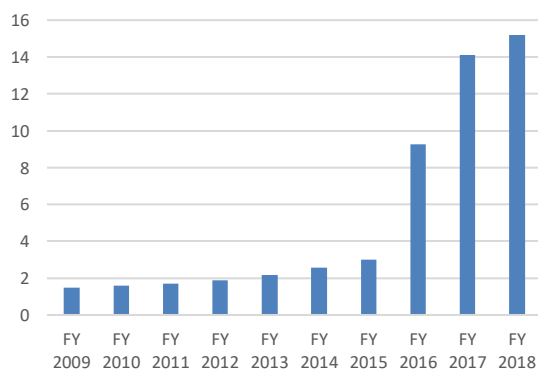
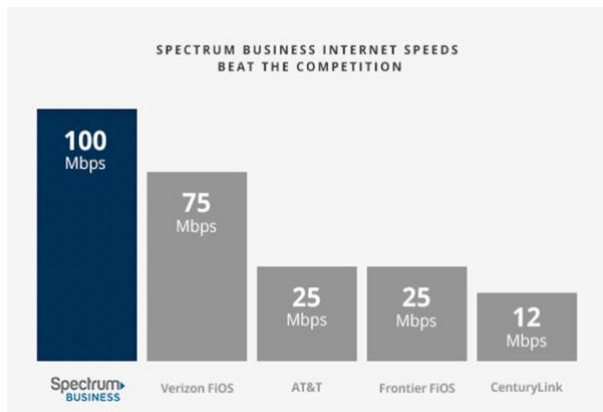


Figure 6: Internet Speed Comparison



Products and Services Charter offers customers subscription-based video services, including video on demand “VOD”, high definition “HD” television, and digital video recorder “DVR” service, Internet services, voice and mobile services. As of December 31, 2018, Charter eliminated the carriage of analog video signals (“all-digital”) in nearly all of our footprint, further freeing up network capacity and enabling them to offer more HD channels, faster Internet speeds and better video picture quality.

Video, Internet, and voice services offered are to residential and commercial customers on a subscription basis, with prices and related charges based on the types of service selected, whether the services are sold as a “bundle” or on an individual basis and the equipment necessary to receive our services. Bundled services are available to substantially all of their passing’s, and approximately 58% of their customers subscribe to a bundle of services including video, Internet and voice.

Video Services Video customers receive a package of programming which generally includes a digital set-top box that provides an interactive electronic programming guide with parental controls, access to pay-per-view services, including VOD, digital music channels and the option to view certain video services on third-party devices. Customers have the option to purchase additional tiers of services including premium channels, which provide original programming, commercial-free movies, sports, and other special event entertainment programming.

Internet Services Spectrum pricing and packaging “SPP” offers an entry level Internet download speed of at least 100 megabits per second (“Mbps”) in 99% of their footprint and 200 Mbps across approximately 40% of their footprint.

Additionally, leveraging DOCSIS 3.1 technology, they offer 940 Mbps speed service (“Spectrum Internet Gig”) in nearly 60% of their entire footprint. Charter also offers a security suite with our Internet services, which, upon installation by customers, provides protection against computer viruses and spyware and includes parental control features. Additionally, Charter offers an out-of-home WiFi service, Spectrum Wi-Fi, to their Internet customers at designated “hot spots

Voice Services Charter provides voice communications services using voice over Internet protocol “VoIP” technology to transmit digital voice signals over our network. Voice services include unlimited local and long distance calling to the United States, Canada, Mexico and Puerto Rico, voicemail, call waiting, caller ID, call forwarding and other features and offers international calling either by the minute, or through packages of minutes per month. For customers that subscribe to both voice and video offerings, caller ID on TV is also available in most areas.

Figure 8: Brighthouse and TWC Logo



Figure 9: Time Warner Cable Valuation

| | |
|--|-----------------|
| Cash | \$100.00 |
| + 0.5409 Equivalent New Charter Shares ¹⁾ | \$95.71 |
| Offer per TWC Share | \$195.71 |
| Total Equity Value ²⁾ | \$56.7B |
| + Net Debt | \$22.7B |
| - Est. Equity Investments | \$0.7B |
| TWC Enterprise Value | \$78.7B |
| - Est. Present Value of Tax Assets | \$1.6B |
| TWC Adjusted Enterprise Value | \$77.0B |

Figure 10: New Charter post-Merger

| Customers in Millions/ \$ in Billions | | Charter COMMUNICATIONS | Time Warner Cable | bright house NETWORKS | New Charter |
|---------------------------------------|------------------------|---------------------------|-------------------------|--------------------------|-------------|
| 2014 Customers ¹⁾ | Passings ²⁾ | 12.9 | 30.5 | 4.7 | 48.0 |
| | Customer Relationships | 6.2 | 15.2 | 2.5 | 23.9 |
| | Video | 4.3 | 11.0 | 2.0 | 17.3 |
| | Internet | 5.1 | 12.3 | 2.1 | 19.4 |
| | Voice | 2.6 | 5.6 | 1.2 | 9.4 |

Mobile Services At the end of the second quarter of 2018, Charter launched their mobile product, Spectrum Mobile, to residential customers under a MVNO reseller agreement with Verizon and began mass-market advertising of Spectrum Mobile service in September 2018. Spectrum Mobile is currently available to residential Internet service customers and Charter will begin to offer the mobile service to all of their small and medium business customers on similar terms in 2019. We believe Spectrum-branded mobile services will drive more sales of our core products, create longer customer lives and increase profitability and cash flow over time. Charter is leveraging their WiFi network in conjunction with additional unlicensed or licensed spectrum to improve network performance and expand capacity to offer consumers a superior mobile service at a lower total cost. Most exciting, they have experimental wireless licenses from the Federal Communications Commission ("FCC", which they are utilizing to test next generation mobile services in several service areas around the country.

ACQUISITIONS

Bright House Networks and Time Warner Cable

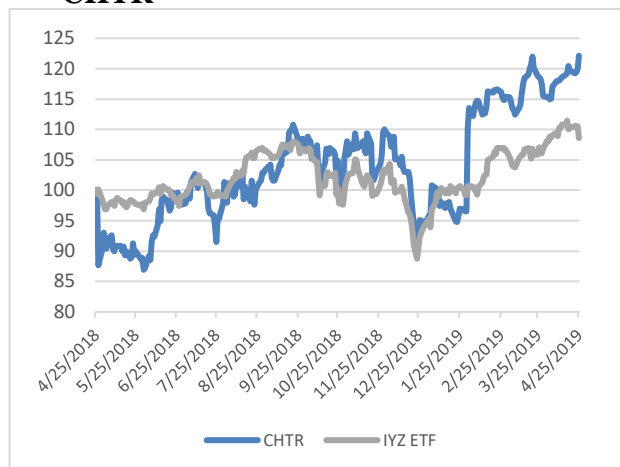
At the time of combination, Bright House Networks was the sixth largest owner and operator of cable systems in the U.S. and the second largest in Florida, with technologically advanced systems located in five states including Florida, Alabama, and Indiana, Michigan and California and two of the top 20 DMAs. Moreover, Time Warner Cable Inc. was among the largest providers of video, high-speed data and voice services in the United States, connecting 15 million customers to entertainment, information and each other.

The combination of Charter, Time Warner Cable and Bright House is now a leading broadband services and technology company serving 23.9 million customers in 41 states. These investments by Charter have driven investment into the combined entity's advanced broadband network, allowed for wider deployment of new competitive facilities based WiFi networks in public places, and expanded the footprint expansion of optical networks to serve the large marketplace of small and medium sized businesses.

Moreover, the merger has resulted in faster broadband speeds, better video products, including more high definition channels, more affordable phone service and more competition, for consumers and businesses. The scale of the new entity has also resulted in greater product innovation, bringing new and advanced services to consumers and businesses, including Charter's Spectrum Guide and World Box and other product innovations.

Industry Overview and Trends

Figure 11: Telecommunications ETF vs. CHTR



From our perspective, there are three mega-trends influencing communication services companies' growth, margins, and returns, which we believe should drive earnings and stock prices in 2019 and over the long term.

The first trend is convergence. To compete for customer engagement, companies are overlapping on more fronts than ever before. For example, America's largest phone company, AT&T, now owns cable network HBO. With its recent acquisition of Time Warner, and its ownership of DirecTV, AT&T is now producing and distributing content. Comcast and Charter Communications are now selling mobile phone services. With 5G on the horizon, some households will be able to purchase home broadband wirelessly.

The second major theme is digitalization. Broadband has been a key cable growth area with subscriptions rising 6% a year with high-speed data demand reaching new highs. Some telecom company networks are now seeing as much traffic in one hour as they did in an entire week less than a decade ago. Total Cable HSD subscribers were 68.2 million in 2018 and are expected to rise to 70.7 million in 2022. As unlimited data plans are now the standard, people are using more broadband without paying more, unlike they do with electricity or fuel. Moreover, residential voice services have witnessed a significant decline in revenues due to the increasing usage of wireless voice services. In addition, growing consumer preference for digital and subscription services instead of linear pay-tv and rental or outright purchase has compelled industry participants to alter their business models. U.S Broadband Only Subscribers has increased from 17.4 million to 22.2 million in 2018 and is expected to continue to rise.

Figure 12: High-Speed Data Subscribers (000's)

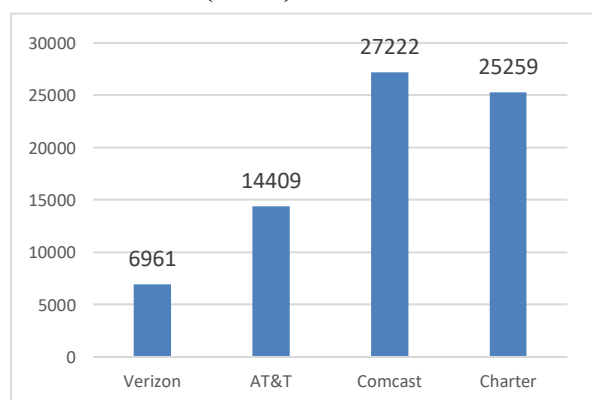
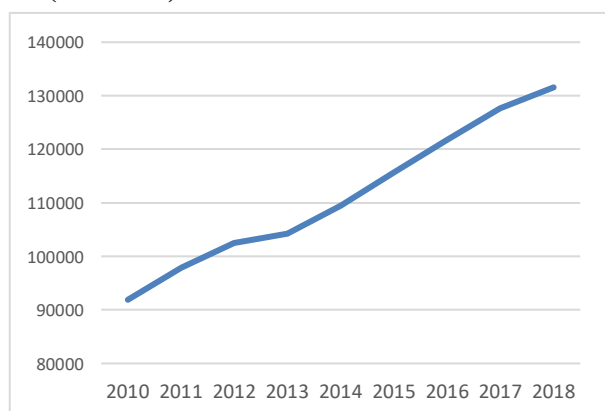


Figure 13: U.S Cable Revenue (Millions)



The third mega-trend is scale. Fewer than 5 years ago, having 25 million video subscribers or 100 million wireless subscribers was considered massive, but that's not the case in today's terms. Globalization is playing a big part in scale, and the internet has broken down barriers to reaching customers. Where we stand today, just over half the world is online but fewer have a smartphone. So, there remains a large untapped market, and new consumer bases will be mobile first and in some cases, mobile only. Companies that are geographically constrained or do not have a direct-to-consumer relationship over mobile are falling behind in scale.

Investment Thesis

Figure 14: Average High Speeds Data Monthly Costs in 5G Home Markets

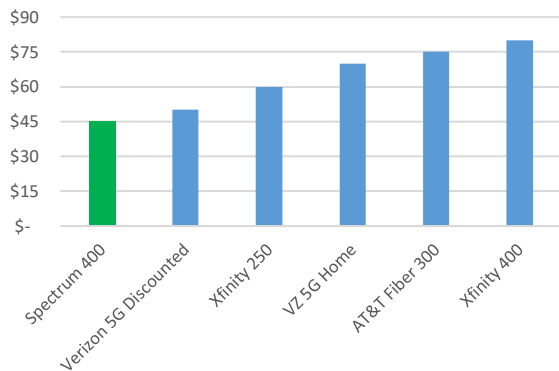


Figure 15: Internet Gig Map

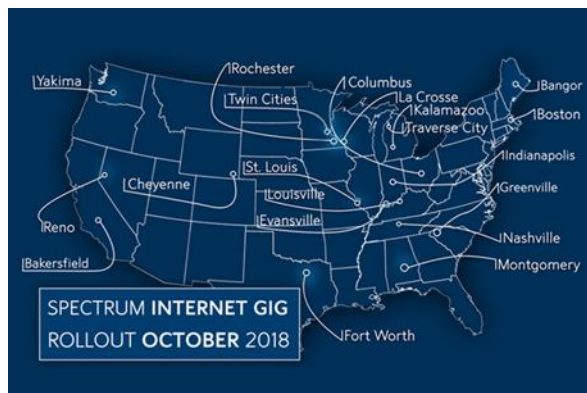


Figure 16: Cable Fiber Coverage

| Company | Fiber Route Miles | On-Net Buildings |
|-------------------|-------------------|--|
| Comcast | 151,000 | Not Publicly Reported |
| Time Warner Cable | 350,000 | 58,000 (lit), 100,000 (near net), 860,000 (HFC on net) |
| Cox | 25,000 | 28,000 (lit), 400,000 (near-net) |
| Charter | 65,000 | 12,000 (lit) |
| Lighpath | 5,800 | 7,000+ (lit) |

THESIS

Charter has now largely completed the formidable task of consolidating three large cable companies; legacy CharterTime Warner Cable, and Bright House. Charter's state-of-the-art, fiber-rich network is superior in its ability to deliver fast and reliable internet to millions of consumers across the country. Thus, Charter should be able to maintain market-share gains and revenue growth on its superior broadband speeds compared with telecom, as well as a shift of Time Warner Cable and Bright House subscribers to its Spectrum-brand pricing and packaging. Lastly, the new entity resulted in greater product innovation, and brought new and advanced services to consumers and businesses

CATALYSTS

Broadband & Subscriber Superiority

Starting speed of Spectrum Internet is at least 100 Mbps in more than 99 percent of the communities. Currently all digital in nearly their entire footprint. Moreover, their all-digital platform enables faster Internet speeds and better picture quality while providing greater plant security and enabling lower installation and disconnect service truck rolls. Spectrum has now rolled out gigabit connections featuring DOCSIS 3.1 internet services to approximately 23 million U.S. homes, with plans to span this service to virtually the entire 41-state footprint in 2019

Mobile Growth & 5G Networks

Charter will be able leverage its network assets for 5G, since its dense last-mile network will form the backbone for small cells needed in 5G deployment. Deep Fiber not only allows cable to deliver broadband speed upgrades, but also strengthens backhaul capabilities to grow denser. (

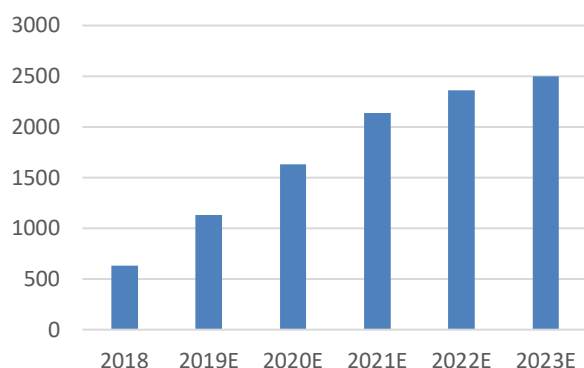
Spectrum Mobile is Charter's most recent ambition has the capacity to strengthen their ability to retain customers long-term. Launched in 2018, a hybrid MVNO provider that uses WIFI and Verizon's Wireless Network (America's Largest LTE network) to provide service. Customers can benefit from obtaining advanced services from a single provider simplifying procurement and potentially reducing their costs.

The main competitive advantage Charter can offer through the mobile service is a lower total cost.

Figure 17: Verizon 4G LTE Coverage



Figure 18: Mobile Subscriber's Analysis (000's)



Using Wi-Fi network in conjunction with additional unlicensed or licensed spectrum improves network performance and expands capacity to offer consumers a superior mobile. The success since the launch has been exceptional. Charter has added over 110,000 mobile lines in the fourth quarter.

Over the longer term, consumer savings from mobile offering will drive incremental cable sales and become a more powerful retention tool. Another big catalyst for Spectrum Mobile will be "Full Bring Your Own Device" availability. Spectrum Mobile now allows customers to bring their own iPhone as long as it is one of the following models; iPhone SE, iPhone 6S or 6S Plus, iPhone 7 or 7 Plus, iPhone 8 or 8 Plus, or the iPhone X. In 2019, Charter will be able to carry the newest iPhone's (Xs and Xs Max) and word Android devices, which will expand mobile market opportunity substantially.

Increasing Synergy among Acquisition's

After the merger, the new entity resulted in greater product innovation, and brought new and advanced services to consumers and businesses. Capital intensity will fall significantly in 2019, as planned, but also beyond 2019. We anticipate this trend because as CPE spend per home declines, consumers increasingly install their own services and the reliability of plant's improve. We also expect Charter's network becomes increasingly cloud-based and IP driven.

Moreover, the transaction structure was designed to provide long-dated and low-cost financing, and enable unified operations, which achieves operating cost and tax objectives.

Valuation

Figure 19: DCF Model

| Implied Equity Value and Share Price | |
|--------------------------------------|---------------|
| PV of Cash Flows | \$ 34,492.62 |
| PV of Terminal Value | \$ 130,265.49 |
| Enterprise Value | \$ 164,758.11 |
| Less: Total Debt | 72827 |
| Less: Preferred Securities | 0 |
| Less: Non-controlling Securities | 1908 |
| Plus: Cash and Cash Equivalents | 551 |
| Implied Equity Value | \$ 90,574.11 |
| Fully Diluted Shares Outstanding | 218 |
| Implied Share Price | \$ 415.48 |
| Current Stock Price | \$ 366.76 |
| Margin of Safety | 13.3% |

Charter was purchased on March 14, 2018 for \$353.34 per share. At the time of pitch, our valuation resulted in a 17.6% margin of safety. Since then, has gained 4.76%. We still believe the stock is trading below its intrinsic value of \$415.48

DISCOUNTED CASH FLOW MODEL

For the Discounted Cash Flow (DCF) model, we assumed total revenue growth rate of 6.0% in 2019 and 2020 and decreased to 5% for the following 3 years. This was based on historic growth and as well as projected subscriber and penetration rates (Appendix E). Next, for terminal growth, we used a 2.5% growth rate, which accounts for the rate of the U.S economy. Additionally, we used a WACC of 8.0%, reflective of Charters strategic use of leverage (4.5x) and a cost of debt of 5.0% From the DCF, we arrived at a price target of \$415.48.

Risks to Investment Thesis

Figure 24: U.S Broadband Only Subscribers (Millions)

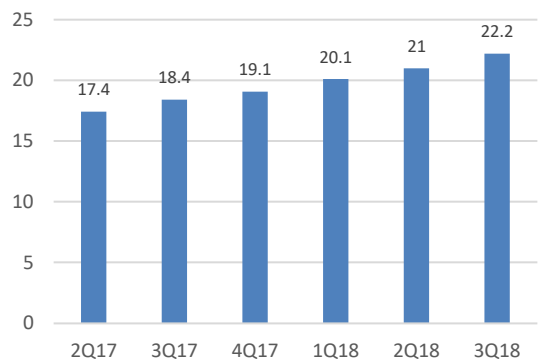
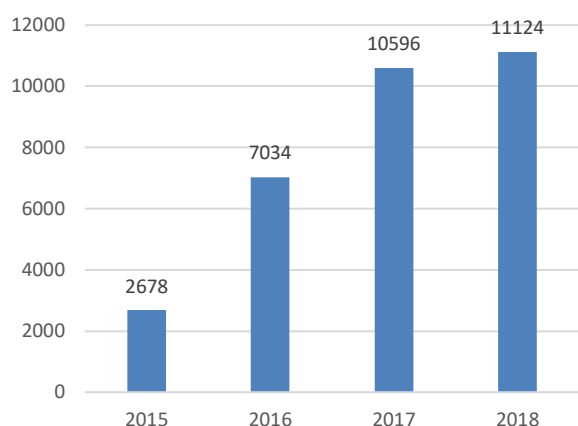


Figure 25: Programming Costs



Cord Cutting

As the proliferation of online video services grows, however, services from V-MVPDs and new direct to consumer offering could negatively affect the growth of their video business. (“V-MVPD”) such as DirecTV NOW, Sling TV and Hulu Live, and direct to consumer products offered by programmers that have not traditionally sold programming directly to consumers, such as HBO Now, CBS All Access and Showtime Anytime. Subscription video on demand (“SVOD”) services such as Netflix, Amazon Prime, and Hulu Plus YouTube and Hulu are further threats.

Highly Competitive Market

Charter Communications operates in a very competitive business environment, which affects its ability to attract and retain new customers. Although, their merger with Spectrum and Bright House has successfully allowed them to gain more market share. Charter’s footprint predominantly overlaps with AT&T Fiber (~6%) and Verizon Fios (~5%). While those carriers have neared the end of their fiber-fed TV rollouts, their penetration is still relatively low vs. our long-term expectations

Increasing Programming Costs

In addition, programming costs are rising at a much faster rate than wages or inflation, and they may not have the ability to reduce or moderate the growth rates or, or pass on to their customers. Increases in the cost of sports programming and the amounts paid for broadcast station retransmission consent have been the largest contributors to the growth in our programming costs over the last few years. Additionally, the demands of large media companies who link carriage of their most popular networks to carriage and cost increases of their less popular networks, has limited Charter’s flexibility in creating more tailored and cost-sensitive programming packages for consumers.

Conclusion

Figure 26: Cable Quote

got cable?

In conclusion, we recommend a buy rating of Charter with a price target of \$415.48 per share, which provides a margin of safety of 13.30% (as of April 26th, 2019). Charter is a stable ten-year investment and will continue to provide returns. Charter is the second largest cable operator in the United States and a leading broadband communications services company providing video, Internet and voice services to approximately 28.1 million residential, small, and medium business customers at December 31, 2018.

Today, the company is working diligently to improve and adapt to market shifts, produce successful movies, and strengthen its presence abroad. Soon Charter will leverage these improvements and continue to grow, insuring its relevance and meaningfulness for the near future.



Appendix

Appendix A: Management

Charter’s management team is composed of individuals with a wide range of experience in the telecommunications industry. The team is dedicated to creating the best intellectual property and fostering an environment of creativity and innovation. Thomas Rutledge is the company’s Chairman, CEO, and prior to becoming CEO of Charter in 2012, Mr. Rutledge, a 42-year veteran of the industry, served as Chief Operating Officer of Cablevision Systems. His vision for the company consists of three concepts: fostering innovation and applying the latest technology, generating the best content, and expanding to new markets across the world.



Thomas M. Rutledge
Chairman and CEO



John Bickman
President and COO



David G. Ellen
Senior Executive Vice
President



Christopher L.
Winfrey
CFO



Thomas E. Adams
EVP, Field Operations



Michael Blair
EVP, Spectrum Networks



James Blackley
EVP, Engineering and IT



Danny Bowman
Chief Mobile Officer

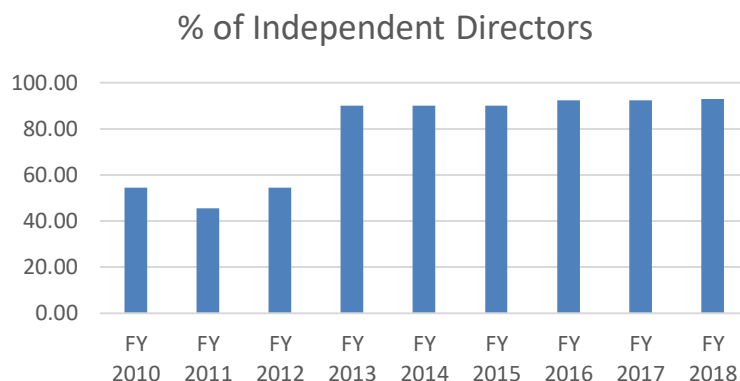
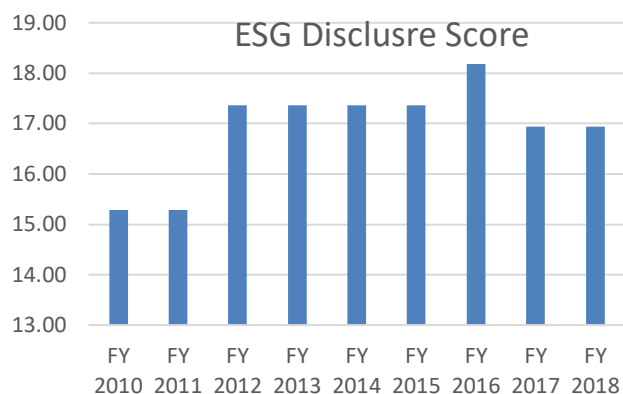
Management Goals:

- ✓ Superior, reliable, consistent services that deliver value
- ✓ Continue to invest in infrastructure improvements
- ✓ Charter is committed to improving communities
- ✓ All-digital network

Board of Director Initiatives:

- ✓ Board committee structure comprised of Audit, Compensation & Benefits, Finance, and Nominating and Corporate Governance
- ✓ Compensation & Benefits Committee reviews and approves the compensation of the senior management

Appendix B: Corporate Social Responsibility



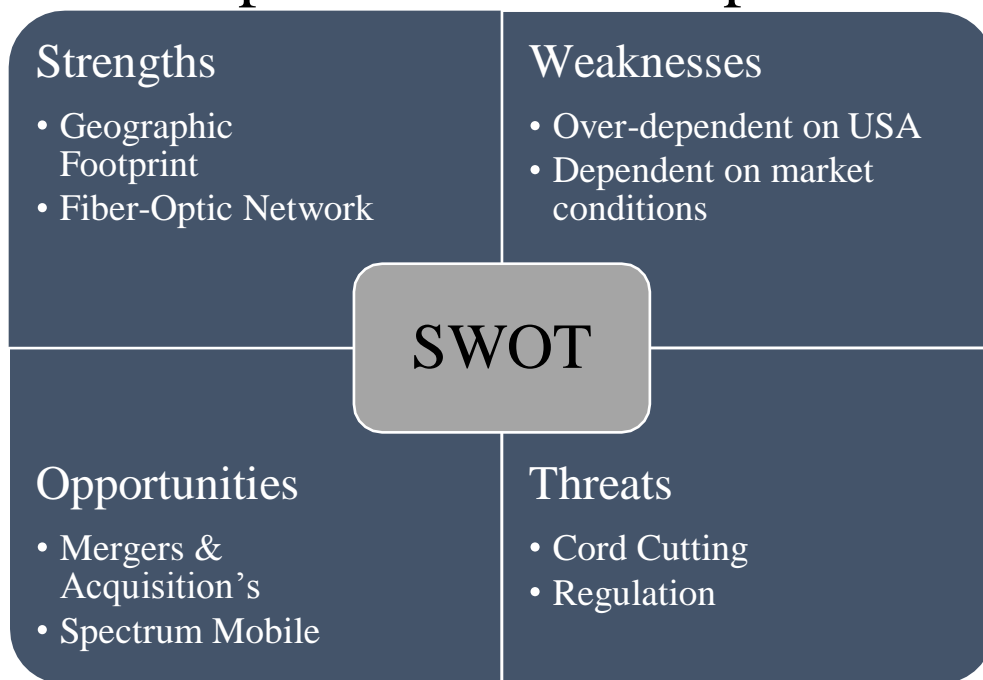
Digital Education Grant

Charter Communications, Inc. announced the launch of its Spectrum Digital Education Grant Program, a philanthropic initiative designed to support nonprofit organizations that educate community members on the benefits of broadband and how to use it to improve their lives. The objective of the Spectrum Digital Education Grant Program is to provide digital education in the communities we serve through financial grants, PSAs, workshops and webinars to local nonprofit organizations.

Spectrum Housing Assist

Spectrum provides critical home repairs across the United States by collaborating with nonprofit organizations and engaging our employees and community volunteers. Spectrum's goal is to improve 50,000 homes by 2020.

Appendix C: Corporate Social Responsibility



Appendix D: Discounted Cash Flow Model

| | Historical Period | | | | Projection Period | | | | |
|---------------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|------------------|------------------|------------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| Video | 4,587 | 11,955 | 16,621 | 17,348 | 18,077 | 18,438 | 18,715 | 18,902 | 19,091 |
| Internet | 3,003 | 9,270 | 14,101 | 15,181 | 16,320 | 17,299 | 18,250 | 19,163 | 20,121 |
| Voice | 539 | 2,005 | 2,542 | 2,114 | 2,044 | 1,977 | 1,912 | 1,845 | 1,784 |
| Residential Revenue | \$ 8,129 | \$ 23,230 | \$ 33,264 | \$ 34,643 | \$ 36,440 | \$ 37,714 | \$ 38,876 | \$ 39,909 | \$ 40,996 |
| % growth | | 185.8% | 43.2% | 4.1% | 5.2% | 3.5% | 3.1% | 2.7% | 2.7% |
| Small & Medium Business | 764 | 2,384 | 3,547 | 3,665 | 3,922 | 4,274 | 4,702 | 5,125 | 5,586 |
| Enterprise | 363 | 1,539 | 2,373 | 2,528 | 2,705 | 3,003 | 3,333 | 3,666 | 4,033 |
| Commercial Revenue | \$ 1,127 | \$ 3,923 | \$ 5,920 | \$ 6,193 | \$ 6,627 | \$ 7,277 | \$ 8,035 | \$ 8,791 | \$ 9,619 |
| % growth | | 248% | 51% | 5% | 7% | 10% | 10% | 9% | 9% |
| Advertising Sales | 309 | 1,235 | 1,510 | 1,785 | 1,607 | 1,815 | 1,670 | 1,837 | 1,709 |
| Mobile | - | - | - | 106 | 583 | 1,166 | 1,749 | 2,274 | 2,956 |
| % growth | | | | | 450% | 100% | 50% | 30% | 30% |
| Other | 189 | 615 | 887 | 907 | 925 | 944 | 963 | 982 | 1,001 |
| Total Operating Revenue | \$ 9,256 | \$ 29,003 | \$ 41,581 | \$ 43,634 | \$ 46,182 | \$ 48,916 | \$ 51,293 | \$ 53,793 | \$ 56,281 |
| % growth | | 213% | 43% | 5% | 6% | 6% | 5% | 5% | 5% |
| Cost of Goods Sold | 4,993 | 14,155 | 20,440 | 20,661 | 21,206 | 21,971 | 22,705 | 23,431 | 24,148 |
| % growth | | 183.5% | 44.4% | 1.1% | 2.6% | 3.6% | 3.3% | 3.2% | 3.1% |
| Other Operating Expenses | 804 | 2,793 | 3,681 | 4,157 | 3,042 | 3,103 | 3,165 | 3,228 | 3,293 |
| % growth | | 247% | 32% | 13% | -27% | 2% | 2% | 2% | 2% |
| SG&A | 629 | 2,136 | 3,036 | 3,042 | 3,233 | 3,375 | 3,488 | 3,604 | 3,771 |
| % of Op. Rev. | 6.8% | 7.4% | 7.3% | 7.0% | 7.0% | 6.9% | 6.8% | 6.7% | 6.7% |
| EBITDA | \$ 4,955 | \$ 9,919 | \$ 14,424 | \$ 15,774 | \$ 18,701 | \$ 20,466 | \$ 21,935 | \$ 23,530 | \$ 25,069 |
| % growth | | 100% | 45% | 9% | 19% | 9% | 7% | 7% | 7% |
| D&A | 2,125 | 6,907 | 10,588 | 10,318 | 10,160 | 9,783 | 9,233 | 8,607 | 9,005 |
| % of Op. Rev. | 23.0% | 23.8% | 25.5% | 23.6% | 22% | 20% | 18% | 16% | 16% |
| EBIT | \$ 2,830 | \$ 3,012 | \$ 3,836 | \$ 5,456 | \$ 8,541 | \$ 10,683 | \$ 12,702 | \$ 14,923 | \$ 16,064 |
| Interest Expense, Net | 1,306 | 2,499 | 3,090 | 3,540 | 3,700 | 4,000 | 4,100 | 4,300 | 4,500 |
| Adj. PBT | \$ 1,524 | \$ 513 | \$ 746 | \$ 1,916 | \$ 4,841 | \$ 6,683 | \$ 8,602 | \$ 10,623 | \$ 11,564 |
| Taxes | (60) | (2,925) | (9,087) | 180 | 1,017 | 1,404 | 1,806 | 2,231 | 2,428 |
| Tax Rate (from MGMT discussion) | -4% | -570% | -1218% | 9% | 21% | 21% | 21% | 21% | 21% |
| NOPAT | \$ 1,584 | \$ 3,438 | \$ 9,833 | \$ 1,736 | \$ 3,824 | \$ 5,280 | \$ 6,796 | \$ 8,392 | \$ 9,136 |
| + D&A | 2,125 | 6,907 | 10,588 | 10,318 | 10,160 | 9,783 | 9,233 | 8,607 | 9,005 |
| -NOWC | 324 | 869 | 265 | 207 | (763) | (439) | (447) | 480 | 862 |
| -Capital Expenditures | 1,840 | 5,325 | 8,621 | 9,125 | 7,730 | 7,371 | 7,151 | 7,071 | 7,087 |
| as % of Sales | 19.9% | 18.4% | 20.7% | 20.9% | 16.7% | 15.1% | 13.9% | 13.1% | 12.6% |
| -Merger & Restructuring Costs | 70.00 | 970 | 351 | 97 | 50 | 50 | - | - | - |
| -Programming Min. Commitments | | 265 | 225 | 103 | 124 | 41 | 26 | - | - |
| Free Cash Flow | \$ 1,475 | \$ 2,916 | \$ 10,959 | \$ 2,522 | \$ 6,843 | \$ 8,040 | \$ 9,299 | \$ 9,449 | \$ 10,192 |
| % growth | | 98% | 276% | -77% | 171% | 17% | 16% | 2% | 8% |
| WACC | 8.0% | | | | | | | | |

Appendix E: Subscriber and Penetration Analysis

| | Historical Period | | | | Projection Period | | | | |
|--------------------------------|-------------------|--------|--------|--------|-------------------|--------|--------|--------|--------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| Ending Basic Video Subscribers | 17,062 | 16,701 | 16,400 | 16,104 | 15,814 | 15,514 | 15,203 | 14,899 | 14,601 |
| % Change YoY | -0.3% | -2.1% | -1.8% | -1.8% | -1.8% | -1.9% | -2.0% | -2.0% | -2.0% |
| Penetration of households | 36.0% | 34.8% | 33.7% | 32.7% | 31.7% | 30.4% | 29.2% | 28.2% | 27.2% |
| Ending Internet Subscribers | 19,911 | 21,359 | 22,518 | 23,635 | 24,699 | 25,810 | 26,842 | 27,782 | 28,615 |
| % Change YoY | 8.2% | 7.3% | 5.4% | 5.0% | 4.50% | 4.50% | 4.00% | 3.50% | 3.00% |
| Penetration of households | 43.7% | 46.4% | 48.2% | 49.9% | 51.2% | 52.4% | 53.4% | 54.2% | 55.2% |
| Ending Telephone Subscribers | 9,959 | 10,331 | 10,424 | 10,135 | 9,831 | 9,507 | 9,193 | 8,889 | 8,578 |
| % Change YoY | 13.0% | 3.7% | 0.9% | -2.8% | -3.0% | -3.3% | -3.3% | -3.3% | -3.5% |
| Penetration of households | 22.5% | 23.2% | 23.2% | 22.2% | 21.4% | 20.7% | 20.0% | 19.4% | 18.7% |
| Mobile | | | | 634 | 1134 | 1634 | 2134 | 2364 | 2500 |
| | | | | | 79% | 44% | 31% | 11% | 6% |

Appendix F: Consolidated DCF Model

| | Historical Period | | | | | Projection Period | | | | |
|--------------------------|-------------------|-----------|-----------|-----------|-----------|-------------------|-----------|-----------|-----------|--|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | |
| Video | \$ 4,587 | \$ 11,955 | \$ 16,621 | \$ 17,348 | \$ 18,077 | \$ 18,438 | \$ 18,715 | \$ 18,902 | \$ 19,091 | |
| % growth | | 160.6% | 39.0% | 4.4% | 4.2% | 2.0% | 1.5% | 1.0% | 1.0% | |
| Internet | \$ 3,003 | \$ 9,270 | \$ 14,101 | \$ 15,181 | \$ 16,320 | \$ 17,299 | \$ 18,250 | \$ 19,163 | \$ 20,121 | |
| % growth | | 208.7% | 52.1% | 7.7% | 7.5% | 6.0% | 5.5% | 5.0% | 5.0% | |
| Voice | \$ 539 | \$ 2,005 | \$ 2,542 | \$ 2,114 | \$ 2,044 | \$ 1,977 | \$ 1,912 | \$ 1,845 | \$ 1,784 | |
| % growth | | 272.0% | 26.8% | -16.8% | -3.3% | -3.3% | -3.3% | -3.5% | -3.3% | |
| Residential Revenue | \$ 8,129 | \$ 23,230 | \$ 33,264 | \$ 34,643 | \$ 36,440 | \$ 37,714 | \$ 38,876 | \$ 39,909 | \$ 40,996 | |
| % growth | | 185.8% | 43.2% | 4.1% | 5.2% | 3.5% | 3.1% | 2.7% | 2.7% | |
| Small & Medium Business | \$ 764 | \$ 2,384 | \$ 3,547 | \$ 3,665 | \$ 3,922 | \$ 4,274 | \$ 4,702 | \$ 5,125 | \$ 5,586 | |
| % growth | - | 212% | 49% | 3% | 7% | 9% | 10% | 9% | 9% | |
| Enterprise | \$ 363 | \$ 1,539 | \$ 2,373 | \$ 2,528 | \$ 2,705 | \$ 3,003 | \$ 3,333 | \$ 3,666 | \$ 4,033 | |
| % growth | 0.0% | 324.0% | 54.2% | 6.5% | 7.0% | 11.0% | 11.0% | 10.0% | 10.0% | |
| Commercial Revenue | \$ 1,127 | \$ 3,923 | \$ 5,920 | \$ 6,193 | \$ 6,627 | \$ 7,277 | \$ 8,035 | \$ 8,791 | \$ 9,619 | |
| % growth | - | 2.48 | 0.51 | 0.05 | 0.07 | 0.10 | 0.10 | 9% | 9% | |
| Advertising Sales | \$ 309 | \$ 1,235 | \$ 1,510 | \$ 1,785 | \$ 1,607 | \$ 1,815 | \$ 1,670 | \$ 1,837 | \$ 1,709 | |
| % growth | - | 300% | 22% | 18% | -10% | 13% | -8% | 10% | -7% | |
| Mobile | | | \$ 106.0 | \$ 106.0 | \$ 583 | \$ 1,166 | \$ 1,749 | \$ 2,274 | \$ 2,956 | |
| % growth | 0% | 0% | 0% | 0% | 450% | 100% | 50% | 30% | 30% | |
| Other | \$ 189 | \$ 615 | \$ 887 | \$ 907 | \$ 925 | \$ 944 | \$ 963 | \$ 982 | \$ 1,001 | |
| % growth | | 225% | 44% | 2% | 2% | 2% | 2% | 2% | 2% | |
| Total Operating Revenue | \$ 9,256 | \$ 29,003 | \$ 41,581 | \$ 43,634 | \$ 46,182 | \$ 48,916 | \$ 51,293 | \$ 53,793 | \$ 56,281 | |
| % growth | | 213% | 43% | 5% | 6% | 6% | 5% | 5% | 5% | |
| Cost of Goods Sold | 4,993 | 14,155 | 20,440 | 20,661 | 21,206 | 21,971 | 22,705 | 23,431 | 24,148 | |
| % growth | 54% | 183% | 44% | 1% | 3% | 4% | 3% | 3% | 3% | |
| Other Operating Expenses | \$ 804 | \$ 2,793 | \$ 3,681 | \$ 4,157 | \$ 3,042 | \$ 3,103 | \$ 3,165 | \$ 3,228 | \$ 3,293 | |
| % growth | 9% | 247% | 32% | 13% | -27% | 2% | 2% | 2% | 2% | |
| SG&A | \$ 629 | \$ 2,136 | \$ 3,036 | \$ 3,042 | \$ 3,233 | \$ 3,375 | \$ 3,488 | \$ 3,604 | \$ 3,771 | |
| % of Op. Rev | 6.8% | 7.4% | 7.3% | 7.0% | 7.0% | 6.9% | 6.8% | 6.7% | 6.7% | |

Appendix G: Sensitivity Analysis

| Sensitivity Analysis of Implied Share Price | | | | | | |
|---|------|--------|--------|--------|--------|--------|
| Terminal Growth Rate | WACC | | | | | |
| | 7.0% | 7.5% | 8.0% | 8.5% | 9.0% | |
| | 1.5% | 405.12 | 356.18 | 314.78 | 279.29 | 248.53 |
| | 2.0% | 467.02 | 408.01 | 358.83 | 317.23 | 281.56 |
| | 2.5% | 542.67 | 470.20 | 410.90 | 361.49 | 319.67 |
| | 3.0% | 637.24 | 546.21 | 473.38 | 413.79 | 364.14 |
| | 3.5% | 758.83 | 641.22 | 549.74 | 476.56 | 416.69 |

Appendix H: COGS & Op. Expenses Analysis

| | Historical Period | | | | Projection Period | | | | |
|---|-------------------|------------------|------------------|------------------|-------------------|------------------|------------------|------------------|------------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| Programming | 2,678 | 7,034 | 10,596 | 11,124 | 11,590 | 12,212 | 12,770 | 13,334 | 13,902 |
| Regulatory, Connectivity and Producer Content | 435 | 1,467 | 2,064 | 2,210 | 2,276 | 2,341 | 2,400 | 2,457 | 2,512 |
| Cost to Service Customers | 1,880 | 5,654 | 7,780 | 7,327 | 7,340 | 7,418 | 7,535 | 7,640 | 7,734 |
| Cost of Goods Sold | \$ 4,993 | \$ 14,155 | \$ 20,440 | \$ 20,661 | \$ 21,206 | \$ 21,971 | \$ 22,705 | \$ 23,431 | \$ 24,148 |
| % growth | | 183% | 44% | 1% | 3% | 4% | 3% | 3% | 3% |
| Transition Costs | 72 | 156 | 124 | 346 | - | - | - | - | - |
| Other | 732 | 2,637 | 3,557 | 3,811 | 3,042 | 3,103 | 3,165 | 3,228 | 3,293 |
| Total Other Operating Expenses | \$ 804 | \$ 2,793 | \$ 3,681 | \$ 4,157 | \$ 3,042 | \$ 3,103 | \$ 3,165 | \$ 3,228 | \$ 3,293 |
| % growth | | 247% | 32% | 13% | -27% | 2% | 2% | 2% | 2% |

Appendix I: WACC

| WACC | |
|---------------------|-------------|
| Risk Free Rate | 3.00% |
| Market Risk Premium | 8.78% |
| Beta | 1.1 |
| Cost of Equity | 12.66% |
| Cost of Debt | 5.0% |
| Debt Weight | 53.10% |
| Equity Weight | 46.9% |
| Tax Rate | 24% |
| WACC | 8.0% |

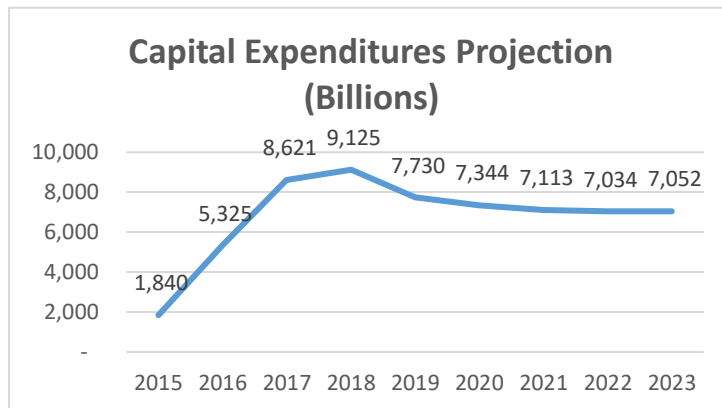
Appendix J: Net Working Capital Analysis

| | Historical Period | | | | | Projection Period | | | | |
|-----------------------------------|-------------------|-------------------|-------------------|-----------------|-----------------|-------------------|------------------|------------------|------------------|------------------|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| A/R-Trade | 285 | 279 | 1432 | 1635 | 1733 | 1823 | 1950 | 2069 | 2500 | 2300 |
| Pre-Paid Expenses/Other ST Assets | 57 | 61 | 333 | 299 | 446 | 469 | 503 | 550 | 568 | 599 |
| Allowance for Doubtful Accounts | 22 | 21 | 124 | 113 | 129 | 173.6 | 204.2 | 234.8 | 265.4 | 296 |
| Current Assets | \$ 364 | \$ 361 | \$ 1,889 | \$ 2,047 | \$ 2,308 | \$ 2,466 | \$ 2,657 | \$ 2,854 | \$ 3,333 | \$ 3,195 |
| A/P & Accrued Expenses | 1635 | 1972 | 7544 | 9045 | 8805 | 9726 | 10356 | 9500 | 8000 | 9500 |
| Current Liabilities | \$1,635 | \$ 1,972 | \$ 7,544 | \$ 9,045 | \$ 8,805 | \$ 9,726 | \$ 10,356 | \$ 11,000 | \$ 11,000 | \$ 10,000 |
| NWC | -1271 | -1611 | -5655 | -6998 | -6497 | -7260 | -7699 | -8146 | -7667 | -6805 |
| Net change | \$ (340) | \$ (4,044) | \$ (1,343) | \$ 501 | \$ (763) | \$ (439) | \$ (447) | \$ 480 | \$ 862 | |

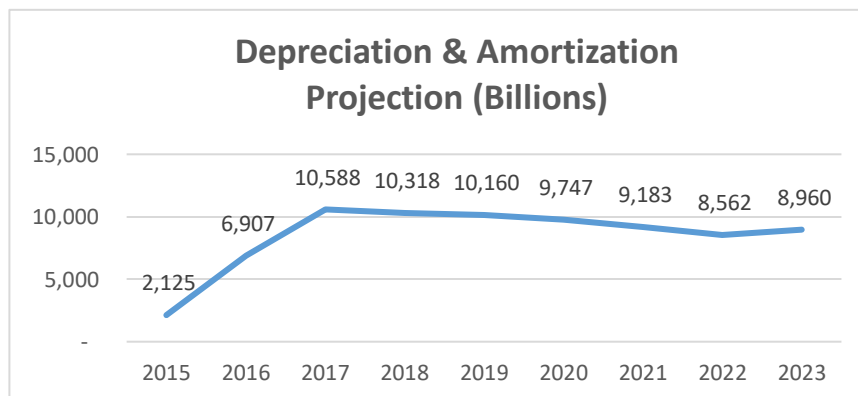
Appendix K: Capital Expenditures Analysis

| | Historical | | | | Projection | | | | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 2018 | 2017 | 2016 | 2015 | 2019 | 2020 | 2021 | 2022 | 2023 |
| Total Revenue | \$ 43,634 | \$ 41,581 | \$ 29,003 | \$ 19,010 | \$ 46,198 | \$ 48,323 | \$ 50,752 | \$ 53,620 | \$ 57,073 |
| Customer premise equipment | 3,124 | 3385 | 1864 | 582 | 2655 | 2549 | 2473 | 2399 | 2423 |
| % of sales | 7.2% | 8.1% | 6.4% | 3.1% | -15% | -4% | -3% | -3% | 1% |
| Scalable infrastructure | 2,227 | 2,007 | 1,390 | 523 | 1782 | 1603 | 1443 | 1400 | 1414 |
| % of sales | 5.1% | 4.8% | 4.8% | 2.8% | -20% | -10% | -10% | -3% | 1% |
| Line extensions | 1,373 | 1,176 | 721 | 194 | 1291 | 1252 | 1239 | 1277 | 1328 |
| % of sales | 3.1% | 2.8% | 2.5% | 1.0% | -6% | -3% | -1% | 3% | 4% |
| Upgrade/rebuild | 704 | 572 | 456 | 128 | 563 | 507 | 482 | 506 | 526 |
| % of sales | 1.6% | 1.4% | 1.6% | 0.7% | -20% | -10% | -5% | 5% | 4% |
| Support capital | 1,697 | 1,541 | 894 | 413 | 1442 | 1370 | 1439 | 1468 | 1497 |
| % of sales | 3.9% | 3.7% | 3.1% | 2.2% | -15% | -5% | 5% | 2% | 2% |
| Total capital expenditures | \$ 9,125 | \$ 8,681 | \$ 5,325 | \$ 1,840 | \$ 7,733 | \$ 7,281 | \$ 7,075 | \$ 7,048 | \$ 7,187 |
| % of Sales | 21% | 21% | 18% | 10% | 16.7% | 15.1% | 13.9% | 13.1% | 12.6% |
| Capital expenditures included in total related to: | | | | | | | | | |
| Commercial services | 1313 | 1305 | 824 | 260 | | | | | |
| All-digital transition | 344 | 122 | 460 | 115 | | | | | |
| Mobile | 242 | | | | | | | | |

Appendix L: Capital Expenditures Projection



Appendix M: Depreciation & Amortization Projection



Appendix N: Sources

Charter 10-K, Charter Investor Relations

Charter 10Q, Charter Investor Relations

Charter's 2018 Fiscal Full Year and Q4 2017 Earnings, Charter Investor Relations

Charter Transaction Announcement, Charter Investor Relations

Morning Star

Value Line

Bloomberg

Statista