A Work Project, presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

WIRELESS HIGH SUSTAINABLE GROWTH

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Abstract

This is an equity research on Verizon Communications. Verizon is a telecommunication company that operates mainly in the US, being one of the leaders of this market. Moreover, the company's revenue is primarily driven by its wireless service, which represents around 70% of its total revenues. Moreover, we are also presenting an overview of the company's business, the industry of telecommunications, the financial performance of the company and the risks our valuation may face.

Verizon
Wireless service
Telecom drivers
5G impact

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VERIZON COMMUNICATIONS INC.

TELECOMMUNICATIONS

STUDENTS: CATARINA ANACORETA CORREIA;
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COMPANY REPORT

3 JANUARY 2020

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Wireless high sustainable growth

The 5G fever

- We are currently issuing a **BUY recommendation** given our YE20 **price target of $66.90 per share**, corresponding to a **general upside of 10%** compared to the current price. We believe the market is underestimating Verizon's growth opportunities.

- Verizon's total revenue grew 3.83% in 2017 and 1.85% in 2018 and it is expected **to grow 3.62% in 2019** showing no signs of slowing down mainly due to wireless.

- 5G technology will provide a significant opportunity for **growth** in the wireless service in 2020 and beyond. Although, Verizon is expected to continue experience losses in wireline, **we do not see it as a threat to the company's revenue growth**.

- **Valuation:** We modelled the YE20 target price using a DCF model, forecasting Verizon's revenue and using a **WACC of 6.86%** and a **terminal growth rate of 3.35%.** Our forecasting period goes until 2028, from where we assume Verizon's revenue will stabilize.

- **Key risks:** 1) Increased competition; 2) Ineffective digital growth and diversification strategy; 3) Changes in regulatory environment; 4) Uncertainty of Capital Expenditures

- **Company description**

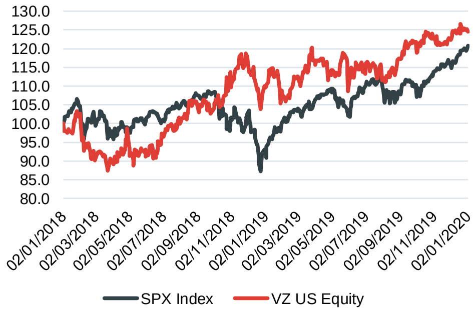
Verizon Communications, Inc. (VZ) **is a telecommunication company leader in the sector.** The company provides products and services through its two most important segments: wireline and wireless, being the last one the segment that drives most of Verizon's revenue.

Recommendation:	**BUY**
Price Target FE20:	**66.90 $**
Price (as of 2-Jan-20)	**61.05 $**

Reuters: VZ.N, Bloomberg: VZ

52-week range ($)	52.28-62.22
Market Cap ($m)	252,490
Outstanding Shares (M)	4,136
Expected shareholder return (%)	14 %

Source: Bloomberg: Company reports: Analysts estimates



Source: Bloomberg

(Values in $ millions)	2018	2019E	2020F
Revenues	133,281	138,103	142,410
Wireless	91,734	93,624	96,418
Wireline	29,760	29,452	29,666
Corporate and Other	9,369	9,368	9,471
EBITDA	44,460	49,863	48,573
EBITDA Margin	34%	36%	34%
EBIT	22,372	28,913	27,412
Net Income	15,120	19,055	18,196
Net Debt	111,907	106,494	100,382

Source: Company reports: analysts estimates

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Executive summary

Verizon is **one of the leader players in the market of telecommunications,** information and entertainment products and services offered to its clients, which can be either consumers, business companies or governmental agencies, operating in more than 150 countries.

The company is currently investing in 5G, with an expected Capex for 2020 of $17.5 billion. This investment is expected to be monetized in 2020, where the company views opportunities to growth.

In what regards Verizon's future, the company expects to invest in different sources of revenues, driven primarily by 5G. The wireless segment, the most important source of revenues for the company, is predicted to follow its current trend and continue to increase at a CAGR[1] of 3.75%.

Company overview

Exhibit 1: Verizon 4G LTE coverage are map (as of 10/19/2018)
Source: Company website

Headquarter in New York, United States, Verizon Communications was created in June 30, 2000. This company is a result of a merger between Bell Atlantic Corp and GTE Corp, being one of the most important business mergers in US. Verizon began trading on the New York Stock Exchange (NYSE) under the VZ symbol on Monday, July 3, 2000. It also began trading on the NASDAQ exchange on March 10, 2010. The company had 144,500 employees as of December 31, 2018 and serves millions of costumers every day, principally in the **USA market.**

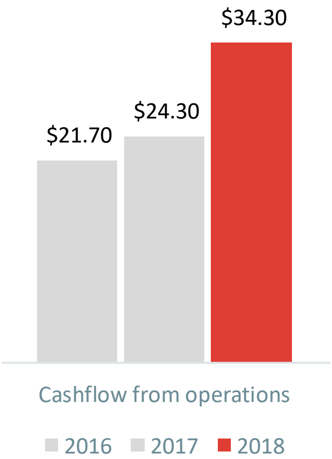


Exhibit 2: VZ cashflow from operations (Values in $ billions)
Source: Company reports

This company has been the leader of the new network technology (5G) wireless technology industry, being the first in the world to launch the 5G Home[2]. During 2018 these capital investments reached a value of $1.7 billion. Moreover, in 2018, it is important to highlight that Verizon generated **$34.3 billion in Cash Flow from operations**, comparing to $24.3 billion in 2017 and $21.7 billion in 2016. In 2018 Verizon also reached **118 million wireless retail connections**, **4.5 million videos subscribers**, **6.1 million Fios internet subscribers** and **1.03% churn rate** in wireless services retail post-paid. The churn rate is the average percentage of customers who terminate their monthly subscription of the company's services and it has been relatively stable over the past few years, consistently remaining under 1.5%, which represents a benchmark in the sector.

Corporate Sustainability is also another relevant point where Verizon is taking action. In fact, Verizon's efforts on sustainability are in the first page of the proxy

[1] Compound Annual Growth Rate
[2] 5G Home is the latest high-speed technology for managing a home's Wi-Fi, music, between others

2019 statement of the company. Verizon is committed to reducing environment impact by reducing waste and supporting recycling. Verizon is also investing on renewable energy, which the company wants to represent 50% of its total electricity usage by 2025.

In terms of Revenue, Verizon's revenue comes from three sources: Wireless, Wireline and Corporate and other.

In the **Wireless segment**, Verizon serves wireless communication products and services across an exhaust network in the US, in a post-paid and pre-paid basis. Wireless segment is divided in wireless service revenue, Equipment revenue and other. Wireless revenues accounts for the major part of Verizon's revenues: 69.3% in 2018, 68.6% in 2017 and 70.0% in 2016. Wireless' total operating revenue was $91.7 billion, an increase of 4.8%, during 2018 compared to 2017, principally as a consequence of increases in equipment and other revenues. However, this was compensated by a fall in service revenues.

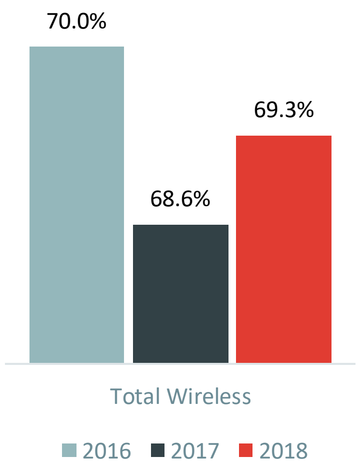


Exhibit 3: VZ Wireless revenue (as % of total revenue)
Source: Company reports

The decrease in service revenue can be explained by the decrease in the company's ARPU, which affects the average return per user in the wireless service. The company is trying to compensate this fall by increasing in Equipment revenue. In fact, equipment revenue increased 17.8%, during 2018 compared to 2017. This was a consequence of a shift to higher priced units in the various devices sold.

In the **Wireline segment**, the company sells communications products and enhanced services, such as video and data services, corporate networking solutions, security and network services and local long-distance voice services. Wireline segment represented 22.5% of Verizon's total revenues in 2018, 24.0% in 2017 and 23.9% in 2016. The Wireline segment operating revenues for the year of 2018 was $29.8 billion, a decrease of 3.0%, compared to the year of 2017. This decrease is explained principally by a decreases in traditional voice, network and HSI services as a consequence not only of technology substitution and competition, but also as a decreases in demand for traditional linear video.

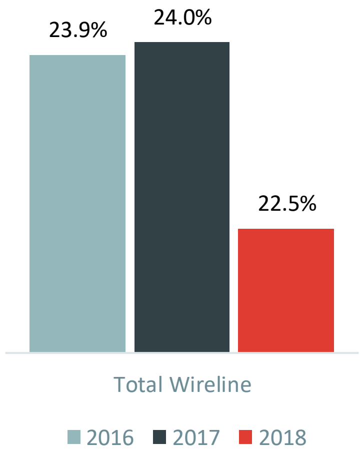


Exhibit 4: VZ Wireline revenue (as % of total revenue)
Source: Company reports

This revenue segment is driven by two sources: **Fios Revenues** and other. Fios is an Internet access, telephone and television service that operates in a fiber-optic communications network. Fios allows people to enjoy a much faster speed than wireless or broadband. Verizon currently offers this Fios in ten different states in the US.

Fios revenue is driven by: **Fios internet subscribers, Fios video subscribers and Fios digital voice subscribers**. With this, we computed a Fios ARPU, which was our main driver for the forecast.

Fios revenues reached a value of $11.9 billion, during 2018 compared to $11.7 billion during 2017. During 2018, **Fios Internet subscriber** increased by 3.7% and **Fios Video subscriber** base fall by 3.6%, compared to 2017. This decrease can be explained by the increased demand in higher broadband speeds and the ongoing shift from traditional linear video to other offerings. Moreover, **service revenues attributable to voice** declined 8.5% in connections. The decline in voice connections is principally a result of competition and technology substitution with wireless, competing voice over Internet Protocol with and cable telephony service. For the future, we see Fios revenue increase as a percentage of a forecasted ARPU, based on past year by year data.

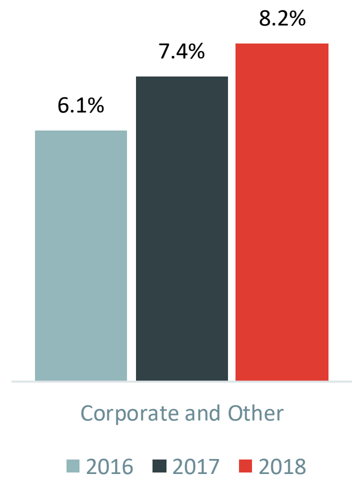


Exhibit 5: VZ Corporate and other revenue (as % of total revenue)
Source: Company reports

Finally, **Corporate and other** is the results of Verizon media business (the Oath brand), and other businesses, investments in unconsolidated businesses, unallocated corporate expenses, pension and other employee benefits related costs and interest and financing expenses. This segment also includes historical results of divested business and other adjustments not allocated to any assessing segment. Moreover, Verizon Media, combines Yahoo! Inc.'s operating business with Verizon's pre-existing Media business, and includes diverse media and technology brands that servers people around the world.

Corporate and other revenues in 2018 reached a value of $10.9 billion in 2018, an increase of 16.6% when comparing to 2017. This segment represents around 8.2% of Verizon's revenues in 2018, 7.4% in 2017 and 6.1% in 2016. Corporate and other revenues increased principally due to an increase of $1.7 billion in revenues of Media business, branded Oath, as a result of the acquisition of Yahoo's on June 13, 2017. This increase was compensated by the sale of 23 customer-facing data center sites in the U.S. and Latin America in the Wireline segment in May 2017.

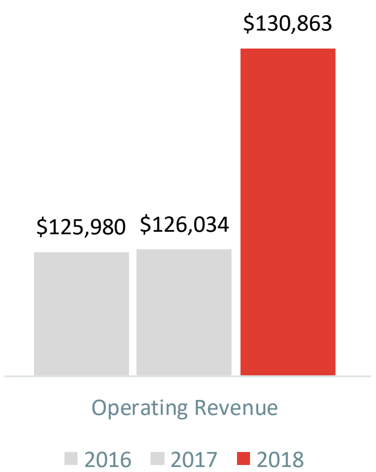


Exhibit 6: VZ Operating Revenue (Values in $ millions)
Source: Company reports

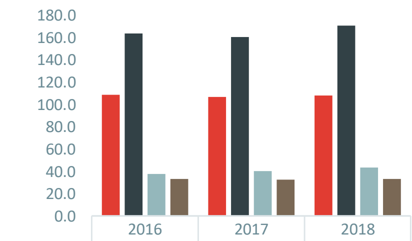
As an overview, Verizon's consolidated revenues are increasing throughout the years. Verizon consolidated revenues in 2018 were $130.86 billion, comparing to $126.03 billion in 2017 and $125.98 billion in 2016. We believe Verizon will continue to increase its revenues in the future, and the decrease in wireless ARPU will be offset by the increase in USA wireless subscribers, impacted by the new network: 5G.

When analysing future revenue drivers, we believe Verizon will monetize the investment in 5G and find new sources of revenues. In fact, new telco services, due to 5G, Internet of Things (IoT), mobile payments and cloud services, will have a relevant impact in 2020-23' total number of subscribers, which affects Verizon's wireless services.

Competitors

The telecommunications industry is extremely competitive. Since Verizon has its massive operations in the United States we have considered its competitors to be the ones operating there.

Verizon primarily competes with other regional wireline and wireless service providers. As of today, in the United States, there are four mobile service providers usually described by the industry observers as "nationwide": AT&T, Verizon, T-Mobile and Sprint. Though none of these service providers has a network covering the entire US land and population, each has a network covering a considerable portion of both and therefore we considered these three service providers to be the main competitors of Verizon. Verizon and AT&T are much larger than the others and benefit from scale advantages and better resources. In fact, AT&T in terms of operating revenues is the biggest of the four, followed by Verizon.



	2016	2017	2018
Verizon	108.6	107.1	108.5
AT&T	163.8	160.5	170.8
T-mobile	37.5	40.6	43.3
Sprint	33.3	32.4	33.6

Exhibit 7: Total operating revenues of VZ and its main competitors (Values in $ billions)
Source: Companies reports

Besides, its rivals include several smaller regional providers, virtual mobile network operators, including Charter Communications, Inc., TracFone Wireless, Inc., Comcast Corporation and many of whom provide or plan to provide no-contract, prepaid and postpaid service plans. Competitors also include companies offering similar forms of communication, such as data services, voice and messaging, using other tools or services.

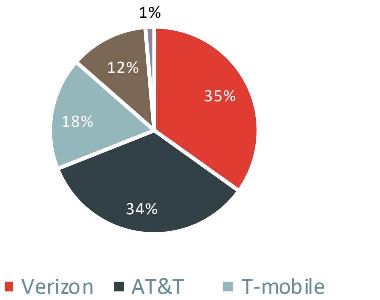


Exhibit 8: Wireless market share of VZ and its main competitors (Q3 2018)
Source: Company reports, eMarketer

Market saturation, customer experience, types of service and product, pricing, network investment and efficiency, technology development and deployment, and the availability of additional spectrum licenses are among the competitive factors in the telecommunications industry.

Verizon's wireless market share[3] of 35% as of 2018 surpass its competitors such as AT&T (34%), T-Mobile (18%), and Sprint (12%). Indeed, the company's largest and most longstanding competitor is AT&T. Extra competition comes from T-Mobile, which has a lower market share but has been attracting customers faster than any other network, and Sprint, which has introduced aggressive price promotions to move its shrinking market share.

[3] Market share was determined based on the size of a company relative to the total size of the industry. The size of each company and industry was measures using key metrics such as revenues and connections/subscribers.

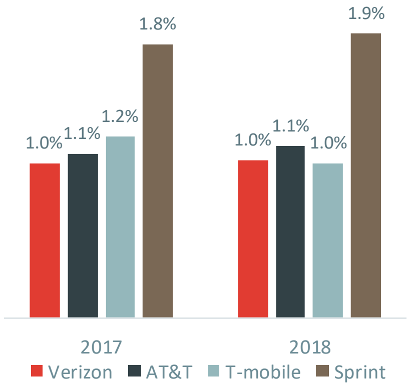


Exhibit 9: Postpaid Wireless churn rate of VZ and its main competitors
Source: Companies reports

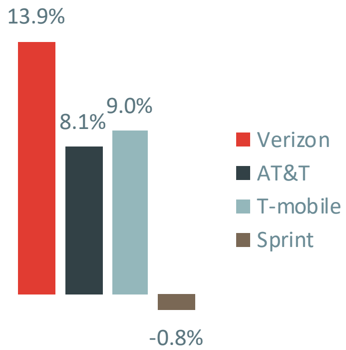


Exhibit 10: ROI of VZ and its main competitors as of Q3 2019
Source: Companies reports

Holder	% of Total Shares Outstanding
The Vanguard Group, Inc.	7.88%
BlackRock, Inc.	7.59%
State Street Global Advisors, Inc.	3.95%
Capital Research and Management Company	2.85%
Wellington Management Group LLP	2.78%

Exhibit 11: Largest shareholders of Verizon as of 30/09/2019
Source: Bloomberg

A service provider's churn rate[4] depends on many factors such as the customer satisfaction with their service provider, cost of switching service provider, and the competition.In 2018, **Verizon had the second lowest churn rate in the wireless segment when comparing to its main competitors** (1.03%).

One of facts that Verizon and AT&T are considered very attractive companies are their dividends (T-mobile and Sprint do not currently pay a dividend). In the past ten years, Verizon has raised its dividend by nearly 32%, while AT&T has seen a slower growth rate of 24%. Currently, Verizon has a dividend yield of 4.03%, while AT&T has a yield of 5.36%. Another thing worth considering is that **Verizon's Return on Investment (ROI) is more than double than AT&T's** (also bigger than Sprint and T-mobile ROI) meaning it is more important for the company to keep to reinvest its earnings than to distribute them to its shareholders. Long-term, this must yield **higher returns and growth for Verizon**.

Nevertheless, Verizon Communications, Inc. is the largest wireless communications service provider in the United States. According to the latest findings from the country's most comprehensive and empirical network monitoring - RootMetrics[5] - the gap between Verizon's network performance and other national wireless providers continues to grow. Verizon won, for the 12th consecutive time, RootMetrics' overall network performance award across six categories: overall performance, reliability, speed, data, call and text.

We believe telecommunication industry is an industry with companies with global presence, which increasingly compete with Verizon's businesses. In this sense, Verizon's revenue may be affected by this intensified competition, that creates brand recognition and customer loyalty. Therefore, we think Verizon will still improve its services and the investment in 5G will allow the company to still be one of the reference players in the market, maintaining its market share, but since the market growing, Verizon's revenues will grow too.

Board of directors and shareholders structure

Hans Vestberg is the chairman (since March 2019) and chief executive officer of Verizon Communications (since August 2018). Vestberg has focused on delivering seamless experiences for costumers over network assets. Moreover, he invested in 5G, believing in its potential for the company.

Verizon **ownership is significantly diluted**, with no shareholder holding

[4] The churn measures the number of connections that are disconnected from mobile wireless service during a given period time period.
[5] Rankings based on the RootMetrics US National, State, and Metro RootScore Reports: 1H 2019

investors, mutual funds, hedge funds and institutions. Largest shareholders are Vanguard Group Inc (with 7.88%), BlackRock Inc (with 7.59%) and State Street Corp (3.95%). In fact, institutional shareholders with 67.64%, followed by public investors with 32.28% and finally individual shareholders, with only 0.03% of the company.

Verizon Strategy

Verizon has been investing in a strategy to improve and maintain its products and services updated, having the objective of guaranteeing user engagement and being able to monetize it. This strategy involves: (1) **huge investments in capital**, to acquire and improve wireless services and provide additional growth in its networks. In fact, for 2019 Verizon plans its investment to be in the range of $17.0 billion to $18.0 billion, continuing to invest in the 5G network and in fiber optic network to support the business, improving technology and data systems. From Q3 results, we can see that Verizon already invested $12 billion in capital expenditures. We believe that investments in networks and platforms will lead to innovative and updated services and products, which will make Verizon delivering competitive products and services (2): **improving customer satisfaction** (as pointed out in the annual meeting of shareholders and proxy statement). This strategy involves gaining customer trust and responsible business practices. With this, Verizon could maintain its old clients and retain the new ones. Following this point, Verizon is also investing in customer driven models, based on customer needs. (3): Verizon **will continue to be a leader in 5G**, growing its Network as a Service solutions. At an investors conference, Verizon's CEO together with the company's leadership team, reinforced its mission to deliver the best 5G network experiences to its customers and also delivering continued value to shareholders. Moreover, revenues from 5G Mobility and 5G Home will begin to scale in 2020 and the investment in 5G will be monetized in 2020, with new revenue opportunities. (4) **Investing and growing in Verizon Media**. As an example, in 2017, Verizon acquired Yahoo as an important acquisition for increasing its market presence with Verizon Media. In this segment, Verizon strategy highlighted in its 2018 annual report is built on providing consumers with owned and operated search properties and finance, news, sports and entertainment offerings and providing other businesses and partners access to consumers through digital advertising platforms. (5) in February 2019 Verizon's meeting with investors, the company introduced a **long-term constant leverage target.** And lastly (6) Verizon plans to **reach a $10 billion cost savings plan**: $1.0 billion in 2018, $3.0 billion in 2019 and $6.0 billion in 2020. This cost initiative passes through migrating customer service to

Exhibit 12: Verizon Strategy for the future
Source: Company report, Verizon Investors Meeting

an online platform, improving and automating some process, a zero-based budgeting and one change from multiple networks to 1 virtual network as a service: a software upgrade with enhanced purchasing power.

Risks to Achieving the Target Price

Verizon performed very well, and we expect it will continue to do so. There are, however, some key threats that could compromise our outlook and predictions on the operations of Verizon if confirmed. Therefore, it is important to look at and dig into the risks that explain each one to provide a broad perspective of this investment.

The effects of competition in the markets in which Verizon operates

As mentioned before, Verizon has the strongest market share of the US mobile and wireless connectivity market. According to a study[6] done in telecom, competition is responsible for about 23.4% of total price decline in the past ten years. We expect the competitive landscape to have stabilized relative to the past few years, but to the extent, there is an increase in the competition, it could pressure our estimates and rating.

Ineffective digital growth and diversification strategy

According to Industry surveys done by EY, digital services are the top priority for telco leaders. On the other hand, generating growth from these services remains a challenge. As 5G moves to a centre stage some assumptions regarding revenues growth were made that may not be verified.

Changes in the regulatory environment

Reinforced by regulations such as the General Data Protection Regulation (GDPR), consumers' worries about how their online data is used continue to escalate. Besides, given that digital trust is nowadays a hot topic for consumers and enterprises alike, and regulators prioritizing data protection, telcos such as Verizon face challenge of guaranteeing that the data and experiences of its consumers are safe and secure. Although Verizon works hard to protect personal information that they collect and store, no system is 100% secure, and they cannot guarantee that their security will prevent any unauthorized attempt to access, use or reveal personal information. This matter may affect negatively Verizon.

[6] "Impact of competition, investment and regulation on prices of mobile services" by Ambre Nicolle

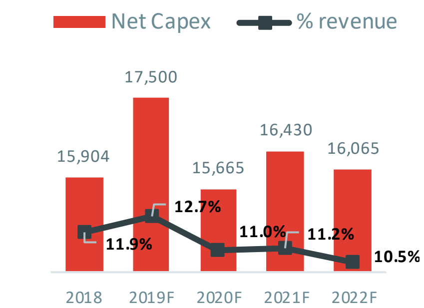


Exhibit 13: Verizon Capex (Values in $ millions)
Source: Company reports, analysts estimates

Uncertainty of capital expenditures

According to GSMA (entity that represents the interests of mobile network operators worldwide), global wireless carriers have invested more than $1.3 trillion in their wireless networks since 2010. This is due primarily to the deployment of 4G wireless technology. Analysts predict that the investment in 5G could prove to be significantly higher than prior generations mainly because carriers need new wireless spectrum, deeper fiber backhauls, particularly in key urban markets, and substantially more cell sites to deliver the benefits of 5G. Nevertheless, the returns generated on the invested are uncertain and may not be verified which represents downside risk to our estimates.

The Sector

Verizon Communications is part of the telecommunications industry, where all telecommunications companies and internet service providers belong. This industry is made of companies that transmit data into words, voice, audio, and video in a global way, where the growing in video, text and data is being higher than the growing in voice.

In terms of clients, Verizon competes not only with other big players, but also with providers of small number of telecommunications and integrated services with global operations. Verizon competes with these providers for large contracts to provide integrated services to global enterprises. Many of these companies have strong market presence, brand recognition and existing customer relationships, all of which contribute to intensifying competition that may affect Verizon future revenue growth.

The industry

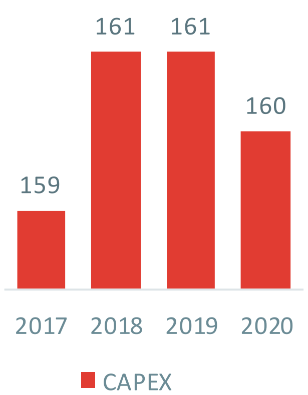


Exhibit 14: Capital expenditures of the mobile industry worldwide from 2017 to 2020 (Values in $ billions)
Source: eMarketer, Statista

The telecommunication sector, which includes fixed-network services and mobile services, had a value of around **$1.4 trillion in 2017**, and it is forecast to grow to almost $1.46 trillion in size by 2020[7], being the biggest markets for telecom services the Asia/Pacific region, Europe and North America. In fact, during the past decades, the telecommunications industry had showed a rapidly growing, with the new technological developments, government initiatives and economic growth. These developments created new opportunities for companies, and the competition between companies also increased. To follow this changing environment, these companies needed to develop or acquire technological resources. With this, many companies, in a strategic way, followed an acquisition or a partnership with local companies, such as Verizon did.

[7] Delloite (2019). 2020 Telecommunications Industry Outlook

Additionally, is a sector where **services spending** has showed some critical values, with a **forecasted value of $1.625 billion for 2019**, growing 0.63% when comparing to 2018, and $1.645 billion for 2020, an increase of 1.23%. These values are expected to follow this tendency until 2023, where the sector's services spending is predicted to reach a value of $2.655 billion[8]. Therefore, in our valuation we forecasted that Verizon will continue to present high values of capital expenditures, in the range of $16 and $20 billion between 2017 and 2028.

We believe that the pattern for **future growth will be primarily driven by 5G**. With new revenue opportunities, 5G is appearing as a revolution for this sector, by its potential impact on IoT, voice assisted technology, Mpayments and Mhealth. The 5G impact will impact telecoms principally in 2020 and beyond. As so, our valuation is impacted since 2020 until 2023 with 0.25% increase in total wireless carriers' subscribers USA, due to the 5G impact. We believe 5G will impact telecom companies until 2023, and after that the market will continue to increase, but at a stable rate.

The telecommunications market is segmented into wired telecommunication carriers, wireless carriers, communications hardware manufacturers, satellite and communication resellers. To offer these services, there are small numbers of large companies with significant market share, called the players. Moreover, the smallest, but fastest growing area of this sector is **wireless communications**, as more communications and computing methods shift into mobile devices and cloud-based technology. Due to this high and effective competition, we forecasted that Verizon will maintain its wireless market share of 35% from 2019 and beyond. However, this does not mean that Verizon is not growing. As the market is growing, even having the same market share, Verizon can capture more clients, which will make the company grow also.

- Wireless service

Wireless technology involves transmitting data and voice through wireless spectrum that is dispersed from surrounding towers. In order to acquire spectrum telecoms need to go through licensing auctions that are held by the FCC (Federal Communications Commission) or through secondary market transactions with other wireless carriers. The big focus in the wireless segment is data, with 4GLTE being the fastest speed available. The launch of 5G is expected to be 50 times faster than 4G.

The wireless industry is mature, and its services are strongly marked by its big 4 companies: Verizon, AT&T, T-Mobile and Sprint. Sprint, which is merging with

[8] IDC (2019) Worldwide Telecommunications Services Forecast

T-Mobile, is considered the cheapest wireless carrier. These four companies have suffered years of strong competition when it comes to wireless service, but **competition has been stabilizing** and revenue is returning to growth since 4Q 2017.

The forecast spending on worldwide wireless telecom for 2019 is expected to achieve $904 billion, compared to $887.4 billion in 2018. By looking at the above values of telecom spending, we can see that this service represents around 50% of the total industry.

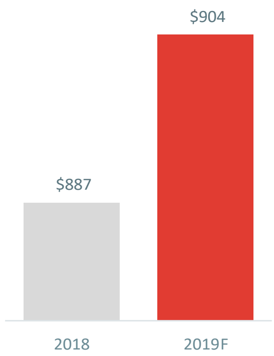


Exhibit 15: Wireless Telecom worldwide spending (Values in $ billions)
Source: Statista estimates, Worlwide IDC

Moreover, the number of mobile subscriptions is increasing worldwide, with a value of 8.160 million in 2018, being LTE, until now, the technology most used, and China the country with more subscriptions in 2018. For the future, we can see that 5G technology will appear and start to grow from 0.16 million subscriptions in 2021 to 1.3 million in 2023. Wireless industry has already achieved a 90% penetration rate amongst adults, and we predict that this will reach 100% in the future.

- Wireline service

The wireline industry offers voice and data services through a vast infrastructure that spreads across the whole country. This segment targets mainly the business market since they need higher levels of data sharing and transmission.

In the past years, the US wireline phone sector have lost a significant number of customers to wireless. In order to tackle this critical situation, the wireline operators have been witnessing a surge in consolidation among major players in order to attain economies of scale with respect to fiber optic cable networking and cloud-based network services.

As we believe the wireline segment have small growth opportunities, our valuation forecasts a stable wireline revenue of around $29 billion, since 2018 until 2028. In fact, since 2014 that this revenue has been decreasing, showing a fall of 9% between 2014 and 2018.

Telecom: what should we expect for the future

S&P Global Ratings[9] forecasts a **global telecom revenue growth of 2% - 3%** throughout the year of 2019. We believe this revenue growth is driven primary by broadband, as the demand for high speed data continues to growth. Therefore, the opportunities will arise in the wired telecommunication carriers, which will gain $338.8 billion of global annual sales by 2022.

[9] S&P Global Ratings (2020). Industry Top Trends 2020: Telecommunications?

Moreover, we expect a **downfall of fixed and mobile satellite services**, as they may be replaced by newest and faster satellite technology, which leads to pricing pressure and oversupply of capacity. In addition, according to this source, it is necessary for the cable companies to still upgrade its infrastructures, which should result in increase in speeds and capacity. For wireline companies, the best option for more densely populated markets is to replace the copper wire with fiber (which can be very expensive). Additionally, Deloitte[10] expects **changing market conditions and consumer preferences**, which we expect to be continuing creating opportunities for telecom companies.

Moreover, we also predict a **decrease in companies' ARPU**, which impacted our valuation. This is a consequence of providers offering lower prices for telecom plans. In our Verizon's forecast we can see this decreasing in ARPU thought the years, which we believe will be compensated by other sources of revenue.

Moreover, the latest EY Global Capital Confidence Barometer reflects the continuing importance of **M&A tendency** in this industry, as it will lead to improvement in operational efficiency. Following this source, 55% of telecom executives expected to actively pursue acquisitions in the next 12 months (Information dated at *28 May 2019*). Additionally, this source points out for the fact that the reviews in companies' portfolios are increasing. In fact, 41% of telecoms nowadays undertake a review every quarter, which can be compared to 24% in October 2018. Therefore, new opportunities of transformation are being created, and companies are reshaping their portfolios to offer better and customized services.

Revenue Model

610,000	Retail post-paid net additions in wireless
615,000	Post-paid smartphone net additions

Exhibit 16: Third quarter of 2019 post paid and prepaid net additions for Verizon
Source: Verizon Quarterly Report (Q3 2019)

Since 2016 until 2018 Verizon's total revenue increased approximately 4% per year, **and in the first 9 months of 2019 already reported, Verizon reached $97 billion,** comparing to $96 billion last year. These $97 billion are already approximately 74% of what we are forecasting for the company to achieve for the all year of 2019.

Verizon also **added 610,000 retail post-paid net additions in its wireless business during the third quarter of 2019**, up from 295,000 a year earlier, and **615,000 post-paid smartphone net additions**, an increase from 510,000. These values are on top of the subscriber additions Verizon recorded in the second quarter, which were already also higher than forecasts.

[10] Delloite (2019). 2020 Telecommunications Industry Outlook

In our revenue model we started by forecasting the total number of subscribers in the **wireless carrier market** in the USA, as this is the primer source of revenue for Verizon. Moreover, we also predicted Verizon market share and Verizon's churn rate, which was important for having Verizon's market presence in the USA and how this impacts revenue. Post-paid net additions are also value drivers from Verizon, which will impact the wireless ARPU. With all this information, we created our revenue model for wireless services, which is better explained in the next section. For the wireline services estimation, we forecasted Verizon Fios ARPU, which could be done be using past data and research from the sector

Value Drivers

- ### Wireless services estimation

The wireless carrier's market is measure as a prime source by the **number of subscribers.** Moreover, the market tendency differs between countries depending on populations, economic development and technological adherence. Therefore, the first variable to be estimated is the number of total subscribers of wireless subscribers' market in the USA. After looking at the past information[11] available we made a forecast prevision for the same.

Note that, as Gillet (2012) explains, not all subscribers drive directly revenue. Active connections, corresponding a percentage of subscribers, drive directly revenue to Telco's companies. We call this a conversion rate. In Verizon, the conversion rate is around 80% in past years, showing a decrease tendency. We forecast this variable continuing this tendency.

Another important variable to estimate revenue in Verizon's wireless segment is its position in the market. We firstly computed Verizon's **market share** in terms of USA total wireless subscribers. It is seen that the market as whole is growing thought-out the years with Verizon' market share remaining stable. We expect a stable market share at approximately 35% for the years to come. In fact, it's seems that Verizon's peers are also investing in 5G, and there is no reason to believe that Verizon will be successful in gaining market share in the near future.

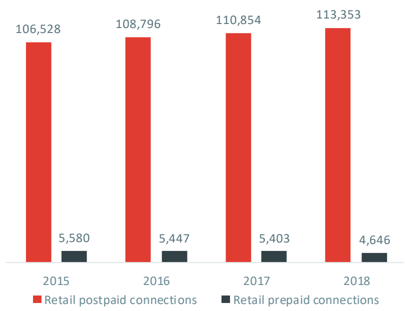


Exhibit 17: VZ subscribers (thousands)
Source: Company reports

From the market, measured in number of wireless subscribers, from the remaining stable of Verizon market share and using a stable conversion rate, it was possible to **estimate the total number of Verizon wireless connections** for the years to come.

Within wireless Verizon connections, we can find prepaid retail connections and post-paid retail connections, with the former being much more relevant. In fact,

[11] Fierce Wireless (2019). How Verizon, AT&T, T-Mobile, Sprint and more stacked up in Q3 2018: The top 7 carriers

during the year of 2018, the number of prepaid retail connections was 4,646 million compared to 113,353 million of post-paid retail connections.

As many analysts are saying, and as it's seen directly through its annual reports, **Verizon is systemically losing prepaid retail connections**. In fact, since 2014 until 2018, prepaid retail connections lost on average 6% connections per year. We assume that this decrease tendency will remain.

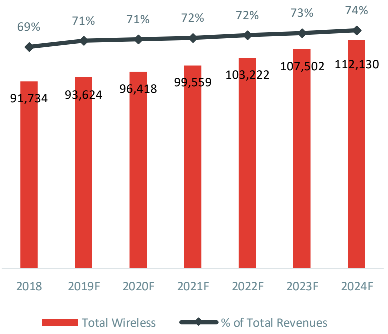


Exhibit 18: VZ wireless revenue (Values in $ millions and as % of total revenue)
Source: Company reports, Analysts estimates

Moreover, Post-paid connections behaviour through the years depend on two important variables: the (1) **churn rate**, that is the number of lost connections divided by last period total connections, and the (2) **number of new clients**.

Recent Verizon announcements are in the direction of maintaining the churn rate in the future. In fact, in the last annual report, Verizon says the company believes experience of matching the unlimited plan with its high-quality network, that continues to attract and retain higher value retail post-paid connections.

So, in order to meet grow market number with a remain stable market share, the strategical number for Verizon in the future will be the number of new connections.

Verizon is actively investing in 5G. This will permit the firm to improve services rendering to its clients. In Verizon's investors meeting in February 2019, 5G was presented as a new opportunity for enable new experiences and as a new network that accelerates business customers' digital transformation, creating a new growth for Verizon.

We therefore assumed an impact (0.25%) on the total number of subscribers driven by 5G and multiple new services in 2020, 2021, 2022 and 2023. In fact, in Verizon's investors meeting in February 2019 it was presented that the 5G will begin to scale and make impact in 2020, and still contribute to growth in 2021 and beyond. A remaining stable market share of Verizon means that Verizon will capture this increase in market for the following years.

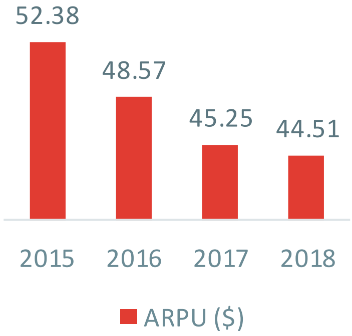


Exhibit 19: VZ ARPU Growth ($)
Source: Company reports

The **ARPU** is other important variable when analysing Verizon's revenue. We computed this past ARPU taking into account Verizon total number of retail connections and Verizon's wireless service revenue. We got a past ARPU that was decreasing throughout the years. As already said**, telecom companies are suffering a decrease in its ARPU**, and this trend is to continue. Therefore, as telecom companies are offering more services for a lower price, we believe there will be a continuous decrease of Verizon's wireless ARPU.

With this, our wireless revenue forecast grows from $93,624 million in 2019 to $135,251 million in 2028, which represents a CAGR of 3.75%.

- Wireline services estimation

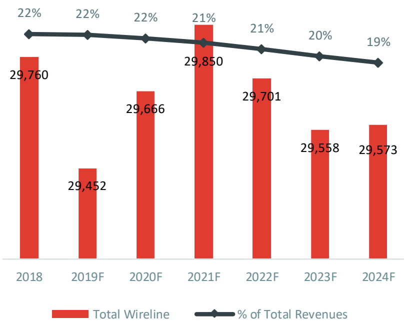


Exhibit 20: VZ wireline revenue (Values in $ millions and as % of total revenue)
Source: Company reports, Analysts estimates

In the Wireline segment, Verizon have experienced continuing access line losses as customers have disconnected both primary and secondary lines and switched to alternative technologies such as wireless, VoIP and cable for voice and data services. In Verizon 2018 annual report, the company expects to continue to experience access line losses as customers continue to switch to alternate technologies. Moreover, we believe Fios Internet connections will grow at the same pace as verified in the past (average of 4%) as the company seeks to increase its penetration in Fios service areas. **In Fios video**, the business continues to face ongoing pressure as observed throughout the linear television market, so we expect its subscribers to decrease by 0.5% from 2020 onwards.

Therefore, to get the wireline forecasted revenue, we firstly got past data from Fios video, internet and digital voice subscribers. With this data, and with the total Fios revenue we were then able to calculate a **Fios ARPU**.

As said above, Verizon expects to continue growing its Fios Internet connections. This increase will compensate the decrease in Fios video. In fact, Fios Video business continues to face ongoing pressure. **Assuming Verizon's video tendency** and what Verizon expects for the next years, we forecasted this line by computing a **future Fios ARPU for the wireline segment**.

Therefore, we forecast a revenue for Wireline services for the year of 2019 of $29,452 million, and it grows until $29,882 million in 2028. We believe that this segment will remain with a stable revenue of around $29 billion.

- Corporate and other revenue estimation:

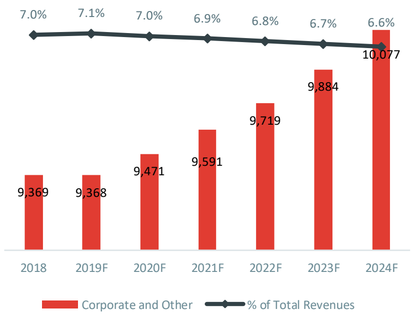


Exhibit 21: VZ corporate and other revenue (millions of $ and as % of total revenue)
Source: Company reports, Analysts estimates

In this Media business, Verizon Media, which operated in 2018 under the "Oath" brand, is primarily focused on digital advertising products. Verizon is focused on returning to revenue growth by implementing initiatives to realize synergies across all of its media assets, a strategy already implemented, and building services around its core content pillars. Moreover, Verizon is experienced growth in mobile usage and video products and see this trend to continue.

As pointed out in the latest annual report, although we believe this segment will grow, Oath brand is experiencing high pressures and competition which have resulted in a loss of market positioning to Verizon competition in the digital advertising business. These pressures are expected to continue. In order to forecast this segment, and since this revenue is directly linked with Verizon core operations, we calculate the weight of Corporate revenues as a percentage of both wireless and wireline segment and assumed this ratio would decrease 0.10% year by year.

Goodwill and Wireless licenses

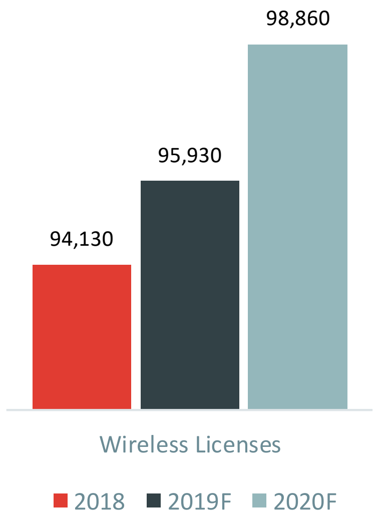


Exhibit 22: Wireless Licenses (Values in $ millions)
Source: Company report, Analysts estimates

Verizon's Goodwill and Wireless Licenses are both intangible assets with a significant value (they represent about 50% of Verizon's total assets). These intangible assets are not amortized, but instead are tested annually in the 4th fiscal quarter for impairment, if there are no events requiring an earlier impairment test.

As a result of Wireless Licenses mandatory impairment tests done in 2018, 2017, 2016, and 2015 the value of these licenses exceeded their carrying value and, therefore, did not result in an impairment. This information is given on the annual reports of 2016, 2017 and 2018, which were audited by Ernest & Young LLP.

For forecast purposes, considering that there is no relevant information from which its expectable a significant decrease in the wireless license value, we expect no impairment for this intangible in the forecast.

For the Goodwill value related with different reporting lines we found some relevant issues for the forecast. The balance of Verizon's goodwill is allocated among four reporting segments: Wireless unit, Wireline unit, Media unit and Connect unit. For the mandatory tests performed in 2018, 2017, 2016 and 2015 for Wireless and Connect reporting units, both fair values significantly exceeded (as reported by Verizon in its audited financial statements) their respective carrying value for the impairment tests. Therefore, we did not forecast an impairment charge for this two reporting units in the future. However, the mandatory goodwill impairment tests of 2018, 2017 and 2016, for the Wireline reporting unit, resulted in a fair value that exceeded goodwill carrying amount by 5%, 14% and 20%, respectively, from which we can expect, given the declining tendency, a decreasing value on this unit in the near future. Additionally, even the management do not believe in a reverse tendency towards recuperation. In fact, as said in Verizon's annual report 2018, probably imposed by its auditors, "the management believes there is an increasing risk that Wireline reporting unit may be required to recognize an impairment charge in the future". So, we strongly believe that in the near future we will assist an impairment loss on this unit resulted by the mandatory annual impairment test on allocated goodwill.

Therefore, we forecast, for the year of 2019, an impairment charge, in result of the impairment test for the Wireline reporting unit, of 50% of its value, and an impairment charge of the remaining value for the year of 2020. Moreover, for the Media reporting unit, the fair value exceeded goodwill carrying amount by more than 20% in 2017. In 2018 an impairment charge caused by the goodwill

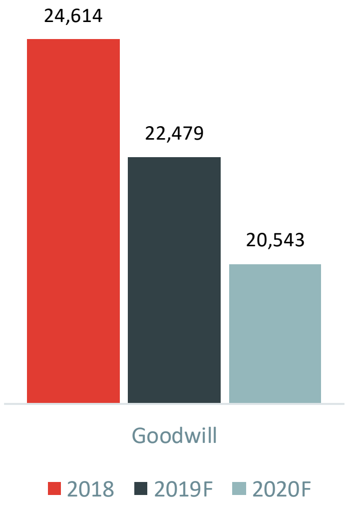


Exhibit 23: Goodwill (Values in $ millions)
Source: Company report, Analysts estimates

impairment test was accounted for the Media reporting unit. As the increased competitive and market pressures that caused this impairment charge are expected to continue, we forecasted an impairment goodwill charge, of the remaining media unit value, in 2019.

When forecasting, we were aware that Verizon records goodwill and acquired intangibles when the price it paid for an acquisition exceeds the target's book value. Therefore, we set the revenue growth from acquisitions equal to zero and held the goodwill constant at its current level. For the wireless licenses, as this number has been increasing and it is predicted to increase by the Verizon's Board, we made it as percentage of forecasted revenues. This treatment is consistent with the wireless licenses value dependency on Verizon´s revenues, as these licenses provide the exclusive right to use certain radio frequency.

Financials

Since 2005 until 2018, excepting in 2008, Verizon showed a positive net income with the highest value in 2017, when Verizon reached a net income of $30.1 billion. For the future, after forecasting revenue and costs according to past and future information, we reach out positive profit, which makes us believe the company will continue to be financial solid.

For the future, we see Verizon creating value for shareholders by **investing the cash flows generated in opportunities that support profitable growth**, thereby increasing customer satisfaction and usage of our products and services. In fact, the **ROIC from investments forecasted shows values between 71% and 76%**. Verizon also used its cash flows to maintain and grow its dividend payout to shareholders. Verizon's Board of Directors increased the Company's quarterly dividend by 2.1% during 2018, making this the twelfth consecutive year in which have raised its dividend. Verizon goal is to continuing using cash to create long-term value for our shareholders. Therefore, Verizon will continue to invest its cash flow in critical opportunities for growing, to make its balance sheet strong and to pay dividend to shareholders.

We also expect for 2019 Verizon to present **non-GAAP EBITDA of $49,863 million**, a YoY growth of 12%. This represents an EBITDA margin of 36%, comparing to 34% in 2018. Verizon expects to its consolidated **operating income margin and adjusted consolidated EBITDA margin to remain strong**.

Moreover, since the value of acquisitions of wireless licenses have been increasing (and will increase in the future, as it is said in Verizon's Annual Report

2018), we forecast a 0.5% growth year by year of the average of Wireless licenses (% Revenues).

Relevant Ratios

In order to measure Verizon's ability in accomplishing its debt obligations without the support of external capital, we calculated the most important **liquidity ratios**. Looking at the short-term liquidity of the firm, Verizon showed a consistent capability in meeting all short-term obligations during the last 5 years. In fact, both the current ratio and the quick ratio were increasing throughout the last years so it's not expected that Verizon will meet liquidity short term problems in the near future.

Liquidity ratios	2016	2017	2018
Current Ratio	1.04	1.10	1.23
Quick Ratio	0.84	0.94	0.99

Exhibit 24: Liquidity ratios
Source: Company report

For this reason, we did not estimate extra financing needs besides the one that derived from the equilibrium of the balance sheet and is implicit on the estimations made. In fact, according to the forecast model used, and the estimations of the drivers, we can see that the decreasing tendency of debt to equity ratio is maintained in the near future.

Efficiency ratios	2016	2017	2018
Asset Turnover	0.52	0.50	0.50
Ebitda Margin	0.36	0.35	0.34

Exhibit 25: Efficiency ratios
Source: Company report

To analyse how well Verizon uses its operational net assets, we computed some **efficiency ratios.** Verizon asset turnover is being stable in approximately 50%, meaning that there isn't a loss of efficiency in using assets to generate revenue during the last five years. However, the company should be aware about its cost efficiency since EBITDA margin is decreasing since 2014, suggesting that measures in improving efficiency should be taken.

Due to this fact, we believe that Verizon is implementing important cost savings (as said, indeed, in its 2018 annual report) so we forecasted improving cost efficiency of 2% in 2020 and 0.8% three years beyond.

Solvency ratio	2016	2017	2018
Debt to equity	4.23	2.54	2.01

Exhibit 26: Solvency ratio
Source: Company report

Regarding **solvency**, the debt to equity ratio is decreasing throughout the years, meaning that the capital structure of the firm is becoming less dependent on debt. We believe that this tendency will continue, and we assist a consistent tendency on debt to equity in our projections.

Coverage ratios	2016	2017	2018
Debt/Ebitda	2.47	2.68	2.59
Ebit/interest expense	6.70	5.81	4.63

Exhibit 27: Coverage ratios
Source: Company report

Moreover, two **coverage ratios** were analysed. The Debt to Ebitda ratio shows that in average Verizon takes 2.6 years in paying its debt using its Ebitda. Moreover, the Ebit to interest ratio indicates that Verizon can generates value through its assets of an average of 4.6 times over its interest expense. These two ratios show that the company is in a healthy shape, when looking to external financing. Considering these values, we believe that in the near future no restructuration on debt or in own capital is needed and current debt conditions in terms of spread could be expected. We reflect these expectations in our projections.

Finally, when looking to Verizon Balance sheet it is seen that intangibles assets represent about 50% of the company total assets. This is a material risk issue as in an event of a huge impairment on these assets, derived from strategical errors, the company could face some problems in sustaining its Balance sheet. Because all business model of Verizon derived from intangibles, we believe that Verizon would sustain this ratio in the future and reflected it in our projections.

Reformulation assumptions

As **Wireless devices payment plan agreements** are purchased to costumers, under a program that they pay lower service fees when comparing to normal service plans, we considered them operational, but noncurrent. The same allocation was done to the **Wireless licenses**, which ones provide Verizon with the exclusive right to utilize certain radio frequency spectrum, to provide wireless communication services. When analysing the liabilities, **deferred income taxes** occur in the normal business activity, but not in a current way.

Moreover, **other assets** were considered to be nonoperating, as they include deposits to the segregated accounts and debt securities. Finally, **other liabilities** include Contract liabilities. This contract arises when Verizon bill its customers and receive consideration in advance of providing the goods or services promised in the contract, which was assumed nonoperating and noncurrent.

Valuation

In order to value Verizon, we used two different models: Discounted Cash Flow Model and the Multiples approach.

Discounted Cash Flow (DCF)

Using a DCF approach, Verizon was valued with a **WACC of 6.86%** and a terminal value growth rate of 3.35%, achieving a weighted-average value per share at a YE 2020 of **$66.90**. Our model assigns a **buy recommendation to Verizon at a YE 2020 target share price**, which represents an **expected return of 14%** to its current share price of $61.05[12] including the expected dividend yield of 4.03%.

[12] Date: 02/01/2020

Using the DCF, we discounted the Unlevered Operating FCF's for an explicit forecast period of 8 years (2021-2028) and the perpetual value of operations as of 2029 at the estimated WACC.

The 3.35% growth rate of Operating FCF's was based on our estimates of the historical return of Verizon on invested capital (ROIC) and the Reinvestment Rate (RR). We calculated a ROIC of 10.43% in our terminal year of 2028. Given that the ROIC is greater than the WACC, we can conclude that **Verizon is in fact creating shareholder value**.

GDP growth rate	
g real	1.94%
US TIPS	0.13%
Implied inflation	1.75%
Nominal GDP g	**3.72%**

Exhibit 28: GDP growth rate estimation
Source: Bloomberg (27/12/2019)

In order to guarantee that there was consistency with the inflation rates, we compared this growth to the **nominal annual average growth of global GDP between 2028 and 2060 of 3.72%**, incorporating the inflation expectations we arrive by computing the difference between US 10 year Government bonds and US 10 year Treasury Inflation Protected Securities. This means that Verizon will keep almost the same weight in the overall economy.

The value of the discounted operations corresponds to $112,534 million and the terminal value is $284,148 million, corresponding to 75% of the total value of the company. We summed to the terminal value the **expected non-core assets and liabilities as of 2020** and subtracted the **Financial Debt** (both market values were assumed equivalent to book values).

The number of shares outstanding is 4,136 million and no share issues or repurchases are expected. The division between Common Equity and Shares Outstanding gives the share price. The correspondent equity value is $276,699 million in comparison to an equity value of $252,490 million as of 2nd January 2020[13].

In what concerns the **WACC**, some assumptions had to be made, such as that debt/equity ratio is constant, and the statutory tax rate and risk of new projects were also assumed constant. Regarding Debt to Equity ratio, although historically the percentage of debt to equity has been decreasing throughout the years, we assumed it would remain constant from 2019 onwards since the company introduced a long-term leverage target in its meeting with the investors on the 21st of February of 2019. This allowed Moody's to change Verizon rating outlook to positive from stable (April 2019). Given this, we were able to use a **single WACC for all CFs**.

Our **cost of equity of 8.54%** was computed using CAPM method[14]. The risk-free used to input into CAPM's formula was considered the last observed value of US

[13] Bloomberg (02/01/2020)
[14] CAPM: Risk Free + Beta unlevered * (Market Risk Premium)

10-year government bond (US10YGOV) of **1.88%**[15]. To this we added the relevered beta of **1.11** multiplied by the market risk premium suggested by common literature of **6.0%**[16].

The beta we considered was computed using the weighted average[17] unlevered[18] rolling (3 years) beta of the industry peers of 0.52 which include AT&T, Charter Communications, T-Mobile, Comcast and CenturyLink. To this value we summed Verizon's unlevered beta debt[19] to get a theoretical Unlevered Beta for Verizon that is 0.71.

Company name	Market Cap (in $m)	Debt (in $m)	E/(E+D)	D/(E+D)	Beta of equity	Unlevered Equity Beta
Verizon	254,475	145,772	64%	36%	0.62	0.39
AT&T	286,648	117,360	71%	29%	0.66	0.47
Charter Communications	119,202	76,158	61%	39%	1.12	0.68
T-Mobile	66,085	21,280	76%	24%	0.67	0.51
Comcast	205,171	107,748	66%	34%	0.99	0.65
CenturyLink	14,631	19,440	43%	57%	1.24	0.53
Average						**0.52**

Table 1- Data used to compute Verizon's Unlevered Equity Beta
Source: Companies reports, Bloomberg

Unlevered Cost of Capital	
Market return	9.08%
Risk-free rate	1.88%
Market risk premium	6.00%
Unlevered Beta	0.71
Unlevered Cost of Capital	6.11%
Relevered beta	**1.11**
Cost of Debt	**4.98%**
Cost of Equity	**8.54%**
D/EV	36.42%
E/EV	63.58%
1-Statuatory Tax Rate	79.00%
WACC	**6.86%**

Exhibit 13: WACC estimation
Source: Bloomberg, Mckinsey Valuation, OECD, Analysts estimates

After that, we had to re-lever the computed beta to Verizon's target debt-to-equity ratio using the current market values as proxy (58%). **We arrived to a relevered beta of 1.11**.

The **after-tax cost of debt of 3.93%** was calculated with the probability of default and the loss given default[20]. The Yield (5.84%) was computed by doing the sum of the risk-free rate with the spread according to Verizon's credit rating Baa1 according to Moody's. According to the Annual Default Study done by Moody's, measured by post-default trading prices the issuer-weighted average recovery rate for senior unsecured bonds was 53.9% in 2017 and the probability of these bonds to default was 1.87%.

The target mix between debt and equity was expected the same as the current market values. **Considering all these assumptions, we arrived at a WACC of 6.86%**.

Multiples

We also computed a multiple valuation in order to see Verizon's value relative to the market perception on the other companies that we see as comparables. For

[15] Bloomberg (27/12/2019)
[16] Copeland, T. E., Koller, T., & Murrin, J. (2005). Measuring and Managing the Value of Companies. McKinsey & Company.
[17] Market cap for each company used as a correspondent weight
[18] $\beta_U = (E/(E+D))*\beta_E + (D/(E+D))*\beta_D$
[19] Beta debt was calculated using CAPM
[20] R_d = Yield to Maturity - Prob$_{(default)}$ * Expected Loss Rate

this analysis we used the following comparable: AT&T, Charter Communications, T-Mobile, Comcast Corporation and CenturyLink. We decided to exclude Sprint since its financials differ a lot when comparing to Verizon.

We were able to retrieve from Bloomberg data from eleven comparable firms. Chosen multiples were EV/EBITDA, EV/EBIT and EV/Revenue and were computed based on the information from the year of 2018. After multiplying Verizon's expected EBITDA, EBIT and Revenue of 2019 by each of the ratios, our median of the mean equity value across multiples was of **$65.43**, which is above its current price of 61.05$[21]. Nevertheless, we believe that Verizon should be more valuable than many of other companies from the telecom industry due to its market share and the fact it was the first to launch on the market the 5G. These growth opportunities are not all linked to the telecommunication industry, and that is why we consider that the DCF valuation captures the value of VZ in a more appropriate way.

Median	Multiple	Implied Share Price
EV/ EBITDA	8.8x	76.45
EV/EBIT	16.7x	63.51
EV/Revenue	2.6x	56.33

Exhibit 29: Multiples valuation
Source: Bloomberg (27/12/2019)

Scenario analysis

Verizon's valuation is dependent on four variables that are not only under Verizon's control, which are: **the churn rate, the 5G impact, the market share and the ARPU**. These four variables are dependent not only on the company's efforts to be successful, but also in Verizon's competitor's behavior. Therefore, we computed three scenarios so to analyze the risk that our assumptions carry on. Our base scenario is the one we shown in the report and the one we believe it is more probable to happen (60%). Both the best and worst case scenario were weighted with the same probability of 20%.

Scenario	Probability	Share Price
Worst Case	20%	$ 58.37
Base Case	60%	$ 66.90
Best Case	20%	$ 80.41
Average		$ 67.90

Exhibit 30: Scenario Analysis
Source: Analysts estimates

In the **worst case scenario (20%)**, we assumed zero 5G impact, an increase of 0.5% in churn rate given the possibility of Verizon not rolling out 5G at the same time as its competitors and a continuous decrease for Verizon's ARPU as it has been verified in the past. We also revise downwards our expectation regarding Verizon's market share from 35% to 34%. With all these assumptions, we get a **share price for YE 2020 of $58.37**, which still represents a downside of 4% from the current share price. Summing it with the expected dividend yield would give investors a positive return of 4% but it would change our recommendation to hold.

Finally, our **best-case scenario (20%)**, considers an increase of 0.5% 5G impact above our base model, a decrease of 0.5% in churn rate assuming that Verizon will be able to mitigate its churn[22], an ARPU maintenance since 2019 and an

[21] Bloomberg (02/01/2020)
[22] Verizon Investor meeting presentation, 2019

increase of 1% in Verizon's market share. With these assumptions, we get a **share price for YE 2020 of $80.41**, which is an upside of 32% from the current share price, highlight our buy recommendation.

Considering the probabilities of each scenario, we get a **target price YE 2017 of $67.90 per share** which would **reiterate our initial buy recommendation.**

Sensitivity Analysis

In addition to computing the scenario analysis, we conducted a sensitivity analysis of our model to see and analyze the impact a change in a specific input would have on our target stock price. All these analysis were applied to the price we got in the DCF model.

Risk free/ Default spread

The risk-free rate is a crucial metric in our valuation model since it affects both the cost of debt and the cost of equity. In fact during the past five years, the US10YGOV has vary between a maximum of 3.23% (5/10/2018) and a minimum of 1.36% (8/07/2016). In order to determine the default spread we used a current Verizon bond with the same maturity as the 10-year US treasury bond. Since we believe the credit rating of Verizon won't change, we chose to keep the spread consistent. Nevertheless, we decided to apply a sensitivity analysis of the **price obtained in the DCF relative to the risk free and to the default spread.**

Default spread \ Risk free	1.4%	1.6%	1.9%	2.6%	3.2%
1.5%	77.21	70.09	63.91	51.11	41.55
1.7%	79.17	71.78	65.38	52.18	42.36
1.9%	81.20	73.53	**66.90**	53.28	43.20
2.1%	83.31	75.34	68.48	54.41	44.05
2.3%	85.51	77.22	70.10	55.58	44.93

Exhibit 31: Sensitivity Analysis: Risk free vs default spread
Source: Analysts estimates

What we see from the analysis of the price relative to both these assumptions is that the price is sensible to variations of both values, varying between $44.93 and $77.21 per share. Given an 1.9% risk free rate, even though the default spread might change it wouldn´t change our recommendation of the target price.

RR/ ROIC

We also did a sensitivity analysis of the **price relative to the ROIC and to the Reinvestment Rate (RR)** since they are the ones determining our perpetual growth rate. In this analysis, the RR was tested to vary 1% and the ROIC 0.25%. What we can conclude is that, again, the price is sensible to variations of both values, varying between $60.31 and $75.5 per share. The price of $60.31 reflects a decrease of 10% from our target price and might change out our recommendation.

ROIC \ RR	30%	31%	32%	33%	34%
9.9%	60.31	62.01	63.80	65.69	67.68
10.2%	61.59	63.40	65.32	67.34	69.49
10.4%	62.92	64.85	**66.90**	69.08	71.39
10.7%	64.30	66.37	68.56	70.90	73.39
10.9%	65.75	67.95	70.30	72.81	75.50

Exhibit 32: Sensitivity Analysis: RR vs ROIC
Source: Analysts estimates

ARPU/ Market share

Since both ARPU and the market share are assumptions that highly influence the wireless service revenue, we wanted to see the target stock price volatility that would happen from modifying both them. In fact, in our report we expect that Verizon will maintain its market share constant over the years (35%) and that the

Market share \ ARPU	0%	10%	20%	30%	40%
33%	60.97	64.65	66.32	66.97	67.21
34%	61.18	64.91	66.61	67.27	67.52
35%	61.40	65.18	**66.90**	67.58	67.84
36%	61.62	65.45	67.21	67.90	68.16
37%	61.85	65.73	67.52	68.22	68.49

Exhibit 33: Sensitivity Analysis: Wireless ARPU vs market share
Source: Analysts estimates

ARPU would deaccelerate its decrease about 20% over the years. We computed a sensitivity for a 1% to 2% change in the market share and a 10% to 20% change in the deacceleration of the decrease in the ARPU.

With a decrease in the market share of 2% and believing that the decrease in the ARPU wouldn't deaccelerate, the stock price decreases by 10%.

Final Valuation Remarks

We conclude that Verizon has a potential upside that can be verified in the target price as of 2020. However, as there is uncertainty, there is the possibility that investors do not value the potential of 5G investment impact on Verizon without witnessing tangible results. Due to these and to other risks stated above, we were conservative in some of the assumptions we made. Still, **we emphasize our buy recommendation for Verizon, as we do believe on the high potential upside it can reach in the long-term**.

Appendix

Revenue Value Drivers

Wireless Value drivers	2014	2015	2016	2017	2018	2019 E	2020 F	2021 F	2022 F	2023 F	2024F	2025F	2026F	2027F	2028F
All values in $ thousands except ARPA															
Market Share forecast															
Total wireless carriers subscribers USA	368,600	395,590	416,610	424,300	441,070	453,857	468,150	484,063	501,727	521,290	541,615	562,734	584,675	607,472	631,159
Y/Y		7%	5%	2%	4%	3%	3%	3%	4%	4%	4%	4%	4%	4%	4%
Verizon market share	36%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
Verizon subscribers	131,890	140,100	145,740	150,460	153,970	158,434	163,423	168,978	175,144	181,973	189,069	196,441	204,100	212,058	220,327
Retail connections forecast															
Retail postpaid connections	102,079	106,528	108,796	110,854	113,353	113,910	114,623	115,557	116,727	118,016	119,190	120,246	121,168	121,938	122,553
New additions		5,429	3,344	3,157	3,641	1,693	1,855	2,083	2,328	2,459	2,357	2,251	2,128	1,984	1,838
Churn rate	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Loss		980	1,076	1,099	1,142	1,136	1,142	1,149	1,158	1,170	1,183	1,195	1,205	1,215	1,222
Retail prepaid connections	6,132	5,580	5,447	5,403	4,646	4,342	4,084	3,805	3,488	3,247	3,020	2,800	2,593	2,408	2,235
Y/Y		-9%	-2%	-1%	-14%	-7%	-6%	-7%	-8%	-7%	-7%	-7%	-7%	-7%	-7%
Loss		552	133	44	757	304	258	279	317	241	227	219	207	185	173
Retail connections	108,211	112,108	114,243	116,257	117,999	118,251	118,707	119,362	120,215	121,263	122,210	123,046	123,762	124,346	124,788
Conversion rate	82%	80%	78%	77%	77%	75%	73%	71%	69%	67%	65%	63%	61%	59%	57%
ARPU forecast															
ARPU	56	52	49	45	45	44	43	43	43	43	42	42	42	42	42
ARPU (% growth)		-6%	-7%	-7%	-2%	-1%	-1%	-1%	-1%	-1%	0%	0%	0%	0%	0%
Wireless service forecast (Values in $ millions)															
Wireless service	72,668	70,462	66,580	63,121	63,020	62,329	61,915	61,736	61,761	61,966	62,182	62,393	62,584	62,742	62,854
Equipment forecast															
Equipment revenue	10,957	16,924	17,515	18,889	22,258	24,422	26,797	29,403	32,262	35,400	38,842	42,619	46,763	51,311	56,300
Y/Y		54%	3%	8%	18%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Other forecast															
Other revenue	4,021	4,294	5,091	5,501	6,456	6,873	7,706	8,419	9,198	10,136	11,106	12,180	13,375	14,671	16,097
% equipment	37%	25%	29%	29%	29%	28%	29%	29%	29%	29%	29%	29%	29%	29%	29%
Total Wireless revenue	87,646	91,680	89,186	87,511	91,734	93,624	96,418	99,559	103,222	107,502	112,130	117,192	122,723	128,723	135,251

Wireline Value drivers	2014	2015	2016	2017	2018	2019 E	2020 F	2021 F	2022 F	2023 F	2024F	2025F	2026F	2027F	2028F
All values in $ thousands except ARPA															
Fios Internet subscribers	6,616	7,034	5,653	5,850	6,067	6,285	6,511	6,748	6,992	7,244	7,506	7,778	8,059	8,350	8,652
Y/Y		6%	-20%	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Fios video subscribers	5,649	5,827	4,694	4,619	4,377	4,124	3,865	3,603	3,340	3,080	2,825	2,577	2,338	2,109	1,892
Y/Y		3%	-19%	-2%	-5%	-6%	-6%	-7%	-7%	-8%	-8%	-9%	-9%	-10%	-10%
Fios digital voice subscribers	4,602	4,754	3,895	3,905	3,803	3,640	3,515	3,379	3,255	3,133	3,017	2,904	2,796	2,692	2,592
Y/Y		3%	-18%	0%	-3%	-4%	-3%	-4%	-4%	-4%	-4%	-4%	-4%	-4%	-4%
Fios ARPU	63	65	70	68	70	72	74	75	77	79	80	82	84	86	88
Y/Y		4%	8%	-3%	3%	3%	3%	3%	1%	2%	2%	2%	2%	2%	2%
Fios revenue (in millions)	12,674	13,763	11,996	11,691	11,913	12,075	12,272	12,439	12,495	12,683	12,885	13,100	13,329	13,580	13,883
Other wireline revenues	20,119	17,387	18,514	18,989	17,847	17,376	17,394	17,411	17,206	16,875	16,688	16,554	16,391	16,194	15,999
Y/Y		-14%	6%	3%	-6%	-3%	0%	0%	-1%	-2%	-1%	-1%	-1%	-1%	-1%
Total Wireline revenue	32,793	31,150	30,510	30,680	29,760	29,452	29,666	29,850	29,701	29,558	29,573	29,653	29,720	29,775	29,882

Financial Statements

Income statement	2014	2015	2016	2017	2018	2019 E	2020 F	2021 F	2022 F	2023 F	2024F	2025F	2026F	2027F	2028F
OPERATING															
Revenues															
Total Wireless	87,646	91,680	89,186	87,511	91,734	93,624	96,418	99,559	103,222	107,502	112,130	117,192	122,723	128,723	135,251
Total Wireline	32,793	31,150	30,510	30,680	29,760	29,452	29,666	29,850	29,701	29,558	29,573	29,653	29,720	29,775	29,882
Corporate and Other	6,640	8,790	6,284	7,843	9,369	9,368	9,471	9,591	9,719	9,884	10,077	10,296	10,536	10,796	11,083
Total Operating Revenues	127,079	131,620	125,980	126,034	130,863	132,444	135,555	139,000	142,641	146,943	151,780	157,142	162,979	169,293	176,216
Cost of Goods Sales	- 49,931	- 52,557	- 52,701	- 53,063	- 55,508	- 54,454	- 58,444	- 61,041	- 63,782	- 66,881	- 70,297	- 74,037	- 78,091	- 82,471	- 87,253
Gross Profit	**77,148**	**79,063**	**73,279**	**72,971**	**75,355**	**77,990**	**77,111**	**77,958**	**78,859**	**80,062**	**81,483**	**83,105**	**84,888**	**86,822**	**88,963**
Selling, General and Administrative Expenses	- 41,016	- 29,986	- 28,102	- 28,592	- 31,083	- 30,350	- 31,062	- 31,852	- 32,686	- 33,672	- 34,780	- 36,009	- 37,347	- 38,794	- 40,380
Depreciations and Amortizations	- 16,533	- 16,017	- 15,928	- 16,954	- 17,403	- 16,682	- 16,793	- 16,902	- 17,162	- 17,437	- 17,694	- 18,031	- 18,415	- 18,830	- 19,274
Goodwill impairments	-	-	-	-	- 4,591	- 2,136	- 1,936	-	-	-	-	-	-	-	-
Operating income before interest income	19,599	33,060	29,249	27,425	22,278	28,823	27,319	29,204	29,010	28,953	29,009	29,064	29,126	29,198	29,309
Interest Income	108	115	59	82	94	90	93	97	98	101	105	108	112	117	122
Operating income before taxes	**19,707**	**33,175**	**29,308**	**27,507**	**22,372**	**28,913**	**27,412**	**29,301**	**29,109**	**29,054**	**29,114**	**29,172**	**29,238**	**29,315**	**29,430**
Operating taxes	- 4,867	- 11,592	- 10,291	7,536	- 4,161	- 5,158	- 4,890	- 5,227	- 5,192	- 5,183	- 5,193	- 5,204	- 5,216	- 5,229	- 5,250
Net Operating income	14,840	21,583	19,017	35,043	18,210	23,755	22,523	24,074	23,916	23,871	23,921	23,969	24,023	24,086	24,180
NON OPERATING															
Other components of net periodic benefit income	-	-	- 2,190	- 11	3,068	-	-	-	-	-	-	-	-	-	-
Equity in losses of unconsolidated businesses	1,780	- 86	- 98	- 77	- 186	-	-	-	-	-	-	-	-	-	-
Other net	- 1,302	71	- 1,658	- 2,092	- 798	- 798	- 798	- 798	- 798	- 798	- 798	- 798	- 798	- 798	- 798
Non Operating income before taxes	478	- 15	- 3,946	- 2,180	2,084	- 798	- 798	- 798	- 798	- 798	- 798	- 798	- 798	- 798	- 798
Non Operating taxes	- 167	5	1,381	763	- 438	168	168	168	168	168	168	168	168	168	168
OCI	- 1,270	- 561	2,123	- 14	- 919	- 124	- 81	31	- 362	- 325	- 172	- 182	- 202	- 249	- 226
Net Non Operating income	- 959	- 571	- 442	- 1,431	727	- 754	- 712	- 600	- 992	- 956	- 803	- 812	- 833	- 879	- 856
FINANCIAL															
Interest Expense	- 4,915	- 4,920	- 4,376	- 4,733	- 4,833	- 4,996	- 4,575	- 4,513	- 4,300	- 4,189	- 4,060	- 3,949	- 3,875	- 3,817	- 3,781
Tax Shield	1,720	1,722	1,532	1,657	1,015	1,049	961	948	903	880	853	829	814	802	794
Net Financial Profit	- 3,195	- 3,198	- 2,844	- 3,076	- 3,818	- 3,947	- 3,615	- 3,565	- 3,397	- 3,310	- 3,207	- 3,120	- 3,062	- 3,016	- 2,987
Comprehensive result	**10,686**	**17,814**	**15,731**	**30,536**	**15,120**	**19,055**	**18,196**	**19,909**	**19,526**	**19,606**	**19,911**	**20,036**	**20,128**	**20,191**	**20,337**

Balanche Sheet	2014	2015	2016	2017	2018	2019 E	2020 F	2021 F	2022 F	2023 F	2024F	2025F	2026F	2027F	2028F
OPERATING															
Current Assets															
Operating Cash	1,271	1,316	1,260	1,260	1,309	1,324	1,356	1,390	1,426	1,469	1,518	1,571	1,630	1,693	1,762
Accounts Receivable, net allowances	13,993	13,457	17,513	23,493	25,102	25,405	26,002	26,663	27,361	28,187	29,114	30,143	31,262	32,474	33,802
Average Collection Period (in days)	40	37	51	68	70	70	70	70	70	70	70	70	70	70	70
Inventories	1,153	1,252	1,202	1,034	1,336	3,001	3,071	3,149	3,232	3,329	3,439	3,560	3,692	3,835	3,992
Average Holding Period (in days)	8	9	8	7	9	8	8	8	8	8	8	8	8	8	8
Prepaid Expenses and Other	2,648	2,034	3,918	3,307	5,453	3,584	3,837	4,292	4,398	4,665	4,517	4,762	5,004	5,192	5,399
Non-Current Assets															
Property, Plant and Equipment, net	89,947	83,541	84,751	88,568	89,286	92,045	93,748	94,994	95,510	96,456	98,067	99,741	101,469	103,414	105,631
Wireless licenses	75,341	86,575	86,673	88,417	94,130	95,930	98,860	102,068	105,455	108,636	112,211	116,175	120,491	125,159	130,277
Goodwill	24,639	25,331	27,205	29,172	24,614	22,479	20,543	20,543	20,543	20,543	20,543	20,543	20,543	20,543	20,544
Other intangible assets, net	5,728	7,592	8,897	10,247	9,775	9,893	10,125	10,383	10,655	10,976	11,337	11,738	12,174	12,646	13,163
Wireless Device Payment Plan Agreement Receivable	1,132	1,155	4,458	5,546	5,037	5,204	5,503	5,485	5,675	5,870	6,030	6,257	6,492	6,737	7,016
Total Operating Assets	215,852	222,253	235,877	251,044	256,042	258,865	263,045	268,966	274,253	280,131	286,777	294,491	302,757	311,692	321,585
Current Liabilities															
Accounts Payable	5,598	6,391	7,084	7,063	7,232	6,891	7,053	7,232	7,421	7,645	7,897	8,176	8,480	8,808	9,168
Average Payable Period (in days)	16	18	21	20	20	19	19	19	19	19	19	19	19	19	19
Accrued Liabilities	11,082	12,971	12,509	14,169	15,269	13,594	14,590	15,238	15,922	16,696	17,549	18,483	19,495	20,588	21,782
Contract Liability	3,125	2,969	2,914	4,050	4,207	3,564	3,648	3,741	3,839	3,955	4,085	4,229	4,386	4,556	4,742
Other current liabilities	3,140	3,446	2,789	1,873	1,520	2,146	2,197	2,252	2,311	2,381	2,460	2,546	2,641	2,743	2,856
Non-Current Liabilities															
Deferred Income Taxes	41,563	45,484	45,964	31,232	33,795	40,372	38,277	40,914	40,646	40,570	40,653	40,735	40,827	40,934	41,095
Employee benefit obligations excluding postretireme	1,846	1,602	1,430	1,415	1,659	1,592	1,654	1,699	1,776	1,872	1,945	2,031	2,131	2,242	2,362
Total Operating Liabilities	66,354	72,863	72,690	59,802	63,682	68,160	67,418	71,077	71,915	73,119	74,589	76,200	77,959	79,872	82,005
Total Operating Invested Capital	149,498	149,390	163,187	191,242	192,360	190,705	195,627	197,889	202,338	207,012	212,188	218,290	224,798	231,820	239,580
NON OPERATING															
Current Assets															
Short-term investments	555	350	-	-	-	-	-	-	-	-	-	-	-	-	-
Assets held for sale	552	792	882	-	-	-	-	-	-	-	-	-	-	-	-
Other assets	3,386	5,493	2,183	2,466	5,088	3,246	3,600	3,978	3,608	3,729	3,771	3,703	3,734	3,736	3,724
Non-Current Assets															
Investments in unconsolidated businesses	802	796	1,110	1,039	671	940	883	831	885	867	861	871	866	866	868
Non-current assets held for sale	921	10,267	613	-	-	-	-	-	-	-	-	-	-	-	-
Total Non Operating Assets	6,216	17,698	4,788	3,505	5,759	4,186	4,483	4,809	4,493	4,595	4,632	4,573	4,600	4,602	4,592
Current Liabilities															
Liabilities related to assets held for sale	-	463	24	-	-	-	-	-	-	-	-	-	-	-	-
Non-Current Liabilities															
Pension and health plans	31,434	28,355	24,736	20,697	16,940	13,083	10,174	7,466	4,805	2,665	525	- 1,615	- 3,755	- 5,895	- 8,035
Non-current liabilities related to assets held for sale	-	959	6	-	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	4,830	7,921	8,519	9,935	12,050	10,168	10,718	10,979	10,621	10,773	10,791	10,728	10,764	10,761	10,751
Total Non Operating Liabilities	36,264	37,698	33,285	30,632	28,990	23,251	20,892	18,445	15,426	13,438	11,316	9,113	7,009	4,866	2,716
Total Non Operating Invested Capital	- 30,048	- 20,000	- 28,497	- 27,127	- 23,231	- 19,065	- 16,408	- 13,635	- 10,934	- 8,842	- 6,683	- 4,540	- 2,409	- 264	1,876
FINANCIAL															
Financial Assets															
Excess Cash	9,327	3,154	1,620	819	1,436	-	-	-	-	-	-	-	-	-	-
Financial Intruments	1,221	1,070	1,895	1,775	1,592	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511
Total Financial Assets	10,548	4,224	3,515	2,594	3,028	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511
Financial Liabilities															
Debt maturing within one year	2,735	6,489	2,645	3,453	7,190	7,190	7,190	7,190	7,190	7,190	7,190	7,190	7,190	7,190	7,190
Long-term debt	110,536	103,240	105,433	113,642	105,873	96,362	94,942	90,132	87,626	84,695	82,184	80,521	79,206	78,387	78,230
Financial Instruments	744	3,720	3,720	2,498	1,872	2,953	2,953	2,953	2,953	2,953	2,953	2,953	2,953	2,953	2,953
Total Financial Liabilities	114,015	113,449	111,798	119,593	114,935	106,505	105,085	100,275	97,769	94,837	92,327	90,663	89,348	88,529	88,372
Net Debt	- 103,467	- 109,225	- 108,283	- 116,999	- 111,907	- 104,994	- 103,574	- 98,764	- 96,258	- 93,327	- 90,816	- 89,153	- 87,838	- 87,019	- 86,861
EQUITY															
Common Stockholder's Equity	15,983	20,165	26,407	47,116	57,222	66,645	75,644	85,490	95,146	104,842	114,689	124,598	134,552	144,537	154,594
Stockholders Equity	15,983	20,165	26,407	47,116	57,222	66,645	75,644	85,490	95,146	104,842	114,689	124,598	134,552	144,537	154,594

Cash Flow Statement	2015	2016	2017	2018	2019 E	2020 F	2021 F	2022 F	2023 F	2024F	2025F	2026F	2027F	2028F
OPERATING ACTIVITIES														
EBIT	33,175	29,308	27,507	22,372	28,913	27,412	29,301	29,109	29,054	29,114	29,172	29,238	29,315	29,430
Notional income taxes	-11,611	-10,258	-9,627	-4,698	-6,072	-5,757	-6,153	-6,113	-6,101	-6,114	-6,126	-6,140	-6,156	-6,180
Tax adjustments	19	-33	17,164	537	914	867	926	920	919	921	922	924	927	931
NOPLAT	21,583	19,017	35,043	18,210	23,755	22,523	24,074	23,916	23,871	23,921	23,969	24,023	24,086	24,180
Depreciations and Amortization	-16,017	-15,928	-16,954	-17,403	-16,682	-16,793	-16,902	-17,162	-17,437	-17,694	-18,031	-18,415	-18,830	-19,274
Gross Cash Flow from Operations	37,600	34,945	51,997	35,613	40,437	39,316	40,976	41,078	41,309	41,614	42,000	42,438	42,916	43,455
INVESTING ACTIVITIES														
Net Capital Expenditures	-7,917	-15,437	-18,558	-15,904	-17,321	-16,326	-15,942	-15,368	-16,003	-16,867	-17,181	-17,523	-18,046	-18,654
Δ Net Working Capital	3,532	-5,658	-2,427	-2,679	-2,773	291	-308	48	-120	296	-91	-80	-14	-20
Goodwill	-692	-1,874	-1,967	4,558	2,136	1,936	-	-	-	-	-	-	-	-1
Intangible Assets (wireless licenses and other)	-14,792	-3,104	-5,307	-7,458	-4,038	-5,333	-5,671	-5,968	-5,883	-6,374	-6,889	-7,372	-7,869	-8,473
Δ Other Operating Assets and Liabilities	3,960	-3,652	-16,751	2,963	6,970	-2,282	2,756	-322	-105	75	27	51	76	114
Gross Cash Flow from Investing	-15,909	-29,725	-45,010	-18,520	-15,027	-21,715	-19,165	-21,611	-22,111	-22,870	-24,133	-24,923	-25,852	-27,034
Operating and Investing Unlevered FCF	21,690	5,220	6,988	17,093	25,410	17,601	21,811	19,467	19,198	18,744	17,867	17,514	17,064	16,420
NON OPERATING														
EBIT	71	-3,848	-2,103	2,270	-798	-798	-798	-798	-798	-798	-798	-798	-798	-798
Equity in losses of unconsolidated businesses	-86	-98	-77	-186	-	-	-	-	-	-	-	-	-	-
Notional Taxes	5	1,381	763	-438	168	168	168	168	168	168	168	168	168	168
Other Comprehensive Income	-561	2,123	-14	-919	-124	-81	31	-362	-325	-172	-182	-202	-249	-226
Other non-operating assets and liabilities	-10,048	8,497	-1,370	-3,896	-4,166	-2,657	-2,773	-2,702	-2,091	-2,159	-2,144	-2,131	-2,145	-2,140
Non-operating Unlevered FCF	-10,619	8,055	-2,801	-3,169	-4,920	-3,369	-3,373	-3,694	-3,047	-2,962	-2,956	-2,964	-3,024	-2,996
Tax Shield	1,722	1,532	1,657	1,015	1,049	961	948	903	880	853	829	814	802	794
Levered FCF	12,793	14,807	5,843	14,939	21,540	15,193	19,386	16,676	17,031	16,635	15,740	15,364	14,842	14,218
FINANCING ACTIVITIES														
Interest expense	-4,920	-4,376	-4,733	-4,833	-4,996	-4,575	-4,513	-4,300	-4,189	-4,060	-3,949	-3,875	-3,817	-3,781
Δ Financial Debt	5,758	-942	8,717	-5,093	-6,912	-1,420	-4,810	-2,506	-2,931	-2,511	-1,663	-1,315	-819	-157
Dividends paid														
Transaction with shareholders and other movements	-13,632	-9,489	-9,827	-5,014	-9,631	-9,198	-10,063	-9,870	-9,910	-10,064	-10,128	-10,174	-10,206	-10,279
Payout ratio	-1	-1	-0	-0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Financing FCF	-12,793	-14,807	-5,843	-14,939	-21,540	-15,193	-19,386	-16,676	-17,031	-16,635	-15,740	-15,364	-14,842	-14,218

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Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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THE LITTLE DOWNSIDE RISK OF 5G TO VERIZON

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Abstract

This sensitivity analysis was done so to understand the 5G impact in Verizon. I have computed three scenarios to determine the risk underlying the 5G assumptions. I estimated a share price for YE 2020 of $67.73 which represents an expected return for investors of 15%.

Verizon
5G
Internet of Things
Exponential Growth

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Individual Part: The little downside risk of 5G to Verizon (Rita Pinto da Silva)

Probably, the biggest technological wave sweeping the world now is the adoption of the **5G, the latest cellular network technology**. 5G delivers a very big improvement in functionality over 4G — it is 100 times faster and has 1,000 times[1] more capacity. Although global 5G coverage is expected to be implemented in 2020, already, certain companies have begun making their own provisions. For instance, Verizon already claimed to have 5G coverage in about 19 selected US cities, with more to come through to 2020. In order to do a deep approach to 5G's impact I have computed a set of three scenarios to determine the risk underlying the 5G assumptions. The base case is the one shown in the whole report and the one I think is more likely to happen (60%). In this case, we assumed a growth of 0.25% in the number of total wireless carriers' subscribers in the US due to 5G new types of revenues, IoT, mobile payments and others. Regarding the ARPU, we assumed its decrease would deaccelerate 20% over the years but wouldn't be linked to the impact of 5G. In that scenario I also believe that the Capital Expenditures as of 2019 will be 17,500. With these 5G assumptions alongside all the other, the share price for YE20 was of $66.90 (upside of 10% to its current price). The worst and best scenario will be explained below.

<u>5G Impact in Price</u>

According to a survey[2] done in the US, 37% of respondents nowadays have unlimited data plans (up from 25% in 2017). Providers are now offering reduced prices for these plans as well as a variety of bundled services, reducing the average revenue per user (ARPU). In order to balance the competitive landscape and perhaps the fact that prices will stabilize, telecom companies are expected to look for new opportunities and expand their boundaries. Though the consensus says that 5G will not substantially change the eroded pricing of the

[1] PwC. (2019). Making 5G pay: Monetizing the impending revolution in communications infrastructure
[2] Delloite (2018). 2018 Global Mobile Consumer Survey (US Edition)

telecom industry mainly due to competition, I think there might be a small probability that 5G might allow telecom providers a valuable chance to see a greater return on their investment. The fact that telecommunication firms use a B2B model along with its potential for premium pricing and additional innovations, could also generate new pricing models were carriers would be able to charge more for superior performance versus usage.

In fact, a recent PwC research[3] shows that just one-third of Internet users would pay more for 5G technology — 33 percent would do so for 5G in the home, while 31 percent on mobile. There may be some segments, such as gaming, in which consumers will be willing to pay incrementally more for a better experience. Therefore, there is a probability that Verizon may be able to better price its services due to 5G. This probability was incorporated in the **best scenario considering an increase in the wireless ARPU from 2020 onwards in 0.5% per annum due to 5G**. This increase allows achieving an ARPU of $45.79 in 2028.

5G Impact in Clients

Due to high competition, one of the most important factors for 5G for the next few years will be how well each Telecom convinces potential customers that its product is the best or the best value. In this field, Verizon has been working well and, on the 11th of September of 2019, the chief executive of Verizon's consumer business reiterated that the operator would begin **offering a refreshed 5G Home fixed wireless service at the beginning of next year**.

5G, is capable of delivering speeds of more than 100 Mbps to the home, especially in the millimetre wave range, making it a viable substitute to wired broadband in several markets, particularly in fibre-free markets. As such, I believe that 5G might be an indeed new form of revenue stream for wireless carriers, mainly in regions where consumers don't have access to fiber at home and cable broadband yet. Verizon's fixed wireless (wired broadband) efforts reflect the operator's desire to pair its mobile 5G offerings for smartphones with a stationary,

[3] PwC. (2018). *Consumer Intelligence Series: The promise of 5G: Consumers are intrigued, but will they pay?*

5G-powered Internet service piped into users' homes and offices. In many places on the US, a consumer's broadband internet provider is also his cable TV provider so, this also represents the company's most direct attack yet against cable companies such as Comcast and Charter Communications, which have based much of their business around selling Internet connections to residential and business users. Based on the information exposed above, the **best scenario incorporates a potential increase in the number of subscribers by 0.5%.** I also considered a worst-case scenario were the total carrier subscribers would decrease by 0.25% YOY. This arises from the possibility of Verizon not being able to monetize as fast as its competitors the 5G. In this case, its subscribers would probably change to another carrier.

Impact in revenues

Once available, 5G is likely to create many revenue-generating opportunities for telecom firms, by helping them gain revenue in the business-to-business (B2B) opportunities (IoT and smart cities) and fixed broadband market. The impact 5G will have in artificial intelligence will also create the possibility for telecom providers to customize their offering.

Internet of Things

Existing networks are struggling to keep up with the exponential growth in the number of connected devices. In fact, 5G will allow to unlock the IoT's potential by having more connections at once (up to one million per square kilometer[4]) at very low power. Although this could generate extra monthly revenues for carries, due to low usage, average IoT revenues for mobile broadband will be a small percentage of those. One of 5G’s applications is self-driving cars which have high seamless coverage constraints. Autonomous-vehicle data could raise global wireless traffic over current levels by 40 times, providing an Iphone-like boost in 2007 for telcos. For this reason, the **upside scenario also accounts for an increase**

[4] EY (2019). 5G is redefining telecoms fast. Are you up to speed?

in total wireless revenues around 1% from 2022 onwards since according to specialists' autonomous cars will only be available by that time.

Other revenues

Other than the opportunities already identified there are two business opportunities which I believe are worth being explored, mHealth (mobile health) and mPayments (mobile payment). Mobile health stands for the practice of medical support through commonly used mobile devices. This would allow telecom operators to monetize services namely by making online medical appointments an accessible solution but also by supporting the deployment of a numerous amount of parallel practices such as medication dosages and vital signs monitorization, which together, would sustain the subscribers' necessity of such services. Mobile operators, on the other hand, can play a distinct part in the world of mPayments: as an integrator for apps, devices, mobile payment methods, and customer identity management. In fact, one study[5] estimated that this strategy might help telecommunications providers increase their revenue from mobile payments by at least four times by 2022. According to a study conducted by Morgan Stanley[6], these other revenues could drive $156 billion of incremental US annual revenues by 2030. Since Verizon market share is 35% this impact can be of $54.6 billion. **This can be translated in approximately an impact of $5.46 bn per year from 2020 until 2030 and is reflected in the upside scenario.**

Impact in capex

One of the big issues of 5G technology is how much will global telecommunication companies spend to build their network. The initial costs of the 5G infrastructure improvements may be enormous and are expected to be 1.7 times de cost of building 4G. One of the key parts of these costs has to do with the high cost of acquiring spectrum since

[5] ACI Worldwide (2018). The Mobile Payments Opportunity for Telcos
[6] Morgan Stanley (2019). For Investors, Could 5G Stream Higher Share Prices?

5G needs new spectrum across distinct frequencies in order to operate efficiently. The 10% expected increase in capital expenditures by 2019 (base case) is mainly due to Verizon's 5G labs launch where they work in collaboration with start-ups, universities and enterprise teams to build a 5G-powered world. Verizon currently has 5 labs in the United Stated in which it aims to develop and test 5G solutions across remote different areas such as healthcare, education, cloud gaming, cybersecurity and mixed reality. Verizon CEO said that "Verizon has been actually for several years investing to be prepared for the 5G and that this is included in the capex guidance for this year.". For 2019, the company **expects the capital expenditures to be in the range of 17 to 18 billion $** due to 5G implementation. In our base case, we assumed Capex to increase to 17.5 billion in 2019. **For an upside and downside case we expected that capex could reach the maximum expected for 2019 and then grow 2% over the forecasted years**.

Conclusion

I truly believe the impact of 5G will be positive and that Verizon will be one of the first carriers allowing its customers to enjoy 5G. Nevertheless, and in order to be conservative, I considered there is as 20% probability of the worst case and best case to happen. Taking into consideration the above exposed assumptions for the different scenarios, I estimated a share price for YE 2020 of $67.73, which represents an expected return for investors of 15% (upside of 11% from the current share price), reinforcing again the buy recommendation.

	ARPU	Capex	Subscribers	Other revenues	IoT	Share Price	Probability
Base Scenario	0% change due to 5G	2019 - Capex of 17,500 0% change afterwards	0.25% increase in total wireless carriers subscribers USA y/y	-	-	66,90	70,00%
Best Scenario	0.5% increase due to 5G from 2020 onwards	2019-Capex of 18,000 2% increase on the next 2y	0.5% increase in Verizon's subscribers y/y	S5.46bn annual increase in total wireless revenues from 2020 until 2028	0.5% increase in total wireless revenues from 2022 onwards	76,90	20,00%
Worst Scenario	0% change due to 5G	2019-Capex of 18,000 2% increase on the next 2y	0.25% decrease in total wireless carriers subscribers USA y/y	-	-	59,92	10,00%

Table I: Scenario Analysis – Assumptions for 2028
Source: Analyst estimates