

Price and Performance (Values in EUR)	
Price	14.79
52 week high	16.26
52 week low	13.95
YTD	-0.2%
Average daily volume (un)	8,919,177
Market Capitalization (mn)	70,412
Beta	0.68
Dividend	0.70
EPS	0.46

Source: Big Research;

Deutsche Telekom	
Ticker Site BiG	DTE
Ticker BiGlobal Trade	DTE
Ticker BT24	DTE
Ticker BiG Power Trade	DTE
P/E Ratio 2019E	15.09
P/BV Ratio	2.30
EV/EBITDA	6.50

Source: BiG Research;

Analysts Consensus (last 3 months)	
Buy	17
Hold	8
Sell	3

Source: BiG Research;

Financial Data	
Sales (USD mn)	75,656
EBITDA (USD mn)	21,837
Number of Employees	215,675
ROA	1.8%
ROE	9.0%
D/E	1.41
Dividend Yield	4.7%

Source: BiG Research;

Notes:

All quotes were updated in Bloomberg at 11h00 of January 10th, 2019.

Relevant Information:

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Deutsche Telekom (Ticker: DTE GY)

Description

Deutsche Telekom is a German telecommunications company that is the biggest in its sector in Europe, by market cap and revenue, and one of the biggest in the world. Its headquartered in Bonn, Germany, and is the leading telecom provider in the country (with around 50% of market share). It was founded in 1995 through the privatization of the former state company Deutsche Bundespost. The government still maintains a 14.5% stake in the company, directly, and another 17.4% through a participation in the government bank KfW. One of its most important aspects is its 64% stake in the United States telecom operator T-Mobile which has seen large amount of growth.

Investment Points

T-Mobile / Sprint merger: The merger is in its final stretch after having been approved by the regulators. However, different states (such as New York or California) have filed a complaint that the deal is anti-competitive (see Risks section). Bottom-line is the deal is very attractive if it were to be approved as T-Mobile would emerge as one of the clear top 3 players in 5G in the US (in what would be a very oligopoly market) and there may be an opportunity to aim for a cheaper buy of Sprint. Regardless of the outcome, we feel the company is being pressured by uncertainty and its value should be restored even in a non-deal case (and the company has promised a USD 9 bn share buyback).

5G Deployment: The 5G deployment that Deutsche Telekom is, mostly, implementing (particularly, in the US, through T-Mobile) is a slower form of 5G that is in the lower-band of 600MHz spectrum. Nonetheless, it is the probably optimal place to be in 5G right now. The company gains all the marketing advantages of advertising its network as “5G” and a large amount of coverage at decent speeds (that are more than sufficient for the average consumer’s use) while not having the massive costs of installing network that can handle the higher frequencies. Higher frequencies of 5G are important but their use cases are much further in the future (such as in IoT and in driverless cars) and, for a regular consumer, there is little reason to upgrade past the current point. The good (and bad) thing about the US market is that spectrum bands carry a lifetime ownership which will make the lower 5G spectrum bands (if our scenario were to happen) very valuable (but also makes them more expensive in auction).

Europe business undervalued: If we remove the 64% participation in T-Mobile (which is valued at EUR 43 billion) the remainder of the business has a market cap of around EUR 27 billion. Even if we allocate all the net debt to the remaining business this would give it an enterprise value of EUR 107 billion which with the EBITDA of the remaining business (~EUR 13 billion) gives it an EV/EBITDA of 6x which is clearly below peers (particularly, when Germany’s KPIs are better than what is typical of other telecoms).

Cell tower portfolio: Deutsche Telekom has around 50 thousand telecommunication towers in its portfolio. Vodafone has recently aimed to spin-off around 60 thousand towers for a valuation around EUR 16 billion to EUR 17 billion. With this amount, Deutsche’s portfolio could be valued at around EUR 15 billion.

Flat dividend: For telecom companies the dividend yield is one of the most important factors. The company promised a minimum floor of EUR 0.6 dividend (with or without a deal for T-Mobile/Sprint) which represents around a 4% dividend (as of today) but with all the investment needs it has in spectrum (there are German and US spectrum auctions that still need to happen) it is very difficult for it to have room to further improve its dividends (excluding any extraordinary dividends from asset sales or from a failure of the Sprint merger). There is also the risk of an unexpected dividend cut if auction prices are too high.

Income (EUR mn.)	2017	2018	2019E
	74.947	75.656	80.099
Opex	(52.717)	(52.323)	(55.204)
D&A	(12.472)	(13.128)	(13.583)
Others	(890)	(1.275)	(1.250)
EBIT	8.868	8.930	10.061
Net Interest	2.197	2.091	2.041
Taxes	(949)	2.225	2.065
Others	(1.840)	(815)	(1.661)
Net Income	5.780	3.799	4.294

Source: Company Data; BiG Research

Balance (EUR mn.)	2017	2018	2019E
Cash & Equivalents	3.312	3.679	2.076
Receivables	9.723	9.988	10.575
Inventories	1.985	1.790	1.895
Intangible Assets	62.865	64.950	68.397
PPE	46.878	50.631	50.561
Other Assets	16.571	14.337	14.403
Total Assets	141.334	145.375	147.907
Short term Debt	8.358	10.527	10.527
Long term Debt	49.171	51.748	50.748
Payables	10.971	10.735	10.735
Others	30.364	28.928	30.364
Total Liabilities	98.864	101.938	98.864
Total Equity	42.470	43.437	42.470

Source: Company Data; BiG Research

Cash Flow (EUR mn.)	2017	2018	2019E
Operational CF	17197	17949	20176
Net Income	5.551	3.327	5.958
D&A	14.587	13.837	16.347
Change in WC	(1.823)	(1.861)	(450)
Taxes	(634)	(697)	(833)
Interest Income / Expense	(2.509)	(1.715)	(2.185)
Others	2.025	5.058	1.339
Investment CF	(16.814)	(14.296)	(16.532)
Investment PP&E	(9.149)	(9.139)	(11.282)
Investment Intangibles	(10.345)	(3.353)	(5.000)
Others	2.680	-1.804	-250
Financial CF	(4.594)	(3.259)	(4.633)
Debt issuance	24.731	59.972	-
Repayment of debt	(26.547)	(57.276)	-
Dividends	(1.559)	(3.254)	(3.333)
Others	(1.219)	(2.701)	(1.300)
FCF	-4211	394	-989

Source: Company Data; BiG Research

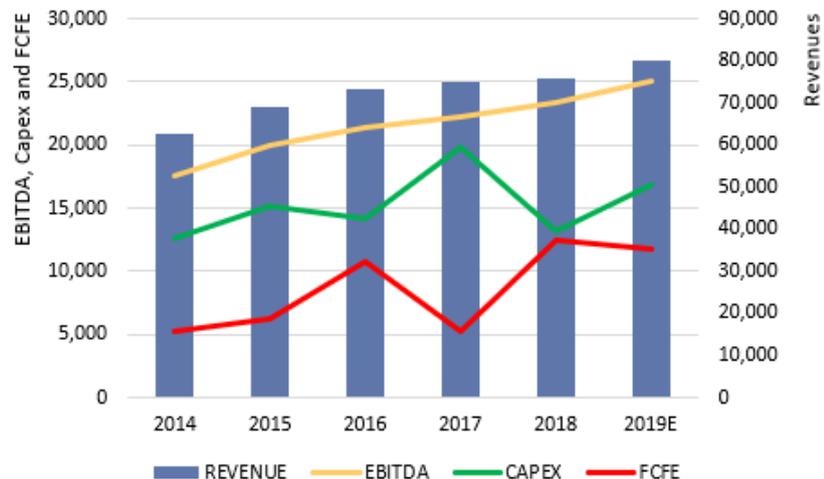
Financial performance and guidance

Until the 3rd quarter of 2019, revenue for Deutsche Telekom had increased by 4.8% (vs. the same period of 2018) to EUR 59 bi. However, in organic terms, this was only a growth of 1.7% (the acquisition of Tele2 Netherlands was the major contributor to the non-organic growth). The major driver for the organic growth was the US business which grew 5.2%. Europe, on the other hand, only grew revenues by 0.5% with Germany growing 0.6%. The good thing is that Deutsche Telekom is growing in all its segments and has double digit growth in 3 out of 5 of its segments.

In Germany's 3rd quarter, the company had 67 thousand net subscriber adds in fixed TV and 47 thousand in broadband. However, overall fixed networks net adds were negative because of a lost 279 thousand in voice. In mobile, the company added 771 thousand clients in the 3rd quarter in Germany and 1.1 million in the US.

Overall, the company is expected to continue its moderate growth in the US and flatter growth in Germany and Europe. The company upgraded 2019 guidance in its latest filings (with adjusted EBITDA rising from EUR 23.9 bn to EUR 24.1 bn).

Historical financial performance of Deutsche Telekom (in EUR million):



Source: Company Data; BiG Research

Cash Flows

The free cash flow guidance (pre-dividend) for the year of 2019 is around EUR 6.7 bn. This is EBITDA after removing capex (but without including spectrum investments as these are uncertain) and removing taxes, interest, working capital and lease expenses. The dividend required is around EUR 2.9 bn so this leaves circa EUR 3.8 bn of room, yearly. However, we must also remove around EUR 1bn from financial lease accruals and the need for spectrum investments (which is typically around EUR 3 bn per year). This, shows, that there is not that much significant freedom in cash allocation.

The upside is that the company has been growing its free cash flow (from 2018 to 2019 the free cash flow pre-dividend and pre-spectrum went from EUR 6 bn to EUR 7 bn) and this growth may help in overcoming the investment needs.

DTE net adds in 3Q (in thousands):

Germany	
Contract	164
DSL	47
Fibre	318
TV	67
Line losses	-232
US	
Contract	1074
Prepaid	62

Source: Company Data; BiG Research

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Revenue by business segment (2018):

▲ Segments and Products

The company primarily splits its business into the different geographies it operates in. In general, in Europe, the typical telecom business is split into fixed lines (which is basically voice and data communication provided by fixed networks), wholesale (where the company focuses on providing telecommunications services to other carriers), mobile (the non-fixed line mobile or data services) and other services.

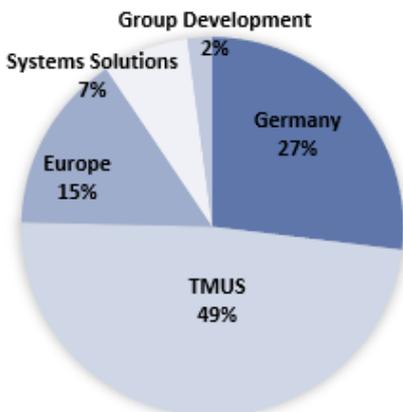
Germany (expected 2019 net revenue of EUR 20.4 bi and EBITDA of EUR 8.6 bi): The home country of Germany is still the major source of revenue for Deutsche Telekom (when T-Mobile US is adjusted for its 64% participation) and the company is the incumbent player in this market. Nonetheless the business here is growing very insignificantly (revenues in this segment only increased 0.57% in the 3rd quarter YoY). The same is true for EBITDA margins which have remained at the 40% range since 2014 but, nonetheless, have been in an upward trend having crossed the 41% target in the latest quarter. The primary difference maker in 2019 has been the mobile segment which managed to increase its revenues by 1.8% in organic terms. However, the fixed lines business decreased by 1.6%. Its major competitors in Germany are Vodafone and O2 (subsidiary of Telefónica). Deutsche Telekom wins in the fact that it has, by far, the best coverage in the country. Nonetheless, Vodafone, in particular, is cheaper and also has very good coverage. It also has, recently, acquired Unitymedia which vastly expanded its next generation network.

T-Mobile US (expected 2019 net revenue of EUR 45 bi and EBITDA of EUR 12.7 bi): The participation of Deutsche Telekom in T-Mobile has been its major winning bet in the latest years. Revenues in this segment have increased by 250% since 2011 (revenues were EUR 15 bi). This growth came from the “un-carrier” marketing strategy where the company offered cheap, simple and contract free deals to its customers with very interesting and captivating promotions. Revenue growth has slowed down, obviously, but is still expected to hit 10% growth in this year of 2019 (reversing a trend of a more significant slowdown in 2018 of only 2% revenue growth). T-Mobile should have a major advantage when 5G comes due to its broad 600Mhz LTE band (which has wide coverage). If the Sprint deal does come through, this coverage should be even greater.

Europe (expected 2019 net revenue of EUR 12 bi and EBITDA of EUR 4 bi): Deutsche Telekom also has business in several European countries such as: Greece, Romania, Bulgaria, Hungary, Poland, Czech Republic, Poland, Netherlands, Croatia, Slovakia, Austria, etc. The overall revenue growth for this geography has been 0.7% with major growth coming from Austria, which grew 10% YoY, and Czech Republic with 5% YoY. Poland has been the worst performer with -3% revenue YoY.

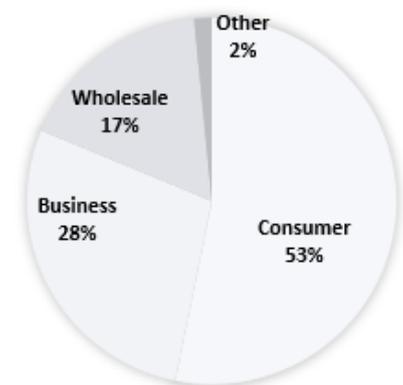
Systems Solutions (expected 2019 net revenue of EUR 5.4 bi and EBITDA of EUR 500 mi): This segment offers fixed and mobile communications, IT infrastructure, digitalization, and security and global partnerships to Deutsche Telekom clients. The business has been on a slightly downwards trend having lost 3% revenues YoY. EBITDA margins are also low at an expected margin of 7.5% for 2019, nonetheless, it has grown by 18% in 2019 from a margin of 6% in 2018.

Group Development (expected 2019 net revenue of EUR 2.2 bi and EBITDA of EUR 1 bi): A special segment which comprises T-Mobile Netherlands, Deutsche Funkturm and an investment in Stroer SE & Co. These are enterprises that are in a more growth stage and require a more entrepreneurial management style. Net revenues increased by almost 30% (due to the acquisition of Tele2 Netherlands) with revenue from the other Netherlands businesses decreasing by 4% while revenue from Funkturm (which focused on tower management software) increased by 5%.



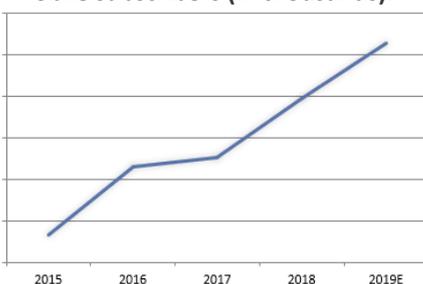
Source: Company Data; BiG Research

Revenue mix in Germany (2018):



Source: Company Data; BiG Research

T-Mobile subscribers (in thousands):



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▲ **Risks**



T-Mobile / Sprint merger: This merger was decided between the two companies back in 2018 and a definitive agreement was signed. The FCC and the DOJ have also already approved this merger. This deal was a massive opportunity for both companies as they could combine their spectrum holdings and create effective cost synergies and have the best ability to provide nationwide 5G. However, the major stoppage has come from the New York and California states filing a case arguing that the deal will be harmful to the consumer and that it reduces competition (with the wireless industry already being too consolidated) arguing that Dish (which was supposed to buy assets from T-Mobile to become a competitor) does not have the ability to properly build a wireless network. If the deal is effectively blocked there is a reason for significant devaluation of T-Mobile stock and, effectively, Deutsche Telekom. Furthermore, even if the deal is not blocked the major downside is that T-Mobile will have to concede to undertake major efforts to not harm consumers and comply with mandatory coverage (therefore losing any potential synergies). The upside is that the merger agreement has already expired and T-Mobile can seek a significant price undercut (Sprint shares have already dropped 40% from all-time high). Analysts are currently split 50/50 on whether the deal will happen or not.

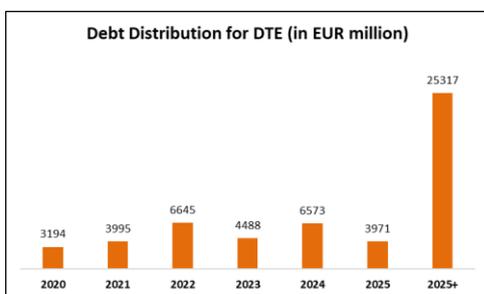
Spectrum Investments: This is a major risk for DTE as it will be a large capital drain going forward. It already had a costly 5G auction in Germany and, now, mid-band auctions in the US are coming up (which will be expensive since they are lifetime ownership). If the Sprint deal does not happen, DTE may have to spend up to EUR 2 bi to EUR 3 bi in the US auctions plus further auctions in Europe.

Congestion and staleness: T-Mobile added 7 million new customers in 2019, however with the controversies surrounding the merger, the company has delayed investments in added network. Customers in major cities have complained about congestion in network.

Outdated copper network in Germany: In its home market DTE has the long-term challenge of both fixed network competition from Vodafone and the fact that both fiber and Fixed Wireless Access (FWA) are becoming more popular. Its copper network is becoming outdated and it may start losing customers in a more consistent fashion.

Net debt to EBITDA approaching the higher end of the range of peers: DTE has had one of the most stable rating histories among major telecoms (holding a BBB+ rating for more than 10 years). However, its net debt to EBITDA (as of the latest filing) is already above 3x and this is quickly approaching a range where it may risk a downgrade and it may make it unattractive vs. its peers. DTE may become “trapped” in its ability to spend.

▲ **Debt structure and leasing**



In 2019, net debt increased by EUR 23 billion to EUR 79 billion mostly because of the application of IFRS 16 (which added EUR 15.6 billion in lease liabilities) but also due to dividend payments (which added EUR 3.6 billion), added leases (added EUR 4.5 billion mostly from additional tower leases in US to expand 5G build), spectrum acquisition (EUR 3.2 billion) and the acquisition of Tele2 Netherlands (EUR 0.4 billion). A free cash flow of EUR 7.6 billion added in reducing these effects.

The company has, currently, EUR 55 billion in non-current liabilities (most are in senior unsecured bonds) and EUR 14 billion in current liabilities. The weighted average coupon for its bonds is around 3.5%. In regards to leases, most of them relate to long-term rental and lease agreements for office buildings and fixed-network or mobile facilities (such as towers or antennas). The total amount of leases outstanding is around EUR 20 billion. The average lease term is around 13 years with the average annual lease payment being around EUR 3 billion.

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▲ Relative Valuation

Name	Country	Market Cap (In USD)	Dividend Yield	Repurchase Yield	YTD	Organic Growth 1Y	Operational Margin	Profit Margin
VODAFONE GROUP PLC	BRITAIN	52,723	5%	0%	-1%	0%	11%	-5%
ORANGE	FRANCE	39,151	5%	0%	-6%	1%	12%	5%
TELEFONICA SA	SPAIN	37,415	6%	0%	-11%	2%	10%	4%
SWISSCOM AG-REG	SWITZERLAND	27,246	4%	0%	10%	0%	17%	13%
BT GROUP PLC	BRITAIN	26,378	8%	0%	-14%	-1%	15%	9%
TELENOR ASA	NORWAY	25,707	5%	1%	-5%	-1%	21%	6%
NOS SGPS	PORTUGAL	2,786	7%	0%	-8%	1%	14%	10%
TELE2 AB-B SHS	SWEDEN	10,027	8%	0%	26%	10%	14%	13%
KONINKLIJKE KPN NV	NETHERLANDS	12,437	5%	0%	4%	-2%	18%	9%
TELECOM ITALIA SPA	ITALY	13,363	0%	0%	18%	0%	14%	2%
DEUTSCHE TELEKOM AG-RE	GERMANY	78,038	5%	0%	0%	1%	11%	4%
Average exc. DTE		24,723	5%	0%	1%	1%	15%	7%

Name	ROA	Net Debt/ EBITDA	P/E next year	EV/EBITDA	FCFE/EV (ex. debt)	CFO-exWC/ Price	CFO-Capex/ Price	Rating
VODAFONE GROUP PLC	-1%	3.5	16.8	6.6	18%	29%	18%	BBB
ORANGE	-1%	2.4	12.5	6.0	5%	30%	3%	BBB+
TELEFONICA SA	2%	3.4	9.4	6.5	22%	n.a.	19%	BBB
SWISSCOM AG-REG	6%	2.1	17.9	8.0	10%	19%	10%	A
BT GROUP PLC	5%	2.5	8.5	5.0	7%	41%	5%	BBB
TELENOR ASA	3%	2.5	14.7	8.4	-101%	16%	5%	A-
NOS SGPS	5%	2.0	13.7	6.3	16%	n.a.	16%	BBB-
TELE2 AB-B SHS	6%	3.5	22.0	15.3	-12%	10%	5%	BBB
KONINKLIJKE KPN NV	4%	0.1	19.8	4.9	11%	18%	11%	BBB
TELECOM ITALIA SPA	0%	4.0	9.2	6.0	13%	50%	14%	BB+
DEUTSCHE TELEKOM AG-RE	2%	3.0	12.8	6.5	18%	33%	17%	BBB+ *-
Average exc. DTE	3%	2.6	14.4	7.3	-1%	26%	11%	-

Deutsche Telekom is at the average of its peers in regards to its dividend yield payment but has the disadvantage of a higher than average net debt to EBITDA (with the possibility of it increasing even further post spectrum auctions). The company also appears to have interesting valuation ratios (such as a FCFE/EV of 18% and CFO/P of 33%), however it is important to keep in mind that the company consolidates T-Mobile as if it owned 100% of its stock (in accounting terms) while its true position is only 64% (which means adjusted ratios should be lower).

The upside is that the company has the size effect to dominate 5G in Germany while it also has growth opportunities that the other European players do not have (due to its exposure to the US wireless market and investments) and diversification in various European countries.

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▲ **Recent major M&A and other deals**

T-Mobile and Sprint merger (announced in April 2018 and approved in 2018 but still pending): The companies agreed to merge in an all-stock transaction with a fixed exchange ratio of 9.75 Sprint shares for each T-Mobile.

Potential Orange and Deutsche Telekom merger (rumored in November 2019): Deutsche Telekom has long been rumored to be interested in merging with Orange. However, Orange has come out in denial of these rumors and any deal would be difficult due to the size difference between the German and French companies (which would imply a need for a takeover that the French government’s participation in the company deems unlikely to take).

Fixed-network business in Romania (sold to Orange in September 2019): Deutsche Telekom held a 54% participation in the Romanian TRC which it sold to Orange.

Tele2 Netherlands (announced in December 2017 and completed in 2019): Deutsche Telekom subsidiary in the Netherlands (T-Mobile Netherlands) did a takeover of Tele2 Netherlands and consolidated it to create a new company which it owns 75% and Tele2 owns 25%. It is now the second player in the Netherlands (with a 30% share of consumers) and is in a prime opportunity to take market from KPN. It also believes it can now be the first provider to have 5G in the Netherlands.

Scout24 (sold participation in 2017): Deutsche Telekom sold the remainder of its 9.3% share (after having sold 70% in 2013 for EUR 1.5 bi) in the company for EUR 340 mi.

EE limited (sold joint-venture participation in 2016): In 2010 a joint-venture by Deutsche Telekom and Orange led to the creation of the company which became the largest mobile network operator in the UK. EE was eventually sold to BT Group for EUR 12.5 billion while Deutsche Telekom was also granted a 12% participation in BT Group. The lock-up of this 12% participation in the group already ended so Deutsche Telekom is free to sell it.

▲ **Graph**

1D EQ DTE:xetr



Source: BiGlobal Trade

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Income (USD mn.)	2017	2018	2019E
Postpaid subs	32,119	32,774	33,711
Prepaid subs	8,989	8,816	8,135
Revenues	32,406	33,600	32,618
Opex	(21,337)	(20,827)	(21,447)
D&A	(8,580)	(9,391)	(9,092)
Others	(238)	2,984	440
EBIT	2,727	398	1,639
Net Interest	(2,365)	(2,563)	(2,431)
Taxes	7,074	35	142
Others	47	(187)	(88)
Net Income	7,389	- 1,943	- 562

Source: Company Data; BiG Research

Balance (USD mn.)	2017	2018	2019E
Cash & Equivalents	6,610	6,982	3,271
Short-term securities	2,354	67	61
Receivables	3,711	3,554	3,640
Inventories	1,003	999	1,002
Intangible Assets	50,360	47,832	47,300
PPE	19,925	21,201	22,134
Other Assets	1,496	3,966	10,953
Total Assets	85,459	84,601	88,361
Short term Debt	3,429	4,557	4,101
Long term Debt	37,463	35,366	34,118
Payables	3,409	3,961	3,598
Operating Leases	-	-	5,667
Others	14,739	14,590	15,077
Total Liabilities	59,040	58,474	62,561
Total Equity	18,808	26,419	25,800

Source: Company Data; BiG Research

Cash Flow (USD mn.)	2017	2018	2019E
Operational CF	10,062	10,429	9,273
Net Income	7,377	(1,943)	(580)
D&A	8,580	9,391	9,092
Change in WC	1,116	(741)	(291)
Taxes	(7,119)	(85)	(106)
Others	108	3,807	1,158
Investment CF	(6,135)	(9,542)	(11,323)
Investment PP&E	(10,780)	(12,404)	(11,564)
Investment Intangibles	(115)	(163)	(30)
Others	4,760	3,025	271
Financial CF	(210)	(483)	(1,657)
Net debt proceeds	11	(457)	(1,612)
Dividends	0	0	0
Others	(221)	(26)	(45)
FCF	3717	404	-3707

Source: Company Data; BiG Research

▲ Sprint

The target of T-Mobile's merger is having some difficulties with growth. In the third quarter of 2019, the revenues of Sprint were USD 7.8 bn having decreased 7% YoY. The expectations for the full year of 2019 are not as bad, however, with revenues to likely decrease by around 2% (although the latest quarter is still missing). Average revenues per user growth are slowing down significantly with the expected values for 2019 aiming for a decrease of -3.5% in postpaid subscriptions and -12.7% in prepaid.

The major issue with Sprint is that it is being caught between a massive need for capex spending due to Spectrum needs (which it has less capacity to absorb than the major players) while not having good enough marketing and attractive deals for consumers (as well as poorer coverage overall). The disruption from the merger offer comes to intensify this issue. With decreasing spending per consumer, the company should be adding much more subscribers but this is not happening.

Nonetheless, Sprint is not that far behind, it has already added 5G coverage in 9 select cities (such as New York, LA, Houston, Chicago, etc.) covering around 16 million people. The company's major 5G spectrum holdings are in the mid-band range (around 2.5 GHz) so this will complement nicely T-Mobile's lower bands.

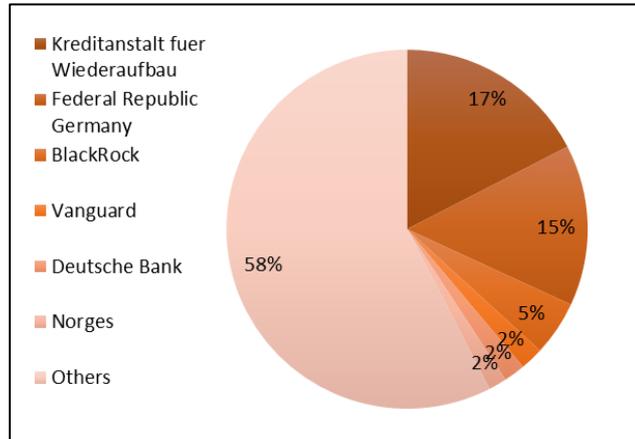
Sprint is currently carrying around USD 34.8 bn in net debt (of which cash and equivalents is only around USD 3.2 bn). With T-Mobile's acquisition this debt will transition into its balance sheet and, therefore, into Deutsche Telekom. Sprint's 2019 expected EBITDA is around USD 11.1 bn which gives it a net debt to EBITDA of around 3.13. Overall, post-acquisition, Deutsche Telekom's debt should rise to about EUR 110 bn (most likely, it will be less than this as the company is to sell assets to Dish if the deal does go through and this should be used to reduce debt) which will give it a net debt to EBITDA of around 3 (not much more than what is already the case).

The deal with Sprint should be valued at around USD 25 bn and this, with the added current market cap of Deutsche Telekom and the net debt of both companies, should push Deutsche Telekom to an enterprise value of around EUR 200 bn which, with an adjusted EBITDA (that, of course, does not yet include any potential synergies) for both Sprint and T-Mobile, puts it at a valuation of around 7.7x EV/EBITDA.

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▲ **Shareholder Structure**



▲ **Analyst Recommendations**

Analysts Consensus (last 3 months)		
Buy		17
Hold		8
Sell		3

▲ **Ratings**

Rating		
Agency	Rating	Outlook
S&P	BBB+ *-	-
Moody's	Baa1	NEG
Fitch	BBB+	STABLE

▲ **Calendar**

- 15-01-2020:** Final remarks of the T-Mobile / Sprint court case
- 19-02-2020:** Full-year financial results for 2019
- 26-03-2020:** Shareholder's meeting
- 14-05-2020:** 1st quarter results 2020

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▲ Spectrum auctions

Main spectrum awards

	Expected start of award procedure	Expected end of award procedure	Frequency ranges (MHz)	Award process	Spectrum acquired (MHz)	Spectrum investment
Germany		Completed	2,100 / 3,400-3,700	Auction (SMRA ^a)	20 MHz/90 MHz	€ 2.17 billion ^b
Greece	Q2 2020	Q3 2020	700 / 1,500 / 3,600 / 26,000	Auction (SMRA ^a), expected	tbd	tbd
Croatia		Completed	2,100 / 2,600	Assignment on application	2x 20 MHz in the 2,600 MHz band	Annual fees, no one-time charge
Croatia	Q1 2020	Q2 2020	700 / 3,400-3,800 / 26,000	tbd	tbd	tbd
Netherlands	Q2 2020	Q3 2020	700 / 1,500 / 2,100	SMRA-clock hybrid auction expected, details tbd	tbd	tbd
North Macedonia		Completed	1,800	Extension of licenses	2x 10 MHz	No extension fees
North Macedonia	Q4 2019	Q1 2020	2,100	Sealed-bid tender ^c	tbd	tbd
North Macedonia	Q2 2020	Q3 2020	700 / 3,400-3,800	Auction, details tbd	tbd	tbd
Austria		Completed	3,400-3,800	Regional auction (CCA ^d)	1x 110 MHz	€ 57 million
Austria	Q1 2020	Q2 2020	700 / 1,500 / 2,100	Auction (CCA ^d), expected	tbd	tbd
Poland	Q2 2020	Q3 2020	800 / 3,600-3,800	Auction, details tbd	tbd	tbd
Poland	Q3 2021	Q4 2022	700 / 3,600-3,800	Auction, details tbd	tbd	tbd
Romania	Q2 2020	Q2 2020	700 / 800 / 1,500 / 2,600 / 3,400-3,800 / 26,000	Auction, details tbd	tbd	tbd
Slovakia	Q3 2019	Q4 2019	700 / 900 / 1,500 / 1,800	Auction (SMRA ^a), expected	tbd	tbd
Czech Republic	Q4 2019	Q1 2020	700 / 3,400-3,600	Auction (SMRA ^a), expected	tbd	tbd
Hungary	Q4 2019	Q4 2019	700 / 2,100 / 2,600 / 3,400-3,800	Auction, details tbd	tbd	tbd
United States		Completed	28,000	Auction (SMRA ^a)	367 MHz (all in 24 / 28 GHz)	\$ 843 million
United States		Completed	24,000	Auction (CCA ^d)	See above	See above
United States	Q4 2019	Q1 2020	37,000 / 39,000 / 47,000	Auction (CCA ^d)	tbd	tbd
United States	Q2 2020	Q3 2020	3,550-3,700	Auction (clock auction)	tbd	tbd

^a Simultaneous electronic multi-round auction with ascending, parallel bids for all available frequency ranges.

^b Annual installment plan until 2030 agreed, starting in 2019, provided we take on additional build-out obligations.

^c Sealed-bid tender: auction in which bidders submit their offers in sealed envelopes.

^d Combinatorial clock auction: three-stage, multi-round auction for spectrum from all available frequency ranges.

▲ Segment growth

	Adj. EBITDA AL (9M 2019) Reported growth rate yoy	Organic growth rate yoy
TMUS	+11.6%	+5.0%
GER	+2.4%	+2.4%
EU	+5.0%	+2.3%
GD	+14.8%	+11.3%
SYS	+10.9%	+10.4%

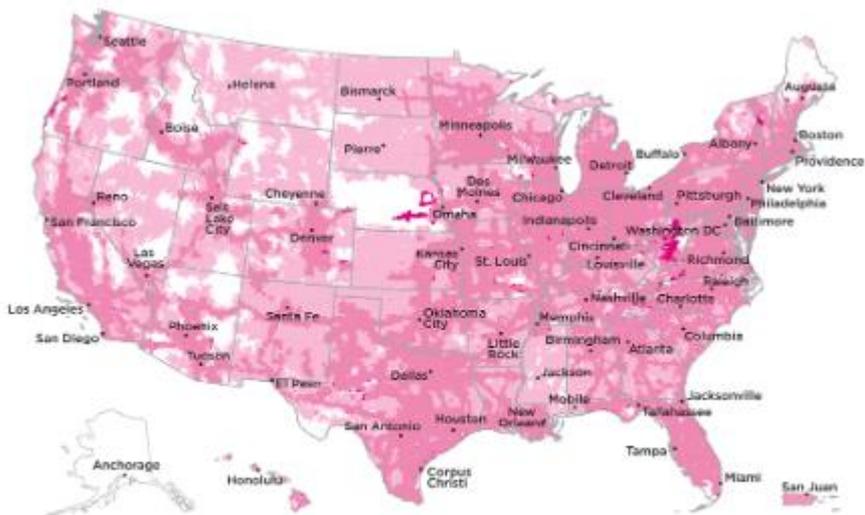
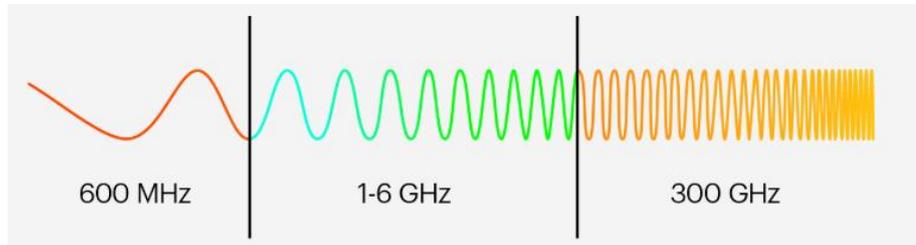
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▲ Frequency bands

Range	Band	Frequency Band	Bandwidth	Frequency Range
Low	71	600 MHz	81 MHz	617MHz - 698MHz
	44	700 MHz	100 MHz	703 MHz - 803 MHz
Mid	66	(AWS) 1700.2100 MHz	100 MHz	1710-1780 and 2110-2200 MHz
	40	2.3 GHz	100 MHz	2.3 – 2.4 GHz
	41	2.5 GHz BRS/EBS in US	194 MHz	2496 - 2690 MHz
	42	3.5 GHz	200 MHz	3400 - 3600 MHz
	43	3.6 GHz	200 MHz	3600 - 3800 MHz
	C-band	4.4 GHz	590 MHz	4400 - 4499 MHz
High	n258	24 GHz mmWave	3.25 GHz	24.25 - 27.5 GHz
	n257	26 GHz mmWave	3.00 GHz	26.5 - 29.5 GHz
	n261	28 GHz mmWave	850 MHz	27.5 - 28.35 GHz
	n260	37 GHz mmWave	1 GHz	37.0 - 38.6 GHz
	n260	39 GHz mmWave	2 GHz	38.0 – 40.0 GHz
	n257	47 GHz mmWave	1 GHz	47.2 - 48.2 GHz



Sprint & T-Mobile

Aggregate Network Coverage

■ Sprint Coverage ■ T-Mobile Coverage ■ Sprint & T-Mobile Coverage □ No Coverage

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