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Nigeria

Telecommunications Report

Includes 10-year forecasts to 2028

Contents

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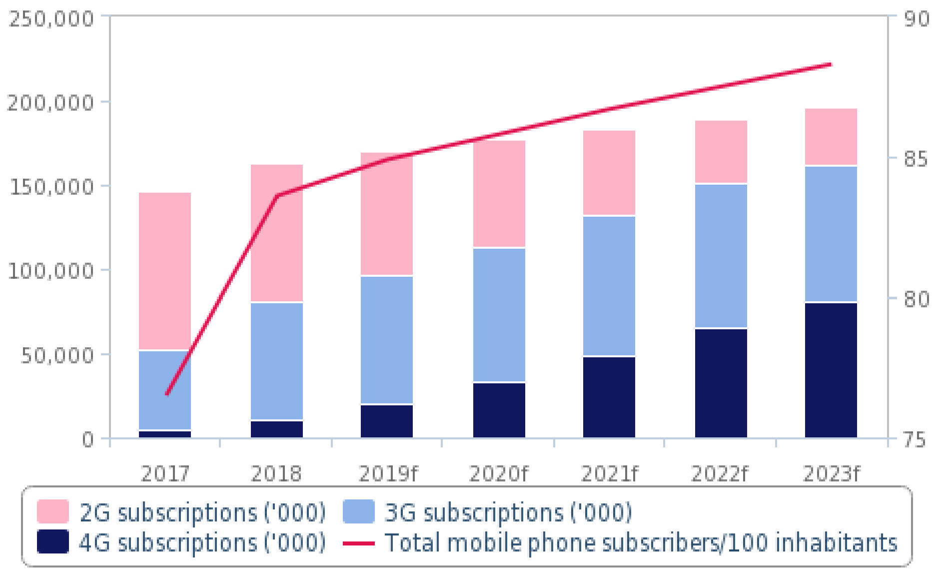
Key View

Key View: *Nigeria's mobile market witnessed its fifth consecutive quarter of positive growth in December 2018. In this Q219 update, we believe the market will continue to shrug off the negative impact of the regulator's SIM registration drive on the back of robust subscriber growth and an improved macroeconomic environment. Moreover, low mobile penetration rates indicate that there remains plenty of scope for expansion, especially in rural areas. The three largest operators by subscriber numbers MTN, Airtel and Globacom's aggressive deployment of their 3G and 4G networks also poses upside risks for the uptake of advanced mobile data services in the country. However, in addition to political risk, operators also face elevated industry risks evidenced by MTN's recent disputes with the Central Bank of Nigeria and the Nigerian attorney general as well as Teleology's sudden exit from 9mobile. In the wireline segment, we expect the combination of mobile substitution, as well as CDMA and inactive fixed voice disconnection, to continue to weigh on demand for fixed voice and internet services.*

Industry Trends - Mobile
(2017-2023)



e/f = Fitch Solutions estimate/forecast. Source: Operators, NCC, Fitch Solutions

Latest Updates And Industry Developments

- The latest data from the Nigerian Communications Commission has the market ending Q418 with 163.674mn subscribers. Again this quarter, the regulator's change of methodology has resulted in it attributing just over 8mn additional subscribers to **MTN** than the operator has reported. Owing to the lack of explanation from the regulator regarding this phenomenal growth, this quarter's update will again utilise MTN's total reported subscribers. However, we may restate the data for the next quarter.
- On the back of registered SIMs entering the market and increased uptake of 3G/4G services, we believe that growth in the mobile market will continue to be positive and that the trend will continue beyond 2019 as the prospects of the market improve out to 2028. We estimate the mobile market will end 2028 with approximately 226.432mn subscribers.
- In March 2019, **Watt Renewable** partnered with Nigerian tower company **Pan African Towers** to provide renewable energy to the company's tower sites in Nigeria.
- In February 2019, MTN announced that it would begin its mandatory listing on the Nigerian Stock Exchange in June 2019.
- In January 2019, **Teleology** exited **9mobile** less than two months after receiving regulatory approval to take over the embattled mobile network operator.

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- Also in January 2019, MTN and the Central Bank of Nigeria's reached a settlement over a USD8.1bn fine levied on the operator for its repatriation of funds between 2007 and 2015. The operator's USD2mn tax dispute with the Attorney General remains ongoing.

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SWOT

SWOT Analysis	
Strengths	• Growth of mobile sector remains robust despite the introduction of compulsory SIM registration and lower than expected macro-economic growth. • All GSM mobile operators offer 3G/3.5G services. • Competition and regulatory measures have helped bring down prices in the mobile sector. • Mobile market boasts the presence of major international investors, including South Africa's MTN and India's Bharti Airtel. • Rapidly growing mobile data user base.
Weaknesses	• Despite strong growth in the mobile market, poor network coverage has traditionally been a problem, which has sometimes affected subscriptions growth and service use. • Rapid subscriber growth and competition have put downward pressure on average revenue per user rates. • Nigerian consumers and price-sensitive and the subscriber base are predominantly prepaid, limiting ARPU potential. • Insufficient investment into wireline networks owing to mismanagement of now-defunct incumbent NITEL. • Operators' ability to serve rural communities continues to lag behind their network presence in urban areas. • Teleology Holdings exit of 9Mobile and IHS Towers returning its Infraco licence indicate the challenges investors face in the Nigerian telecoms market.
Opportunities	• Launches of 4G services and residential broadband will enhance mobile data services. • Investment in terrestrial fibre-optic infrastructure and data centre facilities should enable operators to serve the lucrative corporate market. • Rapid expansion of non-voice services portfolios will create new revenue streams for network operators. • Three mobile operators have outsourced their tower infrastructure. This could have a positive impact on operators' profitability and will reduce the cost of expanding to under-served rural areas. • Leading operators are investing in network upgrade and expansion projects, a development that should sustain subscriber growth and increase use. • Allocation of wholesale broadband infrastructure licences to MainOne and IHS Towers in Lagos and North Central Zone will accelerate deployment of wireline networks. • Investment in fibre networks by the government will encourage growth in the fixed data market, albeit limited to urban areas.
Threats	• Competition is increasing as more companies vie to take advantage of this attractive market. • The Islamic insurgency in the north threatens the operations and network expansion plans of service providers. • Since 2014, the government has taken tougher actions against operators for poor quality of service, which could raise operating expenses and weigh on subscriptions growth. • The government has considerable sway over high-profile decisions as evidenced by two burdensome fines issued to MTN in the last three years. • Fuel shortages are affecting network uptime and pushing up operational costs. • The decisions of the Buhari administration to investigate the sale of NITEL will delay investment into network improvements. • Increasing bureaucratic constraints pose downside risks to network deployment as evidenced by IHS Towers returning its Infraco Licence after failing to secure Right of Way approval.

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Industry Forecast

Latest Updates

- The latest data from the Nigerian Communications Commission (NCC) has the market ending Q418 with 162.058mn subscribers. Again, the regulator has attributed just over 8.93mn additional subscribers to **MTN** than the operator has reported for the same period. Owing to the lack of explanation from the regulator regarding this phenomenal growth, this quarter's update will again utilise MTN's total reported subscribers. However, we may restate the data for the next quarter.
- Growth in the 3G/4G subsector will be relatively strong. We forecast 226.432mn subscribers by the end of 2028 will be 3G and 4G enabled.
- Despite a 2016 slowdown in subscription growth, we forecast broadband internet connections to rise, from an estimated 8.923mn at the end of 2019 to a 12.612mn at the end of 2028 for a penetration rate of 6.2%.
- **Teleology** has exited **9mobile** less than two months after it received regulatory approval to take over the operator.

Structural Trends

Mobile

Subscription growth in the mobile market remains driven by factors, including operators' promotional activities, multiple SIM ownership, the entrance of registered SIMs that were previously discounted and the extension of network coverage to under-served areas. With the exception of **Airtel**, which posted the lowest subscription losses in 2017, MTN and 9mobile reported the largest decline in their mobile subscriber base. This was due to the implementation of regulations governing the definition of an active mobile customer and the subsequent re-emergence of registered SIMs which were previously considered inactive, as well as increased take-up of 3G/4G subscriptions as customers migrated from 2G services. The market is now showing signs of recovery. The latest market data published by the NCC shows that total Nigerian mobile subscriptions have reported positive growth between December 2017 and December 2018.

The Nigerian mobile has not been immune to fluctuating growth in mobile subscriptions. In Q317, it lost 3.057mn subscribers, dropping to a penetration rate of just 73.2%, due to discounting of inactive SIM connections and the implementation of regulations governing the definition of active mobile customers. Despite this setback, the market recovered the following quarter and has continued its positive growth trajectory to date. We continue to maintain a favourable outlook for the market over our forecast period to 2028: 3G/4G uptake and organic subscriber growth will remain hallmarks of the mobile market over the next five years. We believe that 3G/4G subscriptions will amount to 222.924mn in 2028, 98.4% of the mobile market.

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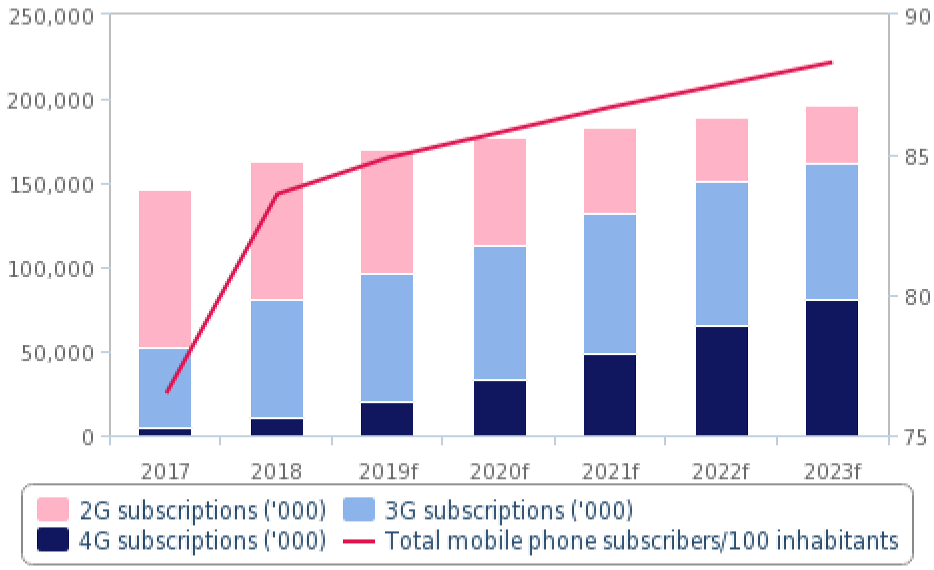
Industry Trends - Mobile
(2017-2023)



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Wireline Voice & Broadband

The number of active fixed-line connections increased by 2,887 subscriptions to end December 2018 with just over 140,491 subscriptions. This growth comes after the market declined by -2.1% to 137,604 subscriptions the previous quarter. This is in line with our view that the wireline market will experience volatile growth as mobile substitution will continue to cannibalise fixed voice subscriptions, in particular, but with the uptake of VoIP as well as broadband services offering some prospects for growth within the overall sector on the back of increased investment and key regulatory developments. Notwithstanding, we believe that the overall decline in the wireless segment is also the result of falling fixed wireless subscriptions due to the poor macroeconomic environment and **Visafone**'s subscriptions falling following its acquisition by MTN. Frequent fluctuations in the wireless segment will pose significant downside risks to our outlook, but as real GDP growth continues to improve in the market, we believe that such fluctuations will be less severe compared to those experienced in 2016 and 2017.

Our forecast anticipates the number of fixed-line subscriptions reaching 79,779 by the end of 2028. Fixed-line penetration will remain flat at under 0.2%. The main upside risk to our outlook comes from the increasing deployment of high-speed fixed broadband technologies and Internet-based voice services, such as VoIP, in business districts and expensive neighbourhoods. The bundling of fixed voice service with non-voice services, such as data and video-on-demand, could boost the uptake of fixed telephony services.

The steady and impressive growth in the number of internet users reflects a growing awareness of ICT services. This has partly been fuelled by the exponential growth of mobile services over the past decade.

We also believe broadband subscriptions will become cheaper as international connectivity improves following the extension of fibre optic and mobile data networks throughout the country. We forecast the market to have 8.923mn broadband connections at the end of 2019, equivalent to a penetration rate of 4.4%. By the end of 2028, we forecast 12.612mn broadband subscriptions, equivalent to a penetration rate of 6.2%.

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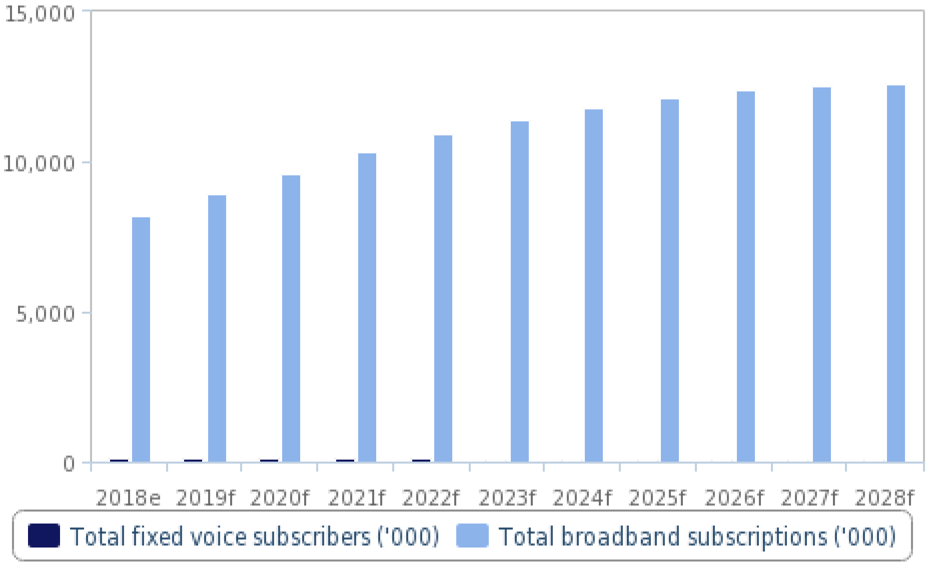
Industry Trends - Wireline Sector
(2018-2028)



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TELECOMS SECTOR - HISTORICAL DATA & FORECASTS (NIGERIA 2017-2022)

Indicator	2017	2018e	2019f	2020f	2021f	2022f
Total mobile phone subscribers ('000)	146,034.2	163,673.9	170,711.9	176,857.5	183,401.2	189,636.9
Total mobile phone subscribers/100 inhabitants	76.5	83.6	84.9	85.8	86.7	87.5
3G subscriptions ('000)	47,534.4	70,124.0	76,365.0	80,106.9	83,151.0	85,728.7
3G subscriptions, % mobile phone subscribers	32.6	42.8	44.7	45.3	45.3	45.2
4G subscriptions ('000)	4,919.0	10,328.0	19,798.8	31,836.4	46,544.9	62,742.5
4G subscriptions, % mobile phone subscribers	3.4	6.3	11.6	18.0	25.4	33.1
Total fixed voice subscribers ('000)	139.3	140.5	129.1	119.3	110.9	104.8
Total fixed voice subscribers/100 Inhabitants	0.1	0.1	0.1	0.1	0.1	0.0
Total broadband subscriptions ('000)	7,459.0	8,217.5	8,922.7	9,626.3	10,328.0	10,946.7
Total broadband subscriptions/100 Inhabitants	3.9	4.2	4.4	4.7	4.9	5.0

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TELECOMS SECTOR - HISTORICAL DATA AND FORECASTS (NIGERIA 2023-2028)						
Indicator	**2023f**	**2024f**	**2025f**	**2026f**	**2027f**	**2028f**
Total mobile phone subscribers ('000)	196,274.2	202,554.9	208,429.0	214,056.6	220,050.2	226,431.7
Total mobile phone subscribers/100 inhabitants	88.3	88.9	89.2	89.4	89.6	90.0
3G subscriptions ('000)	81,956.6	78,842.3	75,846.2	73,191.6	70,410.3	67,382.7
3G subscriptions, % mobile phone subscribers	41.8	38.9	36.4	34.2	32.0	29.8
4G subscriptions ('000)	77,675.2	91,812.1	106,502.0	121,412.3	136,224.6	150,391.9
4G subscriptions, % mobile phone subscribers	39.6	45.3	51.1	56.7	61.9	66.4
Total fixed voice subscribers ('000)	99.5	94.7	90.2	86.1	82.7	79.8
Total fixed voice subscribers/100 Inhabitants	0.0	0.0	0.0	0.0	0.0	0.0
Total broadband subscriptions ('000)	11,405.7	11,804.2	12,134.1	12,400.6	12,562.1	12,612.1
Total broadband subscriptions/100 Inhabitants	5.1	5.2	5.2	5.2	5.1	5.0

f = Fitch Solutions forecast. Source: operators, NCC, Fitch Solutions

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Industry Risk/Reward Index

Heightened Industry And Political Risks Mean More Lows Than Highs On SSA Telecoms Risk/Reward Index

Key View

- This quarter sees more downward revisions to the Sub-Saharan Africa regional scores on our Telecoms Risk/Rewards Index.
- Mounting political risks from election tensions continue to have a negative impact on key markets on the index.
- Operators' strategies to improve their networks and service offerings in early 2019 bode well for key markets in the region and may see their Industry Rewards scores improve in upcoming quarters.

In this Q219 update of our Sub-Saharan Africa Telecoms Risk/Reward Index (RRI), the region's overall score sees a 0.6 point decline to 38.2 points out of a possible 100. This quarter sees a decline in the overall scores of 32 out of the 48 countries surveyed.

South Africa's score of 46.8 points, moves it up two places to fourth position on the index for this quarter. With an Industry Rewards score of 43.8, the market is the most advanced in the region. The government's plans to issue further spectrum in early 2019 may see its Industry Risks score of 45 revised upwards in upcoming quarters. This development also bodes well for operators **Vodacom**, **MTN** and **Rain**'s plans to launch 5G networks in the country.

Kenya's score of 46.6 points sees it retain fifth position on the Index this quarter. **Safaricom**'s dominance over the mobile market continues to stifle competition, while growing fiscal debt has led to higher taxes levied on the market, further squeezing operator margins. This has contributed to a 2.5 point decline in the country's Industry Rewards score, which now sits at just 40 points.

Though it retains pole position on the index, Nigeria scores 51.9 points this quarter, a 1.7 point decline from the previous quarter. This is due to downward revisions to its Industry Rewards (-2.8) and Country Risks (-3.4) scores. In January 2018, **Teleology Holdings Limited** was selected as the preferred bidder for a stake in the former **Etisalat**-owned operator, **9mobile**. However, following a dispute between the investor and its local partners, Teleology looks set to exit its shareholding in the unit, posing downside risks to the operator's turnaround prospects. On the upside, MTN and the Central Bank of Nigeria have resolved a USD10.1bn tax repatriation dispute which begun in August 2018. However, the downward revision to Nigeria's Country Risks score reflects mounting political risks as the country approaches a highly contentious presidential election in February 2019. We caution that this heightens the risk of political scrutiny and government intervention in the telecoms sector

The impact of elections in other markets is also expressing itself on the index.

Cameroon's score of 42.3 points was brought down by a weak Country Risks score of 43.4 points, owing to the continuing Anglophone Crisis which has not abated since the country's October 2018 presidential elections. In fact, our Country Risk team cautions that civil unrest will continue in 2019. The unrest has seen the government introduce internet shutdowns on numerous occasions since 2017 and we would not rule out further disruptions, which would be detrimental to mobile network operators in the country. Likewise, unrest over the December 2018 election results in the Democratic Republic of Congo, which scored 40.2 points this quarter, is ongoing and the country has already experienced instances of internet shutdowns.

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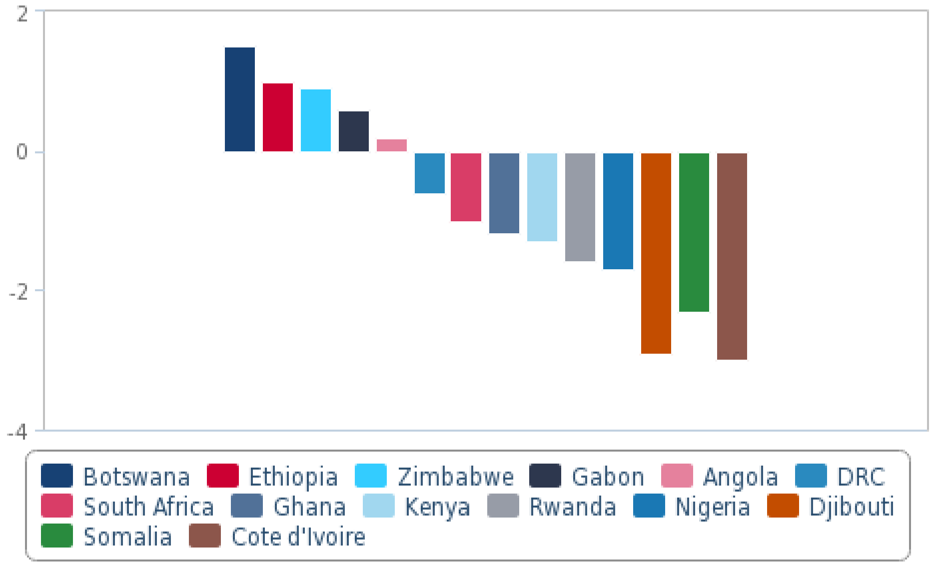
More Markets Down In Q219

Telecoms Score Q-o-Q Changes



Note: Scores out of 100, with higher scores indicating lower risks. Source: Fitch Solutions

Mature markets continue to struggle with limited prospects for organic growth.

A score of 45.4 points allowed Botswana back into the top 10 this quarter. However, an expected average yearly mobile subscription growth rate of only 1% between 2018 and the end of our forecast period in 2028 shows that operators must increasingly rely on the use of value-added and advanced services to drive their margins. Angola's telecoms market also faces weak growth prospects; however, the government's plans to announce a new mobile operator in early 2019 will spur competition and innovation in the, thus far, lacklustre market. We maintain a positive view of the country's broadband market which we expect to reach around 579,000 subscribers in 2028, spurred by government-led investment in terrestrial networks and the launch of Angola Cable's South Atlantic Cable System in September 2018. On the downside, although the country is on track for an economic recovery in 2019, the telecoms sector may still be vulnerable to the economy's oil dependence, impacting consumer spending within the sector.

Rwanda's overall score of 40.7 points sees it drop one place to rank 15th on the Index for this quarter. The country's Industry Rewards score of 30 points is mainly attributed to market saturation in urban areas, as well as depressed ARPUs owing to low consumer purchasing power and the lack of incentive for operators to expand their networks into low income areas. An Industry Risk score of 70 and Country Risks score of 56.1 remain a bright spot for the country, as a proactive regulator and government continue to fairly regulate and promote policies for the benefit of the telecoms sector.

This quarter, Somalia sees the biggest decline (-19.6) points to its Country Risks pillar, contributing to an overall score of 32.6 points and ranking it 41st on the index. Meanwhile, Ethiopia's score of 37.5 points is lifted by a 2.5 point upward revision to its Industry Rewards pillar to 32.5 points. The country's low Industry Risks score of 15 points remains unchanged as the government has yet to implement liberalisation reforms aimed at the telecoms sector. Neighbouring Djibouti and Eritrea remain at the bottom of the Index again this quarter with scores of 30.6 and 28.5 points respectively. Both markets are characterised by state-owned monopolies which continue to stifle their telecoms potential.

Despite the overall decline in the region's overall scores, we are positive about operator-led developments, which bode well for the growth of a number of Sub-Saharan African telecoms sectors, including:

- MTN and **Orange** will launch an interoperable mobile wallet, Mowali, across their markets in 2019, making this the most significant move towards regional mobile money interoperability in Sub-Saharan Africa. In our view, the move will promote promote innovation and the development of more advanced mobile financial services (MFS).

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- Regional operators are increasingly focused on upgrades and expansion of their networks in their markets. For example, mobile network operator **Africell** secured a USD100mn loan from the the Overseas Private Investment Corporation which it will invest in its units including Uganda and the DRC. Meanwhile, Zimbabwe-based **Econet**'s **Liquid Telecom** unit secured USD700mn in financing as it continues its regional expansion gambit.

SUB-SAHARAN AFRICA TELECOMS RISK/REWARDS INDEX, Q2 2019

	Industry Rewards	Country Rewards	Industry Risks	Country Risks	Telecoms Score	Rank
Nigeria	49.5	48.0	60.0	57.2	**51.9**	1
Congo-Brazzaville	37.5	63.3	65.0	53.0	**50.3**	2
Ghana	33.8	56.7	70.0	59.9	**48.7**	3
South Africa	43.8	47.7	45.0	56.6	**46.8**	4
Kenya	40.0	42.7	70.0	49.9	**46.6**	5
Gabon	27.5	73.3	50.0	52.9	**45.9**	6
Cote d'Ivoire	33.8	56.7	60.0	47.9	**45.4**	=7
Botswana	22.5	58.7	70.0	68.6	**45.4**	=7
Senegal	32.5	50.0	60.0	52.3	**43.9**	9
Gambia	30.0	53.3	65.0	47.5	**43.6**	10
Tanzania	36.0	39.3	60.0	56.1	**43.4**	11
Sao Tome et Principe	25.0	63.3	65.0	43.2	**43.1**	12
Cameroon	30.0	60.0	50.0	43.4	**42.4**	13
Equatorial Guinea	30.3	53.3	65.0	35.1	**41.8**	14
Rwanda	30.0	33.3	70.0	56.1	**40.7**	15
DRC	34.4	41.4	60.0	36.2	**40.2**	16
Benin	27.5	53.3	50.0	44.9	**39.8**	17
Burkina Faso	30.0	40.0	55.0	49.2	**39.1**	18
Uganda	32.1	36.7	50.0	51.4	**38.8**	19
Niger	22.5	53.3	60.0	40.0	**38.3**	20
Ethiopia	32.5	56.7	15.0	44.1	**37.5**	21
Angola	22.0	52.7	40.0	56.2	**37.3**	22
Guinea	25.0	43.3	60.0	40.3	**37.0**	23
Liberia	25.0	48.0	55.0	36.9	**36.9**	=24
Madagascar	25.0	48.0	55.0	36.9	**36.9**	=24
Mauritius	25.0	36.7	50.0	59.9	**36.8**	26
Zambia	26.1	43.2	55.0	39.8	**36.7**	=27
Lesotho	25.0	40.0	65.0	38.4	**36.7**	=27
Malawi	26.1	33.3	60.0	48.5	**36.3**	29
Chad	22.5	56.7	50.0	30.7	**36.2**	30

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Mali	27.5	43.7	40.0	44.7	**35.9**	31
Seychelles	17.5	45.0	65.0	47.1	**35.8**	32
Namibia	18.0	50.7	50.0	51.2	**35.8**	32
Central African Republic	26.1	44.7	60.0	25.8	**35.7**	34
Cape Verde	12.5	60.0	50.0	50.5	**35.5**	35
Mozambique	27.5	35.4	50.0	43.5	**35.2**	36
Sudan	28.5	39.0	40.0	40.2	**34.6**	37
South Sudan	25.0	60.0	20.0	34.4	**34.2**	38
Mauritania	20.0	45.6	50.0	36.2	**33.2**	=39
Somalia	25.0	39.6	65.0	15.8	**33.2**	=39
Sierra Leone	23.8	43.3	35.0	39.8	**32.6**	41
Burundi	22.5	33.3	60.0	31.3	**32.1**	42
Zimbabwe	25.0	39.0	35.0	36.8	**31.7**	43
Djibouti	17.5	54.0	15.0	47.9	**30.6**	44
Guinea Bissau	16.3	46.7	50.0	27.8	**30.5**	45
Eritrea	22.5	40.0	15.0	41.7	**28.5**	46
Togo	16.6	42.0	30.0	39.9	**28.3**	47
Eswatini	15.0	40.0	30.0	40.2	**27.2**	48
Average	*26.9*	*47.6*	*51.4*	*44.3*	*38.2*	

Note: Scores out of 100, with 100 highest. The Telecoms Risk/Reward Index comprises two sub-indices, 'Rewards' and 'Risks'. Scores are weighted as follows: 'Rewards': 70%, of which Industry Rewards 65% and Country Rewards 35%; 'Risks': 30%, of which Industry Risks 40% and Country Risks 60%. The 'Rewards' Index evaluates the size and growth potential of a telecoms market in any given state and the country's broader economic/socio-demographic characteristics that impact the industry's development; the 'Risks' Index evaluates industry-specific dangers and those emanating from the state's political/economic profile that could affect the realisation of anticipated returns, based on Fitch Solutions's proprietary Country Risk Index. Source: Fitch Solutions

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Nigeria Risk/Reward Index

Rewards

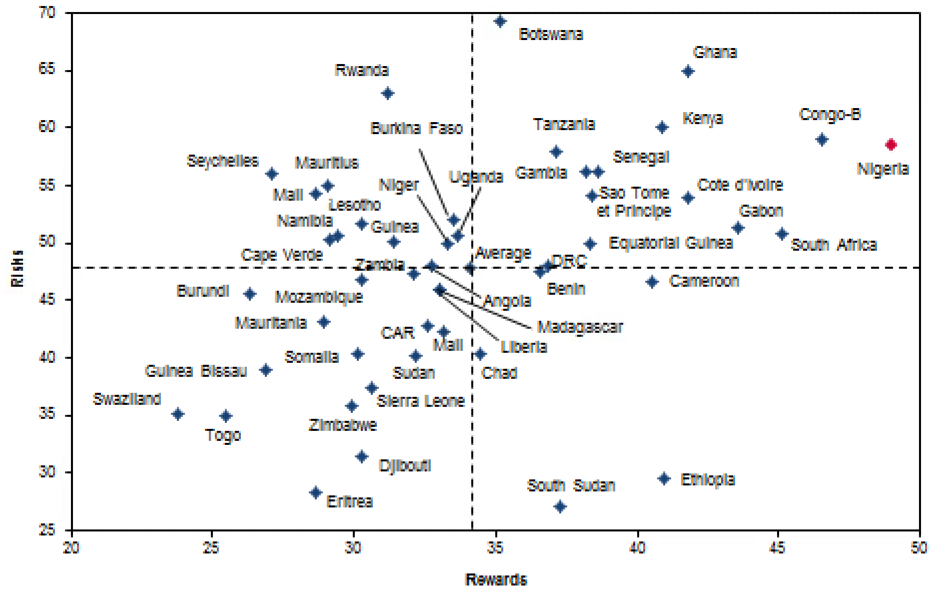
- This quarter, Nigeria's Industry Rewards score sees a 2.8 point erosion to 49.5 out of a possible 100 points. However, it still remains well above the Sub-Saharan African average of 26.9 points. The relatively low rate of urbanisation and the low purchasing power of rural dwellers as well as high and rampant unemployment, which has not improved with real GDP growth, has weighed on the country's rewards profile. However, the score is supported by factors such as a large population (which our Country Risk team estimates to have been 195.88mn at end-2018) as well as positive forecasts for GDP per capita growth trends.
- **MTN**, **Globacom**, **9mobile** (previously **Etisalat**) and **Airtel** have all launched 4G services, with significant investment into boosting their 3G/4G coverage nationwide. But, the regulator still requires improvements in service quality.

Risks

- Nigeria's Industry Risks score of 60 is one of the highest in the region. The score is lifted by the NCC's performance as a proactive and forward-looking regulator. The regulator continues to consult industry stakeholders regarding technological innovation, boosting equitable internet and mobile coverage, and monitoring the day-to-day activities of the mobile carriers.
- Where the NCC is left wanting, however, is in its inability to maintain a high degree of distance from government influence. The Nigerian government continues to have significant sway over policy directives and influence high-profile decisions. The growing regulatory uncertainty has also contributed to the erosion of investor confidence and a decline in capital importation for the sector.

Nigeria vs Sub-Saharan Africa RRI Profile

Q219



Note: Scores out of 100; high scores = lower risk. Source: Fitch Solutions

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Market Overview

Key View: *In this Q219 update, Nigeria has posted positive growth for the fifth consecutive quarter up to December 2018. However, we caution that the possibility of a sizeable number of inactive SIMs still presents in the market may lead to further discounting by the regulator. Nevertheless, our outlook for the telecoms market in the country remains positive with high 3G/4G uptake on the horizon to complement noticeable new subscriber growth levels through to the end of our forecast period in 2028. In the wireline segment, stalled infrastructure investment and customers' increasing access to mobile technology inform our bearish outlook for the market's growth. Moreover, growing government influence and regulatory uncertainty pose key downside risks to investment in the sector as a whole.*

Nigeria's mobile market is characterised by a number of international operators with broad expertise and there is a high degree of competition. Regional titans, such as **MTN** of South Africa and **Airtel** of India, actively compete against each other and against local operators **Globacom** and **9mobile**. We believe this healthy level of competition has largely underpinned the higher subscriber growth trajectory to date.

Market Drivers And Trends

Recent Developments

- The latest data from the Nigerian Communications Commission (NCC) has the market ending Q418 with 174.012mn subscribers. However, the regulator's change of methodology has resulted in it attributing just over 8mn additional subscribers to MTN than the operator has reported. Owing to the lack of explanation from the regulator regarding this phenomenal growth, this quarter's update will again utilise MTN's total reported subscribers. However, we may restate the data for the next quarter.
- These results mark the fifth consecutive quarter of positive growth for the Nigerian mobile market. According to the latest operator and regulator data, the market ended December 2018 with 163.674mn subscribers, representing y-o-y growth of 12.1%. The market continues to shake off the lower-than-expected GDP growth for Q218 as well as the historic discounting of inactive SIMs on 9mobile and MTN's network.
- **Teleology** has exited 9mobile less than two months after taking over the mobile network operator.
- MTN and the Central Bank of Nigeria (CBN) have agreed to a USD53mn settlement over CBN's demand that the operator return USD8.1bn it repatriated from the country between 2007 and 2015. The separate tax court case between MTN and Nigerian authorities was postponed in February 2019.
- MTN announced that it began the mandatory listing of its local unit on the Nigerian Stock Exchange in June 2018.

Mobile

We do not see the competitive landscape changing significantly over the coming years, but competition will begin to heat up as growth prospects brighten. The growth of the market is still significantly driven by promotional offers, multiple SIM ownership and strategies by the operators to lower ARPUs to attract price-conscious consumers. MTN and now Airtel and Globacom's aggressive roll-out of 4G services and advanced data and value-added services will drive growth, along with mobile expansion to rural and previously underserved areas.

Our data are based on market statistics published by the NCC and mobile operator data, less 8.936mn additional subscribers attributed to MTN by the regulator following an apparent but unexplained change of definition. That said, the latest available data show that Nigerian mobile subscriptions reached 154.674mn by the end of Q418, for a y-on-y growth of 12.1% and a penetration rate of 83.6%. All the operators continue on positive customer growth trends, with the exception of 9mobile.

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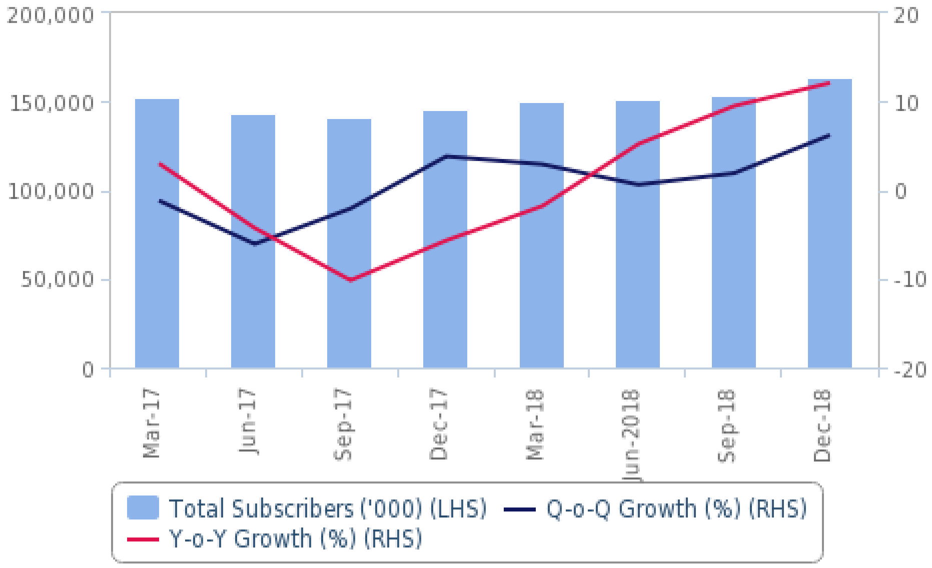
The country has four active GSM operators, MTN, Globacom, Airtel and 9mobile (**Etisalat**), and two mobile CDMA operators, **Visafone** and **Multi-Links**.

Teleology Holdings Limited was selected as the preferred bidder for 9mobile and finalised the acquisition in November 2018. In January 2019, Teleology Holdings Limited exited 9mobile less than two months after receiving regulatory approval to take over the embattled mobile network operator. In spite its financial difficulties, 9mobile remains an attractive proposition at the lower-value end of the market and its potential is further augmented by upcoming reforms to liberalise Mobile Financial Services, further opening the sector up to mobile network operators. As a start, the company's management will move to stem bad publicity and reassure investors while looking to plug the gap left by TH's exit. We would not rule out interest from the reserve bidder **Smile Communications Nigeria** or even less risk-averse operators like Vietnamese-owned regional player **Viettel** whose low-cost voice and data network footprint is spreading across the Sub-Saharan Africa region.

Rapid network expansion to underserved areas, promotional offers, economic growth and rising income levels are the key growth factors in the mobile market. Future subscriber growth opportunities are in under-served rural areas where there is little or no network coverage, and we believe operators that pursue a rural roll-out strategy, will outperform in terms of future subscriber growth.

Mobile Market Growth
2017-2018



Source: National sources, Operator data, Fitch Solutions

According to the latest market data, MTN maintained its lead in Nigeria's mobile market in December 2018, with 58.197mn subscribers. While rivals Globacom, Airtel and 9mobile remained some way behind with 44.180mn, 42.255mn and 15.917mn subscribers respectively. Notably, Globacom's subscriber gain between Q318 and Q418 sees it dislodge Airtel's lead to once again become the second largest operator by subscriber numbers, after MTN. Despite MTN's lead, both Globacom and Airtel have made significant headway over the recent years in eroding MTN's share, which has declined roughly 3 percentage points since March 2016.

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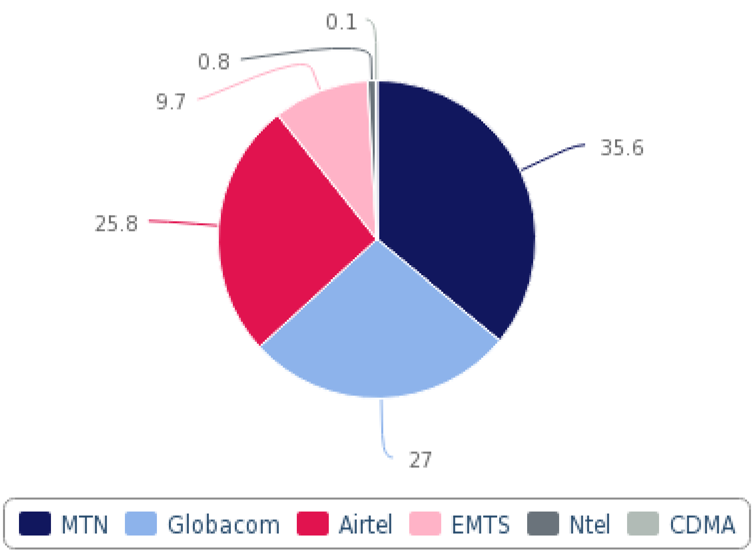
Mobile Market Shares (%)
Q418



Source: NCC, operators, Fitch Solutions

In previous reports, we suggested that fourth player 9mobile's (Etisalat) strong performance during the past three years would encourage Globacom and Airtel to adopt strategies to stave off further erosion of their market shares. To that end, both operators are aggressively deploying advanced services and expanding their 3G and 4G networks countrywide. We believe 9mobile should pursue a rural roll-out strategy, as future subscriber growth opportunities lie in underserved rural areas where there is little or no network coverage. 9mobile was also a late entrant to the 3G and 4G market after missing out on initial concessions, but the NCC has announced plans to facilitate the re-farming of existing spectrum, which, while a significant investment, could bring an opportunity for 9mobile to expand services.

The most potent strategy for outperformance in Nigeria's mobile market is extensive network coverage and superior network quality, as opposed to value-led offerings. This has been a crucial competitive advantage for MTN. All four operators appear to be adopting this strategy, as shown by network investment plans and contract awards announced in 2017.

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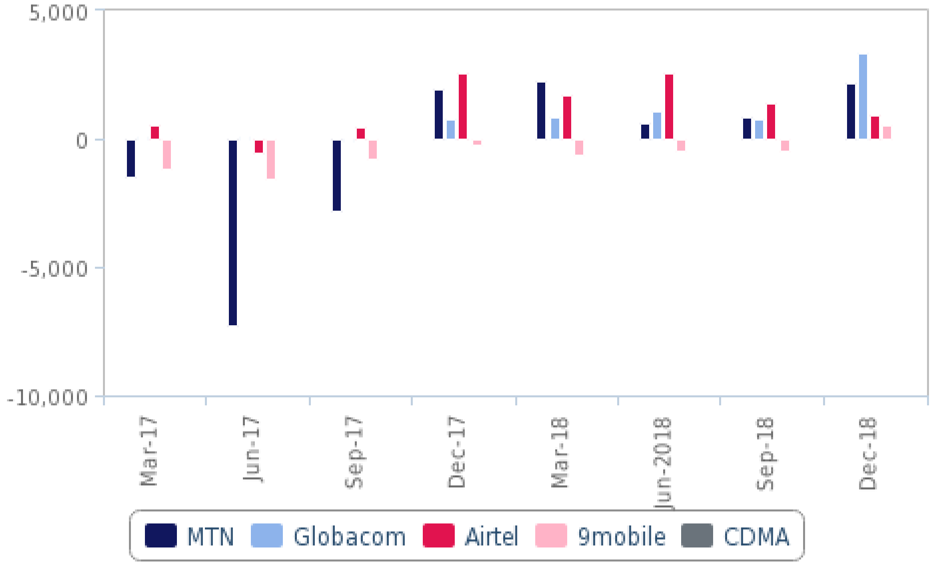
Net Additions By Operator ('000)
2017-2018



Source: Regulator, operators, Fitch Solutions

Following **MATCOM**'s acquisition of **NITEL**, including **M-Tel**'s operating licence and network infrastructure, the groundwork was laid for the emergence of a fifth GSM operator and possible challenger to the dominance of MTN, Globacom and Airtel. In August 2015, President Muhammadu Buhari demanded a report on the sale of NITEL to NATCOM, delaying the new owners' investment and re-entry strategy for M-Tel. However, reports as of April 2016 announced the entry of new operator **ntel** into the market.

MTN is the only operator that regularly publishes ARPU data. MTN reported ARPUS of USD4.22 for Q418, a recovery after five consecutive quarters of declining ARPUS since its Q317 high of USD4.31.

One of the ways in which operators can combat falling prices is encouraging greater service use. MTN's focus on these areas has probably led to its ability to prevent more rapid ARPU erosion, rather than having a significantly better subscriber mix than its rivals. Marketing strategies encouraging increased usage, while still emphasising value, will help operators maintain ARPUs. Mobile operators are rapidly expanding their data networks, a development we expect to support ARPUs in the medium- to long term. However, MTN's latest dispute with the regulator over the operator's repatriation of funds between 2007 and 2015 poses downside risks for growth in the sector: We believe the more unpredictable regulatory environment will lead to investor uncertainty, negatively affecting their willingness to invest in the development of their networks.

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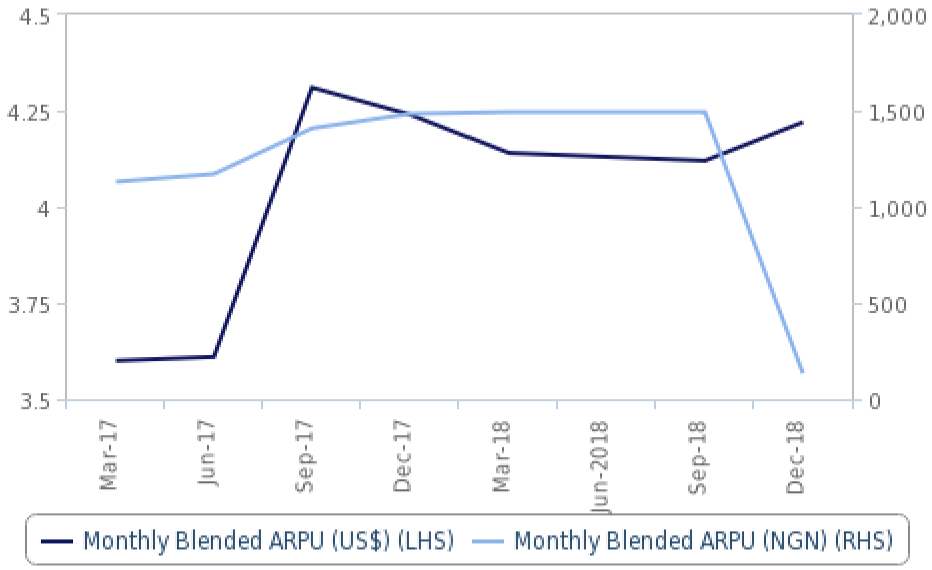
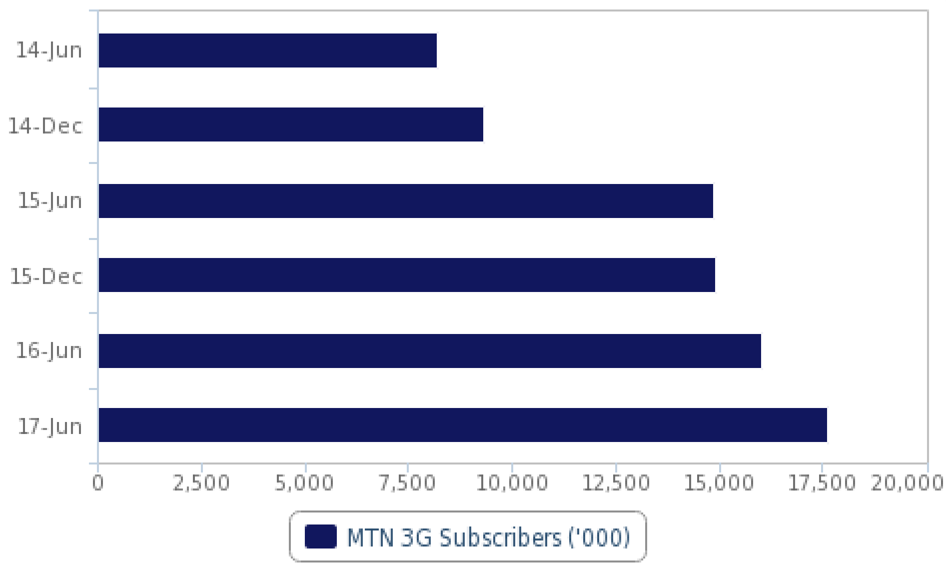
MTN Blended Monthly ARPU
2017-2018 (NGN And USD)



Source: MTN, Fitch Solutions

MTN Active 3G Connections
2014-2017



Source: Operator, Fitch Solutions

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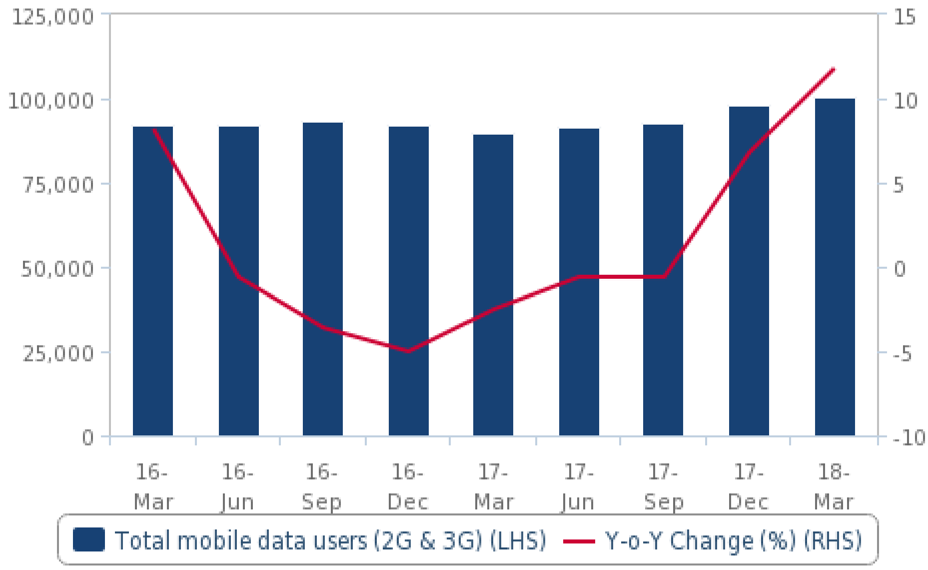
2G And 3G Mobile Data Users ('000)
2016-2018



Source: National regulator, operators, Fitch Solutions

Wireline Voice & Broadband

According to Nigeria's telecoms regulator, there were 140,491 fixed-line connections at the end of December 2018, up from 138,604 in Q318, for a 2.1% y-on-y increase. Of the total figure at end-Q418 **21st Century Technologies**, MTN and Globacom accounted for 103,016; 5,450 and 2,879 connections respectively.

NITEL is the country's only traditional provider of PSTN-based fixed-line services. The latest data from the NCC has confirmed the operator's inactivity and it is therefore no longer included in our analysis of the fixed-line market. In December 2014, the **NATCOM** consortium emerged as the preferred bidder for NITEL and M-Tel after offering USD252.5mn for the two firms. Although the consortium, which includes **NATSPACE Telecommunication Investment**, **PCCW Global** and **Prime Union Investment**, has paid for the assets, President Buhari has demanded a report on the sale, putting it into jeopardy yet again, following several failed attempts to privatise the company over the last decade.

According to the NCC, in Q418 only six alternative service providers were active in Nigeria's fixed-line market (16 operators were previously listed). Of these six, two operators, Visafone and Multi-Links, offer fixed wireless services using CDMA technology, while the other four; MTN-backed **VGC Communications**, 21st Century Technologies, **IPNX** and second national carrier Globacom - provide fixed network services in selected locations. Multi-Links and VGC have been gradually losing market share, while Visafone, 21st Century, IPNX and Globacom have recorded growth in recent quarters.

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NIGERIA - FIXED-LINE MARKET, MAR 2017 - DEC 2018	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
Visafone	26,437	26,437	26,437	26,437	26,437	26,437	26.4	26.4
Market Share (%)	17.3	18.6	18.6	19	19.3	18.8	19.2	18.81758
Multilinks-Telkom	428	428	428	428	428	428	428	428
Market Share (%)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
VGC/MTN	9,532	8,707	8,233	8,290	5,720	6,336	5,433	5,450
Market Share (%)	6.3	6.1	5.8	5.9	4.2	4.5	3.9	3.9
21st Century Technologies	100,745	91,341	91,398	93,178	93,694	97,677	97,860	103,016
Market Share (%)	66.1	64.2	64.3	66.9	68.5	69.5	71.1	73.3
IPNX	2,589	2,541	2,541	2,560	2,624	2,542	2,499	2,281
Market Share (%)	1.7	1.8	1.8	1.8	1.9	1.8	1.8	1.6
Globacom	12,747	12,862	13,033	8,451	7,878	7,177	4,947	2,879
Market Share (%)	8.4	9	9.2	6.1	5.8	5.1	3.6	2
Sub-Total (Fixed/Fixed Wireless)	152,478	142,316	142,070	139,344	136,781	140,597	137,604	140,491
Q-o-Q change	-1.3	-6.7	-0.2	-1.9	-1.8	2.8	-2.1	2.1
Y-o-Y Change	-13.6	-16.5	-10.2	-9.8	-10.3	-1.2	-3.1	1

Source: NCC, Fitch Solutions

Broadband

Neither the NCC nor operators publish detailed data on the number of broadband subscriptions in Nigeria. We estimate the number of regular internet users in Nigeria reached 8.217mn by end-2018, a penetration rate of 4.2%. However, broadband subscriptions growth continue to lag behind internet usage growth owing to the increasing use of mobile handheld devices to access the internet via 2G and 3G networks as well as the high rate of access over shared connections, such as cyber cafes, offices and various public and private institutions. We estimate broadband subscriptions in the country reached 22.58mn in December 2017, up 20.3% y-o-y. Our broadband statistics only recognise unique fixed connections and mobile connections through dedicated data cards/modems.

Fixed broadband penetration has been limited by the country's poor incumbent fixed-line legacy infrastructure, exacerbated by poorly planned urban areas, difficulties acquiring right of way permits and the prevalence of wireless internet services. Therefore, most of Nigeria's businesses rely on very-small-aperture terminal connections, while the residential segment relies on wireless services, such as WiMAX, CDMA and HSPA+. However, businesses increasingly depend on cloud computing and consumers are seeking out new forms of entertainment, such as video-on-demand and online gaming, leading to rising demand for faster and more reliable broadband connections. To take advantage of the rising demand for faster data connections, Airtel Nigeria introduced

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a residential broadband service delivered through dongles, MiFi gadgets and routers in July 2017.

These recent developments in the country's broadband sector are capable of driving growth over the medium term. These include the licensing of a wireless wholesale broadband access service provider, licensing of regional infrastructure companies, government initiatives to encourage the use of ICT services, the implementation of a national broadband plan, consolidation in the fragmented wireless broadband market, and investments in FTTx networks targeted at key consumer segments.

In order to drive broadband penetration in the country, the NCC planned to award seven regional infrastructure company licences. Successful bidders are charged with deploying metro fibre networks in their region and will provide wholesale connectivity on an open access, non-discriminatory and price-regulated basis. In January 2015, the NCC announced **Main One** and **IHS Towers** as the respective winning bidders for the Lagos region and the North Central Zone, which surrounds the federal capital city, Abuja. A big positive in the NCC's choice of Main One and IHS Towers for the first two regions, was their vast experience in deploying and managing telecoms networks in Nigeria and across the wider region. Main One is one of the largest communications service providers in Nigeria. It deployed its own submarine cable linking Nigeria and Ghana to Portugal in 2010 and launched West Africa's largest data centre in January 2015. IHS Towers is the leading independent tower infrastructure company in Nigeria. It also operates in Rwanda, Zambia, Côte d'Ivoire and Cameroon, and signed agreements for a capital raise of USD2.6bn in November 2014. Both companies have the experience and financial backing to deploy regional and metro fibre networks. In February 2018, after numerous delays to the licencing process, the NCC awarded two further licences to **Zinox Technology Limited** for the South-east region and **Brinks Integrated Solutions Limited** for the North-east region of the country. However, in August 2018, IHS Towers returned its licence after it failed to secure Right of Way permissions from local authorities. In October 2018, the NCC issued an infrastructure company (InfraCo) licence to **Sammya Limited**, to roll out broadband infrastructure in the North West region, while **Fleek Networks Limited** and **Raeanna Nigeria Limited** were awarded licences for the North West zone and the South South region respectively.

In order to ensure licensees can concentrate capital on deploying networks as quickly as possible, the government has promised to grant them between five and seven years of tax holidays. They will be offered further incentives, such as subsidies to the tune of a 30% mark-up on capital expenditure and employee tax holidays if they extend networks to less commercially attractive zones. With high levels of unofficial taxation a key damper on investment in the telecoms sector, we believe the government's strategy of offering generous incentives to private investors has a good chance of making an important positive impact on broadband access in Nigeria. IHS Tower's failure to secure the necessary permission to deploy its infrastructure highlight the bureaucratic constraints placed on operators in the sector.

Nigeria's internet market supports a large number of providers, many of which offer very-small-aperture terminal connections services, as well as wireless access services operating in the 12.0GHz to 18.0GHz spectrum range (referred to as 'Ku-band' services). Although the number of Nigerian internet users is low as a proportion of the population, most large towns and cities have multiple internet cafés that ensure that levels of internet use continue to grow. A large number of ISPs also serve the corporate market, including international service providers, such as **BT** of the UK and Channel Islands-based **GS Telecoms**.

Fixed-line incumbents NITEL and 21st Century Technologies are a couple of the few Nigerian ISPs offering ADSL services. The proliferation of ADSL services has been limited by the nature of Nigeria's fixed-line telephony infrastructure. The poorly run incumbent fixed-line infrastructure is a major obstacle to the development of wireline next generation access technologies, such as FTTx. Other limiting factors include poorly planned urban areas, difficulties in obtaining right of way permits and the strong take-up of wireless services. However, there is a latent demand for high-speed broadband services and alternative operators are identifying key market segments to reach with those services.

Given the challenges to rolling out wireline networks, we expect 4G LTE-based broadband connections to drive growth over the next five years. In February 2018, Airtel Nigeria finally launched its 4G network in Ibadan, the Oyo State capital. The operator expanded the service to Abuja two months later. We retain an upbeat view on LTE network upgrades as this presents operators with the opportunity to expand their post-paid subscriber base and promote take-up of more value-added data-intensive services.

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NIGERIA - WIRELINE DEVELOPMENTS, 2013-2018	
Date	**Details**
October 2018	The NCC awarded three additional InfraCo licences to Fleek Networks Limited for the North West Zone, Raeanna Nigeria for the South South region and Sammya for the North West region barring Lagos.
August 2018	The NCC announced that the country's broadband market has achieved a penetration rate of 22%. It also reaffirmed the government's pledge to deploy 18,000km of fibre in the country as well as a NGN3bn (USD8.38mn) subsidy which would be made available for the country's Infraco Licence holders.
June 2018	The NCC announced plans to hold a public inquiry into MTN's acquisition of Visafone Communications and its planned transfer of the latter's spectrum resources in the 800MHz band to MTN Nigeria.
November 2017	The NCC announced plans to facilitate the refarming of existing spectrum. It will auction spectrum in the 2.5/2.6GHz band and, once available, in the 700 MHz band to expand 4G LTE coverage and encourage competition in the data sector.
June 2017	The NCC announced its plan to auction off the five remaining regional infrastructure company (InfraCo) licences. These licences will allow for the deployment of urban fibre optic infrastructure and associated transmission equipment on an open access, non-discriminatory and price-regulated basis. The InfraCos will be responsible for the deployment of broadband infrastructure to the south west, south, south east, north west and north east.
March 2016	After two postponements, the NCC announced that it will proceed with the auction of 14GHz broadband licences for USD16mn in the near future. The licensing of additional spectrum is influenced by the developmental needs of the telecoms sector. The spectrum will be offered on a technology-neutral basis. MTN bid for six lots, paying USD96mn for 60MHz of spectrum and the remaining spectrum went unsold.
January 2015	NCC announced Main One and IHS Towers as the respective winning bidders for InfraCo licences in Lagos region and the North Central Zone, which surrounds federal capital, Abuja.
January 2015	MainOne launched its new Tier-III Lekki Data Centre in Lagos. The facility cost NGN7bn (USD37.6mn) to build and will be managed by Main One subsidiary MDX-i. With a capacity of 600 racks Main One's data centre is the largest of its kind in West Africa.
December 2014	NATCOM consortium emerged as the preferred bidder for NITEL and M-Tel after offering USD252.5mn for the two firms. The consortium includes NATSPACE Telecommunication Investment, PCCW Global and Prime Union Investment.
March 2014	The NCC awarded a 10-year concession to Bitflux Communications to offer wholesale wireless broadband services following an auction. Bitflux, a consortium of three local firms, paid USD23.251mn to beat off a challenge from Global in the final round of the process. The license is technology neutral, although Fitch Solutions expects the operator to deploy a 4G LTE network over the 2.3GHz spectrum band available for the service.
November 2013	Wireless broadband provider IPNX Nigeria entered the fray to offer fibre-to-the-home services in up-scale areas of Lagos, Port Harcourt and Abuja. At launch, IPNX's fibre-optic service will be available to approximately 50,000 residences and businesses in areas of Lagos Island and Victoria Island, including Ikoyi and Lekki.
October 2013	Zamir Telecom signed a partnership agreement with Nigerian interconnect exchange carrier Exchange Telecom, indicating the expansion of Zamir's wholesale VoIP business into the African market.
August 2013	Phase3 Telecom collaborated with Main One Cable to expand their combined fibre optic network to corporate and public institutions across Nigeria. The broadband deployment would facilitate access in Oyo State, while the two

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Date	Details
	operators are also planning to expand their connectivity to other parts of the country.
June 2013	MTN said it had concluded arrangements to deliver broadband through its high-speed fibre network to Victoria Garden City, a gated neighbourhood in Lagos. This is the first of many estates and gated communities the company is targeting with services of up to 100Mbps.
June 2013	MainOne announced plans to roll out fibre-optic broadband services to government agencies, manufacturing companies and other business in Ikeja, a key business district of Lagos.
June 2013	Swift Networks announced the acquisition of rival WiMAX operator Direct on PC.
April 2013	Newtec was selected by Nigerian Communications Satellite (NigComSat) to provide a Ka-band hub platform, including terminals to provide B2B and B2C broadband services. The broadband platform will allow the best possible and cost-effective voice, data, video, internet and application service solutions in Nigeria through the NigComSat-1R satellite.
April 2013	Etisalat launched a metro fibre network in Abuja. The deployment of the Abuja Metro Fibre is part of Etisalat's plans to improve the quality of internet services it offers. The metro fibre network is expected to increase capacity to support additional users, including SMEs and enterprises.

Source: Companies, News sources, Fitch Solutions

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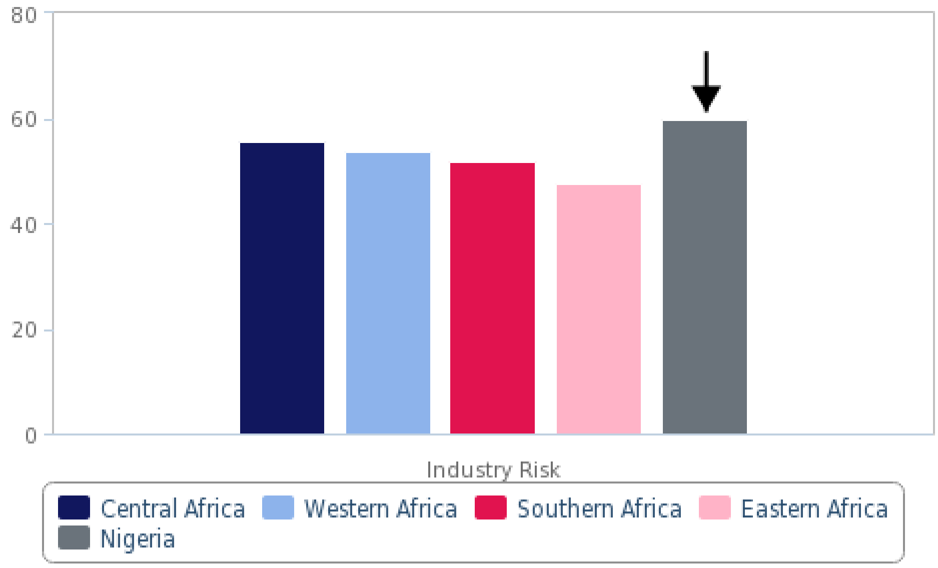
Regulatory Development

Industry Risks

Nigeria again scores a respectable Industry Risks score of 60 out of 100 points on our Q219 Telecoms Risk/Reward Index. The regionally high industry risk score is connected with the Nigerian Communications Commission (NCC)'s performance as it remains proactive and forward-looking in its regulation of the sector. The NCC continues to consult industry players regarding technological innovation, boosting equitable internet and mobile coverage, and monitoring the day-to-day activities of the mobile carriers. However, the regulator has not maintained a high degree of distance from government influence. As such, the Nigerian government still has significant sway over policy directives. Furthermore, it influences high-profile decisions as was evidenced by the severe fine levied against **MTN** for failure to disconnect unregistered SIMs in 2015. The latest burdensome fine levied on MTN by the **Central Bank of Nigeria** (CBN), in August 2018, affirms our long-held view of increased regulatory uncertainty in the country, which has contributed to weak growth in the sector since late 2015. We believe the more unpredictable regulatory environment stems from diverging opinions within the NCC and the government on how to strike a balance between generating increased government revenue and regulating the behaviour of operators whilst promoting the development of the sector.

Prudent Regulator Boosts Score

Industry Risk Scores, Sub-Saharan Africa, Q219



Note: Scores out of 100 with high scores denoting low risks. Source: Fitch Solutions

Main Development: MTN And Central Bank Of Nigeria Settle Repatriation Dispute

In December, MTN and the CBN reached a USD53mn settlement over the latter's August 2018 allegation that MTN had illegally repatriated USD8.1bn in dividends from the country between 2007 and 2015. In August 2018, the CBN ordered MTN to refund USD8.1bn in funds it repatriated from the country between 2007 and 2015. The apex bank challenged the validity of the Certificates of Capital Importation utilised by the operator to remove the sum. Nigerian authorities subsequently issued MTN with a USD2bn tax bill relating to the repatriated funds. CBN also handed out fines amounting to over NGN5.8bn (USD16.02mn) to four banks that facilitated the transactions. MTN denied the allegations.

The separate tax court case between MTN and Nigerian authorities was postponed in February 2019. The Nigerian attorney general

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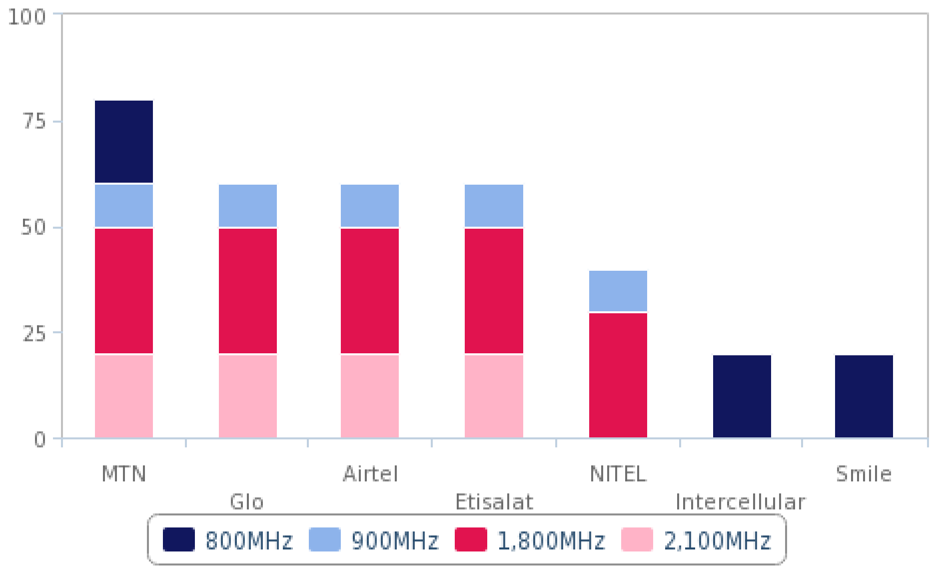
has charged MTN with USD2bn in taxes relating to the operator's equipment imports and payments to foreign service providers since 2008.

MTN Still Leads On Spectrum Assets
Operator Spectrum Holdings (MHz)



Source: National sources, Fitch Solutions

Additional Developments

2019

In January, Teleology announced that it would be divesting its stake in 9mobile, less than two months after receiving regulatory approval to take over the embattled Nigerian mobile network operator. This followed a soured relationship between the company and its local partners amid accusations, from both sides, of non-performance and divergence from agreed strategies.

2018

In November, Teleology completed the acquisition of 9mobile after the NCC had extended the deadline for completion in July.

In October, the NCC issued an infrastructure company (InfraCo) licence to Sammya, to rollout broadband infrastructure in the North West region, while Fleek Networks and Raeanna Nigeria were awarded licences for the North West zone and the South South region respectively.

In June, the NCC announced plans to hold a public inquiry into MTN's acquisition of Visafone Communications and its planned transfer of the latter's spectrum resources in the 800MHz band to MTN Nigeria. This follows complaints by the operator's competitors that the additional spectrum will unfairly increase its dominance over the market.

In February, the NCC reportedly suspended the operational licences of operators found to be involved in call masking and refilling and barring 750,000 phone numbers that were registered with operators and used for those illegal practices. NCC identified six telecoms operators as being involved - Medallion Communications, Interconnect Cleaning House Nigeria Limited, Niconnx Communication, Breeze Micro, Solid Interconnectivity and Exchange Telecommunications - and threatened revocation or suspension of their licences.

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2017

In November, the NCC announced plans to facilitate the refarming of existing spectrum. It will auction spectrum in the 2.5/2.6GHz band and, once available, in the 700 MHz band to expand 4G LTE coverage and encourage competition in the data sector. The regulator hopes the new frequencies will help achieve the 2018 broadband penetration target of 30%; penetration levels were 21% as of February 2017. We are sceptical of the proposition that more spectrum will have a positive impact on the broadband market, as a previous auction was not very popular among operators because of its high price. We believe the regulator must find a balance between generating revenue and meeting the broadband penetration targets, as the long-term economic benefits of making spectrum affordable are greater than revenues from spectrum auctions.

In June, the NCC announced its plan to auction off the five remaining regional InfraCo licences. These licences will allow for the deployment of urban fibre optic infrastructure and associated transmission equipment on an open access, non-discriminatory and price-regulated basis. The InfraCos will be responsible for the deployment of broadband infrastructure to the south west, south, south east, north west and north east.

In August, the NCC announced it started checking the financial and technical status of all licensed telecommunications operators in the country. It argued these measures were necessary to forestall any recurrence of an operator defaulting on its debt obligations. This follows Etisalat Nigeria's (9mobile) rescue after the company failed to pay a consortium of 13 banks USD1.2bn in March 2017.

2016

In early November, the NCC announced its decision to re-instate a data floor price a year after it was eliminated, but on November 30 2016, the day before it was to take effect, the regulator suspended the reintroduction of floor prices.

The NCC tried to auction 14 lots of 2x5MHz spectrum in the 2.6GHz band in 2016. Only MTN Nigeria, subsidiary of one of the largest African telecoms operator, was willing to meet the reserve prices of USD16mn per lot, while the other operators expressed their discomfort with auction conditions and the high reserve prices. MTN bid for six lots, paying USD96mn for 60MHz of spectrum and the remaining spectrum went unsold.

2015

In October, the NCC imposed a USD5.2bn fine on MTN for failing to deactivate 5.2mn unregistered SIM cards by the August 2015 deadline. On December 3 2015, it was announced that the government would cut the fine from USD5.2bn to USD3.9bn. The reduced fine is still more than the USD2.6bn paid by MTN Nigeria in the previous year, and there had been warnings from various critics that this could deter foreign investors. In December 2015, Nigeria's communications minister, Adebayo Shittu, warned that MTN was at risk of facing additional fines if it did not meet the year-end deadline to pay the NGN780bn (USD3.9bn) penalty. In June 2016, MTN and the communications authorities of Nigeria reached an agreement where MTN would pay NGN330bn (USD1.7bn) to resolve the ongoing dispute. MTN is considering undertaking an IPO to raise the cash as the company grapples with a weak economic environment.

In January, the NCC announced Main One and IHS Towers as the respective winning bidders for InfraCo licences in the Lagos region and the North Central Zone, which surrounds federal capital, Abuja. These were the first two of seven regional wholesale broadband infrastructure licences the NCC planned to award, with the aim of improving national broadband networks. In February 2015, the NCC announced plans to allocate the five remaining InfraCo licences in 2016 as part of a drive to facilitate the implementation of national broadband development goals.

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Competitive Landscape

KEY PLAYERS - TELECOMS SECTOR		
Company name	**Ownership**	**Market**
MTN Nigeria	MTN Group (76.08%)	Mobile (GSM 900/1800), fixed-line telephony, internet
Globacom	Mike Adenuga	Fixed-line telephony (local, domestic long distance, international), mobile (GSM 900/1800), data, internet
Airtel Nigeria	Bharti Airtel (79.06%)	Mobile (GSM 900/1800)
9mobile (Previously Etisalat Nigeria)	Teleology	Mobile (GSM 900/1800)
Ntel	NATCOM (100%)	Fixed-line telephony (local, domestic, long distance, international), data, internet, mobile (GSM 900/1800/1900 and LTE)
Nepskom	Eskom Enterprises (51%), government (49%)	Fixed-line telephony (domestic, long-distance, international), data, Internet

Source: NCC, operators, Fitch Solutions

TOTAL SUBSCRIBERS	17-Mar	17-Jun	17-Sep	17-Dec	18-Mar	18-Jun	18-Sep	18-Dec
Subscriber Numbers ('000)								
Total Number	153,082	143,807	140,749	146,034	150,307	151,221	154,060	163,674
Growth (%) q-o-q	-1.2	-6.1	-2.1	3.8	2.9	0.6	1.9	6.2
Growth (%) y-o-y	3	-4.3	-10.2	-5.7	-1.8	5.2	9.5	12.1
Tech: GSM	152,864	143,590	140,532	145,817	150,089	151,004	153,934	163,550
Tech: CDMA	218	218	218	218	218	218	126	124
CDMA as % of Total Subscriptions	0.1	0.2	0.2	0.1	0.1	0.1	0	0.1
Market Penetration (%)	80.2	75.3	73.7	76.5	76.7	77.1	78.7	83.6
No of Net Additions	-1,850	-9,274	-3,058	5,285	4,273	914	2,839	9,613

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	17-Mar	17-Jun	17-Sep	17-Dec	18-Mar	18-Jun	18-Sep	18-Dec
Population Figures ('000)	190,886	190,886	190,886	190,886	195,875	195,875	195,875	195,875
Total mobile data users (2G & 3G)	89,973	91,599	92,976	98,391	100,596	102,805	105,980	111,633
Change (%) y-o-y	-2.5	-0.6	-0.6	6.8	11.8	5.2	9.5	13
As % of total mobile subs	58.8	63.7	66.1	67.4	66.9	68	69	68
Penetration %	47.1	48	48.7	51.5	51.4	52.5	54.1	57

Note: na = not available. Source: NCC, operators, Fitch Solutions

MTN

	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
Total Number	60,392	53,094	50,307	52,273	54,529	55,185	56,035	58,197
2G Data Users	30,519	31,691	32,557	36,070	37,429	38,937	39,725	41,298
Growth (%) y-o-y	-8.5	-3.9	-0.7	13.6	22.6	22.9	22.6	18.4
Market Share (%)	39.45	36.92	35.74	35.79	36.28	36.5	36.4	35.6
Market Penetration (%)	80.2	75.3	73.7	76.5	76.7	77.1	78.7	83.6
No Of Net Additions	-1,449	-7,298	-2,787	1,966	2,256	656	850	2,160
Market Share Of Net Additions (%)	78.3	78.7	91.1	37.2	52.8	71.8	30	22
Blended monthly ARPU (USD)	3.6	3.61	4.31	4.24	4.14	4.13	4.12	4.22
Blended monthly ARPU (NGN)	1,131	1,171	1,408	1,484	1,493	1,493	1,493	1,534
Financial/Structure								
Revenue (NGNmn)		431,454		453,986		411,069		513,205
Revenue (ZARmn)		18,037		17,968		17,230		20,741
Outgoing Voice		11,315		11,429		11,235		13695
Incoming voice		2,126		1,886		1,648		2051
Data		4,085		4,164		2,545		2953
Digital						678		230
SMS		257		257		237		286

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	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
Devices		53		55		46		32
Other		201		177		167		609
EBITDA (ZARmn)		6,906		7,135		7,462		8210
Capital Expenditure (ZARmn) *		4,876		7,152		2,320		-
Capital Expenditure as % Revenue		27		40		13		-
Capital Expenditure/Subscriber		92		137		40		-

Note: na = Not Available. Source: NCC, operators, Fitch Solutions

GLOBACOM

	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
Subscriber Numbers ('000)								
Total Number	37,329	37,411	37,350	38,170	39,043	40,109	40,857	44,180
Data users	27,021	27,184	26,943	26,998	26,694	26,571	27,434	28,055
Growth (%) y-o-y	1.9	2.1	0.2	0	-1.2	7.2	9.4	15.7
Market Share (%)	24.4	26	26.5	26.1	26	26.5	26.5	27
Market Penetration (%)	80.2	75.34	73.73	76.5	76.74	77.1	78.7	83.6
No Of Net Additions	106	83	-61	820	873	1,066	748	3,323
Market Share Of Net Additions (%)	-5.7	-0.9	2	15.5	20.4	21.2	26.4	34.6

Source: NCC, operators, Fitch Solutions

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AIRTEL	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
Subscriber Numbers ('000)								
Total Number	34,657	34,127	34,626	37,234	38,964	39,898	41,314	42,255
Data users	19,424	20,174	21,766	23,985	25,476	26,711	27,925	29,758
Growth (%) y-o-y	13.2	16.4	15.6	22.2	31.2	16.9	19.3	13.5
Market Share (%)	22.64	23.73	24.6	25.5	25.92	26.4	26.8	25.8
Market Penetration (%)	80.2	75.34	73.73	76.5	76.74	77.1	78.7	83.6
No Of Net Additions	540	-530	499	2,608	1,731	934	1415	941
Market Share Of Net Additions (%)	-29.2	5.7	-16.3	49.4	40.5	38.5	49.8	9.8

Source: NCC, operators, Fitch Solutions

9MOBILE (PREVIOUSLY ETISALAT)	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
Total Number	19,622	18,023	17,204	16,955	16,319	15,812	15,355	15,917
Data users	13,008	12,550	11,711	11,339	10,998	10,585	10,151	9,920
Growth (%) y-o-y	-14.7	-17.7	-22.3	-17.6	-15.5	-12.3	-10.7	-6.1
Market Share (%)	12.82	12.53	12.22	11.61	10.86	10.5	10	9.7
Market Penetration (%)	80.2	75.3	73.7	76.5	76.7	77.1	78.7	83.6
No Of Net Additions	-1,188	-1,599	-819	-249	-637	-506	-457	562
Market Share Of Net Additions (%)	64.2	17.2	26.8	-4.7	-14.9	-15.3	-16.1	5.8

Source: NCC, operators, Fitch Solutions

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Company Profile

MTN

SWOT Analysis	
Strengths	• The biggest single mobile operator in Africa, with 217.2mn subscriptions at the end of December 2017. • Footprint across Africa and the Middle East. • Strong brand image as a successful, home-grown African company. • Considerable resources for network investment owing to massive growth in subscriber numbers. • Holds leading market share in many operations. • Experience in more advanced South African market provides a good basis for future development in other markets.
Weaknesses	• Its presence is almost exclusively confined to very low ARPU markets. • Customer base remains heavily skewed towards prepaid users. • Dependence on South Africa and Nigeria for the majority of revenues and profits makes it vulnerable to an economic slowdown in the two countries. • Exposure from regulatory issues across the jurisdictions in which it operates
Opportunities	• It is taking advantage of its experience with 3G/4G services in South Africa to introduce them to other markets. • Moving into corporate data services through MTN Business. • Expanding value-added services portfolio with M-money, M-insurance and M-health offerings. • Investment into digital content through Africa Internet Group helping to diversify revenues and capture synergies between telecoms and services businesses.
Threats	• A world record fine of USD3.9bn imposed on MTN Nigeria will severely impact the group's investment strategy. • Declining ARPUs in many markets due to intense price competition. • Punitive sanctions in many of its operations owing to poor QoS. • Political instability in some international markets, including Syria, Yemen, and Afghanistan.

Company Overview

MTN is one of Africa's largest mobile companies, with operations in 22 countries in Africa and the Middle East. The company was founded in 1994 when parent company M-Cell was incorporated in South Africa and took a 25% stake in MTN Holdings. The latter acquired service provider M-Tel and began offering mobile services in South Africa that year. Over the following years, MTN has expanded its operations, acquiring licences in Africa, Asia and the Middle East.

MTN divides its mobile operations into South and East Africa (South Africa, Uganda, Zambia, Rwanda, Botswana, Swaziland and South Sudan), West and Central Africa (Nigeria, Ghana, Cameroon, Côte d'Ivoire, Benin, Congo-Brazzaville, Liberia, Guinea Conakry and Guinea Bissau) and Middle East North Africa (Iran, Syria, Sudan, Yemen, Afghanistan and Cyprus). It also has businesses in Ethiopia and Namibia.

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Strategy

The company announced a new strategy in H117, to be based on six pillars including better customer experience, focusing on returns and inefficiency, increasing commercial performance, deriving growth from data and digital, technological excellence, and winning over customer hearts and minds.

MTN had a challenging year in 2016. It faced political, economic and regulatory difficulties in a number of countries including its largest markets of South Africa and Nigeria, both of which underperformed in the early part of the year, but rallied in the latter half. In Q416, MTN began a transformation initiative branded Ignite in South Africa and Nigeria, which it will roll-out across its operating markets. Through Ignite MTN aims to become more sustainable, efficient and profitable by accelerating its business and financial performance, extending the range of available services and improving service quality and customer experience. MTN's financial performance improved in H117 and it reported a net profit, compared with a net loss in H116. Its mobile subscriber base fell by 2.1% q-o-q, largely as a result of a redefinition of subscribers; the redefinition process is expected to continue throughout 2017.

After a 2016 net loss, MTN has returned to profitability, reporting headline earnings of ZAR4.5bn (USD345.4bn) for FY2017 (year ending December 2017). The company continues to resolve regulatory issues across various markets which have led to improved corporate governance and internal controls. However, the operator's latest ongoing dispute with Nigerian authorities over its repatriation of USD8.2bn from the country, between 2007 and 2015, shows that despite these efforts, the operator still faces significant downside risks from the legacy of its past actions. As it pursues data and digital services growth strategy, it will also ensure network expansion and upgrades whilst working to reduce its debt. MTN’s key rivals in SSA include Airtel, Globacom, Vodacom and Orange.

Meanwhile, in Ghana, it has launched an IPO to satisfy the terms of its 4G LTE licence in the country. At the same time, the operator is preparing to float shares of its Nigerian unit on the Nigerian Stock Exchange in 2018. Both exercises are driving up operational costs and the need for increased accounting transparency will create recurring costs that will weigh on it long after the IPOs.

On the consumer side, another key facet of MTN's strategy to drive use of non-voice services is its Mobile Money platform, which is available across 14 of its operations. MTN is the largest mobile financial service provider in Sub-Saharan Africa by subscriptions, claiming 17.9mn active users of its mobile money service at the end of June 2017. In order to sustain growth in subscriptions and usage levels, MTN has launched cross-border remittances in East and Southern Africa, in partnership with Safaricom's M-Pesa in Kenya and Vodacom's M-Pesa in Tanzania, the Democratic Republic of the Congo and Mozambique.

Recent Developments

2019

In January 2019, the Ugandan government deported a number of MTN executives, citing national security considerations.

2018

In December, MTN and the Central Bank of Nigeria (CBN) reached a USD53mn settlement over the latter's August 2018 allegation that MTN had illegally repatriated USD8.2bn in dividends from the country between 2007 and 2015. The CBN alleged that the funds were repatriated in contravention of Nigeria's capital control regulations. It fined four banks which facilitated the transactions a combined total of NGN5.8bn (USD16.02mn) and levied a USD2bn fine on the operator.

In July, MTN sold its Cyprus unit to Monaco Telecom, for around USD304mn. We believe that the sale forms part of its strategy to reduce its net debt and may be the start of further retreats from challenging and non-essential markets.

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In March, MTN Group was reported to be expecting to list its Nigerian unit by July 2018. MTN plans to raise at least USD400 million from the initial public offering (IPO). MTN plans an offer price of around NGN80 (USD0.2) per share for the IPO.

In February, MTN Ghana will make 35% of its shares available in an IPO by the end of Q118. MTN had originally begun the process of listing its shares on the Ghana Stock Exchange (GSE) in 2016 under a requirement of its 4G LTE licence, which was granted the previous year.

In January, MTN and Swedish telecommunications company Ericsson performed Africa's first 5G tests in South Africa. The two companies signed a memorandum of understanding in 2017 to jointly develop 5G capacity in Africa.

Also in January, MTN Rwanda announced that it plans to utilise 900MHz UMTS technology to expand its 3G service coverage. The operator currently uses the 900MHz band to provide 2G services and says that all of its 2G base stations will now also support 3G technology. MTN is expecting to invest an estimated USD20mn in the upgrade.

2017

MTN announced a new strategy in 2017, coinciding with the publication of its H117 results. The new strategy will be based on six pillars, including better customer experience, expansion of Ignite and growth of data and digital services.

MTN Group exchanged its 51% stake in Nigeria Tower InterCo, the parent company of Nigerian telecom tower operator INT Towers, for an additional shareholding in IHS Holding. MTN's economic interest in IHS Group increased from 15% to 29%. The transaction enables MTN to simplify its tower ownership structure and diversify its tower infrastructure exposure across the IHS Group which operates in a number of markets across Africa.

In December, MTN, together with Orange, Nexttel and Camtel, was fined by the ART for failing to comply with subscriber identification verification procedures. The operator claimed that the fine amounted to approximately USD6.6mn, and also included a reduction in its operating license term by one year.

2016

In December, MTN Group, which has been trying for several years to repatriate the equivalent of USD1bn from Iran, said it had managed to extract 'several hundred million dollars' from the country with the help of European banks.

In November, MTN Uganda announced the launch of outbound mobile money transfer services to Rwanda and Kenya. In 2015, MTN launched international mobile money transfer services, but only supporting inbound transfers where MTN Mobile Money customers could receive money from Kenya and Rwanda. In this latest development, MTN Mobile Money customers in Uganda can now send money to M-Pesa and MTN Mobile Money customers in Kenya and Rwanda, respectively.

In June, MTN agreed to pay a total cash amount of USD1.67bn fine over three years to the Nigerian government over its failure to disconnect unregistered mobile phone users. Originally, MTN was slapped with a USD5.2bn fine in October 2015 for failing to cut off 5.1mn unregistered SIM cards as requested by the Nigerian government. In December 2015, the fine was reduced to USD3.4bn.

In April, MTN Business launched a cloud delivery platform in Rwanda and Cameroon, which will enable customers to access cloud services. The web portal would also be launched in Swaziland, Ghana and Uganda by the end of April 2016.

In March, MTN indicated it planned to wind down its South Sudanese operations, citing the challenging economic environment, volatile currency movements and US dollar unavailability. The company planned to cut its workforce to 80 and abandon investment plans to deploy 40 communication towers. This development comes after the company registered ZAR434mn in foreign exchange losses in 2015 as a result of the South Sudanese pound deprecating by 509% against the USD during the same period.

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Financial Data

Revenues

2016: ZAR146.894bn

2017: ZAR132.815bn

EBITDA

2016: ZAR40.751bn

2017: ZAR46.955bn

Profit After Tax

2016: ZAR3.103bn

2017: ZAR4.541bn

Operational Data

MTN ARPU (USD)

	Q416	Q117	Q217	Q317	Q417	Q118	Q218	Q318
South Africa	6.69	6.34	6.51	6.69	7.12	8.061	7.451	7.06
Uganda	2.3	2.11	2.06	2.14	2.32	2.17	2.12	2.25
Rwanda	1.87	1.74	2.03	2.45	2.46	2.32	2.13	2.35
Zambia	2.6	2.27	2.68	3.05	3.14	2.82	2.87	2.9
South Sudan	1.95	1.84	2.19	2.27	3.14	3.6	4.93	4.67
Botswana	6.74	6.17	6.7	6.5	7.6	7.6	7.6	7.24
Swaziland	7.77	7.75	7.72	7.28	7.98	7.78	7.12	7.17
Nigeria	3.52	3.6	3.61	4.31	4.24	4.14	4.13	4.12
Ghana	3.27	2.87	3.67	3.73	4.05	4.5	4.6	4.02
Cameroon	3.38	2.98	3.17	3.4	4.32	4.66	4.6	4.28
Ivory Coast	4.51	4.33	4.35	3.99	4.17	4.19	4.1	3.65

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	Q416	Q117	Q217	Q317	Q417	Q118	Q218	Q318
Benin	5.92	5.3	5.09	4.99	4.68	5.45	4.88	4.88
Conakry	2.02	2.16	2.24	2.21	2.12	2.05	1.93	1.89
Congo B	7.35	6.51	7.43	6.78	5.72	5.94	5.99	6.69
Liberia	3.45	2.44	2.59	2.44	3.88	3.47	3.14	2.67
Bissau	3.52	3.48	4.62	3.9	3.78	3.99	4.21	3.52
Iran	3.94	3.86	3.84	4.35	4.87	4.32	4.05	2.52
Syria	2.02	1.96	1.98	2.15	2.29	2.37	2.58	2.84
Sudan	3.41	3.59	3.76	3.92	2.79	1.45	1.37	1.45
Yemen	3.24	3.17	3.29	3.11	2.34	2.38	2.58	2.68
Afghanistan	1.92	1.52	1.72	1.84	1.73	1.69	1.9	1.9
Cyprus	17.53	17.1	20.07	18.62	19.53	20.64	20.09	

Source: MTN

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MTN MOBILE SUBSCRIBERS ('000)

	Q416	Q117	Q217	Q317	Q417	Q118	Q218	Q318
South Africa	30,764	30,231	31,216	30,908	29,516	29,806	30,176	29,471
Uganda	10,549	10,861	11,158	10,806	10,707	10,856	10,511	10,828
Rwanda	4,062	4,210	3,510	3,575	3,413	3,574	3,805	4,203
Zambia	5,802	5,505	5,575	5,695	5,485	5,638	5,747	6,052
South Sudan	771	708	685	691	663	762	927	958
Botswana	1,821	1,784	1,763	1,746	1,746	1,746	1,746	1,669
Swaziland	970	981	987	999	979	1,010	988	952
Nigeria	61,970	60,523	53,094	50,308	52,273	54,529	55,185	56,035
Ghana	19,296	16,789	17,304	17,590	15,667	16,151	16,525	17,111
Cameroon	9,870	9,749	9,541	9,447	7,052	6,596	6,637	6,922
Ivory Coast	9,484	10,399	11,018	11,619	10,922	10,971	11,257	11,208
Benin	4,053	4,162	4,273	4,280	4,358	4,358	4,517	4,826
Conakry	2,563	2,493	2,550	2,696	2,648	2,655	2,827	2,923
Congo B	2,404	2,355	2,345	2,481	2,532	2,373	2,345	2,382
Liberia	1,577	1,495	1,412	1,635	881	915	1,078	1,117
Bissau	685	700	789	795	742	742	790	774
Iran	47,625	48,118	49,041	49,539	43,257	44,551	44,610	44,439
Syria	6,067	5,915	5,915	5,915	5,617	5,617	5,293	5,435
Sudan	7,490	7,604	7,576	7,450	7,582	7,670	7,677	7,600
Yemen	5,252	5,221	5,110	5,089	4,371	4,193	4,213	4,263
Afghanistan	6,895	6,597	6,469	6,516	6,400	6,172	6,062	6,222
Cyprus	409	414	436	447	421	426	441	

Source: MTN

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Globacom

SWOT Analysis

Strengths

- As a wholly owned Nigerian company, Globacom enjoys the goodwill of a significant proportion of the population.
- Globacom has a unified national service licence, allowing it to operate in multiple telecoms market segments, including fixed-line, internet and mobile segments.
- Has offered 3G mobile services since December 2007.
- Investment in submarine cable system Glo-1 and extensive terrestrial fibre-optic network positions Globacom to capture a large segment of the retail and corporate data markets.
- Globacom is expanding internationally with activities in Ghana and Benin.

Weaknesses

- Network capacity is a problem for Globacom, as it is for other operators, with the telecoms regulator imposing fines on the operators in 2012 and 2013, and a ban on selling SIM cards in March 2014.
- Globacom has a poor subscriber mix.
- Globacom has been unable to take advantage of NITEL's lack of competitiveness to expand its fixed-network business.

Opportunities

- Investment in terrestrial fibre-optic infrastructure and data centre facilities should enable Globacom to serve the lucrative corporate market.
- The commercial launch of Glo-1 submarine cable system provides access to cost-effective and reliable international connectivity.
- Globacom has invested in expanding its range of value-added services (VAS) to encourage data usage among subscribers.
- Launch of extended mobile money agent network and partnership with FirstMonie offers strong mobile financial services (VAS) growth potential.
- Globacom launched LTE services for corporate customers in 2011 and for the retail market in October 2016.

Threats

- Security risks related to the activities of Boko Haram in northern Nigeria could result in heightened operating costs and network damage.
- Adoption of tower outsourcing strategies by Globacom's rivals will increase their operational efficiencies, which could undermine Glo's ability to compete on quality of service and pricing.

Company Overview

Founded by Chairman Mike Adenuga, Globacom received its licence to become Nigeria's second national operator in August 2002, for which it paid USD200mn. As part of the licence deal, Globacom also received approval to provide Nigeria's fourth mobile network using GSM technology. In 2007, Globacom was awarded a 3G licence. Commercial 3G services were launched in December of that year. That followed the launch of 4G LTE services for the corporate segment in 2011 and for the retail segment in October 2016.

Globacom has four business units: Glo Mobile (its GSM provider), Glo-Broadaccess (provides fixed-line and internet access services), Glo Gateway (international services using capacity on the SAT-3 submarine cable system linking Portugal with South Africa) and Glo-1 (Glo's own submarine cable system).

In addition to Nigeria, Globacom operates in Ghana, Benin, Côte d'Ivoire, Senegal and the Gambia. Globacom secured its licence to operate in Senegal and the Gambia in 2010. The licence allows Globacom to land its Glo 1 trans-Atlantic submarine cable in the Gambia, with opportunities to extend the infrastructure to neighbouring countries. It also gives it the right to carry traffic for major operators, the government and wholesale customers in the Gambia. In June 2012, Globacom won a licence to land its Glo-1 submarine cable in Senegal with opportunities to extend capacity to Mali. This was followed by the acquisition of submarine landing

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rights in Côte d'Ivoire in October 2009.

Globacom launched commercial mobile services in Benin in June 2008, the same year it won Ghana's sixth mobile licence. Globacom launched commercial mobile services in Ghana in April 2012, having invested around USD750mn in network infrastructure development and marketing campaigns.

Strategy

The launch of a new set of VAS by Globacom in April 2014 was indicative of a new strategy to extract more value from subscribers amid intense downward pressure on revenue from traditional voice services. Globacom's Glo Mobile already had a rich VAS portfolio, with services across multiple categories, including lifestyle, entertainment, sports, fun and games, news and entertainment, and religious and motivational. However, the launch of these services is in line with our expectation that operators will expand their VAS offerings in order to offset the decline in voice revenues, take advantage of the uptake of smartphones and data connections, as well as meet the services gap in other sectors of the economy.

The quantity and variety of VAS offerings available to customers on Globacom's network suggest that it intends to reach a large proportion of its subscriber base as the services appeal to different consumer tastes and segments. There are now more than 50 VAS offerings for customers to choose from on Glo Mobile's platform. Beyond boosting ARPUs, we believe the new services could also reduce the operator's churn rate, which could be well into double figures given its recent operational performance.

On the back of a robust VAS offering, Globacom has been aggressively expanding its 4G LTE network beyond parts of Lagos, Port Harcourt, Abuja, Jos, Warri, Eket Benin City Yola And Zaria since October 2016. Aggressive investment into its 4G network will be increasingly significant if the operator is to grow its data revenues to the point where they offset falling voice revenues.

In the wireline market, Globacom announced the inauguration of its submarine cable venture Glo-1 in October 2010. The 9,800km cable stretches from the UK across West Africa and has landing points in Nigeria, London and Lisbon, connecting 17 countries to the rest of the world. Globacom's USD250mn cable landed in Lagos in September 2009 and Accra in Ghana the following month. Glo-1 became ready for commissioning in July 2010. The cable has an ultimate capacity of 2.5Tbps and is expected to provide faster, more reliable internet services at a lower cost.

Globacom has a 10,000km fibre-optic network connecting more than 40 cities across Nigeria. In addition, Globacom owns a number of metropolitan fibre networks in 13 major cities across Nigeria. The operator plans to increase the number of such networks over time.

Globacom is leveraging its submarine cable as well as its fibre-optic network to offer, broadband internet and wholesale services to the corporate segment. Although the operator has been slow to take advantage of NATCOMs lagging wireline infrastructure, at the time of writing, Globacom claimed that it was planning to launch fixed line services aimed at the enterprise segment, leveraging its fibre network. In that regard, services will be launched in 13 major cities with a capacity to host 300,000 lines.

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Developments

2018

In November, Globacom claimed to have expanded its 4G LTE network to 36 states in the country.

2016

Globacom Aggressively Expands 4G LTE Network

Since its 4G LTE deployment aimed at the enterprise segment, Globacom has been aggressively expanding its 4G network beyond Lagos, Port Harcourt, Abuja, Jos, Warri, Eket, Benin City, Yola and Zaria. By November 2016, the operator reported that its LTE network covered more than 60 locations throughout Nigeria.

NCC Fines Globacom For Mobile Number Portability Breach

In February 2016, NCC ordered Globacom to pay USD110,000 for the operator's non-compliance with mobile number portability regulations in Q415. A similar fine of USD38,065 was also issued to MTN, in the same period.

Financial Data

Globacom does not publish its financial figures.

Operational Data

Mobile Subscriptions

- Q318 (end September): 40.857mn
- 2017: 38.170mn
- 2016: 37.223mn

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Airtel Africa

SWOT Analysis

Strengths	• Backed by major international player Bharti Airtel. • Extensive regional footprint with operations in 15 countries across Africa. • Present in key regional markets, including Nigeria, Ghana, Kenya and Tanzania. • Airtel is in top three positions in most of its markets, enabling it to influence competition dynamics.
Weaknesses	• Low-margin strategy failed spectacularly in Africa, impacting revenue growth and profitability. • Heavily dependent on prepaid subscribers. • Presence in many low-ARPU countries weighs on average regional ARPU levels. • Limited investment in submarine cable systems compared to some of its regional rivals. • Lags behind some major rivals in the development of enterprise services.
Opportunities	• Market consolidation in Kenya has somewhat improved Airtel's competitive position. • Airtel is well placed to take advantage of growing opportunities in m-commerce services with its Airtel Money platform. • Investments in 3G/4G networks enabling Airtel to respond to rising demand for data services. • Divestment of tower assets has freed up much-needed capital and improved cost efficiency. • Airtel is open to new expansion opportunities in the region, either through acquisitions or through green field investments.
Threats	• Insecurity and political conflicts in some of Airtel's markets could threaten the operator's investments. • Airtel's large footprint intensifies the challenge of managing multiple cultural and macroeconomic factors at play in different markets, including language, inflation and forex movements.

Company Overview

Although successful in India, Bharti Airtel's "Minute Factory Model" strategy struggled to take off in Africa since its introduction in 2010. Low population density, lack of purchasing power and the outsourcing partners' inability to measure up to the challenge, has previously prevented Airtel's low-margin high-volume strategy from flourishing. The company only reported its first fully profitable year for FY2017/18 (ending March 2018), with its USD104.2mn profit driven largely by an overall increase in data consumption. In contrast, Airtel reported its first loss in 15 years for its India operations - the result of a domestic price war with Reliance Jio.

In January 2017, it was reported that Airtel was considering divesting or merging some of its African units in order to reduce its overall company debt. Airtel reportedly named Chad, Kenya, Niger, Congo-Brazzaville, Rwanda and Tanzania as markets where it could benefit from reducing its exposure. In 2016, it sold its operations in Burkina Faso and Sierra Leone to Orange for a reported USD900mn. To further cut debt, it has also raised more than USD2bn from tower sales. The sale of an estimated remaining 11,900 towers across Africa should help reduce operating costs and boost the operator's capex budget over the coming years. In May 2018, it was reported that Airtel aims to raise between USD1bn and USD1.5bn by listing 25% of its entire Africa division in early 2019.

Airtel also increased its ownership of Airtel Nigeria in November 2016, purchasing Econet Wireless Limited's 4.2% shareholding in the Nigerian subsidiary. It also acquired Warid Telecoms' assets in Uganda in May 2013 and part of YU Mobile's assets in Kenya in March 2014.

Airtel has also expanded its portfolio of non-voice services for consumers and enterprise solutions for businesses. Since 2013, Airtel has been forming partnerships with content providers across different interests, including education, entertainment, financial services, health, agriculture and information, to launch new non-voice services for consumers. The company is also investing its terrestrial fibre-optic infrastructure to power its recently launched Airtel Connect initiative, a network of fibre and satellite networks, with 42 points of presence (PoP) throughout Airtel's African footprint targeted at enterprise customers.

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We expect future investments to be geared primarily towards building up coverage and capacity of its 3G and 4G networks across the continent and further developing VAS, such as its MFS platform in order to maintain growth momentum in non-voice revenue.

Strategy

Airtel's decision to sell its tower assets across the continent, beginning with the sale of 3,100 towers to Helios Towers in July 2014 and another 3,500 towers to Eaton Towers in September should have a positive impact on its bottom line. The sale of an estimated remaining 11,900 towers across Africa should help reduce operating costs and boost the operator's capex budget over the coming years. In line with this development, Airtel stated plans to invest USD1bn a year in its African operations for the next few years. This is a significant increase from capex of USD629mn in the 12 months to June 2014. We expect these investments to be geared primarily towards building up coverage and capacity of its 3G and 4G networks across the continent and further developing VAS, such as its MFS platform in order to maintain growth momentum in non-voice revenues.

The failure of the low-margin high-volume strategy has spurred Airtel to expand its portfolio of non-voice services for consumers and enterprise solutions for businesses. Since 2013, Airtel has been forming partnerships with content providers across different interests, including education, entertainment, financial services, health, agriculture and information, to launch new non-voice services for consumers. The company is also investing its terrestrial fibre-optic infrastructure to power its recently launched Airtel Connect initiative, which is a network of fibre and satellite networks, with 42 points of presence (PoP) throughout Airtel's African footprint targeted at enterprise customers.

Developments

2018

In May it was reported that Airtel was considering a listing of 25% of its entire Africa Division. The company reportedly aims to raise between USD1bn and USD1.5bn when it lists on the London Stock Exchange in early 2019.

In March, Airtel's Africa division announced its first fully profitable year, since its start of operations, reporting USD104.2mn profits for FY2017/18 (year ending March 2018).

In January, Airtel Malawi launched 4G LTE services. The 4G network is available in the cities of Blantyre, Lilongwe and Mzuzu.

2017

In October 2017, Millicom and Bharti Airtel completed the merger of their Ghana subsidiaries. The deal created Ghana's second-largest mobile operator with nearly 10mn subscribers and USD300mn in revenue. Airtel and Millicom have equal ownership and enjoy governance rights in the combined entity. The two also have board representations and management positions in the merged entity.

In February, Airtel Malawi announced a MWK15.2bn (USD20.98mn) network upgrade to expand and improve the coverage and quality of its voice and data services. The improvements were scheduled to take place between March and July 2017.

2016

In November Bharti Airtel reached an agreement with Zain for the Kuwaiti company to pay Bharti approximately USD129mn for the settlement of a long-running legal disagreement with Econet over its Nigerian unit. Later that month, Bharti bought Econet's 4.2% stake in Airtel Nigeria, bringing the dispute to a close.

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In September, the Tanzanian government regained full ownership of Tanzania Telecommunications Corporation (TTCL) after reportedly completing its deal to buy back a 35% stake in the operator from Bharti Airtel for an undisclosed amount.

In August, Airtel Ghana launched a home solution dubbed Airtel Quonect, a Fibre-To-The-Home (FTTH) solution that provides internet access for home owners and developers.

In July, Airtel Madagascar and Tecno Centre signed a partnership. Under this agreement, all users buying a phone from Tecno Centre will receive a free Airtel SIM with data connection ranging from 50MB to 1GB. In other developments, the Orange Group completed the acquisition of 100% of Airtel Sierra Leone, in partnership with its Senegal-based subsidiary, Sonatel.

In June, Orange Group completed the acquisition of 100% Airtel Burkina Faso through Orange Cote d'Ivoire.

In May, Airtel Ghana partnered with Fidelity Bank and Tiaxa to launch Airtel Money Bosea - a Nano loan scheme that provides access to financial services enabling customers to borrow money instantly through their Airtel Money wallet. Eligible subscribers can borrow up to GHS200 and have up to one month to pay back the fund through deductions via their Airtel Money wallets. In other developments, Airtel Congo launched an international money transfer service between Airtel Chad and Airtel Rwanda. The operator, in partnership with Seychelles Trading Company (STC), also launched a 'Tay n Pay Service' in the Seychelles.

In March, Airtel Zambia extended its partnership with Ericsson for the transformation of the operator's radio access network (RAN) infrastructure. The contract covers equipment, software and a range of professional services, including project management, systems integration and support, while also covering the transformation of Airtel's existing 2G infrastructure and the swapping out of existing 3G sites.

In January, Airtel Zambia announced its plan to invest more than USD48mn to upgrade its network infrastructure across the country.

Financial Data

Annual Revenues

- March 2016: USD3.45bn
- March 2017: USD2.89bn
- March 2018: USD3.04bn

EBITDA

- March 2016: USD667mn
- March 2017: USD859mn
- March 2018: USD1.01bn

Net Profit/Loss

- Net Loss (March 2016): USD457mn
- Net Loss (March 2017): USD242m
- Net Profit (March 2018): USD104mn

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Operational Data

Mobile Subscriptions

- March 2016: 74.675mn
- March 2017: 80.061mn
- March 2018: 89.300mn

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9mobile

SWOT Analysis

Strengths	• Strong subscriber growth since launching commercial operations in 2008. • Rapidly growing mobile data user base.
Weaknesses	• A late entrant to the 3G and 4G market after missing out on initial concessions. • The subscriber base is predominantly prepaid, limiting ARPU potential. • Smaller network coverage area compared to some of its bigger rivals.
Opportunities	• Financial backing from new owners could bring an opportunity for 9mobile to expand services into previously unserved and rural areas and increasing its mobile broadband services. • Significant subscriber growth potential in Nigeria's mobile market, considering the relatively low penetration rate and large population size. • Poor fixed-line infrastructure will drive demand for mobile voice and data services. • The launch of multiple submarine cable systems will complement 9mobile's mobile data services. • Significant network investment plans will sustain growth. • Sale of mobile towers in August 2014 to improve operational efficiency.
Threats	• The introduction of MNP increases the risk of higher churn rates. • The regulator's price cap on SMSes could weigh on non-voice revenues. • Outbreaks of religious and political violence in some parts of the country often have adverse effects on telecoms operations. • High price inflation could reduce telecoms spend among consumers, especially those in low and middle-income brackets. • Volatile subscription growth negatively impacting revenues.

Company Overview

In July 2017, Etisalat Nigeria rebranded to 9mobile. The operator was formerly backed by UAE-based Etisalat Group which exited the Nigerian mobile market in June 2017 after Etisalat Nigeria defaulted on a USD1.2bn loan which was funded by a consortium of 13 local banks. Teleology is in the process of buying the company.

The company was granted a unified access licence by the Nigerian Communications Commission (NCC) in 2007 for a consideration of USD400mn. The licence enables the operator to offer GSM 900/1,800MHz and fixed-line services, but it opted to focus on the high growth mobile sector. Etisalat launched commercial GSM services in March 2008. In December 2010, Etisalat acquired Alheri Mobile services, a telecoms firm owned by Dangote Group, for an undisclosed amount to gain access to a 3G licence after it missed out on the initial 3G concessions. In October 2016, Etisalat commercialised 4G services leveraging spectrum in the 1800MHZ band. At the time of writing, the operator's 4G service was only available in Lagos.

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Strategy

9mobile has adopted a corporate vision of creating more value for customers by improving quality and efficiency, embedding innovation, and increasing the speed of service delivery. As part of this strategy, it is outsourcing non-core IT and network functions to third-party vendors and completed the sale of 2,136 mobile towers to IHS Towers in August 2014. This will enable it to focus on creating value for existing customers, improving customer experience as well as minimising operating expenses. The anticipated active infrastructure sharing framework from the NCC will, particularly, be significant in terms of Etisalat minimising its operational costs.

In the retail market, the operator has been developing value-added services, in view of increasing customer usage of data in its network. Such initiatives include GTEasysavers a mobile financial service developed in conjunction with Guaranty Trust Bank Nigeria and Cliqlite, a web-based platform which provides access to primary and secondary school-related education content. We believe, Etisalat's 4G deployment in October 2016, will further drive the operator's data monetisation efforts.

Developments

2019

In January, Teleology announced that it would be divesting its stake in 9mobile, less than two months after receiving regulatory approval to take over the embattled Nigerian mobile network operator. This followed a soured relationship between the company and its local partners amid accusations, from both sides, of non-performance and divergence from agreed strategies.

2018

In November, Teleology completed its acquisition of 9mobile and the operator has reportedly begun to pay back its debtors.

In January, Teleology was selected as the preferred bidder of 9mobile. Smile Telecoms is the reserve bidder. Both companies were given 30 days to prove that they had the financial resources to take over 9mobile. Teleology is currently in the process of acquiring regulatory approvals. In August 2018, media reports indicated that Teleology's acquisition of 9mobile had received clearance from the NCC and the Central Bank of Nigeria.

In December, five companies were alleged to have proceeded to the next stage in the process for acquiring 9mobile. The five shortlisted firms were reportedly Bharti Airtel, Smile Telecoms, Globacom, Helios Towers and Teleology.

Financial Data

Annual Revenue

- 2017: AED2.388bn (estimate)
- 2016: AED3.408bn
- 2015: AED4.245bn

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Capex

- 2017: AED88mn (estimate)
- 2016: AED295mn
- 2015: AED1.118bn

Operational Data

Mobile Subscriptions

- Q318: 15.355mn
- 2017: 16.955mn
- 2016: 20.810mn

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Ntel

SWOT Analysis

Strengths	• As the historical owner of the fixed-line network, Ntel has a monopoly on traditional fixed-line services, and on ADSL services. • Ntel has a full mobile licence and some GSM and LTE mobile network infrastructure, although only the LTE facilities are operational.
Weaknesses	• The derelict state of Ntel's legacy infrastructure and high saturation of the mobile market has devalued Ntel's assets. • All legacy mobile and fixed-line subscriptions are inactive, according to Nigerian Communications Commission data.
Opportunities	• If Ntel can fund a serious rescue effort, it could still capture some of the considerable growth opportunities in the wireline segment by using NITEL's legacy fixed-line network. • Subscriber and revenue growth on the back of 4G LTE and VoLTE launch.
Threats	• Competition in the telecoms market continues to grow. There is a thriving fixed-wireless market that is growing and improving coverage, which may make Ntel's fixed-line telephone and broadband services obsolete.

Company Overview

In July 2015, NATCOM Development & Investment Ltd acquired the assets of the former state-owned operators Nigerian Telecommunications (NITEL) and Nigerian Mobile Telecommunications (M-Tel), which had been liquidated earlier in the year. Trading as Ntel, the company is a fully licensed wireline and mobile operator, but currently limits commercial activities to the main population centres. The company is focused on providing mobile and wireline services over its LTE networks.

Ntel holds national carrier, international gateway and mobile licences. It has rights to spectrum in the 900/1800/1900MHz bands and a stake in the SAT-3/WASC/SAFE submarine cable system as well as ownership of the Lagos cable landing station.

Local access lines were inherited from NITEL, but are too badly degraded to be of commercial use. However, Ntel does own metropolitan fibre ducts and intercity rights of way that would enable it to develop FTTx capabilities or to work with a specialised third-party provider.

Developments

2018

In March, Ntel announced a national roaming agreement between itself and mobile operators 9mobile and MTN to expand its 2G and 3G service across the country.

2017

Ntel Expands LTE to Port Harcourt

In March, Ntel announced that it had expanded its LTE network coverage to Port Harcourt.

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2016

NATCOM Deploys 4G LTE and VoLTE

Following its USD1bn investment according to Chairman Olatunde Ayeni, NATCOM in August 2016 reported that its 4G LTE network and VoLTE services were live in Lagos and Abuja with further plans to expand the service in Port Harcourt. At the time of writing, the operator aimed to reach 85% mobile broadband market coverage in three years and around 95% in five years.

Financial Data

NITEL has not published financial data, but it is known that its financial position was poor before its liquidation in 2015. Its successor, NATCOM, is a private investment vehicle and is not obliged to report financials.

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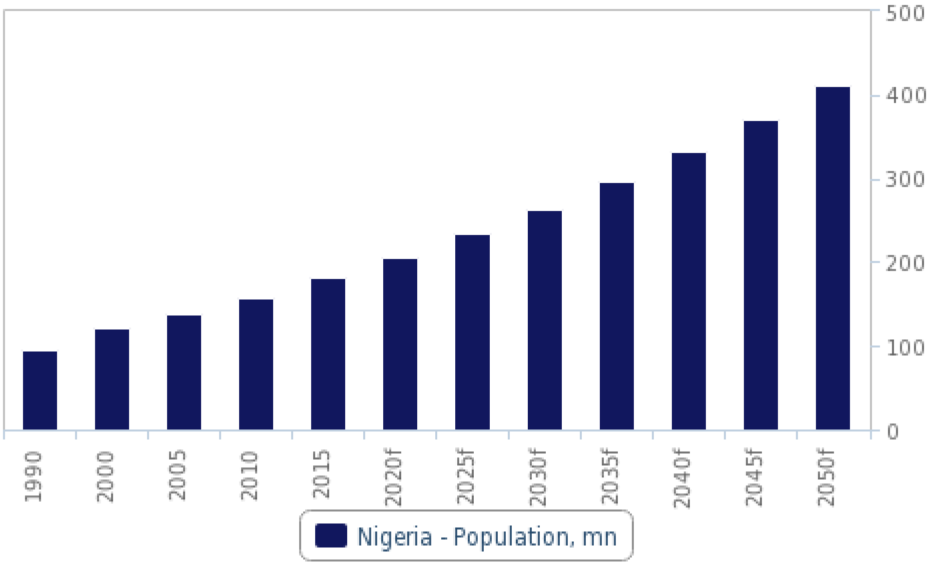
Nigeria Demographic Outlook

Demographic analysis is a key pillar of our macroeconomic and industry forecasting model. Not only is the total population of a country a key variable in consumer demand, but an understanding of the demographic profile is essential to understanding issues ranging from future population trends to productivity growth and government spending requirements.

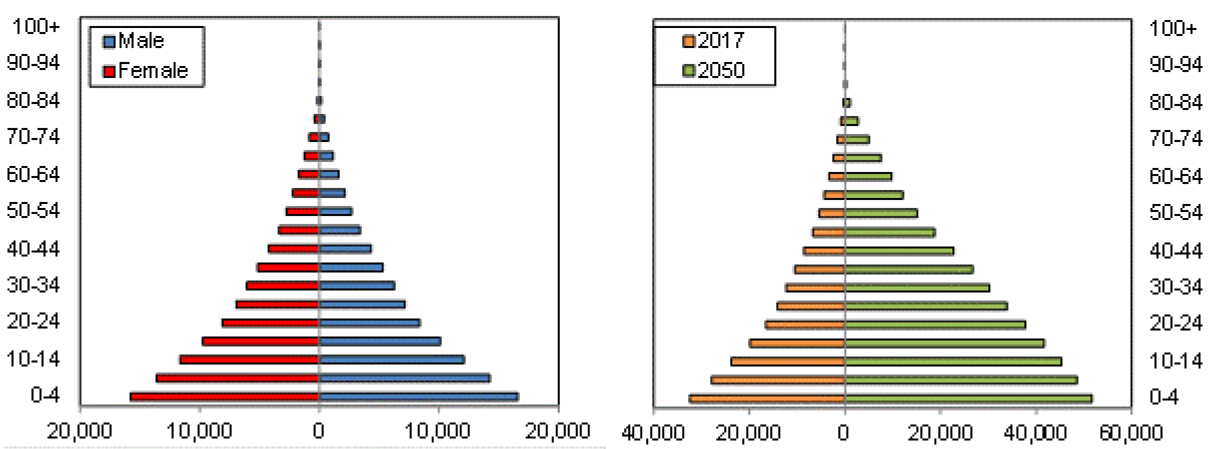
The accompanying charts detail the population pyramid for 2017, the change in the structure of the population between 2017 and 2050 and the total population between 1990 and 2050. The tables show indicators from all of these charts, in addition to key metrics such as population ratios, the urban/rural split and life expectancy.

Population
(1990-2050)



f = Fitch Solutions forecast. Source: World Bank, UN, Fitch Solutions

Nigeria Population Pyramid
2017 (LHS) & 2017 Versus 2050 (RHS)



Source: World Bank, UN, Fitch Solutions

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POPULATION HEADLINE INDICATORS (NIGERIA 1990-2025)

Indicator	1990	2000	2005	2010	2015	2020f	2025f
Population, total, '000	95,270.0	122,352.0	138,939.5	158,578.3	181,181.7	206,152.7	233,691.9
Population, % y-o-y		2.53	2.62	2.70	2.68	2.58	2.51
Population, total, male, '000	47,928.9	61,684.9	70,160.0	80,204.2	91,768.7	104,524.8	118,562.9
Population, total, female, '000	47,341.1	60,667.1	68,779.5	78,374.1	89,413.0	101,627.9	115,128.9
Population ratio, male/female	1.01	1.02	1.02	1.02	1.03	1.03	1.03

na = not available; f = Fitch Solutions forecast. Source: World Bank, UN, Fitch Solutions

KEY POPULATION RATIOS (NIGERIA 1990-2025)

Indicator	1990	2000	2005	2010	2015	2020f	2025f
Active population, total, '000	49,681.5	65,560.5	74,459.2	84,414.5	96,296.0	110,907.5	128,253.5
Active population, % of total population	52.1	53.6	53.6	53.2	53.1	53.8	54.9
Dependent population, total, '000	45,588.5	56,791.6	64,480.3	74,163.8	84,885.7	95,245.2	105,438.4
Dependent ratio, % of total working age	91.8	86.6	86.6	87.9	88.2	85.9	82.2
Youth population, total, '000	42,845.6	53,347.3	60,672.2	69,822.7	79,928.3	89,595.2	98,881.2
Youth population, % of total working age	86.2	81.4	81.5	82.7	83.0	80.8	77.1
Pensionable population, '000	2,742.9	3,444.2	3,808.1	4,341.0	4,957.5	5,650.0	6,557.2
Pensionable population, % of total working age	5.5	5.3	5.1	5.1	5.1	5.1	5.1

na = not available; f = Fitch Solutions forecast. Source: World Bank, UN, Fitch Solutions

URBAN/RURAL POPULATION & LIFE EXPECTANCY (NIGERIA 1990-2025)

Indicator	1990	2000	2005	2010	2015	2020f	2025f
Urban population, '000	28,276.1	42,627.4	54,289.2	68,949.8	86,561.4	106,638.7	129,131.1
Urban population, % of total	29.7	34.8	39.1	43.5	47.8	51.7	55.3
Rural population, '000	66,993.9	79,724.6	84,650.3	89,628.4	94,620.4	99,514.0	104,560.8
Rural population, % of total	70.3	65.2	60.9	56.5	52.2	48.3	44.7
Life expectancy at birth, male, years	44.7	45.4	47.5	50.1	52.2	54.4	56.4
Life expectancy at birth, female, years	47.2	47.2	49.0	51.6	53.8	56.1	58.4
Life expectancy at birth, average, years	45.9	46.3	48.2	50.8	53.0	55.2	57.4

na = not available; f = Fitch Solutions forecast. Source: World Bank, UN, Fitch Solutions

POPULATION BY AGE GROUP (NIGERIA 1990-2025)

Indicator	1990	2000	2005	2010	2015	2020f	2025f
Population, 0-4 yrs, total, '000	16,808.7	21,083.5	24,325.6	27,699.3	31,109.2	33,914.2	36,830.0
Population, 5-9 yrs, total, '000	14,066.1	17,217.6	19,698.2	23,021.7	26,417.7	29,887.1	32,768.2
Population, 10-14 yrs, total, '000	11,970.9	15,046.2	16,648.3	19,101.7	22,401.4	25,793.9	29,283.0
Population, 15-19 yrs, total, '000	9,873.7	13,315.5	14,628.9	16,213.2	18,648.9	21,923.3	25,319.8
Population, 20-24 yrs, total, '000	7,995.2	11,266.8	12,810.6	14,102.2	15,671.5	18,076.4	21,341.5
Population, 25-29 yrs, total, '000	6,722.1	9,154.2	10,783.6	12,292.0	13,565.3	15,115.8	17,517.4
Population, 30-34 yrs, total, '000	5,653.0	7,356.3	8,739.2	10,319.2	11,795.2	13,052.3	14,612.2
Population, 35-39 yrs, total, '000	4,723.9	6,158.7	7,006.5	8,345.9	9,884.0	11,331.0	12,595.7
Population, 40-44 yrs, total, '000	4,126.6	5,142.6	5,839.0	6,665.1	7,964.6	9,463.4	10,898.2
Population, 45-49 yrs, total, '000	3,535.2	4,246.9	4,840.7	5,516.4	6,319.8	7,580.9	9,049.1

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Indicator	1990	2000	2005	2010	2015	2020f	2025f
Population, 50-54 yrs, total, '000	2,903.3	3,631.8	3,941.1	4,511.8	5,165.1	5,945.6	7,166.7
Population, 55-59 yrs, total, '000	2,329.1	2,993.9	3,285.5	3,587.2	4,131.1	4,759.0	5,508.1
Population, 60-64 yrs, total, '000	1,819.4	2,293.6	2,584.1	2,861.3	3,150.5	3,659.8	4,244.8
Population, 65-69 yrs, total, '000	1,318.1	1,628.7	1,826.3	2,085.7	2,336.5	2,605.0	3,053.3
Population, 70-74 yrs, total, '000	829.6	1,037.9	1,136.6	1,300.4	1,508.6	1,719.0	1,940.3
Population, 75-79 yrs, total, '000	411.1	534.9	580.4	654.6	764.6	907.6	1,052.3
Population, 80-84 yrs, total, '000	147.6	194.6	211.9	239.6	277.1	333.4	405.5
Population, 85-89 yrs, total, '000	32.3	42.7	47.0	54.0	62.7	75.3	93.6
Population, 90-94 yrs, total, '000	3.9	5.1	5.4	6.4	7.5	9.1	11.4
Population, 95-99 yrs, total, '000	0.2	0.3	0.4	0.4	0.5	0.6	0.8
Population, 100+ yrs, total, '000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

na = not available; f = Fitch Solutions forecast. Source: World Bank, UN, Fitch Solutions

POPULATION BY AGE GROUP % (NIGERIA 1990-2025)

Indicator	1990	2000	2005	2010	2015	2020f	2025f
Population, 0-4 yrs, % total	17.64	17.23	17.51	17.47	17.17	16.45	15.76
Population, 5-9 yrs, % total	14.76	14.07	14.18	14.52	14.58	14.50	14.02
Population, 10-14 yrs, % total	12.57	12.30	11.98	12.05	12.36	12.51	12.53
Population, 15-19 yrs, % total	10.36	10.88	10.53	10.22	10.29	10.63	10.83
Population, 20-24 yrs, % total	8.39	9.21	9.22	8.89	8.65	8.77	9.13
Population, 25-29 yrs, % total	7.06	7.48	7.76	7.75	7.49	7.33	7.50
Population, 30-34 yrs, % total	5.93	6.01	6.29	6.51	6.51	6.33	6.25
Population, 35-39 yrs, % total	4.96	5.03	5.04	5.26	5.46	5.50	5.39
Population, 40-44 yrs, % total	4.33	4.20	4.20	4.20	4.40	4.59	4.66
Population, 45-49 yrs, % total	3.71	3.47	3.48	3.48	3.49	3.68	3.87
Population, 50-54 yrs, % total	3.05	2.97	2.84	2.85	2.85	2.88	3.07
Population, 55-59 yrs, % total	2.44	2.45	2.36	2.26	2.28	2.31	2.36
Population, 60-64 yrs, % total	1.91	1.87	1.86	1.80	1.74	1.78	1.82
Population, 65-69 yrs, % total	1.38	1.33	1.31	1.32	1.29	1.26	1.31
Population, 70-74 yrs, % total	0.87	0.85	0.82	0.82	0.83	0.83	0.83
Population, 75-79 yrs, % total	0.43	0.44	0.42	0.41	0.42	0.44	0.45
Population, 80-84 yrs, % total	0.15	0.16	0.15	0.15	0.15	0.16	0.17
Population, 85-89 yrs, % total	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Population, 90-94 yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Population, 95-99 yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Population, 100+ yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.00

na = not available; f = Fitch Solutions forecast. Source: World Bank, UN, Fitch Solutions

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Telecommunications Glossary

	Definition		Definition		Definition
3G	Third generation	ILD	International long-distance	na	not available
4G	Fourth generation	IoT	Internet of Things	NFC	Near Field Communication
5G	Fifth generation	IPO	Initial public offering	NFV	Network Functions Virtualisation
ADSL	Asymmetric Digital Subscriber Line	IPTV	Internet protocol television	NGAN/NGN	Next generation access network
AI	Artificial intelligence	ISDN	Integrated Systems Digital Network	OIBDA	Operating income before depreciation and amortisation
ARPU	Average revenue per user	ISP	Internet service provider	OTT	Over-the-top
ASP	Average selling price	IT	Information technology	POP	Point of presence
bn	billion	ITU	International Telecommunication Union	PSTN	Public switched telephone network
CDMA	Code Division Multiple Access	JV	joint venture	R&D	Research and development
DMB	Digital Multimedia Broadcasting	kbps	kilobits per second	RGU	Revenue generating unit
DOCSIS	Data Over Cable Service Interface Specification	KHz	kilohertz	SaaS	Software-as-a-Service
DSL	Digital Subscriber Line	km	kilometre	SIM	Subscriber Identity Module
DTH	Direct to Home (Satellite TV)	LAN	Local Area Network	SMS	Short Message Service
DVB-H	Digital Video Broadcasting - Handheld	LEC	Local exchange carrier	Tbps	Terabits per second
e/f	estimate/forecast	LPWAN	Low Power Wide Area Network	trn	trillion
EBITDA	Earnings before income tax, depreciation and amortisation	LTE	Long Term Evolution	ULL/LLU	Unbundled local loop/Local loop unbundling
EBRD	European Bank for Reconstruction and Development	M2M	Machine-to-machine	UMTS	Universal Mobile Telecomunications System
EC	European Commission	Mbps	Megabits per second	VDSL	Very high-speed Digital Subscriber Line
EMEA	Europe, Middle East and Africa	mn	million	VoD	Video-on-Demand
FDI	Foreign direct investment	MEA	Middle East and Africa	VoIP	Voice-over-Internet Protocol
FTTx	Fibre-to-the-x (x = home, building or cabinet)	MENA	Middle East and North Africa	W-CDMA	Wideband CDMA
Gbps	Gigabits per second	MHz	Megahertz	WiMAX	Worldwide Interoperability for Microwave Access
GPON	Gigabit passive optical network	MMS	Mobile Multimedia Service	WLL	Wireless local loop
GDP	Gross domestic product	MNP	Mobile number portability	WTO	World Trade Organization
GSM	Global system for mobile communications	MoU	Minutes of Use		
HSDPA	High-speed data packet access	MoU	Memorandum of understanding		
Hz	Hertz	MVNE	Mobile virtual nework enabler		
IDD	International direct dialling	MVNO	Mobile virtual network		

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Definition	Definition	Definition
	operator	

Telecommunications Methodology

Industry Forecast Methodology

Fitch Solutions' industry forecasts are generated using the best practice techniques of time-series modelling and causal/econometric modelling. The precise form of model we use varies from industry to industry, in each case being determined, as per standard practice, by the prevailing features of the industry data being examined.

Common to our analysis of every industry is the use of vector auto regressions. Vector auto regressions allow us to forecast a variable using more than the variable's own history as explanatory information. For example, when forecasting oil prices, we can include information about oil consumption, supply and capacity.

When forecasting for some of our industry sub-component variables, however, using a variable's own history is often the most desirable method of analysis. Such single-variable analysis is called univariate modelling. We use the most common and versatile form of univariate models: the autoregressive moving average model (ARMA).

In some cases, ARMA techniques are inappropriate because there is insufficient historic data or data quality is poor. In such cases, we use either traditional decomposition methods or smoothing methods as a basis for analysis and forecasting.

Fitch Solutions mainly uses OLS estimators and in order to avoid relying on subjective views and encourage the use of objective views, we use a 'general-to-specific' method. We mainly use a linear model, but simple non-linear models, such as the log-linear model, are used when necessary. During periods of 'industry shock', for example poor weather conditions impeding agricultural output, dummy variables are used to determine the level of impact.

Effective forecasting depends on appropriately selected regression models. **Fitch Solutions** selects the best model according to various different criteria and tests, including but not exclusive to:

- R2 tests explanatory power; adjusted R2 takes degree of freedom into account;
- Testing the directional movement and magnitude of coefficients;
- Hypothesis testing to ensure coefficients are significant (normally t-test and/or P-value);
- All results are assessed to alleviate issues related to auto-correlation and multicollinearity.

We use the selected best model to perform forecasting.

It must be remembered that human intervention plays a necessary and desirable role in all our industry forecasting. Experience, expertise and knowledge of industry data and trends ensure that analysts spot structural breaks, anomalous data, turning points and seasonal features where a purely mechanical forecasting process would not.

Sector-Specific Methodology

Our Telecommunications industry forecasts are generated using a number of principal criteria, and differ from the regression and/or time-series modelling used in other industries.

- **Average Market Growth**

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Indicator takes into consideration the historical growth patterns of the fixed-line, internet, broadband and mobile markets, providing a basis from which to forecast. Using historical data is often the most desirable method of analysis. In most cases, subscriber data are derived from individual operators and/or national regulators.

- **Subjective Indicators**

Indicators look at a number of factors, such as the following:

- Neighbouring/similar states. These types of markets often share similar telecoms markets. For example, Japan and South Korea are both highly developed technophile markets where growth prospects are high in 4G ecosystems. Meanwhile, China and India both offer high growth in successfully emerging markets.
- Tracking growth. High growth may be more likely to be repeated in the near future, and is unlikely to turn into a significant decline in the short term, although there may be exceptions to this rule.
- Market maturity. Where markets have reached saturation, they are not likely to expand as fast as those that are less developed.
- Competition from alternative technologies, such as VoIP versus fixed-line, fibre versus mobile broadband.
- Operator behaviour. Operators' corporate strategies and investment behaviour may dictate changes in the telecommunications market. This is similarly the case for regulatory developments, which have been accounted for in our integration of the Telecommunications Risk/Reward Index.

Sources

Sources used in telecoms reports include national ministries and media/telecoms regulatory bodies, officially released company results and figures, national and international industry organisations, such as the CTIA, and the International Telecommunication Union (ITU) and international and national news agencies.

Risk/Reward Index Methodology

Fitch Solutions' Risk/Reward Index (RRI) provide a comparative regional ranking system evaluating the ease of doing business and the industry-specific opportunities and limitations for potential investors in a given market.

The RRI system divides into two distinct areas:

Rewards: Evaluation of sector's size and growth potential in each state, and also broader industry/state characteristics that may inhibit its development. This is further broken down into two sub categories:

- Industry Rewards. This is an industry specific category taking into account current industry size and growth forecasts, the openness of market to new entrants and foreign investors, to provide an overall score for potential returns for investors.
- Country Rewards. This is a country specific category, and the score factors in favourable political and economic conditions for the industry.

Risks: Evaluation of industry-specific dangers and those emanating from the state's political/economic profile that call into question the likelihood of anticipated returns being realised over the assessed time period. This is further broken down into two sub categories:

- Industry Risks. This is an industry specific category whose score covers potential operational risks to investors, regulatory issues inhibiting the industry, and the relative maturity of a market.
- Country Risks. This is a country specific category in which political and economic instability, unfavourable legislation and a poor overall business environment are evaluated to provide an overall score.

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We take a weighted average, combining industry and country risks, or industry and country rewards. These two results in turn provide an overall Risk/Reward Index, which is used to create our regional ranking system for the risks and rewards of involvement in a specific industry in a particular country.

For each category and sub-category, each state is scored out of 100 (100 being the best), with the overall Risk/Reward Index a weighted average of the total score. Importantly, as most of the countries and territories evaluated are considered by **Fitch Solutions** to be 'emerging markets', our score is revised on a quarterly basis. This ensures that the score draws on the latest information and data across our broad range of sources, and the expertise of our analysts.

Indicators

The following indicators have been used. Overall, the index uses three subjectively measured indicators, and around 20 separate indicators/datasets.

RISK/REWARD INDEX INDICATORS

	Rationale
Rewards	
Industry Rewards	
- ARPU	Denotes depth of telecoms market. High-value markets score better than low-value ones.
- No. of subscribers	Denotes breadth of telecoms market. Large markets score higher than smaller ones.
- Subscriber growth, % y-o-y	Denotes sector dynamism. Scores based on annual average growth over our five-year forecast period and also take into account the penetration rate.
- No. of operators	Subjective evaluation against Fitch Solutions-defined criteria. Evaluates market openness and competitiveness.
Country Rewards	
- Urban/rural split	A highly urbanised state facilitates network rollout and implies higher wealth. Pre-dominantly rural states score lower, with overall score also affected by country size.
- Age range	Proportion of population under 24 years old. States with young populations tend to be more attractive markets.
- GDP per capita, USD	A proxy for wealth. High-income states receive better scores than low-income states.
Risks	
Industry Risks	
- Regulatory independence	Subjective evaluation against Fitch Solutions-defined criteria. Evaluates predictability of operating environment.
Country Risks	
- Short-term external risk	Score from Fitch Solutions' Country Risk Index(CRI). Denotes state's vulnerability to externally induced economic shock, which tend to be the principal triggers of economic crises.
- Policy continuity	From CRI. Evaluates the risk of a sharp change in the broad direction of government policy.
- Legal framework	From CRI. Denotes strength of legal institutions in each state - security of investment can be a key risk in some emerging markets.
- Corruption	From CRI. Denotes risk of additional illegal costs/possibility of opacity in tendering/business operations affecting companies' ability to compete.

Source: Fitch Solutions

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Weighting

Given the number of indicators/datasets used, it would be inappropriate to give all sub-components equal weight. Consequently, the following weighting has been adopted:

WEIGHTING OF INDICATORS

Component	Weighting, %
Rewards	70, of which
- Industry Rewards	65
- Country Rewards	35
Risks	30, of which
- Industry Risks	40
- Country Risks	60

Source: Fitch Solutions

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