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TANZANIA

TELECOMMUNICATIONS REPORT

INCLUDES 5-YEAR FORECASTS TO 2020

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Tanzania Telecommunications Report Q3 2016

INCLUDES 5-YEAR FORECASTS TO 2020

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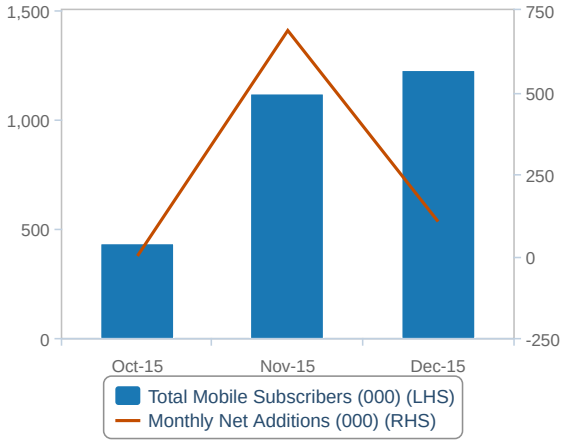
BMI Industry View

BMI View: *Growth in Tanzania's mobile and advanced data segments will be driven by competition as well as increased investment in network expansion by operators. The discounting of inactive SIMs, however - in particular as Halotel enters the market - will see slower growth in some quarters. Furthermore, the continuing fall in the price of mobile devices relative to tablets and laptops will impede substantial growth in wireline broadband. Growth in wireline voice will also continue a negative trend, as the incumbent TTCL restructures and focuses more on its mobile business.*

Viettel/Halotel A Clear Threat To Existing Players

Mobile Subscribers (000) & Net Subscriber Additions (000), October-December 2015



Source: TCRA, BMI

Latest Updates & Industry Developments

- The mobile market grew to 39,005mn in Q315, representing y-o-y growth of 22.4%.
- There were 17,639,349 mobile money subscribers in the country at the end of 2015, the main driver for value-added services.
- Regulatory data from 2015 report stagnation in the number of fixed line subscribers, at 146,000, while internet subscribers continue to grow, reaching 17,263mn.

SWOT

SWOT Analysis	
Strengths	▪ Low mobile penetration means there remains considerable potential for growth. ▪ The market is characterised by healthy competition and numerous operators; strong competition in both the voice and data markets is pushing prices down and encouraging further growth.
Weaknesses	▪ Low purchasing power of consumers means spending remains low. ▪ Fixed-line infrastructure is limited and has attracted little investment. ▪ There is a lack of coverage in rural areas, where the majority of the population still lives.
Opportunities	▪ Investment in 4G LTE and 3G HSPA+ and promotions on 3G handsets will encourage growth in the mobile data market. ▪ Undersea cable connections and competition will continue to drive down the cost of international bandwidth, with the completion of the national backbone network will boost capacity and improve network performance. ▪ Low banking penetration creates significant opportunities for operators in the provision of mobile financial services helping to sustain ARPU levels.
Threats	▪ Demand for 3G is likely to remain limited to higher income urban areas over the short-to-medium term. ▪ Price competition will be exacerbated by the entry of Viettel-backed Halotel in the market from Q415. ▪ Economic uncertainties could threaten customers' willingness to spend on telecoms services and the more popular mobile services may be prioritised by cash-strapped consumers.

Industry Forecast

BMI View: *We are bullish Tanzanian mobile, 3G/4G and broadband market growth, as low penetration rates suggest strong room for expansion, especially in rural areas. Viettel's entry under the Halotel brand will drive further competition, and there is evidence that current operators will increase network investment in the country.*

Latest Updates

- **Tigo** has acquired **Zantel,** and **Viettel** has launched services under the **Halotel** brand. This will drive subscription growth in the market through greater investment and wider coverage.
- Investment in 4G technology and strong demand for data products will support 3G/4G market growth, and by 2020 this technology is forecast to account for almost 60% of the mobile market.
- The number of broadband users will also display a strong increase over the forecast period to 2020, although it is growing from a small base.

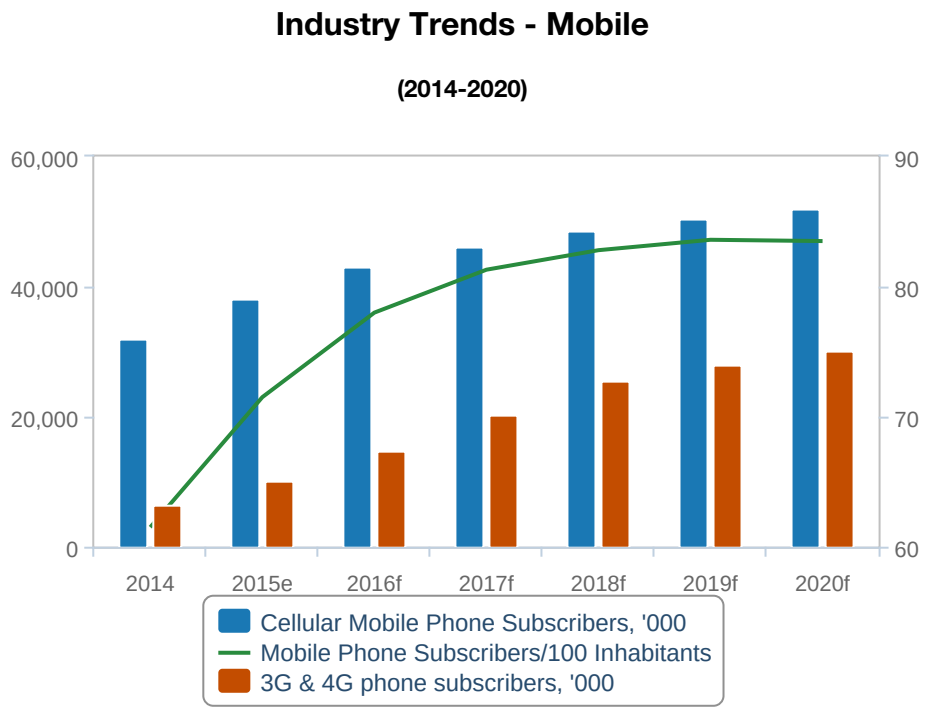
Structural Trends

There is room for growth in mobile services in Tanzania, especially in rural areas, which represent around two-thirds of the country's population. Indeed, the country had a mobile penetration rate of 71.5% in December 2015. We expect mobile subscriptions to grow to 52.0mn in 2020, reaching a penetration rate of 83.5%, with the main driver for that growth being 3G and 4G connections, which by then will represent 30.2mn subscribers.

The entry of Halotel into the market in October 2015 will be a major boost to growth in the country, as we expect the Vietnamese company to follow a similar strategy as in its other African subsidiaries, Mozambique, Cameroon and Burundi. In those markets, Viettel has focused on bringing connectivity to rural areas via voice and data networks, and doing so in Tanzania would enable the operator to reach a large untapped market. Viettel will invest USD1bn in 3G networks in the country and plans to cover 95% of the population by the end of 2016

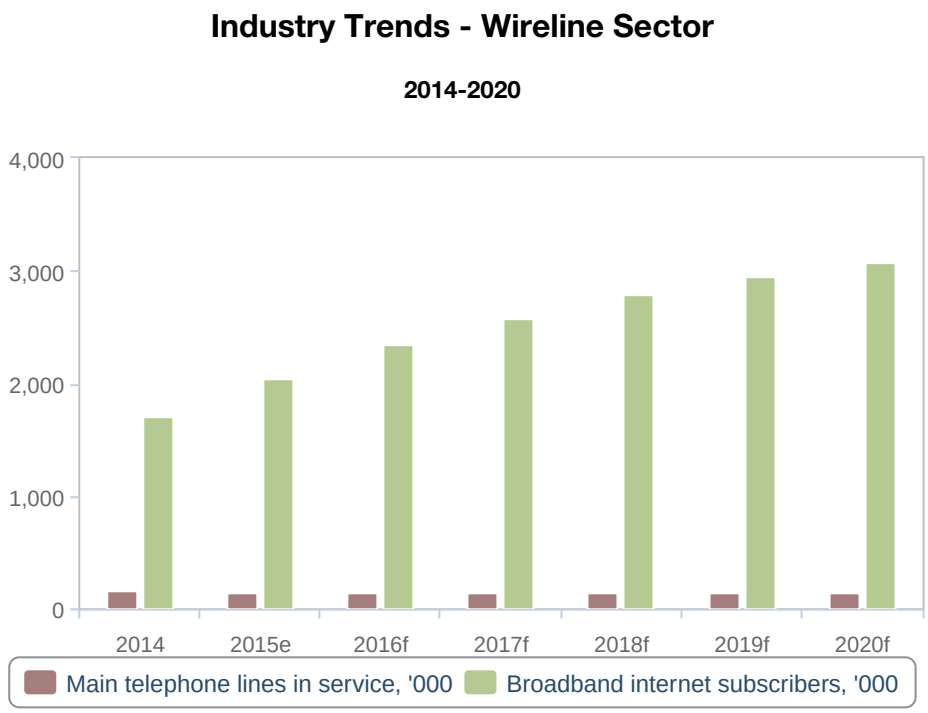
Other operators will need to stand up to Halotel, both in terms of investment and coverage expansion, and they have already expanded their plans. Tigo, **Airtel, Vodacom** and Zantel made their mobile financial services (MFS) systems fully interoperable in February 2015, while Tigo joined **Smile** in launching LTE in the market (the latter only offering data services). Vodacom says it will make its network 4G-ready while waiting for the right licence and authorisation to launch, and fixed incumbent **TTCL** is also looking to launch its 4G network by the middle of the year. This extra competition will drive subscription growth in the Tanzanian market.

Despite a greater uptake of more advanced services, we do not expect it will have a major upside effect on ARPU, as Halotel will continue to focus on lower prices. This will mean its competitors will need to adjust their own tariffs accordingly, and we estimate ARPU will remain subdued.



e/f = BMI estimate/forecast. Source: BMI

The fixed voice market suffers from a lack of investment, with incumbent TTCL focusing more on its fledging mobile operation than on its fixed network. We believe the trend will continue in the next five years, **and greater mobile uptake will also lead to increased fixed-mobile substitution for the few remaining households still predominantly using fixed line services**. We expect the market to have 140,500 subscribers by end-2020, for a penetration rate of 0.2%.



e/f =BMI estimate/forecast. Source: BMI

As for fixed broadband, regulator data show that the market has been driven by an increase in the number of individuals and households subscribing to the service. The market will always be hindered by the price of equipment, with a smartphone far cheaper than a notebook, but there remains some traction, especially in the business segment. The National ICT Broadband Backbone (NICTBB) is still ongoing and is likely to eventually lead to fibre networks being available to consumers and businesses. This will remain a small part of connections, especially relative to dedicated mobile broadband, but **we still expect continuous growth in the segment**, with more than 3mn subscribers and a penetration rate of just under 5% in 2020.

Table: Telecoms Sector - Historical Data & Forecasts (Tanzania 2013-2020)

	2013	2014	2015e	2016f	2017f	2018f	2019f	2020f
Main telephone lines in service, '000	165.0	151.3	146.0	144.1	142.6	141.6	140.9	140.5
Main telephone lines/100 inhabitants	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Cellular mobile phone subscribers, '000	27,442.8	31,863.0	38,235.6	43,015.1	46,241.2	48,553.2	50,495.4	52,010.2
Mobile phone subscribers/100 inhabitants	54.7	61.5	71.5	78.0	81.3	82.8	83.6	83.5
3G & 4G phone subscribers, '000	4,342.0	6,373.0	10,196.8	14,785.4	20,329.9	25,412.3	27,953.6	30,189.9
3G & 4G market, % of mobile market	15.8	20.0	26.7	34.4	44.0	52.3	55.4	58.1
Monthly blended ARPU, TZS	5,952.2	5,096.5	4,604.9	4,342.9	4,227.6	4,162.1	4,086.3	4,000.2
Broadband internet subscribers, '000	1,190.0	1,700.0	2,040.0	2,346.0	2,580.6	2,787.1	2,954.3	3,072.4
Broadband internet subscribers/ 100 Inhabitants	2.4	3.3	3.8	4.3	4.5	4.8	4.9	4.9

e/f = BMI estimate/forecast. Source: National sources, BMI

Industry Risk Reward Ratings

Sub-Saharan Africa Risk/Reward Index

BMI View: *A slight improvement in the average Telecoms Risk/Rewards score for Sub-Saharan Africa reflects the positive impact of consolidation and service-focused growth strategies within the industry, and our expectation that commodity prices will hit their nadir in 2016 and result in a slightly brighter macro story towards the latter years of our forecast period. However, the region will remain a global underperformer, as low spending power and operational risks continue to dampen its potential.*

The Telecoms Risk/Rewards Index (RRI) scores for Sub-Saharan Africa have remained fairly stable in the Q316 update, with the overall regional telecoms score increasing by 0.2 points to 38.3 out of 100. Although only a minor positive gain, it is noteworthy because the region's Telecoms RRI score has steadily declined q-o-q over the last two years, partially due to the inclusion of smaller, underperforming markets, but more importantly owing to the impact of mobile market saturation in urban areas and the collapse of commodity prices. The gains this quarter were primarily in the Country Risk category, where the regional average rose from 44.1 to 45.9, as the most painful impact of low commodity prices on GDP growth (or contraction) in 2015 has passed.

The regional Industry Rewards score was also stable q-o-q in Q316, aided by limited decline in ARPU levels. We expect ARPU depreciation to continue slowing in 2016 and 2017, as the consolidation trend currently led by **Orange** continues, and operators shift their focus toward competing on services rather than price. Mobile financial services already play a key role in bolstering operators' ARPUs, while investment into content, such as e-commerce player **Africa Internet Group**, will further support operators' diversification strategies over the medium and long term.

Despite cause for optimism, Sub-Saharan Africa remains the region with the weakest risk/reward profile globally, as its population is not large or urbanised enough to offset low consumer spending power. This is compounded by poor transport and power infrastructure and a lack of legacy wireline telecoms networks, resulting in high operational costs for telecoms operators. Meanwhile, political uncertainty and unorthodox economic policies in many countries create unpredictable policy and macro environments and challenges, such as high currency volatility and targeted telecoms taxes.

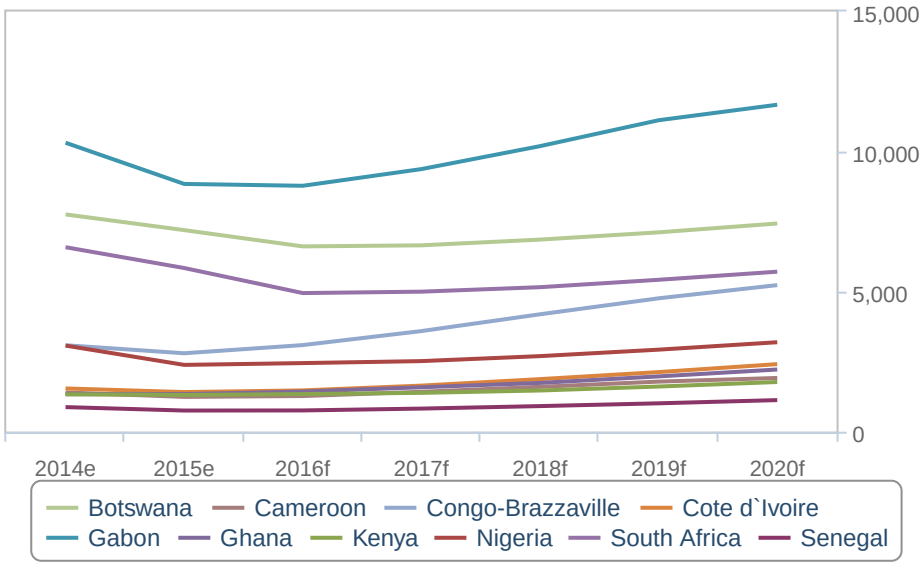
Even the most developed countries continue to present high industry risks for operators. For instance, failure to implement spectrum policy has stalled consolidation in South Africa, Kenya's regulator has been unable to reduce **Safaricom**'s dominance and create a more even competitive landscape, and despite re-

affirming plans to auction spectrum and infraco licences, the threat of regulatory fines and increased telecoms taxes pose a risk to Nigerian operators.

Nevertheless, these three countries, alongside Ghana and Botswana, take the top five spots on our Telecoms RRI, as their relative stability and a good balance between population size and GDP per capita create fruitful opportunities for telecoms operators.

High Spending Power Offsets Small Populations

GDP Per Capita In Top 10 Markets (USD)



e/f = BMI estimate/forecast. Source: National sources, BMI

The Climbers

Although regional scores have remained stable in Q316, there have been some notable movements in individual country rankings. Three big winners this quarter are the Republic of the Congo (Congo-Brazzaville), Ethiopia and Chad. Congo-Brazzaville's improved score is due to a 10.4-point rise in the Country Risk category, pushing it up to 6th place on our RRI table. As highlighted in the chart above, **BMI**'s Country Risk team forecasts Congo-Brazzaville's economy to be among the fastest growing in the region over the five years to 2020, driving rising spending power among consumers. With a relatively small

geography and an urbanisation rate of more than 65%, we have a bright outlook for take-up of advanced data services in Congo-Brazzaville.

Over the last two years, Ethiopia's telecoms monopoly **Ethio Telecom** has carried out an USD1.6bn network investment project. According to its latest results, for the year ended in June 2015, this resulted in net subscription additions of around 17mn y-o-y, to reach 38.8mn. We estimate the mobile penetration rate was still below 50% at the end of 2015, leaving considerable room for growth over the coming years. Despite climbing 5 places to 18th position, Ethiopia still ranks low compared to its potential, as the lack of market liberalisation means that regional players can only capture opportunities through value-added services licences.

Chad's move from 31st to 27th place on our RRI table was mostly due to minor decreases in the scores of other low ranking countries, including Mozambique, Burkina Faso, Burundi and South Sudan. This was combined with a small improvement in its Country Risk score, as we expect private consumption growth to pick up in the final two years of our forecast period.

Notable Drops

Like Congo-Brazzaville, Gabon's bright GDP growth outlook translated into a 10-point rise in its Country Risk score, but this was offset by a nine-point drop in its Industry Rewards score, pulling Gabon down from fourth to seventh place on the table. The decline was due to a contraction in the country's mobile market in 2015, a trend which we believe remains a key downside risk over the coming years, given the penetration rate of nearly 165%.

At the bottom of the table, South Sudan fell four places to 33rd, owing to declines in the Country Risks and Rewards scores. Highlighting the ongoing challenge of operating in South Sudan, **MTN** announced in April 2016 that it has frozen investment plans for the country and will reduce its workforce following a more than 500% depreciation of the South Sudanese pound in 2015.

Table: Sub-Saharan Africa Risk/Reward Index, Q3 2016

	Industry Rewards	Country Rewards	Industry Risks	Country Risks	Q316 Telecoms Score	Q-o-q Change	Q316 Rank
Nigeria	54.6	45.6	55.0	58.1	53.0	-0.4	1
Ghana	41.3	53.3	70.0	52.7	50.2	0.1	2
Botswana	33.0	56.0	60.0	70.3	48.3	-1.3	3
South Africa	42.8	47.7	60.0	53.9	48.2	-0.1	4
Kenya	40.0	42.7	70.0	52.3	47.0	2.3	5
Congo-B	27.5	66.7	65.0	49.8	46.1	5.3	6
Gabon	27.0	73.3	50.0	54.9	46.0	-2.6	7
Cote d'Ivoire	33.3	53.3	60.0	51.2	44.9	-0.4	8
Cameroon	36.3	56.7	50.0	44.2	44.5	0.3	9
Senegal	32.5	46.7	60.0	55.6	43.6	-1.0	10
DRC	38.0	39.3	70.0	39.5	43.3	-0.4	11
Angola	42.6	50.3	30.0	42.4	42.6	-0.3	12
Rwanda	26.1	40.0	70.0	57.6	40.8	1.1	13
Tanzania	29.3	39.3	60.0	59.1	40.8	1.1	14
Mauritius	32.5	33.3	50.0	57.8	39.1	-0.4	15
Uganda	32.1	36.7	50.0	53.5	39.1	0.0	16
Guinea	27.5	43.3	60.0	42.8	38.5	-0.3	17
Ethiopia	40.0	43.7	15.0	46.3	38.1	2.2	18
Zambia	28.5	40.2	55.0	46.7	38.1	-0.1	19
Namibia	25.9	50.7	40.0	51.5	37.9	0.3	20
Mauritania	30.0	45.6	40.0	46.9	37.9	0.0	21
Liberia	23.8	48.0	55.0	39.9	36.8	0.1	22
Benin	25.0	46.7	50.0	37.5	35.9	1.5	23
Niger	27.5	33.3	60.0	39.8	35.6	-1.4	24
Malawi	24.8	33.3	60.0	44.7	35.1	-0.1	25
Mali	25.0	43.7	40.0	44.3	34.7	-1.1	26
Chad	27.5	38.3	50.0	31.8	34.2	0.9	27
Mozambique	26.3	32.4	50.0	43.0	33.8	-0.1	28
Burkina Faso	22.5	40.0	55.0	36.7	33.8	-0.1	29
Djibouti	20.0	57.0	15.0	53.9	33.4	0.0	30
Madagascar	21.4	38.7	55.0	39.1	33.3	0.0	31
Burundi	24.8	33.3	60.0	30.1	32.9	-0.3	32

Sub-Saharan Africa Risk/Reward Index, Q3 2016 - Continued

	Industry Rewards	Country Rewards	Industry Risks	Country Risks	Q316 Telecoms Score	Q-o-q Change	Q316 Rank
South Sudan	28.8	43.7	20.0	39.5	32.7	-1.0	33
Sierra Leone	18.8	46.7	35.0	49.6	32.6	2.4	34
Sudan	23.8	42.3	40.0	35.1	32.4	0.0	35
Zimbabwe	30.0	36.0	35.0	27.5	31.8	-0.1	36
CAR	19.0	41.3	60.0	25.8	31.6	0.0	37
Togo	17.8	42.0	30.0	42.6	29.3	1.5	38
Eritrea	24.8	36.7	15.0	42.9	28.9	-0.8	39
Swaziland	12.5	36.7	20.0	43.5	24.2	-0.8	40
Average	***29.1***	***44.4***	***48.6***	***45.9***	***38.3***	***0.2***	-

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 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, based on BMI's proprietary Country Risk Index that could affect the realisation of anticipated returns. Source: BMI

Tanzania

BMI View: *Tanzania is a market where both rewards and risks are limited. It falls below the regional average in terms of rewards owing to a large rural population, low incomes and a very competitive telecoms market that is focused on price. However, the relative strength of the regulator in setting out policies, alongside broad continuity in political and macroeconomic terms, puts it above average in terms of risks.*

Rewards

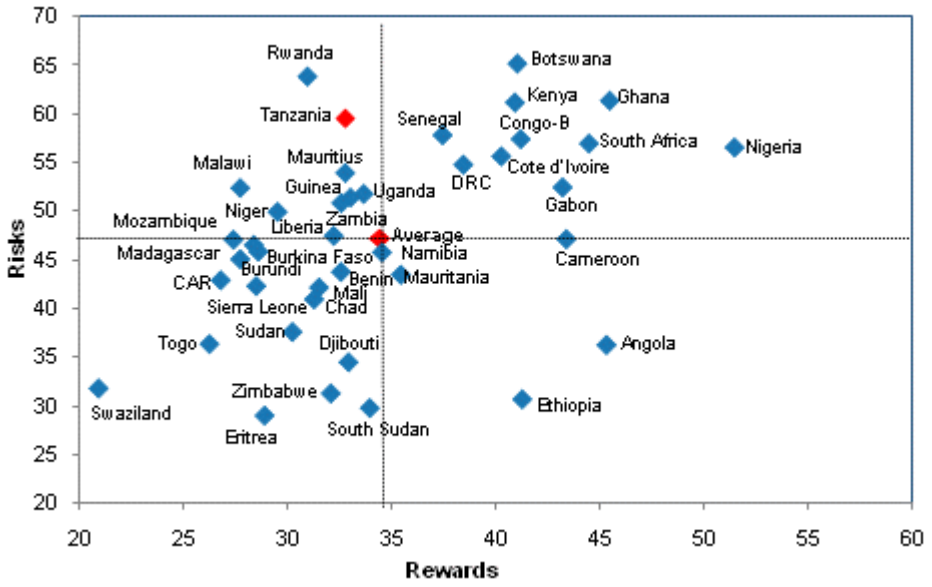
- Despite a low penetration rate and a strong growth forecast, rewards are limited in the market owing to strong competition. The acquisition of **Zantel** by **Tigo** will not reduce the number of players in the mobile market, as **Viettel**-backed **Halotel** launched services in Q415. Based on its strategy in other African markets, this will put further pressure on ARPU.
- A high rural population coupled with a low GDP per capita of USD845 are the main weaknesses in Tanzania. This affects the attraction of the market by reducing the addressable base capable of purchasing telecoms services at a profitable cost for operators.

Risks

- The regulator has been broadly positive in terms of policymaking, through its SIM registration programme, for instance. However, the full acquisition of TTCL by the government, alongside previous examples of higher taxes, could further hinder the market's potential. Tanzania relies on energy and mining as its macroeconomic drivers, and the relative softness of these industries means that economic growth could be below potential. This is the main risk in the market, as overall policy continuity remains strong.

Tanzania vs Regional Risk/Reward Profile

Q3 2016



Source: BMI

Market Overview

Market Drivers & Trends

Recent Developments

- **Millicom**, operating under the **Tigo** brand, finalised its acquisition of **Zantel** in Q415, overtaking **Airtel** as the second player in the mobile market behind leader **Vodacom.**
- The number of operators stayed the same, however, as **Viettel**-owned **Halotel** also launched services in Q415, focusing on data services and rural coverage.
- Mobile money and 4G will be the main drivers, with more than 16mn mobile financial services (MFS) subscribers as of Q315 and Tigo planning nationwide LTE coverage by the end of 2016.
- The government has finalised the full acquisition of **TTCL.**

With a penetration rate of 71.5% at end 2015, the Tanzanian mobile market retains strong growth potential, which will be driven by the focus on mobile payment and advanced data networks. The arrival of Halotel, backed by Viettel, will boost rural coverage in the country. Halotel promises to reach 95% coverage by the end of 2016, while Tigo is planning nationwide LTE coverage. Tigo, becoming the second largest player following its acquisition of Zantel, has greater economies of scale to make these investments, and we believe it is best placed to cope with the arrival of Halotel. Vodacom will remain strong through its leadership in mobile money services, the main value-added service in the country, but Airtel and publicly owned TTCL both face stronger challenges. Airtel will now have a player focusing on the same price point, but with greater investment potential, whereas TTCL is still hindered by its low base. The government acquiring Airtel's 35% in TTCL in order to take full control of the company will help with the management, but more needs to be done to make the carrier a key player in the market.

Mobile

The mobile market has grown strongly over the last five quarters, increasing 22.4% y-o-y to reach 39.0mn in Q415. This follows a period of lower growth over 2013 and the first half of 2014, led by the government's action towards SIM registration. The arrival of Halotel may lead to many more SIMs becoming inactive over the coming quarters, so there is potential for a clean-up and another quarter of low growth.

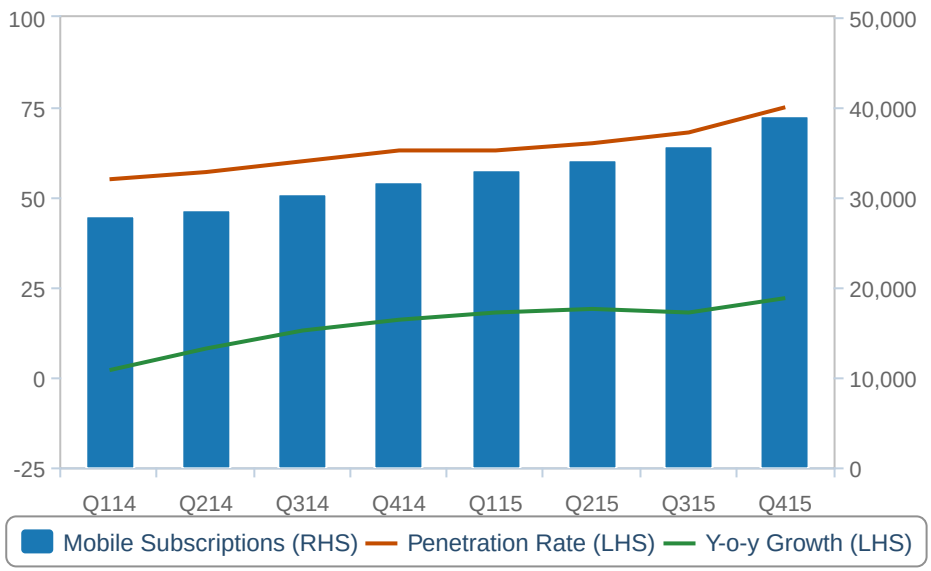
The market, which already has six operators (Vodacom, Airtel, Tigo, Zantel, TTCL and **Benson**), has been joined by Viettel under the Halotel brand; Tigo's acquisition of Zantel during the quarter means the number of operators remains the same. The Vietnamese operator has already launched in Mozambique (in 2012)

and Cameroon (in 2014), and has experienced initial success in the region. It has become the market leader in Mozambique, gaining a third of the market share in just over two years, whereas it gained a share of 3% three months after launching in Cameroon.

Viettel's focus on rural areas and 3G technologies, underpinned by a USD1bn investment, will drive greater availability of services in the country, particularly relevant in Tanzania, where 70% of the population live in rural areas. It will also force the current operators to up their game so that they do not lose out too much to the newcomer. Vodacom and TTCL have announced greater investments in rural areas. Vodacom has outlined plans for two projects worth USD100mn and USD80mn, while Tigo will increase its investments to USD120mn in 2015, compared with USD100mn in 2014. The Millicom subsidiary also launched its 4G network in April 2015, looking to differentiate itself from its rivals. Vodacom's USD100mn investment in rural areas was reaffirmed by its new managing director in H215, while TTCL has claimed that its USD1.2bn investment in fibre optic, satellite networks and infrastructure developments have now linked the country by offering 15Mbps broadband in the nation.

Growth Picks Up, But Still Room

Mobile Subscriptions, y-o-y Growth & Penetration Rate, 2014-2015

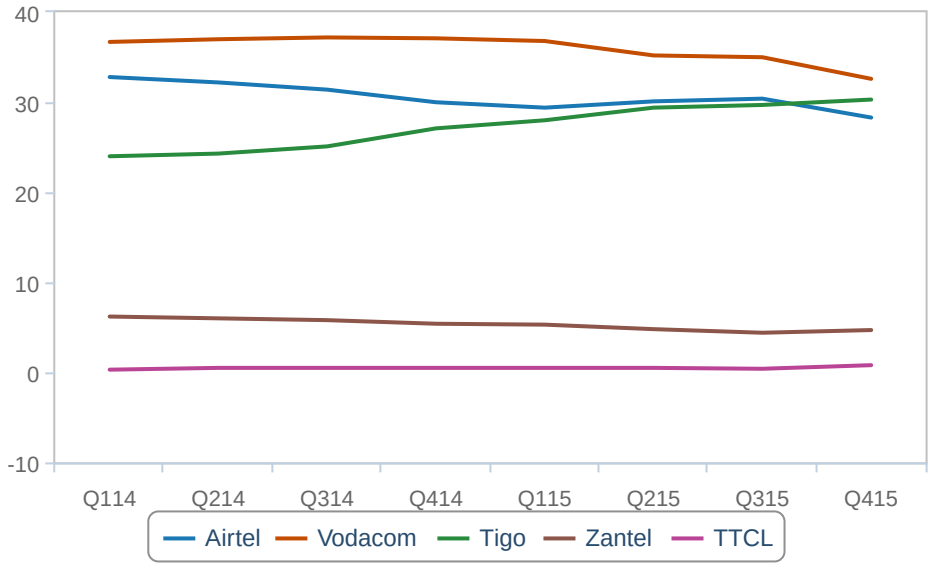


Source: TCRA, Operators, BMI

The addition of Vodacom, Airtel and Tigo (with the acquisition of Zantel)'s market shares in Q315 reached 95.9%, highlighting their domination of the market. However, while TTCL will continue to struggle, we expect Halotel will take share from all players, and will build up enough market to become a strong fourth player in the market.

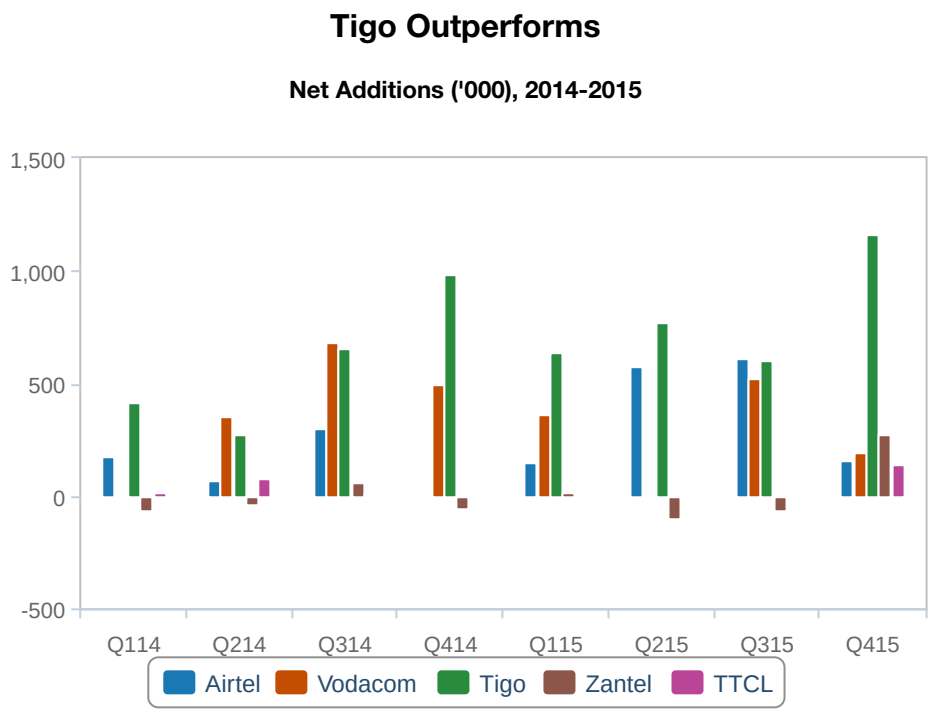
Halotel To Become Strong Fourth Player

Market Share (%), 2014-2015



Source: TCRA, Operators, BMI

Tigo has outperformed the market in terms of net additions since 2014, adding more than 5mn subscribers, compared with just over 2mn for Vodacom, and just under 2mn for Airtel. With its acquisition of Zantel, we expect the carrier to continue its strong performance, even though there is a possibility that its underperforming acquisition will impact its overall performance. Vodacom can leverage its strength in MFS, but we expect it to be the most affected by Halotel's arrival in the market, as the two carriers have very similar strategies.

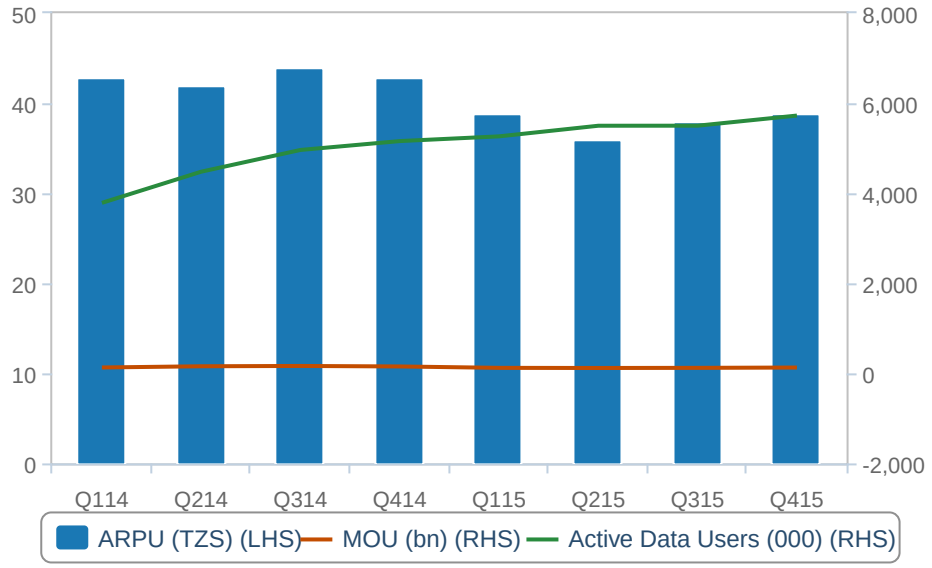


Source: TCRA, Operators, BMI

Vodacom is the only operator reporting ARPU in Tanzania, with Millicom only offering an average figure for its entire African footprint; this stood at USD2.6 in Q415. Despite an increase in the number of active data users, the main driver for ARPU remains voice usage, as the trend for minutes of usage (MOU) and ARPU follows a similar path. This is not surprising, as active data users still represent under 50% of Vodacom's customer base, and the figure remains below its number of M-Pesa subscribers, standing at over 7mn. Stronger price competition from Halotel will further depress ARPU levels, with an increased in data usage not enough to offset the overall declining trend.

No ARPU Uptick From Data Usage, Voice Still Key

Vodacom Active Data Users ('000), ARPU (TZS) & MOU (bn), 2014-2015



Source: Vodacom, BMI

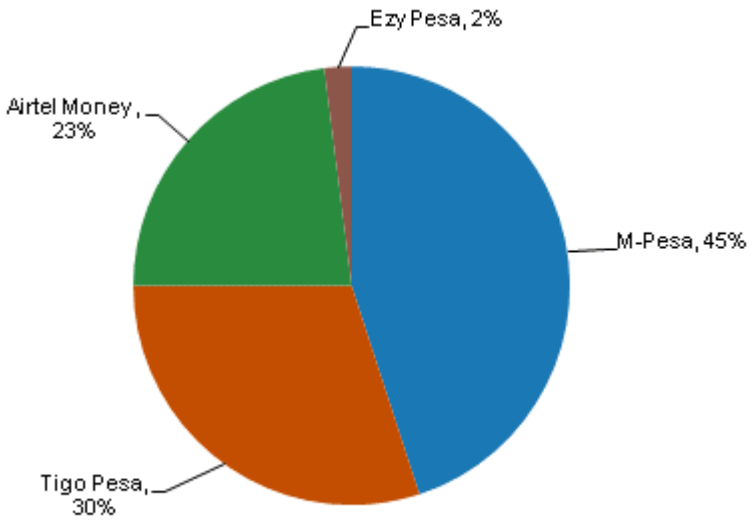
In February 2015, Vodacom joined Tigo, Airtel and Zantel in making its MFS platform interoperable (the latter three had come to an agreement in June 2014). This made Tanzania the first African market where interoperability is the norm. Interoperability has, however, seen the total number of mobile money accounts contract, particularly within the last quarter of 2015. The contraction can be explained by subscribers using their most preferred mobile money accounts and opting to let their less preferred accounts expire.

Halotel has launched its own platform, under the V-Money or Halopesa brands, but remains a clear outsider in the market, with a greater focus on 3G. Vodacom dominates the market, with a 45% share of the 17.6mn mobile money subscribers present in the market in Q415. In Q116, TTCL stated that it aims to invest up to USD850mn to develop its own mobile money platform. The system is to be built in partnership with systems integrator Novatti Group**.** We, however, believe that t*he services will not generate a meaningful increase in revenue, and therefore investing in the proprietary system will not be commercially sustainable in the long run.*

Latest data from the Bank of Tanzania, dating from June 2014, reports the presence of nearly 300,000 agents, with nearly 1.15bn transactions in H114, for a full value of TZS35.329bn.

Vodacom Leads MFS

Mobile Money Subscribers Share (%), Q415



Source: TCRA, BMI

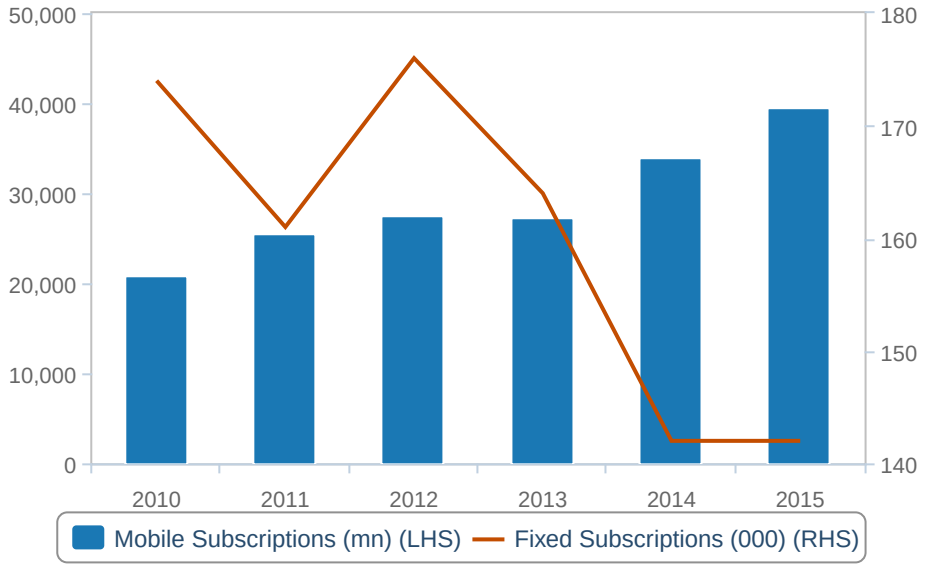
Wireline Voice & Broadband

TTCL has focused less on its fixed network infrastructure, instead expanding its mobile network, including in rural areas. Its recent deal with Huawei, worth USD182mn, will help the operator deploy infrastructure as part of the Universal Communications Service Access Fund contract it won in February 2014, but the network will mostly be mobile, with a mixture of 2G, 3G and 4G technologies.

The lack of investment has led to mobile being the preferred choice for voice communications, and despite the discounting of inactive subscriptions in 2013, we believe the trend of fixed to mobile substitution has been ongoing and will continue to increase, as the entry of Viettel and a greater focus on rural areas will increase mobile penetration.

Mobile Beats Fixed

Mobile (mn) And Fixed (000) Voice Subscribers, 2010-2015



Source: TCRA, BMI

The TCRA reported there were 1,933,792 internet subscribers at the end of 2014, a y-o-y increase of 34.8%, with **BMI** estimating there were around 1.7mn broadband subscriptions, discounting non-broadband connections and migration; this meant a y-o-y increase of 42.9%.

The regulator's data suggests growth was driven by mobile wireless (2G/3G/4G) as well as fixed wirless uptake from households and individuals and enterprises but the overall penetration remains low, at 34%. The government has tried to improve availability of broadband services, but as many other countries in the region, the uptake will predominantly be on mobile services. The arrival of Viettel in the market will boost 3G availability, specifically in rural areas, through an investment of USD1bn. Other mobile operators will need to follow suit, with Tigo and Vodacom announcing further investments in 2015, and the former launching its 4G network in April 2015.

Tanzania, as part of its National ICT policy, launched its National ICT Broadband Backbone (NICTBB) in 2010, the project having five phases:

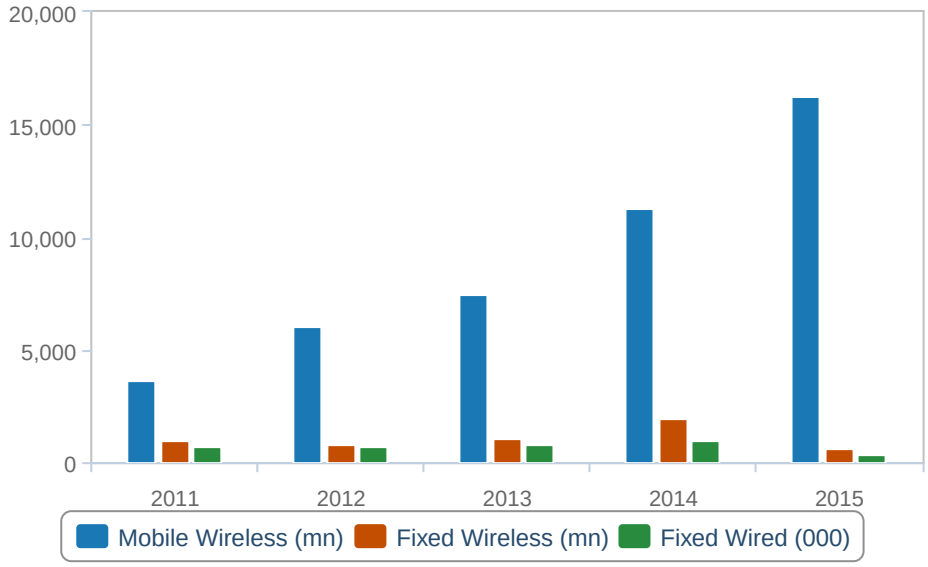
- Phase I: deployment of national backhaul/transport, sea cables

- Phase II: deployment of national backhaul/transport, border posts
- Phase III: backhaul links/regional IP/data centres
- Phase IV: metro OFC networks - DSM metro in a public private partnership
- Phase V: last mine connectivity (wireless/wireline)

The third phase is ongoing, although future deadlines remain unclear. The project is undertaken by fixed incumbent TTCL. When it is completed, cheaper connectivity and greater bandwidth is likely to benefit not only retail customers, which will be few because of the price of hardware, but also businesses, which need more advanced networks. The announcement by TTCL of its greatest fibre-optic infrastructure launch in 2015 will likely boost broadband availability and uptake of internet technologies.

Mobile Wireless Remains Dominant

Estimated Internet Subscriptions By Technology, 2011-2015



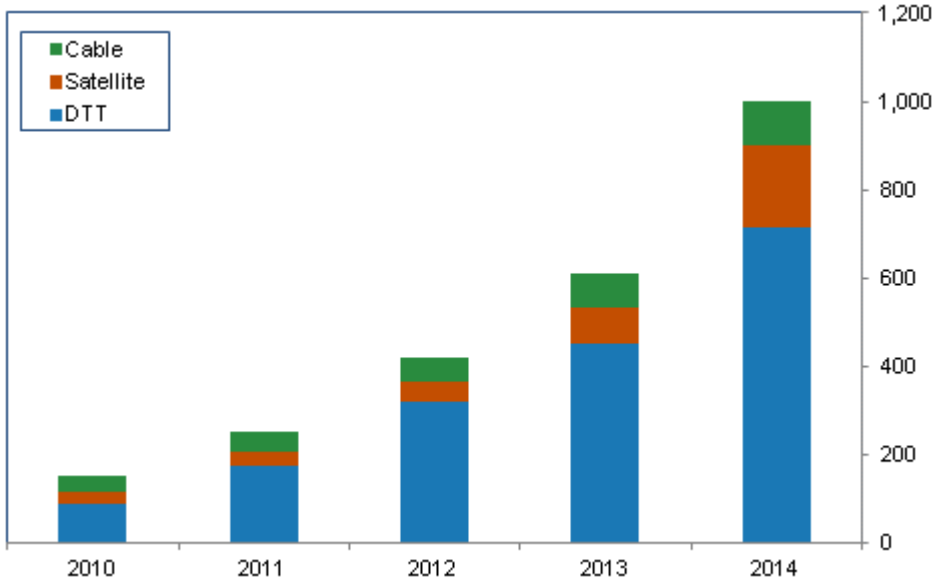
Source: TCRA, BMI

Pay-TV/Convergence

While the number of broadcasting providers has remained stable, reaching 46 in 2015, the number of subscribers has gradually increased through the sale of more equipment. In 2014, there were over 1mn decoders sold, of which 848,961 were on DTT, driving the number of subscribers to just under 1mn. Paid content still remains beyond the reach of most Tanzanians, but the development of advanced mobile technologies could lead to the adoption of more usage on mobile devices. This is clearly another area of investment and development for mobile operators.

DTT Technology Of Choice

Pay-TV Subscribers ('000), 2010-2014



Source: TCRA

Regulatory Development

Table: Tanzania: Regulatory Bodies And Their Responsibilities

Regulatory Body	Responsibilities
Tanzania Telecommunications Regulatory Authority (TCRA) Mawasiliano Towers 20 Sam Nujoma Road P.O. Box 474 14414 Dar es Salaam Tanzania	The Tanzania Communications Regulatory Authority (TCRA) was established in 2003. It is an officially independent authority for the postal, broadcasting and telecommunications industries in the United Republic of Tanzania. It merged the former Tanzania Communications Commission and the Tanzania Broadcasting Commission. It is responsible for licensing and imposing regulations in these industries. The fulfilment of these responsibilities includes:
Tel: +255 22 2199760 - 8 Fax: +255 22 2412009 Email: dg@tcra.go.tz Web: www.tcra.go.tz	▪ Moving the industry towards effective competition and economic efficiency. ▪ Looking after consumer interests. ▪ Promoting the availability of services. ▪ Awarding licences and enforcing licence conditions. ▪ Establishing industry standards for goods and services, and ensuring that standards are met. ▪ Regulating prices.

Source: BMI

Competition

The Tanzania Communications Regulatory Authority (TCRA) is empowered to monitor the market and attempt to ensure effective competition is taking place, according to the Communications Regulatory Act of 2003. It is particularly active in monitoring price trends and how they are affected by competition.

In 2005 the TCRA introduced the Converged Licensing Authority, under which all telecoms licences became technology neutral and service neutral. This opened opportunity for competition in the fixed-line sector; however, TCRA data show that only **TTCL** and **Zantel** offer fixed-line voice services. Zantel operates predominantly in Zanzibar, while TTCL caters mostly to mainland Tanzania and retains a near monopoly over the fixed-line sector.

The mobile sector was subject to a high level of competition prior to 2008, but between then and 2010 the TCRA awarded even more licences. According to the regulator, there were eight licensed operators in June 2008 and of these, six were operational. The operational ones were TTCL, Zantel, **Vodacom**, **Airtel**, **Tigo** and an internet service provider called **Benson** that began offering CDMA-based mobile services in 2007, but by June 2008 had only 3,000 subscribers. The two additional licences belonged to **HITS Telecom** and a

company called **Dovetel**. In November 2008, the TCRA awarded two additional licences to **Egotel** and **MyCell Company**, taking the total of licensed operators to 10. At the end of 2008, only Dovetel had begun operations, over a CDMA network in Dar es Salaam. In July 2009 the TCRA awarded a licence to offer data services to **Smile Communications**. By June 2013, regulatory data showed there were six operators providing mobile services in Tanzania. They were the same six that competed in the market in June 2008.

Licensing

The TCRA is required to process and issue telecommunications service licences. As of February 2005, a converged licence framework was in place. The framework clearly sets out a standardised process for beginning licence tenders and awarding licences to ensure a transparent licensing process and also standardises one-off and recurring licence fees. There are four types of licences under the Converged Licensing Authority: Network Facility License, Network Services License, Application Services License and Content Service License.

In October 2014, Vietnam-based **Viettel** won a concession to build and operate a 3G network in Tanzania. Viettel announced plans to invest USD1bn in its national network. The operator planned to begin deploying its network on November 1 and is expected to launch commercial mobile services in July 2015, according to Tanzania's deputy communication, science and technology minister, January Makamba.

In February 2016, the TCRA reported that it was planning to auction mobile broadband frequencies acquired in the World Radiocommunication Conference 2015 (WRC-15) in order to boost mobile broadband usage in the country. According to TCRA's director general, the auction has an additional objective of establishing transparency. Newly acquired spectrum includes frequencies in the 694MHz-790MHz, 1,427MHz-1,492MHz and 3,300MHz-3,600MHz bands, which will be used for broadband services, in addition to creating an emergency service mobile network. A date for the auction yet to be announced.

Mobile Operators To List On Local Stock Exchange

In October 2014, Deputy Minister of Communication, Science and Technology January Makamba announced that the government is currently in the final stages of implementing regulations which will require telecoms to list on the Dar es Salaam Stock Exchange. Mobile operators will have to launch their IPOs on Tanzania's stock exchange by early 2015, under mandatory rules set by the Tanzanian government to allow citizens to own stakes in the country's telecoms sector. The new regulation aims to boost the stock exchange's value and improve corporate governance and transparency.

The Government Imposes Higher Taxes

In June 2013, Tanzania's finance ministry announced plans to impose a 10% tax on mobile money transfers, as well as an increase in excise duties across the telecoms sector to 14.5% starting July 1 2013, bringing the total tax on gross revenue in the telecoms sector to 36.5%. The following month, the government of Tanzania imposed a monthly excise duty of TZS1,000 (USD0.62) on all mobile SIM cards in the country. For around 8mn of Tanzania's 22mn mobile subscribers, the SIM card tax was more than their monthly expenditure on mobile services. Under pressure from consumers and mobile operators the government finally scrapped the SIM card tax in December 2013, but parliament passed the Excise Management and Tariff Bill of 2013, which increased excise duty on telecoms services from 14.5% to 17%.

In August 2014, the government again proposed to raise excise duty on mobile money transfers from 0.15% to 10%. The TRA states that it intends to collect the tax from mobile operators and financial institutions providing the service, rather than directly on mobile money users. **BMI** is sceptical about the TRA's ability to prevent service providers from increasing their transaction fees in order to protect their margins. Nevertheless, we do not expect the tax on mobile money transfers to affect usage of the service. This is because we expect strong growth in the mobile money segment to offset any decline as a result of more cautious use of the service. Moreover, because Tanzania has a low banking penetration, mobile money users have little choice but to continue using the service.

In May 2015, the Tanzanian government introduced a draft resolution providing for telecom companies to be subject to a 1% universal service fee.

SIM Registration

In April 2013, the TCRA rolled out a campaign aimed at addressing unlawful use of mobile phones in the country. The regulator partnered with the police force and mobile operators to enforce the provisions of the respective laws and regulations. The regulator asked all users of mobile phones to immediately get their SIM cards registered. The regulator initiated the campaign after a SIM card registration survey showed gross violations of the registration laws and lapses in the SIM registration processes.

In June, Tanzania's government rejected requests to extend the July 10 deadline to register SIM cards, as a large number of subscribers had been unable to register their SIMs owing to a lack of necessary documentation. On the deadline, Tanzanian mobile network operators switched off about 650,000 unregistered SIM cards to comply with the Electronic and Postal Communications Act, 2010. Vodacom

Tanzania switched off 450,000 unregistered SIM cards, while **Airtel Tanzania** switched off 200,000 lines. Subscribers caught using unregistered SIM cards are liable to pay a fine of TZS500,000 (USD300) or face a three-month imprisonment, or both.

TCRA Board Dissolved

President of Tanzania John Magufuli in April 2016 dissolved the TCRA board and suspended Director General Ally Yahya Simba for failing to implement the Telecommunications Traffic Monitoring System (TTMS). The decision followed a meeting involving the Communications Ministry, the Ministry of Finance & Planning and Tanzania's anti-corruption bureau (PCCB), which concluded that the failure to implement the TTMS system was costing the government around TZS400bn (USD179mn) in lost telecoms revenues per year. President Magufuli also instructed ICT Minister Makame Mbarawa to appoint an acting director general for the TCRA and urged the relevant authorities to ensure that the delayed local calls revenue collection system could commence operations as soon as possible.

Regulating The Unregulated

The unprecedented growth in the Tanzanian mobile money market has shown great promise. With over 31mn registered mobile money accounts in the country, the government, in cooperation with the Central Bank of Tanzania, is aiming to regulate the mushrooming mobile money services sector of the country. It is yet unclear which governing and regulatory authorities will supervise and regulate the growing sector but we anticipate that the mobile financial services sector will soon be under the jurisdiction of a competent authority.

Tanzania To Join EAC One Network Area

Tanzania is set to join the East Africa Community (EAC) One Network Area, which harmonises mobile roaming tariffs in the region, according to the Tanzania Communications Regulatory Authority (TCRA). The move will considerably cut roaming charges for calls originating from other EAC Partner States, noted TCRA Director General Ally Yahaya Simba, adding voice charges would be harmonised first, with data charges to follow later. The changes will become effective as soon as the existing telecoms policies and regulations are revised.

Competitive Landscape

Table: Key Players		
Company Name	**Ownership**	**Services**
Airtel	Bharti Airtel (100%)	Mobile
Vodacom	Vodacom (65%) One Mirambo Ltd (35%)	Mobile
Tigo	Millicom (100%)	Mobile
Zantel	Millicom (85%) Zanzibar Government (15%)	Mobile
TTCL	State (100%)	Fixed and mobile
Halotel***	Viettel (100%)	Mobile

****Launched in Q415. Source: BMI*

Operators Data

Table: Airtel								
	Q114	**Q214**	**Q314**	**Q414**	**Q115**	**Q215**	**Q315**	**Q415**
Subscribers ('000)								
Total	9,173	9,246	9,546	9,552	9,704	10,279	10,888	11,047
Net Additions	177	73	300	6	152	575	609	159
Market Share (%)	32.8	32.2	31.4	30.0	29.4	30.1	30.4	4.9

Source: BMI, TCRA

Table: Vodacom								
	Q114	**Q214**	**Q314**	**Q414**	**Q115**	**Q215**	**Q315**	**Q415**
Subscribers ('000)								
Total	10,284	10,638	11,316	11,810	12,172	11,996	12,521	12,714
Active Data Customers	3,788	4,480	4,963	5,160	5,265	5,501	5,502	5,727
Net Additions	-5	354	678	494	362	-176	525	193
Market Share (%)	36.7	37.0	37.2	37.1	36.8	35.2	35.0	32.6
Usage								
MOU (bn)	131	158	165	154	123	120	123	130

Vodacom - Continued

	Q114	Q214	Q314	Q414	Q115	Q215	Q315	Q415
ARPU (TZS)	6,377	6,655	6,821	6,593	5,952	6,046	6,265	5,957
ARPU (ZAR)	43	42	44	43	39	36	38	39

Source: BMI, Vodacom, TCRA

Table: Tigo

	Q114	Q214	Q314	Q414	Q115	Q215	Q315	Q415
Subscribers ('000)								
Total (Millicom)	6,277	6,570	7,235	8,193	8,702	9,473	9,982	11,801
Total (TCRA)	6,714	6,988	7,643	8,625	9,265	10,037	10,640	11,115
Net Additions	417	274	655	982	640	772	603	1161
Market Share (%)	24.0	24.3	25.1	27.1	28.0	29.4	29.7	36.0
ARPU (USD)*	3.5	3.3	3.3	3.1	2.8	2.6	2.5	2.6

**For all African subsidiaries. Source: BMI, Millicom, TCRA*

Table: Zantel

	Q114	Q214	Q314	Q414	Q115	Q215	Q315	Q415
Subscribers ('000)								
Total	1,747	1,713	1,772	1,719	1,736	1,636	1,568	1,839
Net Additions	-61	-34	59	-53	17	-100	-68	271
Market Share (%)	6.2	6.0	5.8	5.4	5.3	4.8	4.4	8.4

Source: BMI, TCRA

Table: TTCL

	Q114	Q214	Q314	Q414	Q115	Q215	Q315	Q415
Subscribers ('000)								
Total	72	146	152	156	161	164	161	304
Net Additions	20	74	6	4	5	3	-3	143
Market Share (%)	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.8

Source: BMI, TCRA

Company Profile

TTCL

Strengths	▪ Has a virtual monopoly over mainland Tanzania's fixed-line market.
	▪ Company has a flexible attitude and is willing to look at new technologies.
	▪ Has a fixed-line and mobile network.
Weaknesses	▪ Fairly limited fixed-line customer base and very small mobile customer base, neither of which is growing rapidly.
	▪ Limited investment in new infrastructure for the fixed-line network.
	▪ Holds less than 1% of mobile market share.
	▪ Late to launch mobile financial services.
Opportunities	▪ The fixed-wireless market, which TTCL could easily service with its CDMA facilities, is the best chance of growth for fixed line services.
	▪ Sale of bandwidth from the backbone network to neighbouring countries and telecoms firms would leverage the strength of its own infrastructure and access to undersea cables.
	▪ High-speed national broadband coverage is extremely promising and could connect the entire country with reliable and fast internet connectivity.
	▪ The company plans to list on the Dar es Salaam stock exchange to finance its five-year transformation plan.
Threats	▪ Other companies investing in 4G LTE, WiMAX and fibre optic networks threaten to overtake TTCL in the broadband arena.
	▪ Continuing mobile substitution is stripping away its customer base and putting the big mobile operators in a better position for future investments.
	▪ Renationalisation could see the operator suffer more in future from a lack of investment.

- Investment in network infrastructure is hindered by mounting unpaid bills by corporate and residential users.

Company Overview

The Tanzania Telecommunications Company Ltd (TTCL) was established by an act of parliament in 1993 and started operating on January 1 1994. The company provides voice and data communication services to more than 300,000 business and residential customers in Tanzania, as well as network services for other licensed telecoms operators. It was partially privatised in 2001, with a consortium of European companies taking a 35% stake, which was later taken over by Airtel Tanzania.

In February 2013, it was reported the government of Tanzania started the formal process of taking 100% ownership of TTCL, with the aim of turning it around and making it run profitably. The deputy minister for communications, science and technology, January Makamba, said the decision is a key component of the government's plan to make 'turbulent' TTCL more stable in future. By January 2015 Airtel and TTCL had reached an agreement for the nationalisation of the company under which Airtel would divest its 35% stake in exchange for USD7.7mn. By early 2016, the process was not yet finalised, with the government still looking to take full control of the company.

Strategy

The focus for the future is to develop TTCL's operational model in a way that could provide a template for future African fixed-line operations, where the lack of telephony infrastructure provides an exciting opportunity for an innovative fixed/wireless partnership.

As part of the recent renationalisation effort, the new TTCL strategy aims for higher competitiveness and increased competition by looking to attract retail business clients in addition to the large corporate subscribership. The ambitious refocusing of efforts will generate long-term stable revenues but slower subscriber growth in the subscriber base.

TTCL has been taking advantage of the government's deployment of the Universal Communication Services Access Fund (UCSAF) to build its presence in the mobile market. It won a UCSAF contract to deploy mobile networks in over 400 rural villages in April 2014, followed by its strongest quarter of growth in more than five years in Q214.

The operator has also been building up its range of services on both its fixed broadband network and its cellular infrastructure. In January 2015, TTCL signed a USD182mn deal with China based Huawei Technologies to build advanced landline and mobile infrastructure base with an emphasis on 2G, 3G and 4G data technologies. TTCL also

partnered with Telecom Italia Sparkle to expand IP-Points of Presence in southern and eastern Africa, catering primarily to wholesale telecoms customers.

Operational Developments

Mobile Services

2016

TTCL To Offer Money Transfer Service

TTCL is venturing into mobile money transfer services. The company will utilise an unstructured supplementary service data (USSD) technology to roll out its services. TTCL has contracted payment technology provider Novatti Group to supply equipment worth USD850,000. In total, the company has set aside USD850mn for developing the MFS platform but has yet to confirm when it expects the service to be commercialised.

2015

TTCL Introduced Nationwide Broadband Network

In July 2015 it was announced that TTCL had introduced a nation-wide 100% broadband network that would deliver up to 15mbps of internet speeds regardless of geographical location. The high speed satellite broadband connection comes at the same time as the operator has stated that it has finished building the largest fibre optic network in the country. To date, the TTCL group claims to have invested over USD1.2bn in developing an advanced infrastructure that incorporates satellites, ground stations, data centres and a fibre ring. TTCL has three satellites in orbit and another two fully funded ones under construction.

TTCL Plan Rural Investment And 4G Deployment

In February 2015, the operator announced a USD1.8mn investment in the first quarter of the year in the rural parts of the country, while it also plans to launch a 4G network by July this year.

The contract with Huawei Technologies signed in January 2015 valued at USD182mn signals the most ambitious move by the newly renationalised TTCL. It is supposed to upgrade 2G, 3G and 4G networks throughout the country whilst building new telecommunications infrastructure in both fixed and mobile sectors.

2014

TTCL Partners With UCSAF For Service Roll-Out to underserviced Areas

In April 2014, TTCL partnered with the Universal Communication Service Access Fund (UCSAF) to roll out telecoms services to underserved rural communities in the country. The project, valued at USD10mn, will cover around 500,000 people in 400 villages. TTCL's partnership with the UCSAF should ease the pressure of immediate return on investment as is the case with private financing. However, the project will not be immune to challenges of operating in rural areas, such as low ARPUs and high network maintenance costs owing to poor social infrastructure. That said, there are new

solutions that claim to enable operators to significantly reduce the cost of network deployment and operation in rural areas. We expect TTCL to explore these solutions in order to ensure the sustainability of its network services in those areas. If fully implemented, TTCL can look forward to appreciable growth in its subscriber base, which has been declining steadily.

Operational Data

- Fixed-line subscriptions (2012): 166,148
- Fixed-line subscriptions (2013): 158,935
- Fixed-line subscriptions (2014): 140,391
- Fixed-Line subscriptions (2015): 142,819
- Mobile subscriptions (2012): 55,515
- Mobile subscriptions (2013): 51,831
- Mobile subscriptions (2014): 156,227
- Mobile subscriptions (2015): 138, 754

Company Details

- Tanzania Telecommunications Company Limited
- Extelcoms House
  Samora Avenue

  PO Box. 9070

  Dar es Salaam

  Tanzania

Vodacom Tanzania

Strengths

- The Vodafone connection gives Vodacom Tanzania a wealth of international experience behind it as well as a financially strong backer.
- Has been generally ahead of the pack in launching new and innovative services. Already offers mobile payment and banking services through M-Pesa and also provides a location-based variable call charge tariff and a loyalty scheme, while other operators are only just starting to launch similar services.
- M-Pesa and other VAS have helped Vodacom report rising ARPUs.

Weaknesses

- As with other operators, Vodacom has an extremely limited postpaid subscriber base, with the vast majority of its customers on lower earning, less reliable prepaid contracts.
- Profitability and loyalty remain volatile despite increased usage and the launch of new services

Opportunities

- Biggest opportunity remains the continued rapid growth of mobile subscriber numbers, with mobile penetration rates hovering around 60%.
- M-Pesa continues to be a key competitive advantage, helping attract users onto Vodacom's subscriber base.
- Investment in wireless broadband services and the concurrent government investment in fibre backbone creates a valuable opportunity to grow the wireless data market.
- Investment in 3G and 4G networks will enable Vodacom take advantage of long-term growth opportunities in the data market.
- The company has launched M2M and IoT services targeting the high value enterprise market.

Threats

- New government taxes on the telecoms sector would increase downward pressure on profits.

- Other operators are starting to catch up on the services and technology front, with the deployment of m-commerce and advanced mobile data services.
- Interoperability between Tigo, Airtel and Zantel's MFS platforms could erode Vodacom's dominance in the MFS market.
- Intense competition in the 3G market from Zantel, Tigo and Airtel.
- Possible implementation of regulation forcing operators to list on the stock exchange could dilute Vodacom's control over company strategy.

Company Overview

Vodacom Tanzania launched mobile services in Tanzania in August 2000. The company is a subsidiary of the Vodacom Group, based in South Africa, which is the majority shareholder with a 65% stake. The rest of Vodacom Tanzania is owned by a local company called Mirambo.

Strategy

Vodacom is expanding its non-voice services portfolio, with a particular focus on mobile financial services, insurance services and advanced mobile data services as well as value added services. This is a response to declining voice and SMS earnings. The company's M-Pesa user base reached over 7mn in December 2015, up from 6.1 mn in December 2014. Vodacoms's M-Pawa's saving and loan service is also increasingly gaining traction, ending 2015 with 1.5mn customers. Additionally, in January 2015, Vodacom Tanzania, through its M-Pesa framework, had reached an agreement with Jubilee Insurance to provide comprehensive affordable health insurance options for individuals and families under the bimaAFYA scheme. An aggressive move beyond traditional telecommunications services, M-Pesa subscribers can easily purchase and pay for health coverage via their mobile telephone instantly. Vodacom has consistently run campaigns and advertisements throughout 2015 to push the M-Pesa and mobile banking framework to its clientele and the Tanzanian mobile consumer market at large. It is evident that the operator views this as a critical component of its Tanzanian business strategy.

In capturing the high value enterprise segment of the market, Vodacom in Q116 partnered with Cumii International to launched a M2M and IoT service.

Operational Developments

Developments

2016

Vodacom Partners With Cumii International For Development Of IoT And M2M Solution

In April 2016, Vodacom reported that it is partnering with technology provider Cumii International for the development of an IoT and M2M solution. Initial IoT focus areas for Vodacom Tanzania's IoT services are: vehicle tracking and fleet management services, monitoring of retail points, security systems and other telemetry services, targeting individuals, corporate companies, business enterprises, government and non-governmental organisations. Vodacom's cloud computing service specifically is aimed at enabling business clients to buy data storage and computing power in real time as per their needs through the Internet, with an objective of reducing capital expenditure.

2015

Vodacom To Spend USD180mn On Service Expansion And Network Upgrade

The operator will invest USD100mn in rural areas, as well as another USD80mn upgrading its 2G and 3G networks. The announcements were made in February and May 2015 and new Tanzanian Managing Director Ian Ferrao reiterated these statements again in August 2015 committing Vodacom Tanzania's renewed stance towards rural development.

2014

Vodacom Partners With Bank Of Africa Tanzania for Loan Service

In September 2014, Vodacom partnered with Bank of Africa - Tanzania (BOA-Tanzania) to allow its mobile money distributors to secure loans without collateral security at favourable terms. This is expected to enable the mobile money distributor to provide better service to their clients. Vodacom distributors can take a minimum loan of TZS10mn (USD6,020) to a maximum of TZS75mn (USD45,141) at an interest rate of 1.7% per month and at a one year payback period. The distributors will also be able to secure loans worth up to six times their average commission earned over a period of six months. The partnership arrangement will financially empower distributors who are responsible for ensuring availability of vouchers to customers countrywide.

Vodacom Launches Savings And Loan Service

In May 2014 Vodacom launched savings and loans mobile financial service (MFS) M-Pawa in conjunction with the Commercial Bank of Africa. In July 2014, Vodacom stated that more than 500,000 users had signed up to M-Pawa and that deposits had reached TZS4bn (USD2.4mn) during the first three months of service. M-Pawa is available through Vodacom's network of more than 70,000 M-PESA agents in Tanzania.

Vodacom Secures CSP Contract For Expansion Of Service In To Underserved Areas

In April 2014 Vodacom Tanzania won a contract from the Communications Service Providers (CSPs) to provide telecoms services to rural and underserved areas of the country. The CSP contract covers the provision of telecoms services to 466 villages in 73 wards, covering around 1mn people, according to Vodacom Tanzania Managing Director. The tender was issued under the sponsorship of Tanzania's Universal Communication Services Access Fund as part of the Tanzania Communications Infrastructure and e-Government Project, which is being financed by the International Development Association.

Operational Data

- Mobile subscriptions (2011): 11,621mn
- Mobile subscriptions (2012): 9,357mn
- Mobile subscriptions (2013): 10,289mn
- Mobile subscriptions (2014): 11,810mn
- Mobile subscriptions (2015): 12,714mn

Company Details

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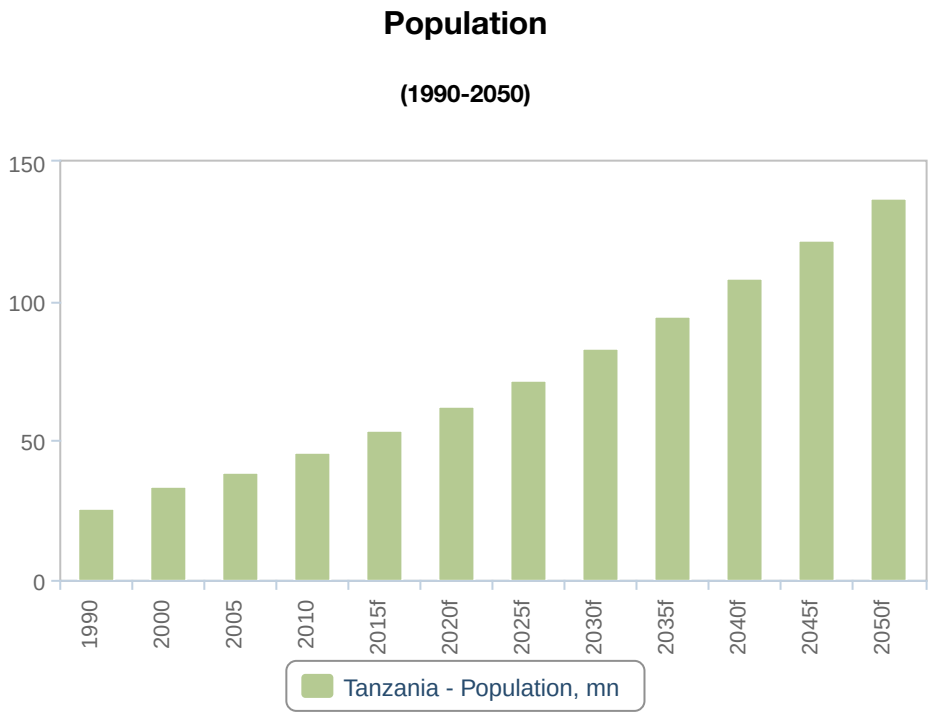
  Dar es Salaam

  Tanzania

Demographic Forecast

Demographic analysis is a key pillar of **BMI**'s 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.

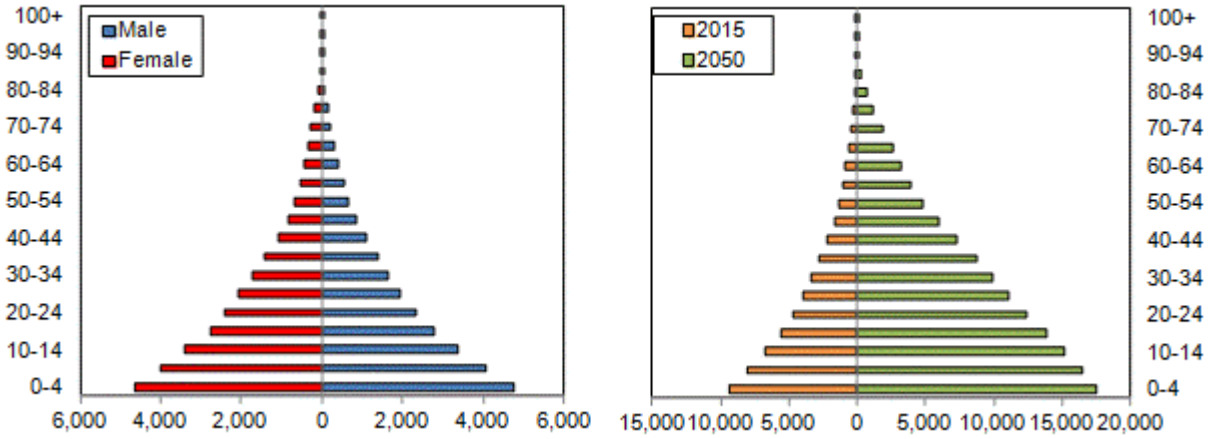
The accompanying charts detail the population pyramid for 2015, the change in the structure of the population between 2015 and 2050 and the total population between 1990 and 2050. The tables show indicators from all of these charts, in addition to key metrics such as population ratios, the urban/rural split and life expectancy.



f = BMI forecast. Source: World Bank, UN, BMI

Tanzania Population Pyramid

2015 (LHS) & 2015 Versus 2050 (RHS)



Source: World Bank, UN, BMI

Table: Population Headline Indicators (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, total, '000	25,458	33,991	39,065	45,648	53,470	62,267	72,032
Population, % y-o-y	na	2.6	3.0	3.2	3.2	3.0	2.9
Population, total, male, '000	12,608	16,910	19,394	22,665	26,574	30,992	35,900
Population, total, female, '000	12,849	17,080	19,671	22,982	26,896	31,275	36,132
Population ratio, male/female	0.98	0.99	0.99	0.99	0.99	0.99	0.99

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

Table: Key Population Ratios (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Active population, total, '000	13,054	17,744	20,295	23,641	27,590	32,573	38,575
Active population, % of total population	51.3	52.2	52.0	51.8	51.6	52.3	53.6
Dependent population, total, '000	12,403	16,247	18,769	22,006	25,880	29,693	33,457
Dependent ratio, % of total working age	95.0	91.6	92.5	93.1	93.8	91.2	86.7

Key Population Ratios (Tanzania 1990-2025) - Continued

	1990	2000	2005	2010	2015f	2020f	2025f
Youth population, total, '000	11,713	15,283	17,606	20,578	24,167	27,686	31,072
Youth population, % of total working age	89.7	86.1	86.7	87.0	87.6	85.0	80.6
Pensionable population, '000	690	963	1,163	1,428	1,712	2,007	2,384
Pensionable population, % of total working age	5.3	5.4	5.7	6.0	6.2	6.2	6.2

f = BMI forecast. Source: World Bank, UN, BMI

Table: Urban/Rural Population & Life Expectancy (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Urban population, '000	4,807.5	7,583.2	9,705.8	12,833.6	16,900.9	21,879.5	27,804.7
Urban population, % of total	18.9	22.3	24.8	28.1	31.6	35.1	38.6
Rural population, '000	20,650.7	26,408.4	29,359.8	32,814.9	36,569.5	40,387.8	44,228.2
Rural population, % of total	81.1	77.7	75.2	71.9	68.4	64.9	61.4
Life expectancy at birth, male, years	48.5	49.9	55.1	60.6	64.1	66.2	67.6
Life expectancy at birth, female, years	51.5	51.1	56.1	62.8	66.9	68.6	70.4
Life expectancy at birth, average, years	50.0	50.5	55.6	61.6	65.5	67.4	69.0

f = BMI forecast. Source: World Bank, UN, BMI

Table: Population By Age Group (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, total, '000	4,641	5,907	7,008	8,135	9,398	10,427	11,486
Population, 5-9 yrs, total, '000	3,822	5,031	5,695	6,816	8,019	9,297	10,337
Population, 10-14 yrs, total, '000	3,249	4,344	4,901	5,625	6,750	7,961	9,248
Population, 15-19 yrs, total, '000	2,722	3,733	4,191	4,811	5,540	6,663	7,880
Population, 20-24 yrs, total, '000	2,247	3,166	3,599	4,107	4,717	5,441	6,559
Population, 25-29 yrs, total, '000	1,844	2,590	3,031	3,502	4,005	4,614	5,333
Population, 30-34 yrs, total, '000	1,510	2,066	2,429	2,917	3,393	3,900	4,507
Population, 35-39 yrs, total, '000	1,222	1,646	1,897	2,309	2,797	3,282	3,792
Population, 40-44 yrs, total, '000	1,036	1,322	1,488	1,786	2,194	2,687	3,175
Population, 45-49 yrs, total, '000	836	1,062	1,215	1,404	1,695	2,101	2,591

Population By Age Group (Tanzania 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 50-54 yrs, total, '000	676	891	976	1,142	1,329	1,615	2,014
Population, 55-59 yrs, total, '000	539	709	821	903	1,077	1,259	1,538
Population, 60-64 yrs, total, '000	416	555	643	755	839	1,006	1,181
Population, 65-69 yrs, total, '000	303	412	485	564	677	758	913
Population, 70-74 yrs, total, '000	200	279	339	408	476	577	650
Population, 75-79 yrs, total, '000	114	163	199	257	309	366	448
Population, 80-84 yrs, total, '000	51	76	96	141	163	200	240
Population, 85-89 yrs, total, '000	16	26	33	44	67	80	100
Population, 90-94 yrs, total, '000	3	5	7	10	14	22	27
Population, 95-99 yrs, total, '000	0	0	0	1	1	2	4
Population, 100+ yrs, total, '000	0	0	0	0	0	0	0

f = BMI forecast. Source: World Bank, UN, BMI

Table: Population By Age Group % (Tanzania 1990-2025)							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, % total	18.23	17.38	17.94	17.82	17.58	16.75	15.95
Population, 5-9 yrs, % total	15.01	14.80	14.58	14.93	15.00	14.93	14.35
Population, 10-14 yrs, % total	12.76	12.78	12.55	12.32	12.62	12.79	12.84
Population, 15-19 yrs, % total	10.70	10.98	10.73	10.54	10.36	10.70	10.94
Population, 20-24 yrs, % total	8.83	9.32	9.22	9.00	8.82	8.74	9.11
Population, 25-29 yrs, % total	7.25	7.62	7.76	7.67	7.49	7.41	7.40
Population, 30-34 yrs, % total	5.93	6.08	6.22	6.39	6.35	6.26	6.26
Population, 35-39 yrs, % total	4.80	4.84	4.86	5.06	5.23	5.27	5.26
Population, 40-44 yrs, % total	4.07	3.89	3.81	3.91	4.10	4.32	4.41
Population, 45-49 yrs, % total	3.29	3.12	3.11	3.08	3.17	3.37	3.60
Population, 50-54 yrs, % total	2.66	2.62	2.50	2.50	2.49	2.59	2.80
Population, 55-59 yrs, % total	2.12	2.09	2.10	1.98	2.01	2.02	2.14
Population, 60-64 yrs, % total	1.64	1.63	1.65	1.66	1.57	1.62	1.64
Population, 65-69 yrs, % total	1.19	1.21	1.24	1.24	1.27	1.22	1.27
Population, 70-74 yrs, % total	0.79	0.82	0.87	0.89	0.89	0.93	0.90
Population, 75-79 yrs, % total	0.45	0.48	0.51	0.56	0.58	0.59	0.62
Population, 80-84 yrs, % total	0.20	0.23	0.25	0.31	0.31	0.32	0.33

Population By Age Group % (Tanzania 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 85-89 yrs, % total	0.07	0.08	0.09	0.10	0.13	0.13	0.14
Population, 90-94 yrs, % total	0.01	0.02	0.02	0.02	0.03	0.04	0.04
Population, 95-99 yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Population, 100+ yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.00

f = BMI forecast. Source: World Bank, UN, BMI

Glossary

Table: Glossary Of Terms					
2G	second generation	GDP	gross domestic product	NGN	next generation network
3G	third generation	GPRS	global packet radio service	Mbps	megabits per second
ADSL	asymmetric digital subscriber line	GSM	global system for mobile communications	MHz	megahertz
ARPU	average revenue per user	HDSL	high-bit-rate digital subscriber line	MNP	mobile number portability
ASP	average selling price	HSDPA	high-speed downlink packet access	MoU	memorandum of understanding
BMI	Business Monitor International	HPSA	high-speed packet access	MOU	minutes of use
bn	billion	HSUPA	high-speed uplink packet access	MPLS	multiprotocol label switching
BTS	base transceiver stations	HTML	hypertext markup language	MSC	mobile switching centre
CDMA	code division multiple access	Hz	hertz	MVNO	mobile virtual network operator
CRM	customer relationship management	ICT	information and communication technology	-	not available
D-AMPS	digital-advanced mobile phone service	IDD	international direct dialling	OIBDA	operating income before depreciation and amortisation
DLD	domestic long-distance	ILD	international long-distance	POP	point of presence
DMB	digital multimedia broadcasting	IPO	initial public offering	R&D	research and development
DSL	digital subscriber line	IP	internet protocol	SaaS	software-as-a-service
DSLAM	digital subscriber line access multiplexer	IPTV	internet protocol TV	SDSL	symmetric digital subscriber line
DSU	digital subscriber unit	ISDN	integrated services digital networks	SIM	subscriber identity module
DTH	direct-to-home	ISP	internet service provider	SMS	short messaging service
DVB-H	digital video broadcasting-handheld	IT	information technology	TDMA	time division multiple access
DVB-SH	digital video broadcasting-satellite handheld	ITU	International Telecommunication Union	TD-SCDMA	time division-synchronous code division multiple access
e/f	estimate/forecast	JV	joint venture	trn	trillion
EBITDA	earnings before interest, taxes, depreciation and amortisation	Kbps	kilobits per second	UMTS	universal mobile telecommunications system
EC	European Commission	KHz	kilohertz	VOD	video on demand

Glossary Of Terms - Continued					
EMEA	Europe, Middle East and Africa	km	kilometres	VoIP	voice over internet protocol
EV-DO	evolution-data optimised	LANs	local area networks	VLAN	virtual local area network
FDI	foreign direct Investment	LEC	local exchange carrier	WAP	wireless application protocol
FTTB	fibre-to-the-building	LTE	long-term evolution	W-CDMA	wideband CDMA
FTTH	fibre-to-the-home	M2M	machine-to-machine	WiBro	wireless broadband
FTP	file transfer protocol	mn	million	WiMAX	worldwide interoperability for microwave access
Gbps	gigabits per second	MEA	Middle East and Africa	WLL	wireless local loop
GPON	gigabit passive optical network	MENA	Middle East and North Africa	WTO	World Trade Organization

Source: BMI

Methodology

Industry Forecast Methodology

BMI's 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 autoregressions. Vector autoregressions 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.

BMI 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. **BMI** selects the best model according to various different criteria and tests, including but not exclusive to:

- R^2 tests explanatory power; adjusted R^2 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**

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 3G. 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, ADSL 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, the GSM Association and the International Telecommunication Union (ITU) and international and national news agencies.

Risk/Reward Index Methodology

BMI's 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.

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 **BMI** 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.

Table: 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 BMI-defined criteria. Evaluates market openness and competitiveness.
Country Rewards	
- Urban/rural split	A highly urbanised state facilitates network rollout and implies higher wealth. Predominantly 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 BMI-defined criteria. Evaluates predictability of operating environment.
Country Risks	
- Short-term external risk	Score from BMI's 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.

Risk/Reward Index Indicators - Continued	
	Rationale
- Corruption	From CRI. Denotes risk of additional illegal costs/possibility of opacity in tendering/ business operations affecting companies' ability to compete.

Source: BMI

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:

Table: 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: BMI