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IRAN

TELECOMMUNICATIONS REPORT

INCLUDES 5-YEAR FORECASTS TO 2019

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Iran Telecommunications Report Q4 2015

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BMI Industry View

BMI View: Iran's telecoms market is an underperformer in the Middle East as a result of political and economic risks, exacerbated by currency depreciation. Access to the latest devices is limited. The UN Security Council's unanimous vote in July 2015 to lift the sanctions against Iran, following a deal on Iran's nuclear programme, however, warrants an optimistic outlook. **BMI**'s Country Risk team has made a slight upward revision to our economic growth forecast for Iran, projecting real GDP growth to pick up from 0.6% in 2015, to 2.9% in 2016 and 3.6% in 2017. This is also likely to have a positive effect on the mobile market and potentially attract more foreign investment. Although mobile penetration in Iran is relatively high at 136.1%, **BMI** believes that there is further scope for growth. Data services, in particular, will grow at an average rate of 36.2% CAGR over the next five years. Iran's second biggest mobile operator **MTN Irancell** has launched 3G and 4G services and market leader **MIC** is planning to do so in the very near future.

Key Data

- We estimate that fixed-line connections increased by 3.0% in 2014 and we expect growth to slow down in the forecast period because of fixed-mobile substitution and a greater focus on mobile services from fixed incumbent TCI.
- We estimate that the country ended 2014 with over 111mn subscribers, boosted by MTN's performance in the latter part of the year after it launched 3G services.
- We estimate there were around 9.9mn 3G subscriptions at the end of 2014 and forecast a figure of 18.9mn at the end of 2015 and we expect the rapid growth to continue over the short term as more operators launch advanced services.

Key Trends And Developments

Iran's nascent 3G/4G market is expanding and **BMI** forecasts it to grow an average of 36.2% over the next five years to 2019. MTN Irancell joined **Rightel** in offering 3G services in the country, launching its network in August 2014. The operator also launched the country's first 4G network in December 2014, looking to take a lead in the mobile data market. In April 2015, only eight months after launching its 3G network, MTN Irancell claimed that the number of data subscribers on its network has increased to more than 21mn, including 7mn on its 3G and 4G networks. The operator now offers 3G services in more than 200 cities and has introduced its 4G network in more than 50 cities throughout the country.

Table: Broadband - Historical Data & Forecasts (Iran 2012-2019)

	2012	2013	2014e	2015f	2016f	2017f	2018f	2019f
3G & 4G phone subscribers, '000	1,100.0	1,600.0	9,920.0	18,947.2	27,473.4	34,067.1	39,177.1	41,527.8
Monthly Blended ARPU, IRR	47,692.8	49,488.9	48,928.8	47,099.7	46,202.5	45,758.3	45,758.3	46,206.9
Broadband internet subscribers, '000	3,076.2	3,694.5	4,531.3	5,417.2	6,403.1	7,482.1	8,641.8	9,864.6

e/f = BMI estimate/forecast. Source: BMI, IDA, operators

- **Iranian Net Communication & Electronic Services** will reportedly deploy fibre-optic FTTx broadband networks, with download speeds of up to 20Mbps, in seven cities in Iran. Iranian Net will install 500,000 access ports in Karaj, Shiraz, Tehran, Isfahan, Tabriz, Mashhad and Qom by the end of H117.
- **MTN Group** has stated that easing of sanctions against Iran would enable it to transfer around USD1bn accumulated dividends and a loan repayment from its Iranian subsidiary. The company has thus far been restricted from taking money out from its Iranian subsidiary.
- MTN Irancell claims that the number of data subscribers on its network has increased to more than 21mn, including 7mn on its 3G and 4G networks. The rise was supported by the expansion of its 3G and 4G networks, providing speeds of up to 150Mbps. The operator offers 3G services in more than 200 cities and has introduced its 4G network in more than 50 cities throughout the country.
- The Iranian government has imposed maximum limits on how much the operators can charge for their data. MTN revealed in its annual report that on 22 December 2014 that the regulator set a maximum tariff of IRR0.5 per KB for post-paid data and IRR0.75 per KB on pre-paid price plans.

SWOT

Iran Mobile SWOT Analysis

Strengths	▪ Continued subscription growth despite high mobile penetration rate. ▪ Competition between operators driving growth and innovation. ▪ The launch of 3G and 4G services driving mobile data uptake.
Weaknesses	▪ Average customer spending levels are low. ▪ Mobile data services are subject to government censoring and filtering. ▪ US embargo puts limits on potential network equipment partners for the operators. ▪ Lack of international investments.
Opportunities	▪ Smartphone penetration is low, with Iran a late developer, meaning there are opportunities for vendors over the medium term in smartphone retail and data service up-sell. ▪ The presence of large numbers of inactive prepaid users inflates the penetration rate and masks the potential for further customer growth. ▪ Although in the early stages, the market for mobile value-added and data services is expected to see strong growth over the next few years as Iran has a relatively young population ; ▪ The government is making headway in a process of lifting the sanctions.
Threats	▪ Government controls over mobile data and internet services could limit the growth of this potentially lucrative sector. ▪ Unstable political and security environment could hinder investment in the sector from equipment manufacturers and content providers.

Political

Political SWOT Analysis

Strengths

- Since the overthrow of the Pahlavi family in 1979, there has been some reduction in the level of political corruption, while wealth distribution has improved marginally.
- The Revolutionary Guard and Basij militia are fiercely loyal to the supreme leader, helping to maintain social stability.
- Sanctions relief will boost economic growth notably.

Weaknesses

- The country has one of the poorest human rights records in the region, and authorities do not hesitate to quell dissidents. A number of journalists and anti-government protesters are being held in custody.
- While decision-making ultimately rests with the supreme leader, the regime is heavily fragmented, and consensus is hard to reach.
- Widespread perceptions of electoral fraud during the course of June 2009's presidential elections have damaged the regime's legitimacy in the eyes of many Iranians.

Opportunities

- The Majlis (parliament) is more than just a rubber stamp; the move by 150 parliamentarians (out of 290) to hold former president Mahmoud Ahmadinejad accountable for his handling of the economy in March 2012 is a positive indication that checks exist.
- The victory of moderate cleric Hassan Rouhani in Presidential elections in June 2013 is leading to a significant improvement in relations with the West.
- The long term potential in Iran across a range of sectors is enormous given a large population, well-educated workforce and pent-up demand.

Threats

- Despite progress in nuclear talks, the prospect of further US and EU sanctions and the possibility of a military strike by the US or Israel cannot be dismissed.
- Youth unemployment is high.

Political SWOT Analysis - Continued

- The strong influence of the Revolutionary Guards within the political and economic arena will continue to present a challenge to reform.

Economic

Economic SWOT Analysis

Strengths	▪ Iran has the world's second largest proven oil reserves after Saudi Arabia, and the world's second largest proven gas reserves after Russia. ▪ Oil and gas aside, Iran is rich in other resources and has a strong agricultural sector.
Weaknesses	▪ Local consumption of hydrocarbons is rising rapidly; this, coupled with ageing technology in the sector, will have a negative impact on its oil and gas exporting capacity. ▪ International sanctions discourage foreign oil companies from bringing much-needed technical knowledge and equipment to maintain oil output levels.
Opportunities	▪ The gas sector remains underdeveloped despite significant improvements in recent quarters, and there is considerable room to maximise this source of revenue. ▪ A shortage of housing, provides opportunities for investment in residential construction.
Threats	▪ Lower oil prices will have a marked impact on the economy. Although an Oil Stabilisation Fund exists to protect the economy at times of weaker oil prices, it has increasingly been used to fund government overspending and could be close to empty. ▪ Capital flight could accelerate should negotiations on the nuclear programme fail.

Operational Risk

SWOT Analysis

Strengths

- Iran boasts high numbers of skilled graduates in technical fields such as engineering, construction and science.
- The transport network offers good internal and cross-border connections, and is currently able to meet the country's supply chain needs.
- The banking sector is relatively well developed, allowing extension of finance and credit to citizens.
- A well established intelligence agency and robust counter-terrorist capabilities deter attacks in most areas of the country.

Weaknesses

- Costs of employment are increases because the Iranian Labour Code affords workers a high level of protection and generous benefits.
- The costs of inland transportation, as well as the risk of congestion and traffic accidents disrupting supply chains, is raised due to reliance on the road network as the dominant freight mode.
- There is widespread corruption and heavy handed censorship, which will pose unforeseeable operational costs and limit business activities.
- The expansion of IS in Iraq poses a significant risk to Iran's security.

Opportunities

- The literacy rate of the labour force is increasing as the benefits of investment in primary school education are filtering through.
- The development of road and rail connections with Iran's neighbours highlights the country's potential to develop into key transit point for East-West trade.
- Relaxing of sanctions is resulting in greater foreign direct investment inflows.
- There is potential to combat the drug supply into Europe through programmes in Iran.

SWOT Analysis - Continued

Threats

- The availability of highly skilled labour is restricted as the brain drain results in an exodus of technically qualified workers.
- The risk of electricity and water shortages will be enhanced due to growth in energy- and water-intensive agricultural, mining and manufacturing industries.
- Lax intellectual property protection carries the threat of patent theft, fraud or infringement, leading to profit losses.
- Even if sanctions are lifted, the difficult operating environment in Iran, typified by high taxes and widespread corruption, will continue to deter investors.

Industry Forecast

Table: Telecoms Sector - Historical Data & Forecasts (Iran 2012-2019)

	2012	2013	2014e	2015f	2016f	2017f	2018f	2019f
Main telephone lines in service, '000	27,448.4	28,462.4	29,316.2	30,049.1	30,650.1	31,120.1	31,586.8	32,050.0
Main Telephone Lines/ 100 Inhabitants	35.9	36.8	37.4	37.8	38.1	38.2	38.4	38.5
Cellular Mobile Phone Subscribers, '000	96,396.5	100,965.7	111,062.3	118,836.7	124,778.5	129,769.6	133,662.7	136,336.0
Mobile Phone Subscribers/100 Inhabitants	126.1	130.4	141.5	149.5	155.1	159.4	162.3	163.7
3G & 4G phone subscribers, '000	1,100.0	1,600.0	9,920.0	18,947.2	27,473.4	34,067.1	39,177.1	41,527.8
3G & 4G market, % of mobile market	1.1	1.6	8.9	15.9	22.0	26.3	29.3	30.5
Monthly Blended ARPU, IRR	47,692.8	49,488.9	48,928.8	47,099.7	46,202.5	45,758.3	45,758.3	46,206.9
Broadband internet subscribers, '000	3,076.2	3,694.5	4,531.3	5,417.2	6,403.1	7,482.1	8,641.8	9,864.6
Broadband internet subscribers/100 Inhabitants	4.0	4.8	5.8	6.8	8.0	9.2	10.5	11.8

e/f = BMI estimate/forecast. Source: BMI, operators, MCI

Mobile

The most recent data from **MTN Irancell** indicates that its subscriber base expanded to 43.94mn by the end of Q414. This indicates that the market is still growing despite a relatively high penetration rate at 141.5%. Our outlook still sees growth slowing over the forecast period, through a rationalisation of multi-SIM ownership and we expect the market to have 136.3mn subscribers by the end of 2019, for a penetration rate of 163.7%. However, as the majority of these subscriptions are pre-paid, it is likely that there will be periods of inactive SIM discounting.

Although the Iranian market has faced political and economic turmoil over recent years and **BMI** is still cautious over Iran's outlook, the UN Security Council unanimous vote in July 2015 to lift the sanctions against Iran, following a deal on Iran's nuclear programme, is ground for an optimistic outlook. **BMI**'s Country Risk team has made a slight upward revision to our economic growth forecast for Iran, in

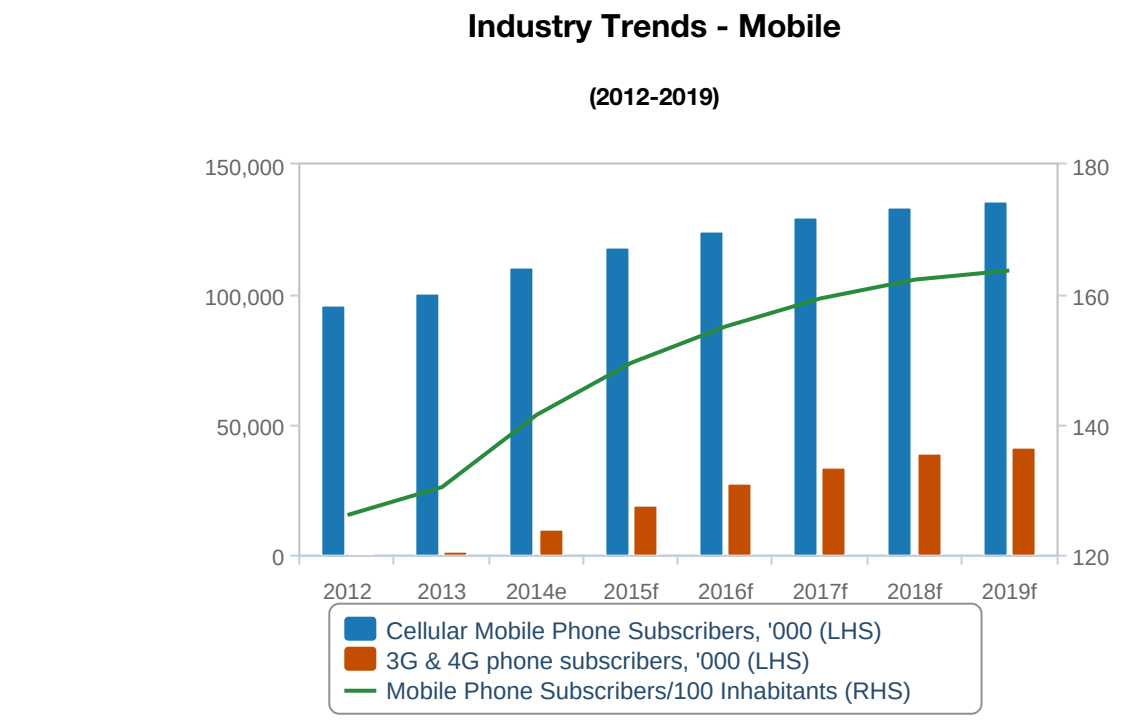
anticipation of a deal with the West in July 2015, projecting real GDP growth to pick up from 0.6% in 2015, to 2.9% in 2016 and 3.6% in 2017.

This could mean that Iran would have easier access to new mobile technology and cheaper handsets, which could add upside to the data usage. However, if Iran chooses to impose higher import taxes on consumer goods, the impact of lifting of the sanctions would be less pronounced.

The outlook for Iran's nascent 3G market still offers upside potential to growth and MTN's 3G launch in August 2014, coupled with its 4G launch in December, will help the operator take a lead in the data market. The company announced that by April 2015 data subscribers on its network had increased to more than 21mn, including 7mn on its 3G and 4G networks.

Our 3G historical data and forecasts reflect **RighTel**'s weaker than expected performance throughout 2013 and the launch of 3G services by MTN and we estimate there were around 9.9mn 3G subscriptions in Iran at the end of 2014, which will grow to 18.9mn by the end of 2015. We still expect **MCI** to launch 3G services during 2015, while future launches of 4G services will also help the mobile broadband market.

By the end of our forecast 3G/4G subscriptions will have risen to 41.53mn growing at the rate of 36.2% CAGR over 2015-2019. **BMI** believes that in 2019 3G/4G subscriptions will account for 30.5% of the whole market.

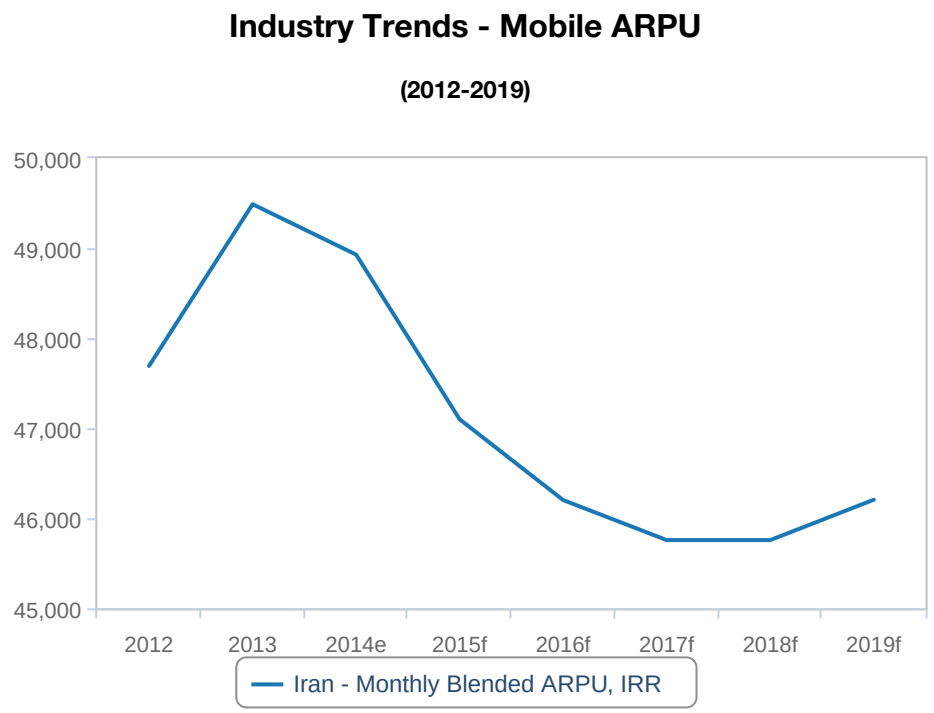


e/f = BMI estimate/forecast. Source: BMI, operators

ARPU

We believe the lifting of economic sanctions on Iran is likely also to have a positive effect on USD ARPUs. MTN's ARPU stabilised at just around USD4 since Q412 a figure that increased in Q314 to USD4.11. However, in Iranian rials MTN has reported rising ARPUs in every quarter in 2014, clearly demonstrating the impact of currency depreciation on USD reported ARPU figures.

We expect ARPU levels in Iran's mobile sector will come under increasing downward pressure because of fierce price competition, even though we do not expect MTN to decline by much, because of its experience in launching advanced mobile data services. On the downside, the Iranian government has imposed maximum limits on how much the operators can charge for their data. The regulator set a maximum tariff of IRR0.5 per KB for post-paid data and IRR0.75 per KB on pre-paid price plans in December 2014.



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

By 2019, we forecast the operator's average monthly ARPU should drop to about USD1. However, the launch of 3G services, first exclusively by RighTel and then by MTN, alongside MTN's launch of 4G poses an important upside risk to our forecast, as we expect there is significant pent-up demand for more advanced data services.

Wireline

BMI has a bearish outlook for the Iranian fixed-line sector, as increased competition in the mobile market has the potential to lower prices and make mobile voice more competitive. This development could result in a trend of fixed-to-mobile substitution in terms of subscriptions and usage. Continued investments announced by incumbent Telecommunications Company of Iran (TCI) and a lack of competition should mean the fixed-line market continues to show some growth in the short term but we believe this trend will reverse over the medium term.

Considering Iran's high mobile penetration rate, the continued growth of the country's fixed-line sector is unusual in a regional and global context, with growth rates higher than 3% since 2011, and we suspect

growth has been sustained by incumbent operator TCI's commitment to deploying fixed-line infrastructure in rural areas. However, recent statements have indicated the operator's increasing focus on its mobile networks, which indicates a slow-down in growth in the fixed-line in line with our forecasts. Over our forecast period to 2019, we expect the market to grow at an average rate of 1.8% and reach 38.5% penetration with 32.1mn fixed lines in service.

In the medium term, the widespread reliance on dial-up internet services using fixed-line infrastructure is expected to continue benefiting Iran's fixed-line market. Over the longer term, regulatory developments to increase the number of fixed-line providers or those authorised to provide VoIP services could see a more significant slowdown in the number of fixed lines.

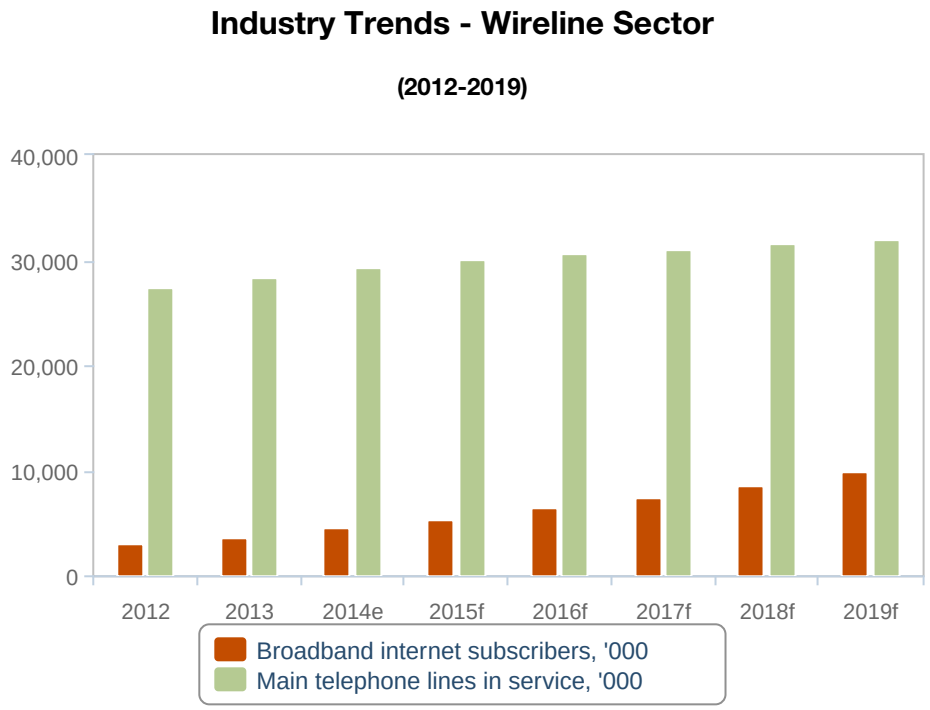
Broadband

BMI estimates the Iranian broadband market increased by 22.7% in terms of subscriptions in 2014 to reach a total of 4.5mn subscriptions, with growth rates in sharp decline since 2013. We expect growth will remain robust over the medium term, but remain below the level observed in 2011 and 2012, of 84.3% and 74.5% respectively. We forecast average annual growth of 16.2% 2015-2019, with the total number of subscriptions expected to reach 9.9mn and penetration of 11.8% by the end of 2019.

The introduction of 3G and 4G services will boost broadband penetration in the market, especially with the presence of MTN Irancell which has experience of bringing advanced data services in emerging markets through stakeholder MTN. **BMI** believes Iran, as with other emerging markets, will see the predominance of mobile services for broadband access.

Our internet user figures remain unchanged after revisions following the release of data by the National Internet Development Center. While our revised forecast does not match these figures - we believe that they are inflated - we have taken them into account in our estimates of market size. Data from the ministry of ICT suggest there were 45.884mn internet users at the end of March 2013. This latest set of figures apparently contradicts these previous estimates, illustrating the difficulties of obtaining accurate data on Iran's broadband market.

Given that the national authorities are likely to inflate subscriber data - not least given the Iranian government's plan to create a proprietary internet system - we have taken these new figures into account only partially. We now estimate that there were 15.1mn internet subscribers in Iran in 2014. By the end of 2019, we expect Iran to have 31.1mn users, with a penetration rate of 37.3%.



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

Iran's low broadband penetration rates are caused by the high cost of internet access and the underlying bandwidth. However, Iran also has a highly regulated internet sector and it is possible that various forms of government control serve to further discourage individuals from acquiring their own internet subscription. Services such as e-education, e-governance and e-health may help to benefit rural communities and would boost broadband penetration rates while Iran's incumbent telecoms operator is also investing in the deployment of a high-capacity fibre network.

Industry Risk Reward Ratings

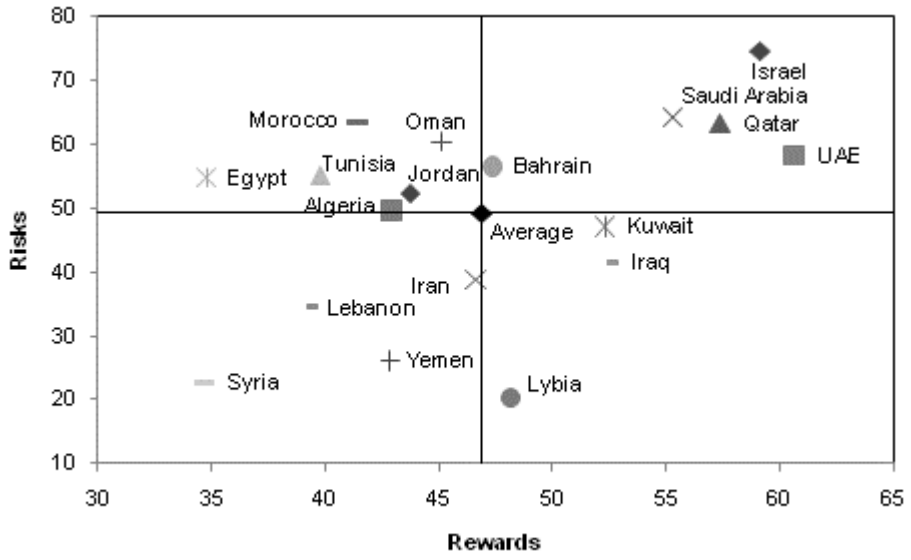
BMI View: *Although there were minor changes to nearly all countries' scores, there have only been minor shifts in the rankings on our Risk/Reward Index for Q415. However, over the next two to three years we expect North African countries and Iran to gradually pull ahead as the data boom takes hold among their large populations.*

There were few major changes to the scores in this quarter's update to the Middle East Telecoms Risk/ Reward Index, resulting in only three minor shifts in the regional rankings. Bahrain pulled ahead of Oman into sixth place, Iraq pulled ahead of Morocco into eighth place and Egypt overtook Libya (whose Country Rewards and Risks scores were previously inflated owing to low base effects) for 14th place. Nearly every country's score recorded a slight change, as the impact of lower oil prices continues to ripple through to GDP and private consumption growth outlooks in the region. All but three countries' scores fluctuated by less than one point. The overall impact was slightly to the downside, bringing the total MENA telecoms score down by 0.2 points, to 47.5.

The biggest changes in scores this quarter happened in countries populating the lower half of the table. Iraq's rating increased by 1.4 points, owing to improvements in both the Industry Rewards and Country Risks categories, These improvements stem from the positive impact of 3G growth and acceleration in GDP growth to 1.8% in 2015, which will gain pace between 2016 and 2019. Meanwhile, Algeria's score tumbled by 1.1 points and Libya's by 1.6 points. Algeria's score dropped as inflation drove down **Ooredoo** and **Djezzy**'s ARPU by more than 10% between Q414 and Q115, putting a drag on the Industry Rewards score. Libya's decline was due to a 6.7-point drop in the Country Rewards score - the largest in any country or category this quarter. Libya remains embroiled in a civil war that resulted in double digit GDP contraction in 2014, which **BMI**'s Country Risk team forecasts to continue in 2015.

Egypt Will Catch Up With North African Peers

MENA Risks/Rewards - Q415

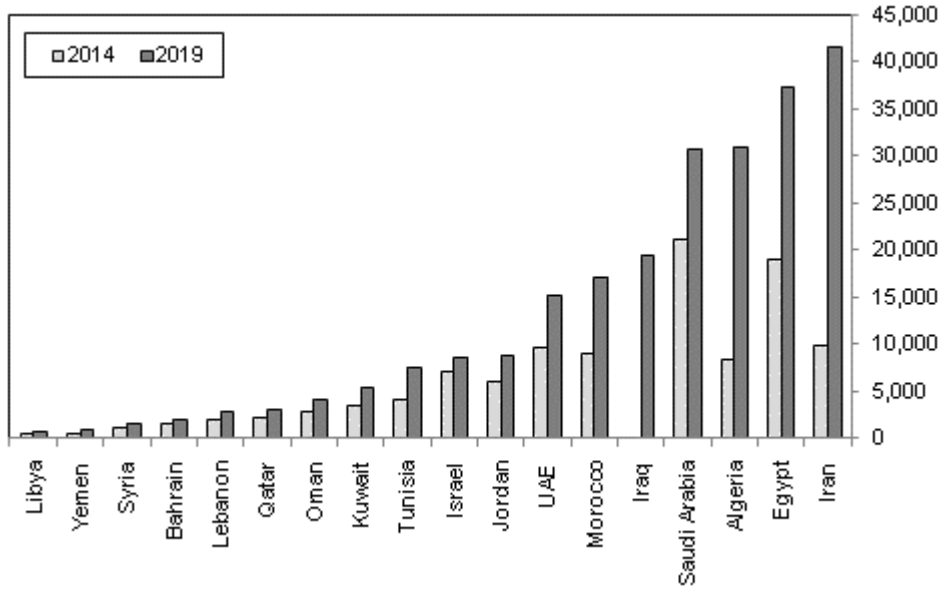


Note: 100 is highest score. Source: BMI

Israel, UAE, Qatar and Saudi Arabia remain the outperformers, reflecting very high penetration of advanced 3G and 4G mobile data services, a growing culture of multiple device ownership and a rapid shift toward fibre in the wireline broadband market. This is creating growing demand for premium services such as video-on-demand, e-commerce and connected homes, as well as laying the foundations for the emergence of the Internet of Things (IoT). Fifth place Kuwait lags fourth place Saudi Arabia by 7.2 points. This demonstrates the importance of a supportive regulatory environment and ICT-focused government initiatives in creating growth opportunities in the telecoms sector. In contrast to governments' strong focus on the technology sector the top four countries, and particularly on smart city development in the GCC, Kuwait's government has still not established an independent telecoms regulator and has made little effort to support the deployment of a national fibre network, which hold back growth in an otherwise wealthy and attractive market.

Iran And North Africa Hold Huge Long Term Growth Opportunities

3G/4G Subscriptions By Country, 2014 Vs 2019



Note: 3G not launched in Iraq until last day of 2014. e/f = BMI estimate/forecast. Source: BMI, regulators, operators

Egypt, Algeria, Iran and Morocco have remained middle-of-the-table countries, despite holding strong growth opportunities owing to their large populations. Growth and investment in the four countries' telecoms sectors has been held back by a variety of different circumstances, notably Iran's economic isolation, Egypt's period of political and economic following the 2011 Arab Spring, the Algerian government's interference into the telecoms sector and the implementation of mobile termination rate cuts in Morocco. However as Egypt's political environment stabilises and Iran moves steadily toward an agreement with the West, allowing for a return to stronger economic growth, we expect a boom in their 3G/4G markets. Likewise, in Algeria and Morocco the allocation of 3G and 4G licences will help to sustain the strong growth in the mobile data market seen over the last year. Although we expect it to take several quarters for the impact of greater usage of mobile data to filter through into ARPUs and have a positive impact on the wider economy, this will result in improved Industry Rewards scores for the four countries over the next two to three years, pushing them up the ranks on our table. As smaller GCC countries such as Bahrain and Oman's economies struggle under the impact of lower oil prices, there may be scope for outperforming markets in North Africa and the Levant to overtake them on our RRI table within the next few years.

Table: MENA Telecoms Risk/Reward Index - Q415

	Industry Rewards	Country Rewards	Industry Risk	Country Risk	Telecoms Rating	Rank	Previous Ranking
Israel	42.5	90.0	80.0	68.9	**63.7**	1	1
UAE	57.8	66.0	50.0	66.4	**59.9**	2	2
Qatar	49.5	72.0	50.0	76.3	**59.1**	3	3
Saudi Arabia	49.5	66.0	60.0	68.5	**58.0**	4	4
Kuwait	38.5	78.0	30.0	64.2	**50.8**	5	5
Bahrain	35.8	69.0	50.0	62.9	**50.1**	6	7
Oman	38.8	57.0	60.0	60.7	**49.7**	7	6
Iraq	50.0	57.0	40.0	43.1	**49.2**	8	9
Morocco	35.0	53.3	70.0	56.7	**48.0**	9	8
Jordan	35.0	60.0	50.0	54.7	**46.3**	10	10
Algeria	37.5	53.0	40.0	59.2	**44.9**	11	11
Tunisia	32.5	53.3	60.0	50.3	**44.4**	12	12
Iran	45.0	49.7	20.0	57.6	**44.3**	13	13
Egypt	30.0	43.7	55.0	54.6	**40.8**	14	15
Libya	40.0	63.3	10.0	30.5	**39.8**	15	14
Yemen	34.4	58.7	20.0	32.3	**37.9**	16	16
Lebanon	26.3	63.3	25.0	44.0	**37.8**	17	17
Syria	27.5	48.0	20.0	25.4	**31.1**	18	18
Average	**39.2**	**61.2**	**43.9**	**54.2**	**47.5**	-	-

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.

Market Overview

Mobile

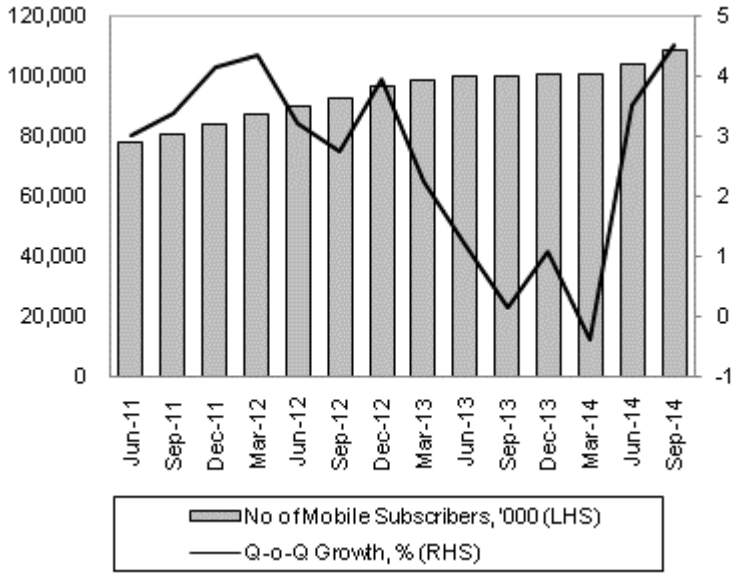
Mobile Market

Market Growth

Iran's mobile market has grown by 9.0% over the year to September 2014 to reach 108.8mn subscriptions. Iran has two leading mobile operators, **MTN Irancell** and **Mobile Communications Company of Iran**. The latter is a state-owned entity, owned by fixed-line incumbent TCI. Irancell is 49% owned by South Africa's MTN. A third operator, **RighTel**, launched in 2011 and had 3G exclusivity until August 2014.

Mobile Market Growth

2011-2014



Source: BMI, operators

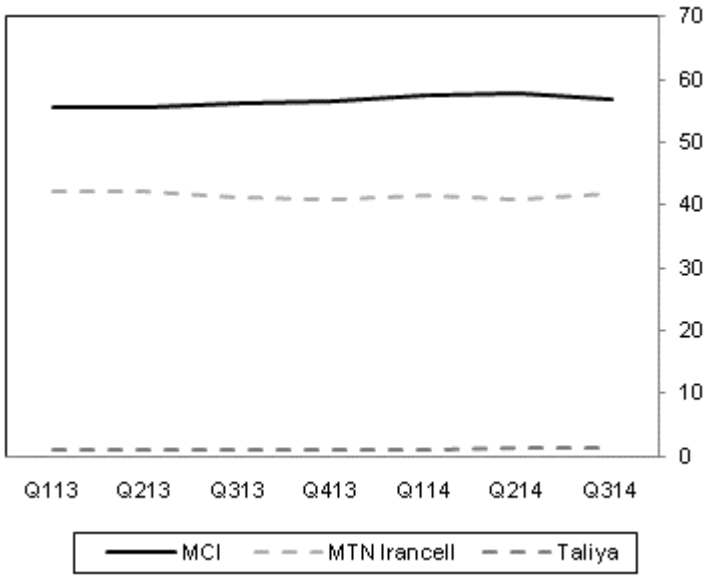
Market Shares

MTN Irancell publishes data most frequently. Data from MTN Irancell show 43,940mn subscribers at the end of Q414, up 6.2% year-on-year (y-o-y). According to its half-year results, Irancell holds second place in Iran's mobile market with a share of 41.8%. The company is successfully increasing its subscriber base in Iran, having added 2.6mn customers in 2014. **BMI** believes that Irancell's data is a good proxy for the Iranian mobile market performance.

Latest figures from MCI lead us to believe that it had over 60mn mobile subscribers at the end of Q314, for a market share of 56.8% up from 56.3% a year earlier. BMI believes the MCI added over 5mn new subscribers over 12 months, but the relatively large share of prepaid users also leads us to believe that some of these customers may be inactive. RighTel stayed stagnant at about 1.3% in Q314 as it lost its 3G exclusivity.

Market Shares

2013-2014 (%)



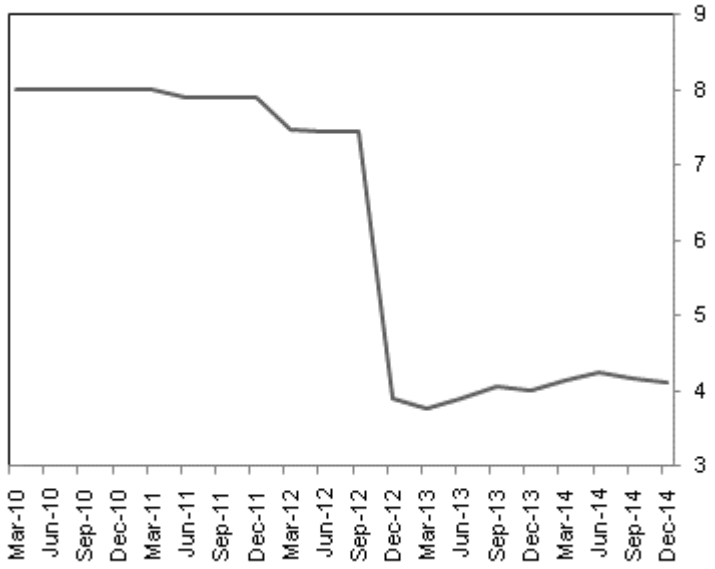
Source: BMI, operators

ARPU

Irancell is the only operator for which ARPU figures are available. After staying above USD8 for most of 2009, 2010 and the early part of 2011 and around USD8 in 2011, Irancell's ARPU plummeted to USD3.91 in 2012 - partly a reflection of exchange rate discrepancies and partly because of Iranians' low purchasing power. It stayed at this level throughout 2013 and rose only slightly to USD4.11 in Q414. The downtrend in ARPU in USD is caused by the depreciation of the local currency following a raft of international sanctions against Iran, as the operator reported increasing ARPU in local currency in every quarter in 2014. It remains unclear whether ARPU will increase with the launch of 3G, as Irancell uses promotions to attract customers and it is likely to face continuous price competition from RighTel and MCI. End of year data showed that thus far the launch of 4G has had little impact on ARPU levels in 2014 as the regulator set a maximum tariff of IRR0.5 per KB for post-paid data and IRR0.75 per KB on pre-paid price plans for MTN.

MTN Irancell ARPU (USD)

2010-2014



Source: BMI, MTN

Network Developments

Tamin Telecom (RighTel) was the only operator to receive a license for 3G services in April 2010. The operator received the exclusive right to provide 3G services until August 2014. In early August 2014 MTN Irancell received permission from the Ministry of Information and Communications Technology to begin piloting 3G services in selected sites in Tehran. Thereafter, from August 23 2014, Irancell was authorised to offer commercial 3G services. MCI was also expected to receive a 3G licence and launch services during H214, but that seems to have been delayed.

MTN Irancell launched Iran's first 4G network in November 2014 using its frequencies in the 1,800MHz band. By the end of 2014, MTN Irancell had expanded its Long Term Evolution (LTE) network to cover 50% of the population.

Mobile Content

Compared with other regional mobile markets, Iran can be considered to be at an early stage in the deployment of mobile VAS. Although all of the country's mobile operators offer basic voice-based VAS such as call forwarding, call barring, caller ID (call line identification presentation, or CLIP) conference calling and voicemail, the market for data services has, until recently, been limited to SMS.

In fact, the head of Iran's judiciary had given communications minister Mahmoud Vaezi until the end of 2014 to enforce blocks on social media and messaging platforms such as WhatsApp, Viber and Tango. Recent developments rather pertain to the advancement of content filters to block unwanted information, not the creation of new content.

All of Iran's mobile operators, including the smaller regional operators MTCE and TKC, offer SMS services. So-called 'value-added SMS services' offered by MTCE include a mobile dictionary service, which enables customers to translate words in Farsi into English and vice versa and a 'Mobile Qur'an' service, which enables users to receive verses from the Qur'an in English and Persian by entering the verse and Surah Number.

Broadband

Market Development

Iranian incumbent operator TCI dominates the internet market through its subsidiary **Data Communication Company of Iran** (DCI). TCI has announced ambitious plans to expand its internet user base but **BMI** believes the market's long-term growth will be held back by the heavy interference from the government on what Iranians are allowed to access. **BMI** estimates there were just under 4.5mn broadband subscriptions in Iran at the end of 2014, a growth of 22.7% for the country's market.

BMI believes that Iran's internet market has the potential to follow global emerging market trends whereby mobile internet services drive market growth. The launch of 3G services by **MTN Irancell** in August 2014, expected to be followed by MCI in 2015, alongside the launch of 4G services will drive mobile broadband growth in the market, as internet access will predominantly be on mobile networks. However, political issues may arise as many conservative leaders have argued that new video services were against Islamic values and could lead to profanity.

Government policy remains a barrier for the development of broadband internet. In January 2014 it was reported Iran was seeking help from China to build its National Information Network (NIN) intended as censored bypass to the world wide web.

Market Shares

Wireline services, including wireline broadband, are provided exclusively by TCI, which is a state owned monopolist.

WiMAX licences were awarded to four companies in March 2009, with specific provinces per licensee. MTN Irancell was licensed to provide WiMAX services in Tehran, East Azarbaijan, Isfahan, Razavi Khorasan, Fars and Khuzestan. The operator has stated that take-up remains slow on account of bandwidth and content limitations. At the end of June 2013, Irancell, had 307,000 WiMAX subscribers, up by almost 33% year-on-year (y-o-y) from 231,000 subscribers in June 2012. In December 2013 MTN Irancell extended its WiMAX network to the city of Khorramshahr thus servicing 38 towns, compared with seven cities at the time of the launch of the service in January 2010. Two other companies, Espadan and Rayaneh Danesh Golestan, were respectively permitted to offer WiMAX services in Esfahan Province and Golestan Province, while a fourth operator, MobinNet Telecom, was awarded a nationwide WiMAX licence.

Network Developments

TIC is one of the major investors in the Europe-Persia Express Gateway (EPEG) fibre optic cable system together with Russian operator **Rostelcom**, **Omantel** and UK-based **Cable and Wireless Company** (CWC). At launch in September 2013, the 10,000km cable running from Frankfurt, Germany, through eastern Europe, Russia, Azerbaijan, Iran, the Persian Gulf and finishing in Oman reportedly brought Iran's international bandwidth capacity up from 72Gbps to 82Gbps. Iran's Communications Minister planned to increase capacity to 100Gbps by 2014.

In June 2013, **ISP Iranian Net Communication and Electronic Services (Iranian Net)** announced plans to begin deploying a fibre-to-the-x (FTTx) network, according to Iran's telecoms watchdog, the Communications Regulatory Authority. Iranian Net has been granted a licence to deploy the FTTx network in Mashhad, Tehran, Shiraz, Karaj, Qom, Isfahan and Tabriz. The company intended to provide services to 400,000 subscribers by the end of August 2013 and gradually increase its subscriber base to a total of 1mn over the next two years. However, the government has only lifted 128kbps-speed restrictions on home internet services in September 2014, causing a delay in the deployment of FTTx insfrastructure. **Iranian Net** announced in Jnue 2015 it aimed to develop services in Tehran, Isfahan, Karaj, Shiraz, Tabriz, Mashhad and Qom, with 500,000 access ports over the next two years.

TCI has not provided any more detailed information regarding the development of its national fibre-optic network, which we believe the operator continues to steadily expand. This was supported by the operator's announcement in May 2013 of plans to invest IRR25trn (USD20.34mn) in its network before the end of the Iranian year, ending March 2014.

Pay-TV

Market Development

Iran's ministry of ICT announced in December 2013 that it had launched the first phase of its IPTV project. Six provinces are to be reached, covering 140,000 households. The ministry expects 7mn subscribers to the service over the long-term, but details on the project remain scarce. **BMI** believes there will be considerable restrictions on content, in the same way the wider internet is restricted in Iran. This may dampen demand for the service in the longterm and the government's involvement with the network may also put off some potential subscribers.

In April 2013, Iran's government announced that it plans to launch its own communications satellite into space within five years, which will broadcast five local channels. Demand for Pay-TV services is minimal in Iran currently.

Fixed-Line

Market Development

The main drag on the development of Iran's fixed-line market is the comparatively high price of products offered by monopoly provider TCI. There were 27.478mn lines in service at the end of 2012, a figure BMI believes grew by 3.6% to reach 28.462mn at the end of 2013. We believe growth will slow as mobile voice continues to become more attractively priced, which will result in fixed-to-mobile substitution as witnessed in other regional markets and indeed globally. The addition of a new operator to the mobile sector could encourage competition and competitive pricing.

Network Developments

Wireline services in Iran are limited to major cities with rural networks undeveloped. Incumbent Telecommunications Company of Iran (TCI) remains in state hands. The complete lack of competition limits incentives for investment and service development.

While both TCI and the Telecommunications Infrastructure Company of Iran (TIC) continue to invest in networks, long-term demand potential is limited by the government's decision to build out its own internet network, with restricted access to content it deems unsuitable. In addition, wireline broadband faces the threat of dedicated mobile broadband with the expansion of 3G services and the launch of 4G networks.

Wireline

Wireline services in Iran are limited to major cities with rural networks undeveloped. Incumbent **Telecommunications Company of Iran** (TCI) remains in state hands, with no competition, limiting incentives for investment and service development. This has been detrimental to the interests of consumers, as well as wider state development goals.

While both TCI and the **Telecommunications Infrastructure Company of Iran** (TIC) continue to invest in networks, long-term demand potential is limited by the government's decision to build out its own internet network, with restricted access to content it deems unsuitable. In addition, wireline broadband faces the threat of dedicated mobile broadband with the expansion of 3G services and the launch of 4G networks.

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Broadband

Iranian incumbent operator TCI also dominates the internet market through its subsidiary **Data Communication Company of Iran** (DCI). TCI has announced ambitious plans to expand its internet user base but **BMI** believes the market's long-term growth will be held back by the heavy interference from the government on what Iranians are allowed to access. This threat has not diminished and in January 2014 it was reported Iran was seeking help from China to build its National Information Network (NIN).

BMI estimates there were just under 4.5mn broadband subscriptions in Iran at the end of 2014, a growth of 22.7% for the country's market. However, we note there is considerable downside potential to our forecast outlook as the government adds more restrictions to what consumers can and cannot access. Iranian data for end-March 2013 claim around 6mn people access the internet using fibre-optic connections; **BMI**'s estimates that the actual number of broadband connections stood at about half this figure. The Islamic Republic News Agency also claims that there were 867,000 people using high-speed internet access in Q113.

The launch of 3G operator **RighTel** in 2011 has the potential to bring dedicated mobile broadband options to a wider number of Iranians and catalyse a dynamic of competition that should incentivise the incumbent to improve quality of service. However, RighTel's network is only covering a handful of cities and the company has given little indication of its plans regarding dedicated mobile broadband options. RighTel's website states its dedicated mobile broadband service offers connections up to 21Mbps and 42Mbps, with prices ranging from IRR20,000 to IRR100,000. At these prices, accessing internet services will remain out of reach for many.

BMI believes that Iran's internet market has the potential to follow global emerging market trends whereby mobile internet services drive market growth. The launch of 3G services by **MTN Irancell** in August 2014, expected to be followed by MCI in 2015, alongside the launch of 4G services will drive mobile broadband growth in the market, as internet access will predominantly be on mobile networks. However, political issues may arise as many conservative leaders have argued that new video services were against Islamic values and could lead to profanity.

Infrastructure

Ongoing investments by TCI in the expansion of optical fibre and international bandwidth capacity should go some way towards improving internet service quality. According to a report in March 2010 by news agency Zawya, TCI had announced plans to extend the National Internet Network (NIN) to achieve true national coverage over the next 12 months. It is understood that the expansion project would also increase network capacity fourfold. Mohammad Ali Aryanian, TCI's deputy director of IT, is reported as saying that contractors were in the process of setting up facilities and equipment for the upgrade, which was to come on stream within six months. The national internet network is scheduled to come online during 2013 and could potentially permit the authorities to cut off the entire country from the World Wide Web.

Meanwhile, several Iranian companies, including TCI, have been involved in different initiatives aimed at expanding the amount of international bandwidth capacity. In November 2009, it was reported that privately owned Iranian company **Iran Mobin** had formed a 50/50 equity joint venture with **C-Ring Telecom**, itself a venture of Russian long-distance operator **Synterra** and Azerbaijan's **AzTelekom**. The project aimed to collaborate on the planned roll-out of a new fibre-optic ring around the Caspian Sea to handle Europe-Asia voice and data transmission and improve internet service delivery in the Caspian region. Iran Mobin will connect to the C-Ring network through the backbone of state-owned Telecommunication Infrastructure Company (TIC) the only backbone infrastructure operator in Iran.

For its part, TIC has signed an agreement with another Russian carrier, **Rostelecom**, to share international transmission links. The two companies were reported in April 2010 to have signed a signed a joint memorandum of understanding to act as strategic partners to create a North-South telecommunications transit corridor. The project reportedly aimed to meet growing demand for telecommunications services in the Caspian and Middle East region and would increase the capacity of international backbone links to transit voice traffic and internet access. As the first step the memorandum included the joint modernisation of national networks and relevant international border crossings through installation of DWDM, increasing total capacity of the transit corridor to 100Gbps. TIC is also involved in two new cable systems providing regional and international capacity.

One of them, the Europe-Persia Express Gateway (EPEG) fibre optic cable system, is a 10,000km cable running from Frankfurt, Germany, through eastern Europe, Russia, Azerbaijan, Iran, the Persian Gulf and finishing in Oman, which went live in September 2013. TIC was one of the major investors in the cable system, along with Russian operator Rostelcom, **Omantel** and UK-based **Cable and Wireless Company** (CWC). At launch, the cable reportedly brought Iran's international bandwidth capacity up from 72Gbps to 82Gbps, which Iran's Communications Minister announced plans to increase to 100Gbps by December 4 2013.

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Two other companies, **Espadan** and **Rayaneh Danesh Golestan**, were respectively permitted to offer WiMAX services in Esfahan Province and Golestan Province, while **MobinNet Telecom** was the fourth company to be awarded a nationwide WiMAX licence to offer services in all 31 provinces. The company paid USD107mn for the licence in 2008, launching services in 35 major cities the following year.

In June 2013, **ISP Iranian Net Communication and Electronic Services** (Iranian Net) announced plans to begin deploying a fibre-to-the-x (FTTx) network by the end of August, according to Iran's telecoms watchdog, the Communications Regulatory Authority. Iranian Net has been granted a licence to deploy the

FTTx network in Mashhad, Tehran, Shiraz, Karaj, Qom, Isfahan and Tabriz. The company announced its intention to provide services to 400,000 subscribers by the end of August 2013 and gradually increase its subscriber base to a total of 1mn over the next two years.

Iran National Internet Network

The continued concern by the Iranian government relating to the spread of outside information within the country remains at the fore and the regime has pressed ahead with the creation of a separate internet network for domestic use only. Plans for the National Internet Network (NIN) were approved by the Iranian cabinet in May 2007 and the June 2009 presidential election, in which the internet disseminated news and images, convinced the authorities that they urgently needed their own, controllable version of the web. The government also argues the NIN is a matter of national security.

In Q212, Ali Aghamohammadi, the Iranian deputy vice president of economic affairs, announced that the country will be launching a new 'halal' internet that will aim to rid the web of Western influences. 'Iran will soon create an internet that conforms to Islamic principles,' he said, 'to improve its communication and trade links with the world.' The network would bypass international gateway connections. In early 2014, TIC deputy head Hassan Karimi said that 35% of domestic data consumption in Iran was hosted by Iranian companies.

According to a 410-page report examining freedom on the internet and published by Freedom House, an American NGO, Iran was the least free country, as it has high levels of oppressive policies, such as intimidating and even in some cases jailing people for what they write online.

In September 2012, the halal network was launched, with government agencies and the military initially being migrated to the closed network. The civilian population will be switched to the new network in due course, which banned Google and Gmail at the end of September 2012. Iran has one of the biggest Internet filters of any country in the world, preventing normal Iranians from accessing countless sites on the official grounds they are offensive or criminal.

In January 2014, it was announced that China would provide the Iranian government with support to build the NIN with the aim of controlling content online and building a 'clean' internet. Details of what support China would offer was not divulged but both governments are known to cut access to content they believe to be unsuitable.

Incumbent Investment

TCI announced planned investments in May 2013 amounting to IRR25trn for the current Iranian year (beginning March 21 2013). Head of the board of directors, Mostafa Seyyed-Hashemi, also reported TCI's investment reached IRR17trn (USD1.4bn) in the previous Iranian year, following the privatisation process in 2009. **BMI** believes this large sum may have been provided by the government to be used to expand the country's National Internet Network.

The quoted figure of USD25trn also appears to be a large amount, potentially more than TCI could afford, despite its operations in mobile and broadband services. It is therefore possible that some of the funding for its investment is coming directly from the government. This would allow Iran to increase the number of internet users in the country, while restricting their access. **BMI** estimates that the number of internet users reached 21.528mn at end-2012 and forecasts this total to reach 37.841mn at the end of our five-year forecast period in 2017. This could result in a boost to our forecasts if the investment is confirmed to be for the NIN as we believe.

TCI has not provided any more detailed information regarding the development of its national fibre-optic network, which we believe the operator continues to steadily expand. This was supported by the operator's announcement in May 2013 of plans to invest IRR25trn (USD20.34mn) in its network before the end of the Iranian year, ending March 2014. According to the head of the Board of Directors, Mostafa Seyyed-Hashemi, investment during the Iranian year ended March 2012 was IRR17trn. However, he also stated that the majority of the investment over the last two years has been on revitalising the company's mobile phone network. This is in line with **BMI**'s view of a slowdown in the fixed-line sector, as consumers increasingly favour mobile phone services.

Pay-TV

Iran's ministry of ICT announced in December 2013 that it had launched the first phase of its IPTV project. Six provinces are to be reached, covering 140,000 households. The ministry expects 7mn subscribers to the service over the long-term, but details on the project remain scarce. **BMI** believes there will be considerable restrictions on content, in the same way the wider internet is restricted in Iran. This may dampen demand for the service in the longterm and the government's involvement with the network may also put off some potential subscribers.

In April 2013, Iran's government announced that it plans to launch its own communications satellite into space within five years, which will broadcast five local channels. Demand for Pay-TV services is minimal in Iran currently.

Regulatory Development

Table: Iran's Regulatory Bodies And Their Responsibilities

Regulatory Body	Responsibilities
Ministry of ICT Dr Ali Shariati Avenue Tehran Iran 1631713461 Tel: 9821 811 3355 Fax: 9821 811 3926	▪ Overseeing the implementation of the information and communication technology (ICT) national development plan. ▪ Drafting national telecommunications policy. ▪ Drafting and implementing amendments to existing legislation or new laws, as necessary. ▪ Issuing licences, concessions and general authorisations. ▪ Mediating interconnection agreements between operators, where relevant. ▪ Regulating tariffs for dominant operators and establishment of calculations for setting prices for other operators. ▪ Monitoring of frequencies and interference with use of the frequency spectrum.

Source: BMI

Legislation And Market Liberalisation

Iran has partially liberalised its telecoms sector by allowing competition and numerous private sector operators in the mobile telephony, data services and internet sectors. In contrast, the fixed-line market remains a monopoly under the control of the Ministry of Communications and Information Technology (MICT).

In December 1999, Iran's *majlis*, or parliament, approved Article 122 of the 'third five-year economic plan,' which gave wider powers to the MICT (which at the time was called the Ministry of Post Telegraph and Telephone). In accordance with Article 122, the ministry was granted powers to authorise private sector companies looking to establish communications networks in Iran. These included companies seeking to set up mobile phone networks, low capacity telephone exchanges (with up to 5,000 numbers) data transfer networks, value-added service networks, rural communication networks, postal networks and postal transport networks. Article 122 further allowed the MICT to license private and co-operative telecoms companies to set up communications networks in areas in which no such networks were offered by government-owned companies.

In addition to removing government monopoly control over the provision of telecoms services, Article 122 of Iran's Third Five-Year Plan established the foundations for increased public participation and foreign investment in the country's telecoms sector and for the eventual creation of an independent regulatory body. In 2003, the ministry established the Communications Regulatory Authority (CRA) as a body to supervise

and promote healthy competition in the telecoms sector. However, the CRA remains under the umbrella of the MCIT, which has retained ultimate control over the sensitive telecoms sector.

In 2007, Supreme Leader Ayatollah Khamenei requested that government officials speed up implementation of the policies outlined in the amendment of Article 44 of the country's constitution and move towards further economic privatisation (the pre-amended Article 44 of the constitution had decreed that core infrastructure should remain state run). Khamenei also suggested that ownership rights should be protected in courts set up by the justice ministry in the hope that this new protection would give an additional measure of security and encourage private investment.

Privatisation Of TCI

Iran's privatisation programme was launched during the government of Mohammed Khatami in the late 1990s. One of the objectives behind selling shares in key state enterprises was the desire to attract greater foreign investment. The government's privatisation programme also forms part of a wide-ranging economic liberalisation programme. Under Iran's Fourth Five-Year Economic Development Plan (2005-2010) the Iranian Privatization Organization, which is affiliated with the Ministry of Economic Affairs and Finance, was charged with the responsibility for setting prices, ceding shares to the general public and listing shares on the stock market of incumbent operator **TCI**.

Repeated preparations to privatise Iran's fixed-line incumbent have been characterised by a mixture of high expectations, disappointment and controversy. Despite early optimism surrounding the privatisation of TCI, by end-2007, no visible progress had been made towards achieving this goal. As a forerunner to the sale of a controlling stake in TCI, a 5% stake in the operator was scheduled to be floated on the Tehran Stock Exchange before the end of December 2007. The floatation finally took place in August 2008.

In November 2009, it was announced by the Mehr News Agency that 50% plus one share of TCI had been offered over the stock market to Tose'e Etemad Mobin consortium for IRR77.985trn.

Competition

In contrast to the monopoly in the fixed-line sector, mobile phone services, based on GSM standard, are offered by TCI and by four private sector companies: **MTN Irancell**, **Taliya**, **MTCE** and **TKC**. A third national operator, **Tamin Telecom (Rightel)**, was licensed in April 2010 but it was not until late November 2011 that the operator, reportedly owned by Iran's Social Security Organization, launched limited services. Iran also has a large number of privately owned ISPs operating within the country; this is in spite of the

high levels of government control over the sector. Iran is also one of the few countries in the Middle East in which development of VoIP has been legalised.

Licensing And Spectrum

The MICT has licensed six operators to provide mobile telephony services in the GSM standard. Two of those operators - **MCI**, which is the mobile unit of fixed-line incumbent TCI, and MTN Irancell - offer services using the GSM 900 and GSM 1800 spectrum bands. Three companies - Taliya, MTCE and **Kish Free Zone Organization** (KFZO) - offer services using GSM 900 spectrum only. It is believed that the Tamin Telecom licence contains a provision allowing it to provide the country's only 3G services for a period of two years - an agreement that was extended for a further year in early 2013. However, it is unlikely the company will benefit from being the first to market and it is unlikely to have the necessary resources to swiftly roll-out services.

In January 2007, it was reported that **Laser Company** had become the first privately owned operator to launch a WiMAX wireless network in Iran, based on 802.16 standards. At launch, the WiMAX network provided wireless internet access to the capital Tehran only. Other companies that have been licensed to provide WiMAX internet access services include **Pars Online** and **Datak Telecom**. However, in June 2013, the CRA announced that Datak Telecom failed to get authorisation for continuation of its WiMAX, as the one year deadline to finalise a licence agreement with the regulator had passed. At the time of writing, Laser's service was no longer operational either.

The regulator is due to auction LTE licences in the first half of 2015 after giving MTN Irancell authorisation to launch 3G and 4G services using its 1,800MHz spectrum.

Regulatory Developments

The telecoms industry in Iran is regulated by the Ministry of Communications and Information Technology (MICT, formerly the Ministry of Post, Telegraph and Telephones). The MICT is responsible for all aspects of telecoms sector regulation and for the adjudication of disputes that arise among service providers. Despite long-term plans to establish an independent regulatory body, there appears to have been little progress towards this accomplishment

In September 2007, it was reported that Iran would begin regulating and filtering multimedia messaging services (MMS) in order to prevent 'immoral' video and audio messages being sent through mobile phones.

Iran's Supreme Council of the Cultural Revolution is understood to have instructed the MICT to acquire equipment that will enable it to filter MMS

Internet usage in particular is subject to strict controls. in 2006, the country's numerous ISPs were ordered to restrict online speeds to 128Kbps and forbidden from offering fast broadband packages. The move by Iran's authorities made it more difficult for internet users to download foreign music, films and television programmes, which the authorities blame for undermining Islamic culture among the younger generation. In January 2013, the government of Iran confirmed it was developing new smart filtering software which would allow Iranians to gain limited access to social networking sites such as **Facebook** and **Twitter**. The government has introduced a national intranet service which contains only approved content, while the conventional worldwide web remains subject to heavy restrictions.

Data Market Held Back By 3G Exclusivity

Tamin Telecom's exclusive rights to 3G network services ended in August 2014, with MTN Irancell being granted the right to offer 3G services. The operator was also the first in the market to launch 4G services in December 2014, with the regulator planning to auction LTE licences in early 2015.

Iranian Internet Controls Grow

In September 2013 the first phase of the Europe-Persia Express Gateway (EPEG), which is a communications highway connecting Europe with Eastern Asia, started operations.

In January 2014 it was reported that Iran was seeking help from China to build its National Information Network (NIN). While cooperation would usually indicate the presence of Chinese equipment manufacturers to aid build-out, on this occasion the help on offer to Iran is to control content online and build a 'clean' internet. The policy of internet control is hardly surprising as the NIN was planned as a means of bypassing the World Wide Web.

The NIN was first mooted in 2005, creating a network separate from the global internet containing content that is 'compatible with religious and revolutionary values'. It is feared that Iran will have the power to cut off all access to the global internet, with many reports of slowing or declined access to international social media sites and a long history of blocking sites as the government sees fit.

In September 2014, it was reported that Iran's Prosecutor General was looking to ban applications such as WhatsApp, Tango and Viber because of its 'criminal content' and this followed criticism from a number of

conservative leaders of the decision to expand the 3G market as the use of social media and other advanced platforms can be seen to promote political unrest and challenge Islamic beliefs.

Company Profile

Telecommunications Company Of Iran (TCI)

Strengths	▪ Remains the only fixed-line operator in Iran.
	▪ Investing in fixed-line operations to the country's rural areas.
	▪ Continuing to record steady growth within mobile market.
Weaknesses	▪ Poor growth within its internet sectors, especially broadband, further hindered by governmental control on data access.
	▪ Growing number of ISPs competing for market share in internet sector.
	▪ Delays to privatisation may have limited the scope of expansion and introduction of new services.
	▪ Privatisation failed to bring an international strategic partner with telecoms experience and financial backing.
	▪ Lack of advanced mobile data services through 3G or 4G.
Opportunities	▪ Higher import tax could provide fledgling domestic handset manufacturers with opportunity to grow.
	▪ Looking to converge its fixed and mobile assets into a compelling offer.
Threats	▪ Award of country's second national GSM licence to MTN Irancell coupled with Taliya's growth into a national operator has resulted in loss of mobile market share.
	▪ Possible liberalisation of fixed-line sector following TCI's part privatisation.
	▪ Unstable political and security environment could hinder investment in the sector from equipment manufacturers and content providers.

Company Overview

Telecommunications Company of Iran (TCI) was formed in 1972 out of its predecessor, the Telephone Company of Iran. After restructuring during July 2005, TCI announced it had reformed into a parent company overseeing 33 subsidiaries including data communications, mobile communications and backbone communications.

In early 2007, the Iranian Privatization Organization announced that a majority (51%) stake in TCI was due to be sold by the end of September 2007. However, it was not until September 2009 that privatisation finally took place. It was reported that local consortium Etemad Mobin paid more than USD7.8bn to secure a 50% plus one share stake in TCI. Etemad-e-Mobin comprises three companies, two of which are reportedly controlled by the Iranian Revolutionary Guard. Shares were exchanged through the Tehran Stock Exchange in November 2009.

A few weeks after the announcement, it was reported that Iran's General Inspections Organisation (GIO) had launched a probe into the connections between Etemad-e-Mobin and the Iranian Revolutionary Guard (*see Regulatory Developments*).

On August 20 2013, the mobile arm of TCI, Mobile Company of Iran (MCI) listed on the Tehran Stock Exchange's Second Market. MCI had previously offered 5.5% of its shares on the Iranian Over-The-Counter (OTC) market, for a combined value of USD396mn.

Strategy

As a state-owned operator, TCI's strategy is strongly influenced by the priorities of Iran's governing authorities. Central to the government's telecommunications strategy has been the expansion of the country's national communications infrastructure. Priority areas include the development of the national fibre-optic network and the development of rural communications infrastructures. Within the field of mobile communications, TCI has pursued the deployment of new technologies, such as GRPS, as well as a range of new data-based value-added services.

In March 2014 TCI reviewed its strategic objective of achieving full convergence of fixed and mobile services. Mr. Jurki Markku Runola, TCI Transformation Plan Advisor, stated that 2013 saw TCI focus on the basics and 2014 will see TCI produce practical outcomes, before growth in 2015 and full convergence of fixed and mobile services in 2016.

Financial Results

At the end of 2013, TCI reported total revenue for the year of IRR115,666bn (USD4.2bn) net profit of IRR23,094bn (USD838mn) operating profit of IRR20,480bn (USD743mn) and total investments of IRR39,827bn (USD1.45bn).

Operational Developments

Fixed-Line Network

In a bid to find new avenues for growth, TCI has focused on increasing its rural network coverage. At the end of 2005, a total of 46,764 villages were connected to TCI's fixed-

line infrastructure. The MICT claimed that this figure had risen to 50,173 by December 2006 and 52,522 by December 2007. In December 2008, the figure stood at 53,845. According to the ministry, at the time of the Islamic Revolution in 1978, just 312 of Iran's 100,000 villages had telecoms services.

As well as purchasing capacity on four international submarine cables (FOG, FLAG, SEA-Me-We and ITUR) TCI has also issued a tender for SDH equipment on all main national routes. By the end of 2008, TCI's national backbone comprised 121,000km of fibre-optic cable, of which 44,000km had been installed during the course of the year. A further 6,000km were installed in the first nine months of 2009, raising the total amount of optical fibre to 127,000km. The TAE (Asia-Europe) cable system was just one of the projects completed during 2007, connecting Iran to Asia and Europe through a 2,200km optical fibre cable. Other accomplishments in 2007 included the construction of a 150km fibre-optic cable connecting Iran and Afghanistan.

Broadband Network

TCI began offering ADSL-based broadband internet access services early in 2004, but deployment has so far been confined to the larger cities and business centres. By the end of 2005, a total of 514 cities had been covered with a total of 14,270 leased access ports. By the end of September 2009, the number of cities covered had risen to 1,223. There were a total of 60,718 national data access ports at the end of September 2009, supporting a data transmission capacity of 26,728Mbps.

Iran's internet market suffered from poor connectivity during 2006, which led to loss of service occurring on average once a month. This was blamed by some in the industry on a failure to provide back-up capacity, which supports network traffic when the main fibre network fails. While technologically advanced countries have several optical fibre networks around which traffic is directed, in Iran's case, incumbent operator TCI is left to compensate for the failings across other ISP networks. Further, in October 2006, the Ministry of Telecommunications announced that high-speed internet access would no longer be made available to residential users, in an attempt to curb Western media influences, which led to the banning of websites such as the BBC's Persian-language site.

Mobile Network

In April 2008 MCI's chairman, Vahid Sadoughi, reportedly announced that the company planned to increase the capacity of its intelligent network (IN) to double its prepaid SIM card network capacity. Sadoughi is reported as saying that, once the operator's network capacity had been expanded, MCI's prepaid customer base was expected to increase to 10mn by the end of April. Lack of network capacity was reported to have caused a delay in the delivery of prepaid SIM cards and resulted in widespread disapproval among 2.558mn waiting applicants.

According to a May 2011 report by the Fars News Agency, which cites comments from MCI's managing director, Vahid Sadouqi, MCI provides services to all of Iran's cities and 57% of the country's villages. The operator's network also covers 97% of all main

roads in the country and 68% of secondary roads. It also provides rural roaming services in 35,000 villages in 20 provinces. The carrier was looking to migrate customers onto 3G and 4G networks as of August 2014, but has yet to launch either service at the time of writing.

Financial Data

- Revenue (2013): IRR115,666bn
- Net profit: IRR23,094bn

Operational Data

Fixed lines

- 2009: 25.410mn
- 2010: 25.584mn
- 2011: 26.540mn
- 2012: 27,478mn
- 2013: 28.462mn

Mobile subscribers

- 2009: 35.427mn
- 2010: 41.297mn
- 2011: 48.233mn
- 2012: 53.897mn
- 2013: 57.037mn

2014: 61.811mn

Company Details

- Telecommunications Company Of Iran (TCI)
- Shariati Avenue
  Tehran

  Iran
- www.tci.ir

MTN Irancell

Strengths	▪ Iran's second largest mobile operator, with an estimated market share of over 45%.
	▪ Has a major strategic backer in the form of South Africa's MTN Group.
	▪ First to market with GPRS and MMS services.
Weaknesses	▪ Subscriber base is understood to be highly dependent on prepaid customers.
	▪ MMS business faces government censoring and filtering.
	▪ Lacks presence in the wireline sector for converged services.
	▪ US embargo puts limits on potential network equipment partners.
Opportunities	▪ Smartphone adoption was strong and penetration increased from almost 25% in MTN's subscription base in 2013 to 39.4%; data revenue almost doubled over 2014.
	▪ Although in the early stages, the market for mobile value-added and data services is expected to see strong growth; the youthful orientation of Iran's population should help to underpin future growth.
	▪ Continuing network roll-out programme will have a positive effect on future growth.
	▪ 3G licences became available in 2014 and 4G services were launched in December 2014
Threats	▪ The privatisation of TCI could raise the level of competition for MTN Irancell.
	▪ Underdeveloped legal and judicial environment could pose challenges.

Company Overview	In November 2003, the Ministry of Communications (now the MICT) issued a notice of its intention to issue a second GSM licence. In February 2004, Turkish operator Turkcell announced it won the tender, at a cost of USD385mn, over its closest rival South Africa's MTN Group. The Turkcell network was expected to launch within a year of licence issue, but by September 2004 the licence had yet to be formally awarded. The

ongoing licence issue culminated in Iranian authorities limiting foreign ownership in Irancell to 49%. Talks between Turkcell and the government eventually fell apart, leading the MICT to award the licence to MTN on November 21 2005. The remaining 51% stake is held by the Iran Electronic Development Company (IEDC). Irancell is currently managed through a shareholder agreement setting out operational management including key positions nominated by respective shareholders IEDC (chairman and managing director) and MTN (chief operating officer and chief financial officer).

Licence Conditions

Under MTN Group's licensing terms, the operator has a 15-year fixed term, followed by an option to renew its licence for an additional five years, which is allowed twice. Fees incurred by the operator, aside from the EUR300mn licence fee already paid to the Iranian authorities, include an annual fee set at 28.1% of the revenue share, based on gross revenue minus handset sales and net interconnection, with connection fees limited to USD150. Moreover, the operator must also pay a universal service fee of 3% of revenue. Other fees, such as numbering, frequency and regulation fees, are applicable, but altogether will not exceed 5% of revenue.

Strategy

MTN Irancell aims to drive mobile penetration and market share through the deployment of innovative products and services. It continues to emphasise the development of segmented prepaid and postpaid packages. The operator also aims to improve the level of customer service that is currently offered; the introduction of online registration and activation within 15 minutes was designed to further this goal. A central part of MTN Irancell's strategy is the implementation of a network that supports 3G services and, over the next five years, a network that covers more than 1,000 cities and comprises almost 6,000 BTSs. The operator aims to provide network coverage to 85.0% of the population by October 2020.

Financial Results

MTN Irancell reported a 14.3% rise in total revenue in 2014, driven by improved distribution in Tehran and four other major cities, increased use of bolt-on packages and the expansion of its 3G network and value-added services. Data revenue, which now contributes 17.6% of the total revenue, grew 96.3% in the year and its subscriber base stood at 43.9mn, up 6.2% compared to a year ago. Smartphone penetration increased by about 15pps to 39.4% in 2014. MTN Irancell reported capital expenditure spending of ZAR6.35bn (USD538.17mn) in 2014, with the operator rolling out 621 LTE sites and 2,151 3G sites.

In 2013, MTN Irancell recorded revenue of IRR49.544trn, up 11% from 2012, but growth was stronger at 18.3% if the negative impact of hyperinflation is taken into account. MTN's revenue growth was driven by growth in data revenue, which increased 72.7% y-o-y, with SMS revenue up 18% and data 60.2%.

Meanwhile, MTN's EBITDA margin declined 1.4pps to 42.8% in 2014, largely as a result of foreign currency denominated costs following rial depreciation. Finally, capex increased, rising to ZAR758mn. Investment for the period included an additional 746 2G sites and 415km of fibre.

Operational Developments

Irancell launched its network in October 2006, with sales and network coverage initially limited to the cities of Tehran, Mashhad and Tabriz. Further coverage was provided by means of interconnection agreements with Iran's other mobile operators.

In February 2007, Irancell launched Iran's first GPRS services, available to prepaid and postpaid subscribers.

In January 2011, MTN introduced a new location-based service which allows identifying the geographical location of a friend and informing them of a subscriber's whereabouts. The friend's location is notified to the subscriber through SMS or MMS.

According to a report by Iran Daily in October 2011, the number of cities covered by MTN was 1,874 by 23 September 2011. This would mean that the telco's network covered 80% of the country's population by that date. MTN's network coverage also includes 22,000 villages and over 20,000km of roads. This exceeds the operator's previously-stated target of 9,000km. In June 2012, MTN revealed it had deployed a total of 7,889 2G and WiMAX sites in the country.

During the second half of the 2013 MTN Irancell began the roll-out of a 3G network with LTE-capable frequency, following approval by the Communications Regulatory Authority. During the period it invested ZAR1.818bn, representing 100 percent of the operation, and deployed 274 new 2G sites. The operator also launched 4G networks in nine cities in December 2014, whereas its 3G network covered 75 cities in all 31 provinces.

MTN Irancell claims that the number of data subscribers on its network has increased to more than 21mn, including 7mn on its 3G and 4G networks, up to April 2015. The rise was supported by the expansion of its 3G and 4G networks, providing speeds of up to 150Mbps. The operator offers 3G services in more than 200 cities and has introduced its 4G network in more than 50 cities throughout the country.

In April 2015, MTN Irancell launched a Wi-Fi service in Tochal. Irancell subscribers can receive 500MB of free high-speed internet for 60 hours by connecting to the operator's Wi-Fi network, called irancellWiFi and sending a blank SMS to 4031 to receive a username and password. Subscribers will be able to receive a username and password only once every 24 hours.

Financial Data

- Annual revenue (2010): IRR26.294trn
- Annual revenue (2011): IRR33.352trn
- Annual revenue (2012): IRR41.980trn
- Annual revenue (2013): ZAR9.514trn
- Annual revenue (2014): ZAR11.631trn

- Capital expenditure (2010): ZAR1.661bn
- Capital expenditure (2011): ZAR1.168bn
- Capital expenditure (2012): ZAR1.122mn
- Capital expenditure (2013): ZAR1.758mn
- Capital expenditure (2014): ZAR6.350mn

All financial data reflect MTN's 49% stake in MTN

Operational Data

- Mobile subscribers (Q410): 29.743mn
- Mobile subscribers (Q411): 34.681mn
- Mobile subscribers (Q412): 40.502mn
- Mobile subscribers (Q413): 41.4mn
- Mobile subscribers (Q414): 43.94mn

Company Details

- MTN Irancell
- 12 Anahita Alley
  Africa St

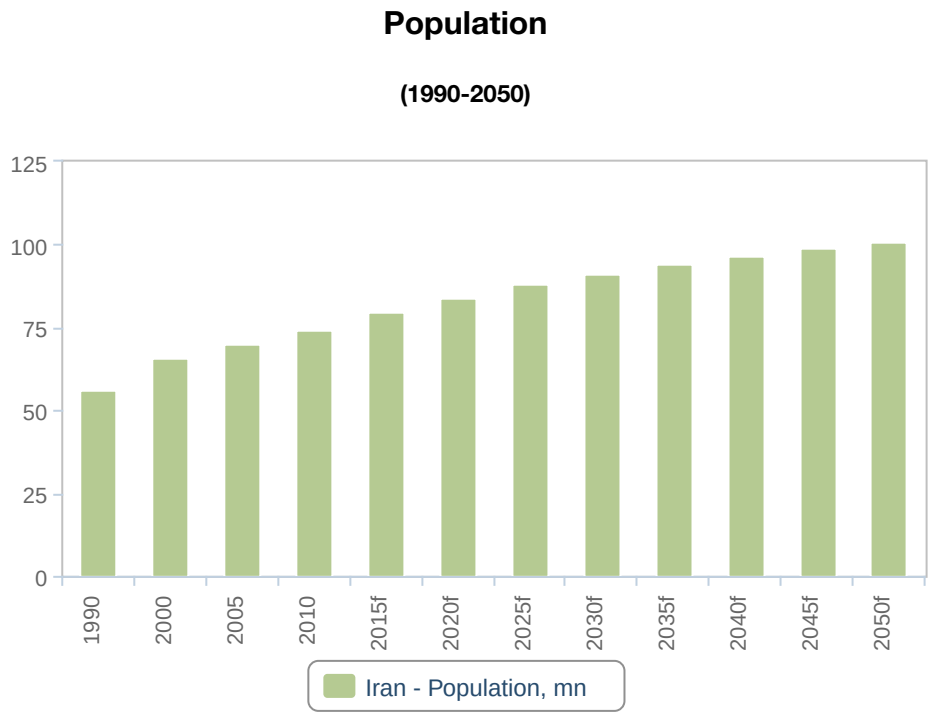
  Tehran

  Iran
- www.irancell.ir

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.

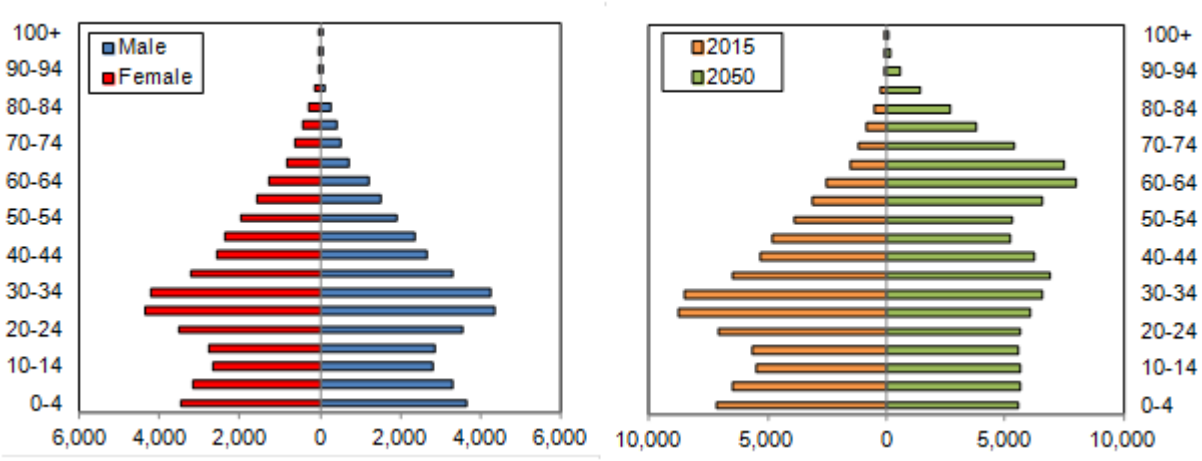
The accompanying charts detail the population pyramid for 2015, the change in the structure of the population between 2015 and 2050 and the total population between 1990 and 2050. The tables show indicators from all of these charts, in addition to key metrics such as population ratios, the urban/rural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



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

Iran Population Pyramid

2015 (LHS) & 2015 Versus 2050 (RHS)



Source: World Bank, UN, BMI

Table: Population Headline Indicators (Iran 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, total, '000	56,361	65,911	70,152	74,462	79,476	84,148	88,064
Population, % change y-o-y	na	1.6	1.2	1.3	1.3	1.1	0.8
Population, total, male, '000	28,807	33,504	35,917	37,656	39,915	42,307	44,213
Population, total, female, '000	27,554	32,406	34,235	36,805	39,560	41,840	43,850
Population ratio, male/female	1.05	1.03	1.05	1.02	1.01	1.01	1.01

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

Table: Key Population Ratios (Iran 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Active population, total, '000	28,945	40,290	48,583	53,034	55,945	58,184	60,945
Active population, % of total population	51.4	61.1	69.3	71.2	70.4	69.1	69.2
Dependent population, total, '000	27,415	25,620	21,569	21,427	23,530	25,964	27,118
Dependent ratio, % of total working age	94.7	63.6	44.4	40.4	42.1	44.6	44.5

Key Population Ratios (Iran 1990-2025) - Continued

	1990	2000	2005	2010	2015f	2020f	2025f
Youth population, total, '000	25,543	22,850	18,115	17,585	19,140	20,362	19,984
Youth population, % of total working age	88.2	56.7	37.3	33.2	34.2	35.0	32.8
Pensionable population, '000	1,872	2,770	3,453	3,841	4,389	5,601	7,134
Pensionable population, % of total working age	6.5	6.9	7.1	7.2	7.8	9.6	11.7

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

Table: Urban/Rural Population And Life Expectancy (Iran 1990-2025)

	1990	2000	2005	2010e	2015f	2020f	2025f
Urban population, '000	31,748.6	42,210.8	47,393.5	51,332.8	55,362.4	59,374.4	63,078.7
Urban population, % of total	56.3	64.0	67.6	68.9	69.7	70.6	71.6
Rural population, '000	24,613.2	23,700.3	22,758.8	23,129.5	24,113.9	24,774.2	24,985.6
Rural population, % of total	43.7	36.0	32.4	31.1	30.3	29.4	28.4
Life expectancy at birth, male, years	61.2	68.7	70.0	71.3	72.8	74.2	75.5
Life expectancy at birth, female, years	65.8	70.6	73.1	75.1	76.6	78.0	79.2
Life expectancy at birth, average, years	63.4	69.6	71.5	73.1	74.6	76.0	77.3

e/f = BMI estimate/forecast. Source: World Bank, UN, BMI

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

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, total, '000	9,312	6,316	5,483	6,555	7,146	6,751	6,148
Population, 5-9 yrs, total, '000	8,905	7,552	5,476	5,416	6,507	7,116	6,729
Population, 10-14 yrs, total, '000	7,324	8,981	7,154	5,613	5,487	6,494	7,105
Population, 15-19 yrs, total, '000	5,822	8,800	9,247	7,215	5,643	5,466	6,474
Population, 20-24 yrs, total, '000	4,697	6,932	9,143	8,993	7,067	5,595	5,424
Population, 25-29 yrs, total, '000	4,054	5,315	6,859	8,704	8,726	6,997	5,541
Population, 30-34 yrs, total, '000	3,535	4,442	5,202	6,521	8,484	8,649	6,937
Population, 35-39 yrs, total, '000	3,030	3,886	4,693	5,210	6,497	8,410	8,579
Population, 40-44 yrs, total, '000	2,123	3,372	4,112	4,833	5,262	6,431	8,333
Population, 45-49 yrs, total, '000	1,620	2,857	3,421	4,032	4,757	5,193	6,353

Population By Age Group (Iran 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 50-54 yrs, total, '000	1,526	1,929	2,800	3,244	3,895	4,665	5,101
Population, 55-59 yrs, total, '000	1,393	1,431	1,766	2,637	3,109	3,788	4,548
Population, 60-64 yrs, total, '000	1,140	1,322	1,336	1,639	2,500	2,985	3,652
Population, 65-69 yrs, total, '000	898	1,145	1,257	1,279	1,550	2,340	2,813
Population, 70-74 yrs, total, '000	507	825	1,055	1,129	1,143	1,369	2,090
Population, 75-79 yrs, total, '000	269	508	654	802	876	902	1,105
Population, 80-84 yrs, total, '000	135	203	347	413	528	598	637
Population, 85-89 yrs, total, '000	48	66	112	172	216	290	343
Population, 90-94 yrs, total, '000	10	17	21	38	63	84	119
Population, 95-99 yrs, total, '000	1	2	3	4	8	15	22
Population, 100+ yrs, total, '000	0	0	0	0	0	1	2

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

Table: Population By Age Group % (Iran 1990-2025)							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, % total	16.52	9.58	7.82	8.80	8.99	8.02	6.98
Population, 5-9 yrs, % total	15.80	11.46	7.81	7.27	8.19	8.46	7.64
Population, 10-14 yrs, % total	13.00	13.63	10.20	7.54	6.90	7.72	8.07
Population, 15-19 yrs, % total	10.33	13.35	13.18	9.69	7.10	6.50	7.35
Population, 20-24 yrs, % total	8.34	10.52	13.03	12.08	8.89	6.65	6.16
Population, 25-29 yrs, % total	7.19	8.06	9.78	11.69	10.98	8.32	6.29
Population, 30-34 yrs, % total	6.27	6.74	7.42	8.76	10.68	10.28	7.88
Population, 35-39 yrs, % total	5.38	5.90	6.69	7.00	8.18	9.99	9.74
Population, 40-44 yrs, % total	3.77	5.12	5.86	6.49	6.62	7.64	9.46
Population, 45-49 yrs, % total	2.88	4.33	4.88	5.42	5.99	6.17	7.22
Population, 50-54 yrs, % total	2.71	2.93	3.99	4.36	4.90	5.54	5.79
Population, 55-59 yrs, % total	2.47	2.17	2.52	3.54	3.91	4.50	5.17
Population, 60-64 yrs, % total	2.02	2.01	1.90	2.20	3.15	3.55	4.15
Population, 65-69 yrs, % total	1.59	1.74	1.79	1.72	1.95	2.78	3.19
Population, 70-74 yrs, % total	0.90	1.25	1.50	1.52	1.44	1.63	2.37
Population, 75-79 yrs, % total	0.48	0.77	0.93	1.08	1.10	1.07	1.26
Population, 80-84 yrs, % total	0.24	0.31	0.50	0.55	0.66	0.71	0.72

Population By Age Group % (Iran 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 85-89 yrs, % total	0.09	0.10	0.16	0.23	0.27	0.34	0.39
Population, 90-94 yrs, % total	0.02	0.03	0.03	0.05	0.08	0.10	0.14
Population, 95-99 yrs, % total	0.00	0.00	0.00	0.01	0.01	0.02	0.03
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 multi-collinearity.

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