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Q3 2016

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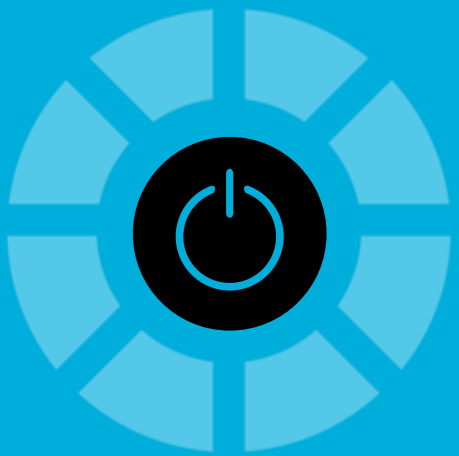
IRAN

CONSUMER ELECTRONICS REPORT

INCLUDES 5-YEAR FORECASTS TO 2020



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INCLUDES 5-YEAR FORECASTS TO 2020

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BMI Industry View

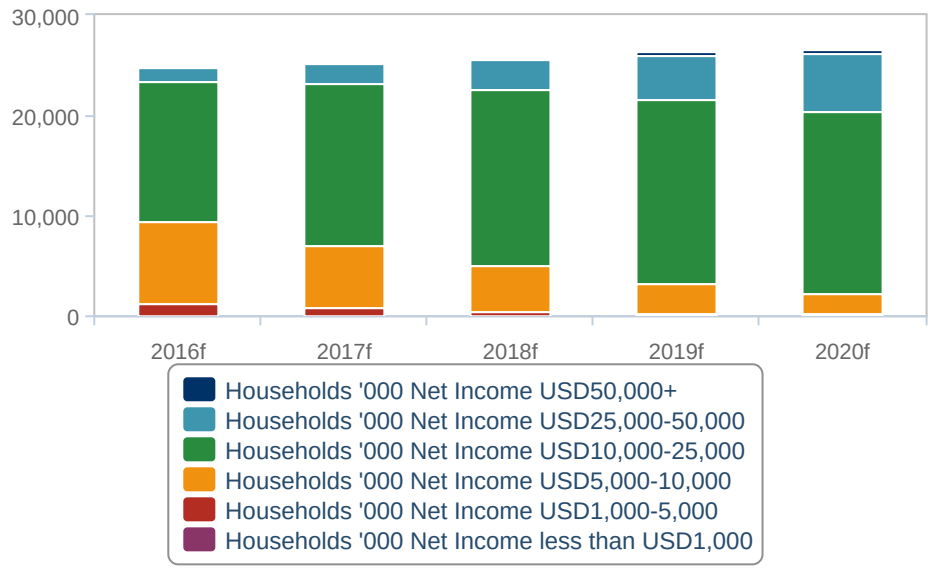
BMI View: *The easing of sanctions has increased optimism about the medium-term prospects of Iran's consumer electronics market through an increase in international vendor competition and an improved economic outlook. The breakthrough in international relations has however coincided with a steep decline in the oil price, and some bottlenecks to market development still exist - for instance, very high tariffs on the import of finished devices and a large informal devices market. Nonetheless, we expect the Iranian consumer electronics devices market will move to a higher growth trajectory, particularly from 2017, as rising incomes and increased supply of devices see vendors tap low device penetration rates in key categories such as notebooks, tablets and smartphones. Our core scenario is for a CAGR of 5.8% over 2016-2020 to a value of USD10.1bn in 2020.*

Latest Updates & Industry Developments

- **Computer Sales:** USD2.6bn in 2016 to USD3.5bn by 2020, corresponding to a compound annual growth rate (CAGR) of 7.0%. In a market with an installed base weighted towards locally assembled desktops there is a huge opportunity for notebook and tablet vendors.
- **AV And Gaming Device Sales:** USD1.5bn in 2016 to USD1.8bn in 2020, a CAGR of 4.0%. Local supply of TV sets means the market was less affected by sanctions, but as the market opens, price erosion and cannibalisation of digital camera volumes will mean the segment underperforms.
- **Handset Sales:** USD3.9bn in 2016 to USD4.9bn in 2020, a CAGR of 5.6%. Low smartphone penetration presents a large opportunity to vendors in contrast to much of the region, where smartphone market saturation will result in decelerating growth and even contraction.

A Middle Income Market With Low Device Penetration Signals Medium Term Potential

Iran Household Income Breakdown (USD) (2016-2020)



f = BMI forecast. Source: BMI, Statistical Centre of Iran

SWOT

Consumer Electronics Market

Iran Consumer Electronics SWOT

Strengths	▪ Iran had a population of 79.1mn at the end of 2015 and is forecast to grow to 83.4mn by 2020, giving the country has the potential to be the leading consumer electronics market in the Middle East. ▪ Iran's youthful and tech-literate population is increasingly well informed about the latest technology trends and brands. ▪ Over two-thirds of Iranians live in urban areas, which bodes well for strong retail growth and broadband access. ▪ The expansion of 3G and 4G services, launched by multiple operators.
Weaknesses	▪ High tariffs on some imported electronics products (eg, more than 50% for mobile handsets and 30% for notebooks). ▪ Local electronics distribution sector is small-scale and fragmented, making it hard for regional vendors and distributors to build channels to market. ▪ Large grey market of pirated goods entering the country through Pakistan, Afghanistan and Iraq. ▪ Political environment creates risk for vendors.
Opportunities	▪ Lifting of US handset sanctions should boost competition and accelerate smartphone adoption, though tariffs will continue to limit potential. ▪ Increased competition and coverage in the mobile data market should drive smartphone sales. Individual retailers of international consumer electronics brands, particularly Apple, are increasingly well-organised, offering their own warranties and services tailored to Iranian consumers.

Iran Consumer Electronics SWOT - Continued

	▪ Government drive to encourage local production, particularly of handsets, could help vendors willing to form partnerships.
Threats	▪ Failure to control parallel imports and inflow of inferior computer components and accessories.
	▪ Political tensions between Iran and the West could limit opportunities for multinational corporations and create an element of unpredictability.
	▪ Oil price slump will reduce gains from sanctions easing, while depreciation against the dollar will squeeze Iranian purchasing power for imported devices.

Industry Forecast

BMI View: *The outlook for the Iranian consumer electronics devices market is mixed, with a low oil price negative, but unlike most markets in the Middle East this is offset by the easing of sanctions and strong economic growth forecast for 2016-2020. We forecast total device spending will increase at a CAGR of 5.8% over 2016-2020 to USD10.2bn in 2020. Under our core scenario we envisage strong income growth and increased supply of devices will drive market development as vendors tap into opportunities presented by the relatively low device penetration rate in key product categories such as notebooks, tablets and smartphones after years of underdevelopment in Iran.*

Latest Updates

- The overall economic outlook is relatively strong for Iran, but rial depreciation will be a drag on purchasing power growth, at least in the short term.
- Aside from short-term disruption, we have a positive outlook for Iranian device demand over the medium term as incomes rise and the easing of sanctions increase supply and competition in key device categories such as notebooks, tablets and smartphones.
- Downside risks do continue to be a factor, including the low oil price that will squeeze the potential windfall from sanctions easing, high tariffs and political risk.

Structural Trends

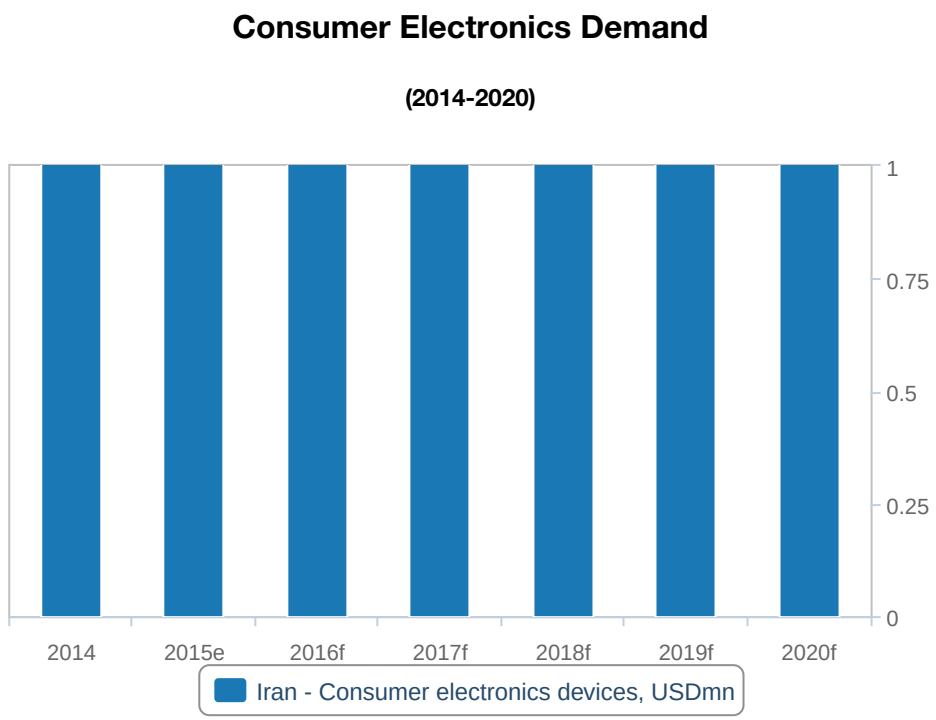
2016 Outlook

Our Country Risk team now forecasts the rial will depreciate from an average of IRR25,832/USD in 2015 to IRR32,000/USD in 2016, a downgrade from the previous update, and this is reflected in a weaker growth outlook for consumer electronics spending. We now envisage total device spending - including PCs and accessories, mobile handsets, TV sets, digital cameras and audio devices - will grow by 0.9% to USD8.1bn in 2016. While depreciation will be a drag, the economy is expected to strengthen overall, with real GDP growth of 3.8% and real private consumption growth of 4.0%, meaning there will still be opportunities for vendors.

Another important factor in 2016 is the easing of the sanctions that have restricted the development of the Iranian consumer electronics market. Supply and competition are set to increase following the removal of sanctions, but **BMI** cautions that the benefit could be distributed over the short-to-medium term rather than a one-time windfall, as exporting to Iran remains a huge logistical challenge and vendors are understandably cautious about the political and security backdrop to sanctions. There will be a delay before new distribution channels are developed, particularly outside the main urban areas. There will be some benefit in 2016, with

PC vendors able to benefit from access, while even some non-US vendors such as **Lenovo** had also been waiting for an agreement between Western nations and Iran before formally expanding into the country.

As a result of the extended process of vendors re-entering the market there is uncertainty about the outlook for 2016, as consumer behaviour also needs to change for faster growth to accrue. Iranian consumers have become accustomed to using informal retail, local assembled desktops, and acquiring devices abroad, particularly in Dubai and other Gulf Cooperation Council (GCC) markets. Even though easing of sanctions is positive, with tariffs remaining very high for imported devices to Iran, it may be that consumers continue to use traditional methods of acquiring devices. **BMI** estimates it is the most affluent segments of the Iranian consumer base that have most fully utilised informal import channels, or acquired devices directly overseas, part of the explanation for relatively low levels of device spending per capita in Iran.



e/f = estimate/forecast. Source: BMI

Market Trends

Under our core scenario for implementation of the nuclear deal and a full lifting of sanctions, we expect the Iranian consumer electronics market to exhibit to move to a higher growth trajectory over the medium term. Although the boon from a return to the global oil market is restricted in the short term by the depressed price, there are plenty of other benefits. Iran will gain immediate access to approximately USD100bn in frozen assets; regain access to SWIFT and the international banking system; and see sanctions pulled back on all key sectors such as energy, transport, insurance and mining.

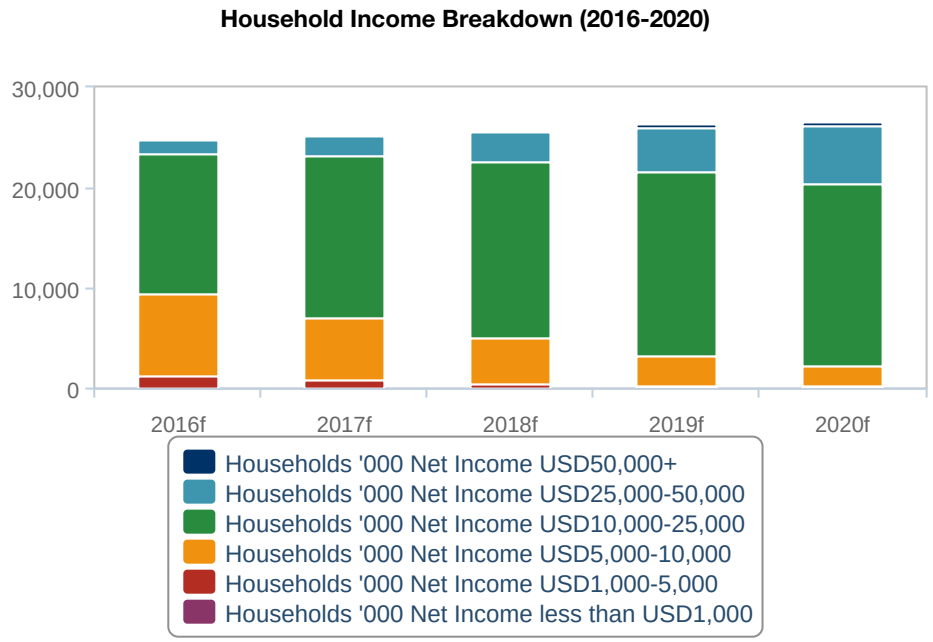
BMI expects this to have a direct impact on the consumer electronics market. While many Iranians have been able to find iPhones and other popular products through specific retailers, abroad or on the black market, the establishment of formal distribution networks should help bring down the cost of these devices, in turn supporting greater demand. For instance, it was reported in July 2015 that **Apple** was in talks with Iranian distributors regarding the creation of a network of premium resellers in Iran. This should result in a considerably larger share of the population's consumer electronics spending taking place through formal retail channels in Iran by 2020.

Downside risk is however significant and multifaceted. The successful implementation of the deal is uncertain. Meanwhile, the operational and regulatory environment will continue to present major challenges to vendors. For instance, the import tariffs for mobile handsets, PCs and TV sets are all high in a regional and global context and a major squeeze on affordability. There have also been suggestions that breaking up the black market could prove challenging when corruption, bureaucracy, nepotism and domestic resistance to opening the economy are rife. At the same time, low oil prices will ensure weak government spending and private consumption growth, and in the absence of a price rise and revenue windfall the government is less likely to consider scaling back device import tariffs.

The outlook is uncertain, but the scale of the opportunity in Iran as inferred from penetration rates that are far below Iran's income profile, means there is low-hanging fruit vendors can target. PC penetration is only at around 50%, and the installed base is weighted towards locally assembled desktops, while smartphone penetration is estimated at just 36% at YE15 due to high cost and restricted supply under sanctions. This installed base is underdeveloped when considered in the context of Iran's household income profile, which is that of a middle income country. **BMI** forecasts just 29% of Iranian households will have incomes of below USD5,000 in 2016 (our threshold for global market participation), and 18% are global middle income with annual income in excess of USD10,000.

Our medium-term household income forecast is central to our view that vendors can tap into low device penetration rates as the bottleneck of sanctions is removed and economic growth accelerates. Our forecast illustrates the robust consumption growth story in Iran 2016-2020 *(see chart below),* with large-scale migration of households up the income scale. This will result in new market entrants, as well an easing of price sensitivity constraints in the mass market, with almost 3.7mn households expected to be added to the USD10-25k income band by 2020.

Household Income Breakdown



f = BMI forecast. Source: BMI, Statistical Centre of Iran

Segments

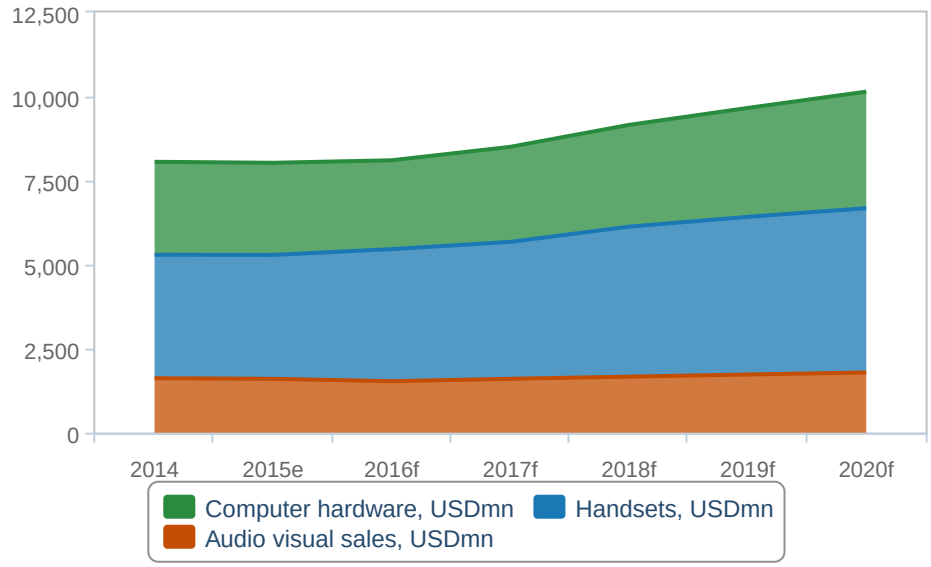
BMI estimates mobile handsets was the largest segment of the consumer electronics market in 2015 at USD3.7bn, accounting for about 46% of total spending. Handset spending is potentially the most dynamic segment of the market, particularly after the removal of sanctions, with additional upside if the government adjusts the tariff regime. There will likely be a short-term boost to sales once devices become available through official channels. We expect the market will continue to be dominated by **Samsung** and the competitive dynamics with Chinese vendors, such as **Huawei** and Lenovo**.** We expect the market to grow

strongly during the forecast period, with handset sales growing by a compound annual growth rate (CAGR) of 5.6% over 2016-2020, increasing the share of handset sales to 48% by the latter years of our forecast.

Computer hardware is estimated to have been the second largest consumer electronics market category in 2015 and is expected to continue to account for about a third of total device spending for the duration of our five-year forecast period. Government spending will help drive the market, while demand will also be strong in the small- and medium-sized enterprise (SME) and consumer segments. Spending will rise at a CAGR of 7.0% over 2016-2020, with an emphasis on notebooks and tablets.

Consumer Electronics Demand

(2014-2020)



e/f = estimate/forecast. Source: BMI

AV devices are estimated to have been the smallest consumer electronics market segment in 2015, at 20% of the total and we expect this share to decline to 18% by 2020. The AV segment growth potential is limited by technology trends including the cannibalisation of digital camera demand by the proliferation of multifunctional smartphone ownership. Meanwhile, saturation of the TV set market and intense price competition between vendors at the global and regional level will diminish returns to vendors over the medium term and see AV spending growth underperform both the handset and PC markets.

Table: Consumer Electronics Overview (Iran 2014-2020)

	2014	2015e	2016f	2017f	2018f	2019f	2020f
Consumer electronics devices, USDmn	8,058.80	8,029.80	8,104.20	8,504.60	9,157.50	9,660.90	10,146.20
Computer hardware, USDmn	2,765.80	2,741.00	2,642.30	2,827.30	3,028.00	3,240.00	3,466.80
Audio visual, USDmn	1,620.10	1,602.20	1,531.70	1,603.00	1,667.50	1,730.90	1,791.50
Handsets, USDmn	3,673.00	3,686.50	3,930.20	4,074.30	4,462.00	4,690.00	4,888.00

e/f = estimate/forecast. Source: BMI

Industry Risk/Reward Index

BMI View: *The commodity slump continues to put a drag on spending in Middle East and Africa's consumer electronics markets, resulting in a 0.6-point decline in the region's Consumer Electronics RRI in Q3 2016. Despite the weaker short term outlook, we retain a positive growth forecast for the region, as demand for the latest devices will remain strong in the wealthy GCC markets, while low penetration will support demand in the more populous markets of Iran, Egypt and South Africa.*

The Middle East and Africa (MEA) Risk/Reward Index (RRI) ranks the 10 countries in our coverage based on an aggregate score of risks and rewards divided into four categories: Industry Rewards, Country Rewards, Industry Risks and Country Risks. It is characterised by a wide spread of markets in the region - from the high income, but with small population, markets of the Gulf Cooperation Council to the less developed, with high potential and high risk, markets such as Iran and Egypt at the bottom of the ratings.

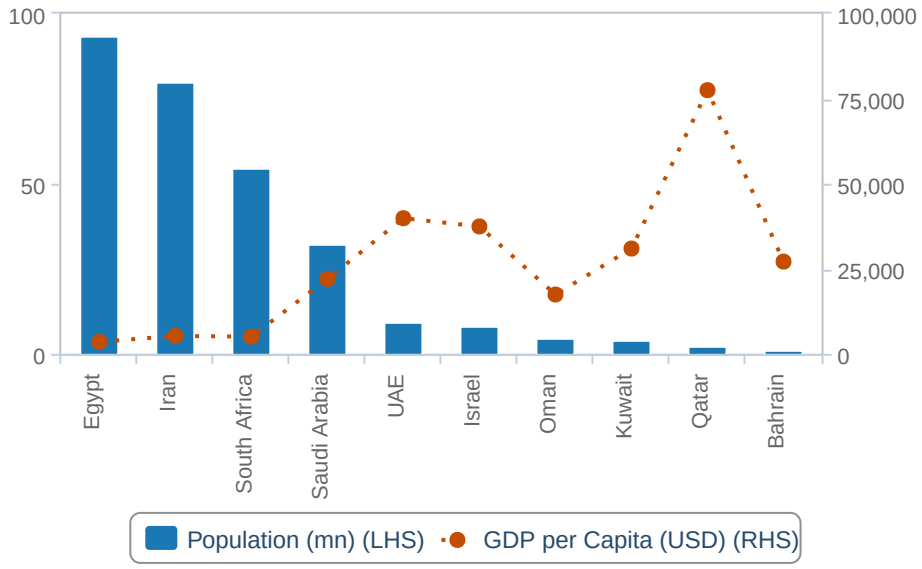
Regional Perspective

The MEA Consumer Electronics Risk/Reward Index (RRI) reflects the broad cross-section of markets in the region. It scores well behind the developed market regions overall. This is because of the inclusion of several lower value emerging markets in MEA, but also the fact that the higher income markets are much smaller in population terms than the US, Western Europe or developed APAC.

The average RRI score in Q316 declined by 0.6 points, as economic headwinds related to the slump in oil prices and the wider commodity market have driven currency depreciation in price sensitive markets such as Egypt and South Africa, weighing on consumer spending on imported devices. For the smaller markets of the Gulf Cooperation Council (GCC), the decline is also reflective of saturated markets, with vendors increasingly relying on replacement sales rather than first-time buyers. These factors also underpin the 1.2-point y-o-y decline in the MEA Consumer Electronics RRI score.

Large Populations Cannot Offset Low Spending Power

Population Versus GDP Per Capita, 2016



Source: BMI

Key Developments

The top three countries in our Consumer Electronics RRI - Qatar, UAE and Israel - were unchanged this quarter, with all three scoring significantly higher than Saudi Arabia in fourth place. Qatar posted the largest q-o-q decline to its score this quarter, owing to a sharp drop in the Country Risks category, as the government reigns in public spending to cope with lower oil prices and reduced liquidity, and a smaller drop in its Industry Rewards score, resulting from a slight downward revision to our growth forecast for the computer hardware market. Nevertheless, as highlighted in the chart above, Qatar remains a highly attractive market as a combination of premium preference, short replacement cycles and an expanding population support steady spending growth.

Israel's score increased by 0.8 points q-o-q in Q3 2016, but our improved outlook for the Consumer Electronics sector in 2016 is not positive enough to offset the 5-point y-o-y decline in the country's overall score, as the depreciation of the shekel and depletion of first-time buyers in the lucrative smartphone market weighed on growth prospects in 2015.

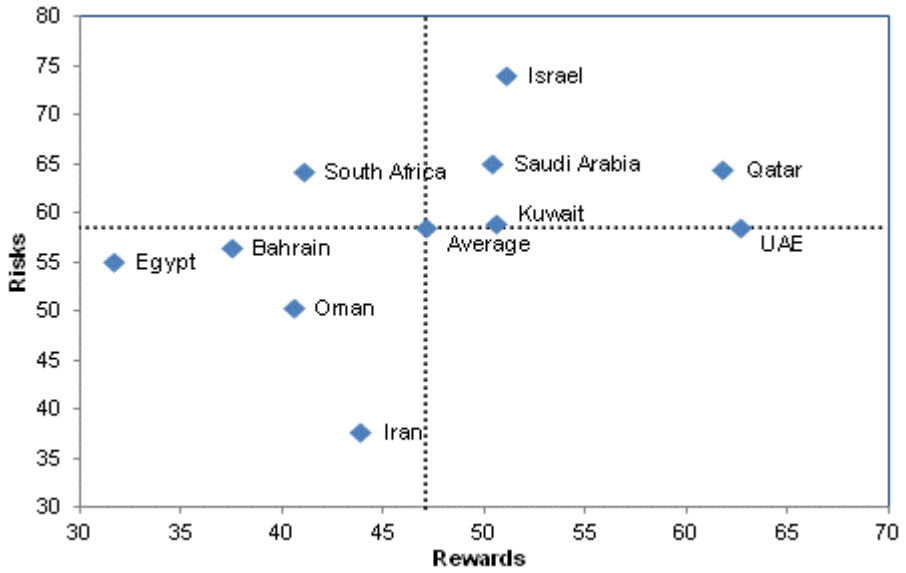
In the middle of the table, Kuwait and South Africa's scores also both dropped on the back of deteriorating Country Risks scores. Like Qatar, both countries have suffered from the fall in commodity prices. Our Country Risk team expects private consumption growth in Kuwait in 2016-2020 to be half that of the previous five years. In South Africa, strong demand for low-cost smartphones and tablets was not able to offset the impact of depreciation of the rand on demand for bigger ticket items such as PCs and TVs.

Although nearly all the countries' overall Consumer Electronics scores changed during the quarter, there was only one positional change with Oman reclaiming seventh place, moving ahead of Bahrain and Iran. This was a result of a decline in Bahrain and Iran's scores by 1.5 points each. Bahrain's Industry Rewards score dropped this quarter, on the back of a small downward revision to our growth forecast to reflect a more bearish outlook for smartphone sales in a saturated market where we now believe price erosion will be more prominent due to economic uncertainties.

We also made a slight downward revision to our growth forecast for Iran in 2016, as we expect further depreciation of the rial to weigh on short term consumer spending, resulting in a slight decline in its Industry Rewards score. The larger impact comes from a four-point drop in its Country Risks score, reflecting our Country Risk and Operational Risk teams' expectations that high levels of corruption, poor rule of law, weak intellectual property rights and high import tariffs will present significant obstacles to companies looking to enter the market as sanctions are lifted.

Middle East And Africa Risk/Reward Profile

Q3 2016



Source: BMI

Table: Middle East And Africa Consumer Electronics Risk/Reward Index, Q3 2016

	Industry Rewards	Country Rewards	Industry Risks	Country Risks	CE Score	q-o-q Change	Rank
Qatar	46.7	90.0	70.0	60.8	62.6	61.6	1
UAE	53.3	80.0	65.0	54.1	61.4	59.4	2
Israel	45.0	62.5	65.0	80.1	58.0	55.0	3
Saudi Arabia	53.3	45.0	55.0	71.6	54.8	50.8	4
Kuwait	37.5	75.0	55.0	61.6	53.1	48.1	5
South Africa	35.0	52.5	57.5	68.7	48.0	42.0	6
Oman	34.2	52.5	57.5	45.5	43.5	36.5	7
Bahrain	30.8	50.0	50.0	60.8	43.2	35.2	8
Iran	43.3	45.0	30.0	42.7	42.0	33.0	9
Egypt	36.7	22.5	52.5	56.6	38.7	28.7	10
Average	*41.6*	*57.5*	*55.8*	*60.2*	*50.5*		

Note: Scores out of 100, with 100 the best. The Consumer Electronics (CE) Index is the principal rating. It comprises two sub-indices, Rewards and Risks, which have a 70% and 30% weighting respectively. In turn, the Rewards index comprises Industry Rewards and Country Rewards, which have a 65% and 35% weighting and are based on growth/size of the CE industry (Industry) and the broader economic/socio-demographic environment (Country). The Risks index comprises Industry Risks and Country Risks, which have a 40% and 60% weighting and are based on a subjective evaluation of barriers to entry and the regulatory environment (Industry) and the industry's broader country risk exposure (Country), which is based on BMI's Country Risk Index. The index structure is aligned across all industries for which BMI provides Risk/Reward Indices. Source: BMI

Market Overview

Recent Developments

- Rial depreciation against the US dollar exchange was a drag in 2015, and will continue to effect purchasing power, at least in the short term.
- Aside from short-term fluctuations, we are anticipating that the Iranian market will witness significant growth once the international sanctions are removed and international trade flows easier as a result of the Iran nuclear deal.
- Fastest growth expected to be in handset segment, underpinned by smartphone upgrades, with significant upgrade potential remaining with a smartphone penetration of 36% estimated at YE2015.

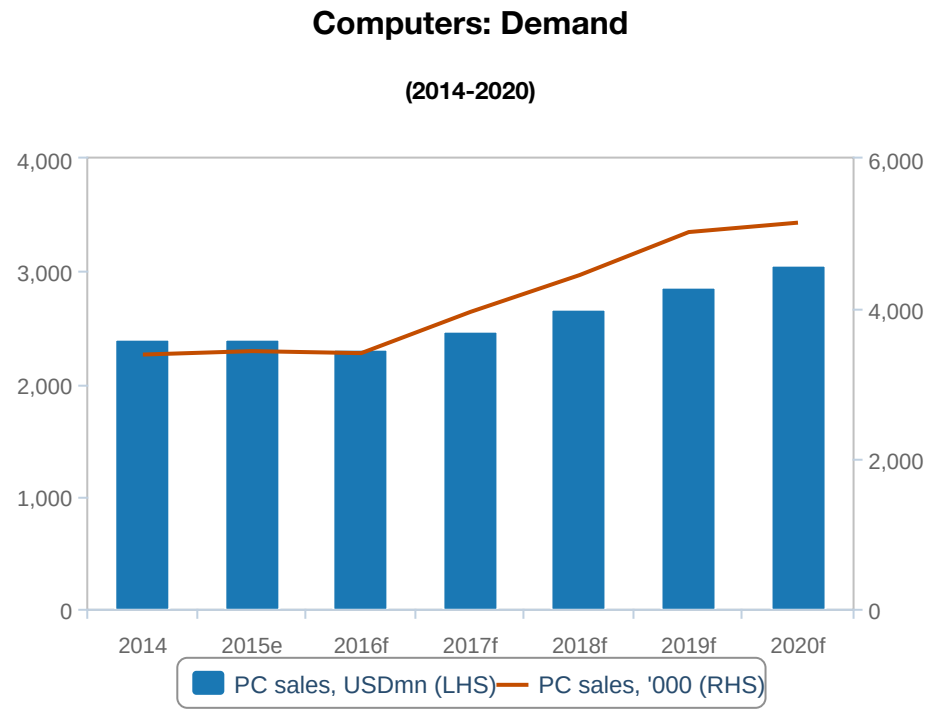
Computers

Table: PC Sales (Iran 2014-2020)

	2014	2015e	2016f	2017f	2018f	2019f	2020f
PC sales, USDmn	2,408.40	2,403.00	2,309.30	2,477.90	2,663.70	2,853.60	3,057.10
PC sales, '000	3,388.30	3,434.30	3,407.30	3,956.80	4,447.80	5,021.00	5,146.50
Desktop sales, '000	1,300.00	1,185.00	1,136.00	1,094.00	1,079.00	1,006.00	967.00
Notebook sales, '000	1,742.00	1,748.00	1,697.00	1,948.70	2,108.00	2,340.00	2,395.00
Tablet sales, '000	346.30	501.30	574.30	914.10	1,260.80	1,675.00	1,784.50

e/f = estimate/forecast. Source: BMI

We forecast a 3.6% decline in Iran's computer hardware market value in 2016, and a 0.8% contraction in PC volumes, as rial depreciation reduces Iranian household purchasing power for imported devices, thus weakening the positive contribution from sanctions easing. Looking beyond short-term volatility as a result of rial performance, we expect the broad easing of sanctions from 2016 will boost market growth by increasing retail supply and competition, as well as enabling vendors to target the enterprise and government sectors, which we expect will generate rising demand for hardware as the economy recovers. This will be driving the computer hardware market growth in Iran. We forecast the market will record a compound annual growth rate (CAGR) of 7.0% over 2016-2020 as a whole, with significantly stronger growth expected in the latter years of our forecast as total spending reaches USD3.5bn in 2020.



e/f = estimate/forecast. Source: BMI

Market Trends

Local assemblers have a large role in the Iranian PC market as a result of sanctions stymieing the development of the market and retail channels. Of the global players, Asian vendors have taken advantage of the gap left by US companies not selling directly to Iran. Compared with many markets there is a much stronger presence of companies such as **LG**, **Samsung**, **Acer**, **Sony** and **Toshiba**. However, there were changes to the market after an August 2013 decision to lift restrictions on selling consumer electronics to Iran. For instance, **Apple** lifted restrictions on those consumers buying devices with the intention of taking them to Iran.

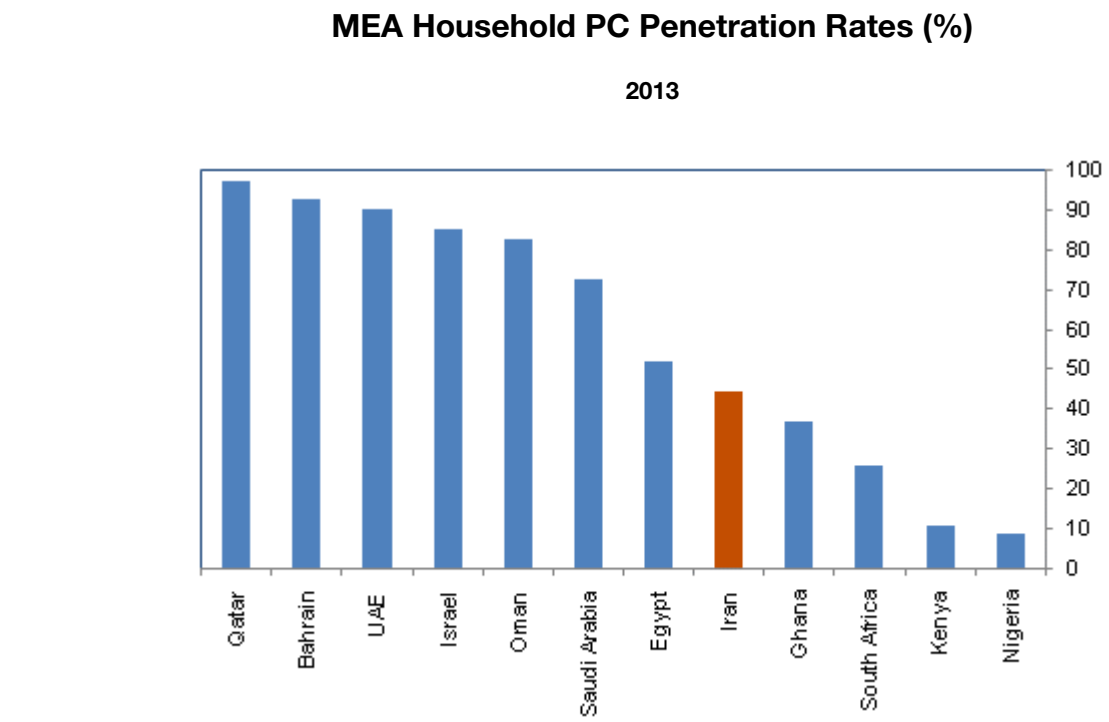
However, sanctions have not been an impermeable barrier, with printers from leading global vendor **HP** readily available in Iran, as was revealed by the controversy surrounding HP's distributor **Redington**. Stung by the bad publicity, HP said that it would tighten sales restrictions on Redington to prevent it from selling printers to retailers in Iran. However, it is doubtful whether HP can do much to prevent its printers from

selling there. Redington laid the foundation for the popularity of the HP printers brand a decade ago, famously decorating its offices in Tehran with giant colourful maps created by HP printers.

It is likely that there will be significant changes to the market with the easing of sanctions. Despite US consumer electronics companies' increased ability to compete with their dominant Asian counterparts, many are yet to expand operations into the country. Exporting to Iran remains a huge logistical challenge while key trade routes are closed and restrictions still apply to the financial sector and many vendors have been unwilling to invest without the greater certainty provided by a wider sanctions relief agreement. US vendors are not the only ones waiting for greater stability; even leading Chinese PC vendor **Lenovo** stated in early 2014 that it would wait for an agreement between Western nations and Iran before formally expanding into the country.

The nuclear deal in July 2015 does appear a watershed for US vendor direct involvement in Iran. In July 2015 it was reported that Apple was already in talks with Iranian distributors regarding the creation of a network of premium resellers in Iran - in a structure similar to the one it operates in South Korea. However, with a degree of uncertainty remaining around sanctions easing and the complexity of compliance it has been suggested that a deal could take as long as until late 2016 to come to fruition.

However, the rescinding of sanctions is not a panacea for vendors hoping to tap the potential of Iran's PC market. **BMI** highlights several other important factors will have a bearing on whether the computer market achieves its potential. High tariffs and the government trade embargo have a significant impact on the market, which remains dominated, in the desktop segment, by local assembly, with monitors procured from warehouses and computer parts malls. Furthermore, local assembly has a political voice that may be resistant to changes. Until now the lack of international production and imports has led to growth in the manufacture of locally made computers (predominantly desktops) and any erosion of their advantages will be contested.



Source: National sources, WEF, BMI

PC Market

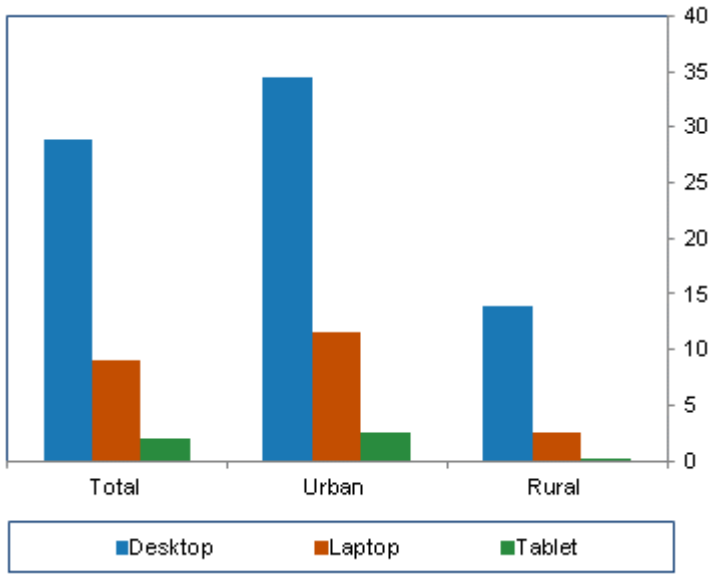
Iran's PC market trails regional peers in terms of hardware adoption rates, a consequence of restricted supply from global markets and economic weakness resulting from the sanctions regime and more recently the sharp decline in the oil price. Another feature of the market is the predominance of desktops, as illustrated by the most recent release of computer usage data for 2013 (*see chart below)*, which has resulted from a reliance on local assembly as global players have been on the fringes of the market.

The easing of sanctions will have a marked impact on the competitive landscape in Iran, as US vendors compete again, and the product mix shifts further to notebooks and tablets as local assembly becomes less prominent. In contrast to the more diverse landscape in most Middle Eastern markets, the direct sales market in Iran lacks full competition, with US vendors such as HP and Apple previously excluded from operations. Some East Asian vendors have operated locally through local partnerships and alliances. For instance, local electronics firm **Maadiran Group** began to manufacture LG monitors in Iran over a decade ago and LG has a premium position in the market, while Samsung has a smaller but significant market

share. **BMI** believes easier access for US and other international brands such as global PC market leader Lenovo will erode the dominance of Samsung and LG in the consumer electronics market.

Iran Computer Usage By Device* (%)

2013

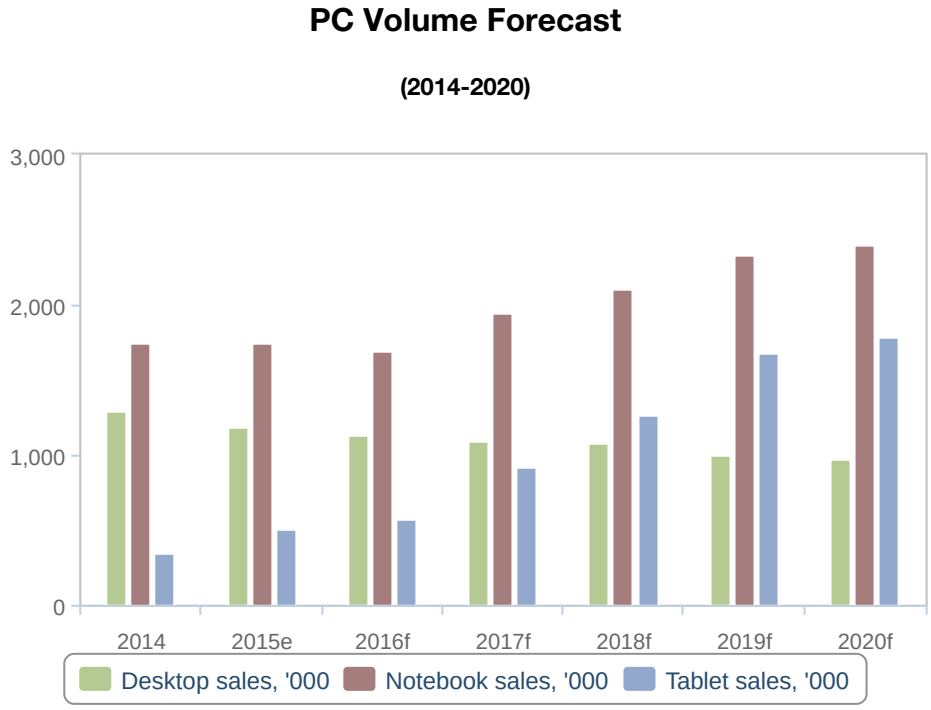


**Iranians aged 6+. Source: Amar*

As the market becomes more competitive, **BMI** envisages faster unit growth overall, and a shift towards notebooks and tablets. Amar data show desktops accounted for the vast majority of computer usage in urban and rural areas in Iran in 2013, and as such we believe there is pent-up demand for mobile form factors that will be unlocked over the medium term. We forecast tablets will outperform with a CAGR of 32.8% over 2016-2020, but this rate is partly due to base effects with the market still severely underdeveloped in 2016. It will be notebooks that we expect to dominate the market in absolute volume terms in 2020, and furthermore, this is where we believe vendors have the potential to achieve wider margins than in the tablet market (aside from Apple's iPad).

The government and commercial segment dominates computer purchases, with more than 50% of the total market. Over the next few years, computer sales should be boosted by government procurement for education projects and other uses, with e-government initiatives helping to fuel spending, along with

privatisations. There should also be growing investment by private companies, particularly in modernising sectors such as telecoms and banking. Despite its huge potential, the small- to medium-sized enterprise (SME) market will be relatively constrained by its lack of access to investment compared with other countries in the region.



e/f = estimate/forecast. Source: BMI

Tablets have reshaped the PC market globally and competitive dynamics since the arrival of the iPad, but due to sanctions on Iran there has been a much smaller impact. Though our core scenario is for tablet growth momentum to gather pace in Iran and close the gap to its peers in terms of penetration over 2016-2020 we believe that there is also potential for form factor evolution and envisage a medium-term blending of form factors through vendor innovation that will make the Apple-defined smartphone-tablet-notebook distinction more fluid before tablets gain a hold in Iran.

In the Android ecosystem (as well as with Apple's move to phablets) there is competition for tablets, particularly small screen devices, from phablets. Meanwhile, Microsoft partner vendors are using Windows and new CPU technologies to innovate with hybrid notebook designs that threaten vendors at the premium

end of the tablet market - evident in Apple's iPad Pro announcement, which is an attempt to replicate Microsoft's success with its Surface range. Windows has a traditional strength in productivity-use cases and software, with the OS being central to the enterprise market and Microsoft's Office Suite ubiquitous. There is therefore an opportunity for vendors to leverage this strength over rival iOS and Android devices by designing tablets with strong productivity functionality alongside the passive media consumption features.

More speculatively, but an insight into innovation trends, is Microsoft Continuum, which enables Windows Phone users to connect their smartphone through a dock or wirelessly to use their phone as a PC with monitor and accessories. Due to the small footprint of Windows Phone the short-term impact will be limited, but it is an indication of the potential for a further squeeze on traditional PC sales, and even tablets, over the medium term. This development would gain additional momentum if Google offers a similar product, the potential for which will increase with the expected unification of Android and Chrome by 2017 (mirroring Microsoft's device unifying Windows 10 OS).

Meanwhile in terms of hardware led innovation, there is an increasing number of vendors releasing 'PC on a stick' devices that use a portable HDMI device that can turn a monitor (or TV) into a PC running Windows 10. They are primarily low-cost devices, which are necessarily vastly underpowered compared to a traditional desktop or notebook, but again show the potential for further blending of form factors over the medium term, as well as being very low cost and so having applicability in emerging markets. These include **Intel**'s Compute Stick (around USD150), **Lenovo**'s Ideacentre Stick 300 (USD150) or Taiwan-based global notebook ODM leader **Quanta Computer**'s white-label NH2 that comes with up to 64GB of storage, Intel's Cherry Trail T3 Atom CPU (1.44GHz), 2GB of RAM and microSD expansion and could undercut the brand vendors on price and specifications.

AV Devices

Table: AV Sales (Iran 2014-2020)

	2014	2015e	2016f	2017f	2018f	2019f	2020f
Audio visual sales, USDmn	1,620.10	1,602.20	1,531.70	1,603.00	1,667.50	1,730.90	1,791.50
Audio application sales, USDmn	358.00	356.60	343.40	354.00	366.10	378.70	392.60
Video application sales, USDmn	1,262.10	1,245.70	1,188.40	1,249.00	1,301.40	1,352.20	1,398.80
Digital camera sales, '000	296.00	239.00	206.00	174.00	162.00	160.00	158.00

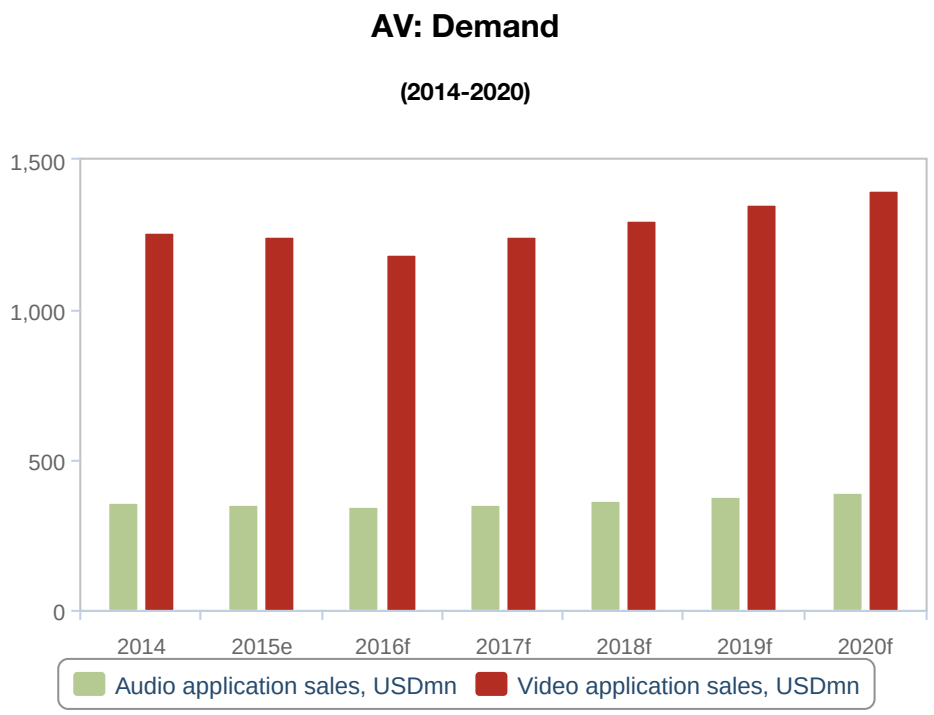
e/f = estimate/forecast. Source: BMI

We forecast AV spending will contract by 4.4% in US dollar terms in 2016 as a result of rial depreciation, which will erode household purchasing power for imported devices. We expect further rial depreciation over the medium term due to the weak oil price outlook, reducing the windfall from the easing of sanctions, but a combination of easier market access, low LCD/LED penetration and pent-up replacement spending will support a stronger CAGR of 4.0% over 2016-2020 to USD1.8bn in 2020.

Market Trends

The sector currently remains restricted by the small scale and fragmented nature of the retail channel, but there is progress. For instance, Maadiran Group has made significant investment in domestic production facilities and it claims to have the largest single consumer electronics manufacturing facility in the region.

Iran's AV devices market is dominated by multinational brands such as Sony, Samsung, **Sharp**, LG and **Toshiba**. Maadiran is becoming an important player via its expanded manufacturing facilities 80km outside Tehran. High tariffs on some products and the trade embargo have allowed local manufacturers to gain a foothold in the market. It is likely that this will change, however, once the sanctions are lifted. The regional competitive landscape has evolved over the last two years, with Samsung moving into a strong position across a range of product groups including plasma and LCD TV sets, LCD monitors, micro hi-fi and DVD recorders.



e/f = estimate/forecast. Source: BMI

TV Sets

The TV set market is served primarily by imports in Iran after a sharp decline in 2007, and a shallower trend of reduced production to 2011 (latest available data). As a result economic trends, including rial performance against the US dollar, will be important in determining volume growth dynamics through affordability. Our Country Risk team for Iran forecasts that depreciation over 2016-2020 will be a drag, but this trend is expected to weaken in the later years of our forecast, while the easing of sanctions should increase supply and competition, meaning less of the price increase will be passed onto consumers. There is also potential for prices to fall further should Iran's high tariff regime for consumer electronics devices be ratcheted down, though this is not a prospect on the short term and is likely to be determined by the revenues received from Iran's return to the global oil market.

One positive is the decision by the government to launch a process of migration from analogue to digital broadcasting. This should stimulate a rise in TV set purchase rates as well as boost demand for set-top boxes. TV sets will be the main driver of AV category sales growth over the forecast period as consumers

upgrade and trade their old models for digital. Taking these trends together we forecast an LED/LCD TV set volume CAGR of 4.9% to 877,000 in 2020.

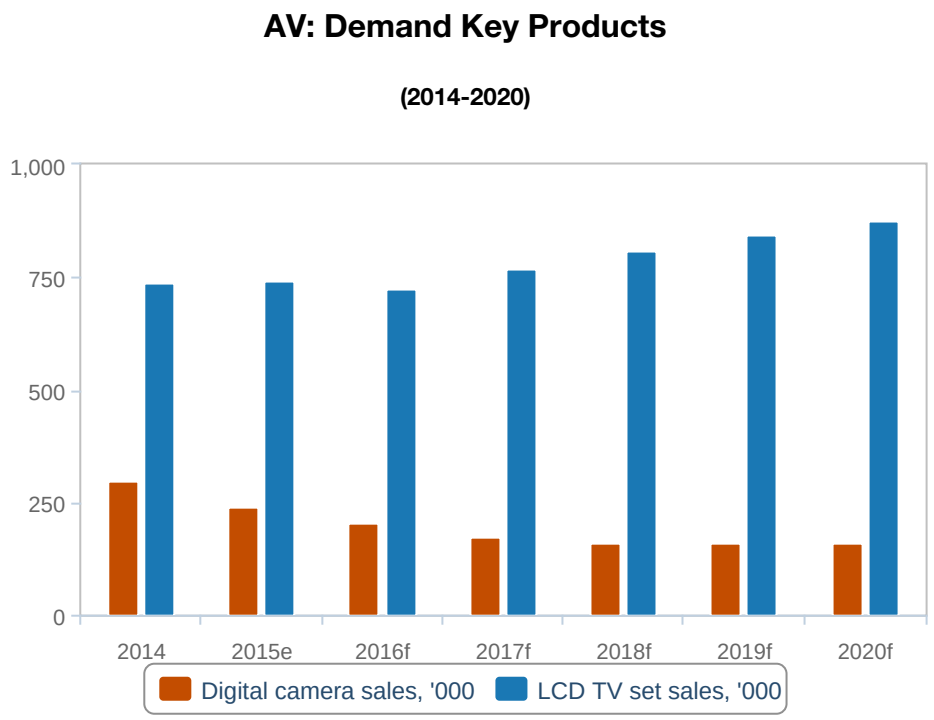
To try and maintain sales volumes, TV set vendors will also focus on product innovation, with drivers including improved display quality and wider screens, as well as design and features such as wireless technology. Regional vendors placed a lot of expectation on LED TVs to drive revenue, as LCD TV prices declined, although demand for LED sets has thus far been limited to high-end consumers.

The leading local TV set manufacturer is Maadiran Group, which in 2006 launched its X-Vision brand. The company claims it is now the third largest LCD TV brand in Iran. Samsung was understood to have claimed top spot in the LCD TV set market ahead of main multinational rivals Sony, LG, **Philips** and Sharp. In Iran, Samsung has built success on localisation of production, marketing and sales activities, as well as brand building, such as its 'silk carpet' campaign, which emphasises the slim size of its LED TV set.

In the Middle East Sony is estimated to have a 15-20% share, while LG and Sharp have around 10%. Samsung and LG placed a lot of expectation on LED TVs, although demand was limited to high-end consumers initially. The launch of local digital TV should benefit sales.

The emergence of the LCD TV market opportunity has prompted a range of consumer electronics vendors, including Sony, Sharp, **BenQ**, **Nikai**, LG and **JVC**, to negotiate new distribution deals or strengthen existing ones to expand their presence in Iran. In 2010 Sharp launched an LCD TV assembly plant in Iran, in partnership with Maadiran Group, though data show little boost to production in 2011 (latest available data).

Sony has already established a service centre in Iran. JVC established a liaison office in Tehran to provide marketing support to local partners and planned to further boost its presence through establishing its own network of retail outlets. According to the company, Iran was already its most significant single market in the Middle East.



e/f = estimate/forecast. Source: BMI

Digital Cameras

Elsewhere in the AV market, digital cameras are forecast to sell at 239,000 units in 2015. The medium-term outlook for sales of digital cameras is weak due to downside of consumers choosing to settle for the camera on their smartphone, and as such we forecast a CAGR of -6.4% 2016-2020 to 158,000 units in 2020.

Audio Devices

Revenue from audio devices was estimated at around USD357mn in 2015 and is expected to rise to USD393mn within the forecast period, with home theatre systems accounting for the largest share of revenue. The soundbar market is one opportunity, though it will rely on LED/LCD set upgrades as a driver of demand, and is likely to be heavily concentrated in the highest income consumer segment.

Game Consoles

We expect the Sony PlayStation3 to be the number one gaming console in the region, with **Nintendo** Wii and **Microsoft** Xbox the other major players. The release of next generation games consoles from Sony and Microsoft in late 2013 could have been expected to boost the market; however, the availability in Iran is restricted and, as such, the release was not a factor affecting our forecast.

Mobile Handsets

Table: Mobile Communications (Iran 2014-2020)

	2014	2015e	2016f	2017f	2018f	2019f	2020f
Mobile handset sales, USDmn	3,672.98	3,686.52	3,930.20	4,074.30	4,462.00	4,690.00	4,888.00
Smartphone sales, USDmn	1,421.00	1,667.00	2,350.00	2,628.00	3,153.00	3,328.00	3,503.00
Mobile handset sales, '000	32,652.60	32,498.90	34,214.00	35,101.70	35,659.50	35,867.50	36,226.20
Smartphone sales, '000	4,650.40	6,001.00	9,245.80	12,080.70	15,012.30	16,732.40	17,762.60

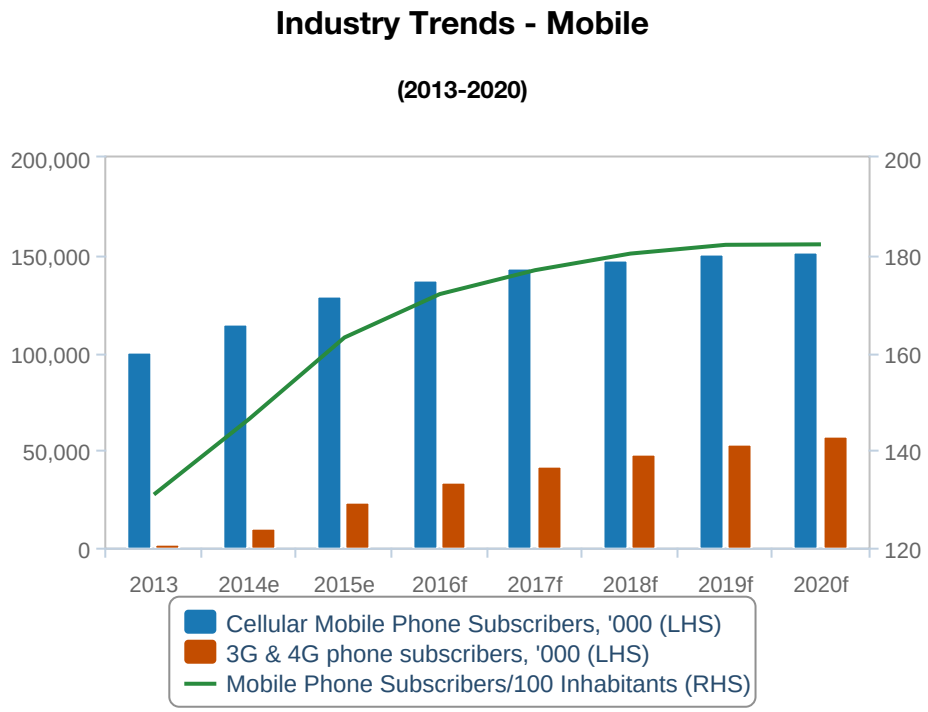
e/f = estimate/forecast. Source: BMI

Iran's handset segment is forecast to outperform in 2016 and over the medium term to 2020. As a result of sanctions the smartphone penetration rate is relatively low, estimated at 36% of adults aged 16 and older at YE15, and this informs our bullish outlook. There remains considerable potential for market value growth as 2G handset users upgrade to smartphones, which will drive up the average selling price of total handset sales even as smartphone prices decline - with further upside if high import tariffs are scaled back over the medium term. This bullish outlook should be measured against downside should supply remain restricted, and the squeeze on affordability from rial depreciation against the US dollar.

Mobile Subscription Trends

Our outlook still sees growth slowing over the forecast period through a rationalisation of multi-SIM ownership, but we still expect growth due to relatively low levels of handset ownership in rural areas. We forecast a CAGR of 2.5% over 2016-2020 to a total of 152mn in 2020, for a penetration rate of 182.2%. There is uncertainty however, as the majority of these subscriptions are pre-paid, it is likely that there will be periods of inactive SIM discounting.

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. We estimate there were around 23.2mn 3G subscriptions in Iran at the end of 2014, which will grow to over 49.4mn by the end of 2020.



e/f = BMI estimate/forecast. Source: Operators, BMI, Amar

Overall Handset Market

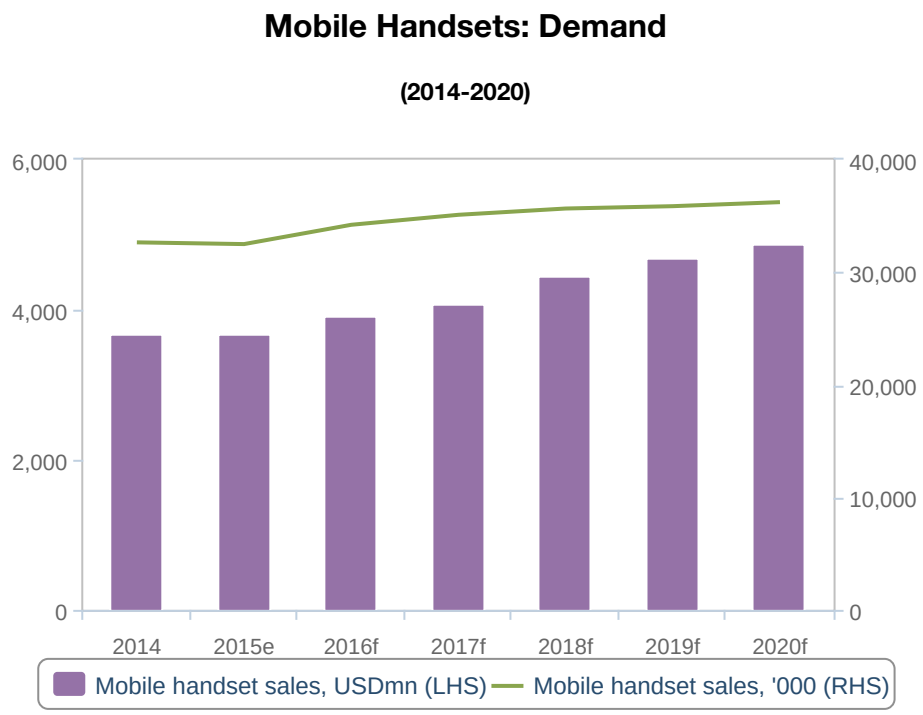
We estimate total handset sales of almost USD3.69bn in Iran in 2015, with growth of just 0.4% from 2014 as a large share of sales still came from overseas via informal channels after sanctions were only lifted in 2015. Rial depreciation will be a less significant factor in the handset segment, and the easing of sanctions will outweigh the squeeze on affordability by catalysing the formalisation of retail channels. The largest contribution to the expanding market is expected to come from the premium segment where Iranians have been most likely to acquire devices internationally. **BMI** forecasts total handset spending will grow at a CAGR of 5.6% over 2016-2020 and reach a total of almost USD4.9bn in 2020.

The weighting of new users towards lower income rural areas will mean a continuation of the downward trend in handset prices. Mobile handsets are readily available from city kiosks at prices of USD20-50. Many of these models come with an equivalent value of call credits, meaning they are in effect free to consumers. Moreover, in rural areas, around 10,000 rural communication centres have been set up, offering local people inexpensive or free access to communications.

There does however remain a major impediment to market development in the more than 50% import tariff on handsets into Iran, which has the effect of reducing the affordability of handsets and pushing consumers towards the black market. The easing of sanctions will have an impact on the growth trajectory of the handset market, but **BMI** argues that optimism about the growth dividend must be tempered against the ongoing operational and political challenges.

In the face of sanctions on consumer electronics imports, Iran sought to make up the deficit by increasing local production and this could prove to be a constituency resistant to an easing of the tariff on handset imports. In the year to March 2012, Iran was expected to manufacture around 5mn handsets, according to local industry estimates, equivalent to around a quarter of the estimated local market. **Hamrah Gooya Aryand Communication Company**, which sells handsets under the GLX brand, has reported an annual production capability of 1.8m units. Contrasting this data were reports in January 2015, from Ministry of Industries and Mines official Abbas Hashemi, that Iran was producing only around 1.5mn mobile handsets a year.

In 2007, LG started producing handsets in Iran in partnership with the Maadiran Group. The agreement was shrouded in secrecy, but Maadiran said it had begun producing five models of handsets under licence from LG. Maadiran had been a long-term distributor for LG. LG's motives for entering the market likely included avoiding the steep tax on imported handsets and the opportunity presented by the Iranian market as relatively un-penetrated by the major rival brands. LG said that it planned to produce 2mn handsets a year, with some exported to other markets in the Middle East.

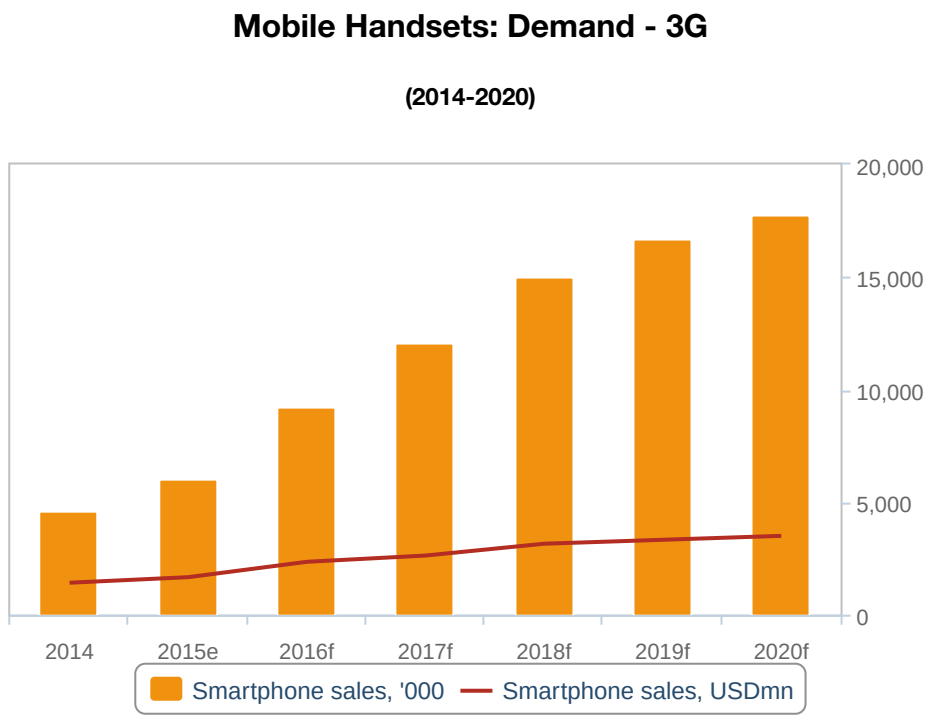


e/f = estimate/forecast. Source: BMI

Smartphones

BMI expects smartphone volume growth to remain strong over the duration of our forecast period, reaching 17.8mn devices sold in 2020 - corresponding to a CAGR of 17.7% over 2016-2020. Growth will be underpinned by both growing sales associated with a deepening of the market and the formalisation of replacement/upgrade sales that were previously acquired from overseas. In addition to increasing volumes, wireless data services will increasingly be used as mobile infrastructure is put in place, encouraging demand for smartphones in the mass market.

While many Iranians have been able to find iPhones and other popular products through specific retailers, abroad or on the black market, the establishment of formal distribution networks should help bring down the cost of these devices, in turn supporting greater demand. The development of 3G and 4G networks in the market is likely to drive further growth in the segment, as operators look to increase data usage amongst their customers. Smartphone revenue is expected to grow at a CAGR of 10.5% to USD3.5bn in 2015, driven by the replacement market and the shift to higher value featurephones and smartphones.



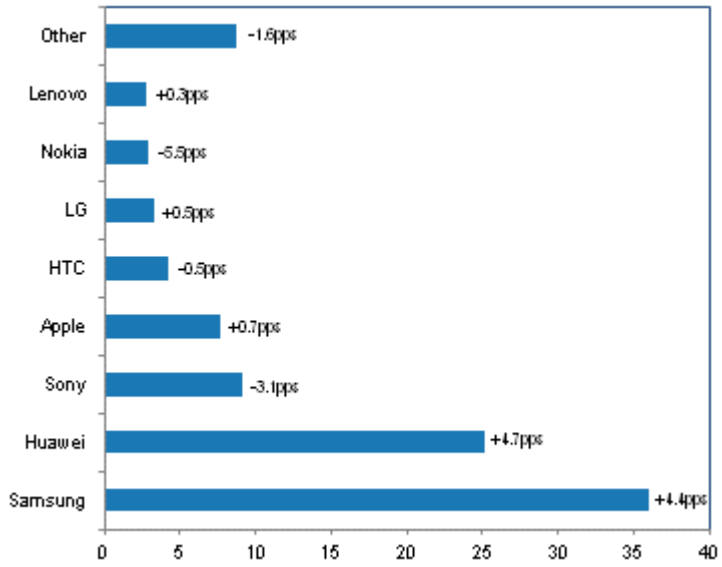
e/f = estimate/forecast. Source: BMI

Nokia has traditionally been the top selling brand in Iran, with a share estimated as high as 60%, but as smartphone supply has increased it has fallen away in line with global and regional trends. Nokia primarily lost out to Samsung, but also emerging leaders of the smartphone market such as LG, **HTC** and most recently **Huawei**, as well as local producers. Statcounter illustrates the fall of Nokia, which has seen its share of browsing traffic decrease to just 2.9% in January 2016, down 5.5pp y-o-y.

Samsung and Huawei have emerged as the clear leaders in Iran's smartphone market, with a lead in terms of installed base and sales growth outperformance inferred from browsing traffic data. Samsung has established itself as the market leader, although browsing traffic data does not reveal the extent to which devices have been acquired officially or from overseas, with a 36.1% share of Iranian mobile browsing traffic in January 2016. It was marginally outperformed in the 12 months to January 2016 by Chinese vendor Huawei, which recorded a 4.7pp increase in mobile browsing traffic, but remained over 10pp behind Samsung at 25.2%.

Samsung And Huawei Coming To Dominate Smartphone Market In Iran

Iran Mobile Browsing Traffic By Vendor (%) And y-o-y chg, January 2016



Source: Statcounter

Industry Trends And Developments

BMI View: *Iran's consumer electronics market stands out in the Middle East as being less reliant on imported finished devices than any other, with a significant share of demand served through local assembly with imported parts. The industry, and market, have however been disrupted over the past five years by sanctions and economic pressures, but with the nuclear agreement struck in 2015 there is hope that the industry and market will strengthen over the medium term.*

Electronics Trade

The Middle East relies on the import of finished consumer electronics devices, and Israel is the only market in the region with a sizeable domestic industry, which is concentrated in high-value components, though Iran does have a large local assembly industry in a regional context. This means the Middle East is primarily a final destination for devices and on the periphery of global supply chains, but there is also intra-regional trade, particularly through the use of the UAE as a regional re-export hub by vendors. Iran had been a key destination for re-export, as well as the UAE acting as a shopping destination for wealthier Iranian consumers, but with the phasing out of sanctions these trading relationships are expected to evolve.

For the region as a whole the trade deficit has widened substantially over the past decade as imports doubled 2009-2014. Rising incomes, and so demand for consumer electronics devices, saw spending increase rapidly, first for notebooks and flat-screen TVs, and smartphones and tablet demand increased rapidly after the respective launches of the iPhone and iPad. There was however a sharp downturn in Middle East consumer electronics imports in 2015 evident in preliminary data, reflecting the negative impact of the oil price decline on major economies in the region. There was however also a decrease in exports reported by Intracen, so the data could reflect shifting intra-regional device trade flows, and the extent to which these factors are responsible will become clearer once final data is reported for key markets in the region.

Table: Middle East Consumer Electronics (CE) Trade, 2009-2014

	2009	2010	2011	2012	2013	2014
Middle East CE Total Trade Balance (USDmn)	-14,131	-21,012	-29,324	-30,107	-31,862	-33,881
Middle East CE Total Exports (USDmn)	7,903	9,135	9,879	9,162	10,705	9,334
Middle East CE Total Imports (USDmn)	22,034	30,146	39,203	39,270	42,568	43,214

Source: Intracen, BMI

Data for Iran's consumer electronics trade reflects the impact of economic factors over recent years, as well as the limited data coverage due to the sanctions regime. There are however several characteristics and trends evident from data for the past decade. Looking beyond the volatility resulting from sanctions, Iran has consistently run a trade deficit for consumer electronics and the value of imports has increased markedly. The local market is served by both imported finished devices and local assembly, with the latter served by the import of parts and components that almost tripled over 2010-2014 (latest official data). The presence of sizeable local assembly operations makes Iran standout in the Middle East, but it has not had any success in the export of devices, and assembly is almost entirely geared towards serving domestic demand. The data also show some trends in terms of products, and the source of imports under a shifting sanctions landscape *(see Regulatory Development section for more details)*. For instance, South Korea stands out as a major exporter to Iran, particularly for TV set parts and mobile handsets, but this was only the case in 2014 and a sharp change from 2010-2011 when the vast majority of total consumer electronics imports came via the UAE. China is another exporter that recorded major gains, again with TV set parts the main product category, but the UAE continued to be a major trading partner for finished devices such as mobile PCs (notebooks and tablets) and mobile handsets.

Table: Iran Consumer Electronics (CE) Trade, 2010-2015

Trade Balance (USDmn):

	2010	2011	2012	2013	2014	2015*
Computer Hardware	- 869	- 1,110	na	na	- 688	- 189
CE Components	- 95	- 122	na	na	- 204	- 214
AV	- 229	- 374	na	na	- 213	- 571
Telecommunications Devices	- 5	- 74	na	na	- 279	- 177
CE Parts	- 338	- 787	na	na	- 1,019	- 239
CE Total	- 1,537	- 2,466	na	na	- 2,402	- 1,390

Exports (USDmn):

	2010	2011	2012	2013	2014	2015
Computer Hardware	4	2	na	na	1	1
CE Components	0	0	na	na	2	1
AV	2	1	na	na	2	1
Telecommunications Devices	0	-	na	na	0	1
CE Parts	0	1	na	na	3	1
CE Total	6	5	na	na	7	6

Iran Consumer Electronics (CE) Trade, 2010-2015 - Continued						
Trade Balance (USDmn):						
CE As % Of National Exports	*0.0*	*0.0*	na	na	*0.0*	*0.0*
Imports (USDmn):						
	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Computer Hardware	873	1,112	na	na	688	190
CE Components	95	122	na	na	206	215
AV	231	375	na	na	215	572
Telecommunications Devices	5	74	na	na	279	179
CE Parts	338	788	na	na	1,022	240
CE Total	1,543	2,471	na	na	2,410	1,395
CE As % Of National imports	*2.8*	*3.6*	na	na	*4.5*	*3.2*

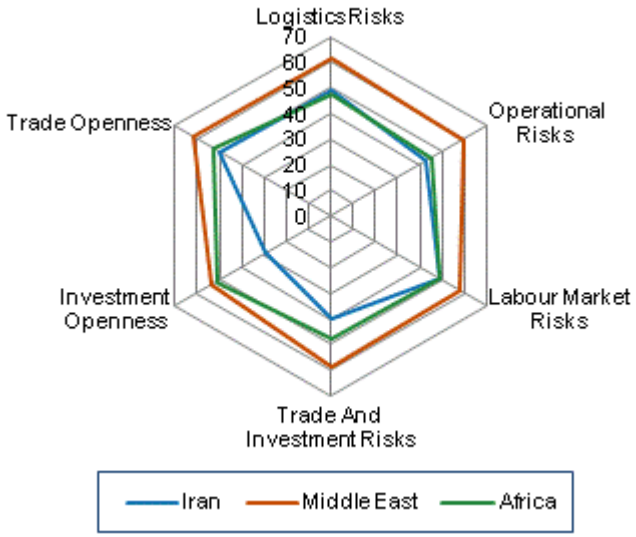
**2015 figure an Intracen estimate. na = not available. Source: Intracen, BMI*

Operational Risk And Government Policy

Iran does not score well compared to its peers in **BMI**'s Operational Risk indices for the consumer electronics industry. The business environment is very challenging, and economic risks and sanctions only added to the weak risk profile facing vendors operating in Iran. As a result, it scores substantially below the Middle East average in all Operational Risk categories, and is also below the African average by most measures. Some positives, for instance wage competitiveness versus the Gulf Cooperation Council (GCC) markets and Iran's strong output of technical graduates do exist, but these are offset by the high risks and the high cost and long time of container import and export that is substantially above the regional average.

Iran Operational Risk Scores In Regional Perspective

2016



Source: BMI

Despite the serious operational challenges for the consumer electronics industry, a combination of sanctions and very high import tariffs has resulted in the development of a local assembly operation in order to serve what is a potentially large domestic market. This has made Iran the leading assembler of consumer electronics devices in the Middle East, though output is only for domestic consumption and there has been no success in growing exports. The role of local assembly in meeting consumer demand is evident in the fact consumer electronics parts accounted for 1.9% of total national imports in 2014, a figure that was more than twice as high as any other Middle East market.

While large in a regional context the electronics industry has been hurt by Iran's hostile international relations over the course of several decades and fallen behind in the global race. In the 1970s, Iran had an emerging electronics industry that was occasionally compared to South Korea, but as the latter surged to become a global leader, Iran's industry development stalled as most electronics firms were reoriented towards military applications and put under the supervision of the Defence Industries Organisation.

Since 2000 however there was a reorientation towards the domestic consumer electronics market for computer hardware, AV and mobile handsets. Organisations with a military backgrounds (and some

continuing operations) such as **Pars Electric Manufacturing** and **Iran Electronics Industries** compete with international vendors (mostly from Asia), and the leading local assembler (for instance for **LG Electronics**) and distributor **Maadiran**. The main decision factors for these companies have been the growing local market, reduced competition from US rivals and a desire to avoid heavy import taxes.

Industry Breakdown

Computer Hardware

Iran does not have a large and globally integrated computer hardware assembly industry, but local assemblers occupy a significant role in the Iranian PC market, particularly for desktops and monitors, that was carved out as sanctions stymied the development of global operations and retail channels. The industry is however much smaller than AV assembly which has much greater scale in TV set assembly operations. One vendor that does stand out is Maadiran that reported annual production of 1.2mn tablets, 800,000 monitors and 60,000 printers in 2015 - and counts Epson, AOC and HP among its partners brands.

There is potential for the end of sanctions to lead to an intensification of competition from global PC brands and squeeze out local assembly that is mostly small scale. However, the rescinding of sanctions is not a panacea for vendors hoping to tap the potential of Iran's PC market as tariffs are very high, making imports of finished devices uncompetitive in the price sensitive mass market. The prospect of tariffs being reduced or eliminated are mixed, because local assembly is reported to have a political voice and will be resistant to changes that undermine their existing market position.

AV

Iran's AV industry is the largest scale and most technologically advanced, and there are several agreements between global brands and local assembler Maadiran Group. National production capacity grew in scale and sophistication until a peak output of 845,982 TV sets in 2003, according to government data, but there was a decline in output as domestic economic conditions and external political relations hurt operations. The government has not produced output data since 2011, but from figures for imports of computer parts we infer the TV set assembly industry has moved back onto a stronger footing. Trade data show TV set parts accounted for 29% of total consumer electronics imports in 2011 - and then 36% in 2014, which was almost double the share from 2010.

The leading local TV set manufacturer is Maadiran Group, which in 2006 launched its X-Vision brand, and is a top five LCD TV brand in Iran. In 2015 it reported a total LCD, LED and Smart TV set annual

production capacity of 400,000 units, along with 1.6mn DVB-T set top boxes. A key part of its business is assembly for global brands, dating back to a 2005 deal with **LG Electronics**, while in 2010 **Sharp** launched an LCD TV assembly plant in Iran in partnership with Maadiran.

Mobile Handsets

Mobile handset production is a government priority but remains small in relation to the size of the market and the local industry has been less successful than both computer hardware and AV. In the year to March 2012 local industry reports stated national handset production capacity was around 5mn handsets, with **Hamrah Gooya Aryand Communication Company**, which sells handsets under the GLX brand, accounting for 1.8mn units. However, the industry appears to have weakened considerably in the past five years and in January 2015 a statement from Ministry of Industries and Mines official Abbas Hashemi put national production at only around 1.5mn mobile handsets a year.

Regulatory Development

Table: Regulatory Bodies

Ministry	Minister
Ministry of Information and Communications Technology	Mahmoud Vaezi
Ministry of Science, Research and Technology	Mohammad Farhadi
Ministry of Industry, Mines and Trade	Mohammad-Reza Nematzadeh

Source: BMI

Five-Year Plan

Information and communication technology (ICT) had a central role in Iran's national development plan, but the development of the electronics industry is not one of the strategic goals listed by the Ministry of Industry, Mines and Trade. ICT initiatives will nonetheless support device spending through plans for increasing internet users, telephone subscribers and mobile subscribers and these have the potential to drive the market for electronics devices. The government also wants to encourage the development of electronic services such as e-government, e-health, e-commerce and e-learning. Various cooperation projects have been launched between the Ministry of ICT and other relevant departments.

Tariffs

Iran has some of the highest tariff rates for electronics in the Middle East, and globally. Intracen data for 2013 show computer hardware faced an average tariff rate of 4.9% in 2013, but the average applied rate was much higher at 19.9%. Components received the most favourable treatment, with the average tariff faced at 5.5% and applied rate at 9.6%, which we believe results from exemptions offered for assemblers operating in Special Economic Zones (SEZs) in Iran. Meanwhile, AV had the highest level of tariff faced at 12.4%, applied at an average of 23.8% - but it was telecommunications that were subject to the highest applied rate at 34.1%.

There is a long history of high tariffs in Iran, for instance in 2006 Tehran imposed a 60% tariff on imported handsets, a sharp raise from just 4% previously, though the rate was subsequently lowered to 25% in 2009 in an attempt to reduce the flow of smuggled. The government has long imposed high taxes on many other, although not all, consumer electronics goods and home appliances. Vendors must also pay an additional

10% surcharge when using foreign shipping companies. Although not a viable option for most vendors during the sanctions era, one solution is to invest in local production to take advantage of incentives offered in SEZs, while continuing to distribute those products for which import tariffs are lower.

Sanctions

The supply of consumer electronics was restricted during the sanctions era, but devices were still widely available due to the multi-layered web of distribution channels in the Middle East, particularly through re-export from Dubai, which supplied up to 90% of the consumer electronics products on sale in the country during the sanctions era. US vendors were the most restricted, particularly in comparison to Asian rivals that had fewer inhibitions as the most recent international sanctions did not include restrictions on sale of electronics goods and as a result direct exports from South Korea and China expanded markedly.

In May 2013, the US eased sanctions on communications hardware and software, which were first imposed in 1992, allowing US-based companies to sell mobile handsets, computers, and software to individuals. Despite US consumer electronics companies' increased ability to compete with their dominant Asian counterparts, many have yet to expand operations into the country. The period of US embargo and strength of feeling means there were brand reputation constraints, for instance **HP** received criticism following reports of the mass availability of its printers in Iran through distributor **Redington**.

In July 2015, the market moved into a post-sanctions era with the Iranian nuclear agreement that paved the way for the return to growth of the Iranian economy and the reopening of a crucial market. Practically all economic sanctions on Iran were lifted by the beginning of 2016 and only sanctions on arms sales and missile deliveries, as well as sensitive nuclear related items, will remain in place for longer. However, we caution against excessive optimism. Even with the gradual relaxation of sanctions, operational and political hurdles remain for foreign companies looking to tap into the Iranian market, for instance it was reported in 2016 that companies were moving back into Iran, but largely without the assistance of Western banks that remain cautious.

The nuclear deal has even resulted in a shifting stance by even US vendors. For instance, in July 2015 it was reported that **Apple** was already in talks with Iranian distributors regarding the creation of a network of premium resellers in Iran - in a similar structure to the one it operates in South Korea. However, with a degree of uncertainty remaining around sanctions easing and the complexity of compliance, it has been suggested that a deal could take a long time to come to fruition.

Digital Broadcasting Migration Under Way

Iran launched its digital migration in 2010 and in 2011 state broadcaster Voice and Vision announced that three new channels would be launched by the end of the year using digital systems. The capital cities of all provinces were to be equipped with digital transmitters. At the time of writing, digital antennas have so far been installed in Ardabil, Namin and some parts of Raza'I, Nir and Meshkinshahr.

The reform also continued to be implemented at a local level. Officials in West Azarbaijan Province launched several projects that provided residents of Orumieyeh Township with 15 digital TV and 10 digital radio channels. A total of 750,000 residents of the province were reportedly able to watch a wide selection of digital channels. Another project was aimed at making 180 transmitters operational to provide 348,985 residents of 12 townships of the province with access to more digital channels. As of August 2011, it was reported that 17 provinces of Iran had been provided with the services.

In October 2013, the deputy head of the Islamic Republic of Iran Broadcasting announced the Iranian state broadcaster planned to launch eight new satellite TV channels by early 2014.

Iranian Leadership Divided Over Internet Controls

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 was 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. In September 2014, it was reported that Iran's Prosecutor General Gholam-Hossein Mohseni-Eje'i was looking to ban applications such as **WhatsApp**, **Tango** and **Viber** because of their 'criminal content', following 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. Iran's judiciary ordered the government to ban access to over-the-top IP voice and messaging applications in January 2015, but the following month President Hassan Rouhanis vetoed the plan to ban WhatsApp.

The Iranian government is willing to negotiate with internet firms such as Facebook, Twitter and **Google** and allow them to operate in the country if they respect its cultural rules and policies, according to Deputy Telecommunications and Information Technology Minister Nasrollah Jahangard speaking in March 2015. 'We are not opposed to any of the entities operating in global markets who want to offer services in Iran,' said Jahangard, as quoted by the Fars News Agency. The minister further stated that the government was also ready to provide facilities to the companies in order to enable them to provide their services in the region.

Competitive Landscape

Due to sanctions imposed by the US and its allies in Iran, the country's consumer electronics market is very different from most in that it includes a large grey market. Aside from the three major supermarket chains, **Carrefour** spin-off **Hyperstar** and local **Refah** and **Shahrvand**, **BMI** understands that the large majority of electronic devices in Iran are sold in small shops owned by individual traders. In Tehran most of these shops are concentrated in the Capital Computer Complex, where more than 350 traders sell devices to an increasingly tech-savvy population. According to the CEO of **RadanMac**, despite US sanctions, by 2013 there were around 100 unofficial **Apple** retailers operating in Tehran. These individual merchants source their products through underground trade routes, either directly from Hong Kong, Singapore and Malaysia, or via Dubai or Turkey.

Retail Sector

Gulf Cooperation Council (GCC) retailers were reported in H115 to be preparing to launch operations ahead of the expected deal around Iran's nuclear program. Dubai retailers have been well served by the dependence of Iranian consumers demanding US vendor products, or those using US components, and as spending patterns change they are looking to capture new business within Iran. Consumer electronics retailer **Emax** is reported to be planning to enter the market, while supermarket brand **Al Maya Group** is also reportedly looking at options for expanding into Iran.

Iran remains dominated by diffuse networks of small retailers, which acts as an impediment to channel development. In the UAE and even in the smaller GCC countries, more organised retail outlets such as hypermarkets and specialist electronics stores have come to account for around 40-60% of sales. A recent development has been the growth of big box retailing associated with 'power retailers' such as **Sharaff**. There is hope, however, of more structure in the retail channel. Three larger government-owned retailers, **Refah**, **Ekta** and **Shahrvand**, have expanded their consumer electronics ranges and offerings. Some consumer electronics vendors, such as **JVC,** have outlined plans to launch their own networks of retail outlets in Iran in conjunction with local distribution partners.

International

Table: Hyperstar	
Address	Shahid Sttari Boulevard, Tehran; and Sepidan Street, Shiraz
Company history	Hyperstar launched in Iran in 2009 and is a hypermart based on Carrefour's model. The Hyperstar chain was established by Dubai-based Majid al-Futtaim (MAF) which is Carrefour's franchisee in the Middle East. Hyperstar was the first large supermarket chain to open in Iran. When the first location opened in Tehran, MAF reported that the store had an average of 10,000 visitors a day. In 2013 MAF stated on its website that there were three Hyperstar superstores in Iran, of which one was in Tehran and another in Shiraz. The company currently has 59 retail outlets.
Products and services	Based on the Carrefour model, Hyperstar sells everything from food, to home decoration, clothing and electronics. In the electronics section, Hyperstar sells large and small home appliances, audiovisual equipment, PCs (including tablets) cameras and mobile handsets. Hyperstar sells both local and international consumer electronics brands, such as Dell, LG, Sony, Samsung and Iranian brand Pars.
Company developments	▪ In 2012 MAF Hyperstar LLC sold its operations in Iran and Syria to its parent company, MAF Capital LLC. This followed net losses of AED143.5mn for its Iranian operations during the year ended December 2012, down from net profits of AED49.9mn the previous year. The sharp decline in profit was likely due to inflation of the Iranian rial and foreign exchange losses. ▪ In May 2013 MAF Holdings bought out Carrefour Group's 25% share of MAF Hypermarkets LCC for EUR530mn (USD716mn) and extended its exclusive franchise partnership with the French company until 2025. ▪ Press reports in early 2016 reported that Hyperstar had an approximate 20-30% same-store-sales growth rate in the first five years of operations.

Source: Hyperstar, BMI

Local

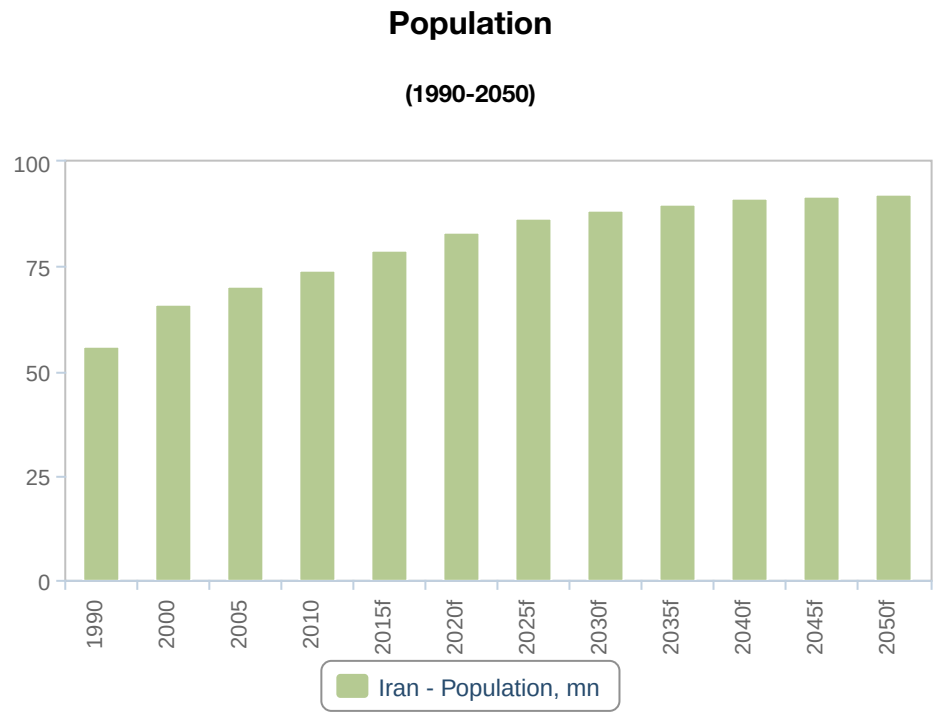
Table: Refah Chain Stores Co	
Address	RCS Head Office, 19 Shahid Sarparast St, West Taleghani Ave, Felestine Square, Tehran
Company history	Refah is a supermarket chain established in 1995 with some 160 branches throughout the country. Though smaller than hypermarkets such as Hyperstar, Refah is based on a similar model and sells everything from food to cosmetics, clothing, textiles, household appliances and consumer electronics. Refah also has an online store.
Products and services	In the consumer electronics section Refah sells televisions, computers, notebooks, cameras, printers, fixed-line telephones and other audiovisual equipment. Refah sells local brands and international electronics brands, such as Sony, Panasonic, Sharp, Samsung and LG. Refah does not advertise the sale of mobile phones on its website, but these may be available in store.

Source: Refah Chain Stores Co, BMI

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.

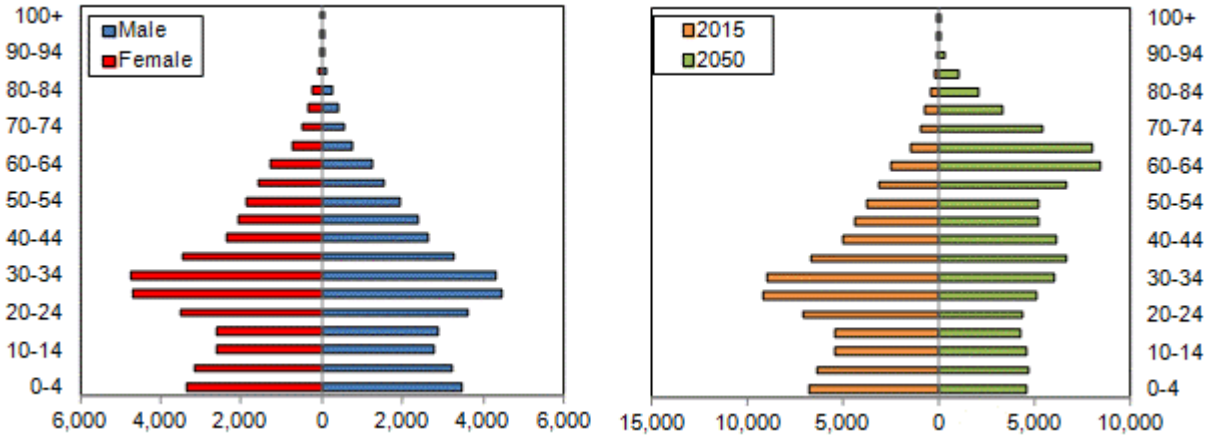
The accompanying charts detail the population pyramid for 2015, the change in the structure of the population between 2015 and 2050 and the total population between 1990 and 2050. The tables show indicators from all of these charts, in addition to key metrics such as population ratios, the urban/rural 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	56,169	65,850	70,122	74,253	79,109	83,403	86,496
Population, % y-o-y	na	1.7	1.2	1.2	1.2	0.9	0.6
Population, total, male, '000	28,617	33,372	35,796	37,542	39,835	41,940	43,439
Population, total, female, '000	27,551	32,477	34,325	36,710	39,274	41,463	43,057
Population ratio, male/female	1.04	1.03	1.04	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	28,800	40,064	48,413	53,171	56,428	58,737	61,495
Active population, % of total population	51.3	60.8	69.0	71.6	71.3	70.4	71.1
Dependent population, total, '000	27,368	25,785	21,709	21,081	22,681	24,665	25,000
Dependent ratio, % of total working age	95.0	64.4	44.8	39.6	40.2	42.0	40.7

Key Population Ratios (Iran 1990-2025) - Continued

	1990	2000	2005	2010	2015f	2020f	2025f
Youth population, total, '000	25,492	23,011	18,251	17,418	18,677	19,449	18,237
Youth population, % of total working age	88.5	57.4	37.7	32.8	33.1	33.1	29.7
Pensionable population, '000	1,876	2,773	3,457	3,662	4,003	5,216	6,763
Pensionable population, % of total working age	6.5	6.9	7.1	6.9	7.1	8.9	11.0

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

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

	1990	2000	2005	2010	2015f	2020f	2025f
Urban population, '000	31,640.1	42,171.7	47,373.1	52,442.2	58,046.4	63,173.8	67,253.7
Urban population, % of total	56.3	64.0	67.6	70.6	73.4	75.7	77.8
Rural population, '000	24,529.1	23,678.4	22,749.0	21,811.2	21,062.8	20,229.5	19,242.9
Rural population, % of total	43.7	36.0	32.4	29.4	26.6	24.3	22.2
Life expectancy at birth, male, years	61.6	69.2	70.4	72.5	74.5	75.1	75.8
Life expectancy at birth, female, years	66.3	71.1	73.5	75.5	76.7	77.4	78.1
Life expectancy at birth, average, years	63.8	70.1	71.9	74.0	75.6	76.2	76.9

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, '000	9,346	6,379	5,494	6,402	6,855	6,228	5,197
Population, 5-9 yrs, total, '000	8,885	7,598	5,556	5,472	6,395	6,836	6,213
Population, 10-14 yrs, total, '000	7,260	9,034	7,200	5,543	5,426	6,384	6,826
Population, 15-19 yrs, total, '000	5,775	8,781	9,299	7,136	5,478	5,407	6,365
Population, 20-24 yrs, total, '000	4,674	6,868	9,123	9,148	7,086	5,434	5,369
Population, 25-29 yrs, total, '000	4,031	5,269	6,796	8,996	9,158	7,026	5,388
Population, 30-34 yrs, total, '000	3,506	4,419	5,156	6,759	9,045	9,096	6,979
Population, 35-39 yrs, total, '000	3,005	3,864	4,670	5,140	6,738	8,988	9,044
Population, 40-44 yrs, total, '000	2,123	3,344	4,091	4,580	5,029	6,688	8,931
Population, 45-49 yrs, total, '000	1,621	2,832	3,393	3,920	4,454	4,979	6,629

Population By Age Group (Iran 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 50-54 yrs, total, '000	1,527	1,930	2,776	3,227	3,813	4,384	4,906
Population, 55-59 yrs, total, '000	1,393	1,431	1,767	2,631	3,124	3,723	4,286
Population, 60-64 yrs, total, '000	1,140	1,322	1,336	1,629	2,497	3,009	3,594
Population, 65-69 yrs, total, '000	899	1,145	1,258	1,193	1,475	2,338	2,828
Population, 70-74 yrs, total, '000	508	826	1,055	1,054	1,009	1,299	2,075
Population, 75-79 yrs, total, '000	269	509	654	780	785	776	1,015
Population, 80-84 yrs, total, '000	136	203	347	413	477	494	502
Population, 85-89 yrs, total, '000	49	67	113	174	194	232	249
Population, 90-94 yrs, total, '000	11	18	22	40	54	63	79
Population, 95-99 yrs, total, '000	1	2	3	5	7	10	12
Population, 100+ yrs, total, '000	0	0	0	0	0	0	1

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	16.64	9.69	7.84	8.62	8.67	7.47	6.01
Population, 5-9 yrs, % total	15.82	11.54	7.92	7.37	8.08	8.20	7.18
Population, 10-14 yrs, % total	12.93	13.72	10.27	7.47	6.86	7.66	7.89
Population, 15-19 yrs, % total	10.28	13.34	13.26	9.61	6.93	6.48	7.36
Population, 20-24 yrs, % total	8.32	10.43	13.01	12.32	8.96	6.52	6.21
Population, 25-29 yrs, % total	7.18	8.00	9.69	12.12	11.58	8.42	6.23
Population, 30-34 yrs, % total	6.24	6.71	7.35	9.10	11.43	10.91	8.07
Population, 35-39 yrs, % total	5.35	5.87	6.66	6.92	8.52	10.78	10.46
Population, 40-44 yrs, % total	3.78	5.08	5.84	6.17	6.36	8.02	10.33
Population, 45-49 yrs, % total	2.89	4.30	4.84	5.28	5.63	5.97	7.66
Population, 50-54 yrs, % total	2.72	2.93	3.96	4.35	4.82	5.26	5.67
Population, 55-59 yrs, % total	2.48	2.17	2.52	3.54	3.95	4.46	4.96
Population, 60-64 yrs, % total	2.03	2.01	1.91	2.19	3.16	3.61	4.16
Population, 65-69 yrs, % total	1.60	1.74	1.79	1.61	1.87	2.80	3.27
Population, 70-74 yrs, % total	0.90	1.25	1.51	1.42	1.28	1.56	2.40
Population, 75-79 yrs, % total	0.48	0.77	0.93	1.05	0.99	0.93	1.17
Population, 80-84 yrs, % total	0.24	0.31	0.50	0.56	0.60	0.59	0.58

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	0.25	0.28	0.29
Population, 90-94 yrs, % total	0.02	0.03	0.03	0.05	0.07	0.08	0.09
Population, 95-99 yrs, % total	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Population, 100+ yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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

Methodology

Industry Forecast Methodology

BMI's industry forecasts are generated using the best practice techniques of time-series 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, which 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.

We mainly use 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. **BMI** mainly uses 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.

BMI uses the selected best model to perform forecasting.

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

Consumer Electronics forecasting is complicated due to the fragmented nature of the market, with little transparency of vendor data and low apparent agreement between many sets of figures in terms of market definition, base and methodology. Individual variables taken into account in creating each forecast include:

- Economic context, and GDP and demographic trends;
- Technological developments, and diffusion rates;
- Underlying demand trends;
- Telecommunications market developments
- Projected GDP share of industry;
- Maturity of market structure;
- Regulatory developments and government policies;
- Exogenous events.

Estimates for each industry segment are calculated using government statistics, where available, and our own macroeconomic and demographic forecasts.

Sources

Sources used in electronics reports include national ministries, statistics agencies, ICT regulatory bodies, national industry associations, officially released company results and figures and international and national industry news.

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.

BMI's approach in assessing the risk/reward balance for infrastructure industry investors globally is fourfold:

- First, we identify factors (in terms of current industry/country trends and forecast industry/country growth) that represent opportunities to would-be investors;
- Second, we identify country and industry-specific traits that pose or could pose operational risks to would-be investors;
- Third, we attempt, where possible, to identify objective indicators that may serve as proxies for issues/ trends to avoid subjectivity;

Finally, we use **BMI**'s proprietary Country Risk Index (CRI) in a nuanced manner to ensure that only the aspects most relevant to the infrastructure industry are incorporated. Overall, the system offers an industry-leading, comparative insight into the opportunities/risks for companies across the globe.

Sector-Specific Methodology

In constructing these indices, the following indicators have been used. Almost all indicators are objectively based.

Table: Consumer Electronics Risk/Reward Index Indicators
Rewards
Industry Rewards
Consumer electronics sales, USDmn
Sales per capita, USD
ICT development
Growth, %
Country Rewards
Urban/rural split
Young population
Richest 10%, % of total
GDP per capita, USD
Risks
Industry Risks
Barriers to entry
Government consumer electronics policies
Country Risks

Consumer Electronics Risk/Reward Index Indicators - Continued
Short-term economic risk
Real PC growth, volatility
Short-term financial risk
Trade bureaucracy
Institutions

Source: BMI

Weighting

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

Table: Weighting Of Indicators

	Weighting (%)
Rewards	70, of which
Industry Rewards	65, of which
Consumer electronics sales, USDmn	50
Sales per capita, USD	16
ICT development	16
Growth, %	16
Country Rewards	35, of which
Urban/rural split	25
Young population	25
Richest 10%, % of total	25
GDP per capita, USD	25
Risks	30, of which
Industry Risks	40, of which
Barriers to entry	10
Government consumer electronics policies	10
Country Risks	60, of which
Short-term economic risk	10
Real PC growth, volatility	10
Short-term financial risk	10

Weighting Of Indicators - Continued	
	Weighting (%)
Trade bureaucracy	10
Institutions	10

Source: BMI