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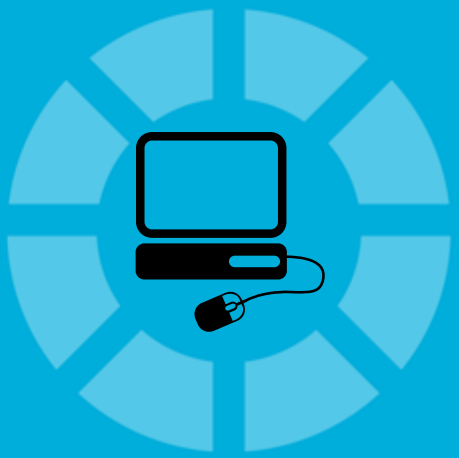
TURKEY

INFORMATION TECHNOLOGY REPORT

INCLUDES 5-YEAR FORECASTS TO 2019



ISSN 1752-4334
Published by:BMI Research

Turkey Information Technology Report Q4 2015

INCLUDES 5-YEAR FORECASTS TO 2019

Part of BMI's Industry Report & Forecasts Series

Published by: **BMI Research**

Copy deadline: July 2015

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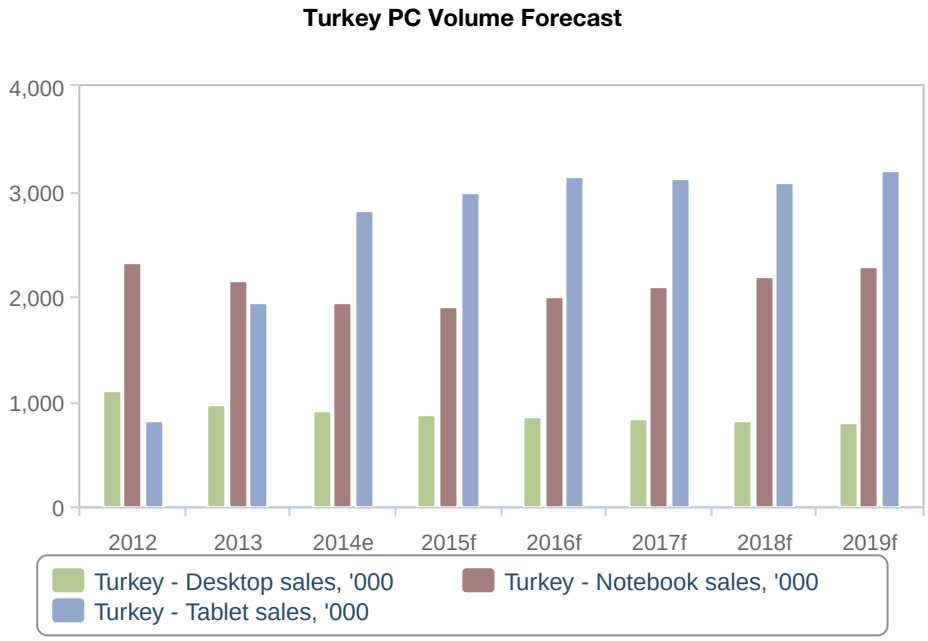
BMI Industry View

BMI View: *We downgraded the growth outlook for Turkey's IT market in 2015 in the Q4 update in response to a more bearish lira outlook by our Country Risk team - which we expect to be a drag on growth through the erosion of purchasing power in global markets. Over the medium term however our core scenario for Turkey is bullish. We expect a convergence of income growth, declining device prices, inward investment and domestic private and public sector modernisation initiatives to drive demand growth. However, there exists significant downside risk from both the vulnerability of the economy to shocks due to a reliance on external financing, the growing concerns over the domestic political situation and the potential for security threats to spillover from neighbouring Syria. Internet censorship is a growing characteristic of the Erdoğan administration and could put off some investors from investing in internet start-ups, while an escalation of the eurozone crisis or a hard landing in China could derail growth.*

Headline Expenditure Projections

- **Computer Hardware:** TRY11.768bn in 2014 to TRY12.812bn in 2015, +8.9%. A more bearish outlook for lira depreciation resulted in downgrade in the Q4 update, while proposed customs duties could result in a further downgrade to the tablet growth outlook.
- **Software:** TRY2.121bn in 2014 to TRY2.439n in 2015, +15.0%. Consumer software spending will remain flat in 2015, but we expect enterprise resource planning spending will grow, particularly among small- and medium-sized enterprises as the software-as-a-service market deepens.
- **Services:** TRY2.946bn in 2014 to TRY3.439bn in 2015, +16.7%. We identify strong prospects for cloud computing growth as telecoms operators invest in infrastructure and service development, but regulatory challenges continue to act as a bottleneck to faster growth of cloud services spending.

PC Volume Dynamics Could Be Disrupted By New Customs Duties



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

SWOT

IT SWOT

Turkey IT Industry SWOT Analysis

Strengths	▪ Strategic location with European as well as Asian influences, making it an ideal testing ground for fresh IT initiatives, particularly as logistics operations strengthen over the medium term. ▪ Government policy framework supportive of ICT development with financial support and other initiatives. ▪ Turkey's population of nearly 76mn at YE2014 is relatively young, meaning demographic changes should contribute to retail hardware demand growth. ▪ Extensive reach of wireless and wireline broadband infrastructure, with ongoing investments by telecoms operators.
Weaknesses	▪ Considerable imbalances among regions and genders in IT awareness. ▪ Turkey has a great deal to catch up with in terms of establishing the soundness of its economic fundamentals if it hopes to compete with its EU peers. ▪ Deficit in supporting infrastructure for cloud services, for instance in terms of server penetration rates in the context of other emerging European markets.
Opportunities	▪ Istanbul financial centre is positioned for strong growth through 2015-2019, which should yield high value opportunities for vendors. ▪ Government investment in modernising public institutions including e-government projects and the target for technology to re-engineer and modernise the agricultural sector. ▪ Government commitment to introducing technology in education with the FATIH tender for tablets to be distributed to schoolchildren from 2013. ▪ Increased local presence of global IT companies in fields of hardware, peripherals, software, system integration and consultancy services.

Turkey IT Industry SWOT Analysis - Continued

- Turkey's Teknopark in Istanbul is expected, by the government, to generate revenues of to USD10bn after completion later in this decade.
- Expanding ecosystem of local software developers and companies, with state support available for expansion.

Threats

- Adoption of Pardus (a Linux distribution) operating system by public sector could squeeze software sales.
- Targeted electronics import tariffs could spillover to PC segment, raising prices and squeezing demand.
- Political turbulence could shake investor and business confidence, including sector specific threats such as government intervention in social media sites, with Twitter and YouTube both blocked in the run-up to elections in 2014.
- Security risk spillover from the conflict in neighbouring Syria.
- Downside risks from economic uncertainty, with a reliance on external financing still a cause for concern.

Political

SWOT Analysis

Strengths

- Turkey maintains a military alliance with the US, which has consistently supported the country in multilateral institutions such as the IMF. The country's NATO membership is a strong deterrent to external security threats.
- In contrast to some other Muslim states, the strong traditions of secularism and the gradual entrenchment of parliamentary democracy limit the appeal of extremist groups.

Weaknesses

- There has been no resolution to the decades-old conflict over the partition of Cyprus - a key impediment to deeper EU integration.
- Kurdish desire for autonomy or separatism - which could be encouraged by Kurdish groups' push for autonomy in northern Syria Iraq - presents a threat to stability and political reform.
- Political divisions between moderate Islamists and secularists are a constant source of tension that has frequently delayed the policymaking process in the past.
- Turkey's support for the Muslim Brotherhood and attempts at extending its foreign policy influence in the region has resulted in strained diplomatic relations with Israel, Egypt, Iraq and Syria, among others.

Opportunities

- Turkey has sought rapprochement in its long-strained ties with Cyprus, Iran and Armenia.
- A peace process with the militant Kurdistan Workers' Party (PKK) remains in play, which if seen to completion would offer a significant peace dividend.
- The ruling AKP party lost its absolute parliamentary majority in June 2015 elections for the first time since 2002, and a move towards consensus building and coalition politics has the potential to strengthen the independence of Turkey's institutions and ease social tensions.

SWOT Analysis - Continued

Threats

- Security risks from Kurdish separatist militants and anti-government organisations remain a concern in Turkey, especially in the south-eastern part of the country.
- There is a significant risk that Turkey could face reprisal from Islamic extremists if it chooses to take a more active role in the fight against the Islamic State in Iraq and Syria.
- Divisions between the moderate Islamist government and secular institutions pose serious threats to the policy agenda.
- After 13 years of policy continuity under the AKP, uncertainty has risen following the June 2015 general election, with any coalition to be inherently unstable.

Economic

SWOT Analysis

Strengths

- Economic reform has broad political support.
- Turkey enjoys a strategic geographic location and an open and increasingly liberal trade and investment climate.
- A young and rapidly growing population provides a key element of robust long-term growth potential.

Weaknesses

- Reliance on short-term foreign capital inflows and borrowing from abroad presents a danger to economic stability by leaving Turkey susceptible to capital flight during periods of tightening global liquidity or risk aversion.
- A structural current account deficit, driven by Turkey's massive energy import needs, implies that economic rebalancing will proceed at a sluggish pace in the coming years.

Opportunities

- Despite a lack of progress in the EU accession process, Turkey is still a major convergence play for investors.
- Structural reforms and continued privatisations will increase the opportunities for investors

Threats

- Monetary policy credibility and independence from government influence has recently been called into question.
- A significant reduction in public debt in the past decade has coincided with a rapid increase in private debt, with much of the borrowing sources from abroad.
- Regional instability has contributed to increased sectarian hostility towards the government with sporadic incidence of violence along border regions with Syria. Instability in Syria or Iraq, or domestic (or regional) terrorism could lower investor confidence and cap much needed fixed investment levels.

Operational Risk

SWOT Analysis

Strengths

- Turkey offers one of the largest and youngest labour markets in Europe.
- Turkey's maritime trade network is the best-connected in the region, with the country benefitting from strong links to international shipping routes.
- There are 19 free trade zones, in which investors benefit from a number of tax incentives.
- Turkish security forces have received extensive training by US counter-terrorism experts. As a result, Turkish security services have highly developed counterterrorism capabilities. Foreign workers and businesses benefit from a relatively safe operating environment.

Weaknesses

- Severance pay packages in Turkey are the most expensive in the region.
- Road-based supply chains face long delays due to traffic congestion, particularly in the city of Istanbul.
- Turkey has the highest profit tax in the region, which decreases profit margins.
- Turkey is exposed to the Syrian civil war and the expansion of the Islamic State (IS) in Iraq, especially in the southern border regions.

Opportunities

- Specialised secondary schools have the potential to provide pupils with dedicated knowledge before attending university.
- Investment in railway and road infrastructure will alleviate congestion and improve cross-border trade links.
- The e-commerce sector is set to benefit from expanding internet penetration rates.
- Turkey's long-standing membership of NATO reduces the probability of the country being victim to external attack.

SWOT Analysis - Continued

Threats

- The informal labour market is likely to continue negatively impacting the efficiency of the formal sector.
- Mismanagement of the country's vast water reserves means that water availability is likely to become a pressing issue.
- Turkey will remain on the US Special 301 Watch List for increased intellectual property rights violation risk for 2014.
- Concerns over the impact of cyber crime are increasing, and there is no specific legislation to address it at present.

Industry Forecast

Table: IT Industry - Historical Data And Forecasts (Turkey 2012-2019)

	2012	2013	2014e	2015f	2016f	2017f	2018f	2019f
IT market value, TRYmn	13,624.1	14,983.7	16,835.7	18,689.3	20,743.3	23,006.3	25,412.8	27,997.3
Computer hardware sales, TRYmn	9,775.3	10,541.0	11,768.1	12,811.5	14,032.8	15,356.7	16,734.3	18,184.2
Personal computer sales, TRYmn	7,986.4	8,612.0	9,608.7	10,454.2	11,443.8	12,515.7	13,630.1	14,802.0
Software sales, TRYmn	1,600.8	1,895.4	2,121.3	2,439.0	2,872.9	3,278.4	3,723.0	4,213.6
Services sales, TRYmn	2,248.0	2,547.2	2,946.2	3,438.8	3,837.5	4,371.2	4,955.5	5,599.5
IT market value, % of GDP	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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

BMI considers the Turkish IT market to have many positive features including relatively low device and solution penetration, a robust economic growth outlook and modernisation initiatives in the public and private sectors. This should support strong medium term IT market demand growth, but there is also downside risk that threatens market disruption. We caution that the economy continues to be vulnerable to economic shocks through a reliance on external financing, while current account weakness downside has most recently manifested in proposed customs taxes on electronics imports. Finally, political risk remains elevated following domestic unrest in 2014 and the introduction of internet legislation, which has been criticised in some quarters but has had little impact on inward investment or sentiment.

Although there is downside risk in our core scenario regarding declining device and solution prices, rising incomes and public and private sector modernisation initiatives will drive demand growth through to 2019. **BMI** forecasts a compound annual growth rate (CAGR) of 10.7% in local currency terms 2015-2019, with total spending expected to reach almost TRY28bn in 2019. It should, however, be noted that as a result of our in-house Country Risk team's forecast for lira depreciation against the US dollar, we forecast a significantly lower CAGR of 3.4% in US dollar terms 2015-2019.

2015 Outlook

BMI made a small downward revision to the IT market growth outlook for 2015 in the Q4 update to reflect the negative impact of lira depreciation against the US dollar. Our in-house Country Risk team for Turkey now forecasts depreciation from an average of TRY2.2/USD in 2014 to TRY2.7/USD in 2015, which resulted in a downgrade of our IT forecast to growth of 11% to TRY18.7bn in 2015. Meanwhile, in US dollar terms we forecast a contraction of 8.4% in 2015 as Turkish purchasing power is eroded in global markets, resulting in deferred purchases and substitutions for lower priced alternatives.

Aside from the impact of depreciation the economic growth story is positive in Turkey, including broad-based income growth, government ICT initiatives and enterprise modernisation. Meanwhile, on the supply side a wave of investments by multinational sector players - including **Apple**, **SAP** and **Hewlett-Packard** - underlines the positive medium-term story in Turkey and its emerging position as a regional IT hub.

There is, however, downside risk in the form of the political unrest arising from AKP division and public protests in 2014; with the government interfering in web services, including temporary bans on **YouTube** and **Twitter** on several occasions since 2014 particularly concerning. There is also the security aspect of said downside risk, with the potential for further negative spillover from the conflicts in Syria and Iraq.

Finally, **BMI** highlights the potential downside of the government's targeting of electronics trade as a means by which to strengthen its current account and reduce reliance on external financing. In July 2015, Turkey's Economy Minister Nihat Zeybekci stated that a customs tax, expected in the range of 10-15%, will be implemented in Turkey - with additional details scheduled to be released in Q315. The government hopes to raise an additional TRY1bn (USD370mn through the measure), which is expected to apply to smartphones, PCs and tablets, but not larger electronics devices such as TV sets. Once details become available in the second half of 2015, we expect to revise down the growth forecast for tablets and potentially traditional PC form factors if covered by the customs increases.

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

Our core scenario for Turkey is one of strong economic growth: in a country with traditionally low PC penetration, continued opportunities for vendors will be ensured, especially in the Anatolian hinterland where penetration is below 50%, compared with about 66% in Istanbul. The fact that there is considerable deficit in PC penetration in the country even though there have been significant rises in the standard of living, presents a huge market opportunity for vendors. Regional and gender imbalances in computer access provide a precise definition of the market opportunity. Meanwhile, government informatisation initiatives, such as the FATIH project to supply tablets to schools, will also drive penetration rates higher.

BMI believes accelerating adoption of cloud services will be a key trend in the Turkish IT market in 2015. The market profile of Turkey provides just the right environment for cloud computing to thrive with a relatively low penetration of on-premises enterprise software deployments, rapidly improving networking infrastructure and cost-conscious enterprises undertaking modernisation and expansion. However, the relative weakness in terms of supporting infrastructure is a bottleneck to growth and further, it should be noted that cloud computing will in part cannibalise revenues that may have otherwise accrued to software and hardware sales, but we expect the lower cost of services will ultimately deepen the market and expand demand.

Drivers

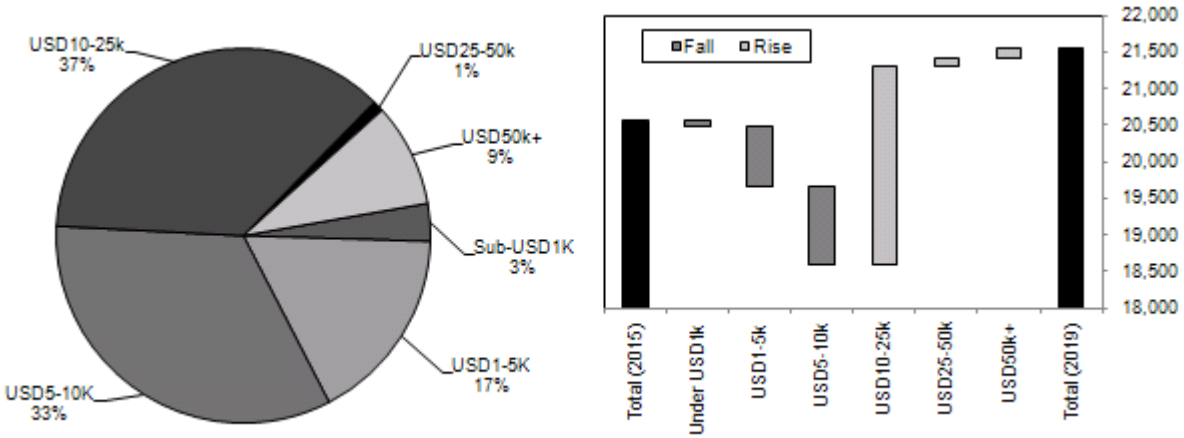
A key dynamic for our bullish outlook for IT market growth in Turkey is the strength of the underlying economic growth story, in contrast to much of the rest of the region, although with downside risk from a reliance on external financing that leaves the economy vulnerable to external shocks. **BMI**'s in-house Country Risk team for Turkey forecast real GDP growth to average 3.6% annually through 2015-2019, with slightly weaker private final consumption growth forecast to average 2.5%, with lira weakness weighing on the outlook. Nonetheless, robust income growth will ensure the retail market will be a medium-term source of growth, as vendors will be able to target first-time household PC buyers, as well as the upgrade/ replacement market as incomes rise and consumer confidence is strong. There are also regional and gender balances in computer ownership, allowing marketers to focus their efforts on this untapped, yet affluent, segment.

BMI's income stratification forecasts provide additional insight to retail hardware spending dynamics. We forecast that per capita income will grow fastest in percentage terms among the poorest 20% and middle 60% of the population to 2019; however, in absolute terms it will be the richer segments of society that gain the most over the medium term. We believe that this income growth for the richest 20% in Turkish society will be a boon for premium focused vendors such as Apple, which opened its first direct retail outlet in Istanbul in 2014 to tap this income growth trend as it has done globally.

Our retail hardware market analysis is supplemented by the introduction of our household income forecast for 2015-2019. The data illustrate Turkey's position as a middle income market in 2015, with only 20% of households with incomes below USD5,000 - the level **BMI** considers the threshold for IT market participation, with sub-USD5,000 households lacking sufficient purchasing power in global markets. The mass market profile is forecast to improve over the medium term, with large-scale migration of households to higher income bands (*see chart below*).

Turkey Household Income Distribution (%) LHS And Change ('000) RHS

2015f (LHS) & 2015-2019f (RHS)



f = BMI forecast. Source: BMI, national sources

BMI highlights the investment taking place by telecoms operators in wireless and wireline data networks as another driver of retail demand for PCs. Coverage continues to be expanded across Turkey, mostly driven by the incumbent **Türk Telekom**; however, around 10 alternative operators are also putting resources into their own fibre network. According to the regulator, as of 2014, Türk Telekom has 192,671km of fibre optic infrastructure, where 123,858m is used for backbone and the remaining used for access. Alternative operators have fibre optic infrastructure of 52,801km, with **Superonline**, **Vodafone Net** and **Telnet** among the largest players. Meanwhile, the Turkish regulator will auction 4G licences in May 2015, and we expect the technology will become commercially available before the end of the year.

The impact of network infrastructure upgrades and expansion will also extend into other areas of the IT market, including software in the form of rich media applications and services in the form of complex installations and regular maintenance, cloud computing and potentially machine-to-machine (or Internet of Things) deployments in the latter years of our forecast.

Government modernisation is another medium-term trend that will drive market growth. Government investment in education will be a major growth driver in the short term via the FATIH project, which will trigger large-scale consumption of tablets, associated content, rendering software, back-end connectivity infrastructure and system integration projects. Additional demand will stem from the government's Vision

2023, in which the development of the ICT sector is due to play a large role in accounting for 8% of GDP by 2023.

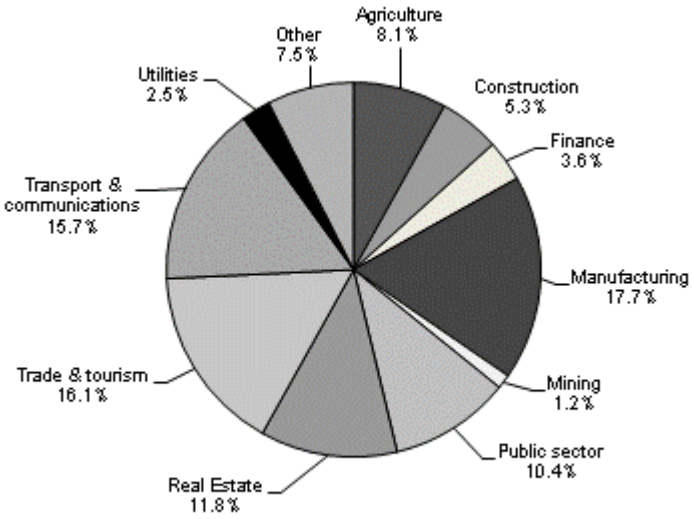
Private sector demand for IT products and services is expected to grow as liberalisation demands greater efficiency and flexibility from Turkish firms. Enterprise software applications including ERP, which need complex and customised installation and maintenance plans, and offer considerable scope for consulting and training services. Cloud computing, bolstered by an array of layered and refined solutions, is believed to have particularly strong appeal to SMEs as they often lack resources for in-house solutions and this method is considered to have a more straightforward use that does not require bespoke solutions.

Sectors

The Turkish economy is quite well diversified, but the principal sector of interest for IT vendors will continue be the government itself, as it is undertaking a far-reaching disinvestment and computerisation programme. The e-transformation of the government departments has multiplied the web-based interfaces of the government with the citizens. These initiatives will create opportunities across the board for IT companies. The government is also investing in defence modernisation, which requires specialised IT support. Further, the FATIH project will have a direct impact on the hardware market.

Turkey GVA Breakdown By Vertical (%)

2015f



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

Finance is traditionally the most overweight IT spending vertical globally - and additional regulatory burden is helping to boost investment levels. Turkey's financial sector is relatively underdeveloped, but it is expected to mature over the medium-term and yield opportunities to vendors. In December 2014, Istanbul reached 47th position in the Global Financial Centres Index, up from 72nd position in 2009. Istanbul is expected to continue its rise, with Z/Yen consultancy forecasting it will rise to 25th position by 2018, aided by the forthcoming EPIAS energy exchange to be integrated into Borsa Instanbul. Meanwhile, the Turkish financial sector is still in the midst of migration to core banking, which will be the key spending area for the finance vertical. There is also a sales opportunity in the mammoth data processing requirement of financial institutions, often in real time and with minimum latency as engagement with global markets intensifies.

Healthcare should also be a significant area of opportunity over the next few years as healthcare organisations seek efficiency improvements and better services. The Health Transformation Project by the Ministry of Health is aimed at an ambitious restructuring of the Turkish healthcare system and has driven an increase in outsourcing of hospital functions.

The outsourcing market has been relatively slow to develop in Turkey, with many local enterprises remaining cautious about loss of control over key processes, while data security concerns also feature prominently. However, **BMI** considers there to be considerable potential for growth over the medium term for the simple reason that business process outsourcing services offer enterprises clear cost savings. **Teleperformance**, a leading global outsourcing provider, estimated a call centre outsourcing market value of USD840mn in 2013, but factoring in in-house services the market was estimated at USD1.50mn.

Finally, the development of the local IT industry will boost market value as government incentives for the development of an innovation ecosystem such as the Teknopark in Istanbul and Bilkent Cyberpark in Ankara, will foster innovation as well as stimulate appetite for IT consumption. The establishment of local manufacturing hubs will also reduce prices and improve availability of relevant models. Increased exposure to industry best practices as a result of efforts to integrate with the EU will emphatically drive home the advantages of employing top of the line IT solutions**.**

Macroeconomic Forecasts

Economic Analysis

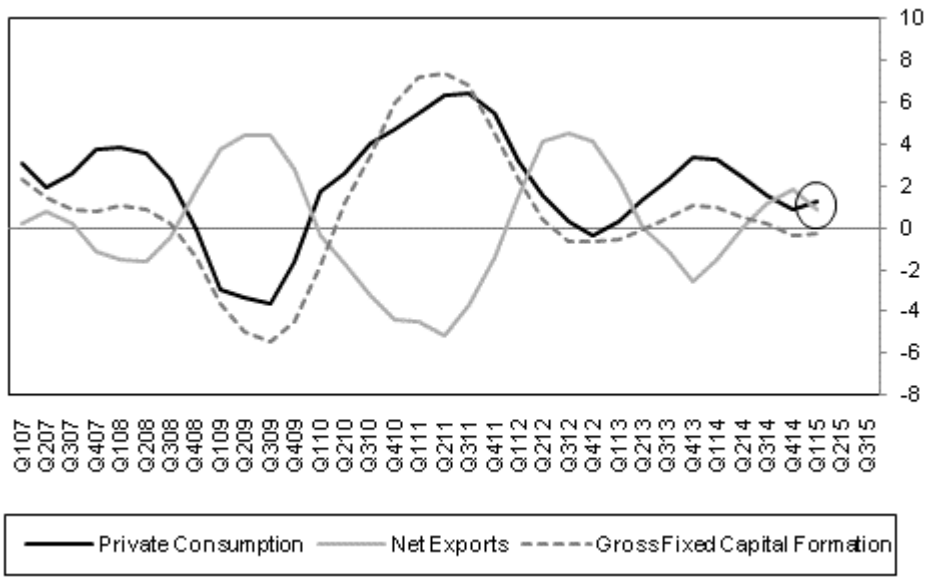
BMI View: *Although the worst case scenario for Turkey's long-term outlook was avoided, the June 7 general election has increased short-term political risks and policy uncertainty, which will undermine potential growth in the coming quarters. We forecast below consensus growth of 2.8% and 3.5% in 2015 and 2016 respectively, and believe a period of slower trend growth is inevitable in the years ahead given the need for external rebalancing.*

Macro Backdrop

Despite Turkish real GDP expanding by an above-consensus 2.3% year-on-year (y-o-y) in Q115, there was a loss of momentum from the previous quarter and, more importantly, the composition of growth highlights the country's macroeconomic imbalances and unsustainable growth model. Private consumption was the main driver of growth, contributing 3.0 percentage points (pp) to the headline figure, while the contribution of investment was flat and net exports subtracted 1.2pp. We have long argued that Turkey is overly reliant on private consumption (68% of GDP in 2014), and that a rebalancing towards higher savings, investment, and exports was necessary to boost long-term growth potential, ease external imbalances and reduce economic volatility.

Private Consumption Driving Growth Again

Turkey - Percentage Point Contribution To Headline Real GDP Growth, 4qma

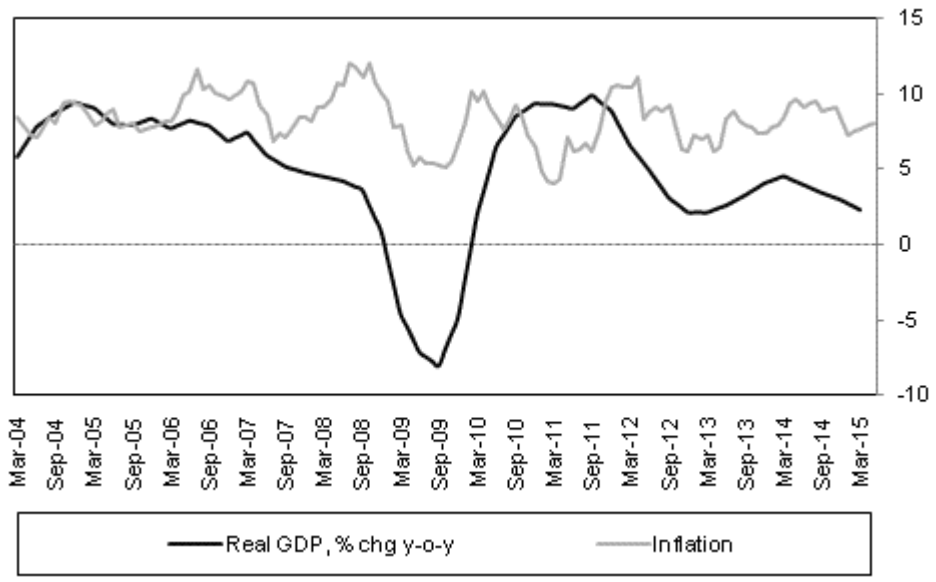


Source: Turkstat, BMI

As it stands, Turkey's externally leveraged growth model continues to entail a trade-off between growth and rebalancing. Strong private consumption, as well as robust domestic credit growth, has helped fuel a massive current account deficit and rising external debt burden, but these will become increasingly difficult to finance as the US approaches a normalisation of monetary policy and the domestic political outlook becomes more unstable. A period of slower trend growth is inevitable even if policy makers resist the necessary adjustment, as they have done in recent years via loose monetary policy and strong support for the construction sector at the expense of manufacturing, among other things.

Stagflationary Backdrop

Turkey - Real GDP, % chg y-oy (4qma) & Consumer Price Index, % chg y-o-y

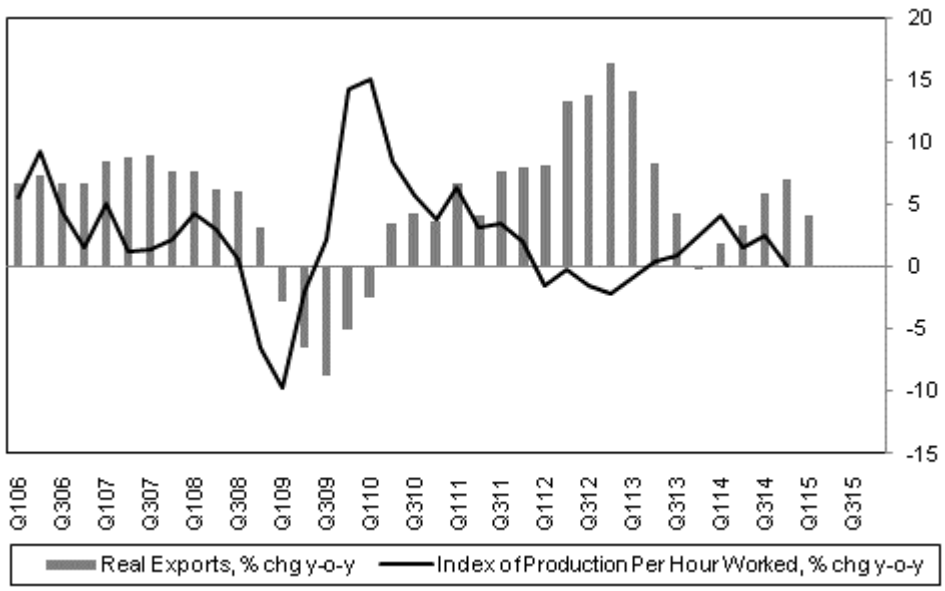


Source: Turkstat, BMI

We have revised down our 2015 and 2016 real GDP growth forecasts for Turkey following the inconclusive general election on June 7, in which the ruling Justice and Development Party (AKP) lost its single party majority for the first in 13 years. This will usher in a newfound period of political uncertainty that will weigh on domestic demand growth, impede effective policy formation and delay further the structural reforms necessary to boost productivity and export growth. Furthermore, we believe monetary tightening will be necessary to maintain foreign investor confidence and fend off rising inflation. From our previous forecast for 3.2% and 3.8% real GDP growth in 2015 and 2016, we now forecast well below consensus growth of 2.8% and 3.6% in those years respectively.

Reforms Needed To Boost Exports

Turkey - Productivity & Real Export Growth, % chg y-o-y



Source: Turkstat, BMI

That said, the election result avoided the worst case scenario for the long-term outlook, which in our view would have been an AKP supermajority able to consolidate power further under President Recep Tayyip Erdogan, and we have not changed our long-term growth forecasts. Significant short-term uncertainties remain, but once the dust settles we believe that a renewed focus on structural reform could emerge within the AKP if its centre of power begins to shift and its policy agenda migrates away from the divisive, narrow, and economically unorthodox platform embraced by Erdogan in recent years.

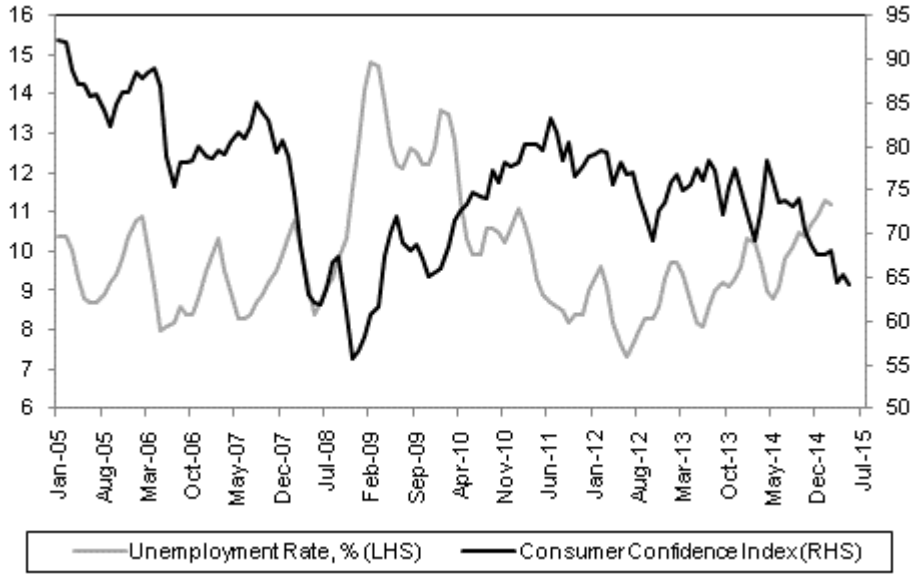
GDP By Expenditure Breakdown

Private Consumption: The strength of private consumption in Q115 was very surprising given broad weakness in other macroeconomic indicators, and we do not believe that the 4.5% y-o-y pace of growth will be maintained. In May the consumer confidence index fell to its lowest level since 2009, when Turkey was in the midst of a deep recession. The downturn in confidence is unsurprising given the steady rise in social tensions leading up to elections, while steady lira depreciation and rising inflation have also undermined sentiment and consumer purchasing power, mitigating potential benefits of lower oil prices. Meanwhile,

growth has not been sufficiently robust to keep a lid on the unemployment rate, which is also running at five year highs. With economic activity to remain below potential and uncertainty prevailing post-election, we do not expect a rapid rebound in either confidence or job creation.

Gloomy Consumer Outlook

Turkey - Consumer Confidence Index & Unemployment Rate

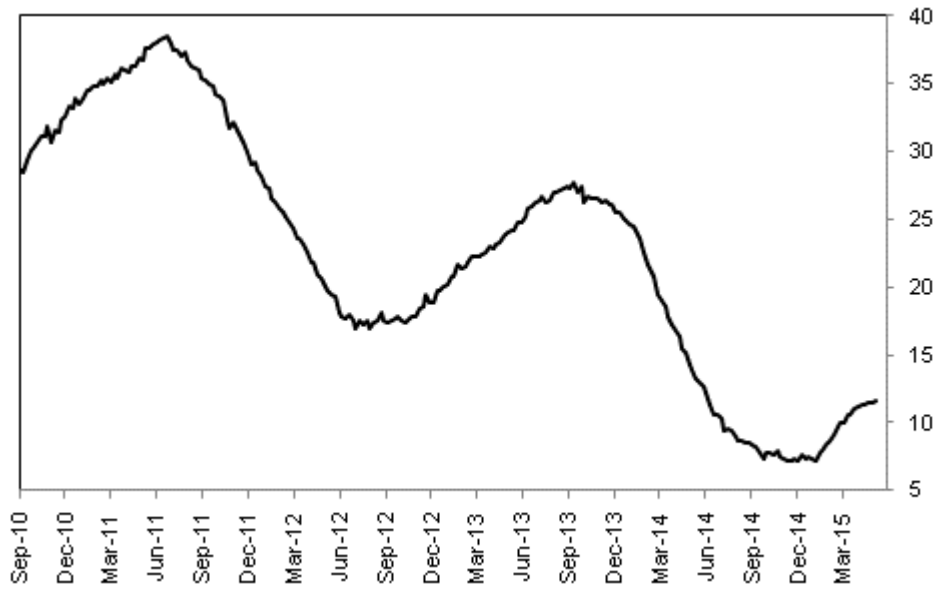


Source: Turkstat, BMI

Relative weakness in consumer credit growth, particularly compared to previous years, is another reason why the Q115 private consumption reading was somewhat of a surprise. Stricter macroprudential regulation of unsecured consumer lending is a significant reason behind the slowdown, and is the most decisive step the government has taken so far in supporting the rebalancing process. Continued weakness in consumer credit also informs our conviction that Q115 rates of private consumption growth will be unsustainable over the remainder of 2015 and into 2016. Nevertheless, private consumption will remain the main growth driver, contributing 1.4pp and 1.5pp to headline GDP growth respectively.

No Return Of Consumer Lending Boom

Turkey - Consumer Loans & Credit Cards, % chg y-o-y



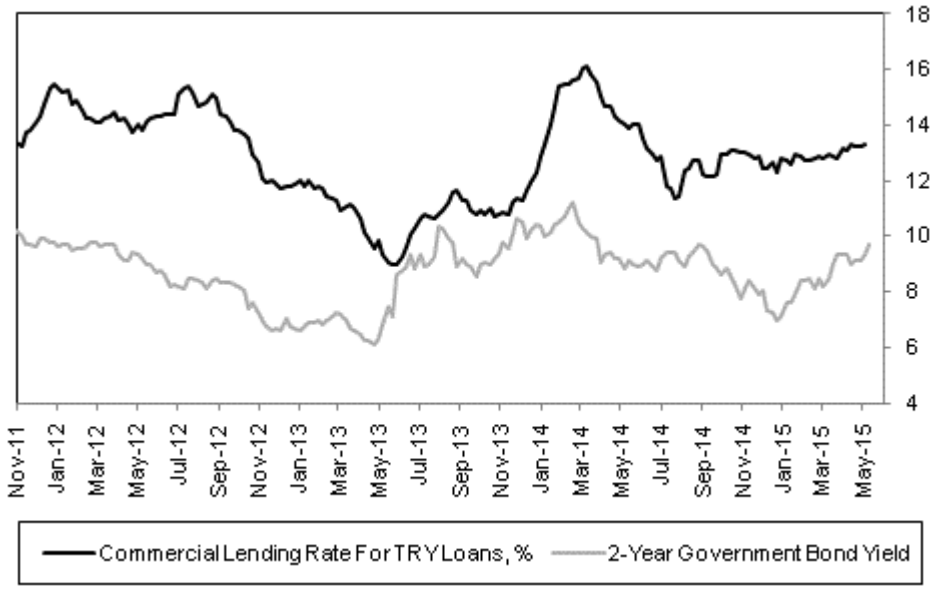
Source: Central Bank of Turkey, BMI

Public Consumption: It is unclear whether a viable coalition can emerge from the June 7 general election, making fresh elections in the coming months a distinct possibility. If a coalition does emerge, however, we believe that all scenarios would entail a commitment to higher fiscal expenditures, although to varying degrees. We have revised up modestly our public consumption forecasts to account for this risk, but acknowledge that the short-term political outlook remains too uncertain to have a firm view on what fiscal policy will look like under the next government. Public consumption will remain a small proportion of GDP, and our forecasts currently imply a contribution of 0.5pp and 0.6pp in 2015 and 2016 respectively.

Gross Fixed Capital Formation: Political uncertainty in the aftermath of the election will be a key impediment to stronger gross fixed capital formation (GFCF), compounding the negative impact of relatively weak export growth, higher borrowing costs and lira depreciation on strained corporate balance sheets. General business confidence has declined in recent months, and a continued lack of clarity on the policy trajectory will preclude a rapid rebound in private fixed investment spending.

Interest Rates Rising

Turkey - Corporate Lending Rate & 2 Year Local Debt Yield, %

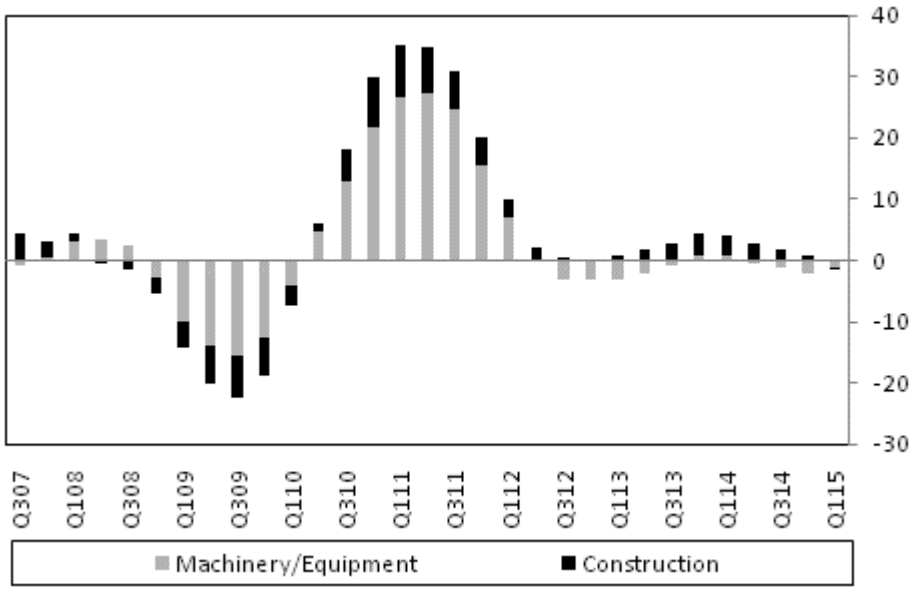


Source: Central Bank of Turkey, Bloomberg, BMI

The non-financial corporate sector holds a net FX short position of approximately 24% of GDP, and the lira has depreciated 32% and 9% against the USD and EUR respectively in the year-to-date. While we believe monetary tightening will support the lira in the coming quarters, we do not expect significant appreciation from spot levels. Meanwhile, we also expect local debt yields to head higher, translating into higher borrowing costs for domestic firms seeking to invest.

Investment At A Stand Still

Turkey - Fixed Investment By Category, % chg y-o-y, 4qma



Source: Turkstat, BMI

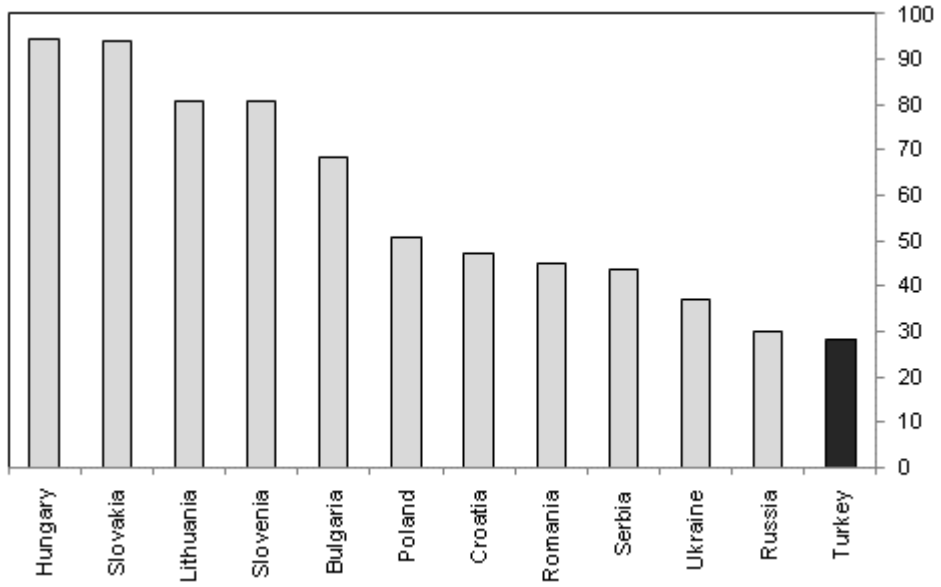
Furthermore, a shift in the balance of power in government could have significant repercussions for the construction sector, whose hefty contribution to headline GFCF growth has already started to wane in recent quarters. This sector has long been championed by Erdogan, who despite having transitioned to the historically ceremonial post of president, has remained the main power broker within the AKP. It is now unclear whether this dynamic will remain in place, or whether overt and implicit government support for major infrastructure and other construction initiatives - such as government debt guarantees - will remain as strong under subsequent governments. This could delay some projects in the coming quarters as investors await further clarity. That said, what Turkey ultimately needs is stronger investment in productive capacity to boost competiveness and export potential in the manufacturing sector. Overall, we forecast GFCF to contribute 0.6pp and 1.0pp to headline GDP growth in 2015 and 2016 respectively.

Net Exports: In spite of the rebound in eurozone growth, export volumes contracted in year-on-year terms in Q115, likely due to ongoing weakness in demand from other key trading partners such as Russia and Iraq, where economic activity is crippled by geopolitical factors. As the eurozone is Turkey's largest market, we do expect export volumes to rebound in the coming quarters and forecast a positive contribution to

growth of 0.3pp and 0.5pp in 2015 and 2016 respectively. While remaining relatively small, this is up from an average contribution of -0.4pp from 2010-2014 and thus represents a significant shift in the structure of growth.

Export Share Small Relative To EM Peers

Exports of Goods & Services, % of GDP, BMI 2015 Forecast



Source: BMI, national sources

Two factors have prevented lira depreciation from translating into stronger competiveness gains. The first is that much of Turkey's trade is denominated in euros and not dollars, but the lira has performed much better against the former, depreciating just 5.5% from 2014 averages based on spot levels at the time of writing. Meanwhile, persistently elevated inflation has eroded potential gains by preventing a stronger correction in the real effective exchange rate. In addition to comprehensive structural reforms aimed at boosting productivity and supporting the manufacturing sector, tighter monetary policy is also needed to aid the rebalancing process and raise exports' share of GDP, which is very low relative to emerging market peers.

Table: Economic Activity (Turkey 2010-2019)

	2010	2011	2012	2013	2014	2015f	2016f	2017f	2018f	2019f
Nominal GDP, USDbn	729.1	772.4	787.1	822.4	799.8	726.6	739.7	786.5	849.9	911.8
Real GDP growth, % y-o-y	9.2	8.8	2.1	4.2	2.9	2.8	3.5	4.0	3.9	3.9
GDP per capita, USD	10,106	10,572e	10,637e	10,975e	10,546e	9,474	9,546	10,054	10,767	11,451
Population, mn	72.1	73.1e	74.0e	74.9e	75.8e	76.7	77.5	78.2	78.9	79.6
Industrial production, % y-o-y, ave	13.1	10.3	2.7	3.0	3.8	4.8	5.0	5.0	4.8	4.3
Unemployment, % of labour force, eop	10.0	8.5	8.8	9.1	10.4	11.0	10.0	9.0	8.5	7.5

e/f = BMI estimate/forecast; Source: National Sources/BMI

Industry Risk/Reward Index

Industry Risk Reward Index

BMI View: *The least mature of Europe's IT markets continue to be battered by weak or negative macroeconomic headwinds as well as the cool political climate surrounding Russia and its key trading partners. In addition, mounting concerns that Greece would default on its substantial debts and exit the eurozone early in Q315 weighed on the region's EU members, regardless of the degree to which they were directly exposed to the situation. Furthermore, having the newly-elected UK government openly mulling a tactical withdrawal from the EU deepened the pall over the region's attractiveness as an investment prospect.*

The 14 European countries surveyed within **BMI**'s IT Industry Risk/Rewards Index achieved an average score of 56.1 points out of possible 100, down by 0.4 points q-o-q. Only one of the 14 achieved an improved score of any note, while a handful saw no changes to their overall scores despite modest downgrades to their Country Risk scores. Much of the q-o-q change was downward in nature, driven by the least attractive markets in the region. Turkey fell one place on the ranking table relative to its peers.

One bright spot - as noted in our last two updates - continued to be the positive impact of lower oil prices. The IT market - which is increasingly being driven by cloud computing services that rely heavily on power-hungry datacentres - benefits from this development, although lower electricity prices had not filtered through to industry indicators at the time of writing. The downside to lower oil prices is that oil-producing states - such as Russia - have recorded weaker or negative economic growth, which has impacted on both public and private sector spending. In turn, countries that depend heavily on Russia for trade, have found it difficult to sustain economic growth as they are less diversified than they would like to be.

Poland saw a modest improvement to its overall IT sector score in Q415, up by 1.1 point q-o-q to 52.2. It is still below the regional average, however, as the very mature IT-centric economies of Western Europe keep the UK, France, Sweden and Germany in pole position with very high scores. France narrowed the gap with the market leader, the UK, albeit by just 0.1 point; this was due to a modest improvement in its Country Risks score. A steadily growing economy bodes well for continued or enhanced government spending in IT services and infrastructure.

There were no changes in any of the scores for the UK. The newly-installed Conservative government had yet to outline definitive plans for economic growth in general and for further support for the digital sector in particular at the time of the latest macroeconomic data. However, a continued pledge to an austerity-led

recovery package suggests that the outlook for IT-related spending is no brighter than before, while a heightened desire to interfere with the workings of the media sector - spearheaded by the launch of a far-reaching review into one of the UK's leading digital champions, the **British Broadcasting Corporation** (BBC) - does not bode well.

The Czech Republic also sees no changes to any of its scores in any category this quarter. It continues to be Eastern Europe's outperformer, staying ahead of the regional average by a little more than four points. The country's macroeconomic profile will remain excellent for private consumption with record low borrowing costs, subdued inflation and tightening labour market conditions. Rapid job creation and wage growth especially in the manufacturing sector will remain a key driver of the rebound in household spending, according to **BMI** analysts. The Czech Republic's exposure to the declining Russian economic story is minimal, but the country's falling demand for Czech-developed IT products and services in the cybersecurity field poses a small downside risk.

The remaining markets surveyed by **BMI** can be split into two groups. The countries that occupy the middle of our index are largely characterised by their more developed IT markets and larger market sizes. The key outlier in this group is Turkey, which scores particularly well owing to its faster growth rate. Turkey's market remains less developed than many of its peers, but is one of the few in the entire region to boast a double-digit compound annual growth rate (CAGR); we forecast 10.7% CAGR over 2015-2019. This will be supported by a number of international players investing in the country, lowering the costs of accessing IT products.

As markets approach maturity, spending on software and services increases faster than spending on hardware, offering long-term growth potential. In the early stages of IT market growth, spending focuses on getting hardware in place, upon which the software and services sectors can grow. As technology changes rapidly, the upgrade demands for software and services means there is continued spending on IT, supported by more industries using technology to lower costs. The markets in the middle of our index are further along the IT development curve and therefore derive more spending from the services segment.

The markets residing at the bottom of our index face a number of pressures and also suffer from being less technologically developed than their neighbours. Serbia's IT market still relies heavily on computer hardware sales with over 40% of households lacking a computing device and hardware accounting for more than 67% of spending in 2014. Flooding and regional geopolitical tensions will weigh on the market's potential to catch up with other markets in the region even as it seeks EU membership, which will drive much of the market's growth. Serbia's overall score declined by 1.8 points to a new low of 37.5 this quarter.

Croatia, Bulgaria and Romania - the most recent members of the EU - still have a long way to go, although the countries retain notably stronger scores than Serbia. Half of IT spending in Croatia in 2015 will be on hardware, with similar rates in Bulgaria and Romania. As these markets mature, greater demand for IT services will emerge and see these markets close the gap with their more developed counterparts. Nevertheless, Croatia and Romania had their Country Rewards scores downgraded sharply this quarter, reflecting lower consumer affluence and continued migration of IT workers to other markets in the region.

Table: Europe IT Risk/Reward Index, Q4 2015

	Rewards		Risks				
Country	**Industry Rewards**	**Country Rewards**	**Industry Risks**	**Country Risks**	**IT Score**	**Rank**	**Previous Rank**
UK	76.7	90.0	90.0	74.8	**81.2**	1	1
France	73.3	95.0	90.0	71.3	**80.3**	2	2
Sweden	63.3	95.0	80.0	85.5	**77.1**	3	3
Germany	66.7	85.0	90.0	79.2	**76.2**	4	4
Czech Rep.	55.0	65.0	55.0	70.7	**60.3**	5	5
Poland	45.0	55.0	50.0	68.3	**52.2**	6	6
Hungary	40.0	55.0	50.0	70.1	**50.3**	7	8
Turkey	43.3	55.0	52.5	48.3	**48.2**	8	7
Slovenia	28.3	55.0	60.0	76.5	**47.3**	9	9
Russia	43.3	55.0	30.0	42.3	**44.4**	10	10
Croatia	33.3	50.0	50.0	57.1	**43.7**	11	11
Romania	36.7	40.0	55.0	55.7	**43.1**	12	12
Bulgaria	33.3	50.0	45.0	56.1	**42.9**	13	13
Serbia	33.3	35.0	45.0	46.5	**37.5**	14	14
Average	*48.0*	*62.9*	*60.2*	*64.5*	***56.1***		

Scores out of 100, with 100 the best. Scores are weighted as follows: 'Rewards' at 70%, of which Industry Rewards 65% and Country Rewards 35%; 'Risks' at 30%, of which Industry Risks 40% and Country Risks 60%. The 'Rewards' score evaluates the size and growth potential of the IT market in any given state, and broader economic/socio-demographic characteristics that affect the industry's development. The 'Risks' score evaluates industry-specific dangers and those emanating from the state's political/economic profile, based on BMI's proprietary Country Risk Indices. Source: BMI

Market Overview

Hardware

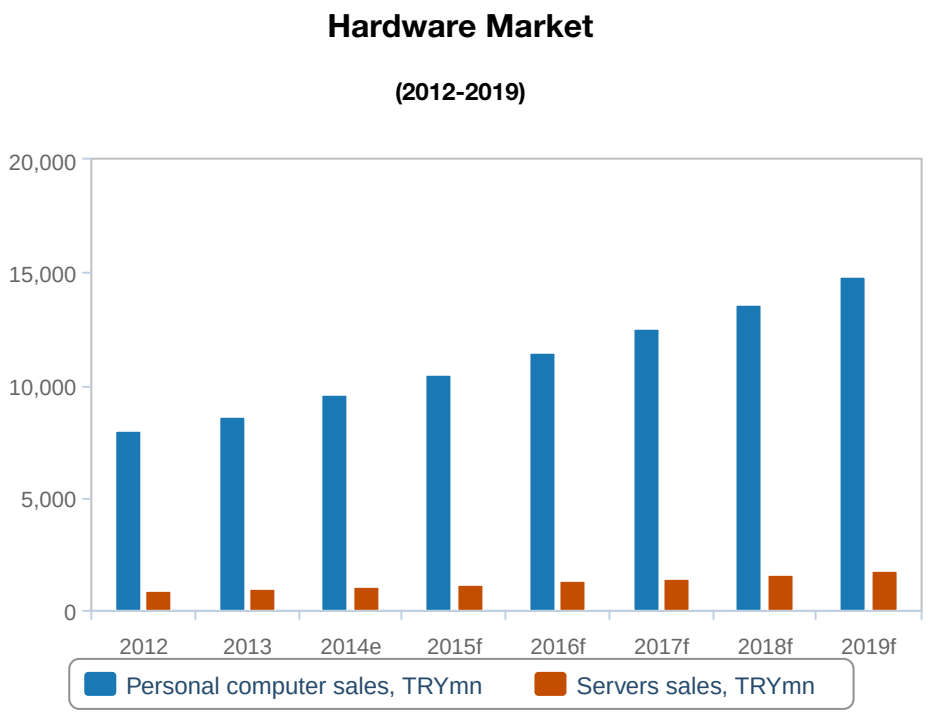
BMI forecasts a compound annual growth rate (CAGR) of 9.1% for Turkey's computer hardware market 2015-2019, with total spending expected to reach TRY18.184bn in 2019. The hardware spending growth outlook is relatively strong in Turkey, particularly in comparison to other Central and Eastern Europe (CEE) markets, due to the robust economic outlook and the relatively low device penetration rates going into 2015.

However, it should be noted that the outlook is significantly weaker in US dollar terms due to our outlook for lira depreciation. We forecast IT hardware demand will contract by around 10% in US dollar terms in 2015, before returning to growth from 2016, with the net result a CAGR of 1.9% 2015-2019. The impact will mostly occur in 2015 when our in-house Country Risk team forecasts depreciation to an annual average of TRY2.7/USD - down from an average of TRY2.2/USD in 2014 - before a more gradual depreciation to TRY3.1/USD in 2019. Although Turkey has some domestic hardware production, which is expected to be encouraged further by tax and customs regime (*see below*), the erosion of household purchasing power in global markets will squeeze demand growth, particularly in the retail PC market.

Market Trends

BMI forecasts that PC sales, which include notebooks and tablets, will account for the majority of hardware sales over the forecast period. Notebooks and tablets will account for close to four-fifths of the overall PC market, with a changing device mix expected over the course of our forecast period as notebook and tablet vendors compete on design innovation, as well as price. The outlook for desktop sales is weaker, but we highlight the continued opportunities in sales to the enterprise and public sector. Meanwhile, printers and servers will account evenly for the rest of the hardware market in Turkey. The user base for these devices is predominantly business and institutional.

However, downside risk threatens the outlook, particularly for tablet sales. In July 2015, Turkey's Economy Minister Nihat Zeybekci stated that a customs tax, expected in the range of 10-15%, will be implemented in Turkey - with additional details scheduled to be released in the following months. The government hopes to raise an additional TRY1bn (USD370mn through the measure), which is expected to apply to smartphones, PCs and tablets, but not larger electronics devices such as TV sets. At the time of writing, with details of the tax yet to be confirmed, **BMI** has not revised the PC market forecast, but there is the significant prospect of a downgrade to the tablet volume forecast in the Q116 update.



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

PC Market

Despite the challenges of lira depreciation against the US dollar and the potential drag of a more restrictive customs regime, in our core scenario the market will continue to develop, and as incomes rise we expect vendors to benefit from the relatively low computer penetration rate in Turkey, offering abundant scope for expansion for PC sales to both first-time buyer households and consumers acquiring personal devices. We believe our assessment of positive fundamentals in Turkey is shared by hardware vendors that are investing in direct retail presence to exploit the tablet opportunity. In April 2014, the first official **Apple** store opened in Turkey. The store is located in Istanbul at the Zorlu Centre, and is the 424th Apple retail store globally. The store will introduce official configuration services and technical support to the Turkish market, reflecting Apple's confidence in continued growth.

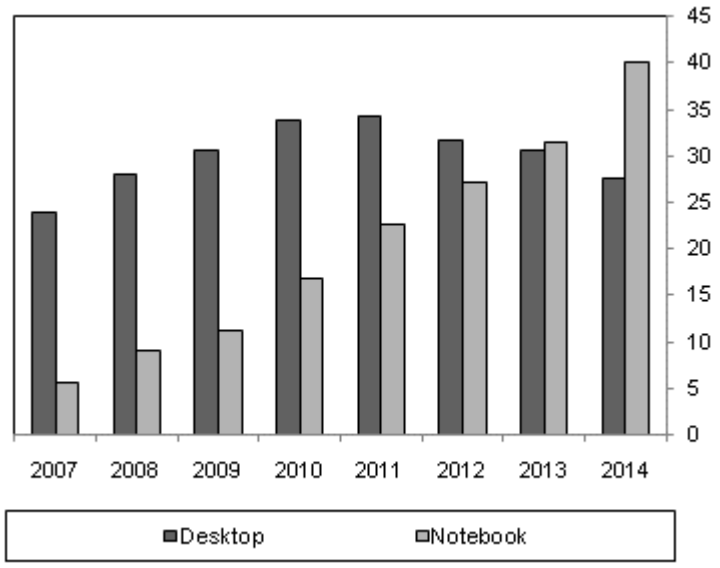
We therefore consider there to be opportunities for sales PCs to first-time households, as well as an upgrade and second/personal PC device market among higher income segments of the population. In contrast to some other developing markets in Asia, the Turkish PC market retains considerable organic growth

potential, with a large section of the population still waiting for inclusion in the information society. Until a few years ago, demand for computers was mainly confined to big cities such as Istanbul, Izmir and Ankara. Now, the fastest growth in sales is coming from previously underserved regions. The surge in sales has prompted foreign and domestic computer firms to increase their local operations.

This opportunity is reflected in the latest household PC penetration rate data from TurkStat for 2014. It shows a decline in the penetration rate of desktops (*see chart below*), but a strong growth momentum for notebooks. Notebook penetration surpassed desktops in 2013, and then increased 8.7 percentage points (pp) y-o-y to 40.1% in 2014 - while the corresponding figure for household desktop penetration declined 2.9pp y-o-y to 27.6%. We consider this to reflect our long-held view of a shift in the PC sales mix away from desktops to mobile form factors such as notebooks and tablets. However, it should be noted that the TurkStat data only reflects the retail market, while the desktop share of public sector and enterprise sales is expected to be substantially more resilient.

Turkey Household PC Penetration (%)

2007-2014



Source: TurkStat

There are other aspects to the pattern of PC penetration in Turkey. Women remain under-represented, while the small- to medium-sized enterprise (SME) segment also represents a major potential growth area for PC

vendors, with Turkey still lagging EU countries with regard to business PC utilisation, particularly among SMEs. Local PC manufacturer **Casper** estimates PC penetration among small- and medium-sized businesses will be as low as 35%, about 30% lower than in competing economies. Consequently, a number of campaigns have been launched to drive computer penetration in education, SMEs, health and other sectors, and penetration was estimated to have risen to 16% by 2013. The government's privatisation programme should also continue to fuel demand for new IT systems.

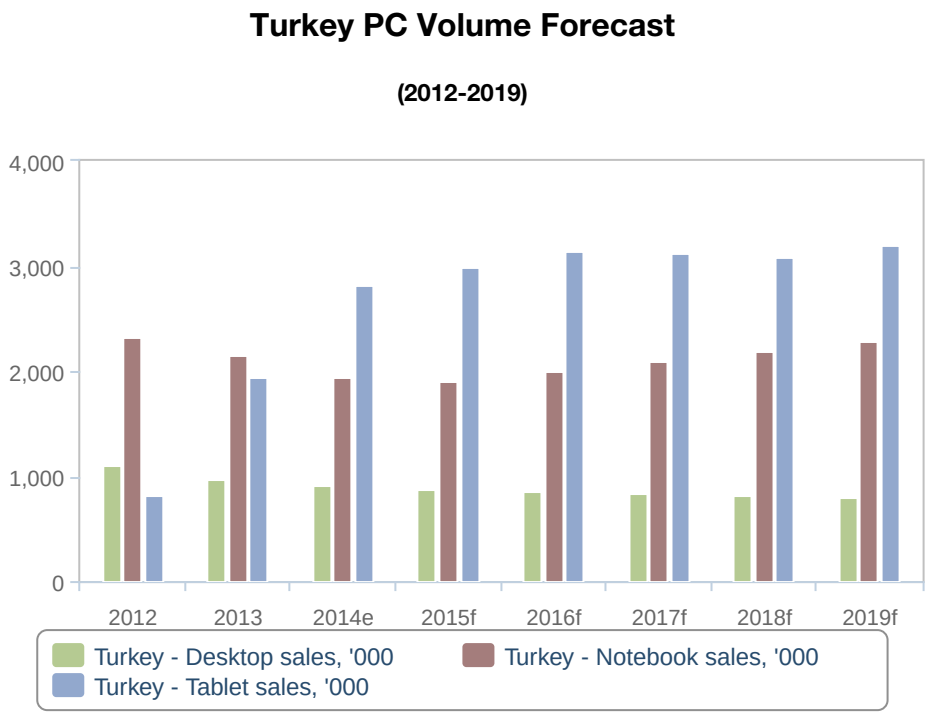
Turkey is also a regional PC market hub and many multinationals import parts and components for assembly and export to Central and Eastern Europe, the Middle East and the EU, as well as for local consumption. **Hewlett-Packard** (HP) was reported in April 2014 to be considering setting up a printer and cartridge manufacturing plant in Turkey. It already produces 80% of desktops for Eastern Europe, the Middle East and North Africa from **Foxconn**'s factory in Corlu, Tekirdag in north-western Turkey. Taiwanese electronics manufacturer Foxconn began the production of HP-branded desktop PCs in its Corlu plant in 2011. Implemented at a cost of USD60mn, the investment project has created 400 jobs to date, which will increase to 2,000 once the plant reaches full operational capacity.

The latest data from the Central Bank of the Republic of Turkey (CBRT) supports the view that Turkey continues to be an attractive manufacturing and assembly location. In 2014, foreign direct investment (FDI) in the manufacture of electronic hardware reached USD918mn, surpassing the 2013 figure of USD607mn.

The Turkish government is also engaged in a transformational e-governance drive that aims at the computerization of government functions as well as web-enabling the government's interface with its citizens. The political stability which saw AKP being voted back into power in its early stages supported development of IT and the government pursued computerisation with greater vigour. However, more recent developments including social tensions, popular protest and corruption scandals create downside risks to our forecasts as the government's focus is moved away from IT development projects.

Tablets will receive a boost from the government's Movement of Enhancing Opportunities and Improving Technology (FATIH) project. In November 2013, the tender for the project was completed, with the contract awarded to **Tepla**, which submitted the lowest bid of TRY409mn for 675,000 tablets, 550,000 covers and 125,000 keyboards. Tepla supplied the first batch of 50,000 General Mobile tablets in December 2013, with further deliveries set to take place through 2014, which the education ministry aims to distribute to select public elementary, middle and high schools.

The boost to the tablet market could prove significant, with penetration of tablets sill relatively low in 2013. TurkStat data show household tablet penetration of 6.2% in Turkey in 2013, with 8.1% in urban areas and just 1.5% penetration in rural areas. The FATIH project will have a large impact, especially in rural areas.



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

Evolving Form Factors

BMI's PC market volume forecast envisages stark differences in the performance of device categories in Turkey over the medium term. We estimate tablet sales overtook notebooks in unit terms in 2014, with sales up 44% to 2.80mn. However, with the first time buyer tablet market increasingly saturated and global consumers demonstrating a shift to longer replacement cycles for tablets, we expect a marked deceleration in tablet growth, with a CAGR of 2.6% forecast for 2015-2019. We estimate tablet penetration reached 10.7% at YE2014, with around 2.50mn first-time buyers, a figure that will remain broadly stable at 2.40mn in 2015. However, by 2019 we expect first time buyers will have declined to 1.60mn, leaving vendors increasingly reliant on replacement/upgrade sales.

Meanwhile, the notebook market is expected to continue to expand over the medium term after a contraction in volume terms in 2013. We estimate sales of 1.95mn in 2014 - a figure we expect to grow at a CAGR of 3.3% to 2.29mn in 2019. There is however some ambiguity about the division of sales between the tablet and notebook device categories due to a blurring of form factors, which is already underway with the wider availability of hybrid notebooks running Windows 8.1, but a trend **BMI** expects to accelerate over the medium term. Finally, we forecast for a negative CAGR of -2.7% for desktop sales over the same period.

As hybrid prices decline we consider emerging markets to be potential sources of growth, as research points to traditional tablets being used as supplementary to other PCs, rather than standalone, which we believe translates into an opportunity for higher functionality devices to gain traction.

The procurement of tablets via the FATIH project, in addition to the widening availability of lower-cost tablets at price points suitable for middle income Turkish consumers has seen adoption rise sharply since 2013. Android tablets from local and Chinese manufacturers have gained traction. One vendor to have performed particularly well in the tablet market is Casper. IDC reported Casper achieved unit growth of 131.2% y-o-y to reach tablet sales of 150,000 units in Q115 across the Middle East as a whole - making it the fifth largest vendor in the Middle East tablet market behind **Samsung**, **Lenovo**, Apple and **Huawei**.

Another development that will affect the tablet market and the notebook market is design innovation based on Windows 8. From October 2012 Windows vendors were able to manufacture touch devices - with a number of tablets released. The addition of more vendors and another touch operating system (OS) will increase competition in the market - putting further pressure on prices.

However, the more significant development is the medium-term impact on innovation and form factors. 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. Early examples have been hybrid devices such as Microsoft's own Surface (RT & Pro), HP's Envy and Lenovo's Yoga and Helix.

Although design innovation has some way to go, and the prices of hybrids will need to decline, the multi-use device has scope to capture a share of the tablet market by offering a stronger value proposition to consumers while not compromising on user experience.

Prospects For Printers And Servers

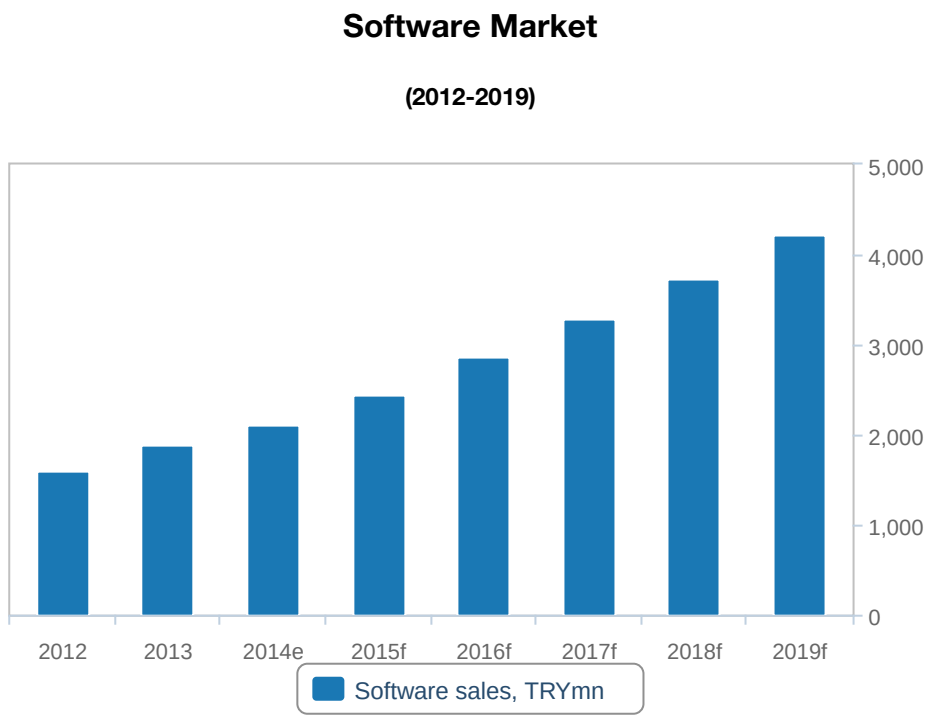
While it is often overlooked, printers are useful gateways for sustained business in the form of peripherals, software updates and services. Turkey has managed to attract the attention of global printing majors into the vibrancy of its market. **Ricoh**, which progressively acquired **InfoPrint Solutions** from **IBM**, set up a subsidiary focussed at allied services and solutions in Turkey in April 2012. **Konica Minolta**, another Japanese printing major, acquired **Transteknik Teknoloji** - its Turkish distributor of 42 years - in February 2012. The former completed this acquisition with a view of improving on its visibility in the Turkish market. **Xerox** has also identified Turkey as a market of focus, partly driven by the need to offset the tepid response of the European region in recent years.

The upbeat business sentiment will find its reflection in the prospects of the server market as well. Most major server vendors continue to enjoy strong presence in Turkey. Turkey serves a regional base for **Fujitsu,** while **Oracle** boasts of a dedicated user group in Turkey. The only significant factor that can play spoilsport is the uncertainty in the immediate neighbourhood of Turkey as well the challenging dynamics of domestic political cross-currents.

Software

BMI forecasts the software market in Turkey will grow from TRY2.121bn in 2014 to TRY4.214bn in 2019, corresponding to a CAGR of 14.7%. The competitive pressures resulting from trade liberalisation and modernisation, as well as wider access to cloud delivery software-as-a-service (SaaS) products underpin our positive medium-term outlook for software spending growth among enterprises and public institutions.

However, the growth rate is expected to slow over the forecast period due to rising penetration of software among consumer and enterprise end-users, as well as the increasing user preference towards cloud computing due to the attractiveness of the on-demand pricing model for software delivery. This will result in a smaller pool of first-time buyers, as well as price erosion as vendors compete through on-premises and cloud delivery models. **BMI** believes the cost and pricing flexibility advantages of SaaS will result in a broader dynamic of price erosion over our forecast period 2015-2019.



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

Some sources of software sales such as banking and securities; government, manufacturing and natural resources; and communications, media and services will continue to provide growth, but as the market matures the sales mix will increasingly shift to SMEs, particularly in terms of first-time sales and demand for basic applications.

The efforts undertaken by vendors and the government to drive software adoptions among Turkish SMEs are yielding slow but firm results. SMEs worldwide are slow to adapt to technology; more so in the case of Turkey which has been a recent entrant to the club of economies seeing sustained growth. The yields of these efforts can be rewarding as SMEs sees a more defining value addition in their operations through IT embracement than their larger counterparts. **BMI** believes the development of the SaaS delivery model in Turkey will be a boost to SME enterprise software adoption, with cost structures more favourable under the on-demand model for SMEs that often lack large budgets, but also have far fewer bespoke requirements.

Enterprise Software

Enterprise applications are the largest single component of overall Turkish software spend, notwithstanding the climate of caution that defines the Turkish business environment. However, economic uncertainty has not been sufficient to halt growth momentum altogether.

Business software highlights gains in efficiency and resultant reduction in costs as its principal selling point and, as such, investment can continue through a temporary blip in growth. Growing volumes of enterprise data, fuelled by the proliferation of devices used by employees, has made storage software a growth category. The growth of server virtualisation is another factor that is encouraging Turkish companies to invest in storage and device management solutions and archiving software.

By most accounts, manufacturing, telecommunications and retail along with the finance vertical remain the largest patrons for enterprise software. Vertical-specific applications along with business analytics, enterprise resource planning (ERP), customer relationship management and supply chain management remain the largest spending areas.

Financial services companies, such as banking will lead the market, with migration to core banking contributing handsomely to the revenues. In contrast to more developed Western European markets, the core banking investment trend is at a relatively early stage, with plenty of growth potential as Turkish banks look to underpin faster roll-out of new services.

The lucrative nature of the Turkish ERP market can be gauged by the extent of **SAP**'s presence in the country. SAP established its Turkey office in 2001. Since then, it has graduated to employing more than 1,500 people in the country; making Turkey one of its largest installations in the region. SAP claims to have a presence in 10 of Turkey's largest companies and claims a leadership position with a market share of close to 46%. SAP has conceded that the upward march of the Turkish economy in direct contrast with the gloomy immediate neighbourhood makes Turkey attractive.

SAP underlined its confidence in the Turkish market with the announcement in July 2013 that it plans to create an research and development centre in Technopark Istanbul. SAP will employ a research staff of 300 engineers at the centre which will receive EUR20mn of investment over three years (2013-2016).

E-Government

The Turkish government continues its path towards achieving meaningful e-governance. It has launched an integrated portal (www.turkiye.gov.tr) that integrates services offered by the prime minister's and president's office, apart from a series of ministries including justice, communications, science and technology, labour, social security and foreign affairs, among others.

The importance of the government vertical cannot be underestimated as it provides a powerful counterbalance to the vagaries of the larger commercial market. E-government also offers scope for lucrative customisation projects. The government sees IT as a key strategic tool to increase the country's skill base and economic competitiveness. In H113, the education ministry signed a deal with **Autodesk** to make the vendor's Autodesk Design Software available to 1.6mn students. The government hopes that access to this technology will help to stimulate the emergence of the next generation of Turkish engineers, architects and designers and digital content creators.

Over the past few years, there have been moves to encourage the trial of open source software in public organisations, starting with the defence ministry, where Turkey's domestically-developed Pardus OS is used.

Operating Systems

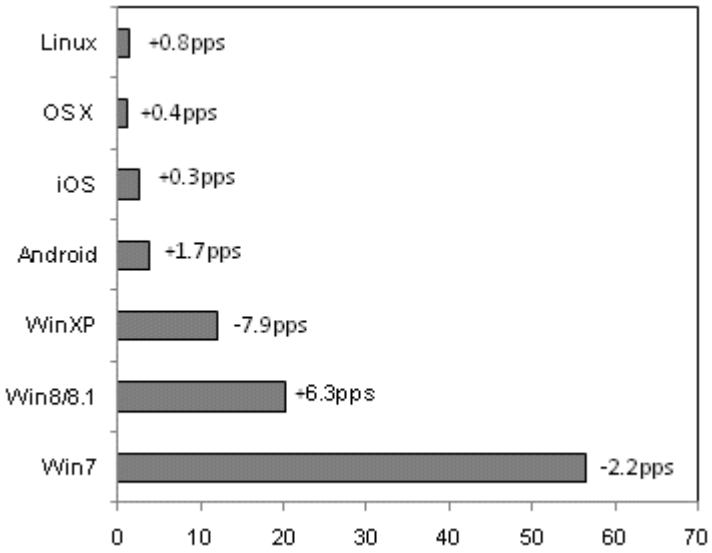
In September 2014, the science, industry and technology ministry started a new project to install the Turkish-developed Pardus OS on 10,000 PCs used in public administration. The ministry is hoping to save a total of USD800mn annually if the Pardus OS is adopted by the 3.3mn PCs used in public offices. This is because Turkey currently pays TRY500 per copy for Microsoft's MS Office suite of productivity software. The latest Statcounter data show Linux OS accounted for 1.3% of total Turkish PC browsing traffic in June 2015, a figure that was up by 0.8pp y-o-y. From this **BMI** infers the government has made good progress in rolling out Pardus (a Linux distribution), with the increase in its browsing traffic share third behind only Windows 8/8.1 and Android, which have far larger addressable markets through retail sales.

BMI believes there to be potential for cost savings, although high-profile cost evaluations in Western Europe, for instance in the UK, have found Microsoft to be a cheaper option when the total cost over the lifecycle of software is factored in. It could therefore be that the Turkish government is in part using the Pardus OS as a negotiating tool when agreeing licence fees with Microsoft.

The Pardus OS was developed by the Scientific and Technological Research Council of Turkey (TÜBİTAK) in 2003, before being released in 2005. Pardus is used in all computers of the Turkish Armed Forces and Turkish General Staff, while it is partially used by almost 20 public institutions, municipalities and universities, including the foreign affairs ministry and the National Police Department.

Turkey PC Browsing Traffic By OS (%) And y-o-y chg

June 2015



Source: Statcounter

Local Software Development

The value added by software exports from Turkey should not be undermined as it has an indirect rub-off in the form of increased user awareness. The availability of a sizeable pool of software developers in the midst of a predominantly software-user community enables nuanced appreciation in the latter of software to be purchased as well catalyses the appetite for software consumption.

The science, industry and technology ministry reported an overall increase of 75% in the value of Turkish software exports during 2007-2011. Turkey is also seeing the development of an ecosystem which fosters

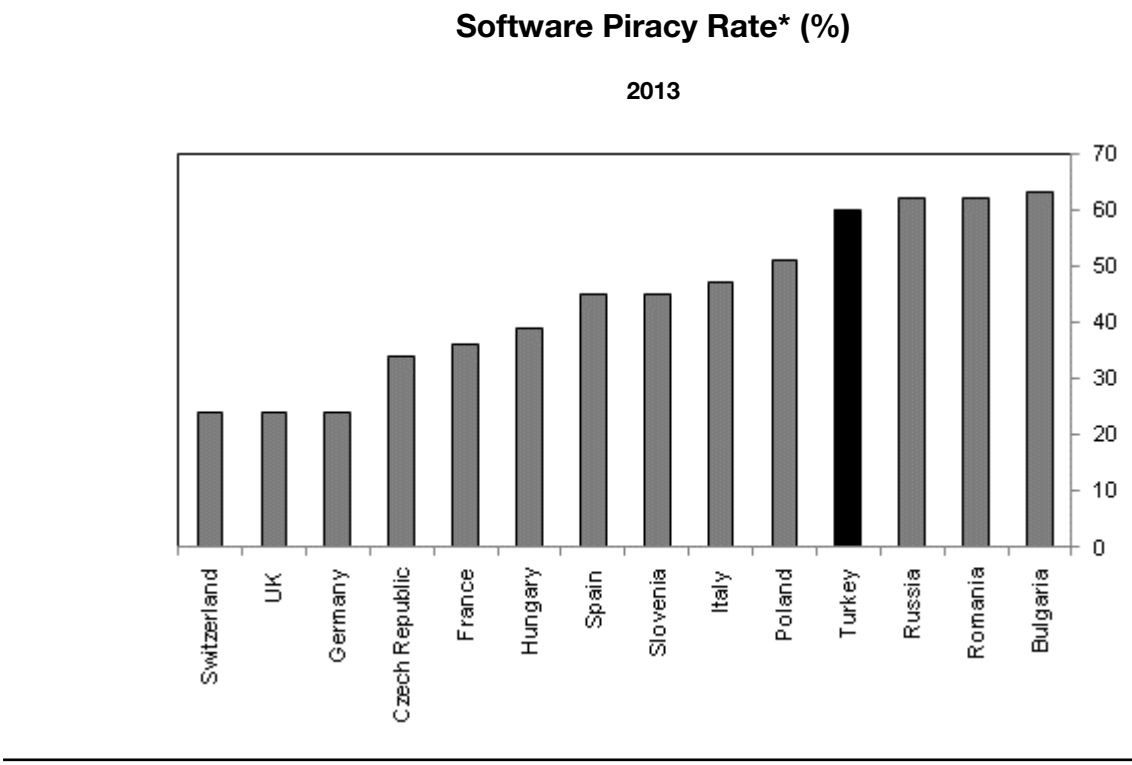
start-ups. **Etohum**, for example, is a start-up mentor and claims to have facilitated the funding of about 150 start-ups in the last half decade through a network of more than 300 mentors and angel investors.

Piracy

Piracy continues to be a significant drag on the Turkish software market, with high rates of incidences in a regional context. The latest data from anti-piracy lobby group the Business Software Alliance (BSA) show the piracy rate in Turkey was the fourth highest in **BMI**'s European IT coverage, slightly lower than Russia, Romania and Bulgaria. The BSA reported a piracy rate of 60% in Turkey in 2013, down from 62% in 2011, but still significantly higher than the regional average.

The drag of piracy on software spending is also evident from company statements. For instance, Microsoft ranks Turkey below only China in terms of prevalence of piracy of its software. Piracy can be a major disincentive for local innovation and makes global players wary of expanding into Turkey on a larger scale.

These challenges notwithstanding, Turkey remains a promising software market. This is evident from the fact that Microsoft ranks Turkey as its fastest growing market - ahead of China, India and Brazil. It is therefore obvious that adherence to the rule of law, as well as concerted user education, will catapult Turkey's software market into a different orbit.



**those responding that they always, mostly, occasionally, or rarely pirate software. Source: BSA Global Survey 2013.*

Cloud Computing

In line with global and regional trends, **BMI** has a bullish outlook for the growth of cloud computing demand in Turkey over the medium term. We forecast an impressive CAGR of 28% 2015-2019, with total spending expected to reach TRY811mn in 2019 as adoption of SaaS contributes the largest share to total cloud market value.

Market Trends

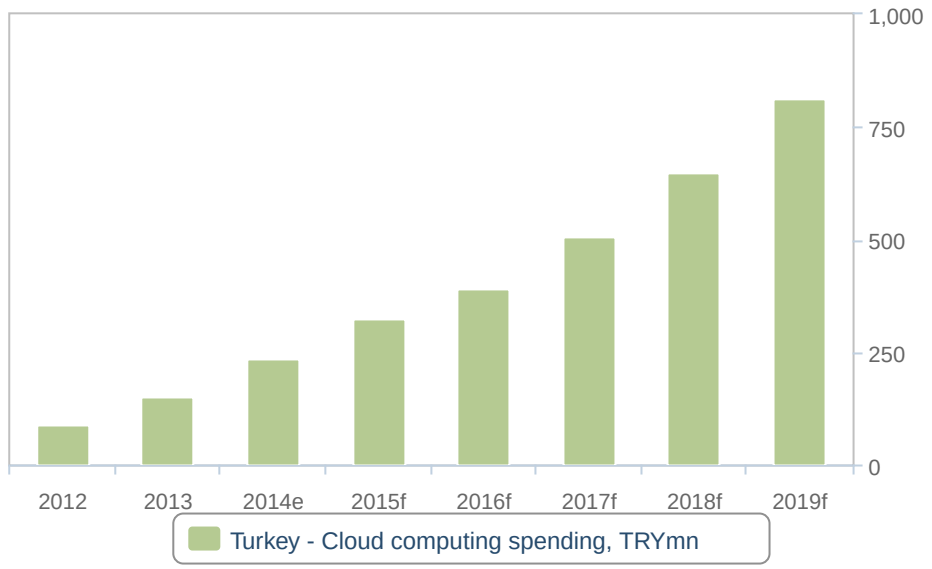
Every major telecoms company in Turkey, including **Vodafone** and **Turkcell**, offer cloud computing solutions and are driving market development through the provision of infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS). In April 2015, **Grid Telekom** selected the Flexiant Cloud Orchestrator for launching a new cloud platform. Flexiant Cloud Orchestrator is a software platform for cloud management, which will enable Grid Telekom to shift from its manual process to provide a self-service platform. This in turn will allow Grid Telekom to offer its cloud services to small- and medium-sized enterprises operating in the region.

Meanwhile, global leaders are able to leverage local cloud presence as enterprises look to quickly target sector opportunities in the fast growing Turkish market. For instance, South Korea-based ICT company **SK Planet** increased its overseas presence in May 2014 by entering into the Turkish market on the IBM Cloud. In expanding its global messenger service TicToc, **SK Planet** chose SoftLayer to provide cloud infrastructure for rapid global operations. TicToc is also likely to be integrated with the DropBox application later in May, which will enable sharing files with diverse formats on TicToc.

Another local vendor, **Koç Sistem**, and UK-based **Zenia Technology Partners** collaborated in July 2014 on the construction of the USD160mn Istanbul One data centre. The data centre became operational in January 2015. The data centre market is widely tipped for rapid growth in Istanbul and Turkey, however there are dissenting voices, including from emerging market data centre consultancy **Unisonius**. It produced a report in January 2015 stating that Istanbul's attractiveness in terms of customers and connectivity is not being properly weighed against the risk of a major earthquake before 2030. Its report accuses data centre owners of risking business continuity for short-term financial gain.

Cloud Computing Market

(2012-2019)



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

Large businesses are most likely to put IT applications such as mail, phone systems and document management into the cloud. However, enterprise applications that require a high level of customisation, or which are subject to regulatory or data sensitivity constraints, are more likely to stay on premises.

The reason for this apprehension is the lack of adequate and unambiguous data protection laws. The draft law regarding personal data usage continues to be under development. Enforcement of privacy related laws remains patchy. While electronic signatures are covered under the 2004 Law of Electronic Signature, there is a complete absence of data privacy regulator or any registration mechanism for information collecting agencies. Cybercrime control laws also remain a work in progress. Internet censorship, largely prevalent in Turkey, also remains a major impediment.

Regulatory Regime And Infrastructure Challenges Potential Bottlenecks

Growing concern over the Turkish administration's politicisation of the ICT industry is mounting. Data privacy and collection has become a huge topic of discussion globally since the revelations of the US National Security Agency's (NSA) PRISM scandal. Cloud computing in particular would be highly exposed to the risks posed by the ability of the NIO to collect data without a court order. So far, this has not appeared to be a concern for those investing in ICT services in Turkey, as such a risk does not necessarily impact profitability or revenue growth (*see Regulatory Developments for further details*).

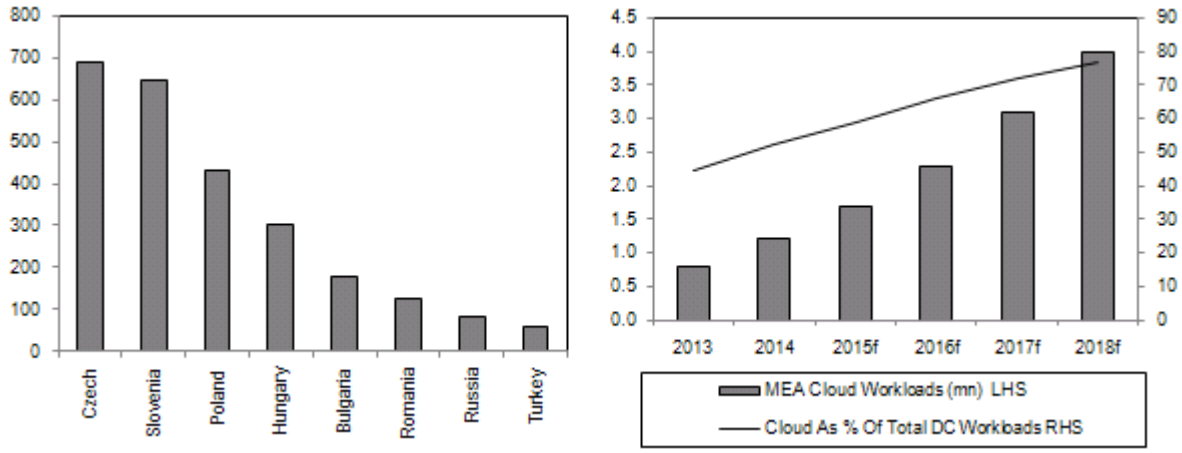
BMI also points to the relative deficit of supporting infrastructure for cloud service rollout in Turkey. The latest World Bank data show that the level of servers per million in Turkey was far some key markets in CEE - as well as being some distance behind Romania and Russia (*see chart below*). This figure includes servers not utilised for cloud servers, but from this figure we infer that infrastructure is a potential bottleneck to cloud services growth, especially in the context of the shift in datacentre workloads towards cloud services forecast by Cisco over the medium term.

While there is a short-term bottleneck in terms of infrastructure to support cloud service rollout, Turkey continues to enhance its profile as a base of data centres. Its strategic geographical location makes it an ideal hosting destination. A significant driver has emerged in the form of organisations looking for help to utilise efficiencies from cloud computing such as SaaS and IaaS. Virtualisation has become an increasingly standard feature of Turkish data centre environments in the past two years. Data centre operator **MedNautilus** launched IaaS cloud solutions in April 2012 in partnership with **Telecom Italia**. **Teknet**, **TurkNet**, **Teknotel** and **Telehouse** are among the other significant data centre operators in Turkey.

Another element of supporting infrastructure for cloud services is domestic network infrastructure capacity and coverage, and the extent of international connectivity. In these areas Turkey is relatively strong, with widespread fibre coverage through **Turk Telekom** and **SuperOnline** (Turkcell), as well as Istanbul's emergence as a major transit route. This position was strengthened in May 2015 when Germany-based **Deutscher Commercial Internet Exchange** (DE-CIX) will open a new internet exchange (IX) in Istanbul. The new IX will offer a neutral interconnection and peering point for internet service providers from Turkey, Iran, the Caucasus region and the Middle East. The company will begin with one location and expand over time to several data centres across the metropolitan area. DE-CIX's IX in Istanbul will be the third exchange along the border of the Mediterranean Sea, apart from the recently announced new internet exchanges in Palermo, Italy and Marseille, France.

Infrastructure Deficit A Bottleneck To Faster Cloud Growth

Server Density, 2014 (LHS) & Cisco MEA* Cloud Workload Forecast (RHS)



**Turkey classed as MEA market in the Cisco cloud forecast. Source: World Bank, Cisco*

IT Services

BMI maintains a bullish forecast for IT services sales growth in Turkey for the duration of our medium-term forecast over 2015-2019. Development of cloud computing services, matched with rapidly growing demand from local and global enterprises, will be a major growth catalyst. Cloud computing market developments are now covered in a separate section in the market overview, but the cloud spending forecast straddles both the software and service segments.

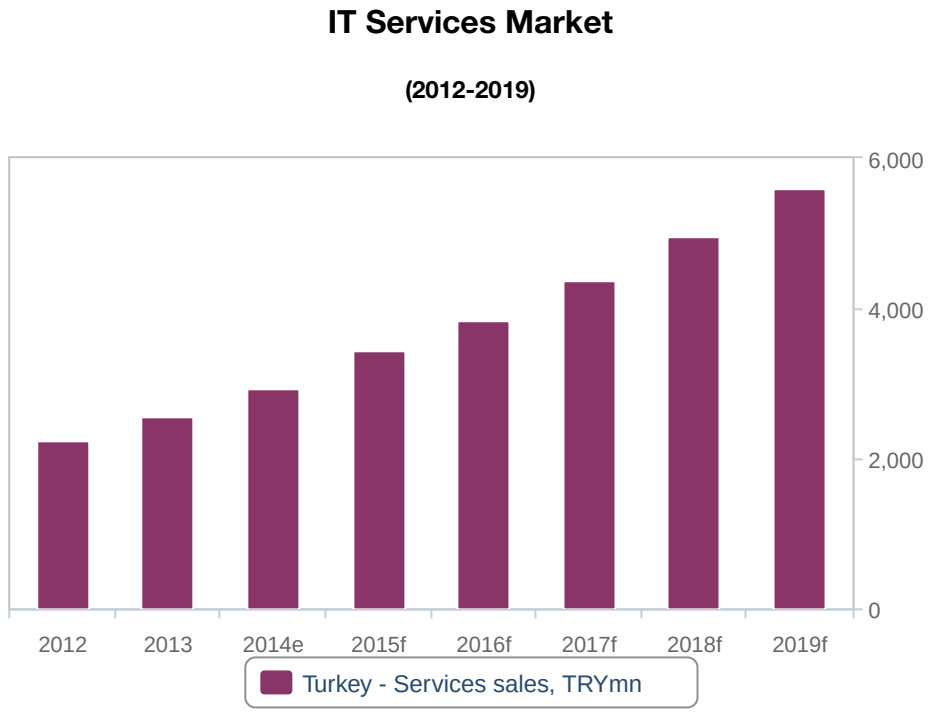
Over the medium term we expect competitive pressures on Turkish enterprises to encourage adoption of cost-saving solutions such as business process outsourcing (BPO) and cloud services. We forecast the Turkish IT services market will be worth TRY5.599bn in 2019, with a CAGR of 13.7% over 2015-2019. The CAGR is in sync with that of the software market, re-emphasising the dependence of the services market on the prospects of the software market.

Significant Drivers For IT Services

- Banks and telecoms companies will lead the way in IT services deployment. Key IT verticals such as banking, telecoms and government and education account for around 50% of all IT spending. Recently, organisations from these sectors investing in new IT platforms have included the education ministry, **Turkland** and **Baranti** banks and leading telecoms company Turkcell.
- The development of Istanbul's financial centre should ensure opportunities continue in the high value financial services vertical. In December 2014, Istanbul reached 47th position in the Global Financial Centres Index, up from 72th position in 2009. Istanbul is expected to continue its rise, with Z/Yen consultancy forecasting it will rise to 25th position by 2018, aided by the forthcoming EPIAS energy exchange to be integrated in to **Borsa Istanbul**.
- Investment by telecoms operators in fibre infrastructure will have positive knock-on effects for the broader ICT industry. Coverage continues to be expanded across Turkey, mostly driven by the incumbent Türk Telekom; however, around 10 alternative operators are also putting resources into their own fibre networks. According to the regulator, as of Q115 Türk Telekom has 197,262km of fibre optic infrastructure, of which 123,957km is used for backbone and the remainder used for access. Alternative operators have fibre optic infrastructure of 53,352km, with **Superonline**, **Vodafone Net** and **Telnet** among the largest players.
- Support and consulting will continue to account for the majority of IT services revenues. As IT upgrade cycles have lengthened as a result of the global economic headwinds, there has been a reallocation of resources towards maintenance and support of existing infrastructure and systems. This has attracted international vendor interest: US-based software company **Pegasystems** agreed to purchase its Turkish partner **Ultima IT** for an undisclosed amount in October 2014. The Turkish company provides consulting and services for the development of strategic business applications and IT Infrastructure in its domestic market.
- The FATIH project envisions the interconnected classrooms with access to global learning resources. The implementation of this exercise requires close interworking among content providers as well as process developers, making it a lucrative project on the IT services front as well.
- Turkey has been engaged in a prolonged exercise of integrating itself with the EU. The EU model is a veritable template of global best practices in governance and administration. The EU region is also an economically influential block which hosts the world's largest businesses, which also happen to be leaders in technology adoption. Interfacing with commercial and government entities in the EU region has a significantly positive impact on the level of awareness of Turkish companies.

The integration has also facilitated the entry and establishment of global IT services majors in the country. Turkey registers a strong presence of global IT services majors such as IBM and **Accenture**, as well as the increasing presence of emerging market IT majors such as **Tech Mahindra**, which opened a regional hub in Istanbul in April 2013. IBM, in fact, added two offices in the country in the cities of Adana

and Bursa in 2012. It is noteworthy that Adana is predominantly an agricultural city. IBM's foray in this region indicates IT services have acquired mainstream status regardless of the vertical. Training and consulting tend to be clubbed with support. However, they seem to be acquiring an independent profile as exemplified in the deal inked in 2007 between IBM and **Zorlan**. The support services segment is estimated to account for about 50% of total spending.



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

Outsourcing

The outsourcing market has been relatively slow to develop in Turkey, with many local enterprises remaining cautious about loss of control over key processes, while data security concerns also feature prominently. However, **BMI** considers there to be considerable potential for growth over the medium term for the simple reason that BPO services offer enterprises clear cost savings. **Teleperformance** estimated a call centre outsourcing market value of USD840mn in 2013, but factoring in in-house services the market was estimated at USD1.5bn.

Teleperformance, a global leader in the outsourcing and call centre market, and a leader in Turkey following the acquisition of **Metis** in 2010, stated in October 2014 that it has a very strong positive outlook for Turkey in the short-to-medium term. Teleperformance is aiming to extend a strong run of growth, after expanding 120% in the five years to 2014. The company owns two operation centres in Turkey: one in Istanbul and the other in Uşak. In Istanbul it employs 1,000 staff with operations in Turkish and German, while the centre in Uşak has 700 employees and services are only in Turkish. Looking ahead, Teleperformance Turkey General Manager Engin Utkan highlighted opportunities in financial services, e-commerce and nearshoring as promising areas of the market.

Smart Services

Telecoms operator data provides some insight into the growth of the smart services market, often termed the internet of things. The service layer is built on top of the operator centric market for machine-to-machine communications, and Turkey's mobile operators have taken strides in developing this market since 2012 when the government modernised the regulatory regime. In July 2012, Turkey passed a law to exempt machine-to-machine (M2M) SIMs from a tax imposed on any new SIM subscription. Previously, a new SIM connection was taxed of TRY37 (USD0.41), but now businesses and service providers installing M2M SIMs will be exempt from the levy. This was a particularly important development as a result of the low ARPUs derived from M2M SIMs, making the reform a catalyst for faster M2M/IoT development in Turkey.

By October 2013, Turkcell reported reported having a total of 1.4mn M2M subscriptions, which it expects to rise to 6mn by 2017. Turkcell expects M2M average revenue per user will rise from EUR2 in 2013 to EUR4 by 2017, making an important contribution to its financial performance as higher value, more data-intensive M2M services account for a greater share of the total.

One avenue to such growth was apparent in July 2014 when Turkcell announced a partnership with **Volvo** and **Subaru** for the launch its Connected Car platform on August 1 2014. Through an online 'infotainment' screen, drivers and passengers will be able to access navigation, Internet, roadside assistance services and related content and solutions.

Turkcell leads the market but incumbent Turk Telekom is also an emerging player through its mobile division **Avea**. In April 2012, Avea signed a cooperation agreement for M2M services with Telefónica, through the Telefónica Digital unit. The agreement covers business development opportunities, including joint commercial and marketing endeavours, as well as technological cooperation in transportation, connected home, telehealth, smart metering and industrial processes. Services are jointly developed on open

standards and be interoperable internationally, enabling services in different regions to be offered through a single SIM card.

Industry Trends And Developments

IT Industry Will Leverage Fibre Growth

Turkey has seen impressive growth in fibre connections over the past three years and this will have positive knock-on effects for the broader ICT industry. Telecoms operators' investments in fibre optic cabling have been met with rapid uptake, with the growth rate of fibre demonstrating a demand among consumers and businesses for higher-speed connections. Coverage continues to be expanded across Turkey, mostly driven by the incumbent **Türk Telekom**; however, around 10 alternative operators are also putting resources into their own fibre networks. According to the regulator, as of 2014, Türk Telekom has 192,671km of fibre optic infrastructure, of which 123,858km is used for backbone and the rest used for access. Alternative operators have fibre optic infrastructure of 52,801km, with **Superonline**, **Vodafone Net** and **Telnet** among the largest players. In terms of total subscriptions, fibre connections reached 1.457mn in 2014, up by 22.1% y-o-y.

Turkey's strategic geographical position should also see it emerge as a regional hub for international ICT companies, with the likes of **Microsoft**, **Intel** and **Hewlett-Packard** (HP) already setting up offices there to serve the rest of Eurasia. There is also a flourishing local software development sector backed by a young, increasingly urbanised and technically literate population of around 76mn. This suggests the ability for IT companies to service both the large local market and other countries in Europe and the Middle East through Turkey's submarine cable connections. Compared with neighbouring countries, it has seen its average peak connection speed rapidly improve over the past year, as fibre-optics access increases. Turkey stands out as a clear outperformer compared to the Middle East; however, looking West, it lags behind the likes of Ukraine and Bulgaria. There is therefore still scope for improvement in its fibre capability as it looks to compete with European companies for IT investment.

Internet Censorship Fails To Dissuade Investors

Growing concern over the Turkish administration's politicisation of the ICT industry is mounting. However, we do not believe this will impact investment. Data from the Central Bank of the Republic of Turkey (CBRT) show no signs of investment slowing down, with foreign direct investment (FDI) in the ICT services sector during the first five months of 2014 performing well and the total for the year set to surpass 2013 levels. FDI in ICT services is also growing as a percentage of total FDI, up to 2.3% as of May 2014 from 1.2% at the end of 2013. Data privacy and collection has become a huge topic of discussion globally since the revelations of the US National Security Agency's (NSA) PRISM scandal. Cloud computing in

particular would be highly exposed to the risks posed by the ability of Turkey's National Intelligence Organization (NIO) to collect data without a court order. So far, this has not appeared to be a concern for those investing in ICT services in Turkey, as such a risk does not necessarily impact profitability or revenue growth.

BMI expects ICT in Turkey to become an outperforming sector, particularly hardware, where PC usage is set to increase. We expect hardware sales to account for around 66% of the ICT market at the end of our forecast period in 2018 and this is being borne out by the high levels of FDI in the manufacture of computers, electronic-electrical and optical equipment. The hardware sector is far less exposed to the internet censorship and data privacy policy risks under former Prime Minister and now President Recep Tayyip Erdoğan, and FDI in this segment has increased from 5.9% of total FDI at the end of 2013 to 15.6% at the end of May 2014. In 2014, FDI in the manufacture of electronic hardware reached USD918mn, easily surpassing the 2013 figure of USD607mn.

Turkey Hoping For Cost Savings From Pardus OS

In September 2014, the science, industry and technology ministry started a new project to install the Turkish developed operating system (OS) Pardus on 10,000 PCs used in public administration. The ministry is hoping to save a total of USD800mn annually if the Pardus OS is adopted by the 3.3mn PCs used in public offices. This is because Turkey currently pays TRY500 per copy for **Microsoft**'s MS Office suite of productivity software. **BMI** believes there to be potential for cost savings, although high-profile cost evaluations in Western Europe, for instance in the UK, have found Microsoft to be a cheaper option when the total cost over the lifecycle of software is factored in. It could therefore be that the Turkish government is in part using the Pardus OS as a negotiating tool when agreeing licence fees with Microsoft.

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Investment In Local Presence

Reflecting the growing significance of the Turkish IT market, **IBM**, **Oracle**, **Accenture**, HP, **Deloitte**, **Siemens**, **CA** and **SAP** all have Turkish subsidiaries employing large numbers of people. In July 2013 SAP announced plans to for a research and development (R&D) centre in Technopark Istanbul. SAP will employ a research staff of 300 engineers at the centre, which will receive EUR20mn of investment over three years

(2013-2016). Meanwhile, Indian IT services firm **Tech Mahindra** announced the launch of its new hub for Turkey and Central Asia in Istanbul in April 2013. Tech Mahindra is focusing on Turkey as a source of growth because of the young and cosmopolitan population, meaning greater demand for IT services and solutions from domestic firms. It hopes the hub will work as a near-shore centre for projects in the Middle East and Europe, and is planning to recruit and train local staff.

Turkey is also a regional PC market hub and many multinationals import parts and components for assembly and export to Central and Eastern Europe, the Middle East and the EU, as well as for local consumption. HP was reported in April 2014 to be considering setting up a printer and cartridge manufacturing plant in Turkey. It already produces 80% of desktops for Eastern Europe, the Middle East and North Africa from **Foxconn**'s factory in Corlu, Tekirdag in north-western Turkey. Taiwanese electronics manufacturer Foxconn began the production of HP-branded desktop PCs in its Corlu plant in 2011. Implemented at a cost of USD60mn, the investment project has created 400 jobs to-date, which will increase to 2,000 once the plant reaches full operational capacity.

Hardware vendors are also beginning to invest in direct retail presence. In April 2014, the first official **Apple** store opened in Turkey. The store is located in Istanbul at the Zorlu Centre, and is the 424th Apple retail store globally. The store will introduce official configuration services and technical support to the Turkish market, reflecting Apple's confidence in continued growth.

While multinationals have a significant presence, as elsewhere, there are a large number of local companies such as **Koç Sistem**, which manages local works such as installations and maintenance, while a foreign partner provides training to the local subcontractor for the relevant services. Leading software companies in the Turkish market such as **Likom Yazilim** and others all offer value-added services including consulting, implementation, operations management, support services and internet services. The young demographics of Turkey have spurred the growth of B2C and B2B companies that emulate the business models of their successful western counterparts with a local touch. It should also be noted Turkey boasts the seventh largest number of **Facebook** users. Software consulting services are generally bundled together with systems integration as part of a whole business package that includes engineering, equipment supply, installation, maintenance and services.

Government policies and incentives are also contributing to the development of a local IT industry. In 2011, the Turkish government announced the establishment of Teknopark, a science and technology park, in about 250 hectares of land near the Sabiha Gocken airport in Istanbul. The park is slated to go full steam by the year 2020 and is expected to contribute USD10bn to the economy annually. The major stakeholders in the

park are the Undersecretariat for Defense Industries and the Istanbul Chamber of Commerce. The park will host multi-disciplinary companies from the defence and civilian domains, including IT companies.

IT Hub

The government is continuing to lay the necessary groundwork for its dream of establishing a 'Silicon Valley' in Istanbul. According to Erdoğan, IT's share in the gross national product is too low and the government has long believed the establishment of an IT park is an important way to attract more investment in the sector. The site will be in Istanbul's Taksim and Maslak districts, and should cover 500,000-square metres when finished. The project is to be financed using public resources and loans from the World Bank, but includes a self-financing element. Among the measures the government has said are being taken to facilitate this goal are tax exemptions, additional resources for R&D projects and other legal arrangements, which it is hoped will encourage more global IT majors to choose Turkey as a base.

The government's IT hub ambitions are no doubt one factor behind the action plan to deal with software piracy in Turkey. Illegal software is estimated to account for almost two-thirds of the country's software market. The plan was devised by the education, culture and justice ministries with input from other government organisations. The most important measure is to end the statute of limitations on copyright infringement cases. The law also allows for a campaign to raise awareness and a regime of software audits of companies. In the past few years, the government has sent several groups of judges and prosecutors to the US for training in copyright issues.

Regulatory Development

Table: Regulatory Authorities	
Government Authority	**Science, industry and technology ministry**
Minister	Fikri Işık

Source: BMI

The Information Society Department, a department in the State Planning Organisation (DPT), is responsible for the overall coordination of ICT projects. To increase participation and the level of success, an advisory board with 41 members was also established. This consulting body gathers representatives from public institutions, non-governmental organisations and universities.

There are about 200 e-government projects of all sizes under way in Turkey. The main ones are the National Judicial Network Project, Accounting Offices Automation Project, Central Census Management System Project, Internet Tax Office Project, National Police Network Project and Government Supply Office's Electronic Sale Project.

EU Authority

As a potential EU member, Turkey is involved in several EU programmes and directives in the IT field. In general economic competitiveness terms, Turkey has to take into account the Lisbon Strategy (drawn up by the European Council in March 2000 as a framework for future action) as it prepares for accession. The EU governing body with responsibility for IT is the Directorate for the Information Society.

Preparatory work began in March 2008 on a national development plan for 2007-2013, coordinated by the DPT. The main goal of the work is to prepare Turkey to become a full member of the EU, although it is uncertain when this goal can be achieved.

Turkey conducted a review of the results of its participation in the EU's sixth framework programme to support technology research and development (R&D). The general consensus is that Turkey failed to get its full share of the funds available under the programme. About 85% of projects submitted by Turkish companies for funding approval were rejected for not meeting the EU's quality requirements on various grounds. In financial terms, Turkey applied for USD48mn of funding, but received only USD4mn. Turkey

was late in joining the sixth framework programme, but it is likely that inexperience in EU procedures was a major factor. Turkey is keen to learn lessons for the seventh framework programme.

IT Development Policy

Industry Minister Nihat Ergün announced several new policies to promote the development of the IT sector at the 3rd Industry Council in November 2013. The government is hoping to make the sector attractive for investors and internationally competitive. The measures include:

- The formation of a Turkish technology stock exchange, modelled on the US NASDAQ.
- Greater support for entrepreneurs including a change in the school curriculum, counselling services and network groups.
- Provide funding for training courses in informatics, biotechnology, nanotechnology, advanced materials, genetics, robotics, artificial intelligence, organic agriculture, nuclear technology and aerial, space and defence technologies.
- Funding for small- and medium-sized enterprises looking to expand internationally, with a particular focus on nanotechnology and biotechnology.

ICT Development Goals 2023

The 2023 vision was devised by the administration of former prime minister and now President Recep Tayyip Erdoğan and is a list of goals which the government aims to achieve by the 100th anniversary of the establishment of the Republic of Turkey. The country hopes to become one of the top 10 economies in the world and ICT has a role to play in reaching this goal. Some of the planned achievements include:

- 30mn broadband subscriptions.
- Internet connections for 14mn households at 1,000Mbps.
- Increase share of ICT from 2.9% to 8% of GDP.
- Reach top-10 countries for e-transformation.
- 80% of the population computer literate.
- Grow ICT sector to 5,500 companies, with 65,000 employees and exports of USD10bn.
- Increase ICT sector output to USD160bn.
- Increase R&D expenditure to 3% of GDP, from 0.85%.

Tech Taxes Loom As Current Account Deficit A Policy Priority

In July 2015, Turkish Economy Minister Nihat Zeybekci stated that a customs tax, expected in the range of 10-15%, will be implemented in Turkey - with additional details scheduled to be released in Q315. Following an analysis by the economy ministry, the rate of the customs tax on electronics will be determined by the Council of Ministers. High-tech exports are currently exempt from customs tax, but have grown to weigh on Turkey's current account deficit, with its reliance on external finance long proving a strategic weakness. The government hopes to raise an additional TRY1bn (USD370mn through the measure), which is expected to apply to smartphones, PCs and tablets, but not larger electronics devices such as TV sets.

Internet Censorship

Under Erdoğan, Turkey has become one of the world's most determined internet censors. Through a number of laws passed by his party, Erdoğan has the power to shut down websites without a court order and collect web browsing data on individuals. In April 2014, Turkey's parliament passed a law allowing the Turkish spy agency to demand any data (company data, emails, text messages, etc) that it deems to threaten national security, without the need for a court order.

Erdoğan has sought blocks on a number of websites, including **Twitter** and **YouTube** in March 2014. The Twitter ban was overturned by Turkey's top court, while **Google** has filed a number of appeals in different courts to end the ban on YouTube (a subsidiary of Google). The government has also put pressure on Google and Twitter with risk of recurring blackouts if the multiple formal requests submitted to Google and Twitter to remove content are not adhered to.

The government owns a 30% stake in largest internet provider **Turk Telekom**. Reportedly the company has begun to use deep-packet inspection technology to examine a computer's network traffic and identify individual's activity and filter content. These moves from Erdoğan place Turkey as among the world's most censored internet nations, along with the likes of Iran and is expected to curb investment in local internet start-ups.

In September 2014, Turkey further tightened state control over the internet with Erdoğan's approval of a new law on September 11. The law gives more powers to telecoms authority to the Telecommunication Transmission Directorate by permitting it to block websites if deemed required for matters of 'national security, the restoration of public order and the prevention of crimes'. The law expands the legislation

cleared in February that allowed the authorities to block access to web pages without the need to secure a court order. The law, which was passed by parliament on September 8, has angered the main opposition Republican People's Party (CHP), which plans to appeal to the constitutional court to overturn it.

In March 2015, the government once again blocked YouTube and Twitter access in the country following the publication of images showing the death of a Turkish prosecutor. Services were restored thereafter, but it raises ongoing concerns about public intervention in the ICT market, and the growing authoritarianism of the current government.

FATIH Initiative

In 2011, a new initiative called FATIH (The Movement To Increase Opportunities in Technology), which aimed to increase the use of technology in classrooms, was launched. Funding for the project is provided through the transportation ministry's universal service budget and has been described as the biggest such allocation in the history of modern Turkey.

Under the government's ambitious modernisation plans for schools, textbooks will be replaced by tablets and chalkboards by electronic whiteboards. The promise of the project is networked tablets, notebooks, printers, cameras for every classroom, as well as educational content that will be developed by the education ministry and other providers. The government plans to equip 15mn students with tablet PCS within four years. Document cameras will enable teachers to be able to access any documents they need for class with the documents being available on the smart 'interactive boards'.

In November 2013 the tender for the FATIH project was completed, with the contract awarded to **Tepla**, which submitted the lowest bid of TRY409mn for 675,000 tablets, 550,000 covers and 125,000 keyboards. Tepla supplied the first batch of 50,000 General Mobile tablets in December 2013, with further deliveries set to take place through 2014, which the education ministry aims to distribute among select public elementary, middle and high schools.

Competitive Landscape

International Companies

Table: Accenture Turkey	
Address	**Accenture Turkey, RBS Building, Tamburi Ali Efendi Sokak, No.13 Etiler, Istanbul 34330, Istanbul, Turkey www.accenture.com/tr**
Company History	US-based Accenture is a global management consulting, technology services and outsourcing company serving the needs of public and private enterprises of all sizes as well as government agencies and utility companies.
Services And Products	Directly and through third-party resellers, consultants and system integrators, Accenture provides a broad range of IT-focused technology, outsourcing and consultancy services. Areas of focus include cloud computing migration strategies, infrastructure outsourcing, enterprise mobility, network transformation and security. Technology partners include Cisco Systems, Oracle, SAP and Microsoft.
Company Developments	▪ In September 2013, Garanti Bank, Turkey's second largest private bank, introduced a mobile banking dashboard, iGaranti, developed in partnership with Fjord, an Accenture-owned service design agency.

Source: BMI

Table: Hewlett-Packard Turkey	
Address	**HP Turkiye Merkez Ofisi, Kucuksu Cd. Akcakoca Sk. Akkom Offis Park Blok, No.2 Kat-7-8, Umraniye, Istanbul, Turkey www.hp.com**
Company History	Hewlett-Packard (HP) has been active in Turkey for more than a decade, but has historically limited its presence to localised sales, distribution and marketing facilities, often in close collaboration with local partners. It has recently begun investing in local production facilities, viewing Turkey as a potential export hub for Europe and the Middle East.
Services And Products	Through an extensive network of local dealers and distributors, HP sells consumer and enterprise grade communications equipment including networking solutions, desktop and notebook computers, storage solutions, servers, printers and software. Target customers are active across a wide variety of industries, including communications, media, energy distribution/generation, public sector, financial services, retail/consumer goods, healthcare, life sciences and transportation industries.
Company Developments	▪ In April 2014, HP was reported to be considering setting up a printer and cartridge manufacturing plant in Turkey. It already produces 80% of desktops for Eastern Europe, the Middle East and North Africa from **Foxconn**'s factory in Corlu, Tekirdag in north-western Turkey.

Source: BMI

Table: Microsoft Turkey	
Address	**Microsoft Bilgisayar Yazilim Hizmetleri Lts Sirketi, Bellevue Residences, Levent Mahallesi, Aydin Sokak No.7, Levent, Istanbul 34340, Turkey www.microsoft.com/tr**
Company History	Microsoft has been active in Turkey since 1993 and operates directly through local sales, marketing, distribution and technical support offices as well as through third party vendors and system integrators. It had 350 employees at the end of 2012. Revenues grew by 22% during fiscal 2013.
Company Developments	▪ In July 2015 the Turkish family and social policy ministry reportedly asked Microsoft to remove zombies, creepers and all violent elements from the Minecraft game when selling to users in Turkey. ▪ In September 2014, the Ministry of Science, Industry and Technology started a new project to install the Turkish developed operating system (OS) Pardus on 10,000 PCs used in public administration. This development could negatively affect Microsoft's revenues in Turkey where its Windows OS and Office Suite of productivity software is widely used in public administration.

Source: BMI

Table: SAP Turkey	
Address	SAP Turkey, Anel Business Centre, Sixth Floor, Revolution Quarter Site Path Sokak No. 5/17, Uskudar, Istanbul 34768, Turkey www.sap.com/turkey
Company History	SAP is a global enterprise applications market leader in terms of software and software-related service revenue. Founded in 1972, it has grown to more than 176,000 customers in more than 120 countries. In 2012 64% of the global transactions touched at least one SAP system. It has subsidiaries in every major country and employs more than 54,000 people in total. SAP markets its products and services through these local subsidiaries, which are licensed to distribute SAP products in defined areas SAP opened its first office in Turkey in 2001 and now has more than 1,500 employees, making Turkey one of its largest regional hubs anywhere in the world. SAP claims to work with 10 of Turkey's largest conglomerates and says it accounts for 46% of the market for business analytics and customer relationship management solutions in the country. In July 2013 SAP announced plans to for a research and development centre in Technopark Istanbul. SAP will employ a research staff of 300 engineers at the centre which will receive EUR20mn of investment over three years (2013-2016).
Company Developments	▪ During 2013, SAP BPC itelligence Analytics implemented SAP's BPC solution for Mercedez-Benz Turk.

Source: BMI

Local Companies

Table: Netas	
Address	**Netas, Yenisehir Mah. Osmanli Bulvari No. 11, Kurtkoy-Pendik, Istanbul, 34912, Turkey www.netas.com.tr**
Company History	Founded in 1968, Netas is a leading provider of IT equipment, services, solutions and support for Turkish enterprises, state agencies and utilities. It is also a major research and development centre for future technologies. Formerly a joint venture with the now defunct Nortel Networks, Netas' majority shareholders currently include One Equity Partners RHEA Turkey Tech BV (48.59%) and the Turkish Armed Forces Foundation (15%). The remaining 36.41% of the company's shares are traded on the Istanbul stock exchange. Netas had 1,349 employees at the end of 2011 (latest data).
Services And Products	Netas provides its customers with networking, security, unified communications, virtualisation, cloud computing, broadband access, defence technologies, optical and carrier Ethernet, GSM-R, IT integration services, strategic outsourcing and tailored software development solutions. The company is active in Asia, eastern Europe and Africa, as well as Turkey. Netas is a key partner of Cisco Systems in these and other markets.
Company Developments	▪ In January 2015, Netas Telekom stated its Probil unit made the best bid of TRY249.9mn for the second phase local area network in the Fatih Project, which integrates technology in the education system.

Source: BMI

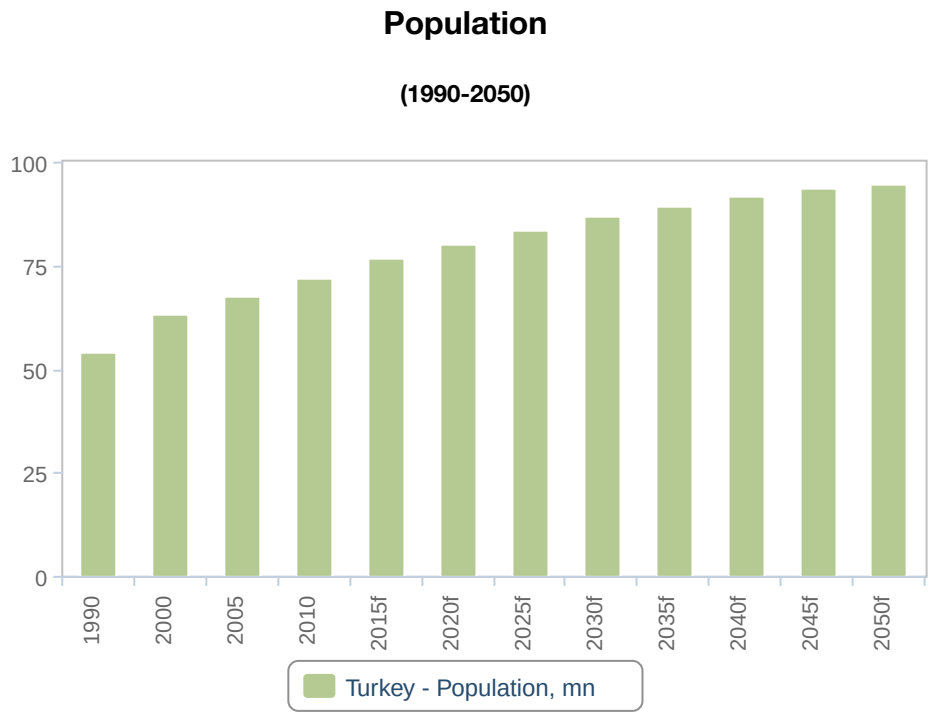
Table: Telpa Communications	
Address	**Büyükdere cad, No. 195 Levent, Istanbul**
Company History	Telpa has traditionally been a mobile phone distributor, and has been a leader in the distribution of GSM handsets in Turkey since 1994. Telpa has been a distributor for several major brands including Panasonic since 1999, Motorola since 2001 and Samsung since 2003. In 2007, Telpa became the largest retailer of mobile phones in Turkey. In 2010, Telpa merged with General Mobile, a hardware designer, with Telpa selling the products as well as providing after sale services. In 2011, General Mobile launched the first Turkish designed tablet, and has since expanded the range - driving Telpa forward in the IT market.
Services And Products	Telpa has partnerships with major international vendors, most importantly for Samsung Electronics - the global leader in handsets and smartphones. Telpa also distributes Belkin accessories and Sandisk's memory products in Turkey. In 2013, Telpa began focusing exclusively on its own brand of Its General Mobile smartphones and tablets, all of which run Google's Android operating system and compete in the mid-to-low end of the market. Telpa also provides after sale service for General Mobile products. In 2014 it General Mobile reported a 20% share of the Turkish mobile handset market, with sales of 150-170,000 units a month. Telpa expects 2014 revenues of almost TRY2bn, and is forecasting mobile phone sales growth of 25% in 2015.
Company Developments	▪ In June 2015, the Android One smartphone, produced in collaboration between Google and General Mobile, was released in Turkey. Due to taxation of smartphones in Turkey the Android One initiative aims at a slightly higher price-performance balance than the initiative in India or emerging Asia Pacific markets. ▪ In November 2014, Telpa CEO Sebahattin Yaman stated Telpa planned to work with Foxconn to make mobile handsets and tablets in Turkey. Foxconn already assembles General Mobile's handsets, but outside Turkey. He also stated that Foxconn was considering moving production of other goods to Turkey to act as a regional hub. The move could be boosted after Turkish Economy Minister Nihat Zeybekci said the government plans to cut back on importing electronic goods and to implement measures to boost local production in November 2014.

Source: 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.

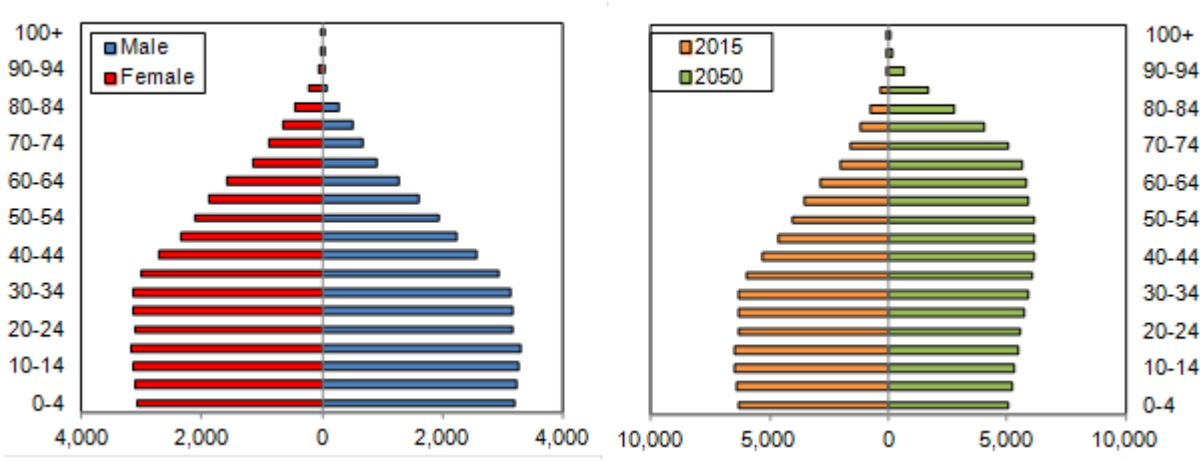
The accompanying charts detail the population pyramid for 2015, the change in the structure of the population between 2015 and 2050 and the total population between 1990 and 2050. The tables show indicators from all of these charts, in addition to key metrics such as population ratios, the urban/rural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



f = BMI forecast. Source: National Sources/BMI

Turkey Population Pyramid

2015 (LHS) & 2015 Versus 2050 (RHS)



Source: World Bank, UN, BMI

Table: Population Headline Indicators (Turkey 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, total, '000	53,994	63,174	67,743	72,137	76,690	80,309	83,712
Population, % y-o-y	na	1.5	1.3	1.3	1.1	0.9	0.8
Population, total, male, '000	26,636	31,080	33,304	35,436	37,653	39,419	41,094
Population, total, female, '000	27,357	32,094	34,438	36,701	39,036	40,889	42,618
Population ratio, male/female	0.97	0.97	0.97	0.97	0.96	0.96	0.96

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

Table: Key Population Ratios (Turkey 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Active population, total, '000	31,966	40,022	43,994	47,789	51,655	54,475	56,784
Active population, % of total population	59.2	63.4	64.9	66.2	67.4	67.8	67.8
Dependent population, total, '000	22,028	23,151	23,748	24,347	25,034	25,833	26,928
Dependent ratio, % of total working age	68.9	57.8	54.0	50.9	48.5	47.4	47.4

Key Population Ratios (Turkey 1990-2025) - Continued	1990	2000	2005	2010	2015f	2020f	2025f
Youth population, total, '000	19,574	19,363	19,306	19,262	19,128	18,594	18,032
Youth population, % of total working age	61.2	48.4	43.9	40.3	37.0	34.1	31.8
Pensionable population, '000	2,453	3,788	4,442	5,085	5,906	7,238	8,895
Pensionable population, % of total working age	7.7	9.5	10.1	10.6	11.4	13.3	15.7

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

Table: Urban/Rural Population & Life Expectancy (Turkey 1990-2025)	1990	2000	2005	2010e	2015f	2020f	2025f
Urban population, '000	31,966.4	40,899.8	45,280.1	50,847.6	57,593.8	63,140.1	68,006.7
Urban population, % of total	59.2	64.7	66.8	70.5	75.1	78.6	81.2
Rural population, '000	22,028.2	22,274.7	22,462.9	21,290.0	19,096.7	17,169.4	15,706.2
Rural population, % of total	40.8	35.3	33.2	29.5	24.9	21.4	18.8
Life expectancy at birth, male, years	60.7	66.4	69.1	70.8	72.5	74.1	75.6
Life expectancy at birth, female, years	68.0	73.8	76.0	77.8	79.2	80.5	81.6
Life expectancy at birth, average, years	64.3	70.0	72.5	74.3	75.9	77.3	78.7

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

Table: Population By Age Group (Turkey 1990-2025)	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, total, '000	6,648	6,570	6,467	6,358	6,309	6,031	5,821
Population, 5-9 yrs, total, '000	6,649	6,368	6,509	6,424	6,378	6,238	6,009
Population, 10-14 yrs, total, '000	6,276	6,425	6,329	6,478	6,440	6,324	6,200
Population, 15-19 yrs, total, '000	5,644	6,460	6,370	6,290	6,480	6,387	6,288
Population, 20-24 yrs, total, '000	4,904	6,097	6,392	6,321	6,274	6,429	6,352
Population, 25-29 yrs, total, '000	4,362	5,469	6,032	6,339	6,298	6,225	6,389
Population, 30-34 yrs, total, '000	3,859	4,756	5,408	5,978	6,309	6,242	6,183
Population, 35-39 yrs, total, '000	3,288	4,227	4,697	5,352	5,943	6,246	6,194
Population, 40-44 yrs, total, '000	2,498	3,728	4,167	4,639	5,314	5,874	6,189
Population, 45-49 yrs, total, '000	2,141	3,154	3,662	4,102	4,595	5,237	5,805

Population By Age Group (Turkey 1990-2025) - Continued	1990	2000	2005	2010	2015f	2020f	2025f
Population, 50-54 yrs, total, '000	1,966	2,368	3,081	3,587	4,048	4,509	5,157
Population, 55-59 yrs, total, '000	1,892	1,991	2,289	2,991	3,515	3,943	4,410
Population, 60-64 yrs, total, '000	1,408	1,767	1,890	2,186	2,876	3,380	3,814
Population, 65-69 yrs, total, '000	958	1,610	1,623	1,753	2,051	2,715	3,207
Population, 70-74 yrs, total, '000	598	1,090	1,393	1,423	1,567	1,854	2,483
Population, 75-79 yrs, total, '000	510	619	844	1,099	1,154	1,300	1,571
Population, 80-84 yrs, total, '000	266	283	396	559	756	820	959
Population, 85-89 yrs, total, '000	93	142	134	197	296	418	476
Population, 90-94 yrs, total, '000	23	36	42	44	69	112	168
Population, 95-99 yrs, total, '000	2	4	6	7	8	15	26
Population, 100+ yrs, total, '000	0	0	0	0	0	1	1

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

Table: Population By Age Group % (Turkey 1990-2025)	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, % total	12.31	10.40	9.55	8.82	8.23	7.51	6.95
Population, 5-9 yrs, % total	12.32	10.08	9.61	8.91	8.32	7.77	7.18
Population, 10-14 yrs, % total	11.62	10.17	9.34	8.98	8.40	7.88	7.41
Population, 15-19 yrs, % total	10.45	10.23	9.40	8.72	8.45	7.95	7.51
Population, 20-24 yrs, % total	9.08	9.65	9.44	8.76	8.18	8.01	7.59
Population, 25-29 yrs, % total	8.08	8.66	8.91	8.79	8.21	7.75	7.63
Population, 30-34 yrs, % total	7.15	7.53	7.98	8.29	8.23	7.77	7.39
Population, 35-39 yrs, % total	6.09	6.69	6.93	7.42	7.75	7.78	7.40
Population, 40-44 yrs, % total	4.63	5.90	6.15	6.43	6.93	7.31	7.39
Population, 45-49 yrs, % total	3.97	4.99	5.41	5.69	5.99	6.52	6.93
Population, 50-54 yrs, % total	3.64	3.75	4.55	4.97	5.28	5.61	6.16
Population, 55-59 yrs, % total	3.50	3.15	3.38	4.15	4.58	4.91	5.27
Population, 60-64 yrs, % total	2.61	2.80	2.79	3.03	3.75	4.21	4.56
Population, 65-69 yrs, % total	1.78	2.55	2.40	2.43	2.67	3.38	3.83
Population, 70-74 yrs, % total	1.11	1.73	2.06	1.97	2.04	2.31	2.97
Population, 75-79 yrs, % total	0.95	0.98	1.25	1.52	1.51	1.62	1.88
Population, 80-84 yrs, % total	0.49	0.45	0.59	0.78	0.99	1.02	1.15

Population By Age Group % (Turkey 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 85-89 yrs, % total	0.17	0.23	0.20	0.27	0.39	0.52	0.57
Population, 90-94 yrs, % total	0.04	0.06	0.06	0.06	0.09	0.14	0.20
Population, 95-99 yrs, % total	0.00	0.01	0.01	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

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. They allow us to forecast a variable using more than its 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, **BMI** uses 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 of **BMI**'s industry forecasting. Experience, expertise and knowledge of industry data and trends ensure analysts spot structural breaks, anomalous data, turning points and seasonal features where a purely mechanical forecasting process would not.

Sector-Specific Methodology

A number of criteria drive our forecasts for each IT variable.

IT 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. In addition, forecasts are affected by consideration of a variety of internal and external political and economic factors.

Within best-practice techniques of time-series modelling, our quarterly updated forecasts are improved substantially by intimate knowledge of the prevailing features of each local market.

Individual variables taken into account in creating each forecast include:

- Overall economic context, and GDP and demographic trends;
- Underlying 'information society' trends;
- Projected GDP share of industry;
- Maturity of market structure;
- Regulatory developments and government policies;
- Developments in key client sectors such as telecommunications, banking and e-government;
- Technological developments and diffusion rates;
- Exogenous events.

Estimates are calculated using our own macroeconomic and demographic forecasts.

Sources

Additional sources used in IT reports include national ministries and ICT regulatory bodies, national industry associations, and international industry organisations such as the International Telecommunication

Union (ITU), officially released company results and figures, and international and national industry 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 (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 (a country-specific category, factoring 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 broken down into two sub categories:

- Industry Risks (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 (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 Score, 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 Score a weighted average of the total score. 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 the score draws on the latest information and data across our broad range of sources, and the expertise of our analysts.

Sector-Specific Methodology

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

Table: It Risk/Reward Index Indicators

	Rationale
Rewards	
Industry	
IT market value, US$bn	Denotes breadth of IT market. Large markets score higher than smaller ones.
Sector value growth, % year-on-year (y-o-y)	Denotes sector dynamism. Scores based on annual average growth over five-year forecast period.
Government initiatives and spending	Denotes spending boost provided by public sector, which can be a crucial determinant of sector development.
Hardware, % of total sales	Denotes maturity of market. A high proportion of hardware sales, compared to services/ software, indicates that the overall IT market is immature.
Country	
Urban-rural split	Urbanisation is used as a proxy for development. Mainly rural states score lower.
GDP per capita, USD	A high GDP per capita supports long-term industry prospects.
Overall score for *Country Rewards* is also affected by the coverage of the power transmission network across the state.	
Risks	
Industry	
Intellectual property (IP) laws	Markets with fair and enforced IP regulations score higher than those with endemic counterfeiting.
ICT policy	Subjective evaluation of official policy towards IT development, as enshrined in statute and tax code.
Country	
Short-term external risk	Score from BMI's Country Risk Index (CRI). It evaluates the vulnerability to external shock, which is the principal cause of economic crises. Such a crisis would cut investment.
Short-term financial risk	Score from CRI, to denote risk of currency crisis and stability of banking sector. The former would hit revenues in hard currency, while the latter would curtail investment funding.
Trade bureaucracy	Score from CRI to denote ease of trading with the state.
Legal framework	Score from CRI denotes the strength of legal institutions in each state - security of investment can be a key risk in some emerging markets.
Bureaucracy	Score from CRI denotes ease of conducting business in the state.
Corruption	Score from CRI denotes the 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 wholly inappropriate to give all sub-components equal weight. The following weighting has been adopted:

Table: Weighting Of Components

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

Source: BMI