

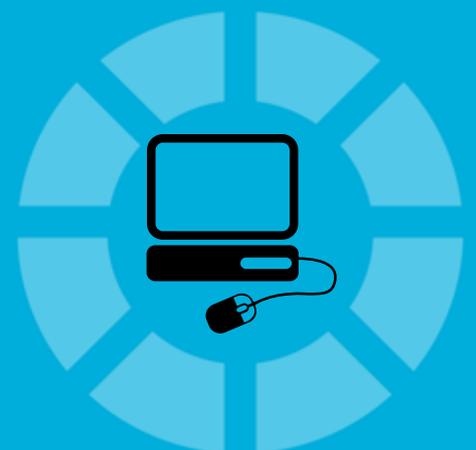
Q3 2015

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ARGENTINA

INFORMATION TECHNOLOGY REPORT

INCLUDES 5-YEAR FORECASTS TO 2019



Argentina Information Technology Report Q3 2015

INCLUDES 5-YEAR FORECASTS TO 2019

Part of BMI's Industry Report & Forecasts Series

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BMI Industry View

***BMI View:** The economic crisis in 2014 had a major disruptive impact on the Argentine IT market, with the devaluation of the peso, import restrictions, high inflation, capital controls, shortage of credit and government debt default all contributing to a recession and sharp contraction of the IT market in US dollar terms. We forecast another year of US dollar contraction in 2015 due to depreciation and inflation, but performance is forecast to be much stronger and we expect the market to move to a higher growth trajectory from 2016/2017 as confidence returns and deferred purchases from 2014-2015 are unlocked. Meanwhile, the impact of economic crisis was not wholly negative, with devaluation helping to make IT exports abroad more competitive and boosting industry development. There are also positive fundamentals for medium-term growth including increases in PC penetration, second device ownership, enterprise software penetration and cloud computing are examples of sectors that have growth opportunities.*

Headline Expenditure Projections

- **Computer Hardware Sales:** ARS18.2bn in 2014 to ARS20.0bn in 2015, +9.9% in local currency. Estimate for 2014 raised but outlook for 2015 unchanged, with economic crisis and particularly peso depreciation a drag on market growth.
- **Software Sales:** ARS13.7bn in 2014 to ARS15.5bn in 2015, up 12.7% in local currency terms. Small- and medium-sized enterprise (SME) demand for software and strong potential in enterprise resource planning (ERP) applications should maintain growth despite macroeconomic challenges.
- **IT Services Sales:** ARS20.4bn in 2014 to ARS23.3bn in 2015, up 13.8% in local currency terms. IT services spending growth expected to outperform as adoption rates for outsourcing and cloud computing accelerate in 2015, with faster growth expected to be maintained over the medium term.

Key Trends And Developments

The devaluation of the peso in 2014 eroded Argentine purchasing power in global markets, which put a significant squeeze on demand for imported hardware. Although Argentina's base of local manufacturers and assemblers were not immune to devaluation with a reliance on component imports, they were still better positioned and have increased market share. Chipset vendor **Intel** expects 63% of PC demand to be met by local brands including **Banghó, Positivo BGH, Exo** and **Newsan** in 2015, with volumes expected to be supported by educational procurement initiatives as well as household demand. **BMI**'s analysis of the distribution of households in Argentina and the trends for 2015-2019, introduced to the forecast in the Q315 update, point to price sensitivity remaining a central factor in the local PC market over the medium term. This is likely to benefit local brands targeting their products at the Argentine mass market, as was the case in 2014.

Another consequence of the devaluation was the rapid expansion of the market for black market goods, which **BMI** believes could remain in place if the government fails to address the issue as economic stability returns. According to a report by the Argentine Chamber of Commerce (CAC) in October 2014, total sales of black market goods increased by 25.5%, although there were important regional differences. The Buenos Aires black market expanded by over 30%, however in Mendoza black market activity declined. The survey does not offer a detailed breakdown by product category, but the CAC did note that technology products were among the most in demand on the black market, along with food and drink, clothing, watches and toys.

SWOT

IT SWOT

SWOT Analysis

Strengths

- The second largest IT market in Latin America.
- Despite fast growth in the PC market, the PC penetration rate shows there is substantial room for organic growth.
- 97% literacy rate and a tech-aware population create a good fundamental context for growth.
- Software and services exporter to the Americas region.

Weaknesses

- Although nominal increases in consumer spending are forecast, in real terms, consumer spending will only increase in single digits over the forecast period.
- Currency depreciation, squeezed real wages, and import restrictions are hitting PC sales, with unit shipments down appreciably in 2014 and forecast to contract again in 2015, albeit at a slower rate.
- Low average incomes and large regional disparities, with 63% of the household electronics market accounted for by Buenos Aires and its surrounding region.
- Limited supply of educated professionals in the IT area is a bottleneck for the faster development of the IT services and offshoring sector.

Opportunities

- Peso depreciation is net negative for IT market development, but it should help the competitiveness of Argentina's ICT exporters including the software development industry.
- Deferred purchases during economic crisis 2014-2015 should support a higher growth rate once stability and confidence returns, particularly from 2017.
- Relatively low household PC and multiple device ownership levels offer opportunities for sales to first-time buyers as well as upgrade/replacements.

SWOT Analysis - Continued

- Ambitious government initiatives for ICT development, such as Mi PC and PC Abuela.
- Restrictions on imports are boosting the local manufacturing sector, which is gaining scale and showing greater responsiveness to global trends, including expanded production of low-cost tablets.
- Strong cloud computing scorecard and policy environment.
- Investment by enterprises in ICT to improve efficiency should see increases in software and services spending.

Threats

- Economic crisis in 2014 resulted in strong growth in black market technology sales, which could extend into 2015 as challenging economic conditions persist.
- Further depreciation would hit PC imports as well as domestic producers, which rely heavily on imported components.
- A contracting economy, rising inflation and power costs will have an impact on consumer and business confidence.
- Argentina faces strong competition for offshoring investment and opportunities from other countries in the region.
- Software piracy is still higher than in some other Latin American countries, with a lack of effective enforcement.

Political

SWOT Analysis

- Strengths**
- Argentina's long history of democracy suggests the threat to political stability will be relatively minimal.
 - After the failure of the 1976-1983 dictatorship, the army no longer plays a major role in local politics.
- Weaknesses**
- An ongoing transition towards more business-friendly policies risks political backlash from long-time allies of the FPV, including public sector unions.
- Opportunities**
- A rebuke of the Fernández governing model in the October 2013 midterm election will result in a shift toward more moderate policies over the next several years that could improve the business environment and start to deal with some of the long-building imbalances in the Argentine economy.
- Threats**
- Fernández could respond to an electoral setback with increasingly unpredictable or interventionist policies aimed at improving her popularity, suggesting the potential for a period of heightened political risk.
 - A lack of results in dealing with double-digit inflation will continue to represent one of the key downside risks to our political rating on the country.
-

Economic

SWOT Analysis

- Strengths**
- Argentina continues to be a world leader in agricultural commodity exports.
- Weaknesses**
- The frequency and pervasiveness of the government's intervention in the economy will hinder inward investment flows for the time being.
 - Government interference at the national statistics agency has hurt public confidence and trust in officially published economic data.
- Opportunities**
- Advancements in natural gas extraction technology hold the potential to make Argentina's vast shale gas reserves accessible.
 - An agreement by the Argentine government with holdout debt investors in 2015 could pave the way for the country to resume coupon payments on all of its restructured debt, and potentially normalise relations with the international investment community.
 - A general election in October 2015 could bring a substantial shift in Argentina's business environment and leading to the implementation of policies to incentivise fixed investment
- Threats**
- Expansionary monetary and fiscal policies will continue to drive high inflation, with another currency devaluation set to occur in early 2016.
 - Government policies have resulted in an economic environment that provides few incentives to long-term investment commitments. This could exacerbate capacity problems in the long run.
-

Operational Risk

SWOT Analysis

Strengths

- The sizeable urban population provides a large potential workforce for labour intensive industries.
- Roads and railways are able to meet the needs of Argentina's vital export supply chains for commodities including agricultural produce and mining products.
- Relatively efficient export procedures have developed in order to get commodities to market more quickly.
- Crime rates are low by regional standards, and foreign workers are not specifically targeted.

Weaknesses

- The brain drain is leading to a lack of skilled workers in some sectors, such as IT and automobiles.
- Utilities infrastructure is outdated and underdeveloped, leaving it susceptible to severe disruption during periods of drought. This increases the risk of electricity and water shortages affecting key industries such as agriculture.
- High levels of perceived corruption undermine public trust in the police force.
- The Falklands/Malvinas Islands dispute continues to cause diplomatic tensions with the UK.

Opportunities

- Education reform will standardise the curriculum and improve teaching standards and learning outcomes.
- Investment in the electricity and water sectors should improve the reliability of the supply over the longer term.
- A number of trade agreements facilitate regional and global trade flows.
- Generally low crime rates leave opportunities for the authorities to tackle growing drug crime. .

SWOT Analysis - Continued

Threats

- Widespread union activity is causing serious disruption to business operations, even for those without a unionised workforce, as transport worker strikes affect all sectors of the economy.
 - Corruption is undermining investor confidence in Argentina due to a perceived lack of competition and an uneven playing field.
 - The times and costs associated with importing goods are increasing, heightening the operational costs of businesses in Argentina.
 - The presence of drug trafficking and an increased market for drugs within Argentina could lead to a rise in organised crime.
-

Industry Forecast

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

	2012	2013	2014e	2015f	2016f	2017f	2018f	2019f
IT market value, ARSmn	35,915.8	43,227.4	52,409.0	58,766.2	71,400.9	84,702.9	98,306.1	113,337.2
Computer hardware sales, ARSmn	13,935.3	16,080.6	18,238.3	20,039.3	23,990.7	28,036.6	32,047.8	36,381.2
Personal computer sales, ARSmn	11,343.3	13,242.4	14,981.0	16,452.2	19,648.4	22,934.0	26,183.1	29,687.1
Software sales, ARSmn	8,773.9	10,774.8	13,725.7	15,467.3	18,743.0	22,175.8	25,668.8	29,514.6
Services sales, ARSmn	13,206.6	16,372.0	20,444.9	23,259.6	28,667.2	34,490.4	40,589.6	47,441.3
IT market value, % of GDP	1.3	1.3	1.1	1.0	1.0	1.0	1.0	1.1

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

The IT market was hit badly by the challenging economic environment in Argentina in 2014, particularly the sharp depreciation of the peso against the US dollar. We estimate the IT market expanded by 21.2% in local currency terms in 2014, but in US dollar terms it contracted by 23.5%. We expect slightly less hostile economic conditions in 2015, but GDP and final private consumption are again forecast to contract in real terms, and the peso is forecast to depreciate further, albeit at a slower rate than 2014. **BMI** forecasts a stronger IT market in 2015 compared to 2014, but the growth will still be below the pre-economic crisis trajectory.

The medium-term macroeconomic outlook is uncertain with ongoing import restrictions and currency devaluation presenting significant downside risk. However, under our core scenario we expect a macroeconomic stabilisation including slower inflation and slower depreciation of the peso against the US dollar, as well as stronger growth from 2016. This will in turn generate higher levels of consumer and enterprise confidence and boost spending on IT products and solutions, as well as unlock deferred purchases from 2014-2015.

BMI forecasts a compound annual growth rate (CAGR) for total IT spending of 16.7% for 2015-2019, with total spending expected to reach ARS113.3bn in 2019. The difference in US dollar terms is stark, with the 23.5% contraction in 2014 contrasting to a CAGR of 6.2% 2015 to 2019.

IT Market Growth

(2012-2019)



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

2015 Outlook

BMI forecasts Argentina's IT market will grow by 12.1% in 2015 in local currency terms, a slowdown from local currency growth of 21.2% in 2014 - but a marked improvement in US dollar terms from contraction of 18.3% in 2014 to contraction of 3.6% in 2015. Confidence will remain fragile and susceptible to external shocks, but under our core scenario of a beginning of macroeconomic stabilisation, confidence should begin to return, albeit only slowly and momentum only expected to really build going into 2016.

The retail hardware market will be dependent on wider economic trends in 2015, but there are favourable trends within the PC market that can be exploited by vendors under our core scenario. We believe there is pent-up demand for desktops as a result of deferred upgrades in 2014, when most of the region saw an uptick in sales as a result of the withdrawal of official support from **Microsoft** for the legacy XP operating system. We also believe increased domestic capacity of notebooks and tablets, combined with price erosion, will drive volume increases, albeit with heightened price sensitivity remaining a feature of the market and potentially limiting vendor margins.

BMI expects strong demand growth for enterprise software and IT services in Argentina in 2015, particularly those targeted at small- and medium-sized enterprises (SMEs), but much of this will depend on the country's economic outlook. Currency devaluation has posed considerable downside risks, but the IT market is supported by well-established and competitive communications infrastructure, which should encourage businesses to make greater use of IT services to encourage more efficiency and cost savings. The impact of recent economic woes is expected to be a greater focus from enterprises on return on investment and generation of cost efficiencies. This can be expected to benefit enterprise software, outsourcing and cloud computing vendors.

New cloud computing offerings and increased competition in this segment should fuel demand from end-users. **Telefónica** was among local market players to launch new cloud services for SMEs. In addition to cost savings, businesses will look to boost efficiency and increase flexibility of response to customer needs. There should be potential for enterprise resource planning (ERP) solutions in sectors such as energy and transport.

Market Drivers

Argentina's PC penetration is relatively high compared to the Latin American average, but is far below levels seen in developed markets - and **BMI** believes there is significant sales potential to the first-time buyer market, in addition to replacement/upgrades and personal device sales 2015-2019. In order for the potential of the PC market to be reached, hardware will have to be available at low prices. Unit prices have been falling globally, but with currency depreciation, PC purchases may be deferred by the price-sensitive mass market consumer as Argentine household purchasing power in global markets has been severely eroded 2013-2015 (*see household income trend analysis below*).

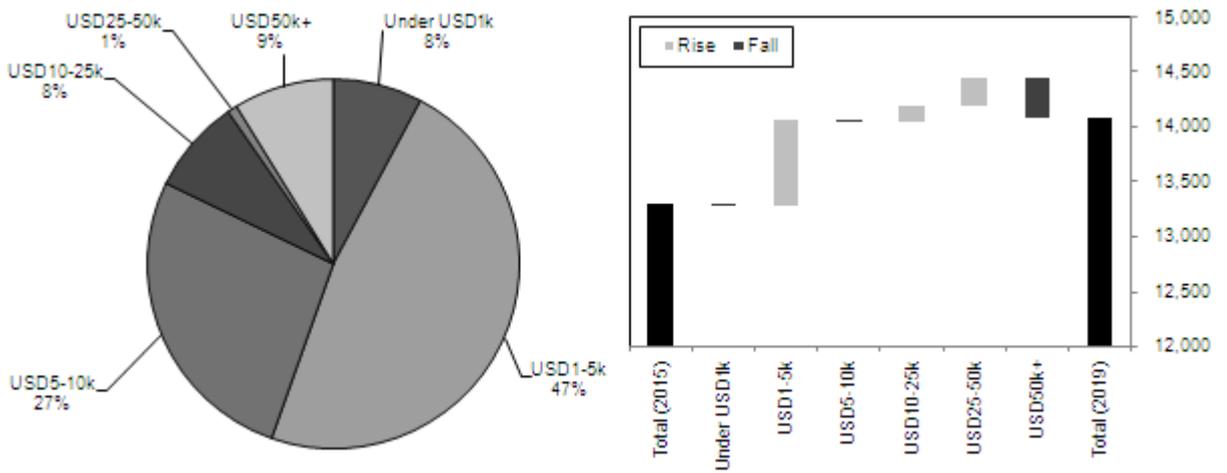
In volume terms, government procurement initiatives for the education system and low-cost tablets and notebooks have been a dominant trend. However, in value terms the outlook is more mixed, with the premium segment of PCs expected to remain overweight in terms of profit. **BMI** bases this outlook on our income stratification forecast, which projects the strongest percentage growth for the poorest 20% and middle 60% of Argentines, but the largest increases in absolute income will be among the richest 20% in society. Therefore, we expect to see vendors compete across the mass market and premium segments of the PC market, but it should be noted that the middle 60% and bottom 20% by income are forecast to have US dollar incomes of just USD1,758 and USD619 respectively in 2019. Vendors therefore need to target appropriately priced devices at these market segments to achieve significant volumes.

We have also added a household income analysis to the IT market forecast in Q3, which expands upon the insights from income stratification analysis. Argentine household distribution by income is heavily weighted towards to low end in 2015 - a consequence of the devaluation in 2014 - with 56% of Argentina's households on incomes below USD5,000 in 2015. This is the level at which **BMI** considers households to be global consumers; ie, sufficient purchasing power to acquire PCs, so we infer from the distribution of household income that the addressable market for vendors is only around 44% of total households.

The household income analysis points to a more optimistic medium term picture as the economy recovers, with a migration of households from sub-USD5,000 to the USD5-10,000 and USD10-25,000 income bands. However, with the majority of new households (around 700,000 2015-2019) are expected to be low income, meaning a mixed medium term outlook. Nonetheless, the migration of households to higher income bands will see new entrants (or re-entrants) to the PC market in Argentina, which could see strong growth in PC volumes if local supply increases and deferred purchases from 2014-2016 are unlocked. Meanwhile, at the premium end of the market the outlook will remain relatively weak, with a contraction in the number of households with incomes of more than USD50,000 forecast for 2015-2019.

Argentina Households By Income (% of total) LHS And Change In Households By Income ('000) RHS

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



f = BMI forecast. Source: National sources, BMI

The Argentine market is characterised by significant income and geographic disparities, reflected in the growth outlook. The economy and IT markets are dominated by the capital Buenos Aires, with higher per

capita income and education levels than the rest of the country. However, vendors expect that the fastest growth will be from other regions, including the north west, which has been a focus of vendor expansion. Government ICT programmes such as PC Abuela will also help to overcome digital inequalities, as the majority of lower-income consumers, at whom these programmes are aimed, live outside the capital region.

There is also untapped potential in the enterprise market, with OECD data showing ERP penetration was still substantially lower in Argentina than in Brazil in 2013. This is as expected, given the economic crisis led some companies to cut IT budgets or look to defer systems updates. However, as companies strive for greater efficiency and expansion internationally, IT investments will have to be made as a way of bringing greater efficiencies and increasing competitiveness in difficult times. Key prospects for ERP implementations and systems upgrades will include companies focused on regional expansion and export-orientated industries, but it will only be from 2016 that enterprise confidence recovers sufficiently to unlock the potential of this opportunity.

Cloud computing is a particularly exciting opportunity for software and services providers in Argentina. Following the pattern set in developed markets, and enabled by upgrades to networking infrastructure throughout the forecast period, **BMI** forecasts organisations will increase spending on cloud computing products such as software-as-a-service (SaaS) and infrastructure-as-a-service (IaaS). Particular areas of opportunity for cloud computing include banking and retailing, as organisations in those fields aim to save money on hardware investments. The cost profile of cloud computing is a good fit for the SME market, where, for instance, in-house customer relationship management (CRM) or ERP installations exceed IT budget capabilities but a rental model is affordable.

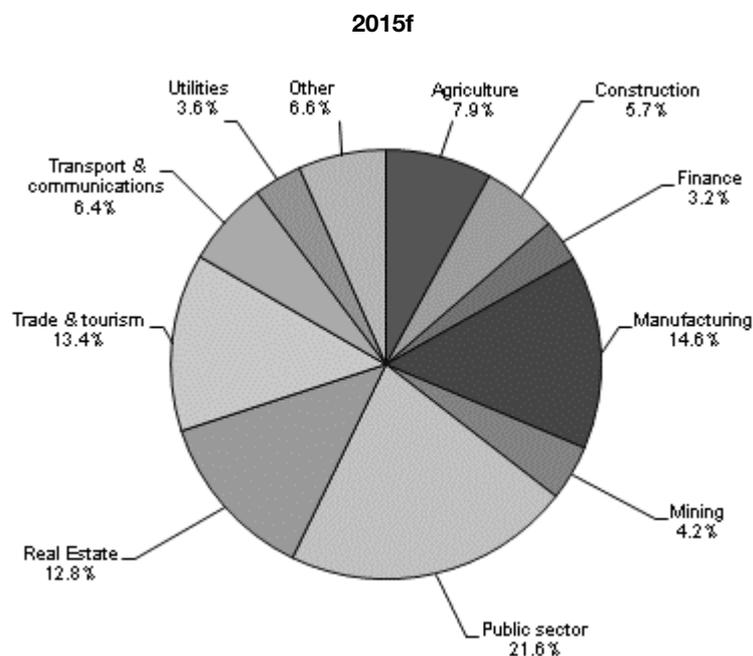
Segments

In terms of enterprise demand, the financial services sector is overweight in IT spending, as is the case globally. Research by CESSI showed the financial services sector was the largest spending vertical at over 25% of the total in 2013, followed by the telecoms sector at a share of almost 19%. This is significantly higher than the respective shares of GVA as forecast by **BMI** at 3.2% and around 6.4% in 2015. We expect financial services and telecoms will continue to generate major projects for vendors as leading adopters of emerging technologies such as real-time enterprise software and services.

Meanwhile, government spending is a key feature of the IT market, most recently in terms of countercyclical support, primarily through the Mi PC cheap computer programme accounting for around 10% of sales in some quarters between 2010 and 2012. There have also been other government ICT programmes targeting specific groups such as the 65+ demographic, which accounts for 10% of the

population. Government programmes relating to computers in education and the development of the offshoring industry are also of major significance.

Argentina GVA By Vertical (%)



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

The consumer segment should continue to be a growth driver. Although the current economic contraction may see a more cautious consumer, the growing penetration of credit cards and the availability of VAT rebates on payments made by debit cards have helped to increase spending. Aggressive expansion plans by retail chains such as **Carrefour** and Chile's **Cencosud** are having an impact on the electronics retail channel in a country where many rural areas previously lacked big supermarkets.

One potentially interesting development for enterprise spending is the application of cognitive computing to replace labour in white-collar roles. In October 2014, **IBM** announced that the cognitive computing solution Watson was to become available in Spanish after a learning process through a partnership with **Caixa Bank** in Spain. Initially, the supercomputer will learn neutral Spanish, and in later stages will work to meet the specificities of idioms from different countries such as Argentina, Colombia and Mexico.

BMI considers the short-term adoption potential of cognitive computing to be limited in Argentina, with labour cost not sufficiently high to be an immediate substitution threat, but as the cost of cognitive applications such as Watson declines we could see adoption in higher value segments such as financial services towards the latter years of our forecast period.

Future growth in the enterprise segment is likely to be strongest from small businesses, particularly with support from government programmes. Argentina has around 300,000 SMEs, of which only around 5% are significant users of IT, according to vendor estimates. Telefónica is participating in a new programme to make computers more affordable for SMEs.

Macroeconomic Forecasts

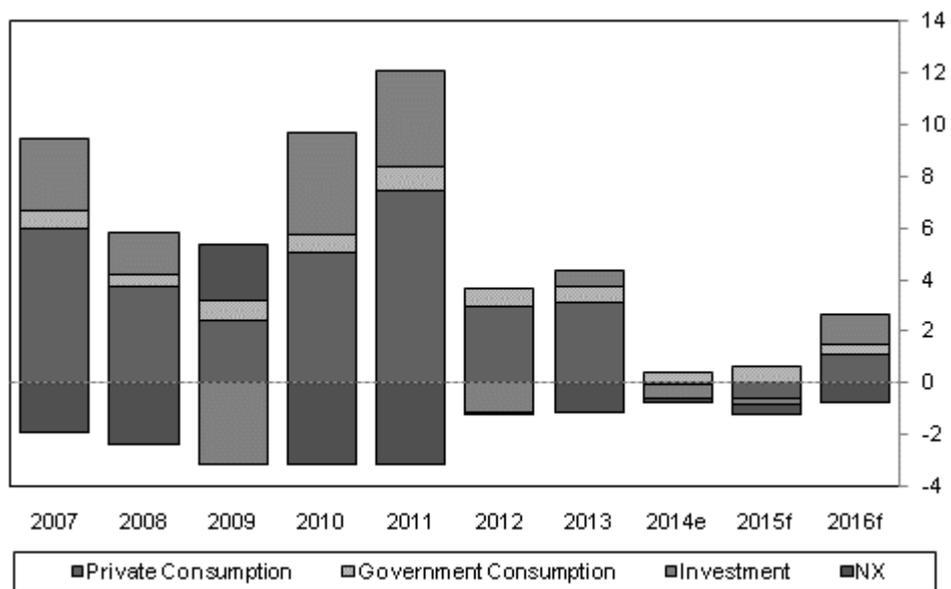
Economic Analysis

BMI View: Argentina's real GDP will contract in 2015 as currency controls and high levels of inflation weaken real wages and discourage fixed asset investment. In 2016, the country's economy will return to positive growth as a new government shifts to comparatively business-friendly policies; however, expansion will remain tepid as structural issues continue to weigh on the country.

The Argentine economy will contract for a second consecutive year in 2015 as government policies continue to discourage investment and high inflation weighs on real private consumption. Public expenditures will expand as the ruling Frente para la Victoria (FpV) boosts spending ahead of the general election in October. This will not be enough to avoid a real GDP contraction of 1.3% due to a deterioration of wages and a continuation of government policies that have failed to incentivise capital formation. After 2015, however, the end of Cristina Fernández de Kirchner's government will usher in greater levels of business activity while bolstering the net exports balance, returning the country to growth of 1.9% in 2016.

No Growth Turnaround In 2015

Argentina - GDP By Expenditure, Contribution To Growth, pp



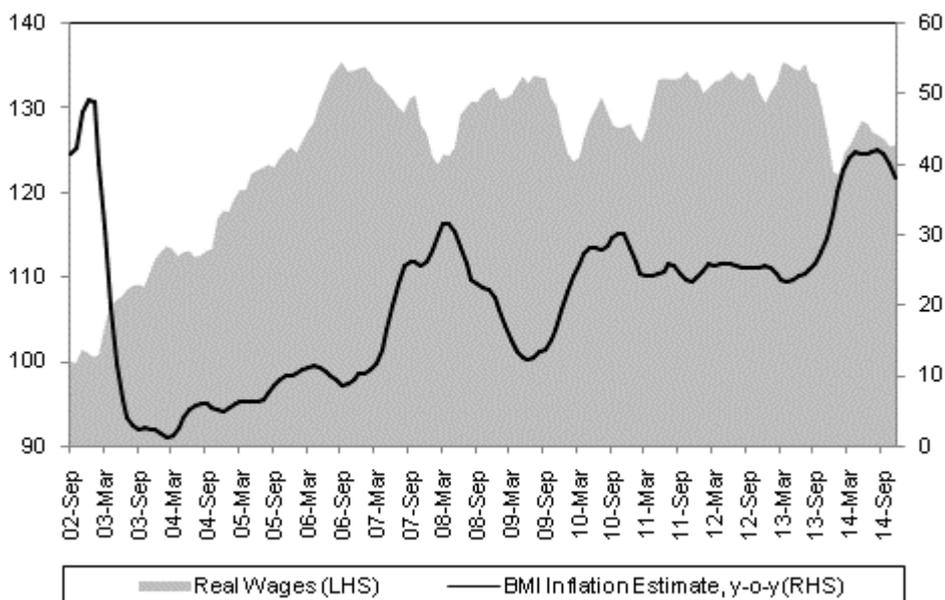
e/f = BMI estimate/forecast. Source: INDEC, BMI

GDP By Expenditure Breakdown

Private Consumption: Growth in Argentina's private sector will continue to face downward pressure in 2015 as high inflation erodes purchasing power. Although consumer confidence has risen in recent months as reserves have begun to stabilise and price expansion has slowed, we maintain our forecast for elevated average inflation through 2015, at 17.0% (see 'Growth To Remain Hamstrung By Weak Consumption And Investment', November 13 2014). Our most recent estimates for inflation (an average of the congressional inflation index and provincial inflation), combined with the government's wage growth estimates, has shown that real wages have declined 7.2% since May 2013 as economic activity has stagnated. While this trend has begun to reverse in recent months, real wages will remain weak through the end of the Fernández administration currency depreciation further weighs on consumers (see 'ARS: Gradual Depreciation To Stave Off Devaluation Until 2016', February 25). Private consumption will contract by 0.8% in 2015 after an estimated 0.1% reduction in 2014.

Deteriorating Wages Will Reduce Consumption

Argentina - Real Wages, September 2002=100 & BMI Inflation Estimate, y-o-y, 3mma



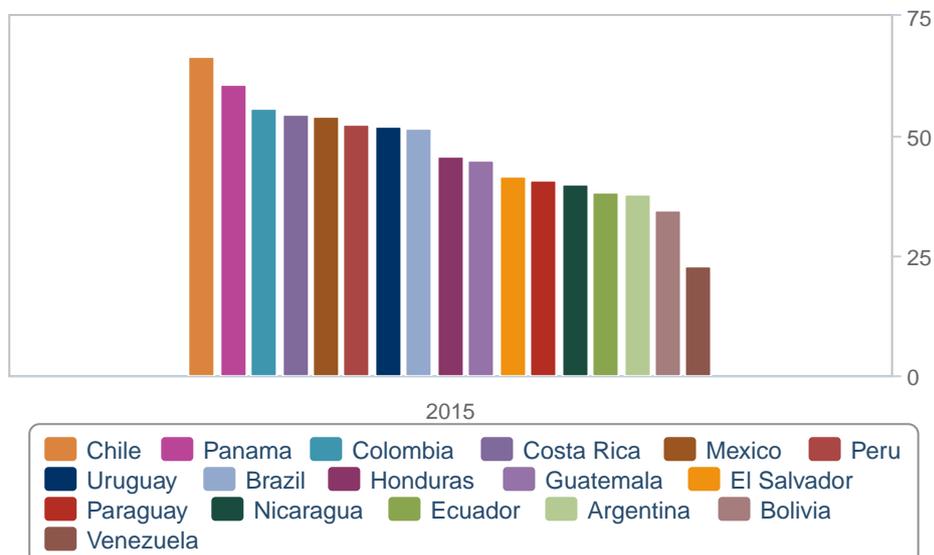
Source: INDEC, Provincial Sources, Unión por la Libertad, BMI

Government Consumption: The current government will increase current spending in 2015 to bolster support for the FpV ahead of the October election (*see 'Election Expenditure Boost To Have Long-Term Effects', March 4*). This elevated level of public expenditures will help to offset the weakness of the other sectors of the economy; however, it will not be enough to forestall a continuation of 2014's economic contraction. We forecast that government consumption will increase 5.5% in 2015 after an estimated 3.5% expansion in 2014.

Gross Fixed Capital Formation: A continued weak business environment, reflected in a 'trade and investment' score of 38.1 out of 100 in our Operational Risk Index, the third lowest in Latin America, will weigh on capital investment in 2015. We project no substantial changes to the country's investment climate as focus shifts to the October election. With a new president incoming in 2016, capital will wait on the sidelines as a new administration is widely expected by the country's enterprises to be more open to investment. Our Infrastructure team further notes that elevated borrowing costs for businesses, following the country's technical default in July 2014, will weigh on the country's infrastructure development. In addition, currency controls discourage large, international firms from entering the market (*see 'Macroeconomic Underperformance To Hinder Infrastructure Growth', January 19*). Moreover, strained government finances will limit public capital projects. Though we forecast the contraction in gross fixed capital formation to moderate to 1.0% following an estimated contraction of 2.5% in 2014, this is mostly due to base effects.

Weak Business Environment Will Discourage Investment

Latin America - Operational Risk, Trade And Investment Sub-score, out of 100

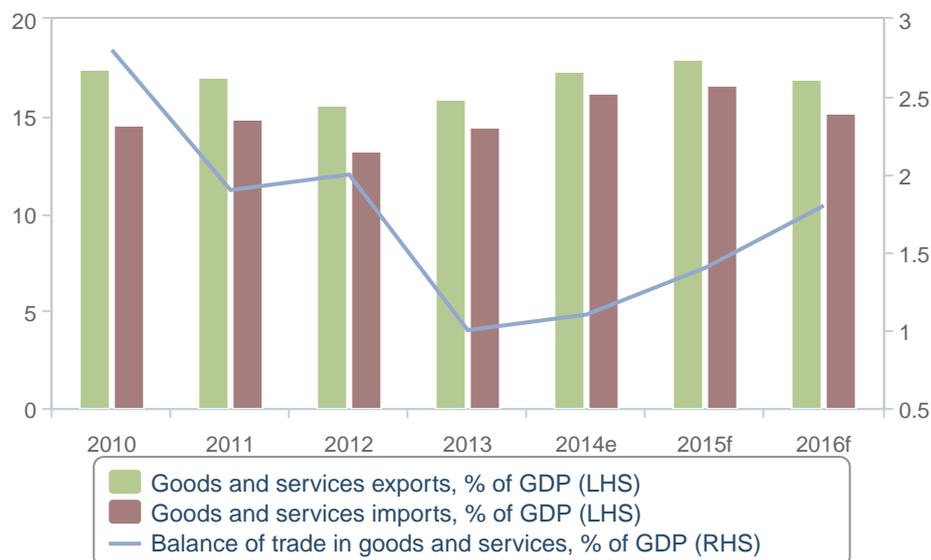


Source: BMI

Net Exports: As strict import controls continue to weigh on foreign goods inflows, government-mandated sales of soy will see export growth accelerate, widening the goods and services trade surplus (*see 'Soybean: Prices To Average Lower In 2015', February 23*). We forecast the Argentine trade surplus to expand to 1.4% of GDP from an estimated 1.1% in 2014 due to an estimated exports contraction of 13.5%. A weakening peso will allow Argentina's exporters to become more globally competitive as the currency reduces the cost of Argentine products internationally, bolstering trade outflows as the country shifts policies in an attempt to accumulate reserves (*see 'External Accounts To Improve On Shift To Business-Friendly Policies', February 11*).

Weakening Currency Controls To Strengthen Net Exports

Argentina - Trade Balance



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

New Government's Policy Shift To See Return To Growth

After a new government is inaugurated in 2016, gross fixed capital formation will return to real expansion. Businesses will begin construction of fixed assets as expectations for more business-friendly policies, such as tax incentives for investment, are implemented. Further, the end of Fernández's administration will improve perceptions about the Argentine government. Reduced restrictions on imports and a weakened peso will reduce the cost for foreign businesses looking to expand in the country and will attract investment into the country's nascent oil and gas sector, which will act as a low-hanging fruit for a new government to attract international investors. Soy exporters, who fought with the Fernández administration over the country's currency controls, will unload their large stores of soy after a devaluation in early 2016, supporting the country's goods outflows.

However, growth will be tepid, as a rebound from years of populist policies will remain difficult. After prolonged hostility from the Fernández government, international firms will hesitate to return to the country and investment will take years to build momentum. Since the current administration greatly increased the public sector's spending on social projects, the government's ability to invest in infrastructure will remain

limited, as these programmes will take years to scale back considering the risks to social stability brought by the end of subsidies. Years of underinvestment will weigh on Argentina's economic expansion as the timeline for completion of capital projects is extended to account for the weakened infrastructure.

Risks To Outlook

The risks to our forecast lie to the downside, as headwinds to the Argentine economy may continue to grow as the government increases spending and public funding options remain limited, increasing the government's reliance on printing money. Private consumption may decline more than forecast in this scenario, as inflation would remain close to its 2014 levels. Moreover, a more substantial devaluation would further weaken private consumption as other parts of the economy deteriorate.

Table: Economic Activity (Argentina 2010-2019)

	2010	2011e	2012e	2013e	2014e	2015f	2016f	2017f	2018f	2019f
Nominal GDP, USDbn	462.8	557.8	603.2	610.2	504.8	506.8	562.2	603.8	631.7	662.5
Real GDP growth, % y-o-y	9.1	8.6	0.9	2.9	-0.5	-1.3	1.9	4.1	3.5	3.3
GDP per capita, USD	11,462	13,695	14,680	14,722	12,075	12,022	13,229	14,095	14,630	15,227
Population, mn	40.4	40.7	41.1	41.4	41.8	42.2	42.5	42.8	43.2	43.5
Industrial production, % y-o-y, ave	9.7	6.6	-1.1	-0.2	-1.2	4.6	5.2	5.4	4.8	3.9
Unemployment, % of labour force, eop	7.3	6.7	6.9	6.4	7.8	7.9	7.5	7.5	8.0	8.0

e/f = BMI estimate/forecast. Source: INDEC, BCRA, BMI

Industry Risk Reward Ratings

Industry Risk Reward Index

***BMI View:** The medium-term outlook for the Americas' IT market has stabilised in wake of telecoms and business environment reforms that benefit Mexico and Argentina, in particular. These two countries rapidly ascended our IT Risk/Reward Index for Q315, overtaking politically- and economically-challenged Brazil. The bigger picture reveals similar headwinds that will further separate the highest and lowest scoring markets.*

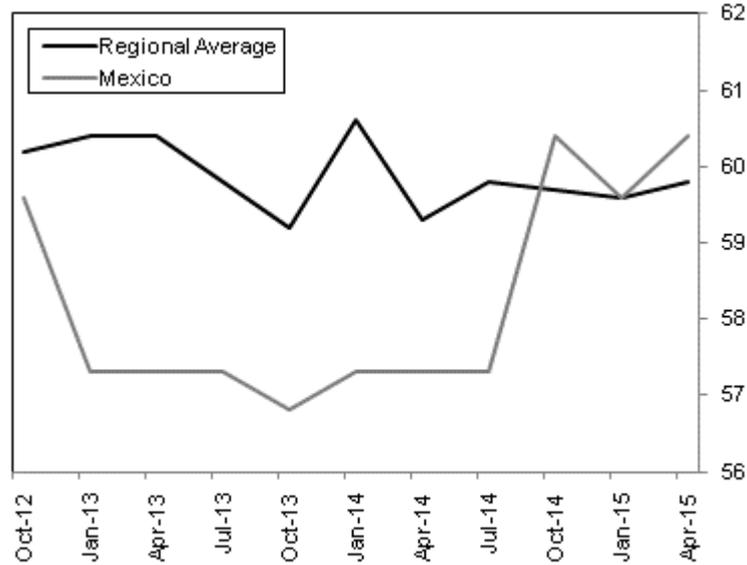
Strong GDP and GDP growth support the USA and Canada's leadership positions and the 10 points between these markets and third-ranked Mexico highlight the distinction between IT prospects across the Americas region. Although Mexico's position has improved, its businesses and households are less likely to be connected or make regular use of technology than seen in the developed IT markets in North America. These two markets pull up the regional average for the IT Index. The average for the Latin American markets alone is 55.5, a full 4.3 points below the total region.

The US and Canadian markets are particularly reliant on the services industries to drive economic growth. These industries are increasingly reliant on IT services and platforms to improve efficiencies and will continue to generate strong opportunities. Economic and political turmoil arguably has less of an influence in these developed markets as services are already online and used by the majority of the population.

Mexico has always outperformed the Latin America Risk/Reward Index (RRI) average principally due to its size. Its greatest weakness has been the dominance of a few players in the telecoms market that have made online access very difficult. However, reforms offer long term potential as connectivity is fundamental to the expansion of the IT market. As it pushes above the regional average and overtakes Brazil and Chile - previously the top markets in the region - the opportunities in Mexico are highlighted, particularly as it catches up to its more developed rivals. While we do not expect Mexico to match the scores of the top two markets, wider improvements across the region will result in a narrowing of the divide.

Mexico Pulling Ahead

Mexico Vs. Americas Average IT Risk/Reward Index Score

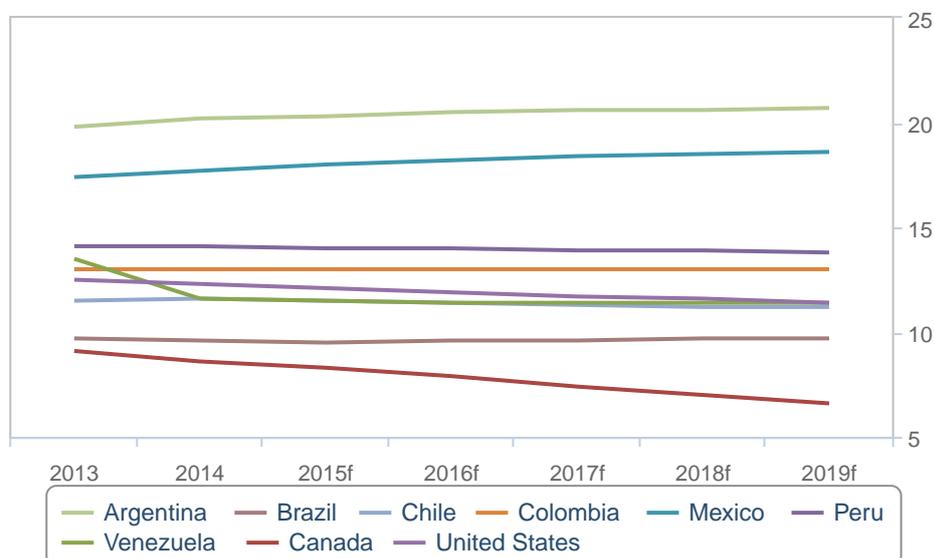


Note: Scores out of 100. Source: BMI IT Risk/Reward Index

Opportunities for companies across the IT industry in Latin America will rely on greater spending by companies. Key industries include financial service providers, health services and manufacturing. The opportunities by country differ greatly. Argentina and Mexico count manufacturing as a major contributor to economic performance and supporting growth. Increasing access to financial services will provide new opportunities although these will not use traditional platforms. We maintain a positive outlook for the growth of mobile financial services (MFS) that will bring more consumers into a formalised financial sector. Peru and Colombia, in particular, have strong opportunities in this sector as a result of multiple product launches across a diverse set of mass-market platforms.

Opportunities In Automation

Manufacturing Nominal GVA, % of Total



f = BMI forecast. Source: National sources, BMI

Greater access to financial tools will also encourage greater spending and we expect platforms for e-commerce and m-commerce to provide a small, but increasingly significant, boost to growth over our long-term outlook. In this area Chile and Argentina stand out, with consumer and household spending remaining strong over our forecast period. Chile in particular is a key market for developments as many companies launch services first to the Chilean market before expanding elsewhere in the region. Coupled with higher PC penetration than the regional average, Chile punches above its weight with its more tech-savvy population. As more consumers gain access to internet services over PCs or mobile devices, online spending will increase and companies will need to invest in the online platforms to support this growth.

While Brazil faces both economic and political turmoil, its position as a regional powerhouse cannot be underestimated. Although we have lowered our IT and economic outlook for Brazil, it remains the largest IT market in value outside of the two developed states in our Index, almost twice the size of Mexico, the nearest rival. While we see a rocky road in the medium term, our forecasts show faster growth from 2017-2019, which will keep Brazil pulling ahead of its larger rivals. Lower oil prices have offered some respite, but greenfield oil production opportunities are diminished, clouding the overall picture.

IT spending across all countries will continue to grow although at differing rates. The head start held by the US and Canada will be insurmountable for Latin American markets even though growth rates may be faster. We expect Latin American markets to leapfrog certain developments, moving to the cloud more quickly and key industries such as finance and healthcare to adopt IT-based solutions more quickly than their developed neighbours.

Table: Americas IT Risk/Reward Index, Q315

Country	Rewards		Risks		IT Index	Rank	Previous Rank
	Industry Rewards	Country Rewards	Industry Risks	Country Risks			
USA	82.5	90.0	55.0	66.8	78.2	1	1
Canada	65.8	90.0	65.0	66.7	71.8	2	2
Mexico	67.5	60.0	52.5	48.1	60.4	3	4
Chile	54.2	70.0	50.0	68.2	60.1	4	3
Argentina	56.7	75.0	40.0	52.1	58.3	5	6
Brazil	63.3	60.0	45.0	50.8	58.1	6	5
Peru	53.3	55.0	45.0	55.1	53.1	7	7
Colombia	50.0	55.0	47.5	46.8	50.3	8	8
Venezuela	45.0	70.0	35.0	34.6	48.1	9	9
Average	59.8	69.4	48.3	54.3	59.8	-	-

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 Argentina's IT hardware market will expand by 9.9% in local currency terms in 2015 to reach a value of ARS20.0bn, with PC sales expected to grow by 9.8% to almost ARS16.5bn. We forecast slightly slower growth in local currency terms in 2015 based on our Country Risk team's expectation for a slowdown in depreciation against the peso compared to 2014. However, the market is expected to fare much better in US dollar terms, with contraction of 5.6% forecast for 2015, compared to the contraction of 23.5% in 2014.. Although conditions will ease slightly in 2015 the economic environment will again present major challenges to vendors, with further depreciation forecast, as well as a real terms contraction in GDP and private final consumption.

The devalued peso and higher interest rates took Argentina's economy for an unexpected turn as it contracted in May 2014, for the first time since September 2012. The result was hardware market growth of 13.4% in local currency terms in 2014, but a contraction of 23.5% in US dollar terms, as computer spending growth was hit hard by inflation of 12.7% and a 48% depreciation of the peso against the US dollar in 2014. One small boost to arise from the major disruption to the computer hardware market in 2014 is the fact that import restrictions on devices boosted local manufacturing, a development we expect to result in a wider range of locally tailored cost competitive devices from 2015, and especially in the latter years of our forecast.

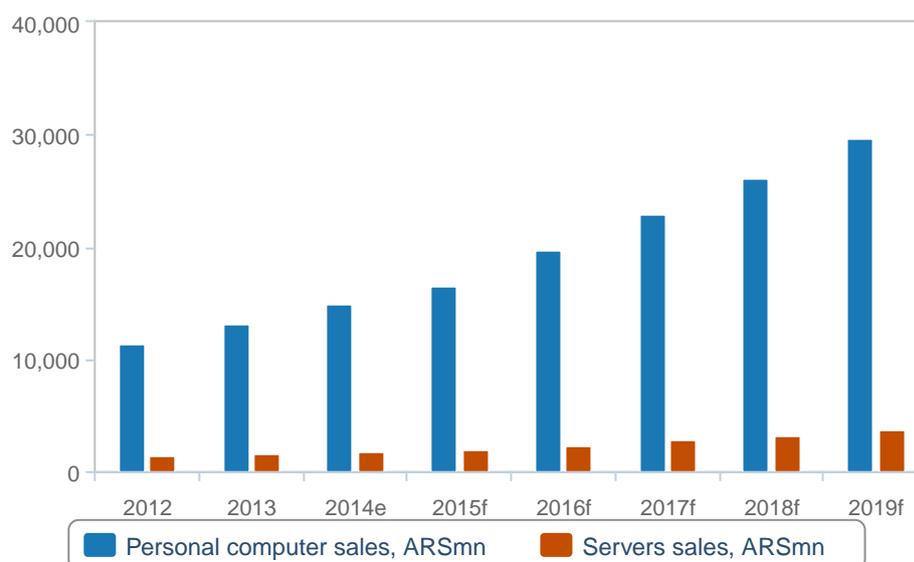
BMI forecasts an improvement in IT hardware sales growth over the medium term, with local currency sales forecast to grow at a compound annual growth rate (CAGR) of 14.8% to ARS36.4bn in 2019. The improvement is more apparent with our forecast converted to US dollars, with a CAGR of 4.5% 2015 to 2019 - and in stark contrast to the 23.5% decline in 2014 and decline of 5.6% forecast for 2015. We expect hardware spending growth will be boosted by stabilisation of the currency and stronger economic growth, particularly from 2017, which will unlock deferred purchases during 2014 and 2015.

By looking at a longer time horizon we believe the indications are for a fairly strong recovery of the PC market as economic conditions stabilise. Device purchases have remained strong considering the economic turmoil in the country at various points in the past decade. The result has been for PC penetration to be above the regional average. However, PCs still remain expensive compared to the wages of many people, and currency devaluation exacerbates this, as many PCs (particularly at the higher value end of the market) are imported, with the rest largely dependent on imported components. The most recent depreciation of the

peso has coincided with global declines in PC prices, easing some of the pressure on sales, but the market was still hit hard in 2014 making it a regional and global underperformer.

Hardware Market

(2012-2019)



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

Market Trends

Government management of the economy has clearly been a drag on computer hardware spending growth but there has been one aspect of policy that stands out as making a significant positive contribution, that of government procurement for the education system. Connect Equality was created in April 2010 by Decree No. 459/10 of President Cristina Fernández de Kirchner. The goal of the initiative is digital inclusion, by distributing netbooks/laptops across students and teachers in public institutions and to develop digital content usable in different education environments. The budget was believed to amount to around ARS4bn.

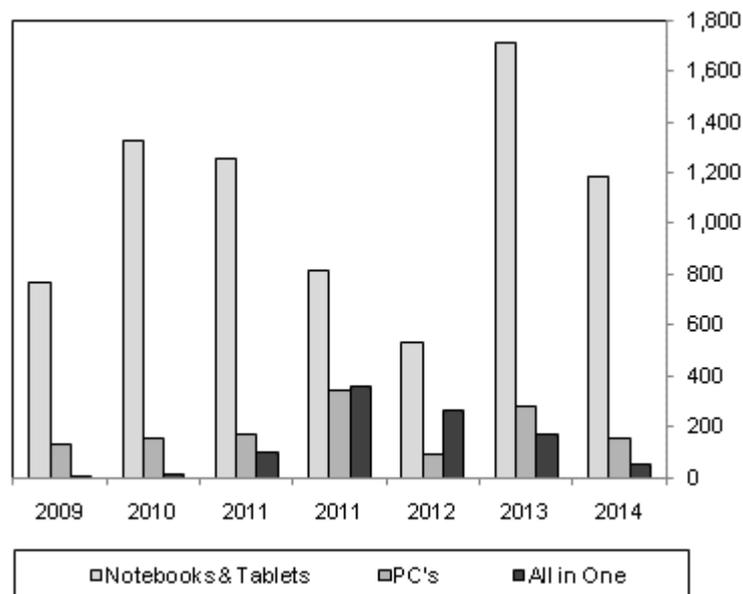
As a result of the scale of the program government education tenders have been a major feature of the PC market. The third phase of the government's digital inclusion programme, Conectar Igualdad (Connect Equality), began in 2012 and was due to involve the distribution of 1.15mn netbooks to 6,077 schools

across Argentina. In April 2015, the Argentine government announced it had already distributed 4.81mn netbooks in public schools under its Conectar Igualdad initiative. The netbooks have been produced locally by Argentine companies including **Newsan**, **Informática Fuegoína**, **Nec Argentina**, **Novatech Solutions**, **Air Computer**, **PC Arts Argentina**, **Coradir**, **Exo** and **Corporate Corp**. The government also plans to install 5,200 digital portable classrooms under a connectivity plan for schools. Quarterly results for Brazilian IT company **Positivo Informatico** support the view that government projects have played an important role in boosting computer hardware sales in Argentina, citing record increases in the number of netbooks and tablets growth. **BMI** believes the latter form factor has great growth potential in particular for those customers unable to afford a desktop or notebook computer.

Businesses increased their IT investments in 2013 but spending in 2014 was curtailed by peso devaluation and domestic economic uncertainty - a trend of deferred spending we expect to extend into 2015. This is expected to induce a renewed round of hardware tenders from 2016/2017 as the economic environment stabilises and enterprises activate previously deferred hardware upgrades. Key verticals such as telecoms and financial services, as well as export industries, are among the most promising potential markets. Demand will also come from small businesses, which have been the target of government ICT programmes.

PC Imports By Device Type ('000)

2009-2014



Source: CAMOCA

Local Production

There is a crossover between the boost to hardware sales from the educational tender and Argentina's trade policy to promote domestic PC production. The government ruled that half the computers supplied under its PC for schools tender must be manufactured in Argentina, which over three years was expected to add at least 500,000 computers to annual production. Meanwhile, the luxury goods tax has also provided a boost to local PC production. The government's pursuit of a domestic IT hardware industry has produced benefits in terms of its trade balance and domestic employment. The government has not offered any indication that it plans to shift emphasis towards liberalisation.

Barriers on imports, introduced by the government in 2012 in response to the country's trade deficit, hit imports of PCs. This is evident in data from IT industry association CAMOCA, which show total imported PCs declined by 41.7% to 888,000 in 2012. More recently, in March 2015 it was reported locally that the government was preparing a new set of import controls centred on technical barriers, bringing it into compliance with the WTO trade regime, with the new regulations expected to be introduced by the end of 2015. Argentina's current regime has been criticised by trading partners including the European Commission, which highlighted restrictions on currency transfers and a special tax on luxury goods of up to 50%.

In its H113 report, CAMOCA stated that 2012's dip in production would be difficult to recover from and registered nearly 1.4mn total imported computers for the first half of 2013, with small- and medium-sized enterprises (SMEs) mainly relying on foreign brands. However, CAMOCA data show the market reached a new peak with a total of almost 2.2mn imported notebooks, tablets and desktops in 2013, with large volumes of tablet imports driving growth. The latest data show a decline in imports in 2014, as would be expected in a climate of peso depreciation and domestic economic crisis.

The restrictions on imports have created an opportunity for local producers of PCs in Argentina, although this will only be fairly modest as the economy recovers. Tierra del Fuego has seen expanded PC production, with CAMOCA reporting notebook production reached 1.1mn units while total computer manufacturing reached 540,000 units (up 54% from H112) in H113. This success in units shipped should be held against the fact that most of the components used in assembly are imported, and as such currency movements mean producers are facing a squeeze in margins or slowdown in sales.

BMI believes government policy was largely responsible for the trend of declining PC shipments in Argentina in 2012. CAMOCA states that its notebooks figures already includes tablet computers, so this

justification for the declining desktop and notebook sales in a large number of markets is not permissible. Instead it is the affordability of computer hardware that is the central issue. According to a survey by **Marco Marketing Consultants**, notebooks are relatively less affordable in Argentina than in many other Latin American countries.

PC Market

The PC market is relatively mature in Argentina compared to the majority of markets in Latin America, with high incomes in a regional context supporting an above average household PC penetration rate. **BMI** estimates Argentina's household PC penetration rate at 47% in 2013 - the highest in the region - but we estimate the gap to have closed in recent years as PC penetration increased faster in more economically robust markets such as Brazil and Chile. Argentina's PC market development stalled at the same time as many of its Latin American peers experienced strong economic and PC market growth.

BMI estimates desktop volume sales declined by almost 19% in 2014 to 740,000, while notebook sales declined by 9.3% - hit by economic conditions and tablet cannibalisation but boosted by procurement of netbooks for distribution in the education system - to around 2.61mn. We expect the market to contract again in 2015 as a result of continued depreciation of the peso and wider economic challenges, but with the sharpest slowdown in notebook volumes due to a smaller volume of educational devices set to be procured. However, over the medium term the trends diverge, as desktop sales are expected to move to a trajectory of gradual decline, while notebooks are expected to grow 2017-2019 as a result of consumer demand for mobile form factors once the market adjusts from the volume peak associated with netbook distribution.

The large volume of educational procurement in 2013 and 2014, combined with the negative impact on imported PC prices from peso depreciation has been a boon to local vendors. A study by **Intel Argentina** estimated in April 2015 that locally manufactured PCs would have a 63% share of the Argentine market in 2015. Intel cited **Banghó**, **Positivo BGH**, **Newsan**, **Exo**, **PC Box** and **CX** as local vendors leading the Argentine market.

PCs are the dominant category of IT hardware spending in Argentina, where device purchases have remained strong considering the economic turmoil in the country at various points in the past decade or more. **BMI** believes there will be a return to the medium term trend of increasing PC penetration and levels of multiple device ownership as the economy stabilises, particularly from 2017. Income growth, declining global component and finished product prices, wider choice of low-cost tablets and greater availability of financing options from retailers and vendors (with government encouragement) will support PC market

expansion. Vendors such as **Lenovo** have already launched their own credit schemes for resellers, supporting sales relative to rival vendors. Growing broadband penetration is another driver, with telecoms companies such as **Telefónica** partnering vendors to offer customers PC and connectivity packages.

The arrival of **Microsoft's** Windows 8 operating system in October 2012 - and its subsequent upgrade a year later to Windows 8.1 - provided a small boost to growth, albeit the impact is obscured by deep economic disruption to PC market growth. Data from Statcounter indicate that, as of the end of April 2015, take-up of Windows 8/8.1 was lacklustre compared to other emerging markets, with its share of PC browsing traffic by operating system (OS) in Argentina reaching 13%. However, it is relevant to note that the 5.1 percentage point (pp) year-on-year (y-o-y) increase in browsing traffic share for Windows 8/8.1 was the largest of any OS, indicating notebooks fared well against tablets, albeit in a weak period for overall hardware sales.

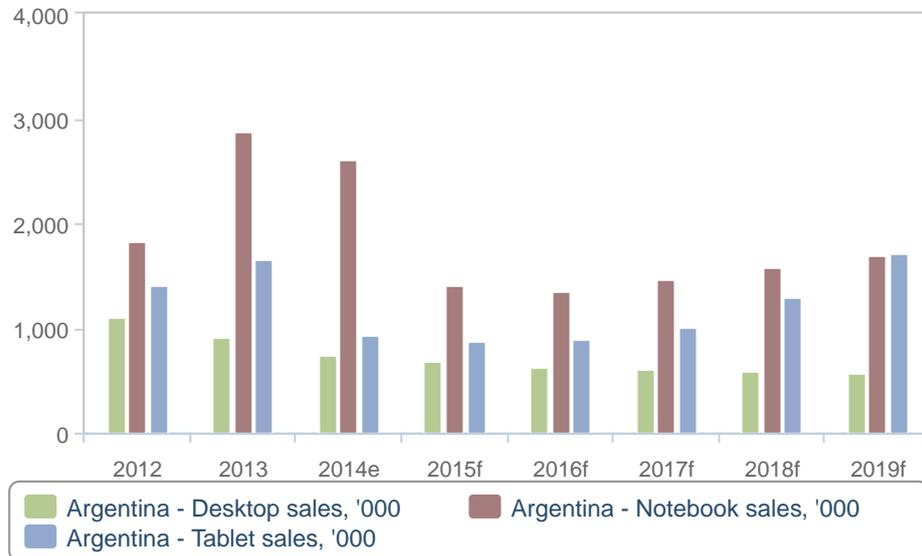
With Windows 8 open to licensing and providing a touch-friendly interface, there is potential for domestically produced hardware to offer tablet-laptop-hybrid functionality and mobility, but at more attractive prices. We expect the impact of this development to occur only gradually, starting from 2014, but it will nonetheless bring hardware designs in line with demand, and occur at the same time as the cost of domestic manufacturing declines. 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 use 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), **Hewlett-Packard** (HP)'s Envy and Lenovo's Yoga and Helix. Most recently **Dell** launched the Venue 8 tablet running full Windows 8.1 with a price point of around USD200 - creating a challenge to the use case and value proposition of **Apple's** iPad and Android vendor offerings. Although design innovation has some way to go, and 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.

Meanwhile, in November 2014 local vendor Exo released its hybrid notebook the Exo Wings 2in1, essentially a tablet with a removable keyboard. In terms of operating system it comes with Windows 8.1 including Microsoft Office 365 free for 1 year in addition to 60 minutes of calls a month via Skype and 1TB storage OneDrive. Other local vendors are also increasingly targeting the higher value hybrid notebook and Ultrabook market. For instance, in March 2014 Banghó launched its Zero Ultrabook, the first Ultrabook with a 4th generation **Intel** processor in Latin America.

PC Volume Forecast

(2012-2019)



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

Tablets

The tablet boom that has taken place globally since 2012 has been slow to develop in Argentina due to a range of factors. Lower incomes than developed markets meant adoption of Apple's iPad was relatively limited, and like most of Latin America the supply of low-cost mass market Android alternatives was slower to arrive than in APAC. **BMI** attributes the later availability of mass market tablets to two factors, the relative underdevelopment of device manufacturing in Latin America and the imposition of import restrictions. However, with local manufacturing capacity increasing markedly in recent years the tablet market began to see stronger growth from 2013, around 12 to 18 months after emerging markets in APAC.

Barriers to importing final products limited purchases of popular tablet devices from a small range of manufacturers such as Apple and **Samsung**. This is in contrast to more open IT markets where tablets made a considerable dent in PC sales by 2012. Nonetheless, Apple has secured a dominant position in the Argentinean tablet market, a position we infer from browsing traffic data (see accompanying chart).

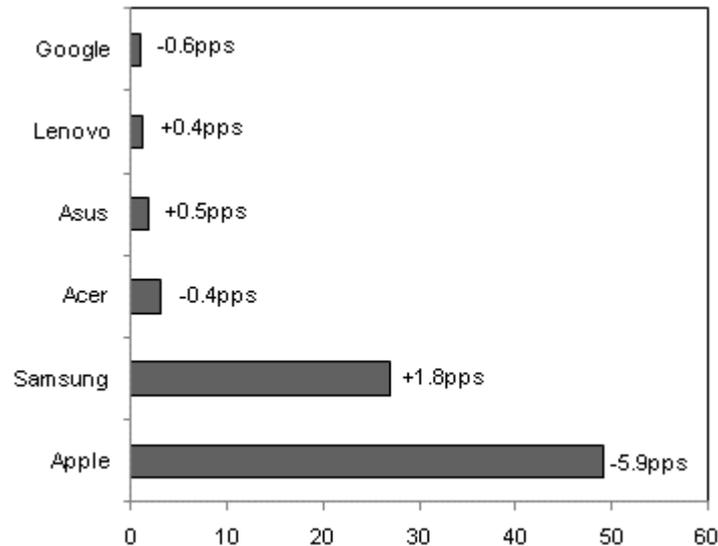
Samsung represents the greatest threat, but as the market becomes more oriented towards mass market price points we expect to see an erosion of Apple's dominance.

BMI estimates tablet sales decreased 43.4% to 936,000 in 2014 as peso depreciation negatively impacted sales, and we expect a further contraction to 871,000 units in 2015, in contrast to chipmaker Intel's forecast for 1mn tablet sales in 2015. One benefit to tablet sales is the move to direct retail of devices by mobile operators. **Claro** Argentina, a subsidiary of Mexico-based telecoms operator **América Móvil**, announced plans to sell tablets in the local market in November 2014. The operator has rolled out data plans for both prepaid and postpaid subscribers. Claro Argentina will use 3G technology to provide the connectivity service.

The boom in volumes will be less pronounced in Argentina compared to APAC as a consequence of evolving market conditions since 2012 and the economic crisis in Argentina. Notebooks vendors have innovated with slimmer design and hybrid notebooks, enabled by Windows 8/8.1 and Intel's latest chipsets, providing competition to premium tablets from Apple, Samsung and other leading players. Meanwhile, Microsoft's decision to slash OS licensing fees on low-cost notebooks in Q1 14 increased their cost competitiveness against tablets running Android. Tablets will still outperform notebook sales, but the competitive dynamics will be slightly different to early tablet adopting markets.

Apple Dominant And Android Vendors Gaining Only Slowly

Argentina Tablet Browsing Traffic By Vendor (%) & y-o-y Change, April 2015



Source: Statcounter

Vendor Developments

The Argentine PC market is still a relative stronghold for multinational brands such as HP, Dell and **Acer**. This is changing with domestic competition and the increased efforts of other international vendors. For instance, in H112 South Korean electronics leader Samsung opened its first store in Buenos Aires, offering a range of the company's products including tablets, notebooks and netbooks.

International vendors including HP, **Toshiba** and Dell also dominate sales of laptops, and continue to target growth opportunities. In September 2014 Toshiba added **Air** as a distributor for its products in Argentina. Toshiba stated the deal will enable it to expand its presence to new cities and provinces as it looks to grow sales across its product range of tablets, notebook and external hard disks.

Meanwhile, Chinese PC vendor and global market leader Lenovo, recognising that availability of credit is an important driver for consumer demand, launched a credit programme for resellers in Argentina in 2013. The programme, launched in conjunction with local bank **Comafi**, makes up to USD15,000 credit available,

repayable in six-to-24 month installments at a fixed interest rate. The credit is made available through Lenovo's local wholesalers: Air Computers, **Microglobal**, **Stylus** and **Tallard**. The financing system helps resellers to increase sales and profitability.

Despite the presence of a range of global vendors, some domestic companies such as Banghó and **Commodore** have found a place in the market, with each having market shares of around 7-8%. Domestic brands such as Air Computers, **Ceven**, **PC Arts**, **Exo**, **Sicsa** and **Megatone** account for around half of desktop sales, while the grey market accounts for one-third of sales.

There has been some progress with new form factors to challenge the traditional divided market between netbooks and notebooks. In 2012, domestic companies such as **Frávega** launched their own tablet products. Frávega started making tablet computers at its plant in Rio Grande, Tierra del Fuego, targeting sales of around 275,000 nationally in 2011. Prior to the tablets launch, all tablets on sale in Argentina were made in China. Frávega also plans to make notebooks and netbooks in Tierra del Fuego, using its own Admiral brand and an international brand. The company has invested ARS75mn in its Rio Grande facility since 2006.

Telecoms operators are one significant retail channel for PC sales. Following similar developments in Mexico and elsewhere in Latin America, Argentina's fixed-line incumbent, **Telecom Argentina** now offers a variety of PCs and laptops bundled with its wireless broadband service. Prices for a basic laptop with Wi-Fi connection start at USD56.16 a month on top of a USD39.90 monthly broadband charge. The most expensive model costs around USD100 a month.

Software

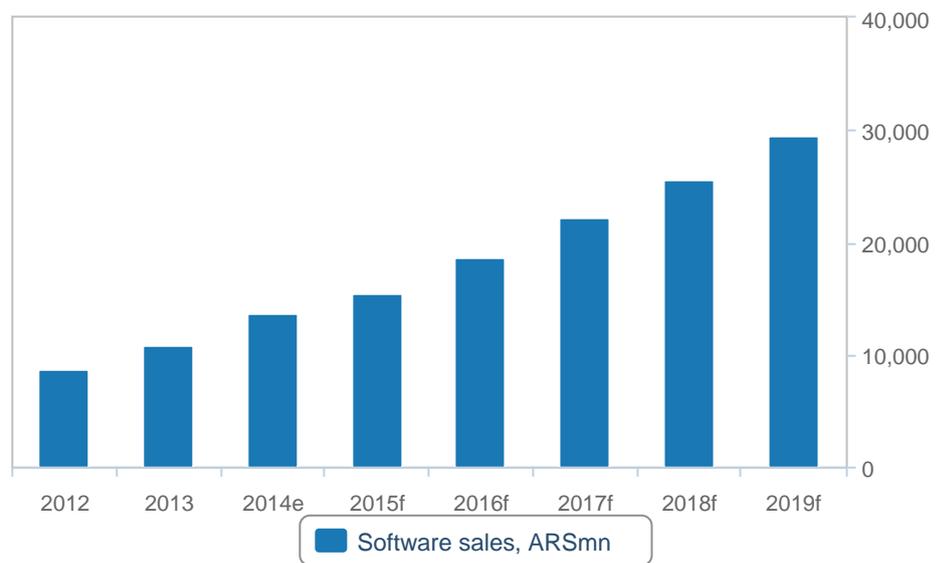
BMI forecasts the Argentine software market will register value growth of 12.7% in 2015 to a value of ARS15.5bn. Growth is forecast to slow in local currency terms from 2014 but performance in US dollar terms will be much stronger under our Country Risk team's scenario for slower peso depreciation against the US dollar in 2015.

We forecast stronger medium term growth in Argentine software spending, both in local currency and US dollar terms. We forecast a CAGR of 16.5% for 2015-2019, with total spending expected to reach a value of ARS29.5bn in 2019. Meanwhile, in US dollar terms we forecast a CAGR of 6.1% for the same period. Demand growth in the retail and enterprise sectors will increase sales, despite high annual software piracy losses. We highlighted a particularly significant opportunity in the enterprise sector through sales of enterprise resource planning (ERP) and customer relationship management (CRM) software.

However, there is a risk that economic uncertainty, domestically and internationally, will result in deferred payment. For instance, 2011 saw a boost from systems upgrades previously deferred because of the economic situation, so we point to the potential for a further period of deferred investment as the Argentine economy faces contraction and consumers tighten their spending. However, as economic conditions ease from 2016 we believe there is the potential for a sharp uptick in spending growth as a result of deferred purchases during 2014 and 2015.

Software Market

(2012-2019)



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

Enterprise Software

The robustness of enterprise software spending means it accounts for around half of total Argentine software revenue. The main functional category currently is ERP solutions, estimated to represent over 80% of the enterprise software total. Demand for ERP solutions will remain robust in the short term due to the large potential market represented by SMEs in many parts of the country.

Companies reporting recent ERP implementations have included power distributor **Edesur** and transport firm **Azul Satar**. Licences acquired are used in different areas such as financials, supply chain management, cost management, plant maintenance and human resources.

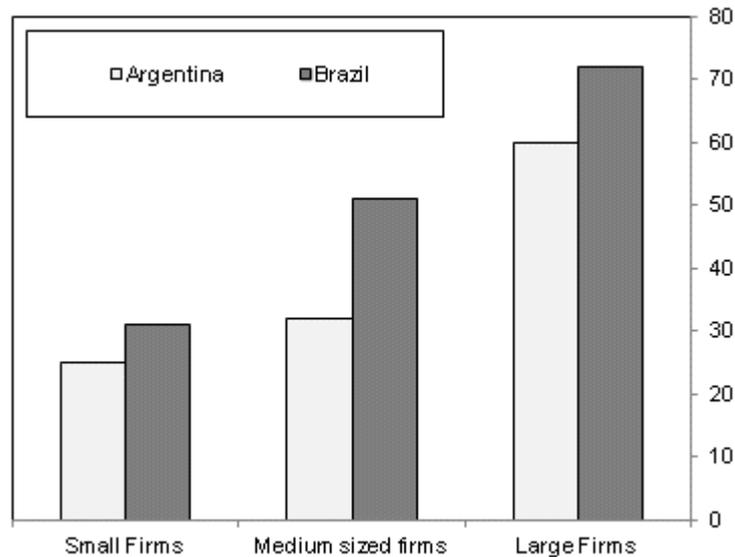
Data produced by the OECD show ERP adoption still lagged behind the levels reached in neighbouring Brazil for SMEs as well as large firms in 2013, from which we infer there is significant growth potential. In Argentina ERP systems are used by 25% of small firms, 32% of medium-sized firms and 60% of large firms, while in Brazil the respective figures are 31%, 51% and 72%. However, the outlook for continued peso depreciation in 2015, and wider economic malaise, could see enterprise software spending deferred to 2016 and beyond due to low enterprise confidence and an uncertain outlook.

CRM, the next largest category, is still less than 10% of the total. HR management is a growing business for applications vendors as SMEs are becoming aware of the potential cost savings from use, particularly through a cloud service. Service provider **Northgate Arinso** estimates that it processes wages and benefits for around 50,000 employees in the Southern Cone region.

However, we believe vendors will increasingly look to business intelligence applications, where faster growth is projected. The business intelligence sector has been a strong performer, with sales of databases growing steadily. Security software should also provide opportunities, with some demand for more sophisticated security solutions.

Room For Growth

ERP Adoption Argentina Versus Brazil, 2013



Source: *Latin American Economic Outlook*, OECD

Open Source

As elsewhere in the region, there is also growing interest in open source software, motivated by a desire to save money and encourage local developers. However, in terms of operating systems, there is no evidence of a shift to open source, with the share of browsing traffic attributable to Linux machines up just 0.2pp y-o-y to 1.4% of traffic in April 2015, according to Statcounter data.

Following criticism of the initial programme, the second phase of Mi PC was widened to offer consumers the option of purchasing PCs with Linux operating systems. Interest in open source may be encouraged by the current economic slowdown, with Argentine state oil company **YPF** migrating its proprietary software to a Linux system.

Operating Systems

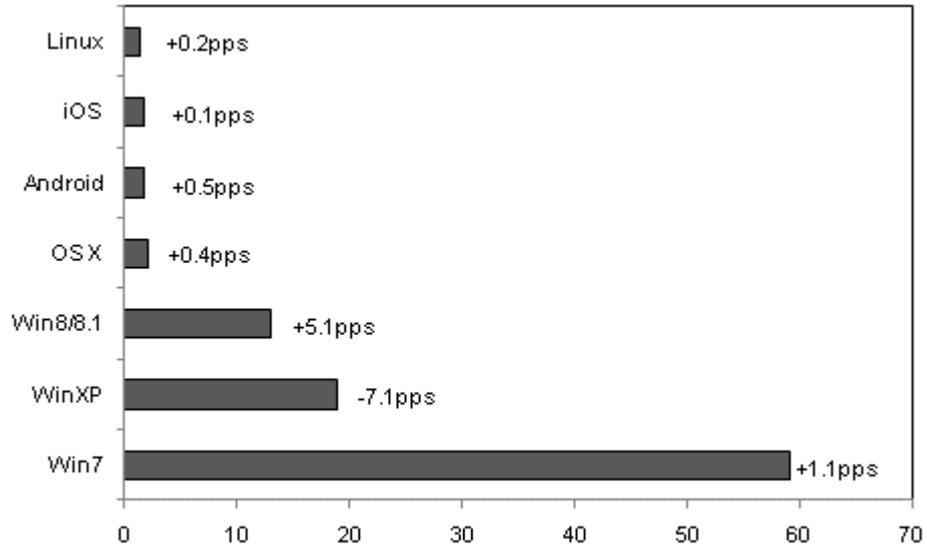
Data on PC browsing traffic reinforce our view of Microsoft's dominance in Argentina, despite it inevitably suffering from a slowdown in PC sales in 2012 and 2013. Microsoft's operating systems combined to account for 92.3% of PC browsing traffic in Argentina in April 2015.

Operating system sales globally were boosted in 2014 by the withdrawal of official Microsoft support for the legacy XP operating system in April 2014. The economic disruption inevitably dampened upgrade momentum slightly in Argentina, but from browsing traffic data **BMI** infers there was still solid demand for migration from Argentinean enterprises. The share of Argentinean PC browsing traffic attributable to XP declined 7.3pp y-o-y to 18.8% in April 2015, however, with migrations clearly slowing from Q214 there is still upgrade momentum remaining once the economy stabilises, most likely from 2016.

As a result of the economic disruption in 2014 and 2015 migrations to Windows 8/8.1 slowed, but the share of traffic was still up by 5.1pp y-o-y to 13% in April 2015. However the share attributable to device running Windows 8/8.1 is likely to be approaching its peak. In January 2015 Microsoft unveiled details about the forthcoming Windows 10 operating system, which will available be free for the first year to users of Windows 7 and 8/8.1, and become a single platform across PCs, tablets, smartphones and the Xbox. **BMI** believes the offer of a free first year could see a significant migration momentum when Windows 10 is released, expected later in 2015. The fact the new OS is being given away for free for the first year also reflects Microsoft's decreased focus on monetising its Windows OS product, moving it closer to the strategies of **Google** (Android, Chrome) and Apple (iOS and MacOSX) that use their operating systems to respectively generate revenue from advertising and hardware sales. We believe Microsoft will increasingly use Windows OS as a means of maximising Microsoft's device penetration, with sales generated from additional products and solutions.

Argentina PC Browsing Traffic By OS (%) And y-o-y Change

April 2015



Source: Statcounter

Piracy

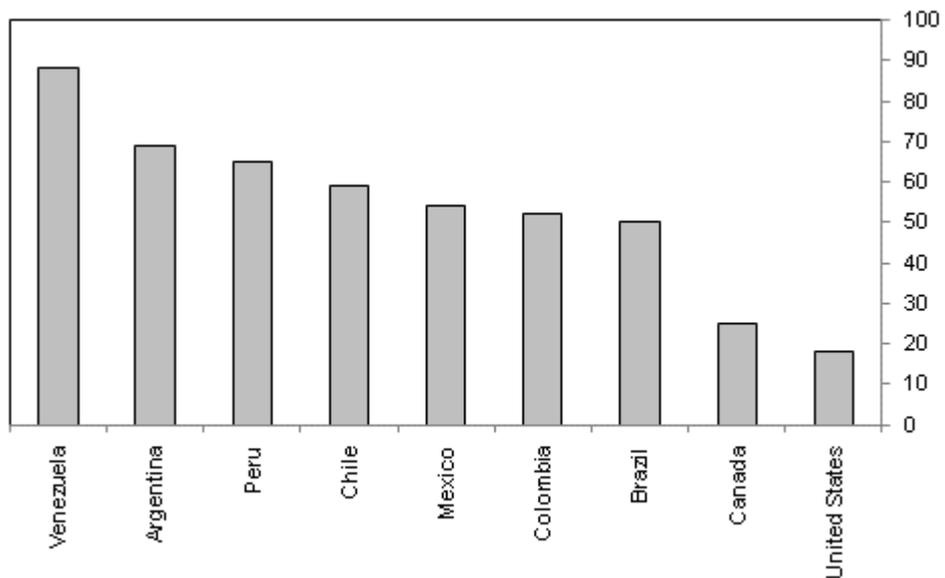
Argentina still ranks high in the International Intellectual Property Alliance's 2013 Special 301 Report for piracy and is given Priority Watch status. Software piracy continues to be a drag on sales growth, with the piracy rate estimated at 69% in 2011 by the Business Software Alliance. This is higher than the level in other relatively developed Latin American markets such as Brazil (53%), Mexico (57%) and Chile (61%), as well as the Latin American average of 64%. This is despite law enforcement agencies mounting periodic crackdowns against illegal software. The law allows for a six-year prison sentence as a penalty for copying and distributing pirated software.

A study by the Business Software Alliance (BSA) found that penetration of illegal software in Argentina was 69% in 2013, the same level as during 2011. The market for illegal software has grown from USD657mn in 2011 to total USD950mn in 2013. This outstrips the market for licensed software which had a market value of USD450mn in 2013.

While government action of piracy has yielded limited results, the introduction of new regulatory compliance laws for electronic invoicing, which took effect for some industries in 2011, provided a boost to enterprise investment in software platforms. Many companies were still adapting to major changes that took effect in 2010, regulating electronic invoicing for Type E export invoices. The new regulations extended the requirement to domestic (Type A and Type B) invoices. Meanwhile, other software vendors have developed programmes for 'retention agents', which are companies that under Argentine tax law are required to withhold taxes on a payable invoice to be later paid to the government.

Americas Piracy Rates* (%)

2013



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

Vendor Developments

Despite the global economic slowdown, Microsoft continued hiring in Argentina and also drafted a financial assistance plan for partners. The company was focused on upgrades and promoting its software to clients as a tool to reduce costs and make them more efficient. Areas of focus included virtualisation solutions, security systems and business intelligence applications. Microsoft will focus on SMEs, of which only about 12,000 of the country's estimated 300,000 SMEs are currently doing business with Microsoft.

SAP Argentina is the leader in Argentina's enterprise applications segment with around a 50% share. Business intelligence was one growth area for SAP, while financial services and healthcare were strong performing verticals, with the trade vertical accounting for 15-20% of SAP's Latin American sales. Going into 2013, the company continued to report wins in a variety of sectors.

Other leading enterprise software vendors include Microsoft and **Oracle**, as well as **Calips** and local competitors **Tango** and **Telesoft**. Together these companies account for around 20% of total software sector revenue. Smaller vendors have been able to take advantage of growing demand for vertical-specific solutions. In H112 airline **Aerolineas Argentinas** implemented a software-as-a-service (SaaS)-based revenue management solution from software vendor **Sabre Airline Solutions**. The software was expected to improve Aerolineas Argentinas' access to customer demand forecasts and flight details.

The government is hoping to develop the role and share of domestic software firms and in January 2013 the Ministry of Science, Technology and Innovation announced its calls for submissions for projects to contribute to the growth of the software industry. The ministry offers subsidies to new companies via the Trust Fund for the Promotion of the Software Industry (FONSOFT) to help them to achieve scale and gain a foothold in the industry.

In April 2015, **Symantec**, the cybersecurity software vendor that produces the Norton range of anti-virus software, announced it was withdrawing from Argentina. Symantec cited recession, excessive regulation and foreign exchange restrictions as the reason for withdrawing, although corporate reorganisation was also clearly a key part of the decision as Symantec group management closed a total of 22 subsidiaries.

In April 2015, Sofrecom Argentina announced its projection for revenue growth of 18% in 2015 to ARS302mn. Additionally, investments of ARS8mn-10mn are planned as Sofrecom Argentina targets domestic and international growth in the telecoms, utilities, financial services, autos and oil & gas verticals.

Table: Argentina Software Exports By Country

Argentina Software Exports (%)	June 11-June 13	Argentina Software Exports (%)	June 11-June 13
USA	52.9	Ecuador	1.2
Chile	8.6	Spain	1.2
Brazil	6.8	Panama	0.8
Mexico	5.7	Paraguay	0.7
Peru	5.6	Bolivia	0.6
Rest of Europe	5.3	Canada	0.4
Uruguay	4	Venezuela	0.2
Rest Of Latin America	3.8	Asia	0.2
Colombia	1.3	-	-

Source: OPSSI

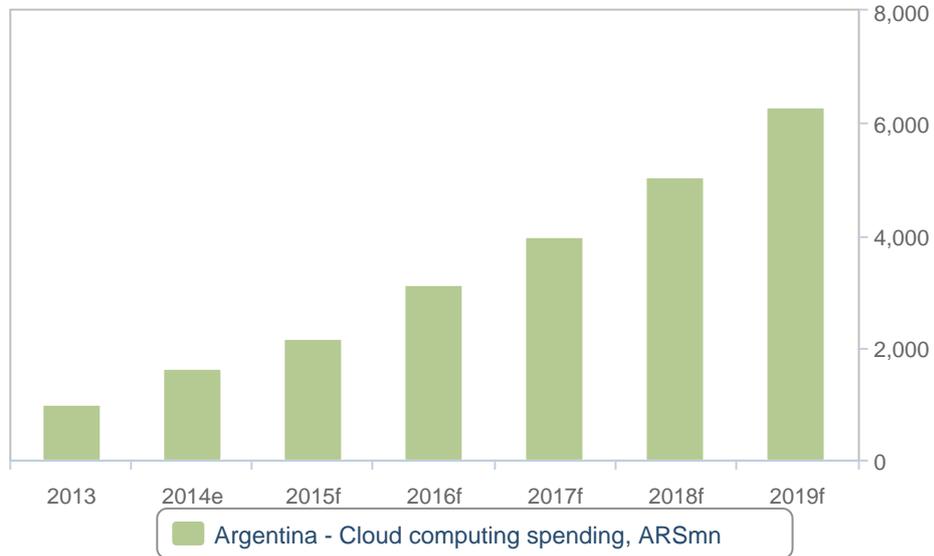
Cloud Computing

BMI estimates the growth of cloud computing demand far exceeded the overall rate for the Argentine IT market in 2014 - as would be expected for an emerging technology. We estimate cloud computing demand grew by around 66% in 2014 to ARS1.64bn. We estimate that close to 25% of total Argentine enterprises were already using some form of cloud computing by the end of 2014. The growth rate will necessarily slow in percentage terms as the market matures but in absolute terms increases will remain significant. We forecast a CAGR for Argentine cloud computing demand of 31% 2015-2019, which will result in a near tripling of cloud demand from ARS2.17bn to around ARS6.31bn in 2019.

The BSA gave Argentina a score of 56.5 in its 2013 Global Cloud Computing Scorecard, pushing it down one spot from the previous year but still at a healthy rank in terms of its cloud computing policy environment compared to its Latin American peers and just behind Mexico. However, putting this in a wider context demonstrates the considerable potential for improvements to network infrastructure. In April 2015 leading global enterprise software vendor highlighted the infrastructure challenges in Latin America as a whole, which continued to moderate cloud service adoption in 2014. Even so, SAP still reported double digit cloud service revenue growth for Latin America y-o-y to Q115, but cloud remains a small part of its 28,000 regional clients, of which around 80% are SMEs.

Cloud Computing Demand

(2012-2019)



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

SaaS

While ERP, CRM and business intelligence software is applicable to large enterprises, it is often not feasible for SMEs with limited capital budgets and less complex businesses. However, as investment in networking infrastructure by wireless and wireline telecoms operators unlocks the potential for cloud services, **BMI** believes enterprise software penetration among SMEs is a growth opportunity by reducing total cost of ownership and upfront cost for software solutions. According to the OECD, in some countries the use of SaaS CRM solutions reduces costs by an estimated 20-25% compared to conventional applications.

This has led vendors to explore opportunities in cloud computing models such as SaaS, with a particular focus on the SME market. The market remains at an early stage, but a combination of enterprise objectives such as cost reduction and greater efficiency should drive more adoption of cloud services. The biggest software opportunities will be in non-critical file storage, or customer-facing applications such as CRM. SaaS won more acceptance as smaller businesses have increasingly had to meet performance, visibility and compliance standards previously expected more of larger companies.

The SaaS opportunity is by no means limited to SMEs. Verticals such as financial services, government and telecoms are also emerging as strong adopters of hosted software. 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-premise. Large businesses are most likely to put IT applications such as mail, phone systems and document management into the cloud.

IaaS

Another area of opportunity will be organisations looking for help in utilising efficiencies from cloud computing such as platform-as-a-service (PaaS) and infrastructure-as-a-service (IaaS). Cloud computing adoption is gaining momentum in Argentina due to improvements to network infrastructure and competition between a widening array of cloud service providers. According to the OECD, in some countries migrating infrastructure to cloud services can reduce costs by over 50%. The availability of cloud solutions is fuelling the managed services trend, as businesses see opportunities to cut capital expenditure costs and delivery productivity gains.

Particular areas of opportunity for cloud computing include banking and retailing as organisations in those fields look to save money on hardware investments. The market should grow as new solution providers are attracted into the market.

Competition has been intense as vendors and telecoms operators vie for market position in the nascent cloud services market. In H1 12, Claro, the local unit of regional telecoms company América Móvil, launched cloud-based services, which it expects to account for 40% of its enterprise segment revenue within the next three years. Claro's launch of cloud computing services was right across major Latin American markets and based in its data centre in Argentina. The data centre facility, at Belgrano, Buenos Aires, was built at a cost of USD15mn. **Fibertel**, the broadband arm of the **El-Clarín** communication group, invested USD300mn and started offering cloud computing services in Argentina. By December 2011, the company had signed up 25,000 customers for its cloud services and charges an average of USD190-300 a month.

Telefónica has launched Espacio Cloud, a corporate website that promotes adoption of cloud computing for small companies, IT professionals and entrepreneurs. The company announced its plans to invest ARS66mn from 2013 to 2014 targeted at developing cloud-based applications and services for SMEs. Telefónica sees Argentina as having one of the highest cloud adoption rates in the region, regarding it as a worthwhile investment.

In February 2015, Argentine telecoms services provider **FiberCorp** launched a new service called Cloud Office, a cloud-based offering for corporations and professionals, in association with **Cablevisión**. The new service allows companies to outsource their office tools. The solution includes four applications: FiberCorp Mail, FiberCorp Office, FiberCorp Videomeetings and FiberCorp DriveBox.

Table: Regional Distribution Of Cloud Workloads, 2011-2016 (mn)

Region	2011	2012	2013	2014f	2015f	2016f	CAGR 2011-2016
Asia Pacific	6.7	10.6	16.2	23.2	31.2	40.6	43%
Central and Eastern Europe	0.7	1	1.7	2.5	3.7	5	50%
Latin America	0.7	1.1	2	3.3	5	7.2	60%
Middle East and Africa	0.3	0.5	0.9	1.5	2.6	4.2	73%
North America	8.1	12.5	17.1	21	25.1	29.7	30%
Western Europe	4.9	7.8	11.7	16.2	20.7	25.4	39%

f = forecast. Source: Cisco Analysis 2012

IT Services

BMI forecasts Argentina's IT services market will reach a value of ARS23.3bn in 2015, up 13.8% from ARS20.4bn in 2014. However, it should be noted that this translates to contraction of 2.2% in US dollar terms - but is a significant improvement on the US dollar contraction of 15.8% in 2014 when peso depreciation was steepest. For a developing market, the percentage of Argentina's IT market revenue generated by services is fairly typical, at just under 40%. IT services revenue is expected to grow faster than the market as a whole, with the CAGR of 18.3% forecast for 2015-2019.

The IT services market has become one of the most dynamic drivers of IT sector spending in Argentina and has attracted greater investment from international vendors. The increasing number of multinational corporations in the market is an important driver for spending, while local firms are trying to use computing resources more effectively and integrate investments in hardware and software.

A key trend that will underpin the development of the IT services market is telecom operator investment in wireless and wireline network infrastructure. This will directly enable utilisation of cloud computing, smart services and outsourcing - while also acting as a demand driver for Big Data solutions as an increasing

range of local enterprises look to harness insights from the increasing volume of data generated by enterprises and consumers.

Investment announcements continued in Q115 despite economic instability. In January 2015, Telecom Argentina invested around ARS210mn (USD24.36mn) to deploy a new fibre optic backbone network based on the dense wavelength division multiplexing technology in the country. Chinese telecoms equipment vendor Huawei will carry out the upgrade. Meanwhile, Movistar announced in February 2015 its plans to invest ARS3bn (USD346.81mn) to deploy 4G LTE services in Buenos Aires Province. The operator aims to provide 4G technology in 53 municipalities by deploying more than 1,300 LTE sites across the province.

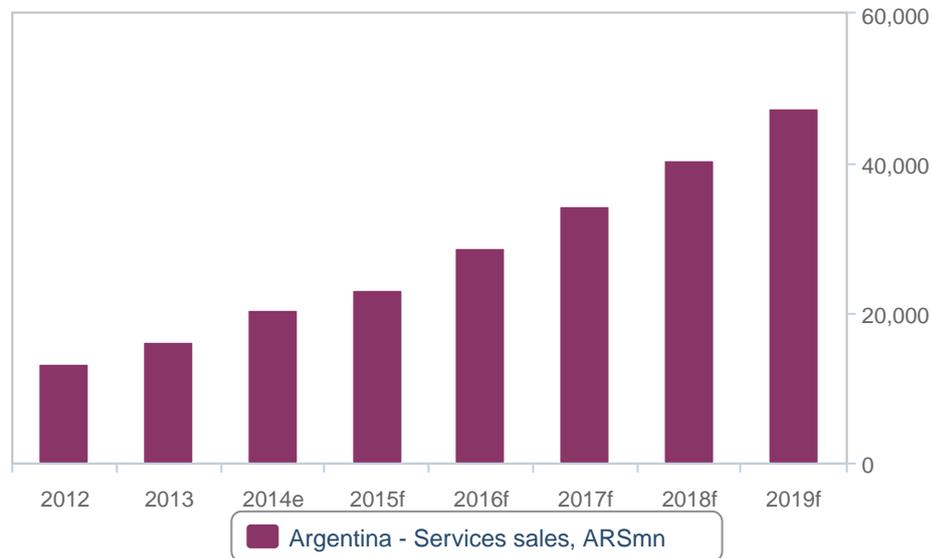
Outsourcing

Outsourcing is an important spur to growth for the IT services sector, especially as Argentina consolidates its reputation as a regional offshoring hub. However, traditional services such as desktop support are still the mainstay of the market, while applications services support is less developed. Political and economic uncertainty could undermine the development of the local outsourcing industry, as the Argentine economy has contracted. Led by the financial, telecoms and public sectors, there is a trend towards bigger managed service and outsourcing deals in key sectors of the local market. **BMI** estimates the addressable IT outsourcing market to have come in at just under ARS2bn in 2013.

Telecoms outsourcing alone could be worth more than USD1bn by the latter part of our forecast period. Argentine telecoms operators are rolling-out new mobile and fixed broadband platforms and services, including 3G mobile, and this is driving IT services investments in applications management. Meanwhile, with operators **Telecom Personal**, **Claro Argentina** and **Telefónica Móviles** and media conglomerate Arlink bidding a total of USD2.23bn in the 3G and 4G wireless spectrum auction held on October 31 2014, there is expected to be continued investment in 2015 and over the medium term.

IT Services Market

(2012-2019)



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

Smart Services

The smart services market, also referred to as M2M and the IoT is forecast to grow rapidly in Argentina over the medium term, but due to smart services being relatively new development globally, our forecast expects growth will be weighted more towards the latter years of our forecasts. The market may take several years to gain critical mass and economic disruption will stymie IoT market development in 2015. However, due to the large infrastructure investments associated with economic development, as an emerging market, **BMI** argues the smart services opportunity will ultimately make a significant contribution to IT market growth dynamics in Argentina.

In December 2014, Argentina's mobile operator **Telecom Personal** entered a partnership with US-based firm Jasper to launch IoT and M2M connectivity for business subscribers. Enterprise subscribers will be allowed to access a highly scalable platform to launch, manage and monetise their connected services internationally, according to Jasper. IoT offers advanced connectivity of devices, systems and services that extend beyond M2M, and includes various protocols, domains and applications. Jasper has previously

partnered with Claro, Telenor, **Vimpelcom**, **Tele2**, Telefónica, **AT&T**, **KPN**, **NTT DoCoMo** and **Etisalat** to launch M2M initiatives.

The IoT is expected to underpin telecom enterprise services offered across several sectors. The plans for connected devices will link transport, power and utilities to communications networks. Further to this, IoT plans will underpin retail and banking sectors as well as being linked to many other markets. Personal's focus on building an IoT platform will enable it to cater to these industries' growing needs. Many companies are turning to technology to lower costs and improve efficiency. Telecoms operators have many opportunities to build revenues from these new sources in addition to providing more traditional communications services.

Vendor Developments

Global vendors such as **IBM** and **Accenture** have netted a growing number of large deals from traditional IT services segments. The latter recently implemented the first phase of a multi-million-dollar solution for Telecom Argentina. The three-phase project is part of an ambitious transformation being undertaken by Telecom Argentina to support its growth in broadband and IT services. IBM is strong in key verticals such as telecoms and banking and has a major regional services contract with Telefónica. IBM recently signed an agreement with Argentina's fourth-largest financial institution for servers and applications migration.

IBM Argentina said it had developed new integrated solutions in response to three local market trends: increasing mobility of data, rising energy costs and increased concerns over IT security. It signed an agreement with Chilean systems integrator **Synapsis** jointly to offer solutions in Argentina and a number of other regional markets. Synapsis will become an IBM solutions integrator, focusing on data centres in a number of verticals including utilities, government, energy and mining. The public sector also remains a key target for vendors, with local and regional players competing with multinationals for projects. The government is also expected to be a key cloud computing vertical.

In October 2014, IBM announced that the cognitive computing solution Watson was to become available in Spanish after a learning process through a partnership with **Caixa Bank** in Spain. Initially, the supercomputer will learn neutral Spanish, and in later stages will work to meet the specificities of idioms from different countries such as Argentina, Colombia and Mexico. **BMI** believes uptake will initially be slow in Argentina and other Latin American markets, and instead expect cognitive computing to see faster adoption rates in high labour cost markets where substitution has a stronger economic rationale. However, if

the cost of Watson services continues to decline it could potentially have an impact by the latter years of our forecast.

Argentina is a regional hub for many IT services providers, with HP plans for setting up a call centre in Argentina to serve Spanish-speaking customers across the Americas. IBM services its major regional contract with Telefónica from its Buenos Aires data centre. The Indian vendors are also mounting a growing challenge. **TCS** recently consolidated its operations in Uruguay and Argentina into a single unit focused on providing near-shore services. Meanwhile, European companies are strong in the market, where they have a long history. German IT services provider **T-Systems**, a subsidiary of **Deutsche Telekom**, has invested USD5mn to set up a new business unit.

Industry Trends And Developments

In February 2015, the Argentine Chamber of Electronic Commerce (CACE) reported that e-commerce sales increased 61.7% year-on-year to ARS40.1bn, including ARS36.3bn in business to customer sales, and ARS3.8bn in customer to customer sales. According to the CACE, online sales accounted for 1.6% of total retail sales in 2014, with a total of 14mn Argentines shopping online, after an average annual growth rate of 50.3% for the preceding five years.

This growth rate has generated continued investment from e-commerce vendors. In March 2015, Argentina-based e-commerce company **MercadoLibre** opened a new office worth USD35mn in Vicente López, Buenos Aires. The new office, which is located on three floors of the Torre Al Río I building, will house 300 employees. The e-commerce company, through its primary platforms MercadoLibre.com and MercadoPago.com, offers solutions to individuals and companies buying, selling, advertising and paying for goods.

However, the optimistic outlook could be under threat as the government attempts to manage risks for the economy as a whole by limiting foreign exchange leaving the economy. For instance, in January 2014 the Administration of Public Revenue (AFIP) set a limit allowing Argentine consumers to purchase just USD25 of goods from international websites each year. Customers buying from abroad that exceed the two item USD25 limit will have to pay a 50% import tax on the goods.

Wayra Looking For Start-Ups

In January 2015, **Wayra**, the start-up accelerator of international telecoms group **Telefónica**, announced the window for making proposals for start-ups in 2015 had opened, with selected start-ups set to receive an investment of USD50,000 and acceleration services. In 2015, Wayra stated it is looking to invest in technology start-ups operating in high growth areas such as web-based automation platforms, mobile applications, software-as-a-service applications and machine-to-machine communications (M2M). Wayra also provided an update for its operations, with a portfolio of 38 Argentine start-ups and 435 globally in Q115.

Data Network Investment To Enable New Services

Argentina's telecoms operators continue to invest heavily to increase the coverage and capacity of wireless and wireline data networks. This will have a positive impact on connected device demand, for instance smartphones, tablets, notebooks and tablets - as well as being an enabler for IT market services such as cloud computing, M2M and Big Data.

Investment announcements continued in Q115 despite economic instability. In January 2015, **Telecom Argentina** will invest around ARS210mn (USD24.36mn) to deploy a new fibre optic backbone network base on the dense wavelength division multiplexing technology in the country. Chinese telecoms equipment vendor **Huawei** will carry out the upgrade. The deployment will eventually provide connecting speeds of up to 100Gbps to subscribers throughout the country. The first phase of the installation between Buenos Aires, Rosario and Cordoba will be finalised by the end of February, with phase 2 extending the new broadband network to the north and south of Argentina, including coastal areas and the mountainous Cuyo region.

Meanwhile, **Movistar** announced in February 2015 its plans to invest ARS3bn (USD346.81mn) to deploy 4G LTE services in Buenos Aires Province. The operator aims to provide 4G technology in 53 municipalities by deploying more than 1,300 LTE sites across the province. Movistar currently provides 4G services in certain areas of the province including Buenos Aires, Mar del Plata, Cariló and Pinamar.

M2M Gaining Momentum

In December 2014, Argentina's mobile operator **Telecom Personal** entered a partnership with US-based firm **Jasper** to launch Internet of Things (IoT) and M2M connectivity for business subscribers. Enterprise subscribers will be allowed to access a highly scalable platform to launch, manage and monetise their connected services internationally, according to Jasper. IoT offers advanced connectivity of devices, systems and services that extend beyond M2M, and includes various protocols, domains and applications. Jasper has previously partnered with **Claro, Telenor, Vimpelcom, Tele2, Telefónica, AT&T, KPN, NTT DoCoMo** and **Etisalat** to launch M2M initiatives.

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opportunities to build revenues from these new sources in addition to providing more traditional communications services.

Black Market Boosted By Domestic Economic Instability

In a climate of exchange rate depreciation and high domestic inflation, the black market for goods expanded rapidly in 2014, according to a report by the Argentine Chamber of Commerce (CAC) in October 2014. Total sales of black market goods increased by 25.5%, although there were important regional differences. The Buenos Aires black market expanded by over 30%, however in Mendoza black market activity declined. The survey does not offer a detailed breakdown by product category, but the CAC did note that technology products were among the most in demand on the black market, along with food and drink, clothing, watches and toys.

Vtex Will Invest USD10mn In 2014

Vtex, a Brazilian e-commerce platform solution provider, will reportedly invest USD10mn in its Argentine business unit during 2014 in order to increase its local staff by 10% and foster greater innovation in its platform activities. Vtex has commercial activity in a number of other Latin American countries aside from Argentina and Brazil, including Chile, Ecuador, Peru, Colombia and Uruguay, as well as offices in São Paulo, Rio de Janeiro, Buenos Aires and Santiago de Chile. Targeting Argentina for this investment demonstrates a commitment to the market amid expectations of growth in e-commerce usage.

Illegal Software Still Ahead Of Licensed Market

A study by the Business Software Alliance (BSA) found that penetration of illegal software in Argentina was 69% in 2013, the same level as during 2011. The market for illegal software has grown from USD657mn in 2011 to total USD950mn in 2013. This outstrips the market for licensed software which had a market value of USD450mn in 2013.

Development Of IT Services And Software Industry

Argentina's Chamber of Commerce for IT Services and Software (CESSI) says the industry will generate revenues of USD7.3bn between 2013 and 2020. The forecasts are part of the 2020 Strategic Plan which lists objectives that will grow Argentina's IT services and software market. Goals include building IT exports to reach USD2.96bn and creating jobs that will see an 80% increase in the number of Argentines employed in

the sector. As **BMI** forecasts show, services and software will increasingly drive Argentina's IT market growth with services rapidly growing over our forecast period.

CESSI says the IT industry adds around 8,000-10,000 new employees a year, which should see the sector easily reach its goal of 134,000 employees by 2020. IT has rapidly grown as an important sector in Argentina, employing almost six times as many people as it did in 2003.

As IT markets mature, IT services form an increasingly important impetus to market value, as the groundwork laid by strong hardware sales in previous years encourages users to look to IT for a wider range of applications. Local consultancy **Claves Información Competitiva** highlights that 54% of Argentina's 3,600 IT companies produce hardware, while 25% produce IT services.

According to CESSI, the software and services industry experienced strong growth in sales and employment in 2013. Sales increased 22.6%, representing faster growth than the 19% recorded in 2012. CESSI reported that software development, proprietary software, implementation and integration accounted for over 65% of sales in 2012 and 2013. The financial services sector was the largest spending vertical at over 25% of the total, followed by the telecoms sector at almost 19% of the total. Meanwhile, in terms of employment, 63% of Argentine software and services companies reported increasing employment in 2014. Total employment in the industry increased by 4% in 2013, slightly slower growth than the 5.2% in 2012, but on a positive note, with sales growth outpacing employment there are indications that productivity in the sector increased in 2013.

CESSI also reported on the development of software and services from Argentina. In line with recent performance, the US continues to be the largest export market at just over 50% of total software and services exports. Following behind are a host of Latin American markets including Chile (10.6%), Mexico (6.5%), Peru (5.9%), Uruguay (4.7%) and Brazil (4.6%), followed by Europe, excluding Spain (7.6%).

Regulatory Development

Government Initiatives

Conectar Igualdad - Connect Equality: Connect Equality was created in April 2010 by Decree No. 459/10 of President Cristina Fernández de Kirchner. The goal of the initiative is digital inclusion, by distributing netbooks/laptops to students and teachers in public institutions and to develop digital content usable in different education environments. The budget was believed to amount to around ARS4bn. In April 2015, the Argentine government announced it had already distributed 4.81mn netbooks in public schools under its Conectar Igualdad initiative. The netbooks have been produced locally by Argentine companies including **Newsan, Informática Fuegoína, Nec Argentina, Novatech Solutions, Air Computer, PC Arts Argentina, Coradir, Exo and Corporate Corp.** The government also plans to install 5,200 digital portable classrooms under a connectivity plan for schools.

Argentina Conectada

The Argentina Conectada plan is at its core a plan to promote broadband connectivity by building a nationwide fibre network. However, it also integrates current programmes focusing on digital terrestrial television, ICT equipment provision, educational training and extending connectivity to remote areas. It also establishes public access ICT centres among other programmes. It focuses on improving not only the availability of basic data transport infrastructure and affordable connectivity services but also appropriate applications and content, a large installed base of terminal equipment and the expansion of ICT skills among Argentinians. The government drew on expertise from the private sector, academia, and other civil society organisations, as well as the private sector in the formulation of the plan.

ArSat is in charge of developing the national fibre-optic backbone network, improving regional interconnection of the network, improving security and increasing competition. Other government departments, such as the communications secretary, focus on improving digital inclusion (for example, through building community centres and improving access in public institutions).

This has proved effective at boosting demand for internet services, complemented by a rise in new technologies that makes it possible to reach more remote regions. USD1.34bn was earmarked for investment in the telecoms sector in 2013, for the deployment of fibre-optic cabling to support the continued rollout of free-to-air digital TV, satellite internet and 3G mobile internet in rural areas.

New Telecoms Regulator

In May 2015, Argentina established a new telecoms regulator to replace telecoms ministry SeCom and telecoms watchdog Comision Nacional de Comunicaciones (CNC). The new body will be known as the Autoridad Federal de las Tecnologias de la Informacion y las Comunicaciones (AFTIC) and will also be responsible for the operation of state-owned telecoms operator ArSat as well as the digital connectivity initiative Argentina Conectada.

AFTIC was created through the country's new telecoms law, which had been approved by the Congress in December 2014. Aside from AFTIC, the bill also included other telecoms provisions such as Net Neutrality and obligations for interconnection on the local network, with our outlook generally positive. AFTIC will be empowered to regulate and supervise the retail prices of telecommunications licensees, to open up networks to small and medium operators and cooperatives, set the guidelines for Net Neutrality and also determine when a company has reached a 'significant market power'. By replacing the ministry and the CNC, this will effectively make AFTIC a policy-maker and a regulator, while also holding a stake in satellite provider ArSat. These conflicting roles could hold back the sector from reaching its full potential and invites undue influence from the government into the market.

A particular example is the way appointments will be made to the new regulator and the short time window to do so. The board will have seven members, of whom two shall be appointed by the Executive Branch (President Kirchner), three selected by the Bicameral Commission for the Promotion and Monitoring of Audiovisual Communication Technologies Telecommunications and digitalization (on behalf of the legislature), one representative of the Provinces and the Autonomous City of Buenos Aires (Ciudad Autonoma de Buenos Aires - CABA), and one appointed by the Federal Council of Telecommunications Technology and Digitisation, representing all stakeholders in the ICT ecosystem. The government wants to appoint these board members within 30 days for a term of four years. This has been criticised by opposition parties because it allows the government to put in place five out of the seven members just months before the Presidential election in October 2015. Opposition parties with the largest representation in Congress would only have two directors and could face an uphill battle in terms of policy until May 2019, when these terms expire.

Regulatory News

Import Controls Being Prepared

In March 2015, it was reported locally that the government was preparing a new set of import controls centred on technical barriers, bringing it into compliance with the WTO trade regime, with the new regulations expected to be introduced by the end of 2015. Argentina's current regime has been criticised by trading partners including the European Commission, which highlighted restrictions on currency transfers and a special tax on luxury goods of up to 50%.

New Quota For FONAPyME

In February 2015, the Argentine Ministry of Industry announced a new quota for the National Development Fund for Micros, Small and Medium Enterprises (FONAPyME). Funding is available for productive investments, with loans of up to ARS3mn available for up to seven years at a fixed rate of 12%. The loans are available for firms to acquire capital goods, facilities or construction of production plants.

Mar Del Plata Technology Park Tender

In January 2015, the mayor of Mar del Plata and the president of Grupo Province jointly announced the tender for the construction of a technology park which will be constructed on 5 hectares of municipal land. There is ARS78mn of public investment in the project, with construction expected to take around 15 months. According to local press reports a total of 25 companies are committed to take part in the project, including **Province NET** which will provide access to a data centre for local developers.

TCL, Siemens And Huawei Meet Argentine Officials In China

As part of President Kirchner's official visit to Beijing, several Argentine ministers met with top executives from leading Chinese IT and consumer electronics vendors to discuss investment into Argentina. Julio De Vido, the minister of federal planning, met with **Siemens China** and **TCL** (a leading TV set and smartphone vendor). Meanwhile, the Secretary of Communications visited **Huawei** to discuss plans for an expansion of manufacturing in China.

Government Establishes ICSC For Internet Governance

Argentina's Ministry of Communications established the Argentina Internet Policy Committee (ICSC) to formulate a national strategy on internet governance. The goal of the committee will be to offer technical support and strive for better representation of Argentina in international forums and organisations. La Nación reported that, under the resolution 13/2014, the commission invites other national government agencies involved in the management of the internet to join ICSC with an aim to 'design a national strategy on internet and its governance'.

Promotional Regime For Software Industry

In September 2013, the Argentine government introduced new tax incentives aimed at providing a boost to local software development companies. A similar promotion scheme established in 2008 signed up around 320 software companies and the government hopes the new fiscal incentives will attract another 500 firms by 2019, when the offer ends. Argentina's software industry lags behind its hardware and services sector and **BMI** believes the government is making an effort to boost software development.

The new legislation will give software-exporting firms a tax break equal to 70% of paid employer contributions and was expected by the government to generate sales of USD3.75bn in 2013, including USD900mn in exports. According to the industry minister, Debora Giorgi, the Argentine software sector consists of more than 4,000 companies, 98% of which are micro, small- or medium-sized firms (SMEs). This means all but 2% of the software companies in the country are locally owned. Argentina's software and IT services chamber (Cessi) reports that the software sector employs nearly 70,000 people and calls for this to expand to 134,000 by 2020. We identify a rise in skilled professionals as a key driver for software development, and the expansion of this workforce will contribute greatly to the development of the industry.

A 2013 study by **Claves Información Competitiva**, a local consultancy, found that 54% of the Argentine IT firms produced hardware, 25% provided IT services and just 16% developed software.

Cessi opened four international offices in April 2013, located in Austin, US; São Paulo, Brazil; Bogotá, Colombia; and Mexico City, Mexico. These cities were chosen following consultations with associated companies and look to provide a boost for local IT exports, expanding their brand power and supporting companies in trade missions with other countries. Further offices could follow in 2014 if there is enough interest, with Chile and Uruguay likely venues. Cessi reportedly expects exports to rise from USD900mn in 2013 to USD2.96bn in 2020.

Competitive Landscape

Key Competitors

International Companies

Table: IBM

Address	Hipolito Yrigoyen 2149, 1640 Martínez, Provincia de Buenos Aires, Argentina
Company history	IBM opened its first branch in Argentina in Buenos Aires in 1923, becoming the first technology company in the country. In 1951 IBM began its manufacturing operations in Argentina. In 1955 it began manufacturing for exports, and by 1972, 85% of production was for exports. In 2001, IBM Argentina opened its Technology Campus in the town of Martínez. In 2006, IBM Argentina became the first IBM subsidiary in America to obtain eSCM-SP (eSourcing Capability Model for Services Provider) level 4 certification. By 2011, the length of fibre optic lines in IBM Argentina's Technology Campus had tripled to 175km. It was also able to store 13.5 petabytes of information, which corresponds to some 3mn DVDs. The site monitored more than 5,000 servers (compared to the original 1,100) and doubled the number of clients served at the help desk.
Services and products	IBM Argentina provides hardware, software, and services across a range of IT applications, working with partners to bring the latest technology and business solutions to its clients. It is particularly strong in key verticals such as telecoms and banking, and has a major regional services contract with Telefónica.
Company developments	<ul style="list-style-type: none"> ■ In March 2015, IBM Argentina was fined USD9.3mn for allegedly seeking to win a contract to computerise the tax collection system, with eleven people charged in a case dating back to 1988-89. ■ In October 2014, IBM announced that the cognitive computing solution Watson was to become available in Spanish after a learning process through a partnership with Caixa Bank in Spain. Initially, the supercomputer will learn neutral Spanish, and in later stages will work to meet the specificities of idioms from different countries such as Argentina, Colombia and Mexico. ■ In 2012, under its Organizational Strengthening programme, IBM Argentina conducted 40 workshops and trained more than 200 civil society organisations. ■ In 2013 IBM worked with more than 100 universities around the country, training, upgrading educational tools and promoting the development of new courses and subjects. Its university programme includes providing free study materials and the free licensing of more than 1,200 products. ■ On April 23 2013, IBM announced insurance company El Norte SA would deploy PureSystems to improve the company's IT infrastructure. The two companies have had a collaborative relationship since 1980.

Source: BMI

Table: Sofrecom

Address	Reconquista 609, Piso 3, C1003ABM, Buenos Aires, Argentina www.sofrecom.com.ar
Company history	Sofrecom is a French software company that has been operating in Argentina since 1982. Since then, Sofrecom Argentina has served more than 120 clients in Argentina and the surrounding region. Sofrecom reports that it has become one of the top 10 IT employers in Argentina. It currently employs more than 700 specialists. Sofrecom is also one of only three companies in the industry in Argentina with ISO9001 certification and Level 5 CMMI (Capability Maturity Model Integration) accreditation. Sofrecom reported a 9 times increase in revenue from 2006 to 2014, reaching ARS254mn.
Services and products	Sofrecom Argentina specialises in the software industry, offering a range of IT solutions. It also maintains networks and offers business consulting. In addition to working in Argentina, it exports its services to Europe and to the rest of Latin America.
Company developments	<ul style="list-style-type: none"> ■ In April 2015, Sofrecom announced its projection for revenue growth of 18% in 2015 to ARS302mn. Additionally, investments of ARS8-10mn are planned as Sofrecom Argentina targets domestic and international growth in the telecoms, utilities, financial services, autos and oil & gas verticals. ■ In July 2014, Sofrecom Argentina achieved accredited status from the Organisation of American States after an audit of its methodologies and capabilities for software development. ■ Sofrecom has a stated goal of becoming one of the top five IT employers in Argentina, and of obtaining level 5 CMMI certification for all aspects of the business, especially services, in 2014.

Source: BMI

Local Companies

Table: Banghó

Address	info@bangho.com.ar
Company history	Banghó was established in 2006 as a business unit of Argentine computer manufacturer and distributor PC Arts, which had created the Banghó brand four years earlier. Its products are manufactured in Argentina in three separate facilities owned by PC Arts. These are in the Polo Tecnológico in the city of Buenos Aires, in the Vicente López district in Buenos Aires province and in the city of Córdoba's Barrio Alberdi. Banghó's products are distributed by the distribution division of PC Arts, which also distributes brands such as AMD, Asus, LG, Intel, Microsoft and Cisco.
Services and products	Banghó markets an extensive range of its own-brand desktops (including all-in-ones and mini desktops), laptops, hybrid notebooks, tablets, servers, monitors and accessories. It currently claims a share of around 7-8% of Argentina's notebooks market.
Company developments	<ul style="list-style-type: none"> ▪ In March 2014, Banghó launched its Zero Ultrabook, the first Ultrabook with a 4th generation Intel processor in Latin America. ▪ From 2014, all Banghó PCs and notebooks come installed with Panda Security antivirus software. • In March 2014, Banghó launched a new line of all-in-one desktops, including the 23-inch touch screen Banghó I5. • In May 2014, Banghó signed a deal with Spanish manufacturer MyWigo, under which the former will produce devices in Argentina. The decision was made as MyWigo looks to adapt to high tariffs on imported electronic products. MyWigo will reportedly invest EUR3mn, with the factory in Buenos Aires serving the whole region, except Brazil, where it will establish an additional facility.

Source: BMI

Table: Exo

Address	Avenida Chiclana 3444, Ciudad Autónoma de Buenos Aires, C1260ACO, Argentina
Company history	Exo was established in Argentina in 1978, as a manufacturer of technology products. It has built partnerships with well-known international firms such as Microsoft, Intel, eBeam and BenQ.
Services and products	Exo manufactures a range of technology products, including its own-brand notebooks, ultrabooks and desktops. It also provides IT training and consultancy services.
Company developments	<ul style="list-style-type: none"> ▪ In October 2013, Exo relocated its headquarters to Buenos Aires' technology district, in a new facility covering 15,000 square metres. ▪ In April 2014, Exo released the EXO Tablet Wave i70, running an Atom Z2460 Dual Core Processor with Android 4.0.4 Ice Cream Sandwich operating system and a 7-inch screen. The retail price at launch was ARS2,999 (USD361). • On April 21 2014, Exo unveiled its Android 4.0-operated tablet, the EXO Tablet Wave i70, in its bid to meet growing demand for mobile devices. • In November 2014, Exo released its hybrid notebook the Exo Wings 2in1, essentially a tablet with a removable keyboard. In terms of operating system it comes with Windows 8.1 including Microsoft Office 365 free for one year in addition to 60 minutes of calls a month via Skype and 1TB storage OneDrive.

Source: BMI

Table: Axoft Argentina (Tango)

Address	Cerrito 1214, C1010AAZ, Buenos Aires, Argentina www.axoft.com
Company history	Axoft Argentina, which was founded in 1989, markets a range of enterprise software under the Tango brand. In 1993 it developed Tango for Windows, the first management software on this platform in Argentina, and which achieved widespread use by small and medium-sized firms. Since then, Axoft has continued to develop pioneering software, and claims that its network of service centres for enterprise resource planning (ERP) software is the largest in South America.
Services and products	One of Axoft's leading products is Tango e10, a range of ERP software which has applications across a number of fields including management, accounts, point of sale and restaurants.
Company developments	<ul style="list-style-type: none"> ■ Axoft claims to be the leader of Argentina's ERP market, with a 57% share.

Source: BMI

Table: Ceven

Address	Marcos Paz 1944 (C1407CSJ), Buenos Aires, Argentina www.ceven.com
Company history	Ceven is an Argentine wholesaler and distributor of IT products established in the country for over 15 years. Ceven has branches located in Buenos Aires, Mendoza and in the US city of Miami, which provide coverage throughout Argentina, as well as Central America, the Caribbean and the US.
Services and products	Ceven is a wholesaler and distributor of computer hardware, software and accessories, from leading brands such as HP, Intel, Epson, Lenovo, AMD, Biostar, LG, Samsung and Kingston. It also markets its own line of notebooks and desktop computers, which it sells under the Gfast brand.
Company developments	<ul style="list-style-type: none"> ■ Ceven aims to cover the entire Argentine market with its services along with its spread throughout Central America, the Caribbean, and the US.

Source: BMI

Table: Noblex (Newsan)

Address	Roque Perez 3650, C1430FBX, Buenos Aires, Argentina www.noblex.com.ar
Company history	Noblex's origins date back to the establishment in 1935 of Nobleza Radio, which pioneered the manufacturing of radios in Argentina. The company began developing black and white TVs, and was also responsible for Argentina's first ever transistor radio. In the 1960s Noblex (as the company was by then known) began to invest heavily in R&D, and it launched the Noblex Micro 9 as the country's first ever transistorised portable TV. In 1999 Noblex was acquired by Grupo Newsan, which was formed in 1991 through the merger of Sanyo Electric Trading Co (Japan) and local Argentine company Sansei. Today Noblex exists alongside Newsan's other consumer electronics brands, Sanyo and Philco.
Services and products	Noblex manufactures a range of consumer electronic products including notebooks, tablets, radios and LED televisions, as well as air conditioning units and handsets.
Company developments	<ul style="list-style-type: none"> ▪ Despite being acquired by Grupo Newsan in 1999, Noblex continues to manufacture its own range of branded products. ▪ Noblex plays on its reputation as a long-running, trusted brand in Argentina, being one of the most recognised local companies.

Source: BMI

Company Profile

Sicsa

- Strengths**
- A leader in the Argentine market.
 - Partnership with Olivetti means Sicsa is backed by a globally renowned brand.
- Weaknesses**
- Production is based in Buenos Aires, so the company is unable to benefit from the tax breaks awarded to companies in Tierra del Fuego.
 - Reliance on imports of components means Sicsa's operating costs are subject to exchange rate fluctuations and other external factors.
- Opportunities**
- Aims for international expansion into Bolivia, Paraguay and Uruguay.
 - As the leading Argentine manufacturer, Sicsa is placed for growth within this fast-growth, large market.
- Threats**
- Companies with lower taxes from Tierra del Fuego are better set to compete in the market.
 - Threat of another economic slowdown in Argentina would hit sales.
-

Company Overview Sicsa is the largest manufacturer of notebooks, desktops and servers in Argentina and has operational partnerships with a number of original equipment manufacturers (OEMs), as well as producing the Axus product line. It has 20 years' history in the Argentine market and has a nationwide network of service centres in 85 locations.

Italian technology group Olivetti began producing PCs, servers and printers with Sicsa as a local partner in 2006. Sicsa invested nearly ARS5mn (USD1.61mn) in the agreement, which allowed the Argentine company to expand quickly and gain 15% market share by 2007. The devices were destined for sale in Uruguay, Paraguay and Bolivia as well as Argentina.

Sicsa said it expected to increase employees by around 50% as a result of the new PC plant. Previously, the company had around 85 employees. Sicsa expanded with a new modern production facility in 2007 of 7,500 square metres in Lugano, capable of producing 1,200 units per day. This is up from a previous capacity of around

7,000-8,000 units monthly. Its products are distributed at around 600 retail points across Argentina and other countries in Latin America.

Local competitors include Air Computers, Ceven, PC Arts and Exo.

Strategy

Sicsa plans to modify its strategy to increase the sale of its revenue that comes from direct sales to verticals such as government and banks. Currently around 80% of Sicsa's overall sales come from the retail segment, but the economic crisis and credit crunch have encouraged the company to diversify. Sicsa plans to invest in strengthening its general market position, and will spend at least USD5mn in upgrading and expanding its production facilities.

Company History

In 2007 Sicsa was the leading provider of local manufacturing and the second largest provider of notebooks in Argentina, leading over international names. It opened a new plant in 2008, with a production capacity of 1,200 units a day. This capacity is principally used to produce Olivetti products. It was built with an initial investment of ARS1mn. The new plant focused on new laptops that featured Intel dual core technology and the Vista Operating System.

Operational Data

- Units sold (Q108): 44,000
- Units sold (2009): 36,000
- Later data not available

Company Details

- Sicsa
- Av Coronel Larrazabal 2851
Villa Lugano

Buenos Aires

Capital Federal

C1439ECC

Argentina
- Tel: (+54) 11 5554 0400
- www.sicsagroup.com.ar

Regional Overview

Americas

BMI View: *The growing middle class trend in Latin America has attracted several major ICT investors and will continue to offer growth potential in the region's smaller markets. While Mexico and Brazil offer significant opportunities owing to their size, both are dwarfed by the US, where consumer spending on technology and communications remains high.*

Key Features

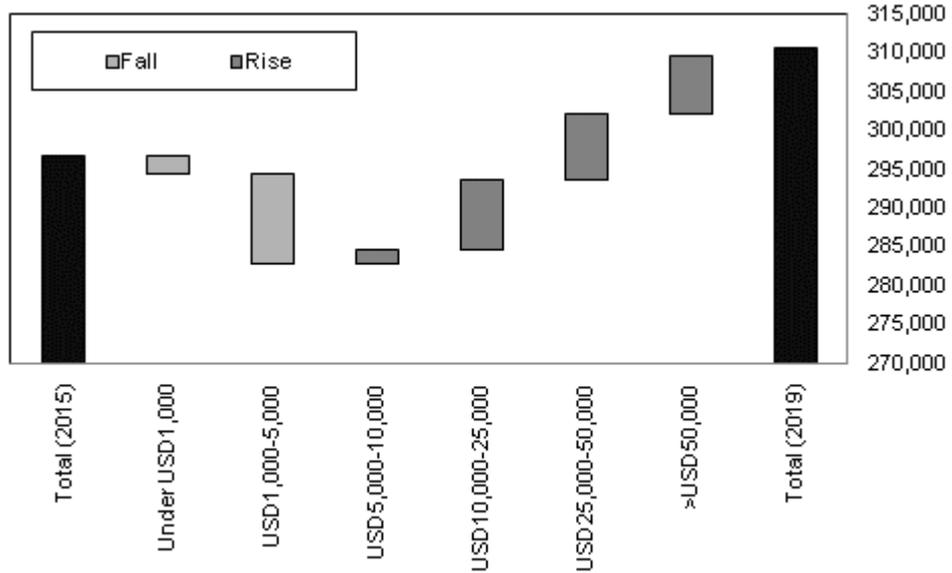
- Economic uncertainty in large emerging markets weighs on outlook
- Middle class emergence in Latin American frontier markets presents upside
- US is forecast to account for almost 68% of Americas households earning >USD50,000 in 2019, virtually unchanged from 2015.

In terms of household income trends **BMI** expects the Americas to be the underperforming region globally 2015-2019. This is due to the negative outlook for several large markets including Argentina and Venezuela, which remain mired in economic uncertainty, with no clear path to stability in the short-term. Despite the challenges, our Country Risk team forecasts a medium-term trend of migration in household income bands from USD1,000-5,000 to USD5,000-10,000, and from USD5,000-10,000 to USD10,000-25,000 in Argentina and Venezuela, respectively, during the 2015-2019 period. However, even this opportunity for vendors will be weighed against political risk factors and economic policy measures including restrictions on device pricing, profit expatriation and hyperinflation.

There are some notable success stories in the Americas that warrant attention, including significant expansion of the middle class in Brazil, Colombia, Ecuador, Mexico and Peru. Economic development in these markets contribute to the majority of new households sitting in the USD10,000-25,000 household income band for the Americas. This is the income band **BMI** associates with a shift towards mid-range products (in a global context), as well as the emergence of demand for personal devices in the PC and AV market, rather than an emphasis on shared household devices.

5mn New Households Will Earn Over USD50,000

Americas Change In Households By Income Level, 2015-2019



Source: BMI Forecasts

Mid-range but design conscious brands are well positioned to capitalise in these markets, as evidenced by the phenomenal success of **Motorola** handsets across the region in 2014 with its mass market price points and solid design specifications enabling it to eat into the lead of **Samsung Electronics**. Motorola is now part of **Lenovo** after being acquired from **Google** in 2014, positioning the global PC market leader well for product and geographic diversification in Latin America over the medium term. **BMI** considers Lenovo's strategy and competitive position to be strong in Latin America, with reason for some confidence regarding the integration of Motorola after the successful acquisition and integration of leading Brazilian PC brand **CCE** already under its belt.

In terms of premium level IT and consumer electronics device demand, our analysis of household income trends points to the continued importance of the US market over the medium term. The addition of over 5mn households earning over USD50,000 by 2019 is a positive trend for **Apple**, which dominates the US premium smartphone, tablet and notebook markets, with no other vendors nearing its brand cache. The Apple Watch could also benefit from high income household growth with a large degree of lock-in to the Apple ecosystem.

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.

Population

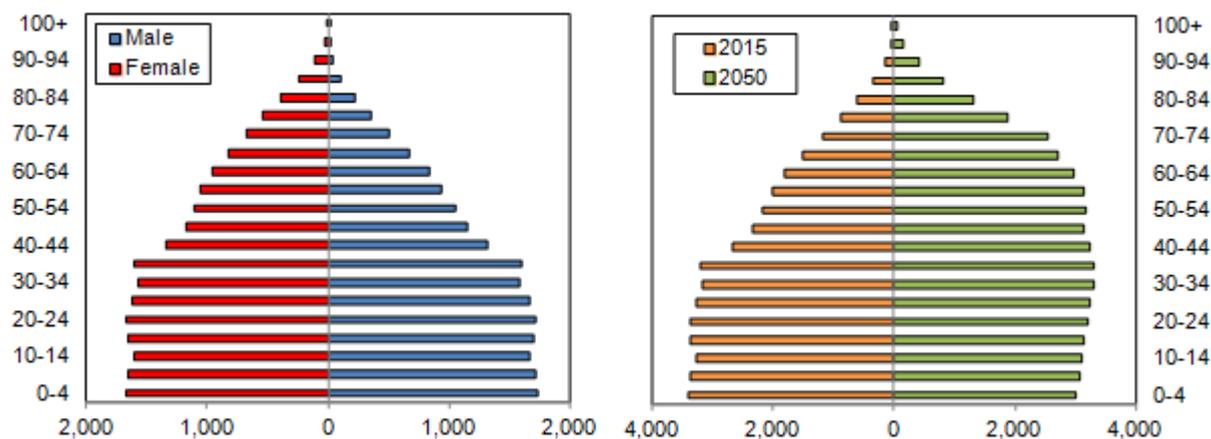
(1990-2050)



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

Argentina Population Pyramid

2015 (LHS) & 2015 Versus 2050 (RHS)



Source: World Bank, UN, BMI

Table: Population Headline Indicators (Argentina 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, total, '000	32,624	36,903	38,647	40,374	42,154	43,835	45,423
Population, % y-o-y	na	1.1	0.9	0.9	0.8	0.8	0.7
Population, total, male, '000	16,007	18,072	18,908	19,753	20,635	21,472	22,266
Population, total, female, '000	16,617	18,830	19,739	20,620	21,519	22,363	23,156
Population ratio, male/female	0.96	0.96	0.96	0.96	0.96	0.96	0.96

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

Table: Key Population Ratios (Argentina 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Active population, total, '000	19,655	22,930	24,520	26,042	27,375	28,429	29,509
Active population, % of total population	60.2	62.1	63.4	64.5	64.9	64.9	65.0
Dependent population, total, '000	12,969	13,972	14,127	14,332	14,779	15,406	15,913
Dependent ratio, % of total working age	66.0	60.9	57.6	55.0	54.0	54.2	53.9

Key Population Ratios (Argentina 1990-2025) - Continued

	1990	2000	2005	2010	2015f	2020f	2025f
Youth population, total, '000	10,013	10,305	10,172	10,043	10,055	10,139	10,081
Youth population, % of total working age	50.9	44.9	41.5	38.6	36.7	35.7	34.2
Pensionable population, '000	2,955	3,667	3,954	4,288	4,723	5,266	5,832
Pensionable population, % of total working age	15.0	16.0	16.1	16.5	17.3	18.5	19.8

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

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

	1990	2000	2005	2010e	2015f	2020f	2025f
Urban population, '000	28,378.4	33,258.9	35,317.2	37,285.2	39,237.0	41,037.0	42,695.9
Urban population, % of total	87.0	90.1	91.4	92.3	93.1	93.6	94.0
Rural population, '000	4,246.5	3,644.2	3,330.7	3,089.0	2,918.0	2,798.5	2,727.2
Rural population, % of total	13.0	9.9	8.6	7.7	6.9	6.4	6.0
Life expectancy at birth, male, years	68.1	70.1	71.1	72.0	73.0	74.1	75.1
Life expectancy at birth, female, years	75.2	77.5	78.6	79.5	80.2	80.9	81.7
Life expectancy at birth, average, years	71.6	73.8	74.8	75.8	76.7	77.6	78.4

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

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

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, total, '000	3,395	3,449	3,321	3,383	3,421	3,384	3,312
Population, 5-9 yrs, total, '000	3,280	3,477	3,407	3,283	3,365	3,404	3,373
Population, 10-14 yrs, total, '000	3,338	3,378	3,443	3,376	3,269	3,351	3,395
Population, 15-19 yrs, total, '000	2,802	3,258	3,353	3,416	3,360	3,253	3,341
Population, 20-24 yrs, total, '000	2,467	3,305	3,225	3,316	3,391	3,336	3,237
Population, 25-29 yrs, total, '000	2,336	2,766	3,270	3,187	3,287	3,363	3,317
Population, 30-34 yrs, total, '000	2,210	2,430	2,736	3,235	3,159	3,261	3,342
Population, 35-39 yrs, total, '000	2,097	2,296	2,401	2,703	3,205	3,132	3,237
Population, 40-44 yrs, total, '000	1,882	2,161	2,262	2,367	2,671	3,170	3,102
Population, 45-49 yrs, total, '000	1,658	2,032	2,120	2,221	2,329	2,632	3,129

Population By Age Group (Argentina 1990-2025) - Continued

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 50-54 yrs, total, '000	1,497	1,795	1,976	2,066	2,170	2,279	2,580
Population, 55-59 yrs, total, '000	1,405	1,542	1,723	1,902	1,995	2,100	2,211
Population, 60-64 yrs, total, '000	1,297	1,341	1,449	1,626	1,803	1,899	2,006
Population, 65-69 yrs, total, '000	1,071	1,192	1,221	1,328	1,500	1,673	1,772
Population, 70-74 yrs, total, '000	807	1,012	1,035	1,071	1,174	1,337	1,504
Population, 75-79 yrs, total, '000	573	730	813	845	884	981	1,130
Population, 80-84 yrs, total, '000	329	436	514	586	616	655	739
Population, 85-89 yrs, total, '000	132	209	250	304	354	381	414
Population, 90-94 yrs, total, '000	35	69	93	115	144	173	191
Population, 95-99 yrs, total, '000	5	14	22	31	40	52	64
Population, 100+ yrs, total, '000	0	1	3	5	8	11	14

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

Table: Population By Age Group % (Argentina 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, % total	10.41	9.35	8.59	8.38	8.12	7.72	7.29
Population, 5-9 yrs, % total	10.05	9.42	8.82	8.13	7.98	7.77	7.43
Population, 10-14 yrs, % total	10.23	9.16	8.91	8.36	7.75	7.65	7.48
Population, 15-19 yrs, % total	8.59	8.83	8.68	8.46	7.97	7.42	7.36
Population, 20-24 yrs, % total	7.56	8.96	8.35	8.21	8.04	7.61	7.13
Population, 25-29 yrs, % total	7.16	7.50	8.46	7.89	7.80	7.67	7.30
Population, 30-34 yrs, % total	6.78	6.59	7.08	8.01	7.50	7.44	7.36
Population, 35-39 yrs, % total	6.43	6.22	6.21	6.70	7.60	7.14	7.13
Population, 40-44 yrs, % total	5.77	5.86	5.86	5.86	6.34	7.23	6.83
Population, 45-49 yrs, % total	5.08	5.51	5.49	5.50	5.53	6.01	6.89
Population, 50-54 yrs, % total	4.59	4.87	5.11	5.12	5.15	5.20	5.68
Population, 55-59 yrs, % total	4.31	4.18	4.46	4.71	4.73	4.79	4.87
Population, 60-64 yrs, % total	3.98	3.63	3.75	4.03	4.28	4.33	4.42
Population, 65-69 yrs, % total	3.28	3.23	3.16	3.29	3.56	3.82	3.90
Population, 70-74 yrs, % total	2.47	2.74	2.68	2.65	2.79	3.05	3.31
Population, 75-79 yrs, % total	1.76	1.98	2.11	2.09	2.10	2.24	2.49
Population, 80-84 yrs, % total	1.01	1.18	1.33	1.45	1.46	1.50	1.63

Population By Age Group % (Argentina 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 85-89 yrs, % total	0.41	0.57	0.65	0.75	0.84	0.87	0.91
Population, 90-94 yrs, % total	0.11	0.19	0.24	0.29	0.34	0.40	0.42
Population, 95-99 yrs, % total	0.02	0.04	0.06	0.08	0.10	0.12	0.14
Population, 100+ yrs, % total	0.00	0.01	0.01	0.01	0.02	0.03	0.03

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 <i>Country Rewards</i> 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, %
<i>Rewards</i>	<i>70, of which</i>
- Industry	65
- Country	35
<i>Risks to</i>	<i>30, of which</i>
- Industry	40
- Country	60

Source: BMI