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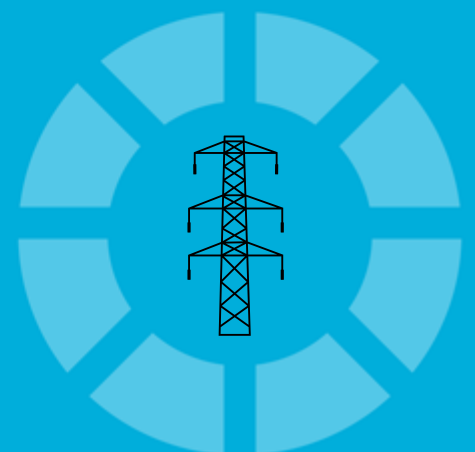
TANZANIA
INFRASTRUCTURE REPORT

INCLUDES 10-YEAR FORECASTS TO 2025

Tanzania Infrastructure Report Q4 2016

INCLUDES 10-YEAR FORECASTS TO 2025

Part of BMI's Industry Report & Forecasts Series

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BMI Industry View

BMI View: Improvements to Tanzania's poor transport logistics network will be the main driver of construction industry growth throughout our 10-year forecast period, with interest in the country's nascent gas sector and the construction of the necessary export infrastructure expected only after 2020 owing to depressed commodity prices. The government will need to tackle allegations of corruption so as not to deter investors.

Forecast & Industry Developments

- We are maintaining our forecasts of 7.6% real growth for 2016 and annual average growth of 7.4% in real terms over our five-year forecast period up to 2020. The development of transport infrastructure, supported by international funding flows, will be the primarily driver of construction industry expansion, as the government works to improve the country's poor logistics profile and capitalise on its maritime access.

- Over our full 10-year forecast period we project annual average growth of 8.4%. Nominal industry value is projected to rise from an estimated USD5.1bn in 2015 to USD15.3bn in 2025, keeping Tanzania as the second-largest construction market in East Africa, behind Ethiopia.

- Persistently low commodity prices and an uncertain regulatory environment continue to deter investment into the country's nascent gas sector.

- Increasing activity in non-residential construction - particularly industrial and commercial developments - supports our outlook for strong industry growth.

Table: Five-Year Forecast Scenario (Tanzania 2016-2025)										
	2016f	2017f	2018f	2019f	2020f	2021f	2022f	2023f	2024f	2025f
Construction industry value, TZSbn	11,861.0	13,379.2	15,172.1	17,315.9	20,110.7	23,348.5	27,039.9	31,236.5	35,993.8	41,666.4
Construction Industry Value, Real Growth, % y-o-y	7.55	6.80	6.30	7.63	8.89	9.10	9.81	9.52	9.23	8.76
Construction Industry Value, % of GDP	11.7	11.6	11.5	11.5	11.8	12.0	12.3	12.5	12.7	12.9

f=BMi forecast. Source: BMI

Risk/Reward Indices

- Tanzania comes out eighth out of 17 markets in our Infrastructure Risk/Reward Index for Sub-Saharan Africa, with its score of 41.1 above the regional average of 38.9.

- The country's underdeveloped banking sector means most infrastructure projects are reliant on donor aid or multilateral financial assistance.

- An opaque business environment, underdeveloped transport links and inadequate poor supply remain the chief deterrents to entering the market.

Table: Infrastructure Risk/Reward Index (Tanzania 2016)						
Risk/Reward Index	Rewards	Industry Rewards	Country Rewards	Risks	Industry Risks	Country Risks
41.1	42.4	47.5	33.0	38.0	25.0	46.7

Source: BMI

SWOT

Infrastructure SWOT

SWOT Analysis

Strengths	■ Since becoming independent in the early 1960s, Tanzania has earned a reputation as one of the more stable political systems in Africa.
	■ The country's maritime access makes it vital to landlocked countries for the import and export of goods in East Africa.
Weaknesses	■ Corruption levels remain high, hindering the transparency of the tendering process.
	■ Delays to project implementation are common.
	■ An overreliance on hydropower means the current drought conditions have had a severe impact on power generation.
Opportunities	■ Huge gas deposits have been found in the country, providing auxiliary infrastructure investment and a boost to future government revenues.
	■ A strong relationship with the Chinese government and Chinese construction companies will continue to support the country's infrastructure development plans.
	■ The demand for hotel rooms is exceeding the supply in Dar es Salaam and highlights opportunities for growth in the hotel sector.
	■ Funds and loans awarded to government to improve roads.

SWOT Analysis - Continued

Threats
- Talk of Tanzania leaving the East African Community, although unlikely, could discourage investment.

- Severe power shortages impact investor appetite and construction projects, although weak oil prices lower the cost of running generators.

- The government still relies heavily on foreign assistance for budget support, meaning withdrawal of this support could have serious implications for fiscal accounts.

Industry Forecast

Construction And Infrastructure Forecast Scenario

BMI View: We remain upbeat on the expansion of Tanzania's construction industry, forecasting 7.6% real growth in 2016 and annual average growth of 8.4% over our 10-year forecast period. Investment into transport infrastructure, particularly port and rail, will be the primary driver of growth as the government seeks to improve its weak logistics profile. Increased movement in the country's gas sector after 2020 - in line with our expectation for an improved commodities outlook - will also keep growth levels elevated.

Latest Updates

- The Tanzanian government has received a USD7.6bn loan from the China Export-Import Bank to carry out the development of a 2,200km intraregional rail network extending from Dar es Salaam to Rwandan capital Kigali, and connecting with cities in Burundi, Uganda and the Democratic Republic of Congo.

- Following the Ugandan government's decision to direct its crude export oil pipeline through Tanzania rather than Kenya, we expect work to begin on upgrading Tanga port - currently geared primarily towards agricultural exports - in the first half of our forecast period.

- Construction of a flyover in the capital city Dar es Salaam, at the junction of the Tanzania-Zambia Railway Authority headquarters and Mandela Expressway, is scheduled to start in October 2016.

- Two industrial construction projects announced in July 2016 - including a tractor assembling plant and a roof tile factory - are scheduled to begin development end-2016.

Table: 10-Year Forecast Scenario (Tanzania 2016-2025)										
	2016f	**2017f**	**2018f**	**2019f**	**2020f**	**2021f**	**2022f**	**2023f**	**2024f**	**2025f**
Construction industry value, TZSbn	11,861.0	13,379.2	15,172.1	17,315.9	20,110.7	23,348.5	27,039.9	31,236.5	35,993.8	41,666.4
Construction Industry Value, Real Growth, % y-o-y	7.55	6.80	6.30	7.63	8.89	9.10	9.81	9.52	9.23	8.76
Construction Industry Value, % of GDP	11.7	11.6	11.5	11.5	11.8	12.0	12.3	12.5	12.7	12.9

f=BMI forecast. Source: BMI

Structural Trends

2016-2025: Buoyant Growth Outlook

We remain upbeat on the expansion of Tanzania's construction industry, forecast to grow at an annual average of 8.4% in real terms over our 10-year forecast period, comfortably above the Sub-Saharan Africa (SSA) average of 6.3% over the same period. Nominal industry growth will rise from an estimated USD5.1bn in 2015 to USD15.3bn in 2025, keeping Tanzania as the second-largest market in East Africa, after Ethiopia.

Expansion over the first half of our forecast period will be driven mainly by investment in improving the country's existing ports and rail infrastructure, which currently ranks poorly from a global and regional perspective. We also highlight the potential of non-residential building projects - most notably in the commercial and industrial construction sectors - to drive growth as more businesses enter the country.

Over the second half our forecast period, in line with improving commodity prices, we expect investment into the nascent gas sector, which will boost energy infrastructure and the supporting logistics. For now, the weak oil price environment as well as an uncertain regulatory picture will deter private investment into Tanzania's gas sector. The government will need to focus on the latter if it is to attract significant foreign investment into gas extraction and the necessary infrastructure development once prices improve.

Growth To Outperform Regional Average

Construction Industry Value, TZSbn & Real Growth, y-o-y (%)
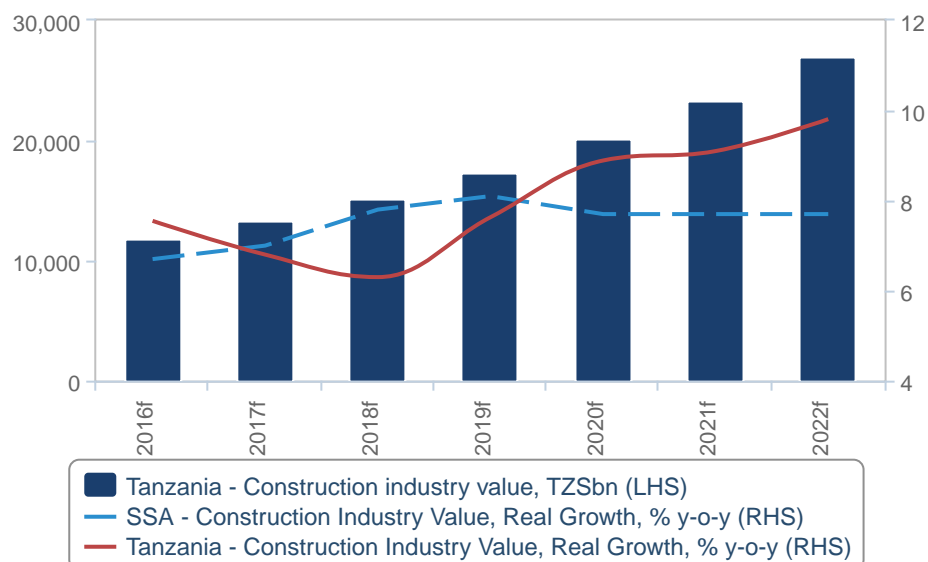
f=BMI forecast. Source: BMI

Transport Expansion On Track Despite Bagamoyo Uncertainty

While last quarter we removed the ambitious USD10bn Bagamoyo Port project from our forecasts, owing to the continued uncertainty around its feasibility, we remain positive on the progression of other port infrastructure developments and the growth of the transport sector as a whole (*see 'Robust Construction Growth Despite Bagamoyo Uncertainty', May 13*). Our Infrastructure Key Projects Database reflects a strong project pipeline for transport sector, thereby underpinning our view for strong growth. The sector will continue to benefit from external funding flows, stemming from development banks and foreign firms. Ongoing upgrades will help to ease some of the logistics capacity constraints currently faced in the country. Within **BMI**'s Operational Risk Index, Tanzania scores below the SSA average in its Transport Logistics Risk score, indicating its lack of competitiveness in the region (*see 'Poor Logistics Infrastructure Impedes Regional Competitiveness', March 10*).

Transport Investment Dominates Project Pipeline

Tanzania - Share Of Total Projects (%) (LHS) & Transport Projects Value, By Sector (USDmn) (RHS)
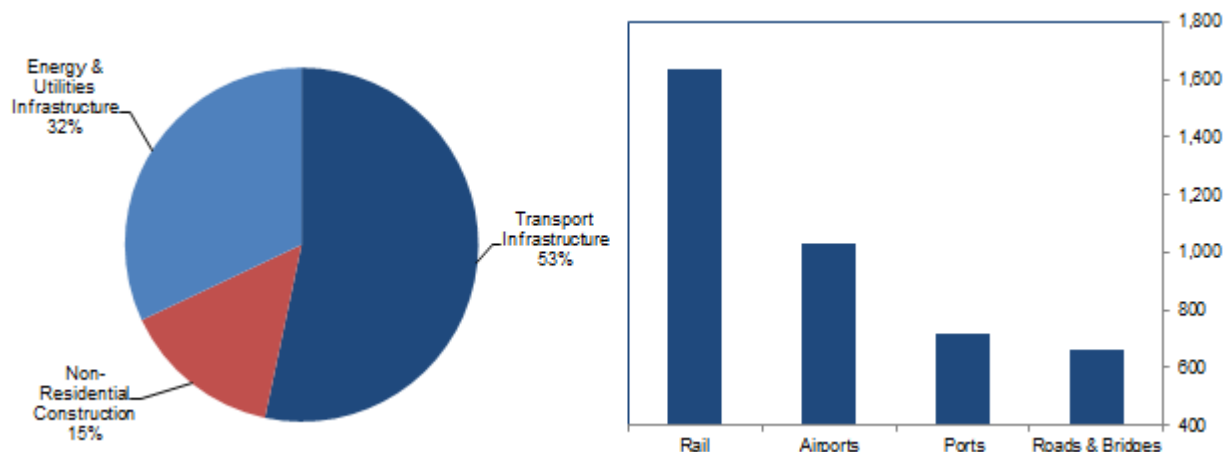
Source: BMI Infrastructure Key Projects Database

Existing Port Infrastructure Receives A Boost

Construction is under way at Dar es Salaam Port, the country's main port which is responsible for around 95% of all Tanzania's export and import volumes. As part of the country's Vision 2025, the government is seeking to increase its port capacity to 28mn tonnes by 2020 from current 14.6mn tons handled in 2014. Berths one to seven at the port are currently being upgraded at an estimated cost of USD596bn, and two more (berths 13 and 14) are due to be built in 2017. The World Bank has provided loans for both projects, amounting to approximately USD1.28bn. Also in the pipeline is a new oil terminal jetty, which is currently in the tender phase.

We also expect work to begin on Tanga Port in the first half of our forecast period, to facilitate the export of Uganda's crude oil reserves to international markets. In April 2016, the Ugandan government announced its decision to build a pipeline from its Lake Albert Rift Basin through Tanzania ending at Tanga Port, rather than through Kenya to Lamu Port (*see 'Two Pipelines To Be Developed', April 27*). Currently Tanga has no oil export facilities and is geared primarily towards agricultural exports.

Finally, the Export-Import Bank of China (Chexim) is reportedly funding a sixth port in Zanzibar to ease congestion on the Malindi Port, which handles around 95% of the island's trade flows. The project is estimated to cost USD200mn and is scheduled to begin construction in 2016.

Potential For Improved Transport Infrastructure

Tanzania & SSA - Logistics Risk Profile
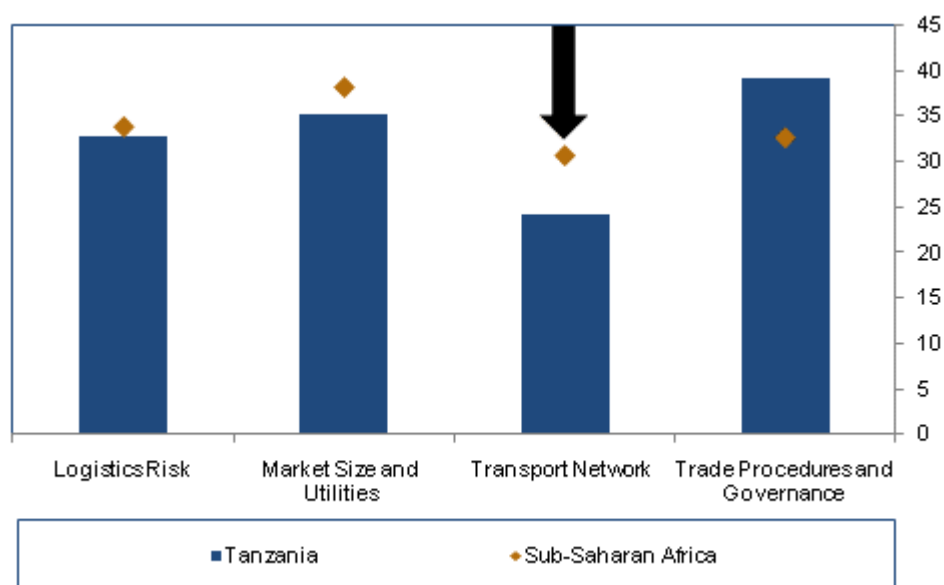
100 = Lowest Risk. 0 = Highest Risk. Source: BMI Logistics Risk Index

Funding Secured For Intraregional Railway Line

Currently in the planning stages is a 2,200km standard gauge railway line running from the Dar Es Salaam port to Rwanda's capital, Kigali, connecting with the eastern part of the Democratic Republic of Congo (DRC) - with two other lines branching off to Musongati in Burundi and to Mwanza port in Uganda - to meet these countries' cargo transportation needs. The aim is to reduce overall transit time and costs and provide a more reliable transport method given the poor state of roads in the region. In July 2016, Chexim announced it was lending the Tanzanian government USD7.6bn to carry out the project.

Additionally, two more lines at the cost of USD6.6bn are to be built to connect Dar es Salaam to the coal, iron ore and soda ash mining regions in the northern and southern parts of the country. The Tanzanian

government has signed a framework agreement with the **China Railway No.2 Engineering Group Company** to develop a 1,000km SGR line from the coal and iron mines from Njombe region to Mtwara Port.

Funding Flows Into Roads Sector

The government is eager to improve its road networks, and in December 2015 received a loan from the African Development Bank (AfDB) worth USD364.4mn for its Transport Sector Support Programme, which involves rehabilitating and upgrading around 500km of roads. The upgrades will benefit trade between Tanzania and its neighbours Malawi and Mozambique, through the Mtwara corridor; and Zambia and the DRC through the Tunduma/Nakonde border and Kasanga Port. The AfDB's contribution will cover 88% of the costs, with the remainder coming from the government.

Also in December 2015, Tanzania signed a USD400mn loan deal with the Japanese government to boost the construction of roads. Projects thus far include the upgrade of the 230km Arusha-Holili-Voi Road and the new alignment of the 100km Kikafu Bridge.

In April 2016, the government launched a project to build a flyover in the capital city Dar es Salaam, at the junction of the Tanzania-Zambia Railway Authority headquarters and Mandela Expressway. Estimated to cost USD500mn, around USD46.5mn will be provided by the Japanese government and the remainder by the Tanzania government. Construction is scheduled to start in October 2016 There are also plans to construct a six-lane 128km highway in the capital city from Kigambini Bridge to Chalinze.

Airport Expansion Under Way

Further supporting business operations, is the expansion of the Julius Nyerere International Airport, which is undergoing its second phase at a cost of USD110mn. Dutch contractor **BAM International** secured the contract for this next leg having successfully completed the USD143mn first phase construction. With the main terminal building, parking, access roads, platforms and a taxiway complete, the company will now undertake the design and construction of Terminal 3, expected to handle the increased international traffic. The 60,000sq m terminal building will increase the total annual capacity to six million passengers. Terminal 2 will then begin catering for domestic flights.

Weak Commodity Prices Weigh On Power Sector

Despite government's plans to use natural gas to boost the ailing power grid, we note this is unlikely to impact on energy infrastructure and the surrounding supply chain logistics in the short term. Our Oil & Gas team highlights a weak oil price environment and an uncertain regulatory picture will hinder progress in the country's natural gas sector.

While the Petroleum Act passed in October 2015 intends to create a more stable and transparent above-ground environment, improving the prospects for exploration and development, there are several layers of fiscal and regulatory uncertainty remaining. Moreover, the significantly expanded role for the Tanzanian state may dull the appetite to invest.

Falling Oil To Drag On LNG

Front-Month Brent Price Forecast (USD/bbl)
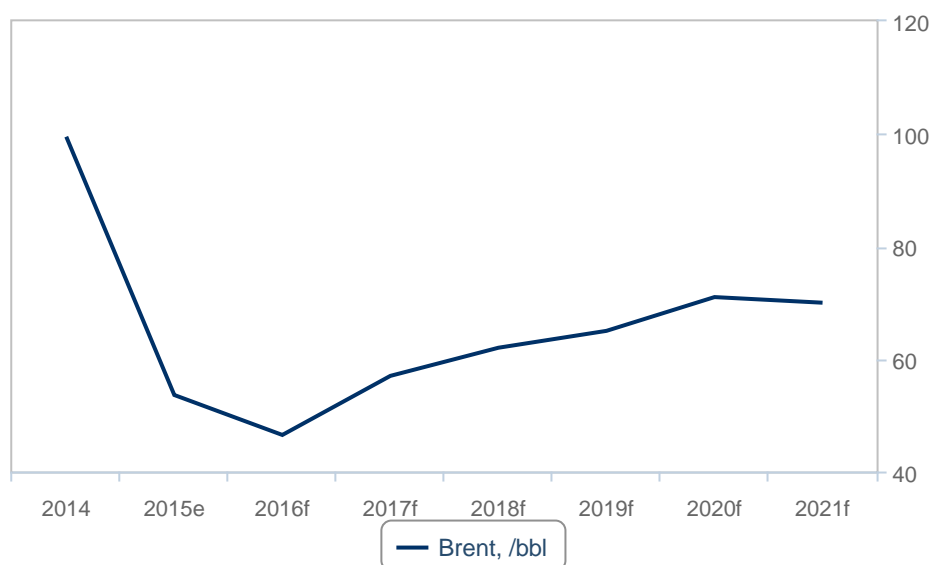
e/f=BMI estimate/forecast. Source: BMI

The weak oil price, however, will benefit energy-intensive industries like manufacturing and heavy industry, given that fuel forms a high proportion of a firm's cost base and is usually sourced from diesel-run

generators. This will drive expansion and investment bodes well for infrastructure development, as manufacturing drives development of factories, labour facilities, supply chain logistics and access to facilities.

Non-Residential Construction Boosting Growth

Within non-residential building, we highlight the potential for Tanzania to capitalise on the potential of its hotel sector as a growth driver. An increasing number of investment activities - as well as the vital tourism industry - are driving the need for international hotels and lodges in strategic areas. Dar es Salaam is currently experiencing a shortage of hotel rooms as the economy expands and the government is eager to attract investment to boost the tourism sector's competitiveness in the region. Providing a necessary boost is the USD20mn committed by Ramada Worldwide to service the 116-room Ramada Encore Hotel in Tanzania's capital, with the chief objective to increase bed capacity. We note the increased demand for rooms is in spite of the country's frequent power outages. However, an increased and more reliable power supply is critical for reducing operating costs for hotel owners, who rely on fuel to run operations during blackouts and load-shedding.

We also highlight increased activity in industrial construction as a growth driver over the medium term. In July 2016, Dar es Salaam secured a soft loan of USD110mn from Poland to build a tractor assembling factory. The manufacturing unit is expected to be in the Kibaha District and intended to produce around 2,400 tractors annually, to be sold in local markets and to other east African countries. Construction is expected to start before end 2016. Also in July 2016, it was announced that Chinese investors will spend USD100mn building a roof tile factory in the Mkuranga District to manufacture 800,000 roofing tiles a day. Nigerian firm **Goodwill Ceramic Limited** is scheduled to begin construction in December 2016.

Industry Risk Reward Ratings

Tanzania - Infrastructure Risk/Reward Index

BMI View: Strong growth forecasts for Tanzania's construction industry will keep the overall Rewards score more or less in line with the regional average, while the small size of the market and government corruption allegations will have a negative impact on overall Risk profile. In **BMI's** *Sub-Saharan Africa (SSA) infrastructure Risk/Reward Index (RRI), Tanzania scores 41.1 out of 100, placing the market in eighth position out of 17 countries and above the regional average of 38.9.*

Rewards

Industry Rewards

With a strong construction industry value growth forecast (averaging 8.4% between 2016 and 2025), industry rewards are elevated in Tanzania. It continues to score 47.5 for this indicator, above the regional average of 40.6. Raised capital investment levels bode well for expansion and confidence in the market. However, the industry will remain fairly small in nominal value terms and this, along with pressure on Tanzania's fiscal position, will hinder faster growth.

Country Rewards

The Country Rewards offered by Tanzania are limited, with conditions on the ground often greatly increasing the time and cost of developing a project. At 33, its score remains unchanged from last quarter, and is just below the regional average of 33.4. A weak financial system means the country is ill-equipped to handle project financing demands and so most infrastructure projects require donor aid or multilateral financial assistance. An inadequate electrification rate is a hindrance to the wider business environment (although lower oil prices mean energy-intensive projects make up a lower proportion of a firm's cost base than previously), and a lack of skilled labour increases the costs for potential sponsors of infrastructure projects.

Risks

Industry Risks

At 25, the Industry Risk score remains unchanged - well below the regional average of 36.5 - which reflects high levels of opacity in the market. This is particularly true within the infrastructure sector in terms of the transparency of the tendering process. At present the market is heavily dominated by Chinese investment, although in the long term we expect more engineering companies to enter the industry, as the nascent oil & gas sector demands higher levels of technical expertise. The country will need to increase competition levels through public-private partnerships, and if there is deregulation of state-controlled areas of the economy, coupled with action to reduce bureaucracy, significant inflows of foreign investment could follow.

Country Risks

Tanzania scores 46.7 for Country Risks, keeping above the regional average of 43.6. In spite of growing discontent with the ruling party, which presents a downside risk, the overall political environment is among the most stable in SSA. The country's corruption credentials (as quantified by Transparency International) have deteriorated, with Tanzania ranked 117 in the 2015 Corruption Perceptions Index. If left unchecked, corruption will adversely affect the country's reputation, deterring potential foreign investment.

Note: Individual country scores are subject to change, based on the latest data available.

Industry Risk/Reward Index

BMI View: Sub-Saharan Africa remains the riskiest region globally to develop infrastructure, as volatile currencies, security threats and inadequate utilities infrastructure hinder the potential to secure a substantial return on investment. Subdued construction industry growth outlooks in the region's largest infrastructure markets - Nigeria and South Africa - is denting investor interest, as both nations battle domestic and external headwinds. Meanwhile, rewards on offer in East Africa on the back of the positive growth story are offset by markets' low industry value in nominal terms and underdeveloped financial sectors.

This quarter we highlight the following trends and changes in our Infrastructure Risk/Reward Index (RRI) for Sub-Saharan Africa (SSA):

- The most significant shift comes as Nigeria slumps from fourth place to rank sixth overall, as macroeconomic challenges take hold and attacks on oil pipelines in the Niger Delta limit government revenue and exacerbate an already dangerous operating environment. West Africa as a whole remains a high-risk region, with political uncertainty and the growing presence of terrorist groups. Cameroon faces the added risk of a political vacuum in the wake of incumbent president Paul Biya's departure from office, expected during our forecast period.

- Botswana, Namibia and South Africa have remained the most attractive investment destinations in Southern Africa, performing consistently well across all four pillars of our index and highlighting the region as the most stable in SSA. This sustained solid performance of these markets is primarily the result of stable policies and lower levels of corruption compared to elsewhere in SSA.

- An improvement in Ghana's economic outlook and energy security sees the market move from eight to seventh place overall. We also expect it to recover from the 2015 recession, estimated at a contraction of 2%, to record positive growth throughout our forecast period.

- Inadequate utilities infrastructure remains a key deterrent to infrastructure companies and investors entering SSA, with insufficient power generation and increasingly constrained water supplies leading to supply chain disruptions and an increase in business costs. Despite commercial and institutional investor interest in the renewable energy sector, markets remain constrained by underdeveloped grid infrastructure and the financial instability and creditworthiness of state utilities. Meanwhile, markets in Southern Africa continue to struggle with persistent droughts that have seen dam levels drop significantly.

High Risk, Low Reward

SSA RRI Index
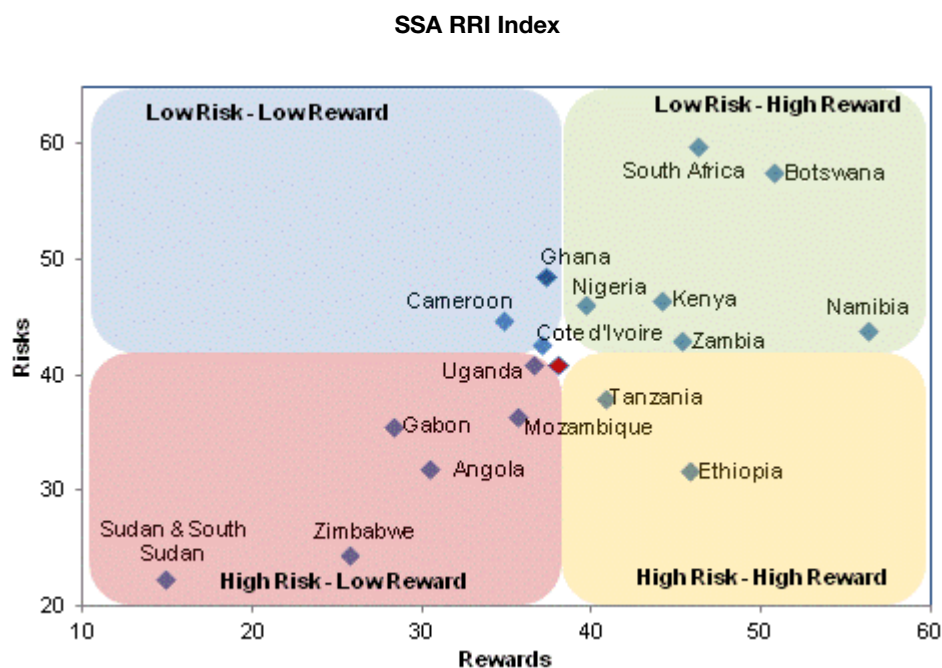
*Scores 0-100, with higher scores preferable. Source: BMI*

The comparatively substantial value of the Nigerian and South African construction industries in SSA has kept these markets positioned near the top of our RRI, despite slower real growth than other markets in the region. However, we note growing operational risks, deteriorating economic outlooks and a decline in foreign direct investment (FDI) in both countries is weighing heavily on their attractiveness and further weakening industry growth. Investors are expected to exercise greater caution operating in these markets as the potential to capitalise on their rewards and garner significant return on capital outlays becomes increasingly less certain.

In Nigeria, private sector involvement in construction projects has declined severely owing to the lack of liquidity in the banking sector - a result of the 2015 introduction of capital controls and the maintenance of a currency peg to the USD despite significant pressure on the naira. We also believe the government will struggle to meet its spending targets as revenues remain under pressure throughout the year, even with a mild increase expected in oil prices - particularly as oil production stumbles in light of increased attacks on oil pipelines in the Niger Delta. Heightened terrorist activity will be a major deterrent to investors, who are already cautious of the exposure of key infrastructure to sabotage. In light of these factors, last quarter we

revised Nigeria's construction growth forecast to 1.1% in real terms for 2016 from the previous projection of 7.0% (*see 'Construction: Growth Slashed As Liquidity Bites - Q3 2016', June 3*).

Capital Controls Will Continue To Deter Investment

Nigeria - Capital Importation, Components, USDmn
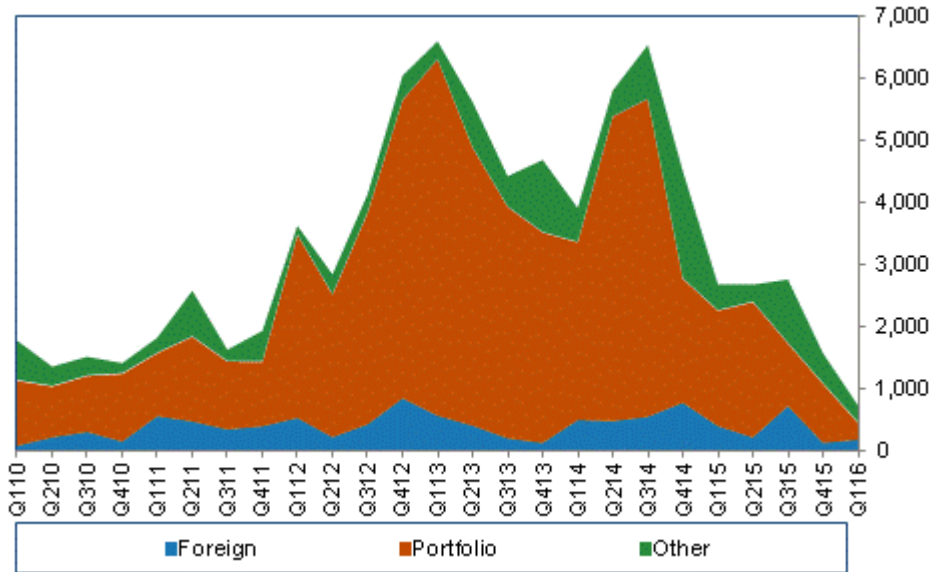
Source: National Bureau of Statistics, Nigeria

Our forecasts for real growth in South Africa's construction market remain subdued at 1.9% expected in 2016. Despite lower risks compared to other SSA markets and its position as the most financially advanced market in the region, South Africa is weighed down by the government's growing inability to deploy the financial capital it has earmarked for the infrastructure sector, as economic growth slows to the lowest level since the 2009 recession. We are also expecting a further slump in foreign direct investment (FDI) inflows to the country in 2016: the prospect of an investment rating downgrade remains a major drag on business sentiment, with further pressure stemming from the uncertainty over policy reform seeking to extend the state's power in land expropriation (*see 'New Investment Legislation: Key Implications For Construction', June 23*).

Business Confidence Takes A Knock

South Africa - Business Confidence Index, 2010=100
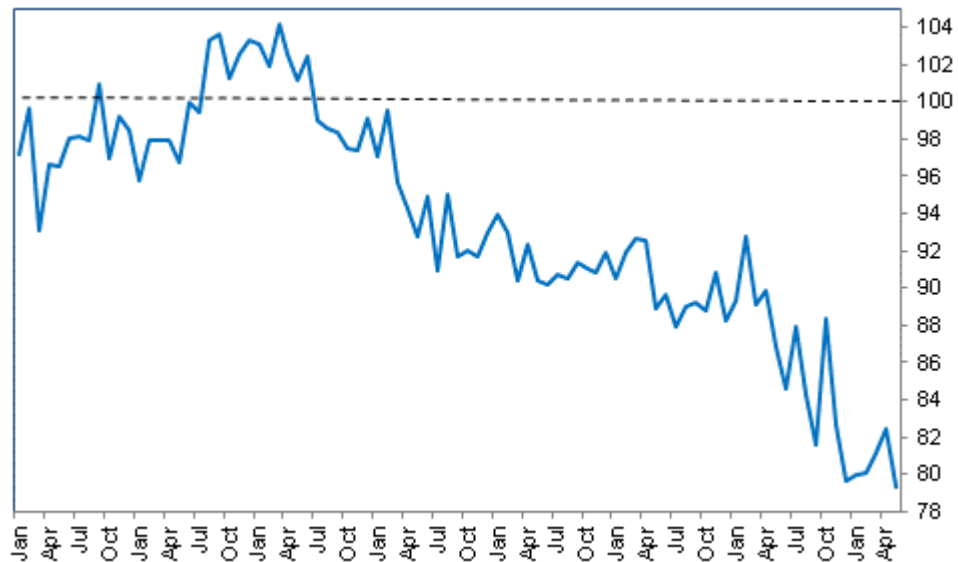
Source: South African Chamber of Commerce And Industry, BMI

Our RRI outperformers, Namibia and Botswana - coming in first and second respectively - continue to be boosted by both governments' prudent fiscal management and increased capital expenditure towards infrastructure development. The transport and utilities sectors will receive major attention as the countries work to improve their overall logistics risk profile in Southern Africa. We also highlight the mining sector's importance to economic growth in both markets remains a key source of demand for infrastructure, keeping their growth trajectories in positive territory over 2016.

Strong Operational Risk Profiles Boost Rewards

Operational Risk Scores
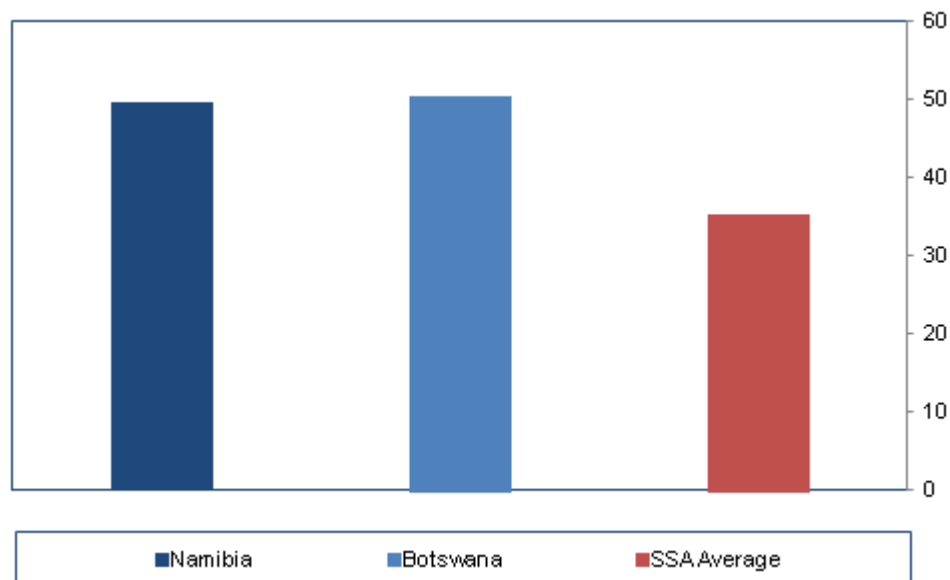
Scores 0-100, with higher scores preferable. Source: BMI

In West Africa, we highlight Cote d'Ivoire as an investment bright spot for infrastructure, with one of the most developed public-private partnership (PPP) markets in SSA, supported by the government's pro-business strategies. Its currency peg to the euro has kept price growth stable, even as currencies in SSA weakened substantially in the commodities downturn. While Nigeria and Ghana score positively across the remaining three pillars, macroeconomic headwinds, caution from private investors and poorer growth stories in these markets have seen Cote d'Ivoire jump to the lead in the Industry Rewards pillar with a score of 42.5. It is the only market in West Africa to rank above the SSA average in this regard.

Dragging on the attractiveness of the Ivorian market is its small size in nominal value terms, which spells greater risks for investors in gaining substantial return on investment that comes with operating in larger markets. Estimated to be worth USD800mn in 2015, Cote d'Ivoire's nominal industry value is small - especially compared with Nigeria at USD18.4bn. Ghana, Cameroon and Gabon are all above the USD1bn mark, worth USD4.2bn, USD1.9bn and USD1.1bn respectively. As such, the country scores lower for Industry Risks than Nigeria and Ghana.

Nigeria Overshadows Peers

West Africa - Construction Industry Value, USDmn
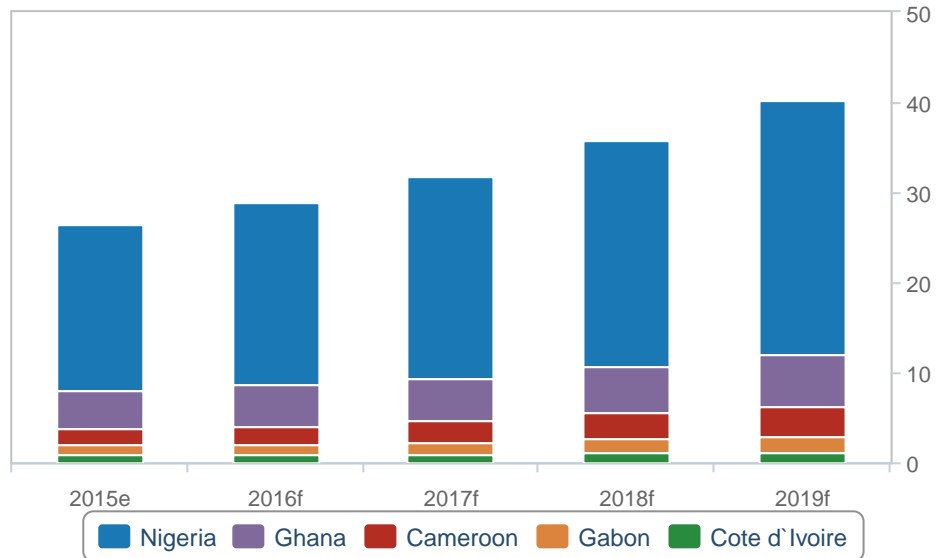
e/f=BMI estimate/forecast. Source: National Sources, BMI

In East Africa, Kenya and Ethiopia remain the most attractive markets for investment, with the former offering a far greater diversity of opportunity compared to its neighbours and the latter boosted by its attractive growth trajectory. Overall Kenya fares significantly better in our Index, ranking above the SSA average across all pillars. The government's effort to open the construction market to greater competition vis-à-vis the PPP model has been critical in attracting private investment and we highlight Nairobi is firmly cementing its reputation as the choice destination for firms operating in East Africa, with a growing hotel industry catering to business and direct flights to the US and Morocco starting in 2016. Meanwhile, Ethiopia's reliance on international sources of capital means many projects go to companies from the source nation. With China dominating these financing flows, Chinese firms have steadily built up a strong market share and are able to undercut on price, limiting the success of other international firms.

China Dominates Ethiopia's Industry Landscape

Market Share (%) According To Major Project Value
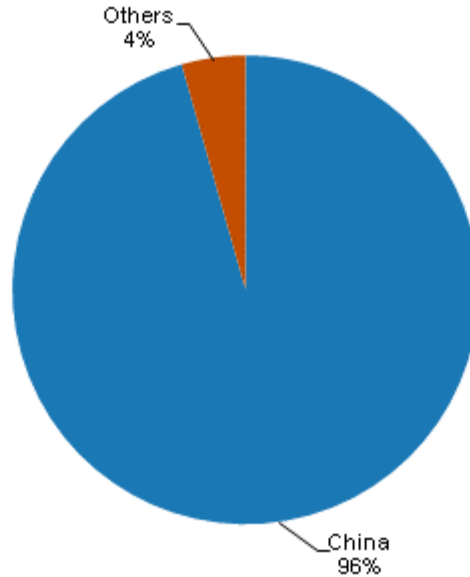
Source: BMI Infrastructure Key Projects Database

Kenya's overall attractiveness is also boosted by its outperformer status for renewable energy in the SSA region. The government has made strides harnessing geothermal and wind to address its power deficit, and while the country still struggles with an inadequate power supply, it fares much better in this regard than its neighbours. In comparison, Ethiopia's electrification rate (currently the lowest per capita in the region) adversely impacts the timely completion of projects and the efficiency of the manufacturing sector, and substantially increases operational costs. We note, however, total generation is forecast to improve by 62% between 2016 and 2020 as the government devotes significant attention to its power sector.

Kenya Posts Most Consistent Performance

East Africa - Risk/Reward Index
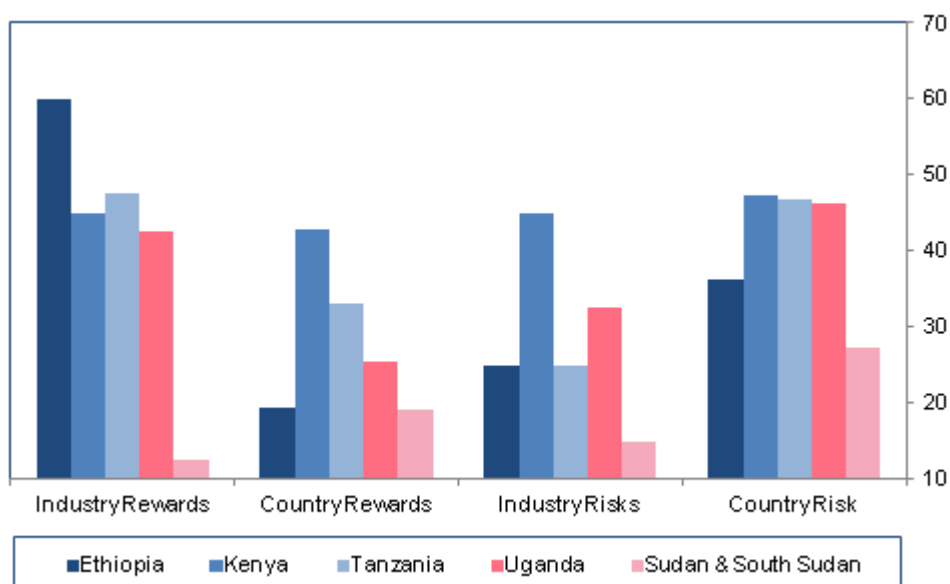
Scores 0-100, with higher scores preferable. Source: BMI

Less risk-averse investors will be drawn to Ethiopia, the only construction market in SSA forecast to record double-digit growth over the next 10 years, as the government continues with its major push for infrastructure development. The country's Industry Rewards score is also boosted by its position as the largest market in East Africa in nominal value terms, having risen from USD1.1bn in 2011, overtaking that of Tanzania (USD5.1bn) and significantly higher than Uganda (USD3.1bn) and Kenya (USD3.1bn).

Table: SSA RRI								
	Industry Rewards	Country Rewards	Rewards	Industry Risks	Country Risks	Risks	Infrastructure R/R Score	Regional Ranking
Botswana	55	43.0	**50.8**	45	65.8	**57.5**	**52.8**	1
Namibia	65	40.2	**56.3**	42.5	44.8	**43.9**	**52.6**	2
South Africa	37.5	62.7	**46.3**	57.5	61.4	**59.8**	**50.4**	3
Kenya	45	42.8	**44.2**	45	47.3	**46.4**	**44.9**	4
Zambia	47.5	32.1	**42.1**	40	44.4	**42.6**	**42.3**	5
Nigeria	30	57.8	**39.7**	35	53.5	**46.1**	**41.6**	6

SSA RRI - Continued							
	Industry Rewards	Country Rewards	Rewards	Industry Risks	Country Risks	Risks	Infrastructure R/R Score	Regional Ranking
Ethiopia	60	19.5	**45.8**	25	36.1	**31.7**	**41.6**	7
Tanzania	47.5	33.0	**42.4**	25	46.7	**38.0**	**41.1**	8
Ghana	32.5	46.5	**37.4**	50	47.6	**48.5**	**40.7**	9
Uganda	42.5	25.6	**36.6**	32.5	46.3	**40.8**	**37.8**	10
Cameroon	37.5	29.9	**34.8**	50	41.1	**44.7**	**37.8**	11
Cote d'Ivoire	42.5	22.4	**35.5**	40	44.3	**42.6**	**37.6**	12
Mozambique	42.5	23.0	**35.7**	35	37.1	**36.3**	**35.8**	13
Angola	40	12.8	**30.5**	30	32.9	**31.8**	**30.9**	14
Gabon	27.5	29.9	**28.3**	27.5	40.9	**35.5**	**30.5**	15
Zimbabwe	25	26.9	**25.7**	26	23.4	**24.4**	**25.3**	16
Sudan & South Sudan	12.5	19.2	**14.9**	15	27.2	**22.3**	**17.1**	17
Regional Average	40.6	33.4	**38.1**	36.5	43.6	**40.8**	**38.9**	-

Scores 0-100, with higher scores preferable. Source: BMI

Methodology

Industry Forecast Methodology

BMI's Industry forecasts are generated using the best-practice techniques of time-series modelling and causal/econometric modelling. The precise form of model we use varies from industry to industry, in each case being determined, as per standard practice, by the prevailing features of the industry data being examined.

Common to our analysis of every industry, is the use of vector autoregressions. Vector autoregressions allow us to forecast a variable using more than the variable's own history as explanatory information. For example, when forecasting oil prices, we can include information about oil consumption, supply and capacity.

When forecasting for some of our industry sub-component variables, however, using a variable's own history is often the most desirable method of analysis. Such single-variable analysis is called univariate modelling. We use the most common and versatile form of univariate models: the autoregressive moving average model (ARMA).

In some cases, ARMA techniques are inappropriate because there is insufficient historic data or data quality is poor. In such cases, we use either traditional decomposition methods or smoothing methods as a basis for analysis and forecasting.

We mainly use OLS estimators and in order to avoid relying on subjective views and encourage the use of objective views, we use a 'general-to-specific' method. **BMI** mainly uses a linear model, but simple non-linear models, such as the log-linear model, are used when necessary. During periods of 'industry shock', for example poor weather conditions impeding agricultural output, dummy variables are used to determine the level of impact.

Effective forecasting depends on appropriately selected regression models. We select 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.

It must be remembered that human intervention plays a necessary and desirable role in all of our industry forecasting. Experience, expertise and knowledge of industry data and trends ensure that analysts spot structural breaks, anomalous data, turning points and seasonal features where a purely mechanical forecasting process would not.

Sector-Specific Methodology

Construction Industry

Construction Industry Value

Our data is derived from GDP by output figures from each country's national statistics office (or equivalent). Specifically, it measures the output of the construction industry over the reported 12-month period in nominal values (ie domestic currency terms). As it is derived from GDP data, it is a measure of value added within the industry (ie the additional contribution of the construction industry over other industries, such as cement production). Consequently, it does not measure the nominal value of all inputs used in the construction industry, which, for most states would increase the overall figure by 50-60%. Furthermore, it is important to note that the data does not provide an indication of the total value of a country's buildings, only the construction sector's output in a given year.

This data is used because it is reported by virtually all countries and can therefore be used for comparative purposes.

Construction Industry Value Real Growth

Our data and forecasts for real construction measures the real increase in output (rather than nominal growth, which would also incorporate inflationary increases). In short, it is an inflation-adjusted value of the output of the construction industry y-o-y. Consequently, real growth will be lower than the nominal growth of our 'construction value' indicator, except in instances where deflation is present in the industry.

Data for this is sourced from the constant values for construction value added, using the same sources noted above. We use officially calculated data to accurately account for inflation specific to the construction industry.

Construction Industry, % Of GDP/Construction Value (USD)

These are derived indicators. We use **BMI**'s Country Risk team's GDP and exchange rate forecasts to calculate these indicators.

Capital Investment

Total Capital Investment

Our data is derived from GDP by expenditure data from each country's national statistics office (or equivalent). It is a measure of total capital formation (excluding stock build) over the reported 12-month period. Total capital formation is a measure of the net additions to a country's capital stock, so takes into account depreciation as well as new capital. In this context, capital refers to structures, equipment, vehicles etc. As such, it is a broader definition than construction or infrastructure, but is used by **BMI** as a proxy for a country's commitment to development.

Capital Investment (USD), % Of GDP, Per Capita

These are derived indicators. We use our Country Risk team's population, GDP and exchange rate forecasts to calculate them. As a rule of thumb, we believe an appropriate level of capital expenditure is 20% of GDP, although in rapidly developing emerging markets it may, and arguably should, account for up to 30%.

Government Capital Expenditure

This is obtained from government budgetary data and covers all non-current spending (ie spending on transfers, salaries to government employees, etc). Due to the absence of global standards for reporting budgetary expenditure, this measure is not as comparable as construction/capital investment.

Government Capital Expenditure, USDbn, % Of Total Spending

These are derived indicators.

Construction Sector Employment

Total Construction Employment

This data is sourced from either the national statistics office or the International Labor Organization (ILO). It includes all those employed within the sector.

Construction Employment, % y-o-y; % Of Total Labour Force

These are derived indicators.

Average Wage In Construction Sector

This data is sourced from either the national statistics office or the ILO.

Infrastructure Data Sub-Sectors

BMI's Infrastructure data examines the industry from the top down and bottom up in order to calculate the industry value of infrastructure and its sub-sectors. We use a combination of historic data as reported by the central banks, national statistics agencies and other official data sources, and **BMI**'s Infrastructure Key Projects Database tool.

Where possible we source historic data for the relative portion of either infrastructure spend or value generated by the various sub-sectors we classify as infrastructure. We seek to segment official infrastructure data into pre-set categories classified by us, across all countries, in order to optimise the ability to compare industry value across the sub-sectors of infrastructure. We then apply ratios to the infrastructure subsector value in order to derive the value. Real growth is calculated using the official construction inflation rate.

In those instances where historic data is not available, we use a top down and bottom up approach incorporating full use of **BMI**'s Infrastructure Key Projects Database, in most cases dating back to 2005. This allows us to calculate historical ratios between general infrastructure industry value and its sub-sectors,

which we then use for forecasting. Our Key Projects Database is not exhaustive, but it is comprehensive enough to provide a solid starting point for our calculations.

The top down approach uses data proxies. We have separated countries into three tiers. Each tier comprises a group of countries on a similar economic development trajectory and with similar patterns in terms of infrastructure spending, levels of infrastructure development and sector maturity. This enables us to confirm and overcome any deficiencies of infrastructure-specific data by applying an average group ratio (calculated from the countries for which official data exists) to the countries for which data is limited.

- Tier I - Developed States. Common characteristics include:

  - Mature infrastructure markets;

  - Investments typically target maintenance of existing assets or highly advanced projects at the top of the value chain;

  - Infrastructure as percent of total construction averages around 30%.

  - Tier I countries: Canada, Germany, Greece, UK, US, France, Hong Kong, Taiwan, Singapore, Israel, Japan, Australia.

- Tier II - Core Emerging Markets. Common characteristics include

  - The most rapidly growing emerging markets, where infrastructure investments are a government priority;

  - Significant scope for new infrastructure facilities from very basic levels (eg highways, heavy rail) to more high value projects (renewables, urban transport);

  - Infrastructure as percent of total construction averages around 45% and above.

  - Tier II countries: Colombia, Malaysia, Mexico, South Korea, Peru, Philippines, Turkey, Vietnam, Poland, Hungary, South Africa, Nigeria, Russia, China, India, Brazil, Indonesia.

- Tier III- Emerging Europe. Common characteristics include:

  - Regional socioeconomic trajectories;

  - Development defined by recent or pending accession to European structures such as the EU. Infrastructure development to a large degree dictated by EU development goals and financed through vehicles such as the PHARE and ISPA programmes, and institutions such as the EBRD and EIB;

  - Infrastructure as percentage of total construction averages between 30% and 40%.

  - Tier III countries: Czech Republic, Romania, Bulgaria, Slovakia, Slovenia, Estonia, Latvia, Lithuania, Croatia, Ukraine.

This methodology has enabled us to calculate infrastructure industry values for states where this was not previously possibly. Furthermore, it has enabled us to create comparable indicators.

The top down hypothesis-led approach has been used solely to calculate the infrastructure industry value as a percentage of total construction. For all sub-sector calculations we apply the bottom-up approach, ie calculating the ratios from our Key Projects Database where data was not otherwise available.

Risk/Reward Index Methodology

BMI's Risk/Reward Index (RRI) provides a comparative regional ranking system evaluating the ease of doing business and the industry-specific opportunities and limitations for potential investors in a given market.

The RRI system divides into two distinct areas:

Rewards: Evaluation of sector's size and growth potential in each state, and also broader industry/state characteristics that may inhibit its development. This is further broken down into two sub categories:

- Industry Rewards (this is an industry-specific category taking into account current industry size and growth forecasts, the openness of market to new entrants and foreign investors, to provide an overall score for potential returns for investors).

- Country Rewards (this is a country-specific category, and the score factors in favourable political and economic conditions for the industry).

Risks: Evaluation of industry-specific dangers and those emanating from the state's political/economic profile that call into question the likelihood of anticipated returns being realised over the assessed time period. This is further broken down into two sub categories:

- Industry Risks (this is an industry-specific category whose score covers potential operational risks to investors, regulatory issues inhibiting the industry, and the relative maturity of a market).

- Country Risks (this is a country-specific category in which political and economic instability, unfavourable legislation and a poor overall business environment are evaluated to provide an overall score).

We take a weighted average, combining industry and country risks, or industry and country rewards. These two results in turn provide an overall Risk/Reward Index, which is used to create our regional ranking system for the risks and rewards of involvement in a specific industry in a particular country.

For each category and sub-category, each state is scored out of 100 (100 being the best), with the overall Risk/Reward Index a weighted average of the total score. Importantly, as most of the countries and territories evaluated are considered by us to be 'emerging markets', our score is revised on a quarterly basis. This ensures that the score draws on the latest information and data across our broad range of sources, and

the expertise of our analysts. Our approach in assessing the Risk/Reward balance for infrastructure industry investors globally is fourfold:

- First, we identify factors (in terms of current industry/country trends and forecast industry/country growth) that represent opportunities to would-be investors.

- Second, we identify country and industry-specific traits that pose or could pose operational risks to would-be investors.

- Third, we attempt, where possible, to identify objective indicators that may serve as proxies for issues/ trends to avoid subjectivity.

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

Sector-Specific Methodology

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

Indicators

Table: Infrastructure Risk/Reward Index Indicators	
	Rationale
Rewards	
Industry rewards	
Construction expenditure, USDbn	Objective measure of size of sector. The larger the sector, the greater the opportunities available.
Sector growth, % y-o-y	Objective measure of growth potential. Rapid growth results in increased opportunities.
Capital investment, % of GDP	Proxy for the extent the economy is already oriented towards the sector.
Government spending, % of GDP	Proxy for extent to which structure of economy is favourable to infrastructure/
Country rewards	
Labour market infrastructure	From BMI's Country Risk Index (CRI). Denotes availability/cost of labour. High costs/low quality will hinder company operations.
Financial infrastructure	From CRI. Denotes ease of obtaining investment finance. Poor availability of finance will hinder company operations across the economy.
Access to electricity	From CRI. Low electricity coverage is proxy for pre-existing limits to infrastructure coverage.
Risks	
Industry risks	

Infrastructure Risk/Reward Index Indicators - Continued

	Rationale
No. of companies	Subjective evaluation against BMI-defined criteria. This indicator evaluates barriers to entry.
Transparency of tendering process	Subjective evaluation against BMI-defined criteria. This indicator evaluates predictability of operating environment.
Country risks	
Structure of economy	From CRI. Denotes health of underlying economic structure, including seven indicators such as volatility of growth; reliance on commodity imports, reliance on single sector for exports.
External risk	From CRI. Denotes vulnerability to external shock - principal cause of economic crises.
Policy continuity	Subjective score from CRI. Denote predictability of policy over successive governments.
Legal framework	From CRI. Denotes strength of legal institutions in each state. Security of investment can be a key risk in some emerging markets.
Corruption	From CRI. Denotes risk of additional illegal costs/possibility of opacity in tendering/business operations affecting companies' ability to compete.

Source: BMI

Weighting

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

Table: Weighting Of Indicators

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

Source: BMI