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Automotive batteries: powering up

Meyrick Barker - Analyst Associate

In this article, we explore the growing impact batteries are having in the automotive world and highlight the challenges encountered in improving their performance. We also delve into the different vehicle battery technologies that consumers will be using in the near future.

Automotive batteries: powering up

Bringing urgency back into battery research

Over the last six years we have seen the emergence of a critical mass of policy makers, scientists, entrepreneurs, and public icons advocating a move away from oil-fuelled transportation to battery-driven vehicles.

Their argument centres on the premise that, if only batteries could store more energy and were cheaper to produce, we could readily adopt affordable electric vehicles (EVs) and help reduce greenhouse gas emissions[1]. One response to legislators demanding a reduction in carbon dioxide and other emissions from vehicles has been for vehicle manufacturers to start adopting lithium-ion battery technology.

Volkswagen's recent emissions scandal has resulted in increased scrutiny on vehicle emissions and has accelerated the drive to amend the way in which emissions are tested.

The evolution of automotive batteries

Lead-acid batteries, originally invented in 1859, were the first batteries used in motor vehicles. They were introduced to provide the initial turning force necessary to start the engine as well as to power the lighting and ignition systems. Over the last 150 years, innovative advances in rechargeable battery technologies have resulted in a seven fold improvement in their specific energy (ie we can now supply more energy with a lighter battery). While these advances are important, they imply a compound annual improvement rate of only 1.6%.

Following the development of lead-acid batteries, key advances in vehicle batteries have included:

- The development of extended battery capabilities to power more advanced electrical systems within a vehicle.
- The introduction of start/stop batteries (or micro hybrids). These type of batteries reduce engine running time (thereby cutting emissions generated by vehicles) and are particularly effective for inner city driving.
- The development of new battery chemistries, such as lithium-ion batteries, has been integral to improving specific energy. These have allowed the replacement (complete and partial) of the internal combustion engine (ICE) with an electric motor and have led to the launch of hybrid vehicles such as the Toyota Prius.

In the years ahead, we can continue to expect incremental performance gains in energy storage as challenging technological constraints are slowly overcome. Improvements in both lead-acid and lithium-ion batteries will continue to reduce the power demands placed on conventional ICEs, further

[1] The extent to which EVs reduce emissions is dependent on the source of the electricity. Fully electric vehicles powered by coal-generated electricity provide a limited reduction in CO_2 emissions.

Contrasting battery technologies

	Performance attributes					
	Energy	Power	Safety	Life	Cost	Examples of use
Nickel cobalt aluminium						Tesla Model S
Nickel manganese cobalt						Volkswagen eUp, BMW i3, Fiat 500e
Lead-acid						Virtually all ICE, PHEV*and HEV*models

Best Worst

* In addition to a lithium-ion battery

Source: Umicore

improving fuel efficiencies. Advancements in lithium-ion batteries will continue to increase the proportion of new hybrid and fully electric vehicles being produced.

Tomorrow's car

When talking about lithium-ion batteries, it is important to note that full-scale EVs are not the only solution that vehicle manufacturers are considering to reduce emissions. Although the cost of lithium-ion batteries is coming down rapidly, various breakthroughs still need to be made before full scale EVs are affordable for the mass market.

Other solutions being considered are:

- Mild hybrid (including 48 volt) solutions: this is a bigger battery than used in start/stop cars and allows the engine to shut off more regularly and for longer periods of time. The battery cannot drive the motor but provides a power assist or 'boost' function. This improves the responsiveness and efficiency of the engine at low revolutions, thereby improving fuel efficiency. The battery is recharged when the driver brakes.
- Hybrid and plug-in hybrid electric vehicles (HEV and PHEV): both these vehicles have a lithium-ion battery and electric motor as well as a standard ICE. A PHEV can typically be distinguished from a HEV as it has a larger battery pack and is therefore able to travel longer distances without using the ICE.
- Fuel-cell electric vehicles (FCEV): these vehicles have fuel cells, which create electricity using oxygen from the air and compressed hydrogen to power an electric motor.

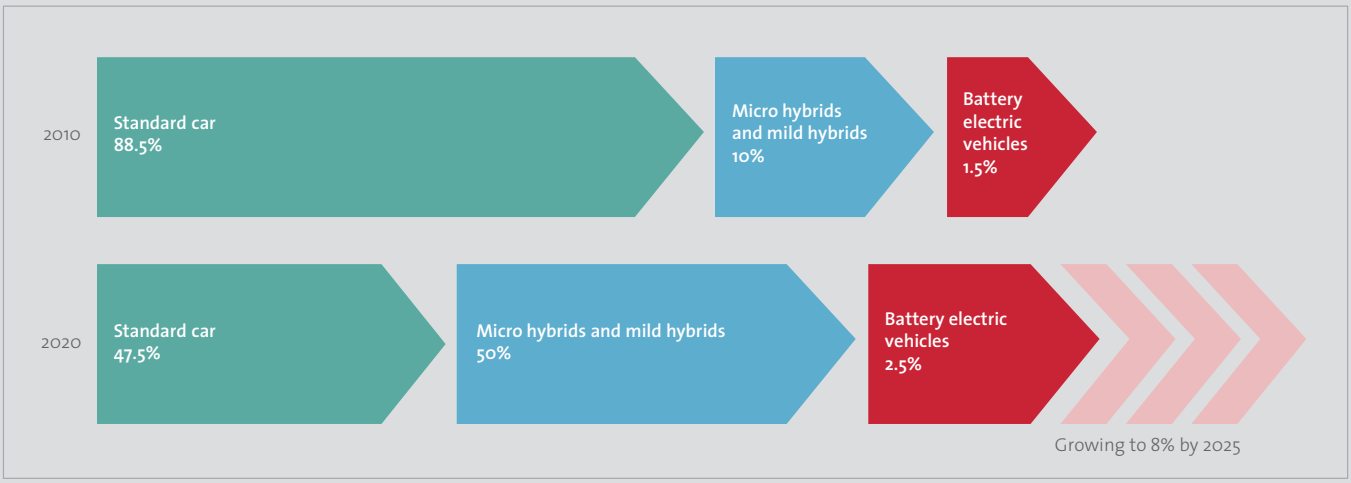
The above options are progressively more expensive as you work down the list.

Advancing battery technology: multiple trade-offs

One can think of batteries as chemistry in a can. To build a cell, take an empty container, insert two electrodes isolated by permeable separators and then immerse all the components with an electrolyte. Join a number of cells together and you have a battery.

When considering EVs, a battery with a higher kW rating (ie power) is able to accelerate faster than one with a lower kW rating. A battery with a higher kWh rating (ie energy) can travel further than lower kWh alternatives. Optimising a battery for either energy or power involves trade-offs of one for the other. Failing to consider both energy and power metrics makes comparisons between different battery technologies incomplete. Similarly, cost metrics such as $/kWh, only tell half the story.

Projections for market penetration of battery electric vehicles



Source: Avicenne Energy, UBS estimates and Deutsche Bank estimates

Automotive batteries: powering up

To increase travelling distances, you need to either boost a battery's energy density or make it bigger. Energy density refers to the amount of energy storage per litre of volume and is improved by adjusting the battery chemistry. For example, Tesla favour using a nickel, cobalt, and aluminium (NCA) mix for their electrodes[2]. BMW think NCA is too volatile and has too little energy, and therefore prefer a competing nickel, cobalt and manganese chemistry (see table on the previous spread).

Enlarging batteries is reasonably straightforward but is incrementally more expensive as they require more of the costly metals, such as nickel and cobalt found in the electrodes of lithium-ion cells. Additional complexities that need to be considered include the weight of the battery, how long it takes to recharge, whether it can operate in both hot and cold conditions and how many times it can be discharged and recharged.

Different ways to enjoy the ride

We expect to see a growing penetration of HEVs, PHEVs and EVs (collectively known as battery electric vehicles - BEVs) in the global vehicle fleet in the future. However, given the great challenges that still need to be met in producing affordable BEVs, we caution that the industry will likely evolve slower than the media often implies.

We believe that BEVs will only comprise a niche portion of the global vehicle fleet by 2020 and 2025 (see graphic on the previous spread). Most of the initial success will be seen in the premium priced vehicles.

The rate at which consumers move away from ICEs will be influenced by the oil price. A low oil price will slow this progression. If one considers the core automotive markets of the US, Europe and China, we believe Europe and China will lead BEV adoption, given the cheaper cost of fuel in the US. Today, lithium-ion batteries cost approximately US$ 250/kWh[3].

Contrasting the key uncertainties of oil price and battery cost, the economics of BEV adoption can be summarised as follows[4]:

- At current lithium-ion battery costs and the low oil price (approximately US$ 30/barrel), BEVs require government incentives to make their cost of ownership competitive with ICEs.
- As battery costs decline towards US$ 145/kWh, and the oil price remains stable, incentives are no longer required in Europe for BEVs to be cost competitive.
- If battery costs decline (as detailed earlier on) and the oil price increases to US$ 120/barrel, incentives can fall away in China (in addition to Europe) for BEVs to be cost competitive.
- Further reductions in battery costs or increases in the oil price are required in the US before government incentives can fall away and BEVs remain competitive.

As the journey evolves from oil-fuelled transportation to one in which BEVs and FCEVs play a complementary role, various investment opportunities will present themselves. These extend beyond lithium-ion battery makers and include the likes of lithium or graphite miners, mispriced lead-acid battery makers (if investors overestimate the rate at which lead-acid battery penetration exits the global vehicle fleet) and battery recycling services.

Our clients with global exposure have already benefited from our investment in Umicore, which produces cathodes that form part of the important battery technology. We will continue to seek opportunities in this field. UP

[2] In a lithium-ion battery, one electrode (ie the cathode) will comprise this mix. The other electrode, the anode, is typically carbon (most commonly graphite).
[3] UBS research. Recall the earlier comments about the shortcomings of this measurement.
[4] In developing this viewpoint, several additional assumptions need to be made around electricity costs, the rate at which ICE fuel efficiency is improved and costs incurred to do so.

Life Healthcare is a cut above the rest

Aslam Dalvi - Investment Analyst

Life Healthcare is South Africa's second largest private hospital group with an estimated 26% share of the local healthcare market[1]. Originally known as Afrox Healthcare, the group was founded in 1983 as a division of African Oxygen Limited (Afrox), the country's largest gas company at the time.

[1] As measured by number of beds

Life Healthcare is a cut above the rest

It listed on the JSE in 1999 through a reverse listing and merger with the Presmed Hospital Group. In 2005, the group was de-listed after being sold to a private consortium led by Mvelaphanda and Brimstone and was renamed Life Healthcare. It subsequently re-listed in 2010. Since then, Life Healthcare has delivered better revenue and profit growth than its competitors. This is mainly due to several structural differences and unique competitive strengths, which we believe will help the group navigate an increasingly challenging local healthcare environment.

As growth in South Africa slows, global expansion is becoming a key focus for local hospital groups. Life Healthcare recently expanded into Poland and India, and is considering a third foreign country entry. While Poland is small and unlikely to be a material contributor to group profitabilty, the foray into India presents a good medium-term opportunity as it gives the company access to one of the world's most attractive healthcare markets.

A different SA hospital group

While the three listed private hospital groups - Life Healthcare, Mediclinic and Netcare - are similar in many respects, there are some important differences that have contributed to Life Healthcare outperforming across several operating and financial metrics (see table below).

One is a higher exposure to complementary services, such as mental healthcare, acute rehabilitation and renal dialysis. Life Healthcare has around 4 744[2] beds dedicated to complementary services, making it the largest player in this market. Underlying growth in these areas has been robust and has supported the company's lower capital expenditure requirements and higher margins, while also providing diversification benefits.

The company remains particularly well positioned to capture growth in the mental healthcare market, which has increased by more than 20% per annum over the last five years. The heightened demand for mental healthcare is a global phenomenon. A recent study by the World Health Organisation highlights that, by 2030, unipolar depression will emerge as the single largest contributor to the world's rising burden of disease.

Another important difference is that Life Healthcare does not have an emergency response unit. In South Africa, two large players currently provide ambulance services to the public: Netcare's 911 and Mediclinic's ER24. These response units are typically 'loss leaders' and therefore dilute margins and returns for the companies that own them.

[2] Including Life Esidimeni, a public-private partnership with the SA government

Comparison of financial and operational metrics

SA hospital divisions	Private bed market share	Number of beds	Number of theatres	PPD* growth (5-year average)	EBITDA** growth (5-year average)	EBITDA bed (R'000s)	Cost/ bed (R'000s)	Occupancy (5-year average)	Top three regions by number of beds		
									First	Second	Third
Life Healthcare	26%	8 671	308	4%	13%	456	1 158	72%	Gauteng	KZN	Eastern Cape
MEDICLINIC	24%	7 885	269	4%	10%	339	1 223	70%	Gauteng	Western Cape	Free State
NETCARE	30%	9 996	352	2%	12%	395	1 335	68%	Gauteng	KZN	Western Cape

* paid patient days ** Earnings before Interest, Taxes, Depreciation and Amortisation
Source: annual reports, Kagiso Asset Management research

The often cited reason for having ambulance units is that they allow the groups to direct patients towards their own facilities, thereby improving volumes, occupancies and returns. However, in practice this is not true as South African law requires ambulances to take critical patients to the nearest hospital - irrespective of which group owns it. Life Healthcare therefore benefits by gaining a large share of emergency cases without any of the associated costs carried by its competitors.

Unique strengths

While the above factors have contributed to the better performance compared to other South African hospital groups, Life Healthcare's main strength has been its ability to better manage costs and thereby deliver superior returns on capital.

Hospitals most often price for their services on what is called a 'fee for service' basis, whereby they bill for each individual service (eg a day in a ward, time in theatre or the use of a piece of equipment). In the 1990s, Life Healthcare took the view that this pricing model was unsustainable and began charging patients a single sum for visiting the hospital - irrespective of the items used or the services required by a patient. This new pricing model forced management to build the necessary processes, systems and culture to focus on minimising costs and capital spend in order to manage profitability and returns.

This cost focus has proven to be an enduring competitive advantage and has allowed Life Healthcare to grow market share, achieve higher occupancies and deliver superior margins. We estimate that the group's revenue market share has grown from below 28% in 2008 to over 32% today, and that occupancies have risen from around 70% to 72% and margins from 25% to 28% in the same period. Life Healthcare today stands out as the lowest cost, highest margin and highest return hospital group among its global competitors (see charts below).

Well placed in a tougher SA environment

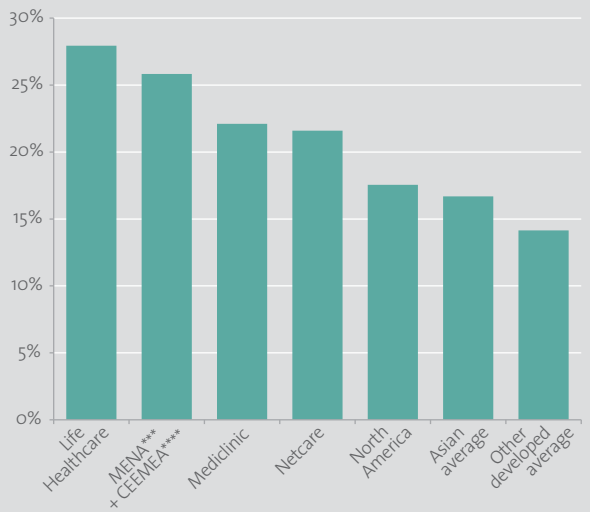
The local private hospital sector has delivered good growth over the last few years with the industry benefiting from numerous tailwinds. These include the rapid growth of the government employee's medical scheme (which has been very successful in growing the medically insured population), a rising burden of disease and a relatively benign regulatory backdrop.

As these tailwinds fade, cost discipline will become a critical factor in growing profitability. In this regard, Life Healthcare remains the best positioned among the three listed private hospital groups.

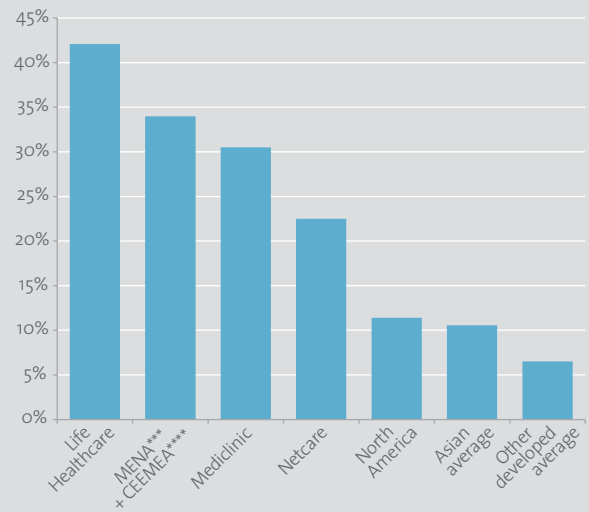
The Indian healthcare market

Against a backdrop of slowing growth in South Africa and rising regulatory risks, Life Healthcare chose to enter the Indian

Comparison of SA hospitals' profitabilty* to other regions



Comparison of SA hospitals' returns to other regions**



* As measured by Earnings before Interest, Taxes, Depreciation and Amortisation ** As measured by Return on equity
*** Middle East and North Africa region **** Central and Eastern Europe, Middle East and Africa

Source: Bloomberg, Kagiso Asset Management research

Life Healthcare is a cut above the rest

market in 2012 through the acquisition of a 26% stake in Max Healthcare - one of India's largest healthcare groups. Life Healthcare increased its stake in the Indian business to 46% in 2014, assuming joint control and solidifying its position as a key player in India.

The Indian healthcare market has grown by a CAGR of 12% per annum since 2008 and the growth opportunity remains large. We estimate that India has around 1.15 million beds, with the private sector accounting for around 65% of total beds. Although large in absolute number, on a per bed basis India still has less than 1 bed per 1 000 people and ranks as one of the world's most underserviced countries from a healthcare infrastructure point of view (see chart below).

Total government spend on healthcare in India is very low at only 1.3% of GDP, compared to the emerging market average of around 3.5%. The result is that reasonable quality healthcare is often only available in private facilities.

The bed opportunity in particular is large and we estimate that India will require 90 000 beds per annum over the next three decades to reach the global bed per capita average of around three. With India continuing to spend so little on public healthcare, the opportunity falls squarely into the hands of private players and we are therefore confident that the private healthcare sector can deliver double digit revenue growth for many years to come.

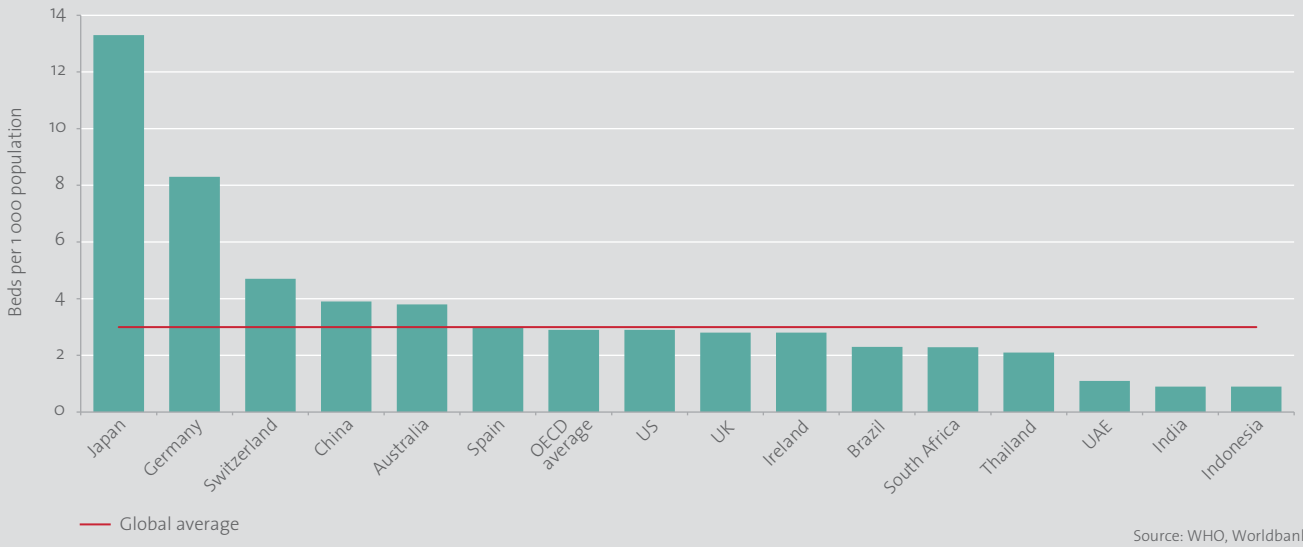
Prospects in India

The Indian opportunity for Life Healthcare extends beyond the exposure that Max Healthcare offers to the fast growing and attractive Indian market.

Revenue at Max Healthcare has grown by 23% per annum since 2008 but profit margins of 10% are low compared to global peers. These subdued margins are due to the very low price of hospital services in India and a lack of cost and capital discipline at Max Healthcare. Life Healthcare's key strength is cost management and we believe there is a large profit opportunity for the group if it succeeds in transferring its cost expertise to Max Healthcare. At the moment, Life Healthcare cannot take advantage of this opportunity because they do not have outright control of Max Healthcare.

India is currently a small contributor to Life Healthcare group profits. However, this could change once Max Healthcare adopts Life Healthcare's cost processes and culture, and could result in the Indian business emerging as a material contributor to Life HealthCare's medium-term profitability. UP

International comparison of hospital beds (2013 or closest year)



Source: WHO, Worldbank and OECD

Food producers: in the pressure cooker

Victor Seanie - Investment Analyst

South Africa has six major domestic food producers accessible to investors on the JSE Securities Exchange, each with annual revenues of between R3 billion and R32 billion. Some of the much-loved household brands owned by these leading food groups are more than 100 years old and include Albany, Koo, Weet-Bix and Bakers biscuits.

Food producers: in the pressure cooker

The severe drought, a weak rand, food commodity price inflation and other competitive forces are expected to squeeze the margins of most local food producers. In this article we explore the major challenges faced by food groups, such as rising inputs costs and currency weakness, and efforts made by these companies to diversify their revenues (including the role of private label brands).

Rising input cost challenges

The current EL Nino-induced drought is said to be South Africa's worst since 1992. It has resulted in lower maize crop yields, which have led to the country having to import an estimated 980 000 tonnes of maize in 2015, and most likely a further three to four million tonnes during 2016. Consequently, South Africa is now a net importer of all three staple starch foods (maize, wheat and rice). This has coincided with the weakening of the rand, which depreciated by 35% in 2015.

In 2013, the wheat reference price was raised from US$215 per tonne to US$294 per tonne. After the global wheat price fell below the US$294 per tonne reference point in 2014, a wheat import tariff was triggered, which is currently at R1 224 per tonne. The wheat import tariff surged from R157 to R1 224 per tonne over the past 13 months.

The price of white maize has increased by 83% year on year to March 2016, while the wheat price has risen by 20% year on year. As a result, food producers will need to implement significant price increases during 2016 to maintain gross profit margins and the consumer will inevitably bear the brunt of these hikes.

In the table on the opposite page, we show the relative significance of agricultural commodity input cost rises within each company. The higher number of product logos indicate higher commodity cost contributions. Wheat is by far the most significant contributor to cost for the bread producers and for AVI, which produces biscuits as one of its key product categories. Pioneer and Premier - two of the largest maize millers - face relatively higher exposure to maize due to a higher proportion of maize meal in their product portfolio.

Currency weakness impacts

Although food producers will experience the negative effects of a weakening rand on input costs (see graph over the page), their revenues are expected to benefit somewhat from hard currency denominated international sales. For example, Rhodes Food will benefit from exports of canned fruit, fruit juice purees and concentrates, while Tiger Brands should

Main product categories of South African food producers

	Tiger Brands	Pioneer Foods	Premier Foods	AVI	Foodcorp	Rhodes Food Group
Bread	Albany	Sasko	Blue Ribbon		Sunbake	
Wheat flour	Golden Cloud	Sasko	Snowflake		Supreme	
Maize meal	Ace	White Star	Iwisa, Super Sun, Impala		Tafelberg, Safari	
Rice	Tastic	Spekko				
Groceries	Black Cat peanut butter, All Gold, Cross & Blackwell mayonnaise, Koo	Ceres juice, Liquifruit juice, Safari dried fruit		I&J fish, Willards snacks, Five Roses tea, Freshpak tea	Yum Yum peanut butter, Nola mayonnaise	Rhodes canned fruit, vegetables and jam, Woolworths ready meals
Breakfast cereals	Jungle Oats, Simply Cereal	Pronutro, Weet-Bix, Nature's Source				
Biscuits		Bokomo rusks		Bakers biscuits	Ouma rusks	

Source: company data

benefit from canned fruit exports. AVI exports hake, kingklip, snoek, abalone and other whole fish to Europe and China, and Premier sells Lil-lets (women's hygiene products) in the UK. As the rand recovers from its current extremely weak levels, food producers should experience input cost pressure relief and gradually improved margins.

Rhodes Food should benefit most from the weak rand due to its high proportion of hard currency exports, while Pioneer Foods will probably be most negatively affected as it has high relative exposures to foreign currencies and commodity food categories (eg maize meal).

Food producers' gross profit margins are expected to come under pressure during 2016 as food input costs rise significantly. In addition, as producers seek to recover higher costs through high price increases, volumes sold are likely to stagnate or decline in the short term. Earnings growth during 2016 is therefore expected to be muted.

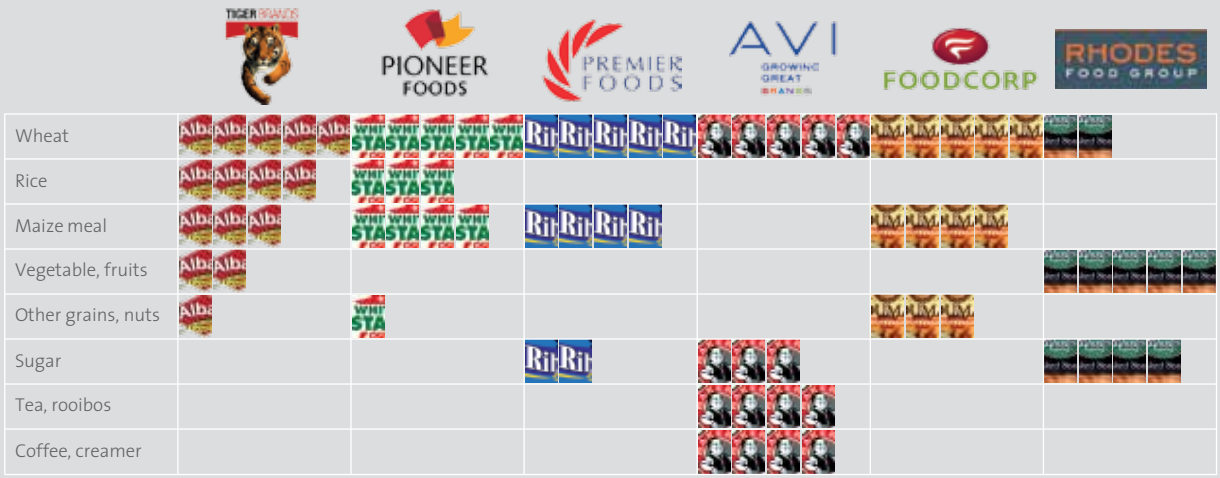
Competitive moves

Certain previously neglected food producers, particularly in the milling and baking industry, have appointed CEOs who are revitalising companies by reducing costs, improving product quality and strengthening brands. They are also broadening their distribution footprints in order to increase profit margins and grow profits. Major beneficiaries of these moves have been Pioneer and Premier, while Foodcorp is now turning its attention to similar initiatives. Under the leadership of Nick Dennis, Tiger Brands rose to become a brand powerhouse during the 2000s. As a result of this, and superior baking technology and product quality, Tiger Brands made large bread profits. Competitors are now gradually closing the gaps in product quality, brand equity and pricing.

African growth

Local food producers have entered other African countries outside of South Africa in different ways, including investing in local operations or exporting from their South African manufacturing hubs. In some cases, they have carved out attractive niches in product categories with little competition - selling to fragmented small retailers and earning higher margins. In other instances, companies have been overzealous and made value-destroying acquisitions or partnered with unscrupulous distributors. It is clear that, while good returns can be made on the continent, the risks are high.

Producers' raw material input exposures



Source: Kagiso Asset Management research and company data

Food producers: in the pressure cooker

Diversifying into private labels

In South Africa, 65% of food is sold through formal food retail channels such as Shoprite, Pick n Pay, Spar and Woolworths. Over the past five years, retailers have increased investment in their house or private label brands. Some food producers, such as Rhodes Food Group, have positioned themselves to produce and package private label brands, including Woolworths ready meals and milk products, and Shoprite canned fruits.

Tiger Brands currently generates less than 4% of annual domestic food revenue from private label manufacturing (mostly value added meat products to Woolworths), while Pioneer Foods generates just under 14% (carbonated soft drinks to Pick n Pay and pasta to Spar). RCL Foods (which owns Foodcorp), currently supplies Woolworths with about R1 billion worth of packaged foods annually.

Private label brands are a significant threat to branded food producers and have essentially increased the number of major food producers by four (each of the major retailers). With these additional brands available, competition for consumer wallets will inevitably become fiercer, which is a positive development for consumers as private label brands are usually a cheaper option and are occasionally of similar or even higher quality than conventional brands. The recent trend among retailers has been a gradual improvement in the quality of their private label brands. Pick n Pay sells both low-priced and some higher-priced store brands. On the other hand, Woolworths has a 95% private label penetration and competes with a high price and high quality strategy.

Private label reach amongst South Africa's food and staples retailers is about 15%. The average in developed countries is 22%, with Switzerland's penetration rate at 45%. Pick n Pay intends to double its private label penetration rate from 15% to 30% in the medium term.

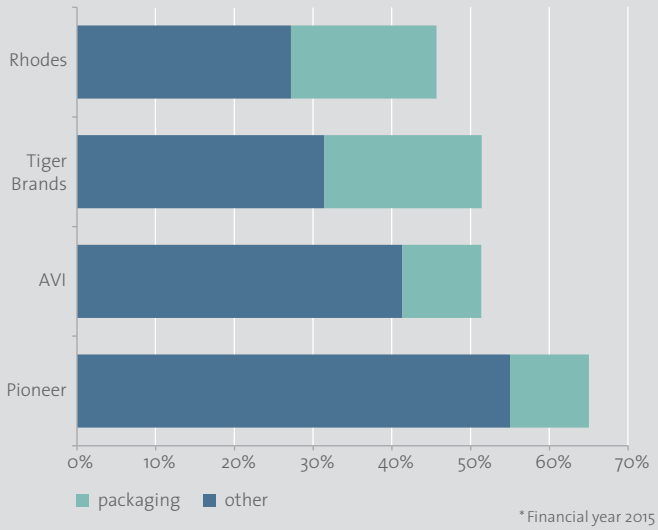
Investment prospects

Looking ahead, Tiger Brands will be hard-pressed to maintain its high bakery margins and faces the challenge of turning around its Africa ex-SA operations, following its exit from Nigerian wheat milling and setbacks in Kenya. Pioneer Foods, while re-energised and determined to continue its margin expansion drive and growth on the rest of the continent, trades in the region of its fair value.

Rhodes Food, the smallest and newest member of the listed food producers, has perhaps been the most prolific and innovative in new product development relative to its size. The company has significant scope to grow earnings at an above average rate. The outlook for Foodcorp and Premier is positive if they succeed in improving their milling and baking margins, while AVI, which has outstanding management and strong brands, has the potential to grow its earnings at a rate above that of the overall economy.

On balance, we believe that challenging times lie ahead for food producers and valuations are not compelling enough to warrant a meaningful exposure. UP

Percentage of costs exposed to foreign currencies*



* Financial year 2015

Source: company data and Renaissance Capital estimates

China's commodity conundrum

Rubin Renecke - Investment Analyst

> After many years of rapid economic development, China is on the cusp of a transition from an investment-led economy to a consumer-driven one. In this article, we focus on China's impact on global commodity demand and assess the growth potential for its commodity demand after a long period of very rapid growth.[1]

[1] On a recent business trip to China, I had the opportunity to assess the state of the Chinese economy and the outlook for infrastructure investment.

China's commodity conundrum

China's commodity demand over the last 15 years

In order to understand China's fast growth and strong demand for commodities over the last 15 years, some context is needed. Prior to 1979, China maintained a closed, centrally planned economy aligned to Soviet-style economic policies. In 1978, the Chinese government decided to reform the economy, adopt free market principles and to open up trade with the West. The result of these economic reforms has been a phenomenal average annual real GDP growth rate of almost 10% from 1979 to 2014.

Of particular interest is the period from the turn of the century. In 2001, the contribution from investment in infrastructure to GDP steeply accelerated, increasing from about 24% the previous year to about 53%. This level of investment activity has been maintained since then, comprising of road networks, power stations, railway lines, new ports and airports, housing, offices and shopping malls. By comparison, South Africa's investment as a percentage of GDP has averaged about 19% over the same period.

China's infrastructure investment required large amounts of basic materials such as steel, copper, zinc and aluminium. In order to achieve this rapid growth, the country focused on building its own capacity to produce basic infrastructure items. The scale of China's investment programme meant that the government had to import the ingredients required to produce the basic infrastructure items. Almost overnight, there was very strong demand for commodities such as iron ore, zinc ore and copper ore. Supply from global mining companies could not keep up with this heightened demand growth, resulting in exponential increases in commodity prices (see iron-ore chart below as an example).

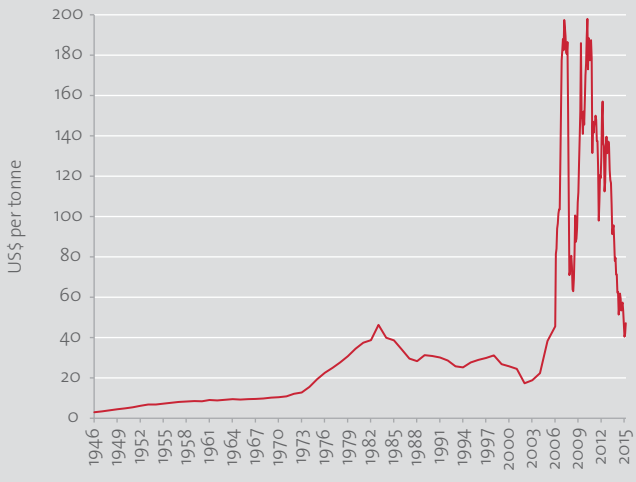
China's impact on commodity demand has been pronounced and it is currently by far the largest consumer and importer of commodities globally. Where China particularly leads can be seen in the right chart below: the top seven commodities and metals it dominates are used primarily in building infrastructure.

Overcapacity and the impact on commodity demand

Three issues seem to be particularly influencing commodity demand at present.

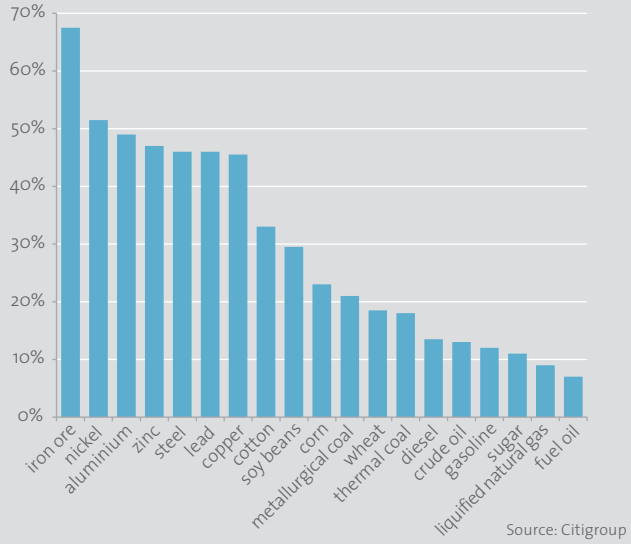
Firstly, there is large overcapacity in many areas of the Chinese economy. For example, the current demand for electricity is 600MW but it has installed capacity of 1 100MW. Current steel production is 800 million tonnes, but installed capacity is 1 200 million tonnes.

Iron ore* price history



*62% iron ore US$/tonne cost and freight China
Source: I-Net, Bloomberg and Kagiso Asset Management research

China's share of global commodity consumption



Source: Citigroup

Secondly, pollution is a serious problem, particularly in the major cities. This is a consequence of rapid industrialisation and is becoming a crippling factor for the future growth and public health of the country. Large industrial plants, such as steel mills and coal fired power stations in particular, are the major cause of the pollution problem. In order to reduce pollution, these plants would need to be shut down.

Thirdly, China's corruption crackdown is large and widespread and is having a material impact on continued spend on non-essential projects. Many of these projects, which were commissioned by corrupt government officials, artificially inflated the demand for commodities and have added to the overcapacity problem.

The negative impact of these three issues on commodity demand is profound. While the second and third points are perhaps of a shorter-term nature, we believe current massive overcapacity in many sectors of the economy will dampen commodity demand going forward.

The chart below shows the total amount of office space in some of China's major cities and the percentage of those offices that are vacant.

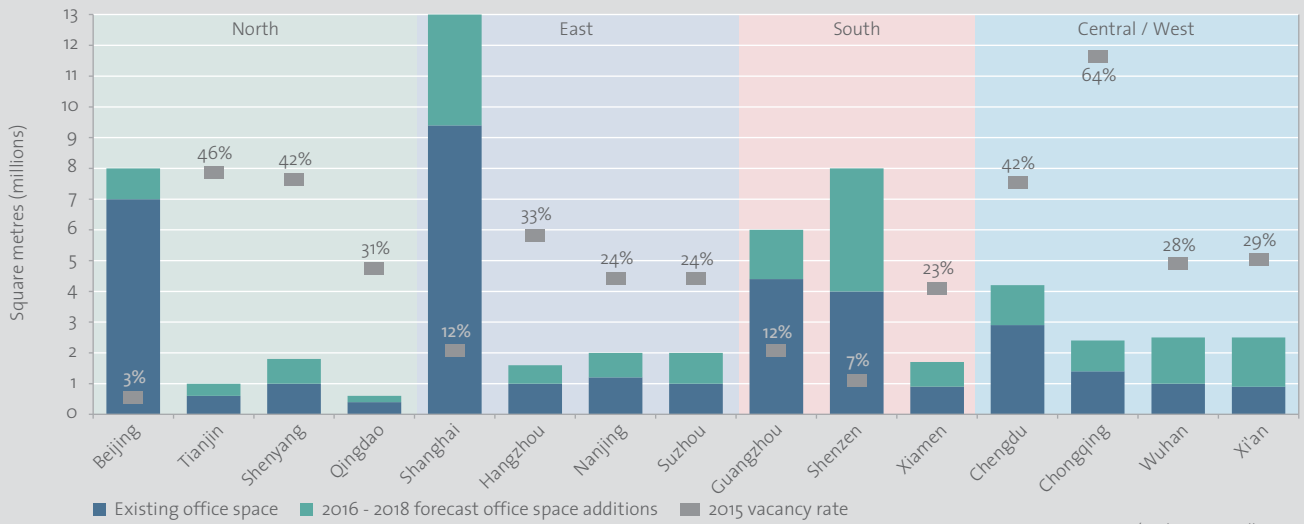
China's huge investment programme over the last few years has created a large base of new infrastructure that exceeds its current needs. Therefore, continued growth in new infrastructure is no longer a big requirement. Mining companies have increased supply quickly over the last seven years in anticipation of continued growth in infrastructure investment but have failed to anticipate the slowdown. For example, global iron ore production destined for export markets has increased by 56% over the last seven years and is forecast to continue growing over the next three years.

Complicating the global supply and demand equation is domestic Chinese production of commodities and metals, which are not governed by the need to meet Western metrics of return on investment. Companies appear to be more concerned with maintaining production and jobs than about incurring financial losses.

Transitioning from an investment-led economy

China will continue to spend on infrastructure investment. It is likely that the rate of spending growth will slow and possibly turn negative. Therefore, the absolute level of ongoing infrastructure investment could well be flat to lower over time.

China's office space and corresponding vacancies



Source: JLL (Real Estate Intelligence Service)

China's commodity conundrum

As the Chinese economy transitions from an investment-driven to a consumer-driven one, the change in demand for commodities will be substantial. We expect commodities that are more geared to consumer products, such as electronics, appliances, cars and jewellery, to attract higher demand.

Outlook

China has been a major force in the global economy over the last decade, contributing materially to global growth and trade. This should continue but the country will trade in different products. It is inevitable that economic growth will moderate from very high levels, given China's rapid ascension to the world's second largest economy.

We don't think that China will experience a recession but rather a lower level of growth fuelled by consumerism, new technological developments and new areas of trade. We are wary of mining stocks that do not have inherent competitive advantages, such as low operating costs, and are instead focusing our portfolios on commodities stocks such as diamonds, copper, platinum and nickel that are linked to consumer products. UP

Kagiso Asset Management Funds

Performance to 31 March 2016	1 year	3 years[1]	5 years[1]	10 years[1]	Since launch[1]	Launch	TER[2]	TC[3]
Unit trust funds[4]								
Equity Alpha Fund	0.4%	9.0%	10.2%	12.4%	18.7%	Apr-04	1.5%	0.3%
South African Equity General funds mean	0.5%	10.6%	11.7%	10.5%	15.5%			
Outperformance	-0.1%	-1.6%	-1.5%	1.9%	3.2%			
Balanced Fund	1.5%	8.2%	-	-	9.7%	May-11	1.6%	0.3%
South African Multi Asset High Equity funds mean	4.6%	10.6%			11.3%			
Outperformance	-3.1%	-2.4%			-1.6%			
Protector Fund	0.0%	5.3%	5.8%	7.7%	10.1%	Dec-02	2.2%	0.4%
CPI + 5%[5]	10.4%	10.1%	10.4%	11.2%	10.7%			
Outperformance	-10.4%	-4.8%	-4.6%	-3.5%	-0.6%			
Stable Fund	3.2%	7.2%	-	-	8.1%	May-11	1.6%	0.5%
Return on large deposits*	5.5%	5.4%			5.3%			
Outperformance	-2.3%	1.8%			2.8%			
Institutional funds[6]								
Managed Equity Fund	-0.3%	8.5%	10.4%	-	12.8%	Sep-06		
FTSE/JSE SWIX All Share Index	2.6%	14.6%	15.4%		14.0%			
Outperformance	-2.9%	-6.1%	-5.0%		-1.2%			
Core Equity Fund	-0.6%	10.5%	12.4%	13.1%	17.4%	Nov-04		
FTSE/JSE SWIX All Share Index	2.6%	14.6%	15.4%	13.8%	18.0%			
Outperformance	-3.2%	-4.1%	-3.0%	-0.7%	-0.6%			
Domestic Balanced Fund[7]	-9.7%	3.4%	6.6%	-	7.7%	May-07		
Peer median[8]	-1.7%	9.2%	11.3%		10.0%			
Outperformance	-8.0%	-5.8%	-4.7%		-2.3%			
Global Balanced Fund[9]	-3.2%	-	-	-	8.4%	Jul-13		
Peer median[10]	2.4%				12.3%			
Outperformance	-5.6%				-3.9%			
Sharia unit trust funds[4]								
Islamic Equity Fund	1.7%	7.3%	7.7%	-	12.2%	Jul-09	1.2%	0.3%
South African Equity General funds mean	0.5%	10.6%	11.7%		14.6%			
Outperformance	1.2%	-3.3%	-4.0%		-2.4%			
Islamic Balanced Fund	3.3%	7.6%	-	-	7.0%	May-11	1.5%	0.2%
South African Multi Asset High Equity funds mean	4.6%	10.6%			11.3%			
Outperformance	-1.3%	-3.0%			-4.3%			

Highest and lowest monthly fund performance	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest
Equity Alpha Fund	*8.2%*	*-4.7%*	*8.2%*	*-4.7%*	*8.2%*	*-4.7%*	*10.9%*	*-9.0%*	*11.9%*	*-9.0%*
Balanced Fund	*5.5%*	*-4.2%*	*6.2%*	*-4.2%*	-	-	-	-	*6.2%*	*-4.2%*
Protector Fund	*3.4%*	*-4.2%*	*3.4%*	*-4.2%*	*4.8%*	*-4.2%*	*7.9%*	*-5.3%*	*9.5%*	*-5.3%*
Stable Fund	*3.8%*	*-3.5%*	*3.8%*	*-3.5%*	-	-	-	-	*4.0%*	*-3.5%*
Islamic Equity Fund	*7.3%*	*-4.6%*	*8.1%*	*-4.9%*	*8.1%*	*-4.9%*	-	-	*8.1%*	*-0.0%*
Islamic Balanced Fund	*4.6%*	*-3.0%*	*8.2%*	*-5.4%*	-	-	-	-	*8.2%*	*-5.4%*

[1] Annualised (ie the average annual return over the given time period); [2] TER (total expense ratio) = % of average NAV of portfolio incurred as charges, levies and fees in the management of the portfolio for the rolling 12-month period to 31 December 2015; [3] Transaction Costs (TC) are a neccessary cost in administering the Financial Product and impacts Financial Product returns. It should not be considered in isolation as returns may be impacted by many other factors over time including market returns, the type of Financial Product, the investment decisions of the investment manager and the TER. [4] Source: Morningstar; net of all costs incurred within the fund and measured using NAV prices with income distributions reinvested; [5] CPI for March is an estimate; [6] Source: Kagiso Asset Management; gross of management fees; [7] Domestic Balanced Fund and benchmark returns to 29 February 2016; [8] Median return of Alexander Forbes SA Manager Watch: BIV Survey; [9] Global Balanced Fund and benchmark returns to 29 February 2016; [10] Median return of Alexander Forbes Global Large Manager Watch. *Return on deposits of R5 million plus 2% (on an after-tax basis at an assumed 25% tax rate).

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