Global Mining Strategy
Is infrastructure the answer?

Equities

Global
Basic Materials

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Can a global fiscal policy response relieve China of its heavy burden?
For the last 15 years, China has been the single most dominant driver of commodity demand. While we don't really expect this to change in the short to medium term, there is likely to be some contraction over the longer term. Subsequently, we have noted with interest the significant number of governments around the world that are now proposing to lift infrastructure investment. In our view, a step-up in global infrastructure funding through fiscal policy could see incremental demand for commodities support prices at higher levels. A report by the World Economic Forum suggests there is an annual 'gap' of around US$1tn between current global infrastructure expenditure and that which is required to drive growth.

Was Q1 an inflection point for miners and Q3 an inflection point for investors?
We have previously stated that 1Q16 may have been the trough for miners in this cycle as well as the bottom of the deflationary cost cycle. With Chinese demand surpassing our original expectations for 2016 we now pose the question could it do the same again in 2017? Discussions with investors would suggest that some underweight positions have been closed out, which confirms our short interest data. However, based on our numbers, short positioning is still 2x that of May-15. Should Chinese demand remain stronger than forecast and incremental infrastructure investment come from non-Chinese fiscal policy response, positive investor interest could continue to build.

Maintaining market weight sector call – still prefer base over bulks
We maintain our previous market weight call with a preference for the industrial metals over the bulk commodities. Our preference for the industrial metals stems from the fact that rebalancing of these markets is either under way or expected within the next 12 months. While we believe iron ore could remain range bound, free cash flow from the iron ore miners is likely to remain impressive. Chinese government intervention in the coal market has possibly distorted the price formation process, in our view. We retain our constructive view on gold and see the recent sell-off as an opportunity to reload.

Most and least preferred commodities and stocks – Model Portfolio Top Picks
The table below highlights our most and least preferred commodities and equities. This is being released along with the UBS Global I/O: Miner's Price Review, Cycling Higher.

Figure 1: Most & Least preferred – Commodities and Equities

Most preferred			Least preferred		
Commodities	Reason	Equity	Commodities	Reason	Equity
Nickel	Strong Chinese demand	Norilsk Nickel	Met coal	Current spot unsustainably high	Vale
Copper	Surplus coming to an end	Southern Copper	Aluminium	China exporting metal	Norsk Hydro
Zinc	Rebalancing under way	Glencore	Thermal coal	Chinese government intervention	Whitehaven

Source: UBS

UBS Research THESIS MAP

MOST PREFERRED

Commodities – Nickel, Copper & Zinc

Equities – Norilsk Nickel, Southern Copper and Glencore

LEAST PREFERRED

Commodities – Met Coal, Aluminum & Thermal Coal

Equities – Vale, Norsk Hydro and Whitehaven

PIVOTAL QUESTIONS

Q: Can a global fiscal response lift incremental demand for commodities?

The division between monetary policy and fiscal policy has become less clear over the last few years as QE has been enacted. However, fiscal policy reaction could provide a significant transmission mechanism for GDP growth. The QE led decline in sovereign bond yields has reduced government interest expenditure and opened up capacity for increased non-interest spending. For the metals and mining sector, we believe this could lead to increased commodity intensive infrastructure programs.

Q: How should investors be positioned?

Market weight but favoring industrial metals over bulks. We maintain our previous market weight call with a preference for the industrial metals over the bulk commodities. Our call is predicated on a view that the combination of lower global capital flows, slowing Chinese growth and the potential for a lift in domestic consumption in China will lead to falling steel production/demand and increased demand for consumer goods. However, we see the key risk to our call from Chinese housing starts and infrastructure build-out potentially being stronger than expected in 2017.

WHAT'S PRICED IN?

A better-than-expected Chinese demand picture Prices have recovered from the 1H16 lows on the back of stronger-than-expected Chinese demand. Additionally, some investors are becoming more sanguine to the potential outlook for 2017. Minor cost inflation has also started to reappear through higher oil prices and increased exploration activity.

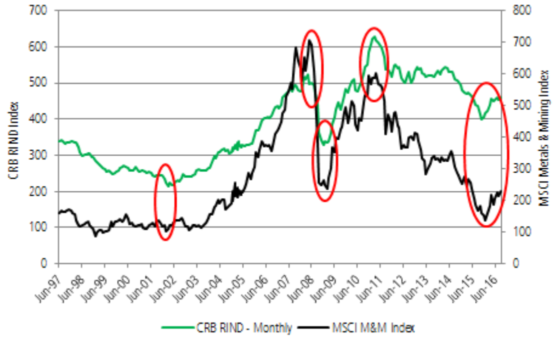
UBS VIEW

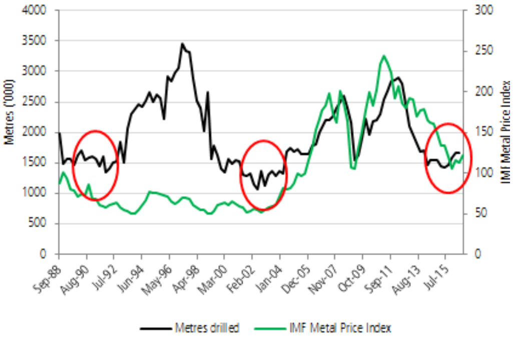
More of the same, but with upside risks: We believe that Q1 was an inflection point in terms of commodity prices and activity for the miners. We also continue to believe China will underpin positive but unspectacular demand growth for mined commodities. For further upside in prices we believe ongoing supply discipline is required, or cost reflation, which is emerging as a theme. Additionally, should large infrastructure programs be put in place, as proposed by many global governments, incremental demand growth for commodities could see prices move sustainably higher in certain metals.

EVIDENCE

Global demand growth has slowed (but has not fallen): Our evidence is based on the upturn of CRB Raw Index in Dec-15 and the potential inflection point for commodity prices and activity in 1Q16. Global PMI's appear to have recovered from the lows earlier this year. Should this lead to a genuine increase in activity then the CRB Raw Index may be one of the first indicators to provide us with confidence.

Q1 2016 an inflection point for demand (CRB RIND), pricing and exploration activity





Source: AB'S, Reuters and IMF

Global Mining Strategy

Summary

Our strategic view on the metals and mining sector remains unchanged in that we see lower FDI and global capital flows going forward, combined with the potential for a lift in domestic consumption in China. On the face of it, this would suggest being underweight Fe ore & Met Coal and overweight Zn, Ni, Cu and gold.

We maintain our market weight call for sector…

Essentially, 18 months of easing property restrictions, lower interest rates & bank required reserve ratios and the significant credit impulse YTD have seen better real demand in China through 1H16. Yet while real activity is lifting, feedback from our recent China trip indicated an expectation for sequential growth to slow through 2H16, as house purchase restrictions return in tier 1 & 2 cities, pressuring current very strong y/y growth lower. From here we believe China will underpin positive but unspectacular commodity demand growth.

Chinese data continues to track ahead of original expectations. Potential for upside risks into 2017…

Market weight call…Investors still underweight

Recent meetings with investors would suggest that, while clients are a little more sanguine towards the potential outlook for 2017, the majority of investors are still underweight the sector. While short positioning is not currently as extreme as it was back in January, it is still around 2.0x the level it was in May 2015.

Globally, investors remain underweight the Metal & Mining sector, less than before, but still underweight…

Some S/T trading opportunities, but L/T support could come from global fiscal response

We have previously written that commodity prices are very sensitive to changes in macro-economic conditions, sentiment and S/D shocks; yet absolute volume demand for metals is largely inelastic. In our view, sentiment was the key driver in 1H16 as Chinese growth slowed and a number of commodities reached surpluses on the back of new projects commissioning. We believe there may be some short-term trading opportunities in the sector over the remainder of 2016 with political events driving gold and seasonality in China potentially influencing iron ore, coal and copper demand.

Short-term trading opportunities in gold, iron ore and coal…

A common message from global leaders over the last six months has been about lifting expenditure on infrastructure through fiscal policy. While we don't expect all the proposed programs to be enacted, we believe there is an increasing probability that incremental demand for commodities could trend higher than we currently expect.

Medium-term demand could receive boost from global fiscal response…

Ultimately, we believe that yesterday's luxuries become today's necessities. As such, the swelling middle class – which, according to an IMF report, is estimated to double from 2 billion in 2012 to 4.9 billion between 2012 and 2030 – is likely to consume most commodities at an ever increasing rate (in absolute terms) and technological breakthroughs could see intensity of use for some industrial commodities continue to rise. On a longer-term view, we believe the Fourth Industrial Revolution will be a key driver of additional technological change.

Long term, it's all about population growth and a swelling middle class…

Key picks

With FDI and global capital flows lower and potential for a lift in domestic consumption in China, we believe supply/demand is likely to rebalance quicker for industrial metals than the bulks. Subsequently our Most / Least preferred commodities and equities are positioned accordingly.

Key picks – Norilsk Nickel, Glencore and Southern Copper

Figure 2: Most / Least preferred – Commodities & Equities

Most preferred			Least preferred		
Commodities	Reason	Equity	Commodities	Reason	Equity
Nickel	Strong Chinese demand	Norilsk Nickel	Met coal	Current spot unsustainably high	Vale
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Source: UBS

return ↑

Q: Can a global fiscal response lift incremental demand for commodities?

UBS VIEW

The division between monetary policy and fiscal policy has become less clear over the last few years as QE has been enacted. However, fiscal policy reaction could provide a significant transmission mechanism for GDP growth. The QE-led decline in sovereign bond yields has reduced government interest expenditure and opened up capacity for increased non-interest spending. For the metals and mining sector, we believe this will lead to increased commodity-intensive infrastructure programs.

EVIDENCE

Global commodity demand is currently driven by Chinese economic activity, with the nation importing c.80% of seaborne iron ore and c.50% of globally mined copper. Significant infrastructure programs are now being proposed by a number of other nations, which is likely to offset some potential contraction from China should it occur, or even provide incremental demand – in our view, this would likely generate a positive reaction to commodity prices.

Monetary Policy versus Fiscal Policy

The division between monetary policy and fiscal policy has become less clear over the last few years as QE has been enacted. However, in how it relates to the metals and mining sector, one of the more important aspects continues to be the potential transmission mechanism through the fiscal channel. As QE led to a decline in sovereign bond yields, it reduced the governments' interest expenditure and opened up capacity for increased non-interest spending.

From a metals and mining perspective, the interest lies in the potential infrastructure and housing component of the 'non-interest' spending. According to the World Economic Forum, global infrastructure investment runs at around $2.7tn per annum; however, this results in an annual 'gap' of around US$1tn between current global infrastructure expenditure and that which is required to drive growth. Over the course of 2016 there have been increasing occurrences of politicians talking about lifting expenditure on infrastructure. We are cognisant that, for the metals and mining sector to see a sustainable uplift in demand and pricing, then the infrastructure projects being proposed need to be incremental to existing expenditure rates.

Clearly, this scenario of increasing infrastructure expenditure may not eventuate if the interest rate environment normalises and government interest payments rise significantly.

The following table lists a selection of proposed infrastructure programs or projects that we have compiled over recent weeks (Figure 3), excluding any Chinese urbanisation – although some commentary on the next round of proposed Chinese PPP infrastructure projects was recently made by the UBS China Strategy team, which suggested more than 500 projects involving Rmb1trn of total investment could be unveiled (Third list of PPP demonstration projects to be announced soon).

Figure 3: Global Infrastructure proposals – the Metals & Mining sector 'wish list'

Country	Proposal	Value (US$bn)	Term (Yrs)	Per annum (US$bn)
US	The 5-Year Infrastructure Bill passed by Congress in 2015	305	5	55
	Both candidates propose repair/expand roads & bridges network and upgrade airports	275 (D) – 500 (R)	5	55 – 100
Europe	European Infrastructure Fund (Juncker bonds) – aiming to lift expenditure to pre-crisis levels	335	3	112
UK	National Infrastructure Delivery Plan – to 2020/21	125	5	25
	National Infrastructure Delivery Pipeline – to 2020/21 (includes above plan)	540	5	108
Asia				
Indonesia	Approx. 30 projects have been proposed between 2016 to 2019 (toll roads, rail, power plants and ports)	400	3	133
Japan	Government infrastructure proposal (includes expediting mag-lev network and ports/airports expansions)	61	4	15
Thailand	Government plans to build 20 infrastructure projects by 2022 including rail modernisation program	50	6	8
Vietnam	Government said it wants to improve poor transport network and build 4 new airports and 2 new ports	48	4	12
India	Amongst other things, significant road programs have been sanctioned (3,600km in 2015/2016)	31	1	31
Philippines	The Budget Secretary said "the economy is deficient in all types of infrastructure – highways and bridges, ports and airports". Plans to lift spending to 7% of economy	145	6	24
Singapore	Signed an MOU with Malaysia committing the two states to build a high speed rail link (309km)	11	7	2
Africa				
Nigeria	National Integrated Infrastructure Master Plan (NIIMP) looks for $3.1tr over next 30-yrs.	3100	30	103
Kenya	Kenya Vision 2030 – plan to deliver 'newly industrialised, middle income country' – Konza Techno City, Mombasa to Kigali rail link, new airport	50	14	4
DRC	African Development Bank suggests $5.3bn a year over the next decade required to rebuild. Grand Inga hydro scheme also estimated at $80bn	130	10	13
Cote d'Ivoire	Government lifted infrastructure spending from 2% of GDP to 6%	25	4	6
Egypt	Proposed new capital and development of Madiaty city	55	7	8
South Africa	Modderfontein, a new city in Gauteng	8	2	4
Ethiopia	Hydro dam on Blue Nile, rail link from Addis Ababa to Red Sea ($4bn - almost complete)	9	3	3
General	North/South Corridor road network to link 8 countries from South Africa to Zambia and the DRC	1	tbc	
Implied total		**5775**		**600 - 750**

Source: Government websites

We will say at the outset that we do not expect all of these projects to be either approved or funded – especially given examples like Nigeria where the British government has suggested there will a $70bn funding deficit per annum; and, Indonesia where the government has stated it will only look to provide 25-30% of the $400bn funding requirement and the remainder to be raised via a PPP

structure. However, the risk of lower (or negative) GDP growth rates is a clear incentive for global governments to push more infrastructure through.

While not a complete global picture, it provides a good indication of the quantum of potential commodity demand from infrastructure over the next 5-10 years. There are some basic rules of thumb we use for commodity intensity within the construction sector (Figure 4).

Figure 4: Commodity intensity of various items

Product	Commodity intensity
1m³ reinforced concrete	395kg cement and 130-175kg steel
1km high-speed rail	c. 200t steel and 10t Cu for catenary - assuming dual track (excluding bridges)
Electric prime mover	3 - 4t Cu
Car (combustion engine)	0.7t steel, 220lb Al, 55lb Cu
Hybrid	70lb Cu
Electric	150lb Cu
Air conditioner	c.4lb Cu

Source: UBS-e

With China currently being such a dominant end user and demand driver of commodities we believe this table of projects would provide some level of support to commodity prices should Chinese demand begin to slowly contract.

We also believe that India could provide strong underlying demand growth for commodities over time – although the country's bureaucracy is likely to see this occur at a much slower rate than that experienced by China.

A significant number of the proposals in the table will require private-public partnership (PPP) type structures to fund. Subsequently, governments will have to structure partnerships in a way that sufficiently rewards investors.

In specific regions, notably Sub-Saharan Africa and West Asia, China has been an important source of funding. In Sub-Saharan Africa, Chinese investment has lifted from $1.9bn in 2005 to $40bn in 2015. This compares to countries where the level of investment is still relatively minor. India, for example has so far only seen $18bn of Chinese investment since 2005.

Chinese global investment still rising

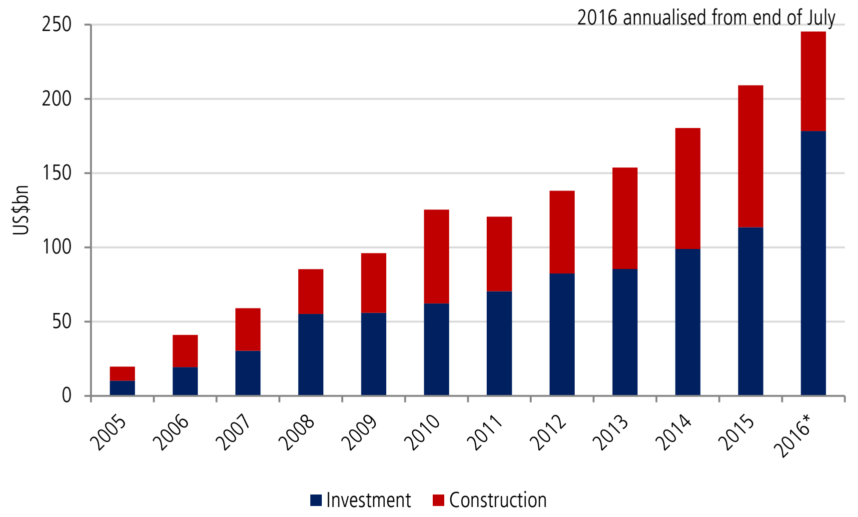
With China looking to transition to a domestic consumption-led economy, labour wage inflation reducing the country's cost competitiveness and the impact of the one child policy on working age demographics, we believe there is potential to see some manufacturing start to migrate out of China into other regions. The formation of the Asian Infrastructure Investment Bank and the One Belt One Road initiative are also likely to see Chinese activity in funding global infrastructure remain at elevated levels, in our view.

We view certain countries within the South East Asian and African regions as potential beneficiaries from this shift. Countries that have seen significant levels of investment include Egypt and Ethiopia in Africa and Pakistan and Vietnam in Asia. Subsequently, we keep an eye on where the Chinese funds are being allocated and for what purpose. The One Belt One Road initiative is based on using southwest China as a gateway to both the land and oceanic Silk Road routes, which traditionally included Myanmar, Laos and Vietnam.

Unsurprisingly, Chinese global investment continues to rise with the annualised data for 2016 indicating another record year.

The following data has been sourced from the American Enterprise Institute and The Heritage Foundation.

Figure 5: Chinese global investment

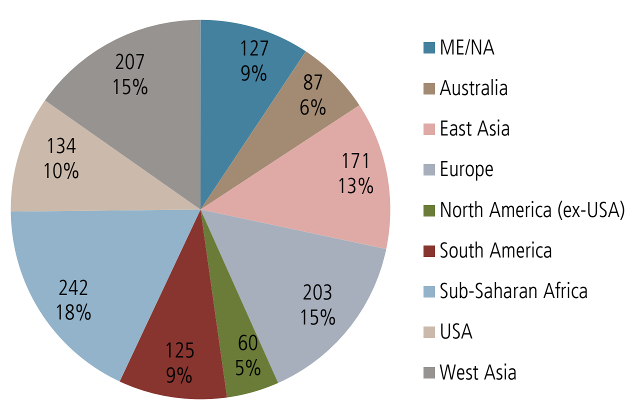


Source: The American Enterprise Institute and The Heritage Foundation

The investment portion includes partial or complete corporate acquisitions, which in most cases would not lead to any increase in commodity demand. Subsequently, we consider the construction contract portion more important. The annualised YTD estimate for 2016 implies a contraction this year. Should this become a trend lower, then a number of the project proposals will struggle to be funded in our view. Subsequently, the combined support of Chinese FDI is almost essential.

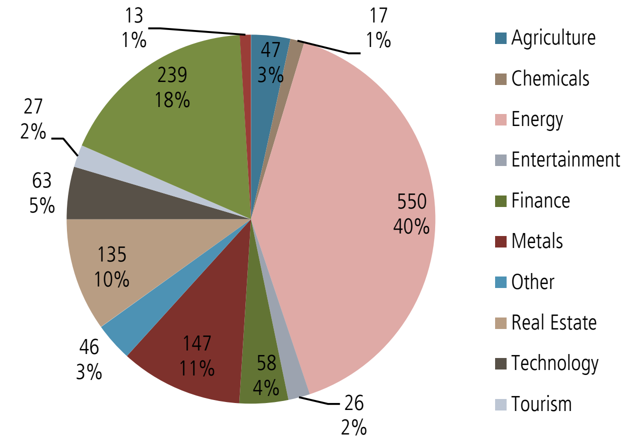
The following charts show the breakdown of Chinese global investment by both region (Figure 6) and by sector (Figure 7). While the locality of investment is relatively even between Sub-Saharan Africa, West Asia, Europe and East Asia, the sector expenditure is dominantly energy (40%) and metals (11%) focused.

Figure 6: Chinese investment by location (US$bn)



Source: The American Enterprise Institute and The Heritage Foundation

Figure 7: Chinese investment by sector (US$bn)

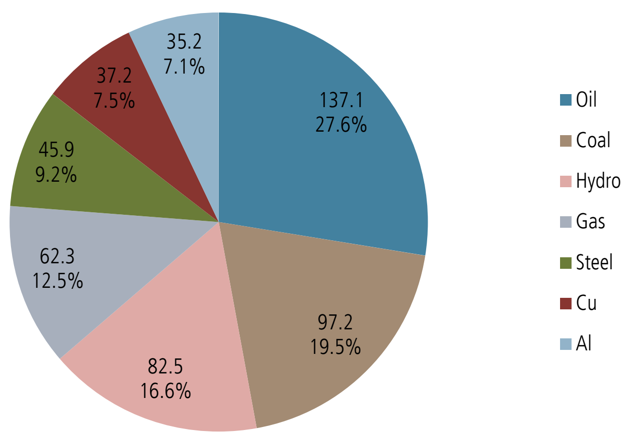


Source: The American Enterprise Institute and The Heritage Foundation

Of the categorised data, approximately $0.5tn dollars has been spent on energy and metals (including steel) projects overseas (Figure 8), with over 76% being

allocated to oil, coal, hydro and gas. In the grand scheme of these large numbers, the allocation to the global metals and mining sector (ex-steel) is relatively minor.

Figure 8: Chinese expenditure on global energy, metals and steel projects (US$bn)



Source: The American Enterprise Institute and The Heritage Foundation

return ↑

Q: How should investors be positioned ?

UBS VIEW

Our view remains unchanged in that we see lower FDI and global capital flows combined with the potential for a lift in domestic consumption in China. On the face of it, this would suggest being underweight Fe ore & Met Coal and overweight Zn, Ni and gold. Overall, this leads to a Market Weight call. Stronger-than-expected Chinese economic data has kept iron ore above our forecasts so far in 2016; however, we expect fading demand and new supply to cap prices from here. While a Market Weight call may be seen as a neutral view, we believe investors are still underweight the sector; subsequently, our call would see shorts trimmed or closed and traditional long-only investors increase current holdings. We continue to see gold as a portfolio hedge as global real interest rates remain at historically low levels.

EVIDENCE

The supply/demand outlook for iron ore and met coal looks challenged from here, as demonstrated by the UBS Commodity Team's modelling. With a house view that Chinese steel production has peaked and new iron ore supply still coming to market, communicating a positive medium-to-long term argument for the bulks remains difficult. However, inversely, modelling of base metals suggests that current surpluses are likely to balance relatively quickly leading to the requirement for additional supply and a return to incentive pricing.

Market weight recommendation

Our Market Weight recommendation remains unchanged. However, we believe it is important to highlight the arguments on both the upside and downside to our recommendation. Broadly speaking, the bears assume a hard landing scenario whereby current demand for commodities from Chinese is unsustainable with the rate of debt formation placing the Chinese financial system at risk. Previous concerns around new supply coming on stream appear to be abating in most discussions with clients. On the upside, it is possible to argue that China can continue along its current path with an increasing focus on reform over large financial stimulus packages, with incremental upside possibly coming from other regions of the globe as fiscal policy encourages infrastructure investment. In this scenario, we would add that the rebalance of commodity markets would likely happen significantly quicker than is currently forecast.

In terms of commodity preferences, with a potential lift in domestic consumption in China, we believe supply/demand is likely to rebalance quicker for industrial metals than the bulks. Subsequently our Most / Least preferred commodities and equities are skewed this way, with some nuances to allow for individual commodity-specific issues.

Subsequently, we reiterate our previous market weight call on the sector. With a large amount of uncertainty embedded in markets (risks stemming from UK vote

to leave the EU, European financial tail risk, US Election outcomes, etc.), we believe investors should not throw the rope after the bucket. It is for this reason that we retain our constructive view on gold and believe investors should also have some portfolio insurance via the gold sector.

After the recent sell-off in the gold sector, we become more constructive on the larger producers, which previously had outperformed the underlying gold price. However, we are cognisant that the gold sector is driven by sentiment more than the other metals and can change direction quickly. The appeal of the larger more liquid names is that exiting a long position is made easier – some of the smaller names become very illiquid in down markets.

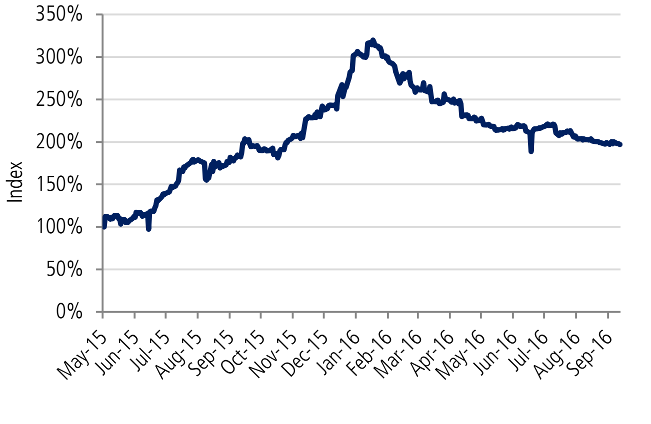
Current investor positioning

Investors still underweight the metals and mining sector…less so, but still underweight

Recent meetings with investors would suggest that broadly negative views on the sector have moderated somewhat. However, we believe the market overall still remains underweight. Tracking of our short interest indices suggests that, while short positioning in the sector has reduced, it is still effectively double the level seen back in May 2015.

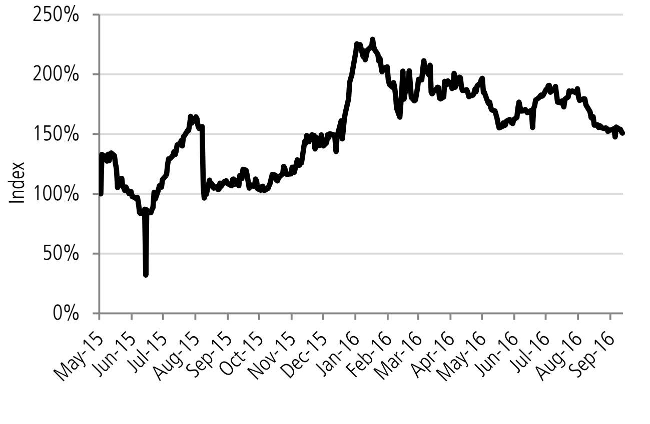
With the recent sell-off in gold and gold equities, we would expect the next update to show an increase in the short positioning in the gold index – for reference, there is a lag on reported short interest data of around 7-days.

Figure 9: Metals & Mining – Sector short positioning



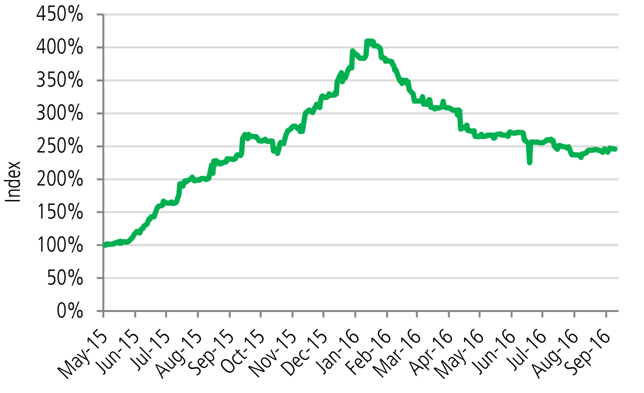
Source: Bloomberg, UBS-e

Figure 10: Diversified miners – short interest



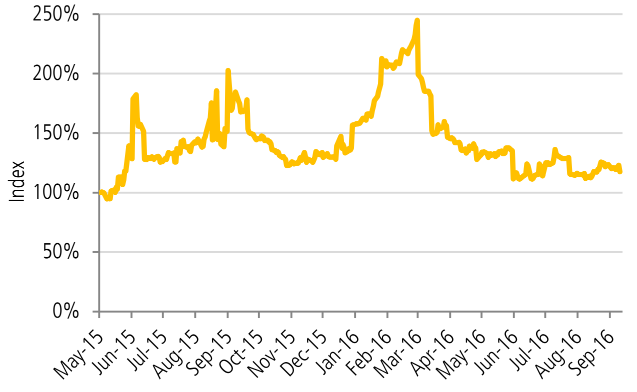
Source: Bloomberg, UBS-e

Figure 11: Base metals – short interest



Source: Bloomberg, UBS-e

Figure 12: Precious metals – short interest

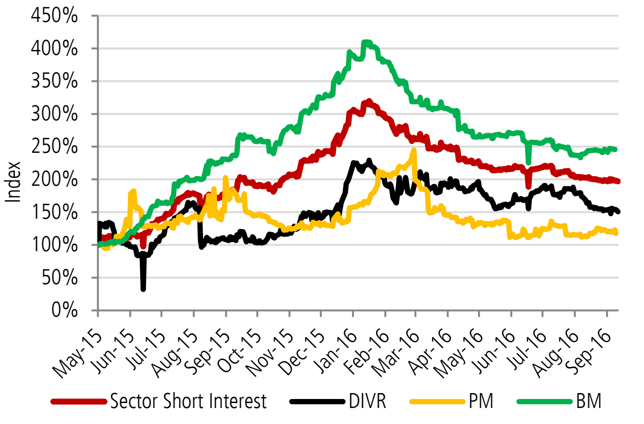


Source: Bloomberg, UBS-e

After the 4 July holiday weekend induced volume event, the overall changes in short positioning have been relatively minor. As mentioned above, we would expect the level of short positioning in the gold sector to have increased on the back of the recent sell-off.

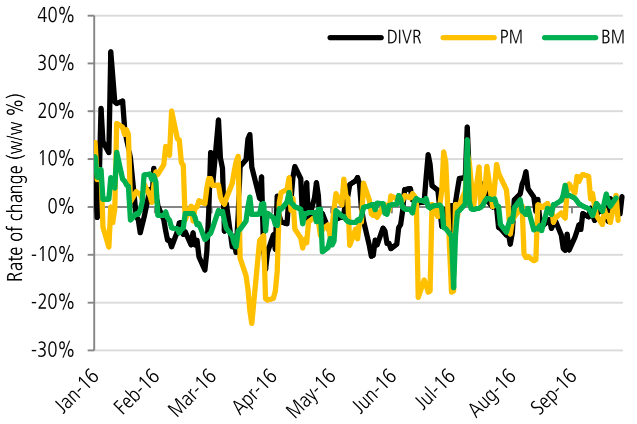
Additionally, we believe there may be some increased short positioning in the iron ore-exposed diversified miners as investors start to position portfolios for the traditional seasonal decline in construction activity in China – there may also be some investors looking to position for a correction to coal prices should the Chinese government increase the number of days' mining available to the domestic coal producers.

Figure 13: Short interest by sector



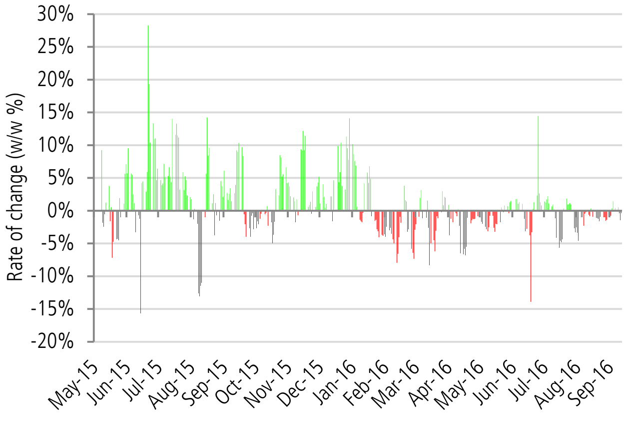
Source: Bloomberg, UBS-e

Figure 14: W/W rate of change by sector



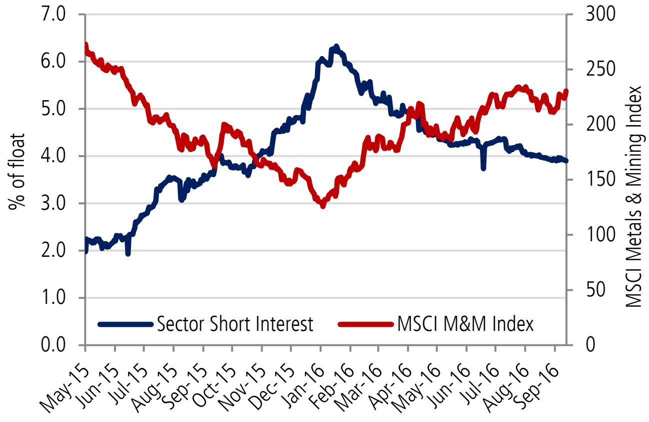
Source: Bloomberg, UBS-e

Figure 15: W/W rate of change - Combined



Source: Bloomberg, UBS-e

Figure 16: Short interest versus MSCI Metals & Mining

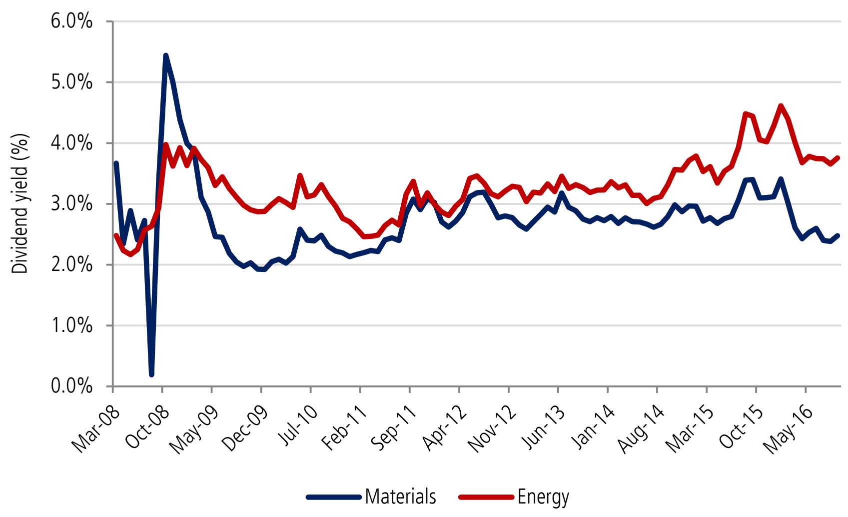


Source: Bloomberg, UBS-e

Dividend yields

The following chart compares the dividend yields of the materials and energy sectors within the MSCI AC World Index (Figure 17). The materials sector dividend yield of 2.48% is below the average of 2.74% across the timeframe of the graph and the energy sector is trading on a dividend yield of 3.76%, which is above the average of 3.27%.

Figure 17: Dividend yield – Materials versus Energy



Source: Factset, UBS-e

What indicators are we watching?

We're currently focusing on the following indicators:

- UBS China Construction Index
- China grid expenditure
- China steel prices
- CRB Raw Index
- US$ Index
- Oil Price; and,
- Investor positioning (as detailed above)

UBS China Construction Index

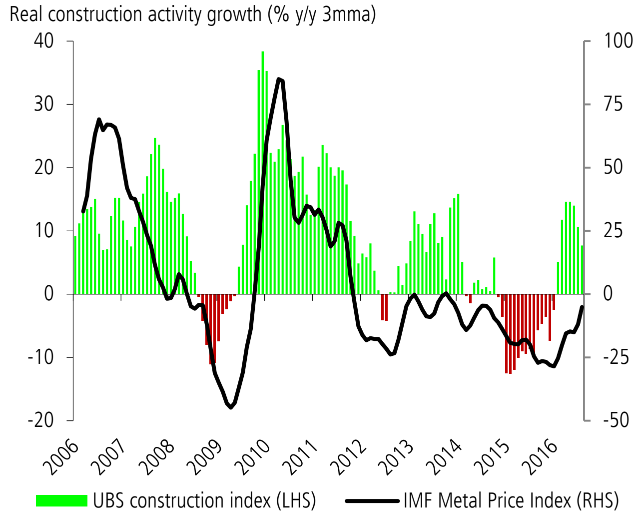
The UBS China Construction Index is based on activity within the property sector. Subsequently, with new starts sliding (from 8.1%y/y to 3.3%y/y) offsetting the strengthening property sales (from July’s 18.7%y/y to 19.8%y/y in August) we saw a further slowing of the index.

Despite property sales accelerating again and real estate investment rebounding to over 6%y/y, new starts cooled further to just over 3%y/y in August as YTD completion and construction activity both slowed as well. The ongoing moderation in new starts may be a function of catch-up after developers' frontloaded new starts earlier this year. The investment rebound might be a sign that robust sales are finally starting to improve developer sentiment, something that likely helped both manufacturing and private investment to improve on a relative basis from July.

August new loans surprised to the upside (RMB 949bn) thanks mainly to robust mortgage lending (household medium and long term loans almost double a year ago). Other shadow credit items either improved or maintained steady growth, suggesting that recent shadow banking regulations have not had any measurable impact on overall credit. Indeed, overall credit accelerated to 16.6%y/y in August, as our monthly credit impulse doubled to 26% of GDP.

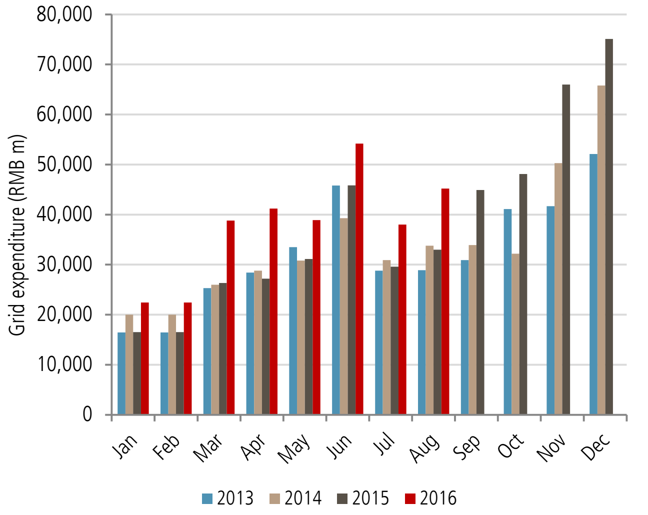
Structural factors underpinning China's property downshift have not changed – namely excess supply and gradual erosion of investment demand for Chinese residential property. That said, better market sentiment, rising property prices and easier credit access have helped to underpin China's property rebound so far in 2016, as household marginal mortgage leverage has increased sharply since H2 2015. We expect property sales to grow by 5-7% in 2016E before easing to 0-2% in 2017E, and new starts to grow by 5% and property investment to expand by 2-7% this year - China by the Numbers (September 2016).

Figure 18: UBS Construction Index



Source: CEIC, IMF, UBS-e

Figure 19: China grid expenditure



Source: CEIC, Bloomberg, UBS-e

China grid expenditure

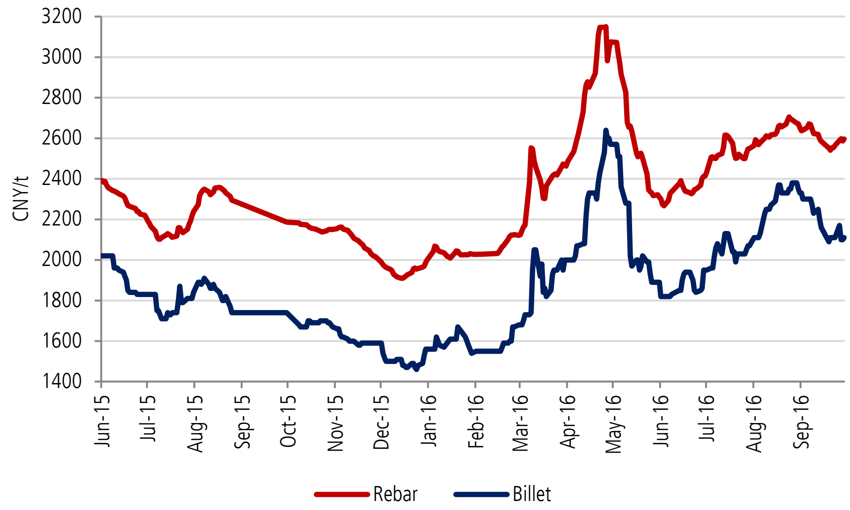
Figure 19 highlights the strength of Chinese grid expenditure in 2016. At the end of August, grid expenditure was tracking up 33% y/y. While we see this as encouraging in that funding is being made available for infrastructure projects, the breakdown of what the funds are being spent on is harder to determine. In our view, depending on the projects under construction, funds could be used to acquire land, steel, aluminium or copper.

Discussions with investors would imply that Chinese grid expenditure is a leading indicator for copper demand and pricing. However, as grid expenditure has lifted over the last three years, copper prices have actually been in decline, which suggests to us that supply really has been the dominant force in the price formation process over the last 2-3 years.

China steel prices

August data from WSA suggested that global crude steel production increased 1.9% y/y to 134Mt. Asia was, again, the area seeing the strongest production growth (+3.4% y/y) with China (+3% y/y), India (+9.4% y/y) and Taiwan (+10.7% y/y) the major drivers. With steel prices in China still $90/t below the highs seen in April, coking coal prices are c$100/t higher and iron ore prices just $12/t below those seen in April, we continue to see a margin squeeze in the Chinese market - Asia pushes August steel production up strongly.

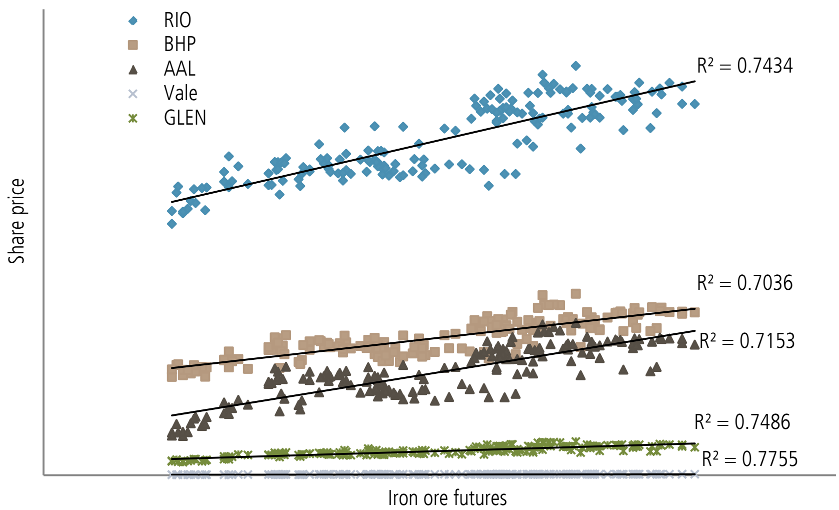
Figure 20: China steel prices (rebar and billet)



Source: Bloomberg

There remains a strong correlation between the Chinese iron ore futures price and the performance of the diversified miners, although it appears this is irrespective of each company's exposure to the iron ore market (Figure 21).

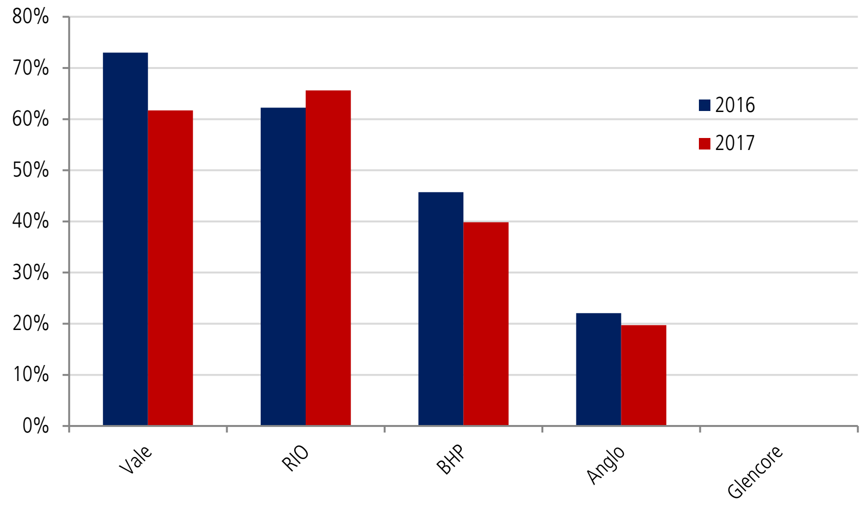
Figure 21: Iron ore futures versus diversified miner's share prices



Source: Bloomberg

For example, Glencore, which has only limited marketing exposure, shows an R^2 of 0.75 – above the R^2 of Rio Tinto, BHP Billiton and Anglo American. Despite this, we still believe taking a view on the Chinese steel market is essential. On this front, we retain a negative view and expect Chinese steel production to fall at 3.5% CAGR between 2016 and 2020.

Figure 22: EBITDA from iron ore for the big diversified miners



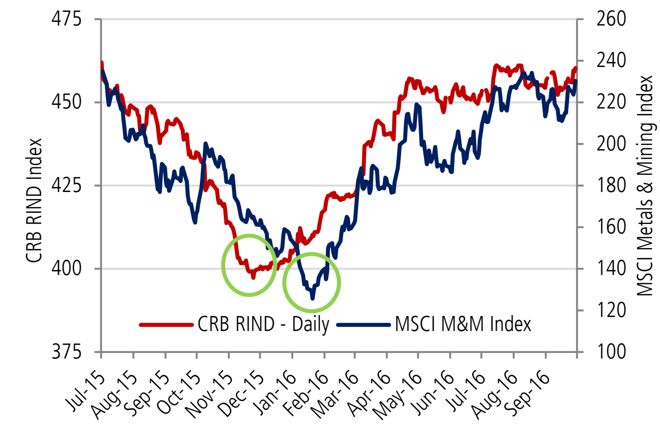
Source: UBS-e

Our steel team recently visited steel mills and coal mines in China and came away with the view that the steel mills were cautious with sentiment worsening in H2. Steel inventories have been rising for 10 weeks as production continued to lift and both domestic demand and exports have slowed - Inventory up for 10 consecutive weeks amid slowing demand. According to the steel mills visited, none thought the iron ore price could be stronger next year. We currently assume an iron ore price of circa $50/t for 2017.

CRB Raw Index (RIND)

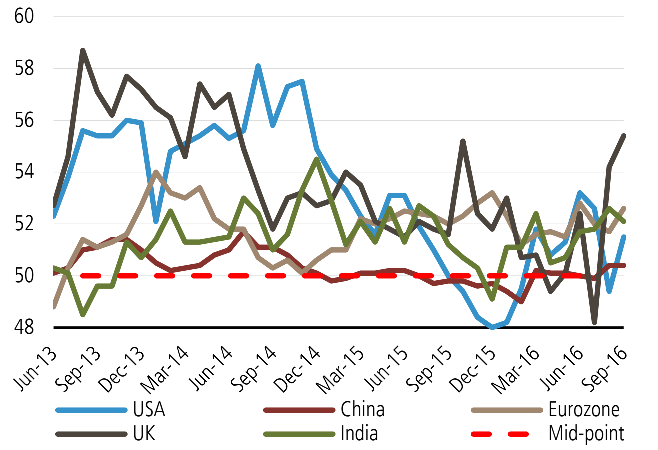
The CRB Raw Index continues to trade at levels similar to that seen at the end of April. Uninspiring global PMI data through the May-July period would potentially explain the sideways trading pattern. However, global PMI data now appears to be experiencing a modicum of strength. If the historical relationship between the PMI data and the CRB Raw Index prevails, then the PMI momentum could possibly lead to a pick-up in the activity of purchasing managers and push the CRB index higher.

Figure 23: CRB Rind vs MSCI Metals & Mining Index



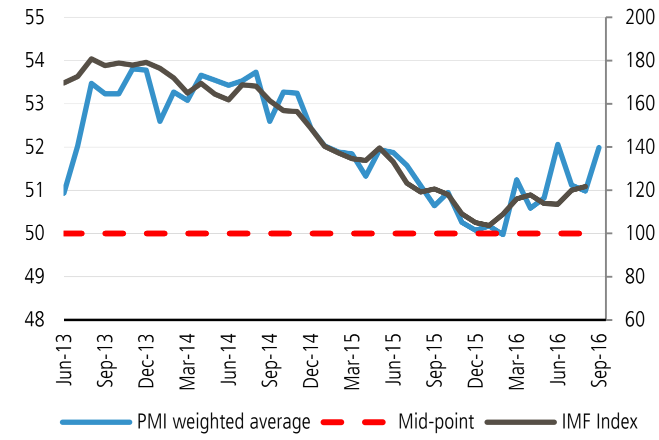
Source: Reuters

Figure 24: Global PMI



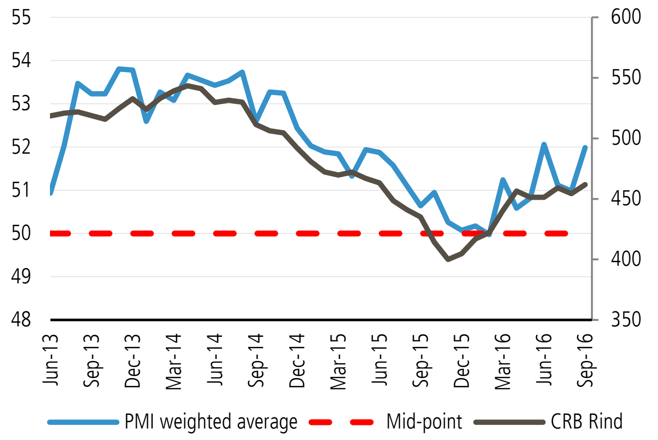
Source: Datastream, UBS-e

Figure 25: Global PMI vs IMF Metals Price Index



Source: Datastream, IMF, UBS-e

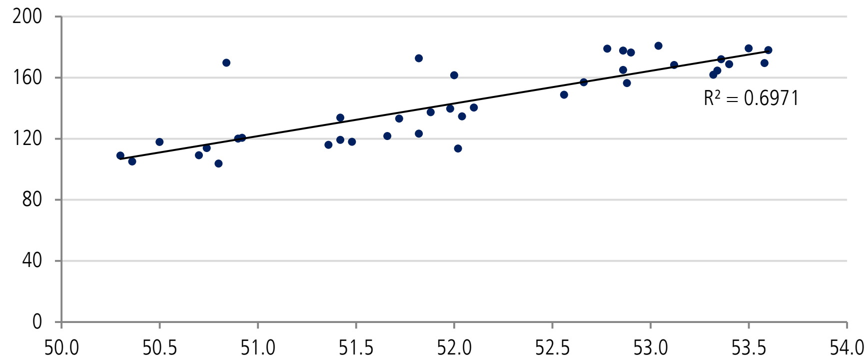
Figure 26: Global PMI vs CRB RIND Index



Source: Datastream, UBS-e

The charts above provide a simple picture to demonstrate the strong relationship between global PMI data and the commodities complex. We've just taken the global PMI data from Figure 24 and generated an average PMI (after applying a relative weighting based on the size of each economy). This has then been plotted against both the IMF Metals Price Index and the CRB RIND Index. Clearly the trends are similar.

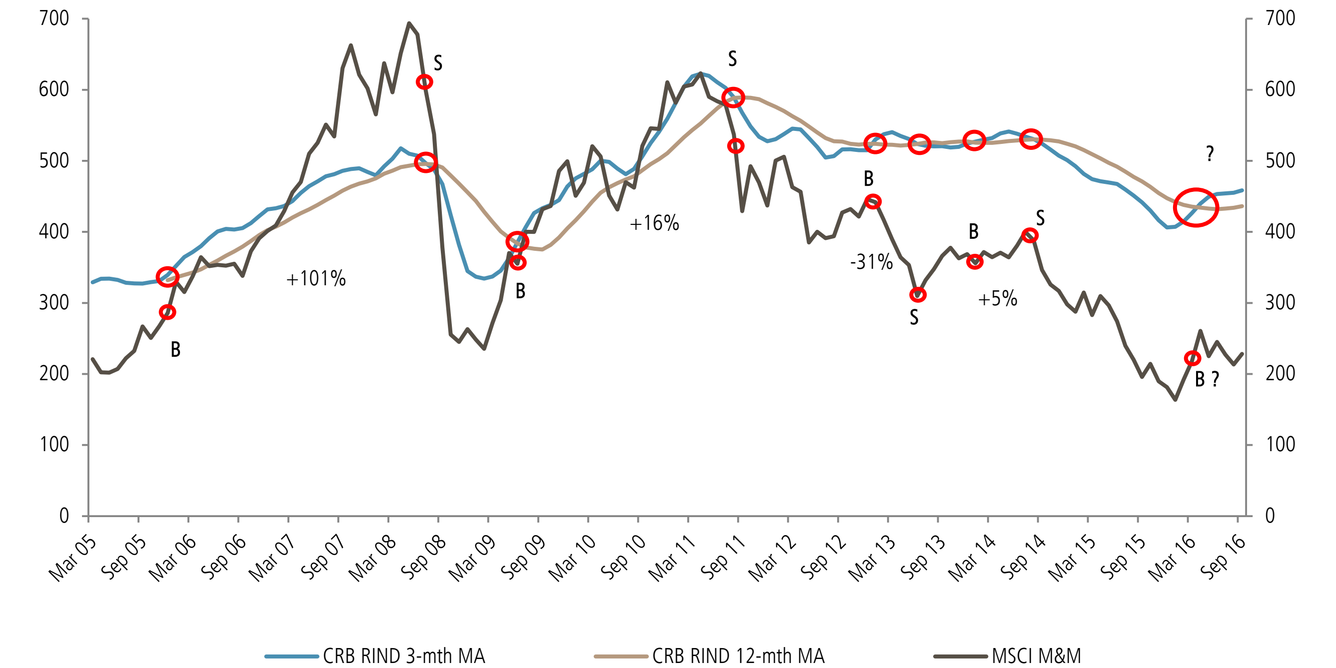
Figure 27: Regression curve – Global PMI and CRB Raw Index



Source: Datastream, UBS-e

The chart below is an update of our regular chart looking at potential buy/sell triggers using crosses in the 3-mth and 12-mth moving average of the CRB Rind Index. The 3-mth MA remains above the 12-mth MA, traditionally a positive signal.

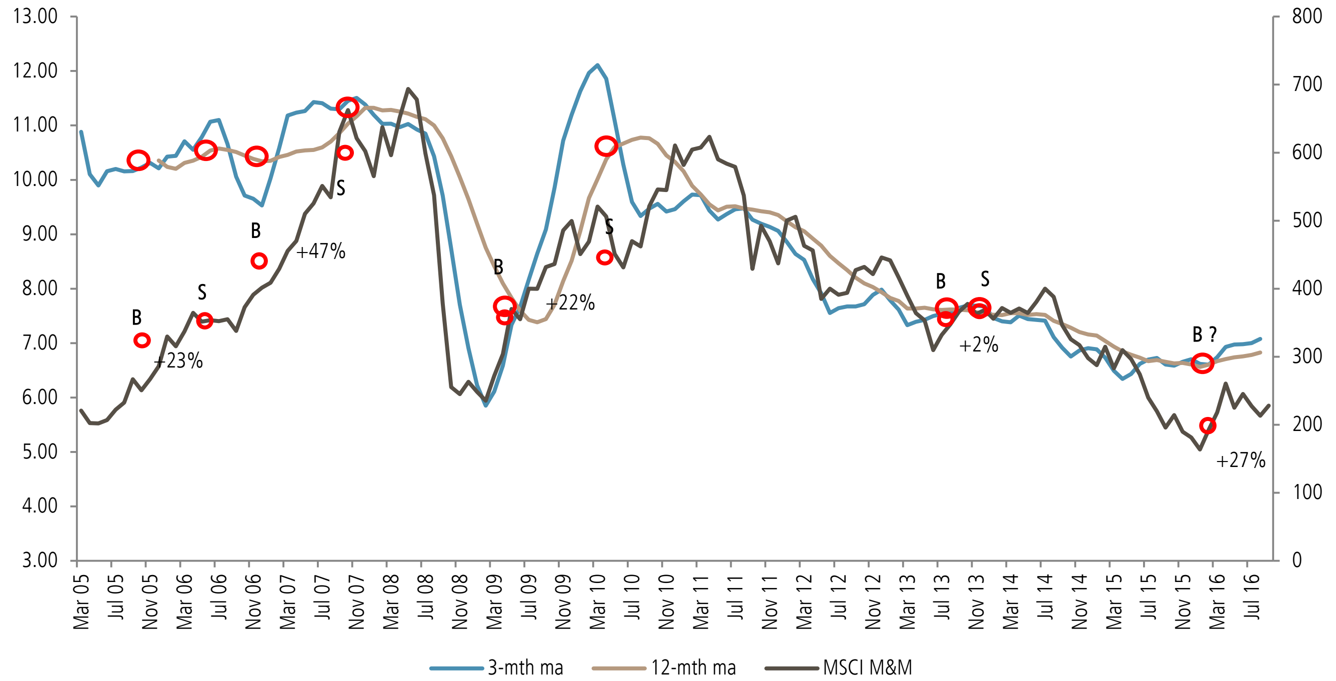
Figure 28: CRB Moving Averages – looking for a Buy signal (Mk I)



Source: Bloomberg, UBS-e

The chart below is based on a similar process, although this time using the Bloomberg Monthly Chinese GDP estimates.

Figure 29: Chinese Monthly GDP Estimate Moving Averages – looking for a Buy signal (Mk II)



Source: Bloomberg, UBS-e

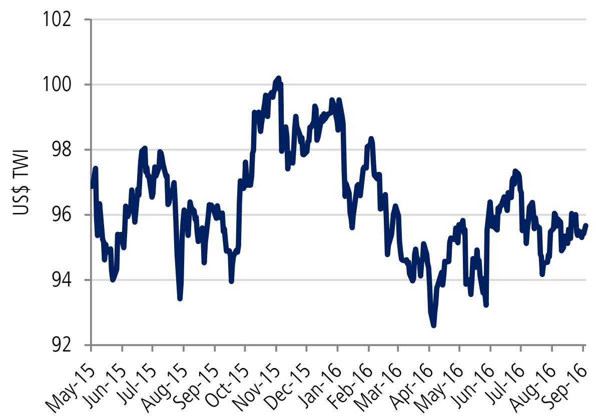
Similarly, the 3-mth MA remains above the 12-mth MA.

US$ Index

During the August and September period, the US dollar experienced strong inflows and actually registered its strongest 4-week normalised inflows since November 2015. In terms of the key commodity currencies, the Canadian dollar and Brazilian Real both saw strong net selling with the Australian dollar and South African Rand seeing net inflows.

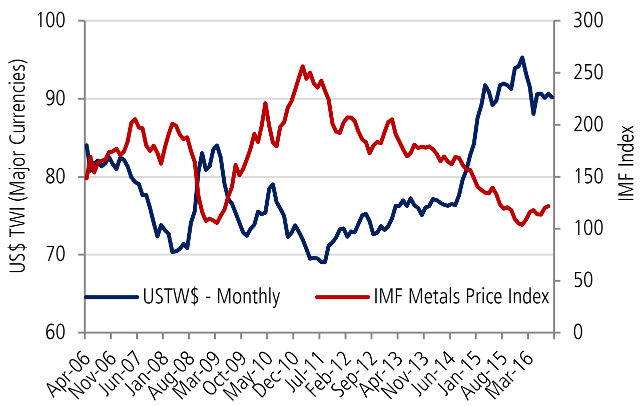
Given the strong historical correlation between the US$ and metal prices, we continue to view the US$ as a sword of Damocles over the commodity complex. In our view, if the US$ rally continues, then metals will come under pressure once again.

Figure 30: US$ TWI



Source: Reuters, IMF

Figure 31: US$ TWI versus IMF Metal Price Index



Source: Bloomberg, IMF

The chart above plotting the US$ TWI versus the IMF Metal Price Index confirms the strong inverse correlation between the components (Figure 31). Over the 10-year time frame represented by the chart, the inverse correlation is -0.81.

Oil Price

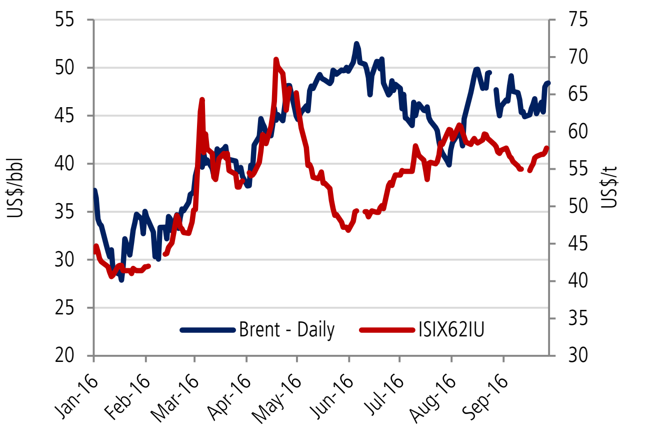
Agency updates released in September highlighted the following key trends:

- IEA citing decelerating Chinese and Indian demand growth, although our oil team believes Chinese demand is being understated and Indian data actually shows demand accelerated in August.
- OECD stocks built by 32.5Mb to an all-time high of 3,111Mb, 361Mb above the 5-year average. Our oil team revised the S/D model to show modest inventory builds until the market moves into undersupply from 2H17.
- OPEC production holds at record highs.

In the absence of a clear price anchor, our oil team believes that, while oversupply persists, crude will likely trade in a wide range between cash costs of current supply at $30/bbl and lower, and the long-run marginal cost at $60-80/bbl (likely in the upper half of that range, set by conventional supply rather than US shale) - Global Oil: A see-saw market seeking balance.

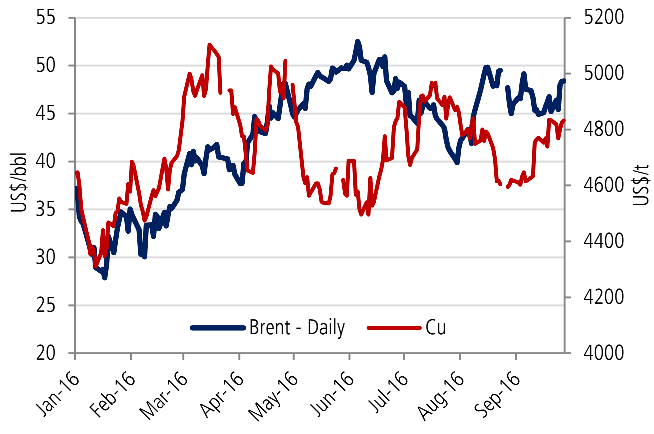
Given the strong correlations between oil and the metals (Figure 32 & Figure 33), the house view on oil is actually one of the significant drivers of our price forecasts. We currently forecast Brent to average US$46.32/bbl in 2016 rising to US$60/bbl (consensus at $55.50/bbl) in 2017 and US$70/bbl (consensus at $62/lb) in 2018.

Figure 32: Brent versus Iron Ore



Source: Bloomberg

Figure 33: Brent versus Copper



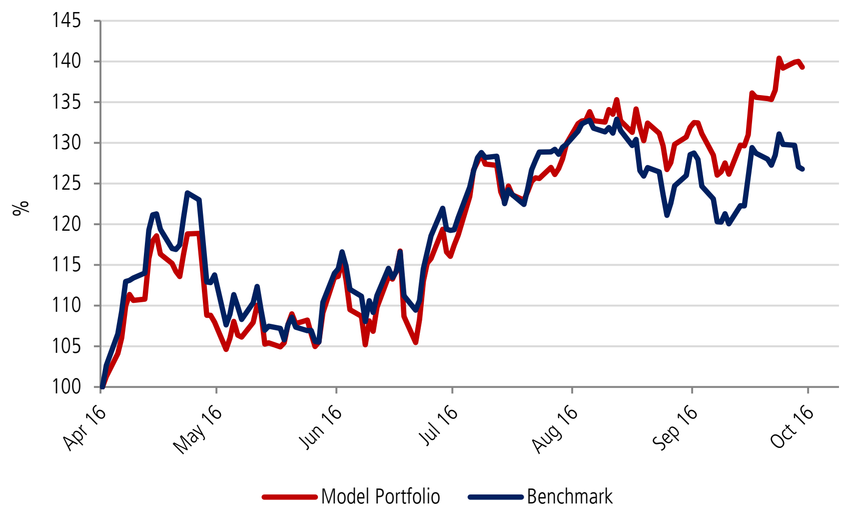
Source: Bloomberg

Model Portfolio

The following chart plots the performance of the UBS Metals & Mining Model Portfolio against the MSCI Metals & Mining benchmark from the inception of our model portfolio on 8 April 2016 through the close of business on 5 October.

Model portfolio implies return of 39.3% versus the benchmark at 26.8%...

Figure 34: Model portfolio versus MSCI Metals & Mining Index



Source: Datastream, UBS-e

From the release of our inaugural Model Portfolio through until the close of business on 5 October, the indicated performance has been +39.3%, which compares to our benchmark at +26.8%.

The indicated performance returns are based on capital appreciation and dividends but exclude transaction costs such as commissions, fees, margin interest and interest charges. Actual transactions adjusted for such transaction costs will result in reduced total returns. Prices of stocks in this performance reflect closing prices. Since its inception on 8 April 2016, the model portfolio has had 25 stocks, of which 19 advanced and 6 declined while on the list.

A complete record of all the recommendations upon which the report is based is available from UBS upon written request. Past performance is not an indication of future results.

Our benchmark is the MSCI ACWI Metals and Mining Index, which is composed of large and mid-cap stocks across 23 DM countries and 23 EM countries. Based on the changes from the Quarterly Price Review and recent equity performance, we have updated our global model portfolio.

South32 and Grupo Mexico replaced by Randgold and Southern Copper…

Figure 35: Changes to model portfolio

Out		In	
Stock	Comment	Stock	Comment
South32	The stock has performed very strongly ; however, both met coal and manganese prices are at the upper end of expectations and are at risk of pulling back	Randgold	Preferred senior gold producer. Generating strong returns from disciplined approach to growth. Has potential to pay out significantly higher dividend with next result
Grupo Mexico	The stock has performed well through the year, especially relative to Southern Copper	Southern Copper	We see Southern Copper as the cheaper entry into the business. Appeal due to superior production growth and sector-low cash costs

Source: UBS-e

The following table shows our updated portfolio.

Figure 36: UBS Metals & Mining Model Portfolio

NAME	MKT_CAP	COUNTRYID	REGIONID	COMMOD	PORTFOLIO
BHP Billiton	81148	AUS	AUST	DIVR	33.9%
Glencore	35626	GB	EUR	DIVR	14.9%
Coal India	30155	IND	ASIAXJP	ENER	12.6%
Norilsk	24892	GB	EUR	BM	10.4%
Southern Copper	22155	MEX	SAM	BM	9.2%
Potash Corp	13631	US	NAM	IND	5.7%
Randgold	8172	GB	EUR	PM	3.4%
Korea Zinc	7319	KOR	ASIAXJP	BM	3.1%
Boliden	6612	SWE	EUR	BM	2.8%
Evolution	2818	AUS	AUST	PM	1.2%
Acacia	2385	GB	EUR	PM	1.0%
Independence Group	1753	AUS	AUST	BM	0.7%
KAZ Minerals	1321	GB	EUR	BM	0.6%
Petra	905	GB	EUR	PM	0.4%
Alacer	670	AUS	AUST	PM	0.3%

Source: UBS

The weightings in the portfolio are simply based on relative market capitalisation.

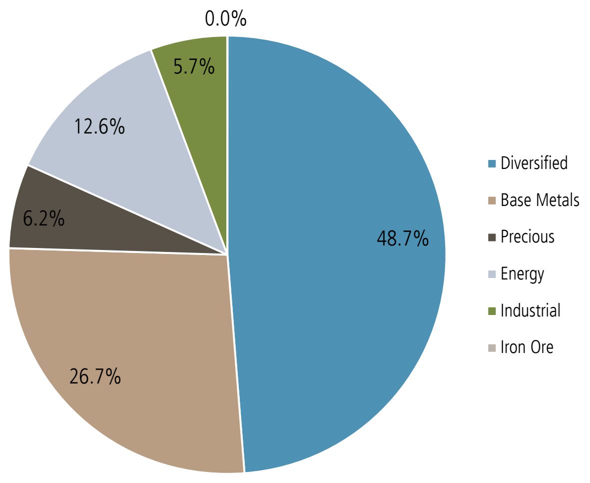
Figure 37: Portfolio spread by market capitalisation

Market-cap Threshold	Size band	Frequency
500	< 500m $	0
2500	0.5 -2.5bn $	5
5000	2.5 - 5 bn$	1
10000	5 - 10 bn$	3
50000	10 - 50 bn$	5
50000	> 50 bn$	1

Source: UBS and Reuters

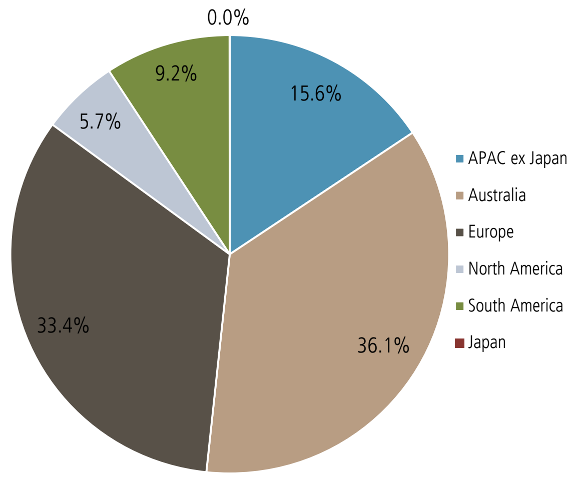
The commodity sectors are divided in Diversified Miners (DIVR), Base Metals (BM), Precious Metals (PM), Energy (ENER), Iron Ore (FEO) and Industrial commodities (IND).

Figure 38: Model Portfolio – Split by Commodity



Source: UBS

Figure 39: Model Portfolio – Split by Location



Source: UBS

- After the recent sell-off in the gold space, we have increased our exposure from 2.8% to 6.2%. We retain our constructive view on the commodity.
- We retain our minimal exposure to iron ore.
- The weighting to base metals remains relatively consistent at 26.7%; however, both Glencore and BHP have significant base metals production as well.

Most preferred commodities and stocks

The table below highlights our preferred commodity picks from our commodities team.

Figure 40: Most preferred commodities

Commodity	Reason
Nickel	Chinese demand remains strong, significant portion of cost curve losing cash. Philippines government likely to reduce laterite mining – although there is a risk of Indonesia lifting its export ban
Copper	The period of surplus is coming to an end. Within 12 mths we think market focus will move towards solid demand growth & a deceleration in mine supply growth.
Zinc	Mine supply has contracted significantly, uncertainty on where new supply will come from

Source: UBS

Based on the above commodity preferences, our preferred equities are Norilsk Nickel, Southern Copper and Glencore.

Least preferred commodities and stocks

The table below highlights our least preferred commodity picks from our commodities team.

Figure 41: Least preferred commodities

Commodity	Reason
Met coal	Current spot HCC at US$213/t is unsustainably high, given falling Chinese steel output over 2017e and expectations for Chinese & seaborne supply to lift.
Aluminium	Long term ROICs in industry to be challenged by China exporting a growing domestic aluminium surplus to global markets, displacing existing capacity.
Thermal coal	Concerned by Chinese intervention supporting prices that could be removed at any time. Additionally, anticipated supply response is expected to see spot trade down from current levels

Source: UBS

Based on the above commodity preferences, our least preferred equities are Vale, Norsk Hydro and Whitehaven.

Risks to our call

While there are clearly a significant number of moving parts that impact the Metals and Mining Sector, we believe the following issues represent the biggest risks to our market-weight recommendation.

- Recent China numbers are an aberration – data from China has been ahead of market expectation in 2016. If upcoming data shows negative swings then commodities are likely to come under pressure across the board.

- US$ continues upward trajectory – the US dollar has historically exhibited a strong inverse correlation with commodity prices. Subsequently, should the dollar resume its upward trajectory that commenced in July-11 then commodities could fall further. Clearly, the interest rate narrative has dominated the US$ discussions for a number of years now, and future rate rises may lead to dollar strength. However, there have been periods in history where commodities have traded up in a rising interest rate environment.

- Combination of above two would lead to continued capital outflows – Capital flows remain a strong driver of commodity demand in EMs. Subsequently, slowing Chinese demand growth and FX-related capital outflow would be a negative environment for commodities.

- Oil price falls – The strong correlation between metals and the oil price has been a feature of the commodities market since the oil price fell substantially in mid-2014. Should the energy complex come under renewed pressure, then we would expect metals prices to fall as well. However, with oil contributing to a significant portion of a miners cost base, the lower oil price would lead to a lower cost base and cost curve compression, thus reducing the impact on margin contraction.

- Equity market correction – Should there be an equity market correction, for whatever reason, then clearly our stock selections could underperform. In this environment, we would likely advocate increasing the gold weighting in the portfolio.

Appendices

UBS Commodity views

The following text and charts have been taken from the UBS Commodity Team's Global I/O: Miner's Price Review, titled "Cycling Higher", published on 10 October, 2016.

Summary of changes

- For the second quarter in a row, the majority of price changes here are upgrades, not downgrades. Perhaps 1Q16 will prove to be cycle lows in prices.
- The biggest changes are to **Met coal** and **Manganese**. China's 276-day rule has tightened met & thermal markets dramatically. Policy and supply reaction risks are likely to weigh on spot prices over the next year, but nevertheless, large upgrades have resulted. **Premium coking coal** upgraded 16% in 2016e to US$ 101/t & 28% in 2017e to US$130/t; **thermal coal** upgraded 3% in 2016e to US$61/t and 5% in 2017e to US$62/t.
- **Manganese** ore price forecasts are upgraded 27% in 2016e to US$3.63/dmtu and 11% in 2017e to US$3.76/dmtu as strong demand from China has driven a strong lift in imports following the ore inventory drawdown in 1Q16. Supply is lifting, but should only gradually pressure spot lower over 2017e.
- We lifted our **Copper** price to US$2.30/lb for 2017e (+7%) as a model update has led to deficits forming (better demand + slowing supply growth).
- Our bullish **nickel** price forecasts are lifted to US$5.50/lb (from US$5.00/lb) in 2017e on larger-than-expected closures in the Philippines.
- **Alumina** price forecasts are trimmed 7% for 2017e to US$260/t. Prices have been weak on a temporary mismatch in China from refinery restarts occurring faster than smelter capacity. We expect this is change as 300ktpa of smelter capacity ramps up in 2016Q4 so we are still bullish.
- Our **Gold** price forecast for 2017e is unchanged as we don't think the macro backdrop has shifted materially to warrant a change in our outlook.
- Most other commodities in the base metals space see very minor changes, mostly mark to markets for 2016Q2, with unchanged forecasts.

Figure 42: UBS commodity price forecasts – summary of changes

Commodity	2016	2017E	2018E	2019E	2020E	LT real
Copper (US¢/lb)	216(210)	230(215)	260(nc)	300(nc)	330(nc)	295(nc)
Alum. (US¢/lb)	72(nc)	75(nc)	80(nc)	85(nc)	90(nc)	80(nc)
Nickel (US$/lb)	4.3(nc)	5.5(5)	6.3(6)	7.5(nc)	8.5(8.9)	7.9(nc)
Zinc (US¢/lb)	92(nc)	110(105)	100(nc)	95(nc)	105(nc)	98(nc)
Gold (US$/oz)	1282(1280)	1400(nc)	1450(nc)	1475(nc)	1500(nc)	1300(nc)
Platinum (US$/oz)	1017(995)	1100(nc)	1325(nc)	1500(nc)	1600(nc)	1600(nc)
IO (fines; US$/t cfr)	53(nc)	50(nc)	52(nc)	58(nc)	62(nc)	55(nc)
Mn Ore (US$/dmtu cfr	3.6(2.9)	3.8(3.4)	3.9(nc)	4.2(nc)	4.5(nc)	4(nc)
HCC (US$/t fob)	111(96)	130(101)	99(95)	105(nc)	119(nc)	105(nc)
Thermal (US$/t fob)	61(59)	62(59)	57(nc)	58(nc)	62(63)	55(nc)
AUD (US¢)	75(74)	76(75)	76(75)	76(75)	75(nc)	75(nc))

Source: UBS Research; nc=no change; iron ore prices 62% Fe eqv; thermal coal is spot.

Biggest changes?

Met coal +4-28% for 2016-17e;

Mn ore +11-27% for 2016-17e;

Nickel +4-10% for 2016-17e;

Copper +3-7% for 2017-18e;

UBS vs Consensus

For the second time in as many quarters, years even, our collection of price forecasts are generally above consensus. Below find outlines of our forecast and variance to consensus. We are generally above consensus due to an improving view on China demand & an above-consensus oil view (which drives reflation). For 2016-17 in general;

- **Higher than consensus:** Crude Oil, Copper, Nickel, Zinc (for 2017e), Precious metals, Manganese, Zircon & Titanium Feedstocks.
- **In line or near consensus:** Iron Ore, Thermal Coal, Aluminium, Alumina, , Uranum
- **Below consensus:** Not really any major commodities.

From our collection of calls, the ones we consider most different are;

- **Crude Oil:** Here UBS is forecasting US$60/bbl for 2017e & US$70/bbl for Brent. This is 10% above consensus for 2017e, higher in 2018-20e. The forecast lift in oil is a driver of assumed reflation over time in our cost curves & for our mined commodity price assumptions being higher than consensus.
- **Copper:** We had been among the most bearish on copper in early 2016 (& for much of the past 2-3 years), but are now changing our view to a more bullish stance. Our work on China's copper demand is bottom up, where we believe our peers are top down or driven by economy-wide views, for background on our work (but now dated views) see Copper: Can the Panda Bear eat the surplus? Our change in view is driven by better indicators of copper activity downstream, particularly consumer items (air-conditioners & vehicles). We forecast US$2.30/lb for 2017e & US$2.60/lb in 2017e, 4-8% above consensus (we were previously below).
- **Nickel:** We are more bullish (11-14% for 2016-17e) than consensus, which to be fair is almost uniformly positive on this metal. Here we think most are looking at the potential looming supply shock from the Philippines. Where our more bullish view is different may be on the demand side. We are influenced by very strong stainless steel production in China (+8%y/y to July-16) & a view that restocking may occur due to a recent lift in Nickel & Chromum prices. Our upside case of US$8/lb is very bullish against spot of ~US$4.50/lb, but is in line with the magnitude of prior rallies.
- **Precious Metals:** Here our price forecasts are 6-23% higher than consensus for 2016-2020e. Much of this is driven by our positive view on gold, which we think will be a key driver for price action across the precious metals complex. We expect gold to have a measured move higher from here driven by broad-based, strategic investor positions. Silver's relative performance vs gold could be choppy, but we continue to expect a lower gold:silver ratio over the long run as improvements in S/D fundamentals are likely to attract investor interest. For PGMs, substantial gains expected further out put us considerably above consensus. Our view captures the expectation that fundamental factors are likely going to return as price drivers once signs of market tightness start to emerge, which in turn should revive investor interest. Price reaction is likely to be amplified given current limited interest and lack of investor positioning.

UBS top commodity picks

<3-month view

(1) **Zinc**: Concentrate markets are very tight from mine supply shuts, now also tightening the metal market. Idled capacity mostly controlled by Glencore.

(2) **Nickel**: In early 2017, the loss of 10% of mine supply from the Philippines should start to have an apparent impact on inventory & prices. Stainless Steel production appears robust too.

(3) **Alumina**: set to benefit from ~300ktpa of Al-smelter ramp-ups in China over the next 3 months. Linkage near historic lows.

(4) Gold: We expect gold's uptrend to continue, albeit price action could become choppy in the near term as the market recalibrates Fed expectations; seasonality should come into play for the remainder of the year.

(5) Silver: Silver should continue to track gold price action – there's a risk that silver underperforms on the back gold weakness ahead of a Fed rate hike.

(6) Copper: Surpluses are near an end, consumer demand (appliances & cars) is starting to follow China's 2016H1 property strength.

(7) Palladium: Performance has surprised on the upside while positioning remains lean; investor interest may be slowly returning helped by strong Chinese auto demand.

(8) **Platinum:** There could be upside risks to platinum amid wage negotiations in SA, especially since a deadlock does not seem to be priced in; however we expect any upside to be short-lived in the absence of signs of market tightening

(9) **Titanium feedstock**: Set to benefit from a delayed uplift from China's 2016 property sales recovery. Downstream pigment prices are lifting.

(10) **Zircon**: China's property sales are also positive tailwind, price lift by Iluka appears to have been accepted.

(11) **Iron ore**: Prices remain in US$50-$60/t range, but falling Chinese steel mill margins and seasonally better supply should weigh on spot into end 2016.

(12) **Uranium**: Spot continues to struggle, now below US$25/lb, but even as demand remains patchy, current prices are arguably unsustainably low.

(13) **Aluminium:** China smelter restarts could cap recent price appreciation, inventory still an overhang from the carry trade.

(14) **Thermal coal**: China's 276-day rule is being massaged to lift domestic supply, but the pre-winter re-stock and multi-year low Chinese inventory should see markets remain tight, and spot supported, into end 2016.

(15) **Manganese**: Spot has been driven higher by demand recently, but we expect resurgent supply and easing demand into 2017 to push spot lower.

(16) Metallurgical coal: 4Q16 contracts set to settle to perhaps double 3Q16 levels as tight China supply and lags in seaborne supply response should see tightness persist to end-2016.

>12-month view

(1) **Nickel:** Positive demand growth from stainless steel, mine shuts set to tighten the market. Oil price lift would be positive for both demand of stainless steel & cost reflation of mine supply. Indonesia policy a bearish risk to navigate.

(2) **Copper**: Within 12-months we think market focus will move towards solid demand growth & a deceleration in mine supply growth.

(3) **Alumina**: Price reflation from higher oil prices expected to lift cost curve via mining & freighting bauxite. Indonesia policy a bearish risk to watch though.

(4) **Uranium**: Restarting Japanese nuclear power, new nuclear capacity in China, and a lack of mine investment = gradually tightening markets.

(5) **Zinc**: We still expect elevated prices & margins but the supply shock of 2016 should start to fade from the return of idled mines & new projects.

(6) **Titanium feedstock**: Around $1-2bn of mine supply investment is threatened unless we see higher prices soon. Risks are emerging from growth in China pigment capacity seeking low quality feed & exporting product.

(7) **Zircon**: Stable prices still expected with major producers managing back inventory & supply to feed market growth.

(8) Gold: Expect gold strength to continue as the trend of strategic allocation broadens and extends. Gold is seen as the cleanest way vs its peers to express a low-for-longer view on rates against an uncertain macro backdrop.

(9) Silver: Silver could outperform gold during periods when risk sentiment stays buoyant, but higher price volatility suggests it is less likely to be considered in strategic portfolio allocations and viewed instead as a short-term play.

(10) Palladium: We estimate that inventories are being drawn down at a faster rate and expect signs of market tightness to emerge next year, but periods of heightened risk aversion could pose challenges in the interim.

(11) **Platinum:** Support is expected to come more from its positive correlation with gold. We don't expect significant signs of tightening until around 2018, as the market continues to digest above-ground stocks.

(12) **Iron ore**: Supply cuts and closures should support pricing but weak demand and falling controllable costs make it hard for a sustained lift.

(13) **Aluminium**: Long-term ROICs in industry will be challenged by China exporting a growing domestic aluminium surplus to global markets, displacing existing capacity.

(14) **Manganese**: Current spot prices incentivise higher supply heading into flat to falling steel production in 2017e, combining to pressure prices lower.

(15) **Thermal coal**: Slower Chinese construction activity in 2017e and anticipated supply response is expected to see spot trade down from current levels.

(16) **Metallurgical coal**: Current spot HCC at US$213/t is unsustainably high, given falling Chinese steel output over 2017e and expectations for Chinese & seaborne supply to lift.

UBS commodity price forecasts

Figure 43: UBS commodity price changes – base metals & uranium

Commodity	period	old	new	new vs old	Vs. Consensus	
Copper (US$/lb)	2016E	2.10	2.16	3%	2.14	1%
	2017E	2.15	2.30	7%	2.20	4%
	2018E	2.60	2.60	0%	2.41	8%
	2019E	3.00	3.00	0%	2.53	19%
	2020E	3.30	3.30	0%	2.68	23%
	LT price (nom. 2021)	3.35	3.33	-1%	2.99	11%
	LT price (real 2015)	2.95	2.95	0%	2.64	12%
Aluminium (US$/lb)	2016E	0.72	0.72	1%	0.72	1%
	2017E	0.75	0.75	0%	0.74	2%
	2018E	0.80	0.80	0%	0.76	5%
	2019E	0.85	0.85	0%	0.79	8%
	2020E	0.90	0.90	0%	0.82	10%
	LT price (nom. 2021)	0.91	0.90	-1%	0.96	-6%
	LT price (real 2015)	0.80	0.80	0%	0.85	-5%
Alumina (US$/t)	2016E	245	239	-2%	238	0%
	2017E	280	260	-7%	260	0%
	2018E	300	290	-3%	277	5%
	2019E	320	320	0%	288	11%
	2020E	345	340	-1%	299	14%
	LT price (nom. 2021)	346	344	-1%	349	-1%
	LT price (real 2015)	305	305	0%	308	-1%
Nickel (US$/lb)	2016E	4.30	4.31	0%	4.25	1%
	2017E	5.00	5.50	10%	4.83	14%
	2018E	6.00	6.25	4%	5.62	11%
	2019E	7.50	7.50	0%	6.28	19%
	2020E	8.90	8.50	-4%	6.73	26%
	LT price (nom. 2021)	8.97	8.91	-1%	8.40	6%
	LT price (real 2015)	7.90	7.90	0%	7.42	6%
Zinc (US$/lb)	2016E	0.92	0.92	0%	0.91	2%
	2017E	1.05	1.10	5%	1.01	9%
	2018E	1.00	1.00	0%	1.02	-2%
	2019E	0.95	0.95	0%	1.04	-8%
	2020E	1.05	1.05	0%	1.04	1%
	LT price (nom. 2021)	1.11	1.11	-1%	1.06	4%
	LT price (real 2015)	0.98	0.98	0%	0.94	5%
Lead (US$/lb)	2016E	0.80	0.83	3%	0.81	2%
	2017E	0.80	0.90	13%	0.82	10%
	2018E	0.85	0.85	0%	0.84	1%
	2019E	0.95	0.95	0%	0.85	12%
	2020E	1.05	1.05	0%	0.85	23%
	LT price (nom. 2021)	1.09	1.08	-1%	0.94	15%
	LT price (real 2015)	0.96	0.96	0%	0.84	15%
Uranium (US$/lb)	2016E	30	28	-5%	29	-1%
	2017E	32	31	-2%	32	-3%
	2018E	42	42	0%	37	13%
	2019E	55	55	0%	43	27%
	2020E	62	62	0%	50	24%
	LT price (nom. 2021)	62	62	-1%	60	4%
	LT price (real 2015)	55	55	0%	53	4%

Source: UBS Research

Figure 44: UBS commodity price changes – precious metals, Manganese, mineral sands, exchange rate

Commodity	period	old	new	new vs old	Vs. Consensus	
Gold (US$/oz)	2016E	1280	1282	0%	1274	1%
	2017E	1400	1400	0%	1317	6%
	2018E	1450	1450	0%	1303	11%
	2019E	1475	1475	0%	1310	13%
	2020E	1500	1500	0%	1299	15%
	LT price (nom. 2021)	1475	1466	-1%	1271	15%
	LT price (real 2015)	1300	1300	0%	1123	16%
Silver (US$/oz)	2016E	16.8	17.7	5%	17.5	1%
	2017E	18.3	19.1	4%	19.0	0%
	2018E	19.0	19.8	4%	18.7	6%
	2019E	20.0	20.2	1%	19.1	6%
	2020E	21.0	21.0	0%	19.1	10%
	LT price (nom. 2021)	22.7	22.6	-1%	20.0	13%
	LT price (real 2015)	20.0	20.0	0%	17.7	13%
Platinum (US$/oz)	2016E	995	1017	2%	1021	0%
	2017E	1100	1100	0%	1110	-1%
	2018E	1325	1325	0%	1179	12%
	2019E	1500	1500	0%	1257	19%
	2020E	1600	1600	0%	1300	23%
	LT price (nom. 2021)	1816	1805	-1%	1524	18%
	LT price (real 2015)	1600	1600	0%	1347	19%
Palladium (US$/oz)	2016E	581	598	3%	605	
	2017E	755	755	0%	672	12%
	2018E	850	850	0%	728	17%
	2019E	900	900	0%	762	18%
	2020E	950	950	0%	774	23%
	LT price (nom. 2021)	1021	1015	-1%	767	32%
	LT price (real 2015)	900	900	0%	678	33%
Brent crude oil	2016E	46	46	0%	45	3%
	2017E	60	60	0%	54	10%
	2018E	70	70	0%	62	14%
	2019E	75	75	0%	54	39%
	2020E	75	75	0%	66	13%
	LT price (nom. 2021)	79	79	-1%	68	15%
	LT price (real 2015)	70	70	0%	60	16%
Mn Ore (US$/dmtu 44% CFR)	2016E	2.86	3.63	27%	3.33	9%
	2017E	3.38	3.76	11%	3.21	17%
	2018E	3.94	3.94	0%	3.38	16%
	2019E	4.19	4.19	0%	3.55	18%
	2020E	4.50	4.50	0%	3.73	21%
	LT price (nom. 2021)	4.54	4.51	-1%	4.17	8%
	LT price (real 2015)	4.00	4.00	0%	3.69	8%
Rutile (US$/t)	2016E	638	638	0%	660	-3%
	2017E	788	788	0%	772	2%
	2018E	950	950	0%	839	13%
	2019E	1075	1075	0%	894	20%
	2020E	1275	1275	0%	924	38%
	LT price (nom. 2021)	1475	1466	-1%	985	49%
	LT price (real 2015)	1300	1300	0%	870	49%
Zircon (US$/t)	2016E	885	885	0%	893	-1%
	2017E	994	994	0%	979	1%
	2018E	1200	1200	0%	1066	13%
	2019E	1325	1325	0%	1133	17%
	2020E	1525	1525	0%	1186	29%
	LT price (nom. 2021)	1589	1579	-1%	1194	32%
	LT price (real 2015)	1400	1400	0%	1055	33%
A$/US$	2016E	0.742	0.745	0%	0.740	1%
	2017E	0.750	0.760	1%	0.725	5%
	2018E	0.750	0.758	1%	0.750	1%
	2019E	0.750	0.755	1%	0.760	-1%
	2020E	0.750	0.752	0%	0.770	-2%
	LT	0.750	0.750	0%	0.81	-7%

Source: UBS Research

Figure 45: UBS commodity price changes – iron ore, metallurgical & thermal coals (FOB)

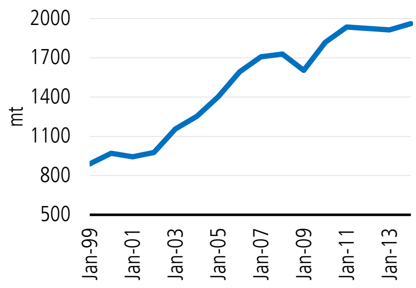
Commodity	period	old contract		new contract		new vs old	consensus	consensus	UBS vs cons
Iron ore fines (62%Fe, Pilbara fines)		US$/t fob	% chg yoy	US$/t fob	% chg yoy	% chg	US$/t fob	% chg yoy	% diff.
	2016E	49		49		0%	49		0%
	2017E	44	-11%	44	-11%	0%	43	-11%	0%
	2018E	43	-2%	43	-2%	0%	45	4%	-5%
	2019E	49	13%	49	13%	0%	49	8%	0%
	2020E	53	9%	53	9%	0%	51	4%	5%
	LT price (nom. 2021)	53	1%	53	0%	-1%	52	3%	2%
	LT price (real 2015)	47	0%	47	0%	0%	46	3%	2%
Iron ore fines (62%Fe, landed North China)		US$/t cfr	% chg yoy	US$/t cfr	% chg yoy	% chg	US$/t cfr	% chg yoy	% diff.
	2016E	53		53		0%	53		0%
	2017E	50		50	-5%	0%	50	-7%	1%
	2018E	52	2%	52	2%	0%	51	3%	0%
	2019E	58	12%	58	12%	0%	56	9%	2%
	2020E	62	8%	62	8%	0%	58	4%	6%
	LT price (nom. 2021)	62	1%	62	0%	-1%	62	7%	0%
	LT price (real 2015)	55	0%	55	0%	0%	55	7%	0%
Hard coking coal		US$/t fob	% chg yoy	US$/t fob	% chg yoy	% chg	US$/t fob	% chg yoy	% diff.
	2016E	96		111		16%	92		21%
	2017E	101	6%	130	18%	28%	94	3%	38%
	2018E	95	-6%	99	-24%	4%	96	2%	3%
	2019E	105	11%	105	7%	0%	104	8%	1%
	2020E	119	13%	119	13%	0%	112	8%	6%
	LT price (nom. 2021)	119	1%	118	0%	-1%	129	15%	-8%
	LT price (real 2015)	105	0%	105	0%	0%	114	-12%	-8%
Low Vol PCI		US$/t fob	% chg yoy	US$/t fob	% chg yoy	% chg	US$/t fob	% chg yoy	% diff.
	2016E	79		83		5%	n/a	n/a	n/a
	2017E	83	5%	103	23%	23%	n/a	n/a	n/a
	2018E	75	-10%	78	-24%	4%	n/a	n/a	n/a
	2019E	82	10%	82	5%	0%	n/a	n/a	n/a
	2020E	90	9%	90	9%	0%	n/a	n/a	n/a
	LT price (nom. 2021)	91	1%	90	0%	-1%	n/a	n/a	n/a
	LT price (real 2015)	80	0%	80	0%	0%	n/a	n/a	n/a
Semi-Soft coking coal		US$/t fob	% chg yoy	US$/t fob	% chg yoy	% chg	US$/t fob	% chg yoy	% diff.
	2016E	75		80		7%	n/a	n/a	n/a
	2017E	77	2%	97	21%	26%	n/a	n/a	n/a
	2018E	69	-10%	72	-26%	4%	n/a	n/a	n/a
	2019E	73	6%	73	2%	0%	n/a	n/a	n/a
	2020E	79	8%	79	8%	0%	n/a	n/a	n/a
	LT price (nom. 2021)	79	1%	79	0%	-1%	n/a	n/a	n/a
	LT price (real 2015)	70	0%	70	0%	0%		n/a	n/a
Thermal coal - contract		US$/t fob	% chg yoy	US$/t fob	% chg yoy	% chg	US$/t fob	% chg yoy	% diff.
	JFY16E	61		61		0%	n/a	n/a	n/a
	JFY17E	67	10%	70	15%	4%	n/a	n/a	n/a
	JFY18E	61	-9%	61	-13%	0%	n/a	n/a	n/a
	JFY19E	62	2%	62	2%	0%	n/a	n/a	n/a
	JFY20E	62	0%	62	0%	0%	n/a	n/a	n/a
	JFY21E	63	1%	62	1%	-1%	n/a	n/a	n/a
	LT price (real 2015)	55	0%	55	0%	0%	n/a	n/a	n/a
Thermal coal - spot		US$/t fob	% chg yoy	US$/t fob	% chg yoy	% chg	US$/t fob	% chg yoy	% diff.
	2016	59		61		3%	58		5%
	2017	59	-1%	62	1%	5%	61	4%	2%
	2018	57	-4%	57	-9%	0%	60	-1%	-6%
	2019	58	3%	58	3%	0%	62	3%	-7%
	2020	62	7%	62	7%	0%	62	-1%	0%
	LT price (nom. 2021)	62	1%	62	0%	-1%	65	6%	-5%
	LT price (real 2015)	55	0%	55	0%	0%	58	-12%	-4%

Source: UBS Research

Apparent consumption – by commodity

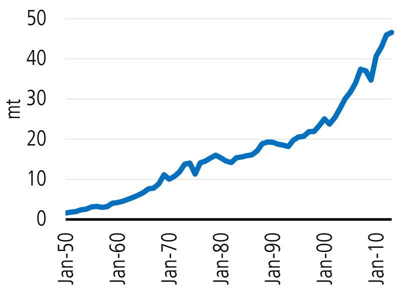
The following series of charts highlight that general demand for commodities, while exhibiting certain levels of variability, tends to follow a broad overall trend of growth. The exception appears to be Al, which demonstrated a significant steepening of the curve around 2000, attributed to an apparent voracious appetite for Al within China.

Figure 46: Iron ore apparent consumption



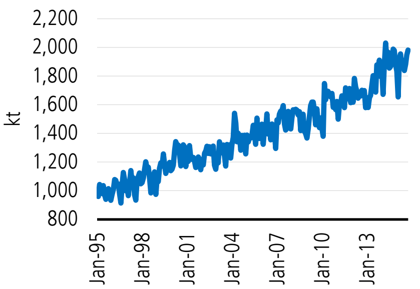
Source: Bloomberg

Figure 47: Aluminium global consumption



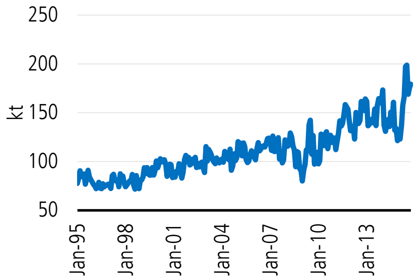
Source: Bloomberg

Figure 48: Refined copper global consumption



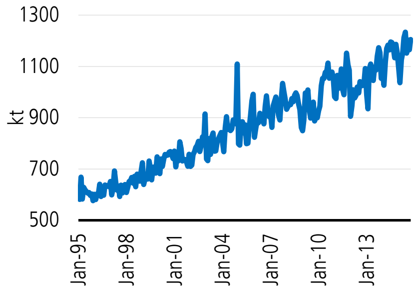
Source: Bloomberg

Figure 49: Smelter/Refined nickel global consumption



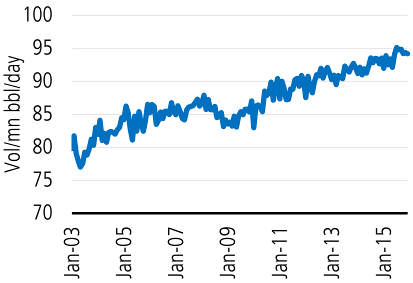
Source: Bloomberg

Figure 50: Zinc slab global consumption



Source: Bloomberg

Figure 51: Crude oil and liquid fuel global consumption

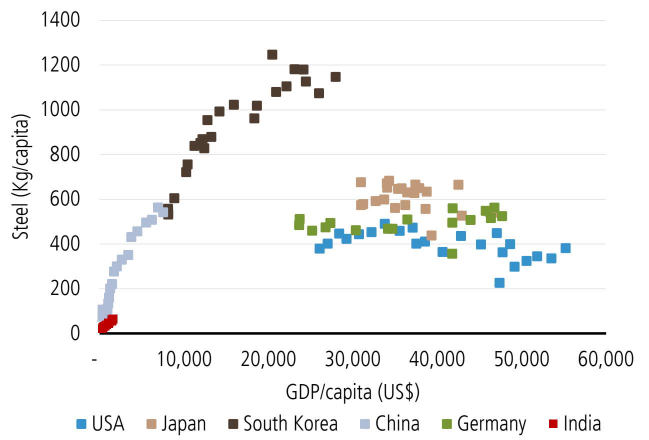


Source: Bloomberg

Intensity of use – by commodity

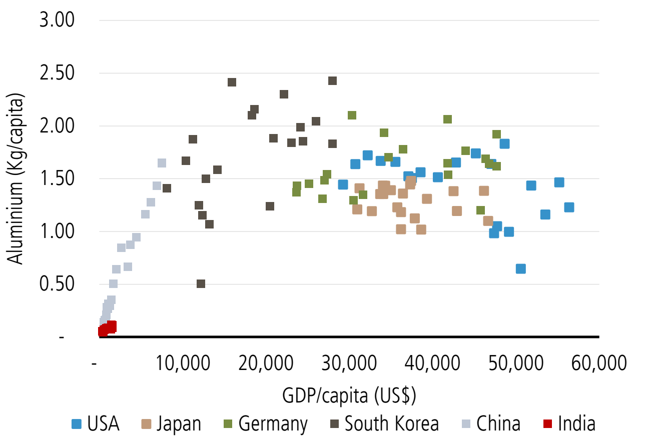
The following charts plot the most recent IU data for each product.

Figure 52: Steel



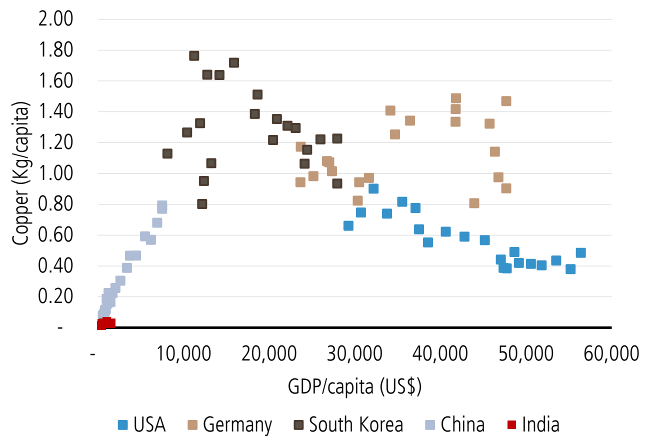
Source: Wood Mac

Figure 53: Aluminium



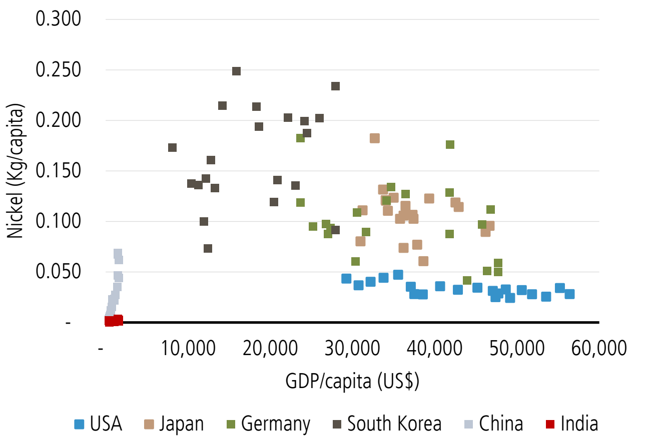
Source: Wood Mac

Figure 54: Copper



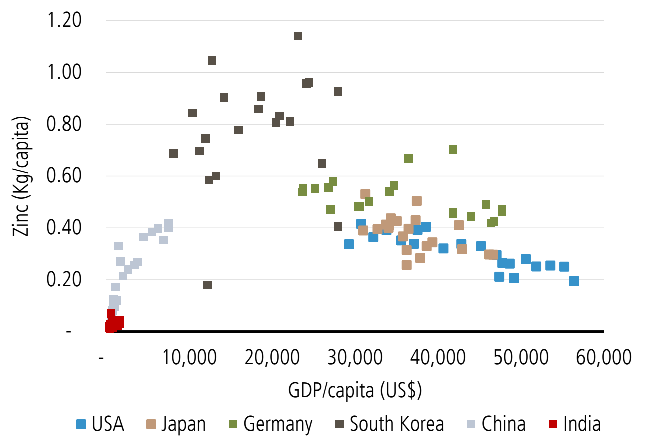
Source: Wood Mac

Figure 55: Nickel



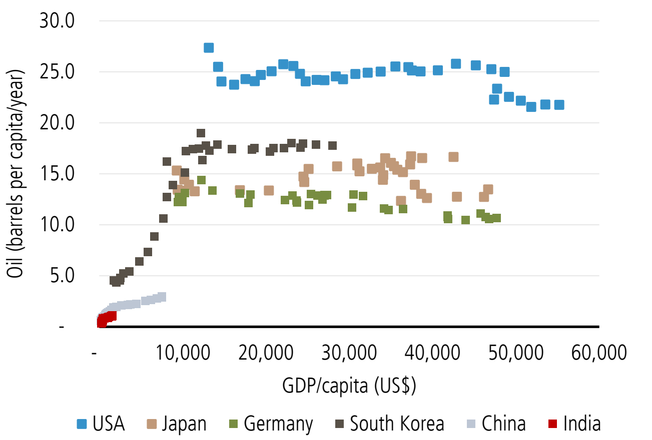
Source: Wood Mac

Figure 56: Zinc



Source: Wood Mac

Figure 57: Oil



Source: Wood Mac

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Investment risk inherent in the resource sector includes, but it is not limited to, movements in commodity price and currency which may differ materially from the assumption used in this report. Furthermore, the sector is subject to political, financial and operational risks, each of which has the potential to significantly impact company/industry performance.

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12-Month Rating	Definition	Coverage[1]	IB Services[2]
Buy	FSR is > 6% above the MRA.	45%	28%
Neutral	FSR is between -6% and 6% of the MRA.	39%	25%
Sell	FSR is > 6% below the MRA.	15%	17%
Short-Term Rating	**Definition**	**Coverage[3]**	**IB Services[4]**
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%

Source: UBS. Rating allocations are as of 30 September 2016.
1:Percentage of companies under coverage globally within the 12-month rating category.
2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.
3:Percentage of companies under coverage globally within the Short-Term rating category.
4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

KEY DEFINITIONS: Forecast Stock Return (FSR) is defined as expected percentage price appreciation plus gross dividend yield over the next 12 months. **Market Return Assumption (MRA)** is defined as the one-year local market interest rate plus 5% (a proxy for, and not a forecast of, the equity risk premium). **Under Review (UR)** Stocks may be flagged as UR by the analyst, indicating that the stock's price target and/or rating are subject to possible change in the near term, usually in response to an event that may affect the investment case or valuation. **Short-Term Ratings** reflect the expected near-term (up to three months) performance of the stock and do not reflect any change in the fundamental view or investment case. **Equity Price Targets** have an investment horizon of 12 months.

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Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
Acacia Mining Plc	ACAA.L	Buy	N/A	476p	10 Oct 2016
Alacer Gold Corp	AQG.AX	Buy	N/A	A$3.01	10 Oct 2016
BHP Billiton Plc[4, 7, 14, 16, 22]	BLT.L	Buy	N/A	1,267p	10 Oct 2016
Boliden	BOL.ST	Neutral	N/A	SKr210.50	10 Oct 2016
Coal India	COAL.BO	Buy	N/A	Rs319.30	10 Oct 2016
Evolution Mining[13]	EVN.AX	Buy	N/A	A$2.23	10 Oct 2016
Glencore Plc[2, 4, 5, 7]	GLEN.L	Buy	N/A	228p	10 Oct 2016
Grupo Mexico[6a, 6b, 7]	GMEXICOB.MX	Buy	N/A	P47.24	07 Oct 2016
Independence Group NL[4, 20]	IGO.AX	Neutral (CBE)	N/A	A$3.82	10 Oct 2016
KAZ Minerals PLC[20]	KAZ.L	Buy (CBE)	N/A	254p	10 Oct 2016
Korea Zinc	010130.KS	Buy	N/A	Won458,000	10 Oct 2016
Norilsk Nickel[4, 22]	NKELyq.L	Buy	N/A	US$15.47	10 Oct 2016
Norsk Hydro[22]	NHY.OL	Neutral	N/A	NKr35.67	10 Oct 2016
Petra Diamonds Ltd	PDL.L	Buy	N/A	147p	10 Oct 2016
Potash Corporation of Saskatchewan Inc.[6b, 7, 13, 16]	POT.N	Buy	N/A	US$15.98	07 Oct 2016
Randgold Resources[16]	RRS.L	Buy	N/A	7,065p	10 Oct 2016
South32 Limited[18]	S32.AX	Buy (UR)	N/A	A$2.42	10 Oct 2016
Southern Copper[16]	SCCO.N	Buy	N/A	US$26.22	07 Oct 2016
Vale[16]	VALE.N	Sell	N/A	US$5.57	07 Oct 2016
Whitehaven Coal Limited[4]	WHC.AX	Neutral	N/A	A$2.72	10 Oct 2016

Source: UBS. All prices as of local market close.
Ratings in this table are the most current published ratings prior to this report. They may be more recent than the stock pricing date

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