



# Commodities Quarterly

## OPEC: Chop Chop

**Commodities As An Asset Class:** Commodities have fallen from the top to the bottom of the asset class league table during the third quarter. However, commodity volatility risk premium strategies have bucked the trend and posted strong gains this year.

**Energy:** We look for a seasonal pick up in oil product demand, a cold winter and OPEC production cuts as requirements to prevent a more dramatic slump in the crude oil price. We see strong natural gas production growth continuing with Northeast infrastructure completions in Q4 dampening the price outlook, although inventory levels are likely to remain somewhat below normal.

**Precious Metals:** The gold outlook remains clouded by our assessment that US real yields, the US dollar and the S&P500 will all post further advances heading into next year. However, we still view physical fundamentals in the PGM complex as healthy and consequently see fresh price highs ahead.

**Industrial Metals & Materials:** The sector has displayed resilience in the face of US dollar strength. Of the group we expect nickel, lead and zinc will be the outperformers particularly since these markets have a relatively low exposure to the Chinese property market.

**Bulk Commodities:** In many instances, prices have fallen below marginal cost of production. However, producer cost containment has delayed the necessary quantum of supply cuts needed for a price recovery.

**Agriculture:** While there is an absence of obvious catalysts to drive agricultural prices higher currently, we believe the strong rebound in agricultural production has pushed prices in grains and soybeans into territory that is starting to look cheap.

### OPEC: Chop Chop



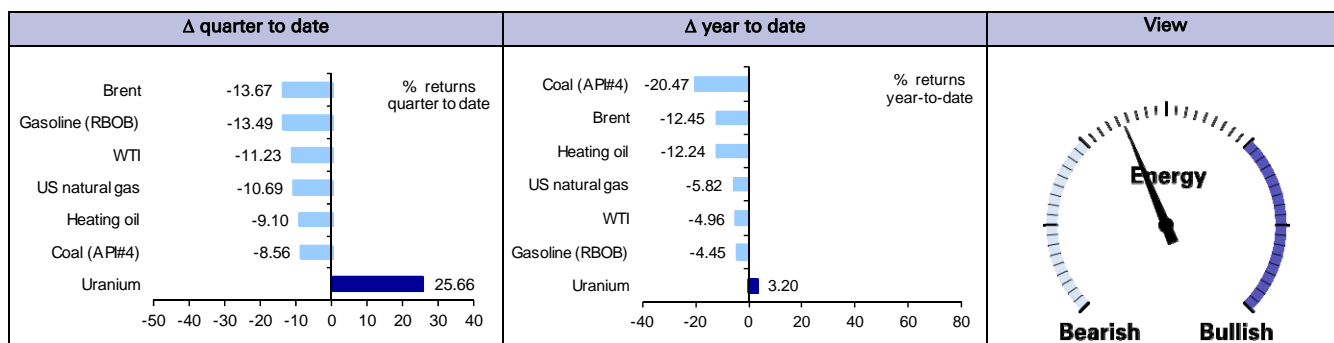
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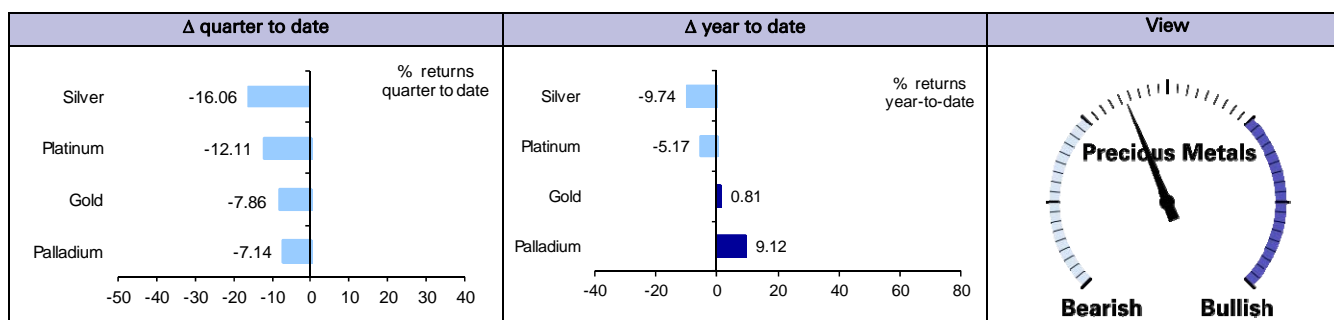


## Commodity Performers

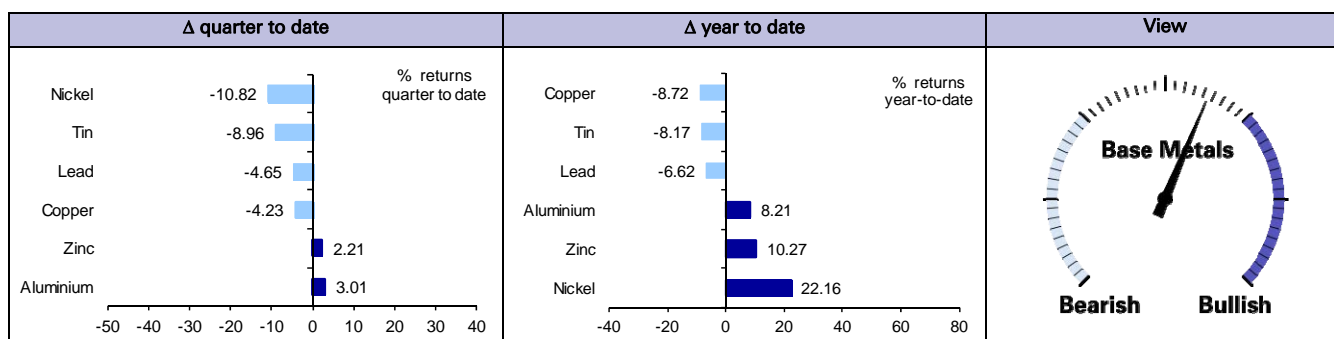
### Energy



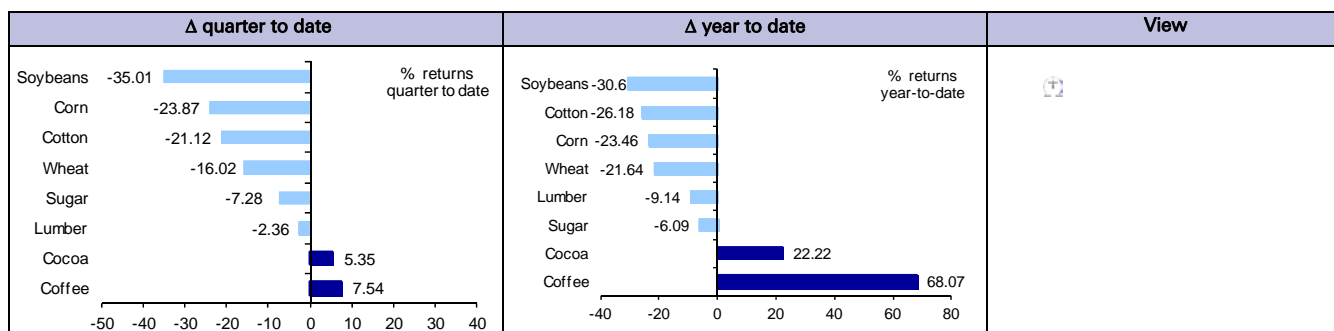
### Precious Metals



### Industrial Metals



### Agriculture



Sources: Deutsche Bank, Bloomberg Finance LP (Prices as of close of business Friday September 26, 2014. Dials refer to the current quarter)

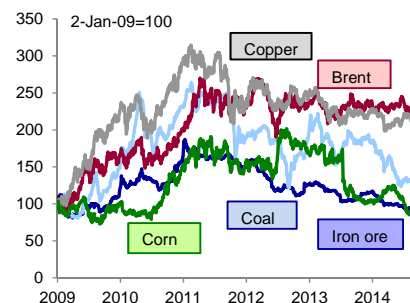


## #1 Executive Summary

### OPEC: Chop Chop

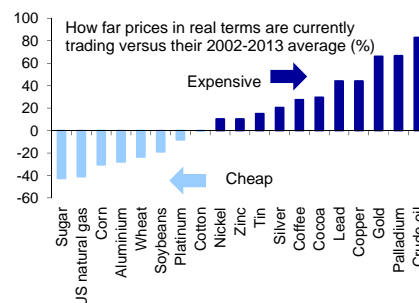
- **Bulks and agricultural commodities have led the charge lower in commodity prices during the third quarter of this year.** Weakness is now spreading into the energy and metals markets. We believe OPEC production cuts and the vigour of world growth will be the deciding factors as to whether further losses across these sectors will take hold.
- **The appearance of contango in the Brent forward curve is a clear example of the rapid deterioration in physical fundamentals in the oil market.** OPEC will need to chop production over the next year to prevent a more dramatic decline in the oil price. Given our upbeat world growth assumptions for 2015, OPEC action to defend the oil price will most likely succeed.
- **In contrast, the level of backwardation in WTI and the tight discount of WTI to Brent indicate a tighter fundamental picture in the US oil market.** One way to continue this trend would be if the US government removed the crude oil export ban. However, pipeline expansions in the US, which will deliver additional crude oil into Cushing, threatens to dissolve the current strength in the WTI market.
- **Strong US natural gas production growth and above-normal summer injections have led us to shift our price outlook lower.** We expect infrastructure completions of pipeline and compressor stations in Q4 will allow greater volumes of Marcellus production to reach market, while declines in the Haynesville will be slower going forward.
- **In the recent absence of major strikes or weather events, the major risks to the thermal coal price outlook are regulatory in nature.** Most notably, the Chinese policy to ban low-quality coal and an Indonesian requirement for exporters to register for licenses are shifting Pacific Basin balances.
- **A new long term uptrend in the US dollar is now firmly entrenched and will continue to pose risks to large parts of the commodities complex.** On our reckoning we are only half way through the current US dollar cycle in duration and magnitude terms. As a more hawkish Fed emerges, this will push interest rates, equities and the US dollar higher and conspire to drive gold prices lower.
- **It has been a mixed performance across the PGM complex with rhodium and palladium the star performers.** We continue to be constructive to this part of the precious metals complex given healthy underlying demand and the prospect of market deficits and falling inventories over the years ahead.
- **Industrial metals have been remarkably resilient to the strengthening US dollar.** However, in the event of any growth setbacks this sector will become increasingly vulnerable. Of the group we expect nickel, lead and zinc will be the most resilient particularly since these markets have a relatively low exposure to the Chinese property market.
- **Grain and soybean prices have fallen to their lowest levels in over four years.** Prices are responding to a strong recovery in global agricultural production. However, positioning and sentiment indicators suggest the sector may be oversold and trading cheap. We are therefore on alert for factors that could push prices higher. This may have to wait until 2015 as models have downgraded the chance of a strong El Niño event this winter.

Figure 1: Bulks & grains lead the move lower in commodities



Source: Deutsche Bank, Bloomberg Finance LP

Figure 2: Valuing commodities in real terms



Source: Deutsche Bank, Bloomberg Finance LP

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## #2 Trade Recommendations

### Event Risks For Commodities

#### ■ **How to play an OPEC quota reduction announcement:**

The last time the cartel announced a quota reduction was in December 2008. An analysis of national budget breakevens for member countries outlines the parameters of the debate which will take place when the next OPEC meeting convenes in November. Already, two of the lowest-breakeven countries (Kuwait and the UAE) and have spoken out against a premature adjustment to the quota, while the country with the highest breakeven (Iran) has urged decisive action to keep oil prices from falling further. Historically speaking, there is a relationship between the 1st to 12th month Brent contango and OPEC supply adjustments which indicates that a OPEC quota reduction is now overdue. Furthermore, comments from the OPEC secretary general strongly hint at the likelihood of OPEC production averaging 500 kb/d lower in 2015. Given the historical success of OPEC in supporting oil prices whenever global growth is relatively strong (above 2.5%, versus our 2015 forecast of 4.0%), this suggests that the level of the Brent front-end contango is likely to subside and move closer to backwardation, and that the decline in long-dated prices is likely overdone.

#### ■ **How to position for a cold northern hemisphere winter:**

US natural gas provides the most focused play on a colder-than-normal northern hemisphere winter, particularly because storage levels remain below normal despite a very strong summer injection season. If stocks finish where we expect in the first week of November at 3,543 bcf, this would be the lowest percentage of working gas capacity (76%) since 2002. In a cold scenario this would emerge as a supply weakness, particularly if the cold is positioned in the early part of the winter.

Yet the prompt to winter spread finished September at unusually low level of USD0.23/mmBtu, well below the 2001-2013 average of USD0.75/mmBtu, which suggests the market is positioned for a continued surplus of production in the context of a normal-to-mild winter. Finally, short positioning by non-commercial traders in natural gas has risen steadily over the year and is now at the highest level since March 2011.

The March-April spread is historically the most sensitive to colder-than-normal winter weather as falling gas inventories create the possibility of lower storage deliverability, and thus rapidly raise expectations for a tight March supply-demand balance in comparison to April.

#### ■ **In the event of the US lifting the crude oil export ban:**

A reversal of the US crude oil export ban has been argued as sensible given the US position on the benefits of free trade, and because of the boost it would give to the US balance of trade and the long-run sustainability of US oil production.

Viewed on a long historical timeline, the spread between WTI and Brent has more typically been positive as a result of the US being the marginal demand market for crude oil, and gasoline being the primary oil product demanded. In the old world, WTI would then set the marginal price, and Brent would price at a discount to allow for the transportation spread.

A lifting of the crude oil export ban would shrink the WTI discount relative to Brent but not restore a premium to WTI, in our view, since Asia now represents the marginal barrel of crude demand rather than the US. With the US gasoline deficit now shrinking, the marginal barrel of US exported crude could very well



be refined outside the US and the resulting products marketed internationally as well. The WTI discount to Brent could then shrink to the transport differential of \$2/bbl, very much below the current \$10/bbl represented by the 2015 forward curve.

■ **Positioning for divergent central bank policy**

In October we expect the Fed will finally terminate its programme of asset purchases. This will prepare the market for a rate hike in the first six months of next year. In contrast, we expect the ECB will announce public QE over the same period. This will mean divergent real interest rate spread developments between the US and Euro area which will be US dollar bullish and long term bearish for gold. Over the past 20 years, the US dollar has typically rallied by between 5-10% in the six to nine months before the Fed embarks on a new tightening cycle.

■ **How to exploit a more pronounced slowdown in the Chinese property market**

Since the Chinese property sector comprises 30% of steel demand, the most obvious route to play this theme would be short iron ore. However, we believe this offers limited upside, given the 42% price decline that has already taken place this year. We prefer being long metals which have limited exposure to this sector, and short those metals which have relatively more exposure. Consequently we recommend long nickel versus short copper.

Copper is more exposed to the China property sector versus nickel, and the supply side dynamics for nickel are also more favourable. Nickel inventories in laterite ore and metal have remained stubbornly high, but we think the physical tightness in nickel will emerge in 2015, as the high grade laterite ore stockpiles in China start to diminish.

In addition we recommend a long zinc exposure. Like nickel, zinc also has limited exposure to the China residential property market. Moreover supply remains constrained in the near term through a combination of poor Chinese smelter profitability, weak Chinese mined production growth, and from the beginning of next year mine closures outside of China.

■ **What happens on a strengthening El Niño?**

Agriculture returns are on course to post their worst annual returns performance since 2008. We believe positioning and sentiment indicators imply the sector may have moved into oversold territory. We are therefore on alert to possible catalysts that will trigger a price recovery. The most obvious near term threat would be a strengthening El Niño event. While this would imply a mild northern hemisphere winter, it could trigger powerful supply losses in Australia (wheat) and China (soybeans).

However, recent weather models have been downgrading the strength of an El Niño event this winter. Consequently we believe we will have to wait until early next year and as expectations for crop conditions for the 2015-16 crop year start to be revealed.

*The Commodities Research Team*



### #3 Commodity Indices

#### Volatility Risk Premium Strategies Buck The Trend & Power Ahead

- Long only and enhanced beta strategies have all suffered heavy losses over the past quarter and since the end of 2013. However, alpha strategies and specifically indices that extract the volatility risk premium across commodity markets have performed strongly.
- We see structural reasons why volatility risk premium strategies will continue to perform, most notably in the energy sector but also in the form of a diversified basket strategy.
- We believe energy returns will remain vulnerable heading into the fourth quarter. However, a more constructive market could emerge if OPEC initiated production cuts and a cold winter assisted in a more robust seasonal pick up in oil demand.
- In the absence of a US slowdown, we believe precious metals returns will continue to move lower. This will be based on further advances in US real yields, the US dollar and the S&P500. However, like agriculture there is some risk that gold has currently moved into oversold territory.
- Although industrial metal returns fell in the third quarter, the sector has so far failed to succumb to the extreme losses posted in the energy and agricultural sectors. However, we expect the sector will become vulnerable to US dollar strength if it is accompanied by any signs of a weakening in Chinese and US real economy data.
- As the threat of an El Niño event has faded over recent weeks, the main supportive factors for the agricultural sector are positioning and sentiment indicators which suggest the sector may have moved into oversold territory.
- Since the end of last year, the only commodity sector that has contributed positively to overall index returns has been livestock. This is a rare event since over the last decade this sector has posted positive annual returns only 20% of the time.

In the three months to September benchmark index returns have posted their worst quarterly performance since June 2012. Not only did all the five broad commodity sectors post negative returns over this period, but it has also pushed commodities from being the best to the worst performing asset class by the end of the third quarter. Losses since the end of June have been concentrated in the agricultural and energy sectors, with the decline in the SPGSCI agricultural sub-index representing the worst quarterly performance since the end of 2008 at the height of the financial crisis.

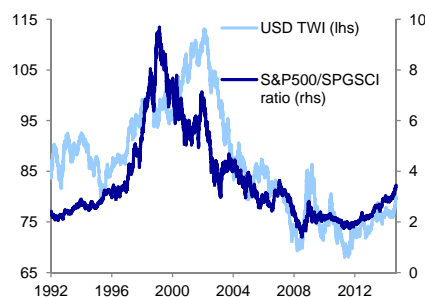
Part of the problem for index returns recently has been the strengthening in the US dollar. Since our forecasts see US dollar strength continuing for the next few years, this is likely to be a strong headwind for commodity returns. Indeed, relative to equities, commodities are likely to under-perform in this environment, Figure 2. This will not only affect the appeal of commodities but it will most likely mean that the asset class will have to compete more aggressively for risk capital.

Figure 1: Excess returns in 2014

(USD terms)	Δ MTD	Δ QTD	Δ YTD	Sharpe
DBLCI-OY Balanced	-6.47	-10.85	-7.42	-1.38
DBLCI-OY Diversified	-5.86	-10.80	-7.34	-1.05
DB Booster	-5.88	-10.70	-5.48	-1.04
DBLCI-Mean Reversion	-7.76	-11.13	-9.11	-1.59
DBLCI-MR Enhanced	-7.13	-11.92	-4.02	-0.78
DBLCI-MR Plus	-0.41	-1.57	-2.85	-1.99
DBLCI Backwardation Long	-4.27	-8.66	-5.94	-0.49
<b>Risk factors</b>				
DB Commodity Curve Alpha Lite	0.31	0.90	1.09	1.41
DBLCI Backwardation Alpha	1.51	-1.27	-4.90	-0.66
DBLCI Momentum Alpha	1.36	1.73	-1.95	-1.13
<b>SPGSCI sector performance</b>				
Energy	-4.34	-11.55	-6.61	-0.48
Industrial	-5.86	-2.58	-1.39	-0.07
Precious	-6.12	-9.26	-0.52	-0.63
Agriculture	-10.94	-19.34	-18.02	-1.83
Livestock	5.47	-1.27	19.36	1.53
<b>Performance of other benchmark indices</b>				
SPGSCI	-4.68	-11.21	-6.16	-0.71
BCOM	-5.84	-11.47	-5.22	-0.83

Sources: Deutsche Bank, Bloomberg Finance LP  
(Figures are cob September 25, 2014. Sharpe ratios are calculated on a YoY basis)

Figure 2: Equities vs. commodities & the USD TWI

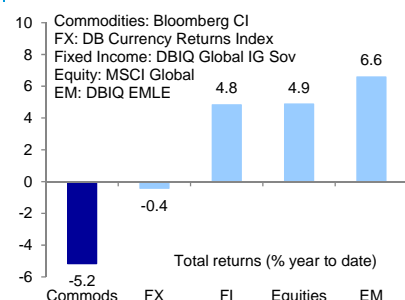


Source: DB Asset Allocation Research, Bloomberg Finance LP



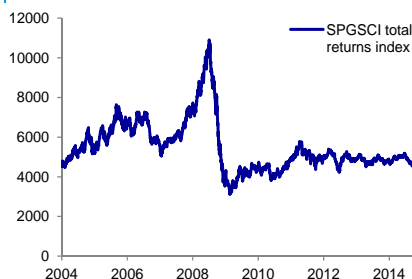


Figure 3: 2014 asset class returns compared



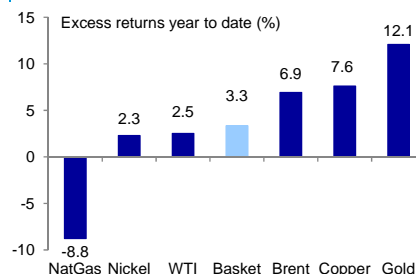
Source: Deutsche Bank, Bloomberg Finance LP (26-Sep-14)

Figure 4: Performance of the SPGSCI



Source: Deutsche Bank, Bloomberg Finance LP

Figure 5: 2014 volatility risk premia strategies compared



Source: Deutsche Bank (Data as of 26-Sep-14)

While long only benchmark returns have struggled, the performance of certain alpha strategies has been more impressive. Indeed volatility risk premium strategies have delivered returns in excess of 10% in certain cases, Figure 5. Volatility risk premium strategies are focused on the difference between the realized and implied volatility across asset classes and the routes to isolate and capture this risk premium.

While in equity markets the implied vol premium is driven mainly by institutional investors purchasing downside protection, in commodity markets the main drivers are commodity consumers and producers buying options to hedge their commodity price exposure. The existence and persistence of a volatility risk premium exists because of a lack of natural sellers of options.

Figure 6 examines the implied versus realised volatility premium across various commodities across different time periods. We believe commodity hedging strategies and hedge ratios may explain the difference of the volatility risk premium across various different commodity markets. We find that the risk premium is particularly rich in the energy sector and specifically in Brent crude oil. Since hedging is more prevalent in the energy sector, this might help to explain why the premium is rich in this sector.

Of the commodities where a transparent implementation of the strategy is possible, Brent, WTI, gold, copper, nickel and US natural gas exhibit historical risk/return characteristics. However, we find that a diversified basket has historically displayed better risk-adjusted returns than an individual strategy.

Figure 6: Measuring the 3M implied volatility risk premium by market

	Implied vs. realised premium (long-term)*	Implied vs. realised premium (since 2010)
Brent crude oil	5.52%	6.67%
WTI crude oil	3.30%	4.84%
Natural Gas	3.19%	1.23%
Aluminium	1.32%	1.65%
Copper	0.93%	4.02%
Nickel	1.40%	2.72%
Gold	1.10%	0.84%
Silver	-0.55%	-0.98%

Sources: Deutsche Bank, Bloomberg Finance LP

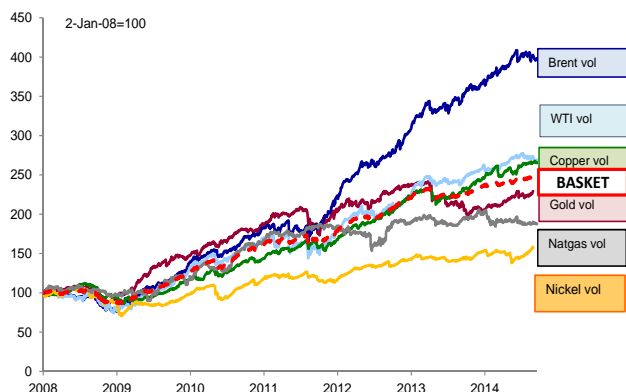
Figure 7: A diversified basket typically delivers better risk-adjusted returns

	Gold	Brent crude oil	WTI crude oil	Copper	Nickel	Natural Gas	Basket
Ann. Return	10.98%	23.51%	16.12%	14.03%	5.33%	16.12%	14.99%
Ann. Volatility	12.59%	12.92%	15.02%	8.34%	9.42%	14.65%	7.00%
Sharpe Ratio	0.87	1.82	1.07	1.68	0.57	1.10	2.14
Max Drawdown	-25.0% (May-07 to Oct-08)	-27.4% (Dec-07 to Dec-08)	-30.0% (Sep-07 to Dec-08)	-23.14% (Jul-08 to Feb-09)	-34.91% (Mar-06 to Jan-09)	-18.30% (Jun-08 to Jun-09)	-16.89% (Aug-08 to Jan-09)
Recovery Time (months)	5.9	4.6	7.1	9.1	14.4	1.5	4.9
Data since	Jan-07	Dec-07	Dec-06	Dec-05	Dec-05	Dec-06	Dec-07

Sources: Deutsche Bank, Bloomberg Finance LP

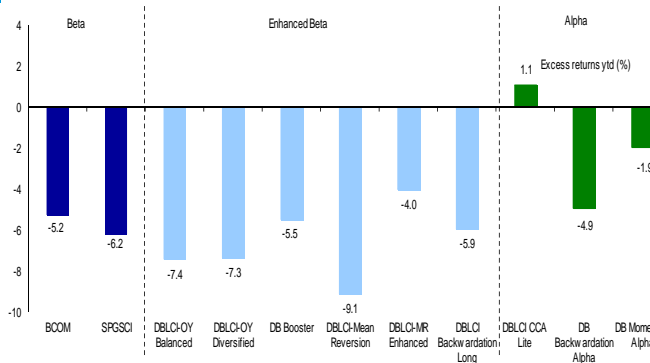


Figure 8: A diversified volatility risk premium basket typically delivers better risk-adjusted returns



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 9: 2014 commodity index scorecard



Sources: Deutsche Bank, Bloomberg Finance LP

Indeed diversifying across several commodities has historically reduced maximum drawdowns and dampened the volatility of the index. This is due to the fact that index drawdowns are often a result of sharp underlying price movements, which are unlikely to occur in all commodities at the same time. For example, the sharp gold price correction in April 2013 or the price jump in Brent crude oil in June 2014.

### Conclusion

While there may be some signs that the sell-off in commodity returns may have entered overextended territory during the third quarter we see any correction in precious metal returns will be short-lived since the adjustment in US interest rates and the US dollar are set to continue into 2015.

While weakening physical fundamentals in the crude oil market are bearish, we see a number of bullish factors. We would view OPEC production cuts as the most bullish and would expect this would not only help to stabilize crude oil price but would help to eliminate contango in the Brent forward curve. In our view, losses in the agricultural sector are drawing to a close but catalysts to drive sector returns noticeable higher are absent for the time being.

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## #4 Global Macro

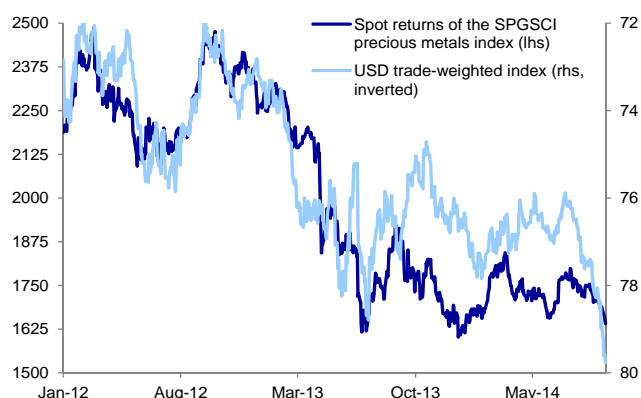
### Fighting A US Dollar Upswing

- Economic growth remains uneven around the world. We expect the US offers the best prospects for a sustained recovery, while the revival in export growth in China may help to dispel fears following the weak industrial production report that the country can still meet the government's 7.5% GDP growth target. However, of most concern is the Euro area, where growth is unlikely to break much above 1% this year or next.
- Subdued commodity demand growth and in many instances strong supply growth, most notably in the energy and agricultural sectors, are pushing many commodity prices to multi-year lows.
- Indeed downside risks to oil demand growth are occurring at a time of rapid non-OPEC supply growth. On our estimates, the imbalance between global oil demand and non-OPEC supply will continue for the next two years.
- In order to prevent a more dramatic decline in the oil price, we expect OPEC will be forced into action to cut production. History suggests such action has a high rate of success in environments where world GDP growth is above 2.5%.
- We expect a new long term uptrend in the US dollar will also pose contagion risk to commodity markets. We view precious metals and energy as most vulnerable to a strengthening dollar. However, in the event that global growth numbers fail to improve, then we expect the recent out-performance of industrial metal prices will be difficult to sustain.
- On our assumptions, gold will continue to face ongoing headwinds heading into next year. This is based on further advances in the S&P500, US real interest rates and the US dollar.
- While we expect silver prices will be dragged lower by losses in the gold market, we are surprised by the extent of silver's under-performance relative to gold. In the event that US manufacturing sector confidence and the US equity market remain strong, we would expect this under-performance will prove short-lived. Indeed following the recent liquidation in speculative length, the positioning environment for silver is improving.
- The strong rebound in global agricultural production over the past few months has pushed food prices to fresh four year lows. As the market has downgraded the prospect of a strong El Niño event this winter, the risk of a supply induced price spike has also receded.
- However, positioning and sentiment indicators suggest the sector may be moving into oversold territory and as a result prices in the next crop year may be starting to under-price supply side risks over a one to two year horizon.

Across many commodity markets, physical fundamentals have deteriorated rapidly over the past few months. This has been most acute in the crude oil and agricultural markets, but financial forces have also been working against parts of the precious metals complex. Perhaps the biggest external threat to the complex is the US dollar, which over the past few months has been staging a more convincing rally against the G10 currencies.

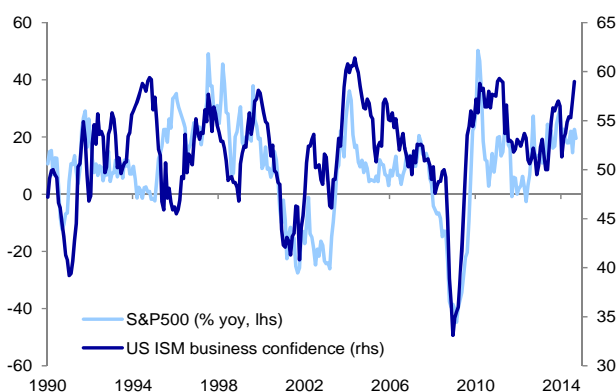


Figure 1: Precious metal prices & the US dollar



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 2: US ISM index & the S&P500



Sources: Deutsche Bank, Bloomberg Finance LP

Since 1973 the US dollar has displayed long run cycles of rising and falling for extended periods of time. On average bull runs in the US dollar last around six years and from trough to peak the dollar typically rallies by around 34%. Since the current rally began in July 2011 and the US dollar trade-weight index has strengthened by approximately 18% over this period, one can consider that we are only half way through the current cycle.

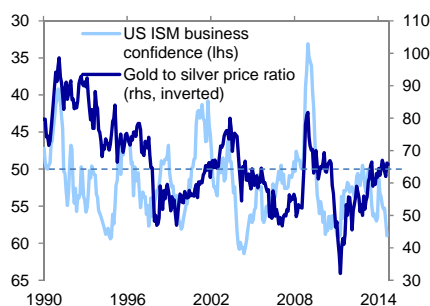
We believe the latest decline in gold prices towards the USD1,190/oz lows hit at the end of last year, have been triggered not just by a turn higher in US real interest rates and a falling equity risk premium, but also a more rapid appreciation in the US dollar, Figure 3. Not until the adjustments in these markets are complete do we expect a more constructive environment for gold to emerge.

Just as further gains in the US dollar are expected heading into next year, we expect the US equity market is also set to move higher compounding the problems for gold. This reflects the fact that the level of the ISM index is closely tied to year-on-year changes in the S&P500. Given the recent surge in US business confidence, the S&P500 still has some room to rise to reflect the ISM index hitting its highest level since February 2011, Figure 2. In addition, the US electoral cycle should also be beneficial to the domestic equity market. We find that US mid-term elections have typically delivered gains of 8% during the quarter of the elections and these gains have continued into the early months of the following year.

As we outline in the Precious Metals section of this report, what comes as a surprise to us is the under-performance of silver relative to gold in an environment where US growth indicators are improving. Figure 3 reveals the gold to silver price ratio has been rising steadily over the past few years to reach its highest level since August 2010. In our view, this is at odds with the rise in US business confidence and either commodity markets are overplaying downside risks to global growth or the US equity market is moving into significantly over-extended territory and ripe for a correction.

One could also argue that the nickel to gold price ratio is another commodity ratio that is portraying a dismal global growth outlook and consequently at odds with the strength in global equity markets. Historically, turning points in the nickel to gold price ratio has been a reliable guide to the global growth cycle and hence the US Treasury yield, Figure 4.

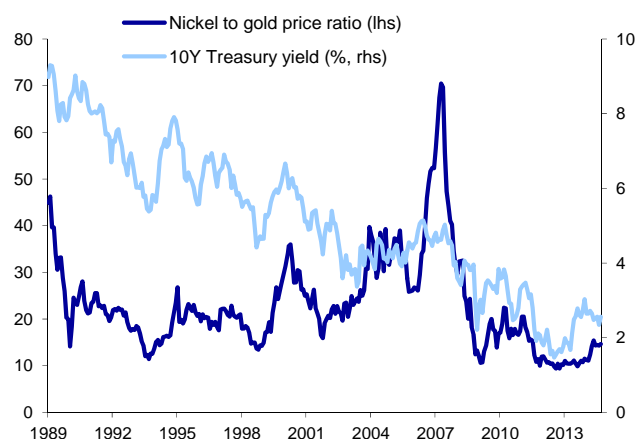
Figure 3: US ISM index & the gold to silver price ratio



Source: Deutsche Bank, Bloomberg Finance LP

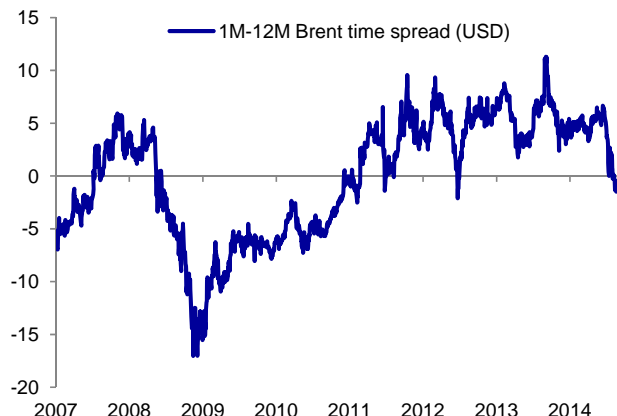


Figure 4: The reflation ratio & the US Treasury yield



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 5: The Brent forward curve's move into contango



Sources: Deutsche Bank, Bloomberg Finance LP

We find that in environments where global growth is under attack, nickel prices tend to underperform gold. This reflects the importance of nickel in steel production, which has tended to be coincident indicator for global industrial production growth. Moreover, when global growth is weakening central banks are typically easing monetary policy, real interest rates, the US dollar and the US equity market are declining all of which are beneficial to the gold price. As a result, the dismal recovery in the nickel to gold price ratio part of which would have been triggered by the Indonesian export ban, suggests a very weak backdrop to commodity demand growth globally.

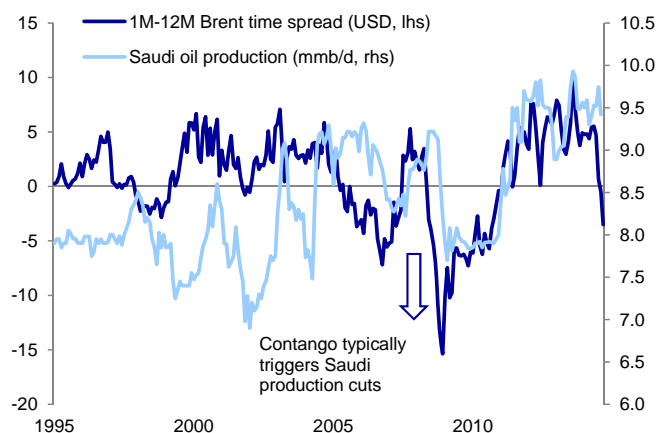
Another sign of weak commodity fundamentals is the rapid appearance of contango in the Brent forward curve, Figure 5. We believe there have been several factors responsible for driving the Brent forward curve into contango over the past two months. These have included easing concerns of a disruption to Iraqi oil production, European refinery run cuts, a recovery in Libyan crude oil production, strong North American crude oil production displacing West African crude and softer Asian demand.

We view contango not only as a sign of an increasingly oversupplied crude oil market, but, that OPEC has lost control of the physical oil market. As a result, if contango is sustained, we would expect OPEC will be increasingly inclined to take action and cut production to restore backwardation to the crude oil market.

Figure 6 examines the relatively close relationship between Saudi oil production and the Brent forward term structure. We find that a flattening in the Brent term structure and at the extreme the appearance of contango has prompted OPEC and more specifically Saudi Arabia to cut production, in an attempt to withdraw oil from the market and tighten supply-demand fundamentals. In the past such efforts have proved successful, with periods of contango tending to be relatively short in duration. It is only when world growth slumps below 2.5% does OPEC struggle to stabilize oil prices and restore backwardation. Since we expect global GDP growth to accelerate towards 4% next year, we believe OPEC is in a strong position to restore order to the crude oil market.

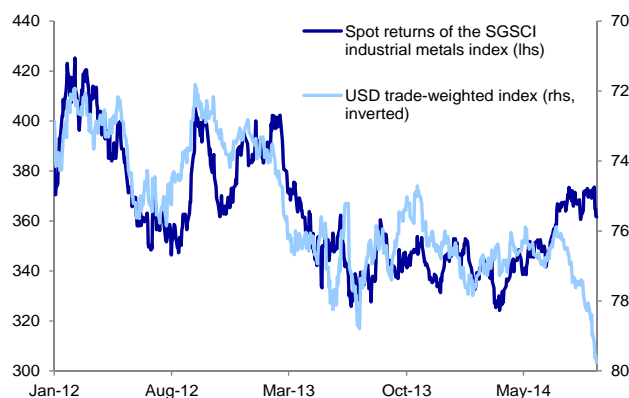


Figure 6: OPEC production & the Brent time spread



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 7: Industrial metal prices & the US dollar



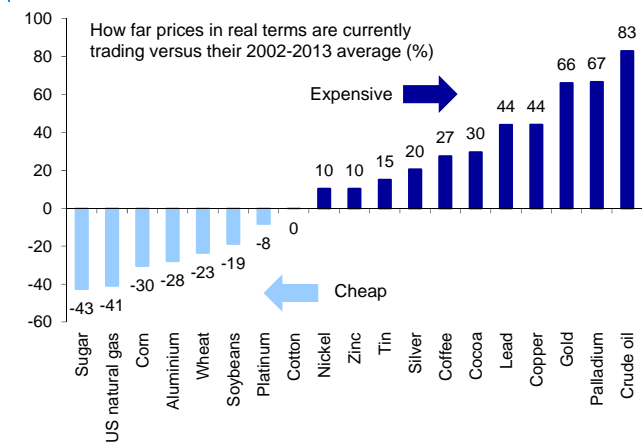
Sources: Deutsche Bank, Bloomberg Finance LP

We have shown in the past that while industrial metals are at risk from a strengthening US dollar, the sector is also highly sensitive to the performance of world growth. However, Figure 7 provides a sobering warning to the industrial metals sector. Namely that in the event that real economy data releases disappoint, most notably in the US and China, the industrial metals sector is increasingly vulnerable from a currency perspective.

Moreover a more pronounced slowdown in the Chinese property market also poses downside risks to steel and industrial metals demand. However, we are maintaining our relatively bullish view on industrial metals and specifically nickel, zinc and lead. Not only do these markets have a relatively limited exposure to the Chinese property sector, but we expect supply side dynamics to encourage inventory drawdown in response to deficits in these markets. In contrast, we expect a recovery in mined supply will push the copper market into surplus in the final quarter of this year.

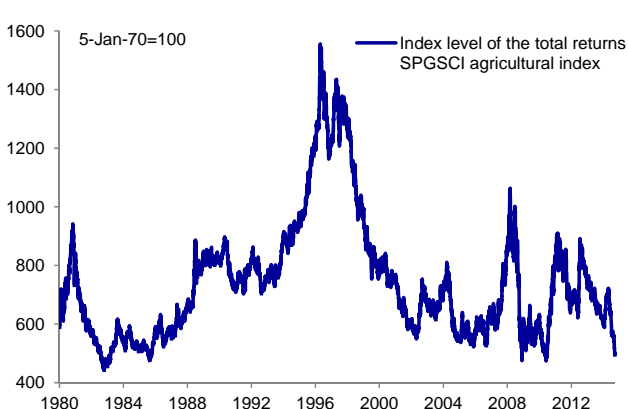
Alongside the decline in oil prices and the implicit boost to growth this implies, inflation figures are also being pressured lower by falling food prices. In many markets, agricultural prices are trading at their lowest levels in over four years.

Figure 8: Valuing commodity prices in real terms



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 9: Index level of the SPGSCI agricultural index



Sources: Deutsche Bank, Bloomberg Finance LP



However, there are signs that the agricultural sector may be moving into oversold territory and trading cheap on a valuation basis. Not only has the speculative community cuts its aggressive length in the sector over the past few months, most notably in sugar but also corn, but in some markets the speculative community has built large net short positions, for example in wheat and soybeans. When measured in real terms, we also find that many agricultural commodities are trading significantly below their long run historical averages in real terms, Figure 8.

From an index perspective, the SPGSCI total returns agricultural index has fallen by approximately 18% in the first nine months of this year. As a result, the sector is on course to post its worst annual returns performance since 2008. This weakness has been triggered by a powerful rebound in agricultural production. Indeed in the US the current and prospective crop years are on course to be the best years in terms of US corn production on record. Since weather models have downgraded the prospect of an El Niño event this has reduced the risks of a supply disruption, for example in lowering Australian wheat or Chinese soybean production.

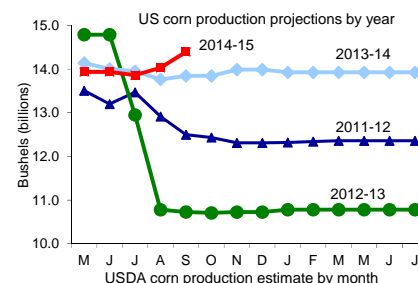
### Conclusion

We believe a large part of the move lower in commodity prices during the last quarter has been linked to US dollar strength alongside strong supply growth in a number of markets such as iron ore, crude oil and grains. Since we believe we are only halfway through the latest upswing in the US dollar in both magnitude and duration terms we are on alert for further price declines across commodities.

We believe this will be most relevant for the precious metals complex and specifically gold heading into next year. However, we expect losses in the crude oil complex can be arrested by OPEC production cuts which we believe will become increasingly urgent. We are maintaining our relatively bullish outlook for industrial metals and specifically nickel, lead and zinc. However, the sector has been remarkably resilient to US dollar strength and in the event of any growth disappointments most notably in China this sector is vulnerable. While there is an absence of obvious catalysts to drive agricultural prices higher currently, we view the sector as moving into territory that can be considered oversold and cheap.

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Figure 10: US corn production upgrades for 2014-15



Source: Deutsche Bank, Bloomberg Finance LP



## #5 Crude Oil

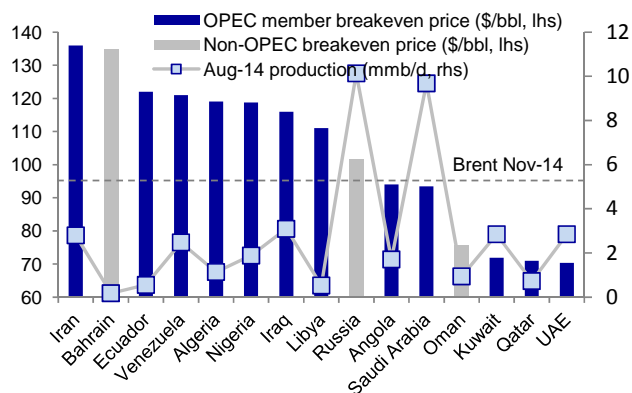
### Crude Oil Contango & OPEC Action

- There is room for debate over exactly what sequence of events will lead to a curtailment of supply from OPEC and Saudi Arabia in the next year, as well as questions over what price levels will be regarded as sufficiently problematic to trigger a quota reduction. We suggest that in addition to flat prices, it may be informative to watch front-end contango as a risk factor for OPEC action.
- Brent front-end contango is likely to persist as long as disruption risks remain quiescent in Libya and Iraq, at least until the completion of refinery turnarounds in November. This suggests that prices are likely to cause increasing discomfort for producers given the strains it starts to imply for national budgetary requirements.
- US tight oil appears to be the element of the supply picture most capable of supporting prices based on breakeven costs for new development as well as response times. In the event of a failure of OPEC to respond promptly to oil price declines, we note that 9% of 2015 US tight oil production would become uneconomic at USD90/bbl and 39% at USD80/bbl (Brent equivalent).
- The WTI-Brent spread has remained stubbornly tight around the USD4/bbl level. Meanwhile the decline in Cushing inventories since May 2013 has halted. We continue to expect pipeline completions from the fourth quarter of this year and into 2015 are likely to bring incremental production volumes into Cushing and widen the WTI-Brent spread.

### Overview

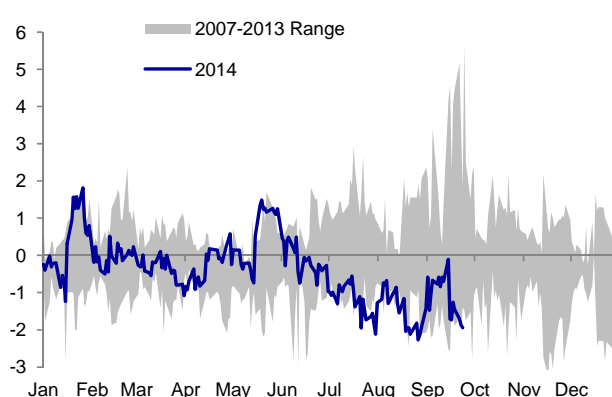
The decline in oil prices has brought Brent towards the lower end of what OPEC ministers have described as comfortable, and also below the national budget breakevens for a number of OPEC member countries. For the time being, public statements by oil ministers in Saudi Arabia, Kuwait and UAE indicate no need for an emergency meeting, and regard any suggestion of a quota cut as premature. Interestingly, these countries are among those occupying the lower end of the national budget breakevens, Figure 1. By contrast, Iran with the highest breakeven has been vocal in speaking out for more decisive action. In any case, it seems fair to say that the market will be particularly watchful over comments from oil ministers leading up to the OPEC meeting on 27 November.

Figure 1: Producer country budget breakeven prices



Source: DB Emerging Markets Research, Reuters, IEA, Deutsche Bank

Figure 2: Brent Spot-Front Month spread (\$/bbl)



Source: Bloomberg Finance LP, Deutsche Bank





We would also note that there have been instances when material supply adjustments have been carried out in the absence of any quota change, most recently in the case of Saudi Arabia adjusting output in response to Libyan production.

The forward curve in Brent both on the Spot to Front Month (Figure 2) and 1st to 12th month (Figure 4) indicates that the market is in oversupply, and forward estimates of the call on OPEC run on an upward trajectory through 2016. While we have noted the likelihood of some support to the market come November (*Higher Refining Margins To Drive End-Year Demand*, 18 Sep 2014), the broader backdrop of rising non-OPEC supply remains firmly in place.

#### OPEC sensitivities

The downward trend in oil prices has been supported by at least three fundamental factors in our view: the quelling of the risk premium for supply disruption, rising Libyan production despite an unresolved conflict, continued strength in US production reducing demand for West African crude, and refinery maintenance schedules removing demand in September and October.

OPEC secretary general Abdullah al-Badri has stated that both OPEC production and its overall quota would likely fall by 500 kbd in 2015. This fits with our estimates that average OPEC production in the year-to-date of 30.1 mmb/d would need to fall to 29.6 mmb/d in 2015 and 29.3 mmb/d in 2016 to accommodate further growth in total non-OPEC supply of 1.2 mmb/d in 2015 and 1.3 mmb/d in 2016, led by the US at 1.0 mmb/d in yoy growth. If the entire adjustment were borne by Saudi Arabia, it would imply Saudi production falling from 9.7 mmb/d in August to average 9.2 mmb/d in 2015 and 8.9 mmb/d in 2016 (including its share of Neutral Zone production), and likely at least 0.3 mmb/d lower than that if Libyan production is maintained at 0.8 mmb/d as currently reported.

This also implies a rise in OPEC spare capacity from 4.2 mmb/d to at least 5.1 mmb/d in 2015 assuming no further increase in Libyan and Iraqi production, and as much as 6.0 mmb/d assuming IEA forecasts for Libyan and Iraqi production growing to 1.16 mmb/d and 3.87 mmb/d, respectively.

However, front-month Brent still rests within that the range of acceptable prices described by Saudi Oil Minister al-Naimi as “\$100, \$110, \$95” which casts doubt on the immediacy with which Saudi Arabia would reduce production and exports. In addition, the Saudi deputy oil minister Prince Abdulaziz suggested that no supply adjustment is forthcoming as long-term fundamentals remain robust, and short term price fluctuations hold little importance.

Therefore it may be more informative to examine curve structure as a signal for OPEC action. Historically there has been a good deal of association between changes in the structure of the Brent curve and contraction and expansion in Saudi oil production, Figure 4. Based on this assessment one could argue that the fall in Saudi production from 9.5 mmb/d in June 2014 to 9.42 mmb/d in August has lagged the decline in the Brent structure over the same period from \$5.5/bbl to -\$2.5/bbl.

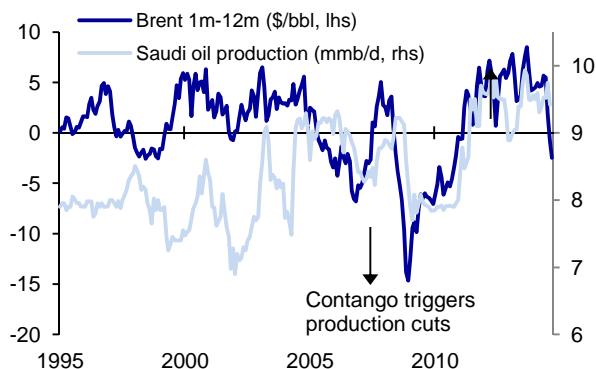
Figure 3: DB oil price forecast

	WTI (USD/bbl)	Brent (USD/bbl)	WTI- Brent Spread (USD/bbl)
2013	98.01	108.74	-10.74
Q1 2014A	98.61	107.87	-9.26
Q2 2014A	102.99	109.76	-6.77
Q3 2014E	99.00	105.50	-6.50
Q4 2014E	94.00	103.00	-9.00
2014E	98.65	106.53	-7.88
Q1 2015E	93.00	104.00	-11.00
Q2 2015E	93.00	104.00	-11.00
Q3 2015E	92.00	103.00	-11.00
Q4 2015E	91.00	102.00	-11.00
2015E	92.25	103.25	-11.00
2016E	89.25	100.75	-11.50

Source: Deutsche Bank

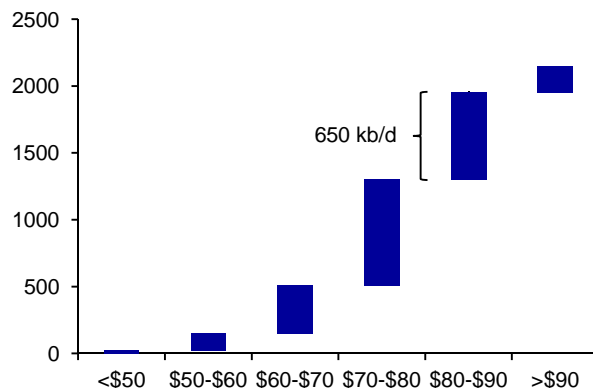


Figure 4: Brent structure and Saudi production



Source: Bloomberg Finance LP, IEA, Deutsche Bank

Figure 5: 2015 US tight oil production by incentive price (kb/d)

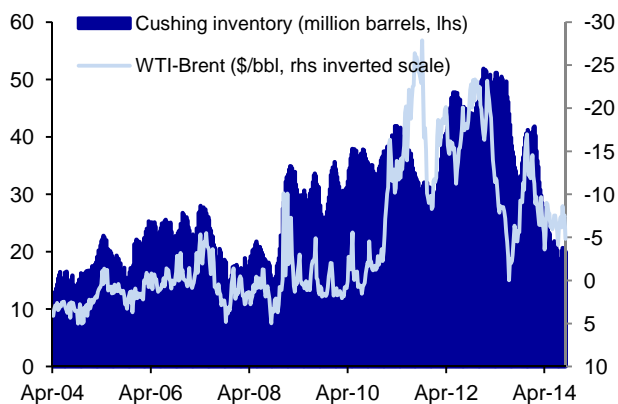


Source: Wood Mackenzie, Deutsche Bank

### Production cost support

While we would expect an OPEC quota reduction to occur before any non-OPEC supply curtailments, it has been suggested that OPEC may refrain from immediate cutbacks in order to assess the price sensitivity of US tight oil production. In this unlikely event we would regard US production to be more price responsive than higher-priced (when measured on investment breakevens) Russian or Canadian supply because of shorter drilling contracts. Although the weighted average cost of US tight oil is USD72/bbl, close to 200 kb/d (or 9%) of 2015 expected production would not attract new investment below USD90/bbl, and a further 650 kb/d would become unattractive between USD80-USD90/bbl, Figure 5.

Figure 6: Cushing inventory and WTI-Brent spread



Source: Bloomberg Finance LP, EIA, Deutsche Bank

### WTI-Brent

We expect that Q4 will be an active quarter for US pipeline capacity being brought online, with net capacity rising into Cushing, Oklahoma. The incoming flows should help to restore inventories as upstream feeder pipelines come online through 2015 and thereby relieve upside pressure on WTI and widen its discount to Brent, in our view.



Cushing storage remains at 20 million barrels which has raised concerns over whether supply could be rationed if operational minimums for the facility are reached. Estimates vary as to what that minimum level would be, but operators have indicated that it may be as low as 10%. With Cushing, OK net available shell storage capacity reported at 80,955 thousand barrels as of March 2014, this suggests that we are still some way above the implied tank minimum of roughly 8 million barrels.

The supply sources for new pipelines or pipeline expansion projects will be the Canadian oil sands in Alberta, the Bakken formation of the Williston Basin in Montana and North Dakota, and the Denver-Julesburg Basin straddling Colorado, Nebraska and Wyoming. While supply feeding the Pony Express will arrive largely by rail or truck, some proportion of the supply impact may be gradual owing to delays in the commissioning of upstream feeder pipelines. Thus, infrastructure builds largely drive our view of a widening in the WTI-Brent discount.

**Figure 7: Pipelines and expansions leading into or out of Cushing, OK**

Pipeline or expansion phase	Start	End	Capacity (kb/d)	Completion	
Seaway reversal (Phase 1)	Cushing, Oklahoma	Freeport, Texas	150	Jun-12	Drawing from Cushing
Seaway expansion (Phase 2)	Cushing, Oklahoma	Freeport, Texas	250	Jan-13	
Keystone Gulf Coast	Cushing, Oklahoma	Nederland, Texas	700	Jan-14	
Seaway twin (Phase 3)	Cushing, Oklahoma	Freeport, Texas	450	Oct-14	
Flanagan South	Patoka, Illinois	Cushing, Oklahoma	600	Oct-14	Feeding into Cushing
White Cliffs expansion	Platteville, Colorado	Cushing, Oklahoma	76	Aug-14	
Pony Express	Guernsey, Wyoming	Cushing, Oklahoma	230	Oct-14	
Double H	Dore, North Dakota	Guernsey, Wyoming	50-100	Q4-14	Upstream supply lines
Alberta Clipper Phase 1	Hardisty, Alberta	Superior, Wisconsin	120	Jul-15	
Alberta Clipper Phase 2	Hardisty, Alberta	Superior, Wisconsin	230	Jul-15	

Source: Deutsche Bank

In October, the 600 kb/d Flanagan South (from Illinois to Cushing) will feed into the new Seaway Twin expansion (450 kb/d, beginning mid-October) from Cushing into the Gulf Coast. Thus there is a net possible capacity upturn of 150 kbd of Canadian oil sands production into Cushing sometime in October. This adds to the incremental 76 kb/d from the White Cliffs Pipeline expansion which became operational in August and feeds from the Denver-Julesburg Basin. Finally, the Pony Express (230 kb/d) pipeline began linefill in August and is expected to begin commercial shipments in October, moving Bakken crude from Wyoming to Cushing.

This gives a possible total of 456 kb/d of incremental Cushing supply in Q4, although some degree of utilisation may depend on the completion of the Double H pipeline (50 kb/d) from North Dakota to Wyoming (to help fill Pony Express, originally planned for August) and the Alberta Clipper expansion (350 kb/d in two stages, from Alberta to Wisconsin) which has now been delayed to 2015.

The key risk is a loosening of the export restrictions surrounding US crude oil production, which would create new demand and likely tighten the spread considerably from the -\$10-11/bbl showing on the 2015 forward curve. At the moment there are no clear indications of any such plans.

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Figure 8: Global oil supply & demand, 2006-2017

Unit: Million bbl/day	2006	2007	2008	2009	2010	2011	2012	2013	2014E	2015E	2016E	2017E	ANNUAL AVERAGE RATE		
													'00-05	'05-10	'10-15
<b>CONSUMPTION</b>															
OECD Americas	25.7	25.9	24.6	23.7	24.2	24.0	23.6	24.1	24.1	24.2	24.1	24.1	1.2%	-1.3%	0.0%
USA	20.7	20.7	19.5	18.8	19.2	18.9	18.5	19.0	19.0	19.1	19.0	19.0	1.1%	-1.6%	-0.1%
OECD Europe	15.7	15.5	15.5	14.7	14.7	14.3	13.8	13.6	13.5	13.4	13.3	13.3	0.6%	-1.4%	-1.8%
Germany	2.6	2.4	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	-1.1%	-1.2%	-0.7%
OECD Asia-Pacific	8.7	8.6	8.3	7.9	8.1	8.1	8.5	8.3	8.3	8.2	8.2	8.2	-0.1%	-1.7%	0.2%
Japan	5.2	5.0	4.8	4.4	4.4	4.4	4.7	4.5	4.4	4.3	4.2	4.2	-0.7%	-3.5%	-0.6%
<b>TOTAL OECD</b>	<b>50.2</b>	<b>50.1</b>	<b>48.4</b>	<b>46.3</b>	<b>47.0</b>	<b>46.4</b>	<b>45.9</b>	<b>46.1</b>	<b>45.9</b>	<b>45.8</b>	<b>45.6</b>	<b>45.5</b>	<b>0.8%</b>	<b>-1.4%</b>	<b>-0.5%</b>
FSU	4.1	4.1	4.2	4.0	4.2	4.5	4.6	4.7	4.8	4.8	4.9	5.0	0.6%	1.6%	2.8%
Europe	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	4.2%	-0.8%	-0.1%
China	7.2	7.6	7.8	7.9	9.0	9.4	9.8	10.1	10.4	10.7	11.2	11.7	7.8%	5.9%	3.6%
Other Asia	9.2	9.8	9.6	10.2	10.9	11.2	11.6	11.9	12.0	12.4	12.7	12.9	2.9%	4.0%	2.7%
Latin America	5.2	5.3	5.7	5.7	6.1	6.2	6.4	6.6	6.8	6.9	7.0	7.1	1.2%	3.8%	2.6%
Middle East	6.1	6.4	6.9	7.2	7.3	7.5	7.7	7.9	8.1	8.3	8.5	8.8	4.5%	4.4%	2.6%
Africa	2.9	3.1	3.3	3.5	3.6	3.6	3.8	3.8	3.9	4.1	4.3	4.4	3.5%	4.3%	2.5%
<b>TOTAL NON-OECD</b>	<b>35.4</b>	<b>37.1</b>	<b>38.1</b>	<b>39.3</b>	<b>41.7</b>	<b>43.1</b>	<b>44.6</b>	<b>45.7</b>	<b>46.6</b>	<b>48.0</b>	<b>49.3</b>	<b>50.7</b>	<b>3.6%</b>	<b>4.1%</b>	<b>2.8%</b>
<b>GLOBAL OIL DEMAND</b>	<b>85.6</b>	<b>87.1</b>	<b>86.5</b>	<b>85.6</b>	<b>88.7</b>	<b>89.5</b>	<b>90.5</b>	<b>91.7</b>	<b>92.5</b>	<b>93.7</b>	<b>94.9</b>	<b>96.1</b>	<b>1.8%</b>	<b>1.0%</b>	<b>1.1%</b>
<b>SUPPLY</b>															
OECD Americas	13.9	13.8	13.4	13.6	14.1	14.6	15.8	17.2	18.8	19.6	20.6	21.5	-0.4%	0.3%	6.9%
USA	7.0	7.0	7.0	7.4	7.8	8.1	9.2	10.3	11.7	12.7	13.4	14.0	-2.5%	1.9%	10.3%
Mexico	3.7	3.5	3.2	3.0	3.0	2.9	2.9	2.9	2.8	2.7	2.7	2.8	1.8%	-4.7%	-2.0%
Canada	3.2	3.3	3.2	3.2	3.3	3.5	3.7	4.0	4.2	4.3	4.5	4.7	2.2%	1.8%	5.3%
OECD Europe	5.3	5.0	4.7	4.5	4.1	3.8	3.5	3.3	3.1	3.1	3.0	2.8	-3.6%	-6.1%	-5.7%
North Sea	4.8	4.6	4.3	4.1	3.8	3.4	3.1	2.9	2.7	2.7	2.5	2.3	-3.9%	-6.4%	-6.5%
Other OECD	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3	-7.6%	2.0%	-8.7%
<b>TOTAL OECD</b>	<b>19.8</b>	<b>19.5</b>	<b>18.8</b>	<b>18.8</b>	<b>18.9</b>	<b>19.0</b>	<b>19.9</b>	<b>21.0</b>	<b>22.3</b>	<b>23.0</b>	<b>23.8</b>	<b>24.4</b>	<b>-1.6%</b>	<b>-1.3%</b>	<b>4.0%</b>
FSU	12.3	12.8	12.8	13.3	13.6	13.6	13.7	13.9	13.9	13.8	13.9	13.8	8.2%	2.7%	0.3%
Non-OECD Europe	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-3.4%	-1.8%	-1.0%
China	3.7	3.7	3.8	3.8	4.1	4.1	4.2	4.2	4.2	4.3	4.3	4.4	2.2%	2.3%	0.9%
Other Asia	3.8	3.7	3.7	3.7	3.7	3.7	3.6	3.5	3.4	3.5	3.5	3.4	0.1%	-0.5%	-1.4%
Latin America	3.6	3.6	3.7	3.9	4.1	4.2	4.2	4.2	4.3	4.5	4.7	4.9	1.9%	3.5%	1.9%
Middle East	1.7	1.7	1.7	1.7	1.8	1.7	1.5	1.4	1.3	1.3	1.3	1.2	-3.3%	-1.0%	-6.2%
Africa	2.5	2.6	2.6	2.5	2.5	2.5	2.2	2.3	2.3	2.3	2.4	2.4	4.4%	0.5%	-1.6%
<b>TOTAL NON-OECD SUPPLY</b>	<b>27.8</b>	<b>28.2</b>	<b>28.4</b>	<b>29.0</b>	<b>29.9</b>	<b>29.9</b>	<b>29.5</b>	<b>29.5</b>	<b>29.6</b>	<b>29.8</b>	<b>30.2</b>	<b>30.2</b>	<b>3.8%</b>	<b>1.9%</b>	<b>-0.1%</b>
<b>PROCESSING GAINS</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.1</b>	<b>2.1</b>	<b>2.1</b>	<b>2.2</b>	<b>2.2</b>	<b>2.2</b>	<b>2.2</b>	<b>2.3</b>	<b>1.3%</b>	<b>1.2%</b>	<b>1.3%</b>
<b>GLOBAL BIOFUELS</b>	<b>0.8</b>	<b>1.0</b>	<b>1.4</b>	<b>1.6</b>	<b>1.8</b>	<b>1.9</b>	<b>1.9</b>	<b>2.0</b>	<b>2.1</b>	<b>2.2</b>	<b>2.3</b>	<b>2.4</b>	<b>17.3%</b>	<b>23.9%</b>	<b>3.9%</b>
<b>TOTAL NON-OPEC SUPPLY</b>	<b>50.4</b>	<b>50.7</b>	<b>50.6</b>	<b>51.4</b>	<b>52.7</b>	<b>52.9</b>	<b>53.3</b>	<b>54.7</b>	<b>56.3</b>	<b>57.4</b>	<b>58.7</b>	<b>59.5</b>	<b>1.4%</b>	<b>1.1%</b>	<b>1.7%</b>
<b>*TOTAL SUPPLY</b>	<b>85.5</b>	<b>85.6</b>	<b>86.7</b>	<b>85.6</b>	<b>87.4</b>	<b>88.6</b>	<b>90.9</b>	<b>91.4</b>					<b>1.9%</b>	<b>0.6%</b>	
<b>OECD STOCK CHANGE</b>															
Industry	0.25	-0.24	0.32	0.01	0.06	-0.28	0.19	-0.19							
Government	0.22	-0.31	0.32	-0.10	0.07	-0.20	0.16	-0.22							
	0.03	0.07	0.01	0.10	-0.01	-0.08	0.03	0.03							
<b>OPEC NGLS</b>	<b>4.2</b>	<b>4.3</b>	<b>4.5</b>	<b>5.1</b>	<b>5.5</b>	<b>5.9</b>	<b>6.2</b>	<b>6.3</b>	<b>6.4</b>	<b>6.7</b>	<b>6.8</b>	<b>6.8</b>	<b>7.0%</b>	<b>5.8%</b>	<b>3.9%</b>
<b>**Other &amp; Balance</b>	<b>-0.34</b>	<b>-1.28</b>	<b>-0.07</b>	<b>0.04</b>	<b>-1.39</b>	<b>-0.56</b>	<b>0.13</b>	<b>-0.11</b>	<b>-0.38</b>	<b>-0.46</b>	<b>-0.28</b>	<b>-0.38</b>			
<b>OPEC CRUDE OIL</b>	<b>30.9</b>	<b>30.7</b>	<b>31.6</b>	<b>29.1</b>	<b>29.2</b>	<b>29.9</b>	<b>31.3</b>	<b>30.5</b>					<b>2.0%</b>	<b>-1.0%</b>	
<b>***IEA's Call on OPEC Crude</b>	<b>31.0</b>	<b>32.2</b>	<b>31.4</b>	<b>29.1</b>	<b>30.5</b>	<b>30.7</b>	<b>31.0</b>	<b>30.8</b>	<b>29.9</b>						
<b>***DB's Call on OPEC Crude</b>								<b>30.8</b>	<b>29.9</b>	<b>29.7</b>	<b>29.4</b>	<b>29.8</b>			
<b>Brent (1st Month) USD/bbl</b>	<b>66.10</b>	<b>72.66</b>	<b>98.52</b>	<b>62.67</b>	<b>80.34</b>	<b>110.91</b>	<b>111.68</b>	<b>108.70</b>	<b>106.28</b>	<b>103.25</b>	<b>100.75</b>	<b>105.00</b>			
<b>WTI (1st Month) USD/bbl</b>	<b>66.25</b>	<b>72.36</b>	<b>99.75</b>	<b>62.09</b>	<b>79.61</b>	<b>95.11</b>	<b>94.15</b>	<b>98.05</b>	<b>98.40</b>	<b>92.25</b>	<b>89.25</b>	<b>95.00</b>			
<b>WTI-Brent</b>	<b>0.15</b>	<b>-0.29</b>	<b>1.23</b>	<b>-0.58</b>	<b>-0.73</b>	<b>-15.80</b>	<b>-17.53</b>	<b>-10.66</b>	<b>-7.88</b>	<b>-11.00</b>	<b>-11.50</b>	<b>-10.00</b>			

\*Total supply excludes inventory change and other categories. \*\*Other & Balance includes Misc. to balance and Floating Storage. \*\*\*Call on OPEC crude includes stock change and other.  
Source: US DOE/EIA, IEA, Deutsche Bank



## #6 Refining Margins

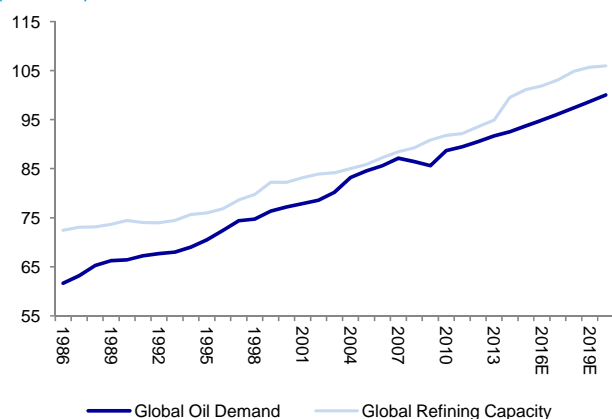
### Downward Pressure on Refining Margins

- We expect a global overcapacity in refined products to put downward pressure on refining margins in the US and Europe. This results primarily from a sustained expansion of refinery capacity primarily in China and the Middle East as countries in these regions seek to increase self-sufficiency, while capacity shrinks in Europe.
- The geographical distribution of capacity changes reflects product demand shifts, as growing Chinese demand for refined products is offset by weakening demand in developed market countries.
- As the global gasoline deficit narrows, we expect the US and Europe to export growing regional surpluses to Asia, Africa and the Middle East. US naphtha surpluses are similarly expected to be imported by Asian economies running regional deficits.
- By contrast, the European deficit in gasoil and diesel products will attract growing imports from the US, Russia and Asia as the global surplus persists.

#### Overview

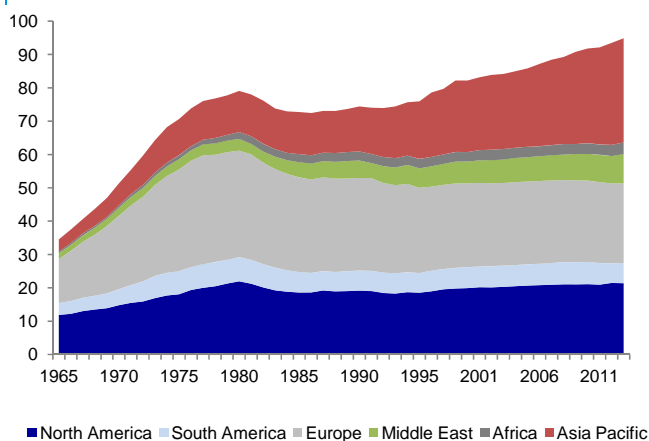
Global oil demand is expected to reach 106 million barrels per day by 2020. This growth is mainly driven by the EM countries whereas demand growth in the developed nations continues to be weak. China is estimated to grow at an average of 4% annually from 2015 onwards and we expect Chinese demand to reach 13.37 mmb/d by 2020. Rising Chinese demand notwithstanding, we believe that surplus capacity and the lack of demand growth for crude and oil products in the developed economies will create pressure on refining profitability in the US and Europe.

Figure 1: Global Oil Demand Vs Refining Capacity (mmb/d)



Sources: IEA, Wood Mackenzie, BP Statistical Review, Deutsche Bank

Figure 2: Global Refining Capacity (mmb/d)



Source: IEA, Wood Mackenzie, BP Statistical Review, Deutsche Bank

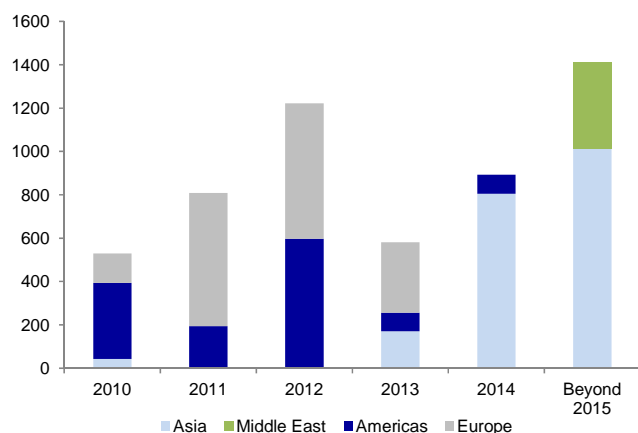
#### Global refinery expansions of 7.6 mmb/d to 2020

Refinery expansion has been rapid in the last decade, largely in Asia followed by the Middle East. According to the BP Statistical Review of World Energy, refining capacity was expanded by 10.7 million barrels between 2003 to 2013, of which 60% were added in China alone. Alongside China, India exhibited capacity growth of 2.02 mmb/d, accounting for 20% of total additions. With refinery expansions continuing at similar rates, we expect 7.9 mmb/d of



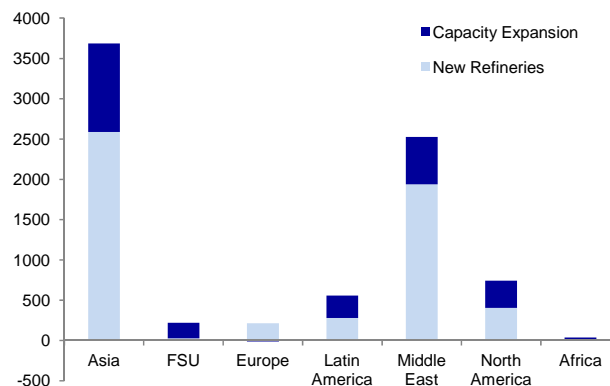
distillation capacity to be added between 2014 and 2020, of which 45% will be in Asia and 33% in the Middle East. China will be adding 2.7 mmb/d of refining capacity from 2014 to 2020 and has dominated capacity additions in the last decade, driven by growth in oil product demand. In addition to the new capacity, many existing refineries in Asia will be upgrading to add complex conversion units for better product yields. Moving forward, the Middle East will also be adding sizeable capacity. Saudi Arabia alone has added approximately 400 kb/d of refining capacity (Jubail) in the past year and will be adding 800 kb/d more (Yanbu and Jazan) by next year. Latin America is set to add 550 kb/d of capacity from 2015 to 2020 contributing 7% to global refinery capacity growth.

Figure 3: Global Refinery Closures (kb/d)



Sources: Wood Mackenzie, BP Statistical Review, Deutsche Bank

Figure 4: Global new refinery capacity additions, 2014-2020 (kb/d)



Sources: Wood Mackenzie, BP Statistical Review, Deutsche Bank

### Refinery closures to occur largely in Europe

While global refining capacity expands, we have also witnessed refinery closures in the recent past. Weak refining margin conditions in Europe have led to a reduction of 1.7 mmb/d of refining capacity in the period 2010-2013. Refinery utilization has remained low in Europe due to poor macroeconomic conditions and weak demand growth. Additionally, although the transport sector accounts for more than half of Europe's oil demand, it competes with coal and natural gas in non-transport sectors. The US and Latin America have also witnessed 1.3 mmb/d worth of refinery closures from 2010-2014, though most of these refineries were converted into terminals for oil storage. Closures in the EM markets were more limited and are mostly attributable to the replacement of older, less-efficient capacity with large modern capacity. Overall, capacity additions over the last 3 years have comfortably exceeded the volume of closures and have exacerbated the global glut in refined oil.

### Regional product balances

On the product side, according to data published by the IEA and Wood Mac, we expect global gasoil/diesel demand to increase by an average of 1.48% per year to reach 29.7 mmb/d in 2020. Gasoline demand is projected to grow at an annual average of 1% to reach of 25 mmb/d in 2020. Most of this growth will be seen in 2015 and 2016.

Based on data provided by Wood Mackenzie on refinery and non-refinery product supply, we expect naphtha, gasoil/diesel and fuel oil to be in global surplus, whereas gasoline is likely to be in a global deficit. Comparing the regional balances for each product, the considerable Asian deficit in naphtha

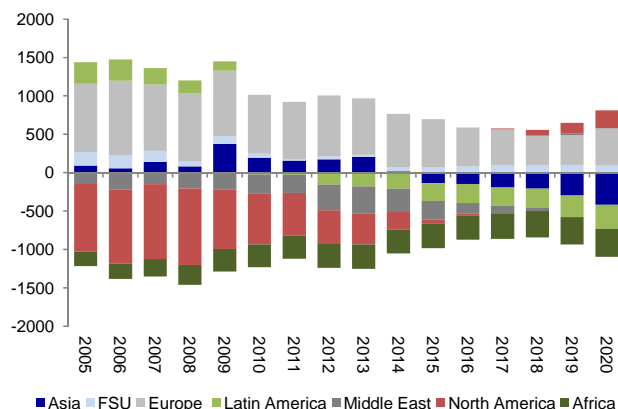




will likely persist in coming years due to strong regional demand for naphtha as a petrochemical feedstock. In contrast, North America has exhibited a surplus of naphtha as increasing low-cost NGL supplies are destroying current demand. We therefore expect North America to emerge as a significant exporter of naphtha to the Asian market.

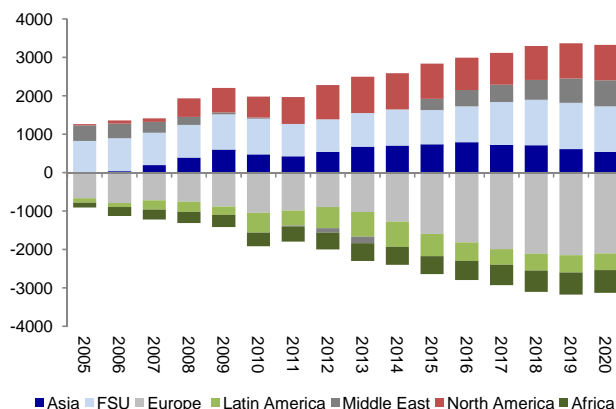
We expect the global gasoline market to remain in deficit as we move closer to 2020. Regionally, balances for gasoline in Europe are set to be in surplus. Declines in gasoline demand in the last two decades, the popularity of diesel cars, and slow economic growth have been the major factors to contribute to this surplus in Europe. North America historically saw deficits in gasoline but will emerge as a surplus region beyond 2017 due to increases in refinery runs. Asia, which was a surplus region until 2013, heads into an increasing gasoline deficit growing stronger each year as we move closer to 2020. Growing refining capacity in Asia is not sufficient to meet the region's growing gasoline demand. Hence, we expect the destination for European gasoline exports will gradually shift from the US East Coast to Asia and Africa by 2017.

Figure 5: Regional Balance for Gasoline (kb/d)



Sources: Wood Mackenzie, BP Statistical Review, Deutsche Bank

Figure 6: Regional Balance for Gasoil/Diesel (kb/d)

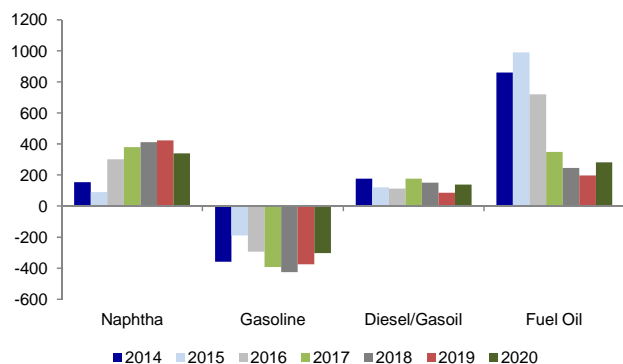


Source: IEA, Wood Mackenzie, BP Statistical Review, Deutsche Bank

The global gasoil/diesel balance, on the other hand, appears to be in surplus. Growth in European distillate demand in the last decade coupled with refinery shutdowns and reduced runs mean that Europe regionally has been in a gasoil/diesel deficit and this deficit is expected to widen as we head towards 2020. The existing Asia gasoil/diesel surplus is expected to grow in the future due to new capacity additions. Capacity additions in Asia over the 2005-2007 period (Reliance) have turned Asia from a diesel deficit region to a diesel surplus region. As capacity continues to grow, we expect this surplus to persist. The Middle East will turn to a net surplus in 2015 when new capacities come online and will emerge as a key exporter to Europe. Russian flows of gasoil/diesel to Europe are expected to remain high but we also expect to see an increase of US and Asian flows of gasoil/diesel to Europe.

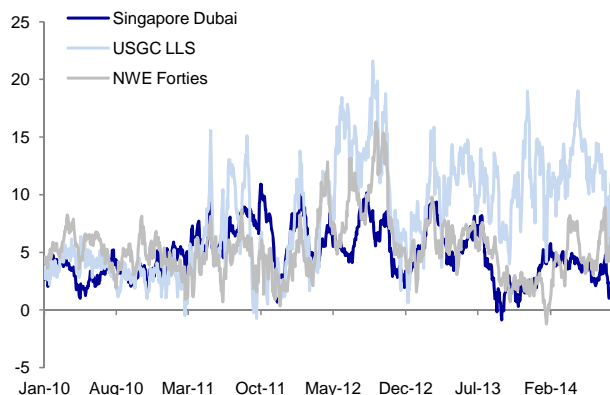


Figure 7: Global Product Balance (kb/d)



Sources: Wood Mackenzie, BP Statistical Review, Deutsche Bank

Figure 8: Global Cracking Refining Margins (\$/bbl)



Source: Platts, Deutsche Bank

### Refining margins will continue to weaken

Although we have seen a recent spike in refining margins recently due to the slump in crude prices, we expect margins to weaken in the next year. For 2015, a 47% or 169 kb/d reduction in deficit levels in gasoline as compared to 2014 will put downside pressure on global gasoline prices for the next year whereas the ongoing surplus in the gasoil/diesel market will continue to keep the gasoil cracks low. We expect a combination of both is likely to weigh down on refining margins for the next year. The weakening refining margin outlook in coming years is unlikely to slow down capacity additions since China and the Middle East are broadly aimed at improving their domestic product self-sufficiency by creating higher-value products. As a result we expect this to create pressure on refining profitability in the developed markets such as the US and Europe.

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## #7 US Natural Gas

### Readjusting For Supply

- Our lowered expectations of the price outlook into 2015 are driven as much by production forecasts being revised upwards as the more comfortable storage situation after a mild summer. On normal weather assumptions we see storage re-entering the 10-year range over the course of the winter, although likely remaining at a deficit throughout 2015.
- Infrastructure completions in the Northeast promise increased capacity to bring new Marcellus production to market through the end of the year. Moreover, rising growth in the Ohio Utica and Permian regions add sizeable contributions while further declines in the Haynesville appear limited.
- The scale of investment in new industrial capacity is considerable, driven by the low cost of feedstock. We expect that the construction of facilities in the Gulf Coast, Ohio Valley and Midwest for the manufacture of petrochemicals and derivatives will add demand of 3 bcf/d by 2017.
- Utility gas demand and LNG export form the other two legs of a strong structural demand growth picture. Fuel-switching away from retiring coal-fired generation is likely to boost utilisation in the gas-fired fleet significantly in 2015, with a cumulative impact of 2.3 bcf/d by 2017.
- Despite our lower price outlook in a seasonally normal weather scenario, upside risks in the event of a colder-than-normal winter are arguably higher than usual given the persistent storage deficit relative to normal.

#### Strength of supply growth tames winter premium

High rates of dry gas production growth have been a consistent trend in the latter part of the summer as storage volumes close the deficit versus average. This stands in sharp contrast with the trend of rising deficits in the latter part of the 2013-14 winter, and lower-than-normal injections observed in Q2-14. Our assessment of the prospects moving forward into 2015 centers around continued strong production growth in Q4 facilitated by infrastructure completions in the Northeast, balanced against a healthy structural demand outlook in the longer term.

Year-over-year production growth averaged 3.8 bcf/d in August, the highest rate of the year thus far. The rate of annual supply growth through the end of August (+2.6 bcf/d) compares favorably with previous years 2006 to 2013 (+1.9 bcf/d), and is above the average since 2006, despite nominal average Henry Hub prices (\$4.6/mmBtu) being below the average since 2006 (\$5.2/mmBtu).

Therefore it may make some sense to interpret the low prompt to Winter spread average of \$0.13/mmBtu in 2014 (relative to the 2001-2013 average of \$1.10/mmBtu) as a reflection of confidence in production growth rather than complacency over storage adequacy. Broadly speaking, supply growth is being incentivized at lower prices than in the past which will likely lead to only moderate upside price moves in response to growing industrial, utility and export demand in the medium term, Figure 2.

We also note that a net short positioning by non-commercial traders (those not engaged in business activities hedged by the use of the futures or options markets) has continued to rise since the start of the year in a nearly unbroken trend and is now near the highs of the year at 181,425 contracts as of 23 September, Figure 3.

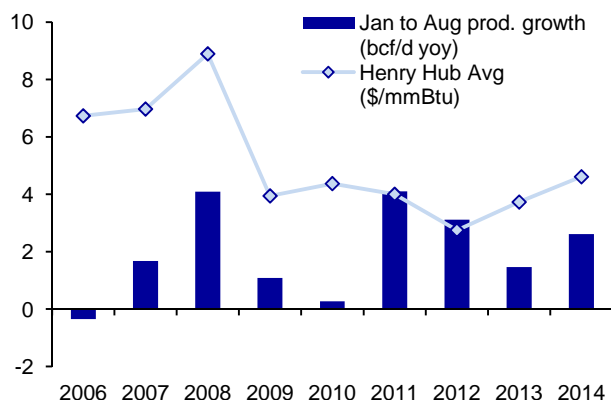
Figure 1: DB natural gas price forecast

	Nymex Gas (USD/mmBtu)	WTI/Gas Ratio
2013	3.72	26.3
Q1 2014A	4.72	20.9
Q2 2014A	4.59	22.4
Q3 2014E	3.94	25.1
Q4 2014E	4.00	23.5
2014E	4.31	22.9
Q1 2015E	4.20	22.1
Q2 2015E	4.00	23.3
Q3 2015E	4.00	23.0
Q4 2015E	4.05	22.5
2015E	4.06	22.7
2016E	4.25	21.0
2017E	4.50	21.1

Source: Deutsche Bank

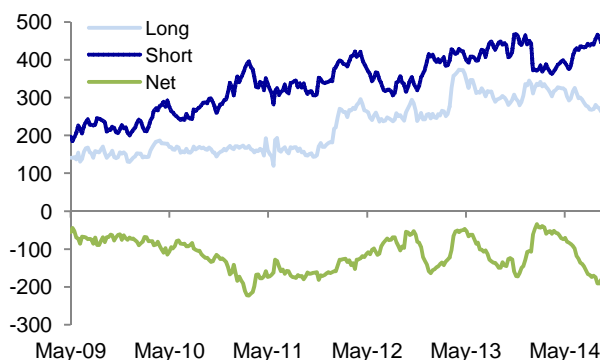


Figure 2: Historical rates of production growth



Source: Bentek Energy, Bloomberg Finance LP, Deutsche Bank

Figure 3: CFTC Non-commercial positioning



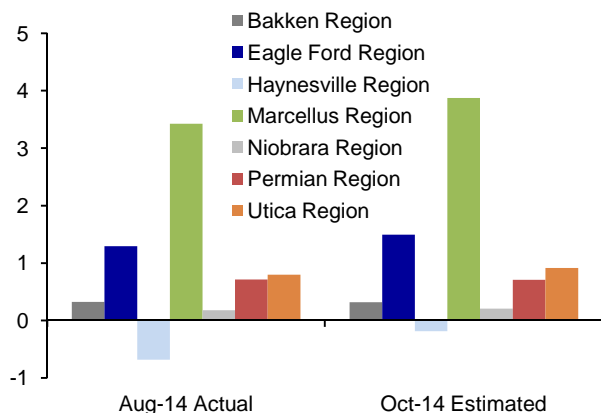
Source: Bloomberg Finance LP, Deutsche Bank

### Infrastructure completions in the Northeast

The commissioning of pipelines and compressor stations feeding new supply into the market from the Northeastern region figures prominently into the picture. Such completions focus primarily on the Marcellus and could add a possible 0.5 bcf/d to the market in November. This includes the impact of the Texas Eastern Appalachia to Market (TEAM) project located mainly in Pennsylvania (0.6 bcf/d capacity) to be finished in November and EQT Midstream's additional compressor at the existing Jefferson station in Pennsylvania (0.6 bcf/d capacity). Further downstream links will deliver this gas to customers through the Rockaway Lateral in New York, Columbia's West Side Expansion into Kentucky, and the Gulf Bi-Direction Project offering backhaul capacity into Louisiana.

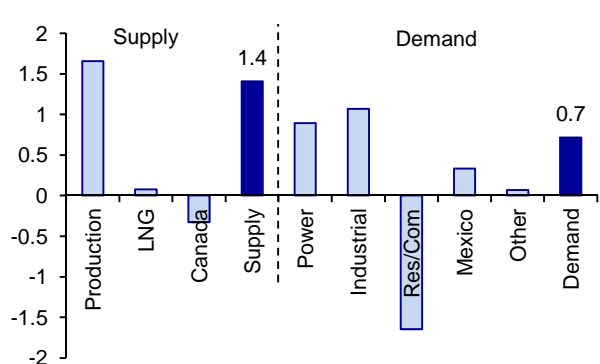
While the Marcellus will continue register the largest growth by unconventional basin, the Ohio Utica will see annual growth rates nearly triple by October from a year ago, while the Haynesville has brought down its rate of decline from -2.5 bcf/d a year ago to a nearly flat -0.2 bcf/d estimated in October. Overall, we expect production growth to generally remain strong, with national dry gas production growth for Q2 and Q3 matching our forecast at 3.2 bcf/d yoy.

Figure 4: Production growth by key regions (bcf/d yoy)



Sources: US EIA, Deutsche Bank

Figure 5: Supply demand assumptions in 2015



Source: US EIA, Deutsche Bank



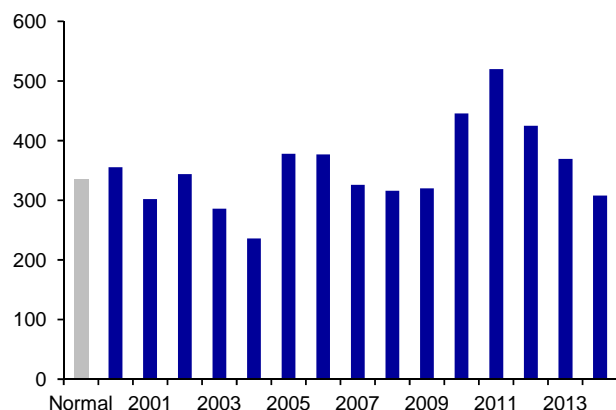
Although producers have generally resisted accelerating development plans in response to higher prices earlier in the year, we expect that prices above \$4.00/mmBtu will continue to drive growth of 1.4 bcf/d yoy in 2015 on top of what has already been a very strong 2014 production year.

Major regions of production growth will continue to be led by the Marcellus, although with a greater emphasis on the southwest portion of the basin where liquids production improves economics. Other major growth areas will include the Ohio Utica, where positive well results have been matched with appropriate investments in gas processing facilities and pipeline capacity, and the Eagle Ford. Associated gas production will also make contributions to growth as producers have focused their efforts mainly on oil plays as demonstrated by oil-directed rig counts which reached new highs in September 2014. Lastly we expect that the Haynesville region will level out around 4.0-4.2 bcf/d through 2017 after sizeable declines in 2013 and 2014 from 6.4 bcf/d in 2012. In the longer term we believe drilling activity could raise volumes here beyond 2017 in response to higher prices.

#### Demand picture bolstered by investments in industrial capacity

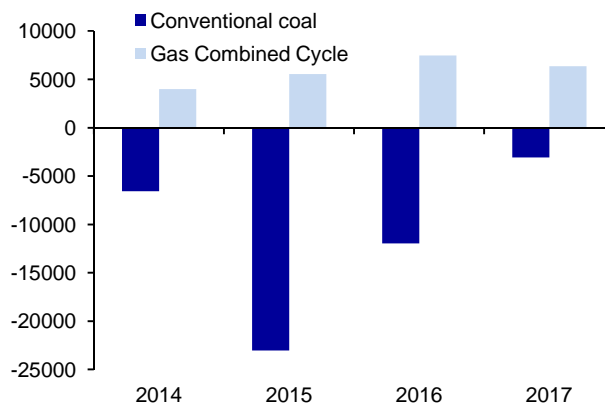
On the demand side, we have raised our expectations for industrial consumption in response to the strong pipeline of incremental capital expenditures of \$62bn through 2020. These investments are driven by the low cost of feedstock and will go towards the construction of facilities in the Gulf Coast, Ohio Valley and Midwest for the manufacture of petrochemicals and derivatives (including methanol, ethylene, propylene, and butadiene), inorganic chemicals and nitrogen-based fertilisers.

Figure 6: US national cumulative CDDs (76F base temperature)



Source: US EIA, Deutsche Bank

Figure 7: US power generation key retirements and new build by year (MWh)



Source: Wood Mackenzie, Deutsche Bank

The bulk of these investments take place over the 2014 to 2017 period with start-up dates clustered over the 2016-2017 period. Consequently we now expect industrial demand to rise steadily from 20.5 bcf/d in 2013 to 24.3 bcf/d in 2017. For more detail on this topic please refer to *Fueling the Next Industrial Expansion* from the Deutsche Bank Oil & Gas E&P equity research team.

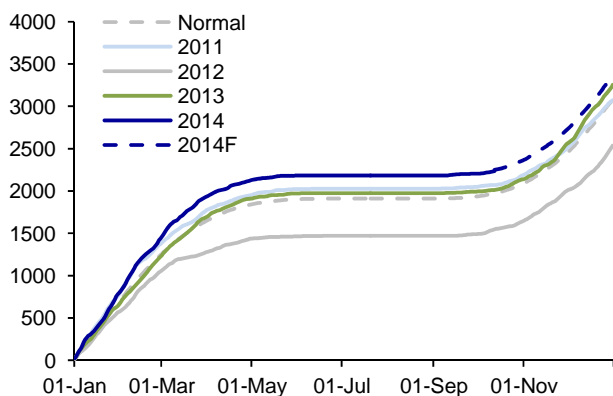
Electric power consumption has fallen in 2014 as a result of the first mild summer since 2009, Figure 6. We expect power demand for gas to rise again in 2015 and 2016 as demand is shifted away from retiring coal-fired generation and into natural gas and renewables. From 2014 through 2017, we expect total retirements of conventional coal capacity of 45GW, matched against new build of gas combined cycle capacity of 23GW, Figure 7. We note that the



impact of these coal-fired retirements is blunted by the fact that the plants in question are among the older, less efficient ones which we estimate were running at only 42% utilisation in comparison to the remainder of coal-fired capacity running at 69% utilisation.

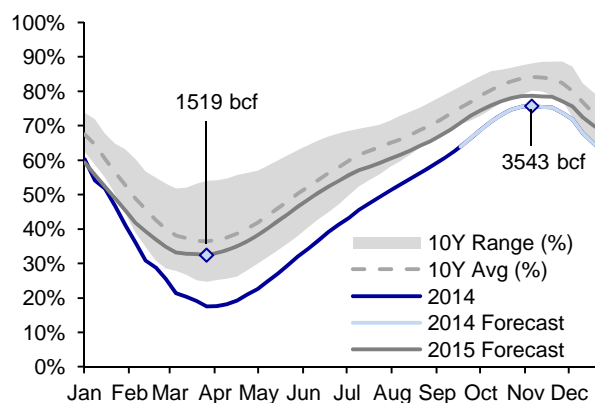
Even so, we estimate that after subtracting the new contribution of solar and wind generation capacity over 2015 to 2017, the gas-fired fleet will likely run at higher utilisations to replace the power supply formerly provided by the lost coal-fired capacity. The added gas-fired capacity plus the increased utilisation rates means that we estimate electric utility demand for natural gas rising by a cumulative 2.3 bcf/d by 2017 in comparison with 2014.

**Figure 8: Cumulative national demand-weighted HDDs (base temperature 61F)**



Source: EarthSat, Deutsche Bank

**Figure 9: US natural gas storage volume (% of working gas capacity)**



Source: US EIA, Deutsche Bank

The coming expansion of LNG liquefaction as a source of demand has been well signalled and should come as no surprise. The first projects to enter operational service will be Cheniere Sabine Pass Phases 1 and 2, with each phase involving two trains of 4.5 mtpa each (0.6 bcf/d), totalling 2.3 bcf/d across both phases. We expect initial volume of 0.6 bcf/d in 2016 ramping up to the full volume of 2.3 bcf/d in 2019. Other projects to enter the market over the 2017 to 2020 period will likely include Freeport, Lake Charles, Cove Point, and Cameron.

Regarding weather, we note that the NOAA Climate Prediction Center expects greater than normal probabilities of warmer-than-normal winter weather across much of the northern US, and colder-than-normal risks confined to a small region of Texas and New Mexico. However, as the risks are moderate (40% chance of cold rather than the neutral 33% probability) we build in only normal weather assumptions going forward through the end of 2014 and into 2015 for heating degree days (HDDs), Figure 8. This would mean that 2014 finishes the year as the coldest since at least 2000.

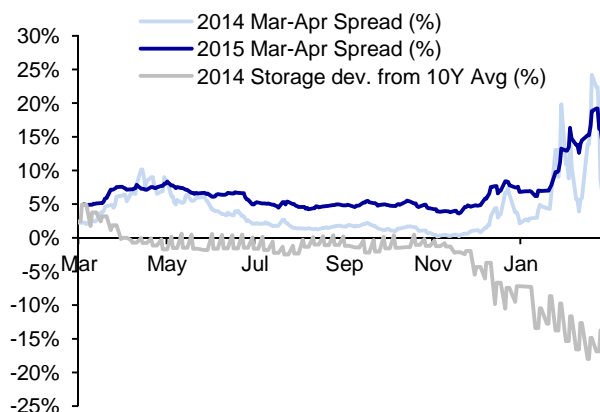
#### Storage likely to be closer to normal ranges by early 2015

As a result of these assumptions we arrive at a trajectory for storage which sees volume re-entering the 10-year range by the end of the year, and approaching normal by the end of March 2015, but remaining below the 10-year average throughout 2015. Clearly this projection will have a wide variability around weather developments, with a still-large sensitivity to colder signals in the early part of the winter as storage remains in a recovery mode.



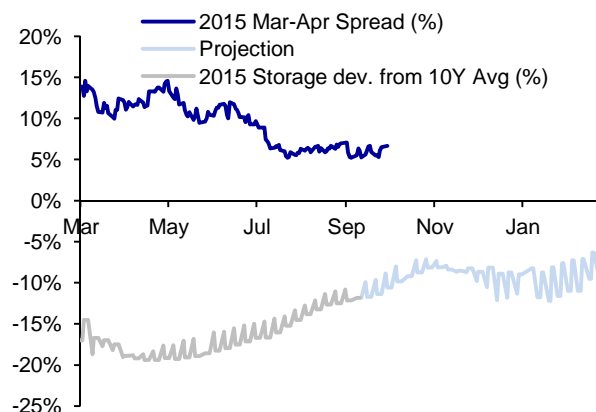


Figure 10: March/April spread as a function of storage deviation from Mar 2013 to Feb 2014



Source: US EIA, Bloomberg Finance LP, Deutsche Bank

Figure 11: March/April spread as a function of storage deviation from Mar 2014 to Feb 2015



Source: US EIA, Bloomberg Finance LP, Deutsche Bank

The most relevant forward spread to watch in relation to the development of storage over the course of the winter will be the March-April 2015 spread which has contracted from 15% since March to a current level of 7% as a result of the mild summer and above-normal injections. On the assumption of seasonal weather we expect the storage deviation to the 10-year average to narrow modestly through the end of the year but remain below average, while a colder-than-normal winter would result in a strengthening of the March premium back towards levels last seen in Q2.

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Figure 12: US natural gas supply & demand

Bcf/day	2012	2013	1Q 2014	2Q 2014	3Q 2014E	4Q 2014E	2014E	1Q 2015E	2Q 2015E	3Q 2015E	4Q 2015E	2015E	2016E	2017E
<b>CONSUMPTION</b>														
Residential	11.3	13.6	28.8	7.4	3.6	15.7	13.9	25.0	7.1	3.6	15.8	12.9	12.9	13.0
Commercial	7.9	9.0	16.4	6.2	4.7	10.3	9.4	14.1	6.0	4.6	10.3	8.8	8.8	8.8
Industrial	19.7	20.5	23.0	20.0	19.8	22.4	21.3	24.0	21.3	21.0	23.3	22.4	23.3	24.3
Electric Power	24.9	22.3	19.7	21.0	26.8	19.8	21.8	20.1	21.7	28.8	20.3	22.7	23.4	24.1
Other	5.9	6.0	6.8	5.9	6.0	6.3	6.2	6.8	6.1	6.0	6.3	6.3	6.4	6.4
<b>Total Demand</b>	<b>69.8</b>	<b>71.4</b>	94.7	60.5	60.8	74.6	<b>72.7</b>	89.9	62.2	64.0	76.0	<b>73.0</b>	<b>74.7</b>	<b>76.5</b>
YoY % change	<b>4.0%</b>	<b>2.3%</b>	7.4%	1.4%	0.1%	-3.1%	<b>1.8%</b>	-5.1%	2.8%	5.2%	2.0%	<b>0.5%</b>	<b>2.3%</b>	<b>2.4%</b>
<b>DOMESTIC SUPPLY</b>														
Alaska	1.0	0.9	1.0	0.9	0.8	1.0	0.9	1.0	0.8	0.8	0.9	0.9	0.9	0.9
Gulf of Mexico	4.1	3.6	3.2	3.3	3.1	3.1	3.2	3.1	3.1	2.9	2.9	3.0	3.1	3.2
Other US	64.1	65.7	67.9	69.5	71.0	71.1	69.9	71.4	71.8	71.9	72.3	71.9	73.4	75.5
<b>Marketed Production</b>	<b>69.1</b>	<b>70.2</b>	72.1	73.7	74.9	75.2	<b>74.0</b>	75.5	75.8	75.6	76.2	<b>75.8</b>	<b>77.3</b>	<b>79.6</b>
<b>Dry Gas Production</b>	<b>65.7</b>	<b>66.5</b>	68.2	69.6	70.7	70.9	<b>69.9</b>	71.3	71.5	71.4	71.9	<b>71.5</b>	<b>73.2</b>	<b>75.5</b>
YoY % change	<b>4.8%</b>	<b>1.2%</b>	4.1%	5.1%	5.9%	4.9%	<b>5.0%</b>	4.5%	2.8%	0.9%	1.4%	<b>2.4%</b>	<b>2.4%</b>	<b>3.1%</b>
Net Storage Withdraws	0.0	1.5	22.8	-12.3	-12.6	1.9	0.0	15.5	-11.3	-9.6	2.5	-0.7	0.0	0.5
Other & Balance	-0.1	-0.235	-0.1	0.2	-0.9	-1.2	-0.5	0.1	-0.2	-0.5	-0.9	-0.4	-0.4	-0.4
<b>Total Domestic Supply</b>	<b>65.6</b>	<b>67.8</b>	90.8	57.5	57.2	71.7	<b>69.3</b>	86.8	60.1	61.3	73.5	<b>70.4</b>	<b>72.9</b>	<b>75.7</b>
Gross Exports	4.4	4.3	4.7	4.0	4.3	4.6	4.4	4.7	4.8	4.6	4.9	4.7	5.7	6.6
<b>GROSS IMPORTS</b>	<b>8.6</b>	<b>7.9</b>	8.6	6.9	7.9	7.4	<b>7.7</b>	7.8	6.9	7.4	7.4	<b>7.4</b>	<b>7.5</b>	<b>7.5</b>
Pipeline	8.1	7.6	8.4	6.8	7.7	7.3	7.6	7.6	6.7	7.2	7.2	7.2	7.3	7.3
LNG	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Source: US DOE/EIA, Deutsche Bank



## #8 Thermal Coal

### Policy Actions Drive Risks

- In the absence of supply disruptions owing to strikes or weather events, we expect drivers for the market will come mainly in the form of regulatory changes. We believe the market is in a protracted period of adjustment after the step change in demand growth from the 7% experienced from 2003-2012 to 1-2% from 2013 onward.
- With Chinese import volumes already growing at the slowest rate since net imports began, we expect that government-mandated cuts to imports by power generators of 40 mt over the balance of the year is likely to negate the customary seasonal upswing in thermal coal pricing. If implemented as we expect then this would tip annual Chinese imports into contraction in 2014 and raise further downside risks for the market.
- Despite a one-month delay in implementation of the Indonesian government requirement for all thermal and metallurgical coal exporters to register for a license with the Ministry of Trade, coal exports have already been affected and we observe the first annual decrease in Indonesian coal exports this year.
- The producer response to reduce unit production costs through rationalization and by increasing output volume has largely been successful. Marginal costs have kept pace with price declines, and costs have declined for the second year in a row in Australia. However, there are valid concerns about the sustainability of some cost-saving measures.
- Capex required for new mines has also likely declined in tandem. Consequently we are seeing signs that GVK Hancock will proceed with its plans for a rail corridor linking the Galilee Basin with planned port facilities at Abbot Point, opening the door to multiple large-scale developments including Alpha and Carmichael.
- A long-discussed measure to prohibit the use of low-quality coal in China will prove a greater spur to the domestic market than import demand for seaborne coal, in our view. Imported volumes are less likely to be transported long distances, which triggers a more restrictive quality specification under new guidelines.

### Overview

After years of being conditioned to expect regulatory changes to eventually be postponed, cancelled, poorly enforced, or watered down to little effect, we see this as the year that governments finally allow long-discussed guidelines to take hold in practical terms. It may be that prices have reached levels low enough that changes which would previously have been seen as too painful are now bearable. In any case, both Chinese imports and Indonesian exports will likely show their first annual declines this year since China became a net importer of coal in 2009, and since at least 2000 in the case of Indonesia.

### China coal quality rule to support domestic market

The Chinese ruling on coal quality originated from a May 2013 proposal from the National Development and Reform Commission (NDRC) which gained momentum from the State Council in December 2013 and was further moulded into its current form from May to September of this year. The latest formulation will take effect on 1 Jan 2015 and adds a more stringent set of guidelines for coal to be burned in three key coastal regions. In our view, this policy measure will serve dual purposes of reducing emissions by curtailing production of low-quality coal, and simultaneously supporting market prices to ensure the viability of supply projects in the longer term.



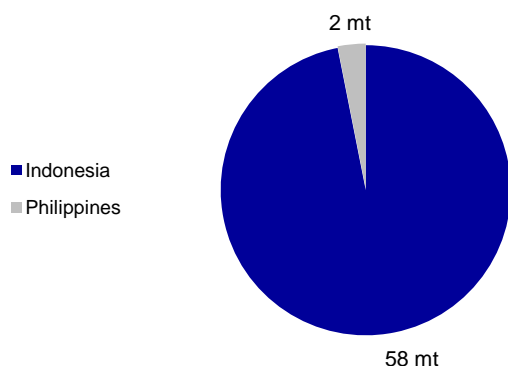
Figure 1: Restrictions on Chinese coal production, consumption and imports

Coal type	Distance over 600km	Calorific value (NAR)	Ash (%)	Sulphur (%)
Lignite	FALSE		30%	1.50%
Lignite	TRUE	3,946	20%	1%
Bituminous	FALSE		40%	3%
Bituminous	TRUE	4,300	30%	2%
3 Key Regions			16%	1%

Source: Reuters, Deutsche Bank

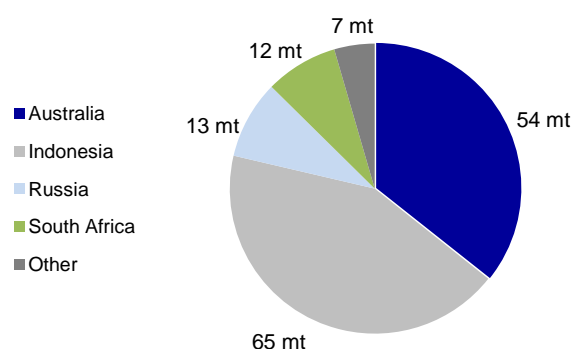
In a note published earlier this month, (*China Import Ban Takes Shape*, 22 Sep 2014) we detailed the regions of domestic production likely to be most heavily affected. In Eastern Inner Mongolia, we estimate 50-80 mt may be prohibited owing to the minimum energy specification of 3,946 kcal/kg NAR for lignite to be transported more than 600 km (*Impact of new rule on quality of commercial coal: not material*, 17 Sep 2014). This already excludes volumes which could be washed and upgraded to meet the specification and volumes which are transported less than 600 km. However, we have not made any allowance for "coal-by-wire" by which coal could be burned at local power plants and the resulting electricity fed into aluminium manufacturing sites or transmitted over long distances. These measures could potentially help to reduce the impact to domestic miners. In Yunnan, 33 mt of high-ash lignite exceeds the maximum ash content for lignite production, and could be affected if not washed or upgraded from 35% ash to 30% ash.

Figure 2: China lignite imports by source



Source: McCloskey, Deutsche Bank

Figure 3: China bituminous imports by source



Source: McCloskey, Deutsche Bank

We believe the effect on Chinese import demand will be less important, as the major sources of import, Indonesia and Australia, typically produce qualities of coal which are largely exempt from the ban. The primary areas of concern are for roughly 47 mt of Chinese imports of Indonesian lignite which may fall below the minimum energy content for lignite to be transported more than 600 km within China. However, as coal is typically consumed within 600 km of the port, this is likely to have little practical effect on coal imports, in our view.

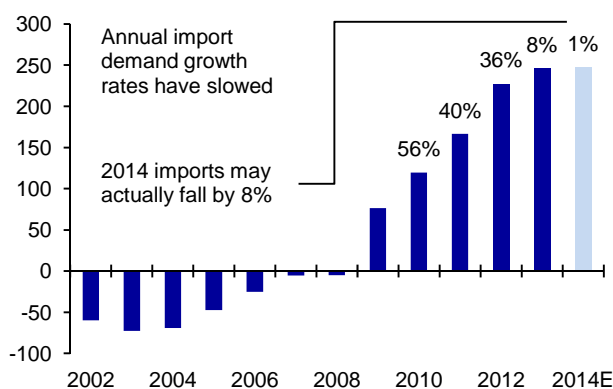
The potential objections over the impact to producer revenues have probably been muffled to some extent by the government mandate for electric utilities to reduce thermal coal imports in the total amount of 50 mt, of which as much as 40 mt may occur this year. Therefore, we expect that China's net imports of thermal coal will in fact decline this year, perhaps by as much as 8%, rather than grow at the 1% implied by annualized year-to-date imports as shown in



Figure 4. These mandated cuts have been allocated on a company basis to major state-owned utilities, and will have their biggest effect on uncontracted imports from smaller producers, many of which are likely Indonesian. The impact of the cuts to utilities has been significantly offset by higher hydropower output this year, Figure 6. The increased output is explained not just by newly commissioned capacity but also by the highest utilisation rates since at least 2001, by our estimates.

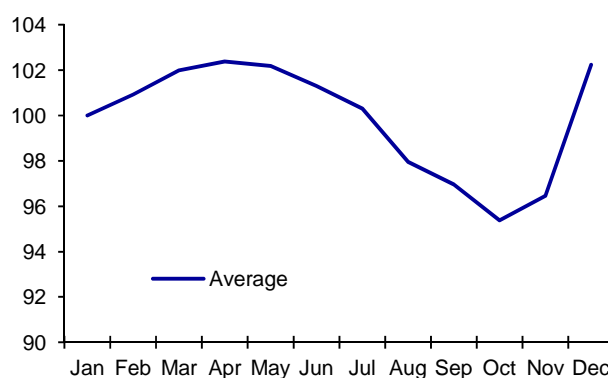
Even a 50% implementation relative to the stated amount would lead to an 8% fall in annual Chinese net imports, and likely derail the customary pre-winter restocking uplift in Newcastle prices, Figure 5.

Figure 4: China annual net import demand (million tonnes)



Source: McCloskey, Deutsche Bank

Figure 5: Seasonal Newcastle price, 2001-2006 and 2009-2013 (indexed Jan=100)



Source: Bloomberg Finance LP, Deutsche Bank

#### Indonesia requires exporters to register for licenses

A ministerial regulation issued on 15 July this year requires all coal exporters, for both thermal and metallurgical coal, to apply with the Ministry of Trade for a registered export license. The deadline for this requirement was 1 Sep 2014, but has now been postponed to 1 Oct 2014 over claims that the process for obtaining a license was unclear, according to Platts. Together with the Chinese mandate for reduced coal imports, this is the second negative driver for Indonesian exports from small and illegal exporters, which we have previously estimated to be in the range of 70-80 mt per annum (*A Weak Quarter Ahead*, 2 Jul 2014). These reasons explain why we are already seeing a decline in annualised Indonesian exports, which could well fall even further in Q4 and support thermal coal prices.

As a side note, the initiative by the Ministry of Resources to increase royalties paid by IUP producers from 3-7% to 7-9% will have little practical effect for some years, as the increase is to be triggered only when Newcastle prices rise above \$90/t. According to our price forecast this will not occur until perhaps the end of the decade.

#### Indian coal permits to be reaucted

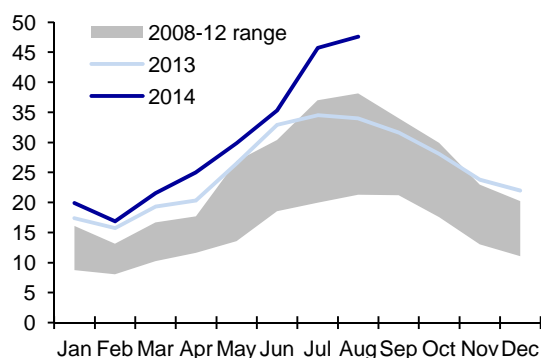
India's Supreme Court ruled in favour of the cancellation of 214 out of 218 mining permits earlier found to have been improperly allocated since 1993. Several permits assigned to ultra mega power projects would not be disturbed at all, according to Bloomberg. The mining permits are associated with combined production of approximately 45-50 mt this year, with an additional 6 mt beginning next year. However, mines already in production or nearing production would be allowed to continue operation for six months before the



permits and operations are temporarily reassigned to Coal India before then being reallocated via auction.

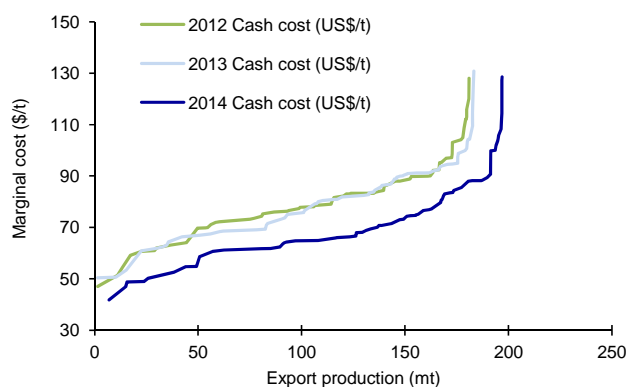
Even so, there are concerns that the handover from former permit holders could result in a disruption of volumes produced as Coal India will be unfamiliar with the nature of existing operations. Any material loss of volume will worsen the supply constraints already plaguing the power industry, where coal inventories have plummeted to dangerously low levels even as new commissionings of coal-fired generation capacity have risen (*Power crisis in the making...*, 28 August 2014). Port congestion and the higher cost of imported coal will be obstacles in raising imports to meeting any resulting shortfall in domestic production.

Figure 6: China hydropower output in coal terms (million tonnes)



Source: Bloomberg Finance LP, Deutsche Bank

Figure 7: Australia thermal coal cash costs (\$/t)



Source: Wood Mackenzie, Deutsche Bank

#### Australian cash costs fall for a second year

Australian cash costs have fallen for the second year in a row, and with much greater effect than in 2013. The weighted average of cash costs fell by \$10/t in 2014, or 13%, with exchange rates accounting for slightly less than half (5% of 13%) of the decline. In what has been at least a two year cost-cutting effort, miners have been successful in slimming down the cost structure of production in a number of ways, most notably through numerous rounds of job reductions and raising efficiency and lowering unit costs through increases in production. Relatively few thermal mines have been placed on care and maintenance, with the majority of such announcements associated with metallurgical coal.

As successful as these measures have proven, there are valid concerns over the long-term sustainability of some methods where sustaining capital expenditures have been sacrificed or where reductions in strip ratios have come at the expense of compromised mine plans. In effect, some of the cost savings achieved today may result in higher costs incurred in the future. That said, miners generally report that they still have room to go in terms of cost reductions.

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Figure 8: Seaborne thermal coal supply-demand balance (million tonnes)

Including Anthracite, Bituminous, Sub-bituminous, and Lignite

	2010	2011	2012	2013	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Indonesian exports	298	353	384	424	420	454	486	508	515	519	523
growth	27%	18%	9%	10%	-1%	8%	7%	5%	1%	1%	1%
Australian exports	142	148	171	188	197	208	217	224	227	237	252
growth	2%	4%	16%	10%	5%	6%	4%	3%	1%	5%	6%
Russia exports	75	86	104	110	106	106	108	110	113	115	117
growth	-3%	15%	21%	6%	-4%	0%	2%	2%	2%	2%	2%
South African exports	71	69	76	71	75	77	78	80	82	83	84
growth	5%	0%	6%	-5%	5%	2%	2%	3%	2%	1%	1%
Colombian exports	69	76	79	74	77	82	84	86	88	90	92
growth	9%	10%	4%	-7%	5%	6%	2%	2%	2%	2%	2%
US exports excl. Canada & Mexico	15	30	46	41	40	40	40	40	40	40	40
China exports	18	11	8	6	6	6	6	6	6	6	6
Other exports	127	131	135	139	143	145	146	148	149	151	152
<b>Total seaborne thermal supply (Mt)</b>	<b>815</b>	<b>905</b>	<b>1003</b>	<b>1053</b>	<b>1064</b>	<b>1117</b>	<b>1165</b>	<b>1203</b>	<b>1220</b>	<b>1241</b>	<b>1265</b>
growth	10%	11%	11%	5%	1%	5%	4%	3%	1%	2%	2%

Japanese imports	131	126	139	141	143	146	148	150	152	154	156
growth	12%	-4%	10%	2%	2%	2%	1%	1%	1%	1%	1%
Korea & Taiwan imports	163	174	170	172	175	178	182	185	188	191	195
growth	11%	6%	-2%	1%	2%	2%	2%	2%	2%	2%	2%
European imports	187	209	223	220	220	211	201	197	179	160	164
growth	-5%	12%	7%	-1%	0%	-4%	-5%	-2%	-9%	-10%	3%
China imports	137	178	235	252	233	256	266	271	276	282	287
growth	40%	29%	32%	7%	-8%	10%	4%	2%	2%	2%	2%
India imports	75	92	119	139	156	163	172	182	196	211	228
growth	25%	22%	30%	16%	12%	5%	6%	6%	8%	8%	8%
Other imports	131	144	150	155	157	159	161	163	166	168	170
<b>Total seaborne thermal demand (Mt)</b>	<b>825</b>	<b>922</b>	<b>1036</b>	<b>1079</b>	<b>1085</b>	<b>1113</b>	<b>1130</b>	<b>1149</b>	<b>1157</b>	<b>1167</b>	<b>1200</b>
growth	11%	12%	12%	4%	1%	3%	2%	2%	1%	1%	3%

<b>Notional market balance</b>	<b>-10</b>	<b>-17</b>	<b>-33</b>	<b>-25</b>	<b>-20</b>	<b>4</b>	<b>35</b>	<b>54</b>	<b>63</b>	<b>74</b>	<b>65</b>
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<b>Contract thermal coal (JFY)</b>	<b>91</b>	<b>122</b>	<b>119</b>	<b>100</b>	<b>85</b>	<b>83</b>	<b>88</b>	<b>91</b>	<b>94</b>		
<b>API 4 (FOB Richard's Bay)</b>	<b>91</b>	<b>116</b>	<b>93</b>	<b>81</b>	<b>76</b>	<b>79</b>	<b>82</b>	<b>85</b>	<b>88</b>		
<b>Newcastle FOB</b>	<b>99</b>	<b>121</b>	<b>94</b>	<b>85</b>	<b>76</b>	<b>80</b>	<b>85</b>	<b>88</b>	<b>91</b>		

Units in million tonnes

\*Excluding Canada and Mexico

Sources: McCloskey's, AME, BP, CEIC, Deutsche Bank

Source: McCloskey, Deutsche Bank





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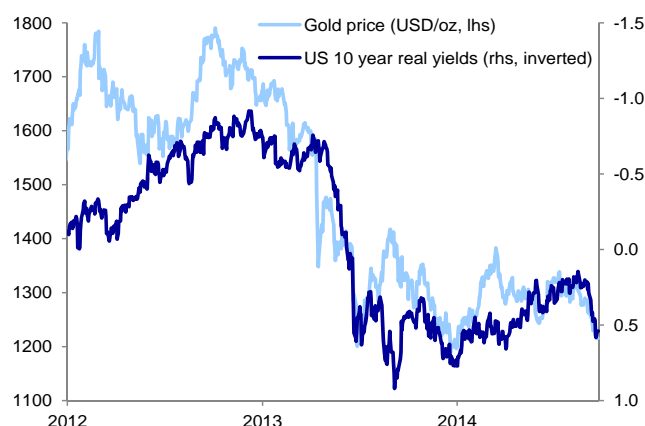
## #9 Precious Metals

### Financial Market Adjustments Will Maintain The Headwinds

- We believe the forces that ended the bull run in gold and silver prices in 2011 and which then triggered a more violent correction from the second quarter of last year will continue over the coming year.
- Not until there has been a more complete adjustment in US real interest rates, the US equity risk premium and the US dollar would we expect a less destructive environment for the gold price to emerge.
- Of the financial forces at play, we continue to view the adjustment in the US dollar as far from complete. In fact since the birth of floating exchange rates in 1973, the US dollar has exhibited cycles of rising and falling for extended periods of time. We find that US dollar bull cycles typically last for around six years and the US dollar trade-weighted index typically rallies by approximately 34%.
- Since the current upswing in the US dollar began in July 2011, it has rallied by approximately 18% on a trade-weighted basis. One can therefore consider that in duration and magnitude terms we are just half way through the current cycle.
- In comparison, the adjustment in the US equity risk premium and US long term real interest rates from their respective highs and lows in 2012, may be more mature. Indeed at current levels the US equity risk premium is one percentage point below its 2009-2013 average. As a result, downward pressure on gold prices from these markets may be less acute than the risks posed by a strengthening US dollar.
- In our view, the most likely scenario for a sustained rally in the gold price would be downgrades to the US growth outlook since this would push out the date of Fed tightening, encourage a decline in US real interest rates, a weakening in the US dollar and a correction in the S&P500 all of which would be bullish gold prices. However, we attach a low probability to this scenario.
- More perplexing from our standpoint, is that in the recent environment where US growth has been accelerating we have seen the ongoing under-performance of silver relative to gold with the gold to silver price ratio now at its highest level since August 2010.
- While ETF holdings in silver have been largely unchanged over the past few months, relative to gold we have seen a more dramatic adjustment in COMEX positioning with net length in silver having been almost eliminated over the past few months. This may provide a more constructive positioning environment since net shorts in silver have tended to be a rare event over the past decade.
- In contrast to gold and silver, the performance of the PGM complex has been more robust. While there remains significant positioning risk given the extent of net speculative length in these markets, we view physical fundamentals in these markets and specifically in palladium and rhodium, as strong.
- Within the PGM sector, the main outlier has been platinum which despite the strikes in South Africa has suffered from similar price declines as gold and silver this year. The high levels of inventories are likely to blame but with the market set to remain in deficit for the next few years, we continue to look for a price recovery in this part of the PGM complex.

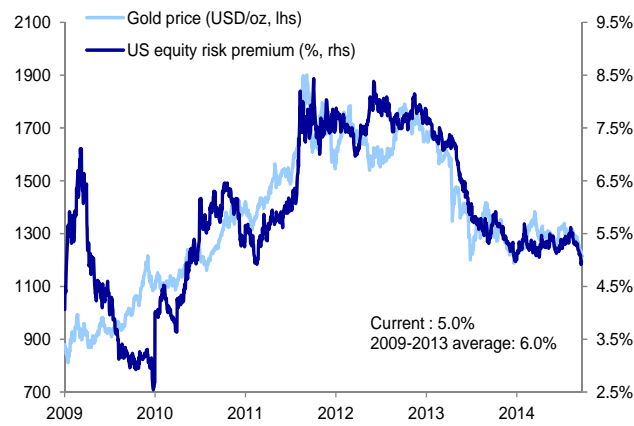


Figure 1: US real yields & the gold price



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 2: US equity risk premium & the gold price

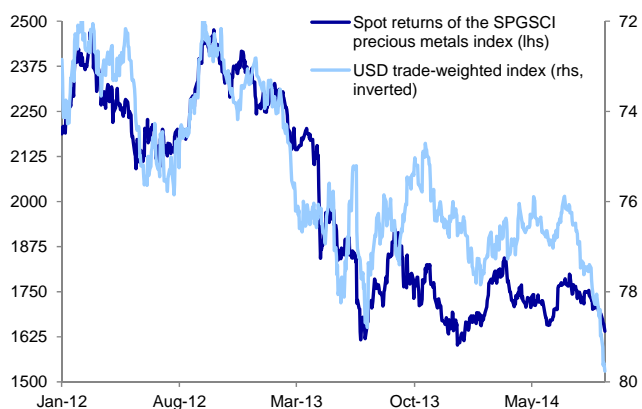


Sources: Deutsche Bank, Bloomberg Finance LP

The decline in gold prices over the past month reflects, in large part, powerful adjustments in US interest rate, equity and FX markets. Indeed after a sustained decline in US long term real yields throughout most of this year, signs of a more hawkish Fed emerging during the second half of this year has finally triggered a back up in US Treasury yields and hence long term US real interest rates, Figure 1.

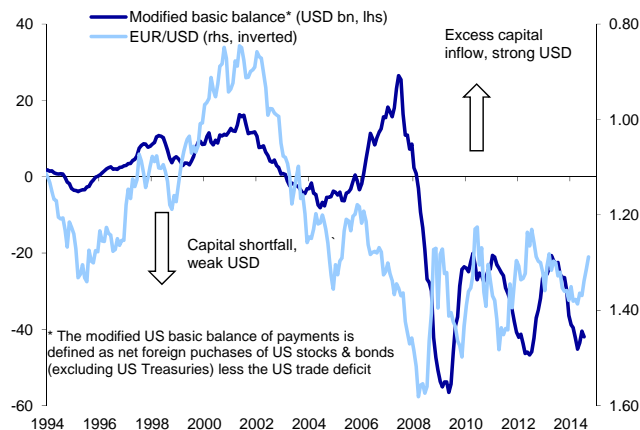
Since market confidence is high that any turn in US interest rates will not derail the economic upturn, this has allowed the S&P500 to hit fresh highs during the third quarter of this year and this has been mirrored in the US equity risk premium hitting its lowest level since the middle of 2010, Figure 2. The final catalyst which has encouraged losses across parts of the precious metals complex has been a renewed strengthening in the US dollar. Divergent central bank policies between the Fed and the ECB are only likely to accelerate US dollar strength. Of the financial forces we track in assessing prospects for the precious metals complex, we believe the US dollar poses the greatest risk given the durable nature of US dollar strength over coming years.

Figure 3: Precious metal prices & the US dollar



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 4: US modified basic balance & EURUSD



Sources: Deutsche Bank, US Treasury



Figure 5: Long run cycles in the US dollar



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 6: Fair value for gold versus a variety of different metrics

In real terms (PPI)	725
In real terms (CPI)	770
Relative to per capita incomex	800
Relative to the S&P500	900
Versus copper	1050
Versus crude oil	1400
<b>Average</b>	<b>941</b>

Sources: Deutsche Bank

We find that the US dollar can be a good leading indicator of US portfolio flows. Figure 4 tracks foreign purchases of US equities, agency and corporate bonds less the monthly trade deficit. We find that powerful turns in the US dollar typically occur just before marked changes in the US basic balance. Latest US Treasury data of July 2014 still reveal the ongoing underfunding of the US external deficit. However, on our reckoning the emergence of divergent central bank policy between the US and the Euro area alongside the prospect of superior investment returns in the US compared to the rest of the world should help to encourage a marked improvement in the basic balance over the coming year.

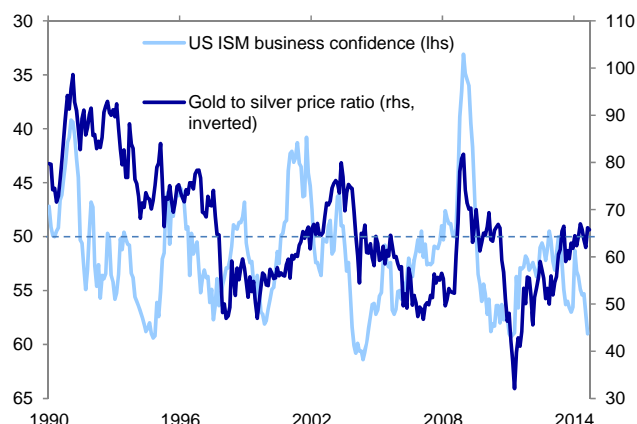
Typically powerful turns in the US dollar occur when interest rates, trade and portfolio flows move in favour of the greenback. We expect this cycle will be no different and it will help to sustain what has been a slow, but, gradual strengthening in the US dollar gathering momentum over coming years.

Historically the US dollar has exhibited cycles of rising and falling for extended periods of time, with bull cycles typically lasting around six years in duration and trough to peak rallies in the US dollar averaging around 34%, Figure 5. Since the current upswing in the US dollar trade-weighted index began in July 2011 and the dollar has appreciated by approximately 18% over this period, one can consider that in duration and magnitude terms we are currently half way through the current US dollar cycle.

With further gains in the US dollar and the prospect of further rises in the S&P500 and long term real yields, additional downside for gold prices seem inevitable, in our view. We therefore expect gold's premium versus financial and physical assets will continue to be surrendered in this environment. In fact in April last year we examined at what level the gold price would need to fall to eliminate the premium it has been traded against various physical, financial assets and when measured in real terms and relative to per capita income. These findings are outlined in Figure 6. It revealed that even at USD1,200/oz gold prices cannot be considered cheap. As a result we would not view current price levels as offering much support in the face of further advances in the US dollar, long term real interest rates and the US equity risk premium.

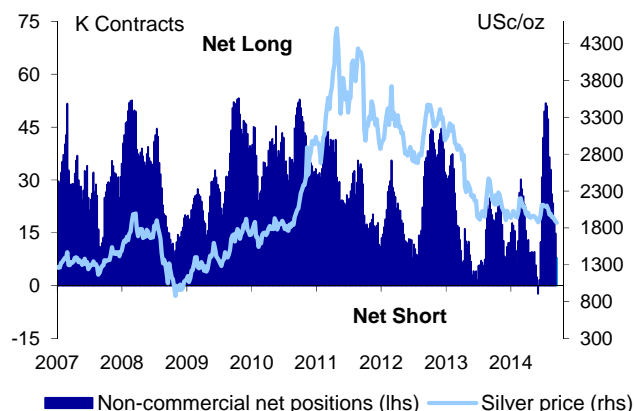


Figure 7: US business confidence & the gold to silver price ratio



Sources: Deutsche Bank, Bloomberg Finance LP

Figure 8: Speculative positioning in silver



Sources: Deutsche Bank, Bloomberg Finance LP

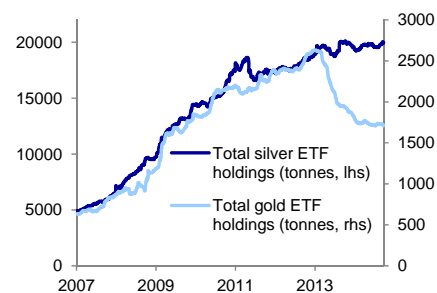
Inevitably the falling gold price will have important implications for major gold producing companies, which we estimate that on a use of cash basis North American gold producers require a gold price of USD1,200/oz just to remain cash flow neutral on current production.. Gold prices below this level implies the sector would, on average, incur deficit spending to fund all-in costs, pay taxes, interest expense, current dividend and fund growth capex.

While gold prices are moving towards levels last seen at the beginning of this year, the more dramatic decline in silver prices this year has pushed the gold to silver price ratio to its highest level since August 2010, Figure 7. In our view, silver's relatively poor performance is inconsistent with the acceleration in US business confidence. Indeed in environments where US business confidence is above 50 and rising typically are associated with the out-performance of silver relative to gold.

From a flow perspective, we find that silver ETFs have actually enjoyed net inflows of just over 400 tonnes during the third quarter of this year. In contrast, net speculative length on COMEX has dropped by over 80% over the same period, Figure 8. Since the speculative community has only held a net short position once over the past decade, we believe a more supportive positioning environment is emerging for silver, particular in the event that US growth indicators continue to improve.

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Figure 9: Holdings in gold & silver ETFs



Source: Deutsche Bank, Bloomberg Finance LP



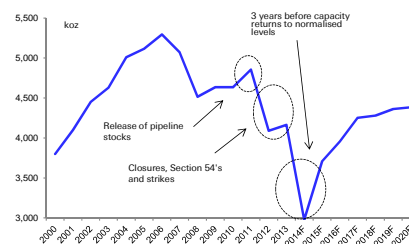
## #10 Platinum Group Metals

### PGM supply - back to the "new" normal?

#### Summary

- Platinum's performance YTD (-1%) is surprising given the protracted South African strike. The recent sell-off was driven by the company updates which showed a better than expected production recovery, a strong USD which put gold under pressure, and profit-taking from investors, as evinced by the sharp reduction in not long positions on the Nymex. Palladium was also hit by profit-taking during September, but ETF holdings and net long positions remain more "sticky". Rhodium has been the stand-out performer year to date, driven by modest ETC inflows. Given the pull-back in both platinum and palladium, Rhodium may be vulnerable in the near-term.
- The South African platinum producers are recovering well from one of the worst strikes in the platinum industry. We expect production across all three PGMs to return to "normal" in 2016E. The return to normal production in South Africa will ensure that the platinum and rhodium markets return to modest deficits from 2016E onwards (2 – 5% of annual gross demand). Any weakness in either Chinese jewellery or Auto demand will result in a more balanced market and result in a limited drawdown of stocks. Despite the recovery in South African production, the palladium market is likely to remain in a significant deficit (c.10% of gross annual demand), which results in a continued drawdown of liquid stocks. Despite the metal's out-performance versus platinum, palladium remains our preferred metal in the sector, especially in light of the recent price weakness.
- The medium-term demand outlook for the PGMs remains healthy in our view, although we see a tougher period over the next two quarters. Auto sales in the major regions of Western Europe (in line), the US (surprised on the upside) and China (surprised on the upside), have all remained strong, with growth beating our expectations. However, sales in the emerging market regions of Brazil and Russia have been weak, surprising on the downside. Chinese jewellery demand remains reasonable, but is unlikely to be as strong as 2013.
- All three of the major producers are undertaking a strategic review of their assets, with Amplats arguably the most advanced in terms of disclosure. We continue to think that some of the loss-making shafts or areas will be curtailed over the medium-term. However, the producers are in a tough position, with a near-term imperative to ramp up production to offset a high fixed cost base, and stem the cash burn, versus ensuring the medium-term profitability and health of the industry and the individual companies. This tension, in combination with labour expectations is likely to result in further industrial action in our view.
- We retain our constructive view on the complex as a whole with continuing deficit market and prices appreciating modestly over the course of the decade. However, this positive outlook for platinum and rhodium is dependent on the outcome of the strategic reviews by the South African producers. We expect common sense to prevail and the unprofitable capacity to be phased out. We have however downgraded platinum by 3 – 5% over the next few years to reflect the possibility of limited action; but have upgraded palladium by 5% and 2% in 2014E and 2015E.

Figure 1: SA platinum supply bounces back



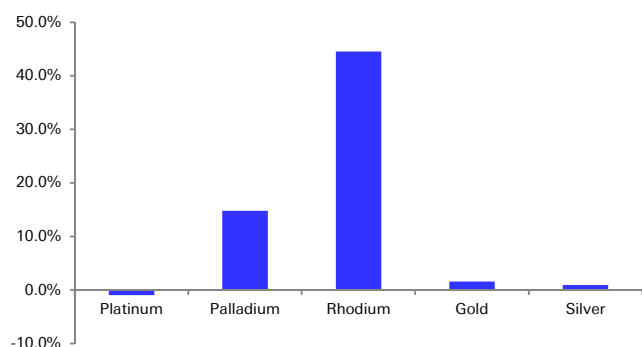
Source: JMAT, SFA Oxford, Deutsche Bank



### Euphoria deflated

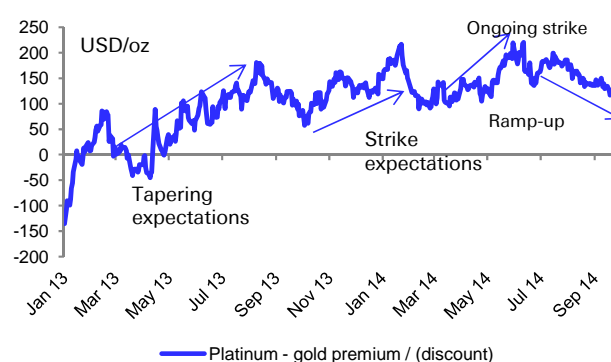
The precious metals complex has given up much of the gains achieved in the first two quarters over Q3. Although the strong USD performance introduced headwinds for the entire complex, Platinum's underperformance versus gold is an indictment of the finely balanced supply-demand balance. We think this lacklustre performance, despite one of the most disruptive strikes in the South African platinum industry's history, is due to the producer reports of a better than expected ramp-up and ample liquidity. Palladium has also given up much of its gains, but given the more compelling fundamentals means that the metal is still up 15% YTD. Rhodium has continued its strong recovery off very low levels, partly due to the strike, but also due to improving demand from Euro VI legislation. The metal is up 45% YTD, but may be vulnerable to a short-term pull-back, given the performance from the rest of the PGMs.

Figure 2: Precious metal performance YTD



Source: Thomson Reuters Datastream, Deutsche Bank

Figure 3: Platinum – gold spread (USD/oz)

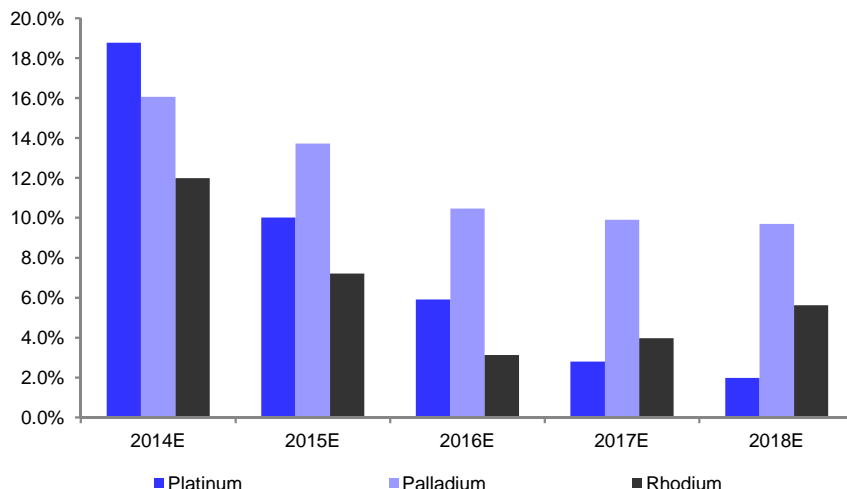


Source: Deutsche Bank, Thomson Reuters Datastream

The South African PGM producers remain in a tough position, caught in a tough position, between the short-term reality of poor cashflows, weakened balance sheets and a full labour complement putting further pressure on cashflows, and the medium-term requirement to cut loss-making areas in some of the older and less productive mines. Putting aside individual producer pressures, the platinum market ideally needs more of a deficit to draw down the stockpile of metal accumulated since 2007, to introduce some pricing tension. As highlighted in the chart below, even post the recovery in production from South Africa, palladium deficits are forecast to remain at 10% of gross demand pre investment flows. However, Platinum and Rhodium deficits are likely to come down to 3 – 6% of gross demand in 2016E and 2017E.



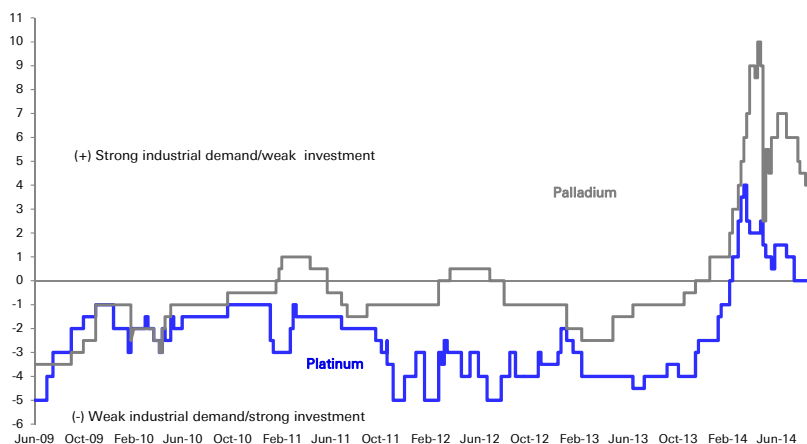
Figure 4: PGM annual deficits\*\* as a % of gross demand\*



Source: Deutsche Bank, \*We define gross demand as net jewellery and electronics demand, less investment demand, \*\*Deficits are also defined pre investment demand

A further indication that the extreme tightness in the platinum and palladium market has eased, is the return to near parity of the sponge – ingot premium in both platinum and palladium.

Figure 5: US sponge vs Zurich ingot switch (USD/oz)



Source: Mitsubishi Corp (USA), Deutsche Bank

*The tightness in both platinum and palladium sponge has eased since the South African producers have ramped up*

#### The race between drawing down stockpiles and production recovery

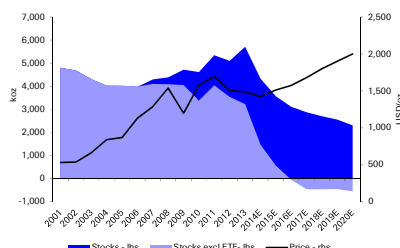
We have reviewed our above ground stock data, focusing on liquid stocks. We define liquid stocks as producer, consumer, investor and ETF holdings, and exclude closed loop working inventory in our estimates. We have also based our estimates on consultant SFA Oxford's assessment of liquid stocks at the end of 2013. SFA Oxford estimate that there were 3.2Moz of liquid platinum stocks excluding ETF holdings, 8.3Moz of liquid palladium stocks, and 400koz of liquid rhodium stocks. In platinum, we estimate that these stocks will be drawn down to low levels by 2016E, but would point out that including ETF holdings, which we assume to be "sticky", the draw-down is modest post 2017. The absolute level of stocks remain above 2.5Moz until the end of the decade on our numbers. Palladium stocks start at a much higher level, but the





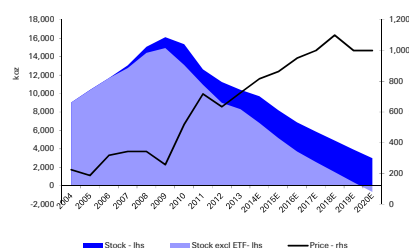
rate of drawdown is much more rapid. We expect the tightness in the market to emerge around 2018F. We expect Rhodium tightness to emerge around 2017F.

Figure 6: Platinum liquid stocks



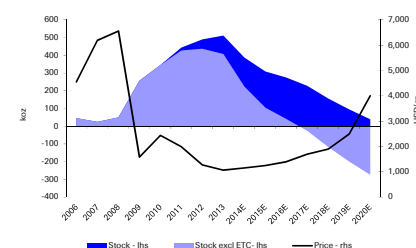
Source: SFA Oxford, Deutsche Bank

Figure 7: Palladium liquid stocks



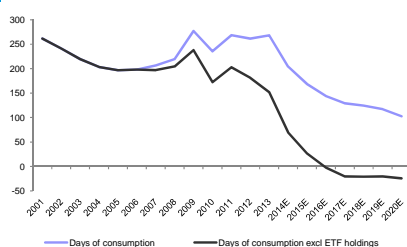
Source: SFA Oxford, Deutsche Bank

Figure 8: Rhodium liquid stocks



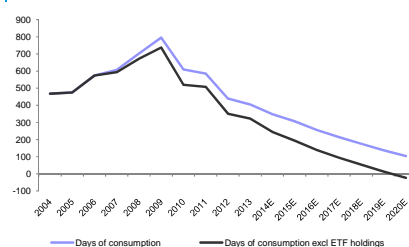
Source: SFA Oxford, Deutsche Bank

Figure 9: Platinum days of supply



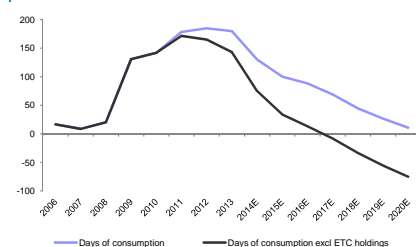
Source: SFA Oxford, Deutsche Bank

Figure 10: Palladium days of supply



Source: SFA Oxford, Deutsche Bank

Figure 11: Rhodium days of supply



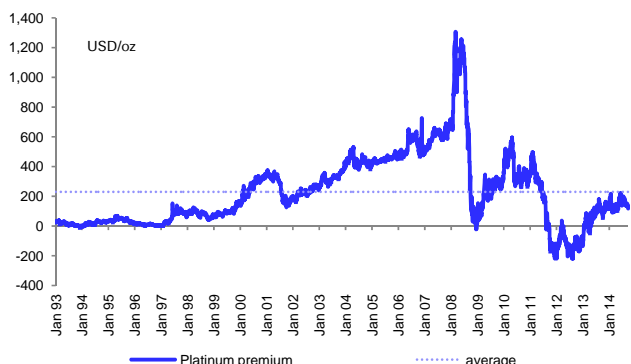
Source: SFA Oxford, Deutsche Bank

### Relative value – charting the ratios

We believe the current price ratios between the various PGMs can be informative in highlighting relative value, especially as the individual metals can be substituted for one another. Although gold, cannot be used in place of platinum in the majority of applications, the market does reference the platinum price to gold as well. In this way, gold does have some influence over the PGMs. The current platinum premium is USD117/oz, which is roughly half the long-run average, suggesting that platinum is still good value relative to gold. Rhodium is currently good value versus both palladium and platinum versus long-run historical averages, suggesting some motivation to switch back into rhodium. Likewise platinum is good value relative to palladium versus the long-run average. However, given the relative strength in the palladium fundamentals versus platinum, we continue to see palladium re-rating versus platinum.

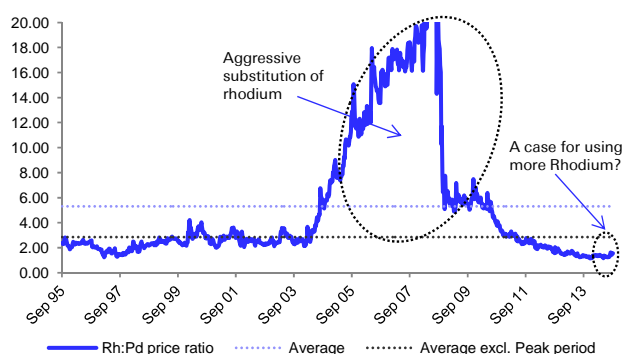


Figure 12: Platinum premium over gold



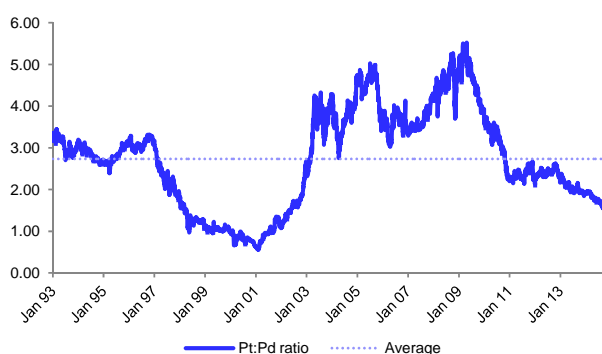
Source: Thomson Reuters Datastream, Deutsche Bank

Figure 13: Rhodium – Palladium ratio



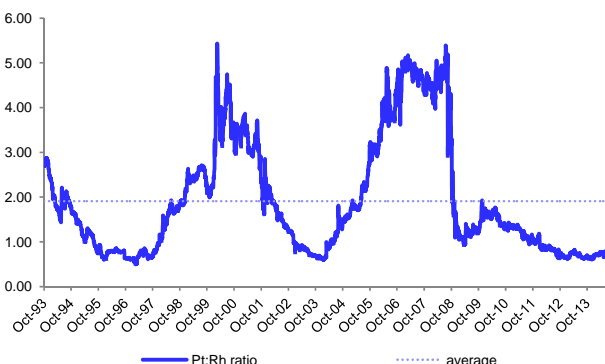
Source: Thomson Reuters Datastream, Deutsche Bank

Figure 14: Platinum – Palladium ratio



Source: Thomson Reuters Datastream, Deutsche Bank

Figure 15: Platinum – Rhodium ratio



Source: Thomson Reuters Datastream, Deutsche Bank

### Global Auto sales: A period of tougher comps and increasing risks

Global vehicles sales are up c.4% YTD, with robust growth in the US, Japan and China, a continued albeit modest recovery in Western Europe, but weak sales in many of the emerging markets such as Brazil and Russia. Indian vehicle sales look to have turned the corner, and are showing some signs of a recovery. The heavy duty vehicle sector (trucks), has seen similar trends to the passenger vehicle markets, with a robust US, an improving Europe and a weak Brazil. Although the trend remains positive, we expect growth to slow down in Q4, because of a much stronger base in Q4'13. We also see rising risks for Auto sales in many regions. Eastern European and Russian sales are likely to remain weak due to the Ukrainian crisis. Japanese sales are likely to slow significantly in H2 as the higher sales tax impact feeds through. Tighter credit in South America is likely to keep Auto sales growth in negative territory, US vehicle sales have been at near record levels, and our US Auto team has suggested that there may be upside to 2015 market expectations given the strong momentum. However, we do think that continued momentum in the US will have to be driven by ongoing credit expansion, which poses some risks in the medium term.

*The risks are rising in some of the key Auto sales regions.*

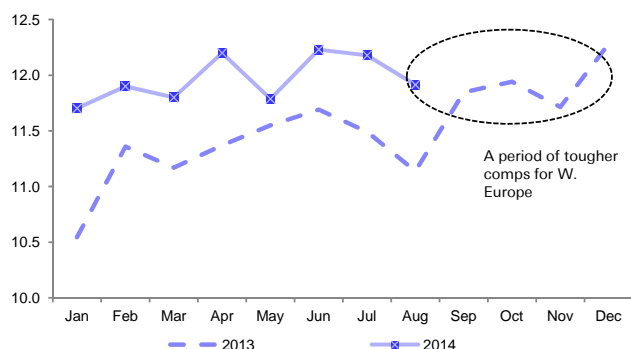


W. European registrations have continued to grow at a steady pace over the past few months. August registered an increase of just 1% but when the calendar impact is excluded, the growth rate is similar to the previous months. YTD volumes were 8.0mn units, up 5% YTD. The August SAAR dipped to slightly 11.9mn/yr, after 12.2mn in July (~12.0mn/yr YTD). YTD SAAR is broadly in line with our European Auto team's estimate for the full year of 12.1mn/yr. The Western European SAAR has been now stable at around 12.0mn/yr units for a year (except for the weaknesses in November '13 and January '14).

*European growth will continue in H2, but the rate will be slower due to the base effect*

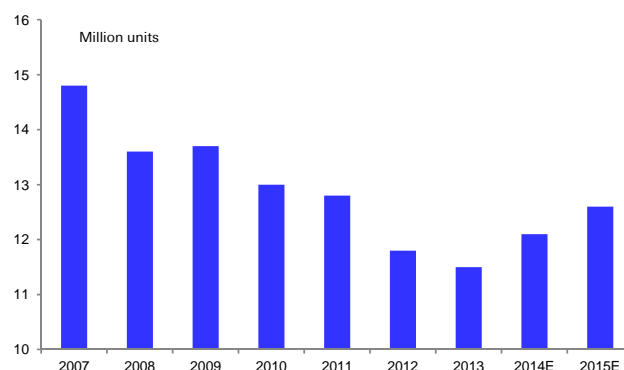
Volumes in the five core markets saw a boost of 2% in the month (adj. +7%), with YTD core market volumes at 6.3mn units, or up 6% YTD. August is a seasonal low, so this result is positive. Spain (+14% YoY, +17% YTD) and UK (+9% YoY, +10% YTD) were the only markets to see an uptick in volumes as Germany (+3% YTD) and Italy (+4% YTD) remained stable. In contrast, French volumes saw a decline in the month (-3% YoY, +2% YTD). All the core markets had one less registration day last month. So far in Q3, volumes are up by 4% in the core markets – similar to the rate seen in Q2, however off a stronger base. Our European Auto team continues to forecast growth in 2015E, but at levels well below the 2011 levels.

Figure 16: Western European SAAR – month run rate



Source: LMC, Deutsche Bank

Figure 17: Western European SAAR - forecasts



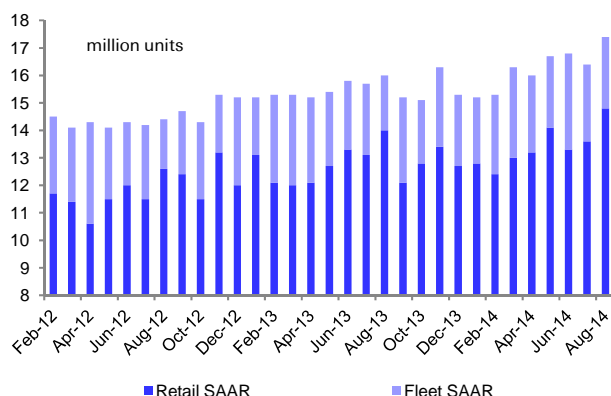
Source: LMC, Deutsche Bank

The August U.S. light vehicle SAAR came in at 17.4MM in August; the highest level since January 2006. Sales increased 9.3% yoy, adjusted for one fewer selling day. The SAAR now stands at 16.3MM YTD (16.7MM excluding the low, weather impacted, levels seen in Q1). The SAAR increased 1.05MM sequentially from July driven mostly by Chrysler and the Japanese OEMs. Strong Labor Day activity appears to have driven the upside vs. expectations, and this may have included a "pull forward" resulting from incentive activity. As of mid-August industry revenue per unit was +\$391 yoy, while industry incentive spending per unit was +\$132 yoy. Nevertheless, the SAAR could be around 16.5MM unit for the year with an exit rate in the high 16MM to low 17MM unit range. The current momentum suggests that there may be some upside to current 2015 estimates.

*US SAAR continues to beat expectations. Upside to 2015 estimates or simply unsustainable?*

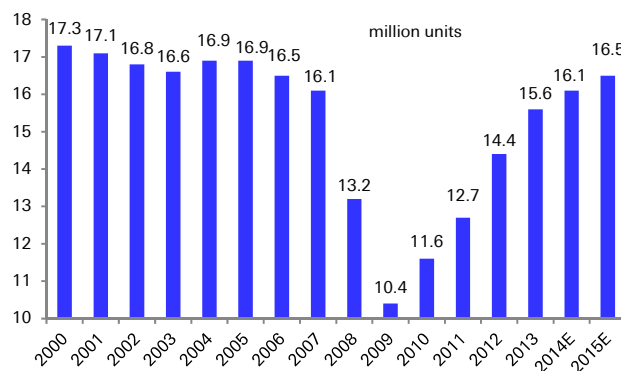


Figure 18: Monthly retail and fleet SAAR (million units)



Source: Deutsche Bank, Ward's, JD Power

Figure 19: US SAAR annual performance and forecast



Source: Deutsche Bank, Ward's, JD Power

The North American Class 8 sales were 24.7k units in August, up 19.6% yoy in units sold terms. The Class 8 SAAR was 314k units vs. 288k units in July and was the highest sales SAAR since Feb'07, in line with the light vehicle sales trend. The sales improvement is also consistent with the six month average order SAAR of 342k units. Although our US Auto team expects some moderation in order trends during the coming months, demand trends appear to suggest further upside to FY15 expectations (DBe 295k units).

Our Auto team has revised their **Brazilian** heavy truck forecast from 97 to 92k units, implying a decline of 9% Y/Y. This number is largely in-line with the latest SAARs. Hence, they do not expect much further downside in H2.

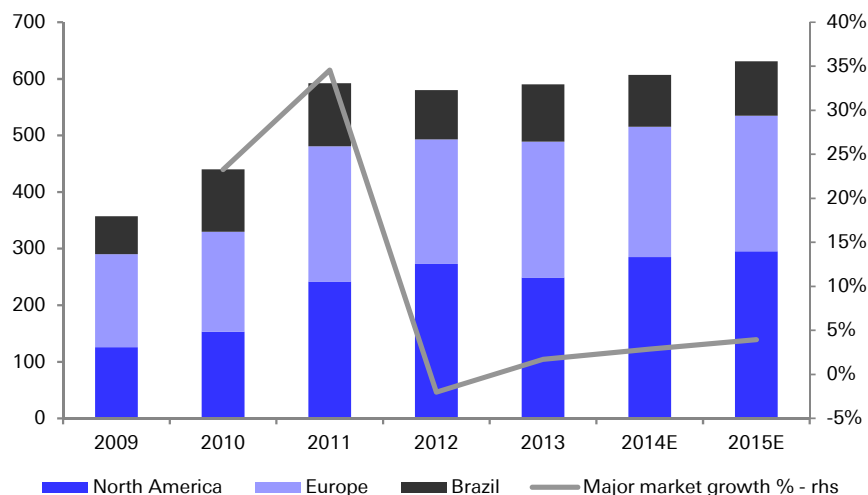
After the Q2 SAAR came in slightly below our team's expectations, the improved order intake recently noted cannot accelerate registrations quickly enough, to increase the SAAR substantially. Thus, despite observing a positive sequential momentum the team has also downgraded their heavy truck market forecast for **Europe** by 8k units from 238k to 230k.

*Low single digit growth in the heavy duty truck market*

In contrast to this, they recently upgraded their US market outlook for class 8 trucks to 285k this year and 295k in 2015 (from 270 and 280k).



Figure 20: Global heavy duty truck forecasts – low single digit growth



Source: Deutsche Bank, Company reports, ACT research

**Russian** light vehicle sales remained weak over the summer with the August decline of 26% YoY, lower than the YTD trend down 12% YTD. This quarter is trending to be worst decline so far this year (-2% in Q1 and -12% in Q2) unless the proposed scrappage incentives (RUB10bn with vouchers ranging between RUB40k-350k/vehicle) come into effect sooner rather than later. Our Auto team currently expects the volumes to decline by 16% over H2 to reach 2.4mn units this year.

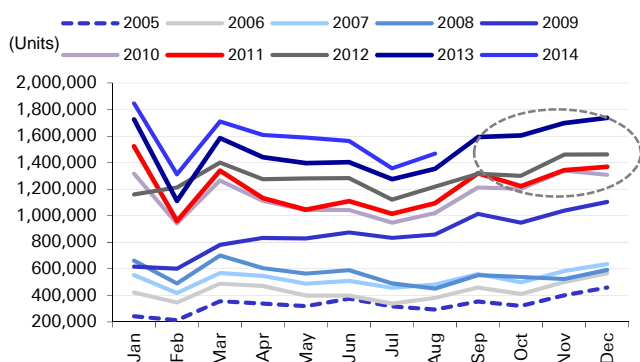
**Chinese** vehicle sales have maintained the strong sales growth momentum seen in 2013, with the passenger vehicle sales up 10.3% YTD. The growth momentum is slowing however, with August sales up 8.5% YoY. The picture in commercial vehicle sales was slightly more mixed, with sales down 5% YTD, and July sales down 16.3% YoY.

The fuel-efficient car subsidy program re-launch with a new eligible model list was announced on the 11th of September. China's National Development and Reform Commission (NDRC), together with two other ministries, announced a new list of car models to be eligible for RMB3,000/car fuel efficient car subsidies. To recap, the previous round of subsidy program ended on 30 Sept '13. While the Chinese Govt announced in 2013 that the program would be extended further to end at Dec '15, there was no new eligibility list available and hence no car models were awarded the subsidies between Oct '13 and Aug '14.

The new eligibility list acts as a formal re-start of the subsidy program. The new list, covers 28 passenger vehicle (PV) manufacturing entities and 163 trims within 89 car models. The new list covers major small-size PV models of key auto OEMs in China. Our China Auto team does not expect a strong demand pick-up for local brands as in 2009-10 amid other stimulus policy implementation, and maintain their forecast that China PV demand will grow by 9-10% per annum in 2014-15E. As this initiative targets the smaller vehicle sizes, with lower PGM loadings, we do not expect a significant impact on PGM demand either.

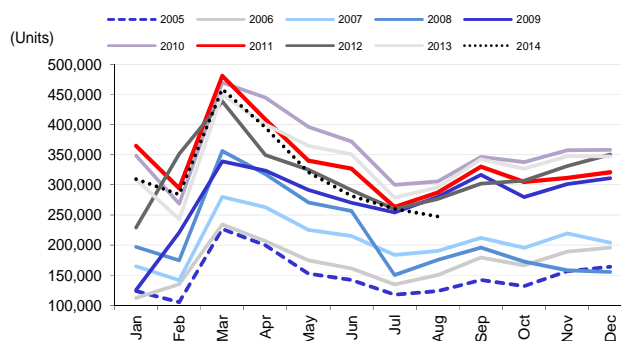


Figure 21: Chinese passenger vehicle sales



Source: CAAM, Deutsche Bank

Figure 22: Chinese commercial vehicle sales

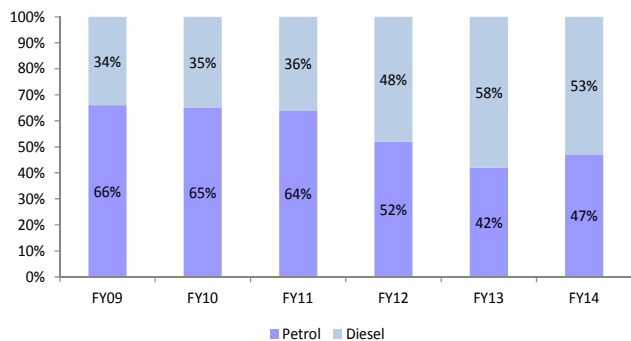


Source: CAAM, Deutsche Bank

The August **Indian** domestic commercial vehicle volumes were in line with our Indian Auto team's expectations. Medium and heavy commercial vehicle (MHCV) volumes (+11% YoY) turned positive after a hiatus of 15months, while LCV remained weak (-35% YoY). At the individual manufacturer level, Ashok Leyland's (ASOK.BO-INR38.7-H) MHCV volumes (18% YoY) were strong, as were Maruti's (MRTI.BO-INR2928-B). Aug volumes (+27% YoY), driven by an uptick across all segments. Our team continues to forecast industry demand revival over FY15-17E (15% p.a.).

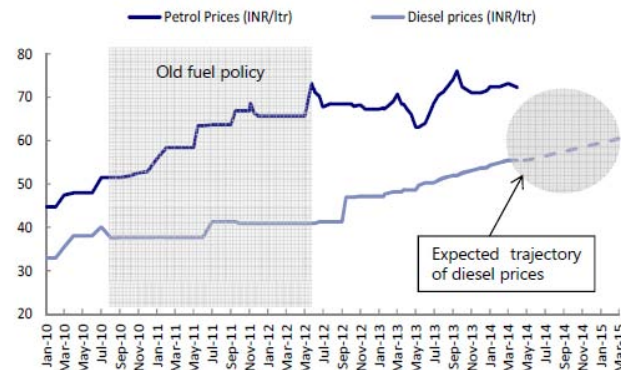
As we highlighted in the last Commodity Quarterly, the key risk to platinum demand is the decreasing subsidies of diesel in India, with our Indian oil team expecting diesel to be de-regulated by year end. During 2010 to 2012, diesel costs in India were 25 – 40% below that of gasoline. This led to diesel vehicles gaining significant market share and significant investments by the Auto OEM's were made to capture this market opportunity. However, the reversal of the subsidy policy means that the absolute price differential could narrow over time to less than 10%, with diesel losing some of its market share. Company commentary and channel checks suggest that the future mix could settle out at 50 - 50. Whilst this would be slightly negative in the short-term for platinum demand, the growth in vehicle sales (given the low penetration levels) and the likelihood of tightening emission legislations is still net positive for the metal over the longer term.

Figure 23: Indian market share by power train type



Source: Company reports, Deutsche Bank

Figure 24: Indian diesel and petrol prices



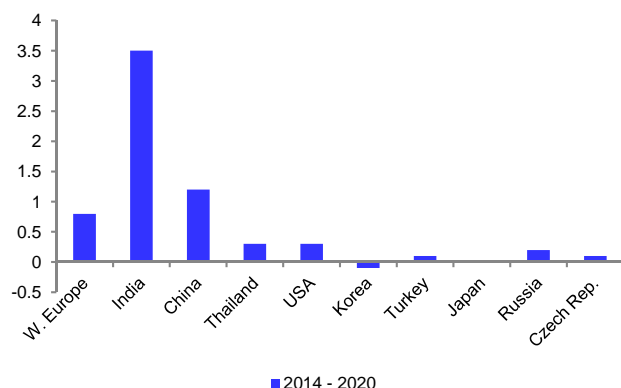
Source: Company reports, Deutsche Bank



India remains the key growth region in terms of diesel power train market penetration, with most other regions experiencing a decline in market share. In absolute unit terms, we estimate an additional 6.4 million diesel units to be produced between now and 2020, with India contributing over half of the additional units. A catch-up in emission legislation in all the other regions does represent some upside, but overall, we expect palladium demand growth to outstrip that of platinum, given the slow drift away from diesel power trains and the risk associated with Indian demand.

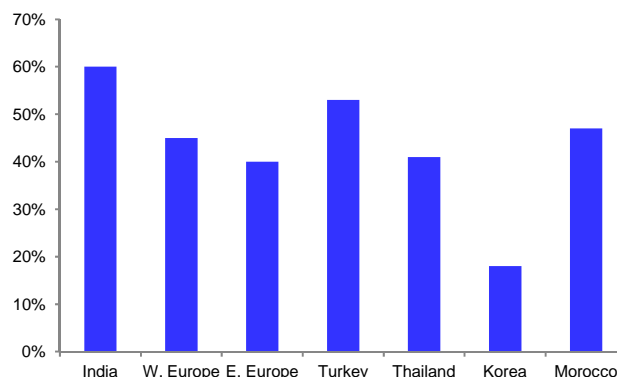
*Diesel power trains are likely to lose market share on a global basis. India will be the driver of growth, but there are some risks.*

Figure 25: Additional diesel units (million) by 2020E



Source: LMC Automotive, Deutsche Bank

Figure 26: Diesel Power train market share by country in 2020E



Source: LMC Automotive, Deutsche Bank

#### A repeat of 2013 China jewellery demand is unlikely

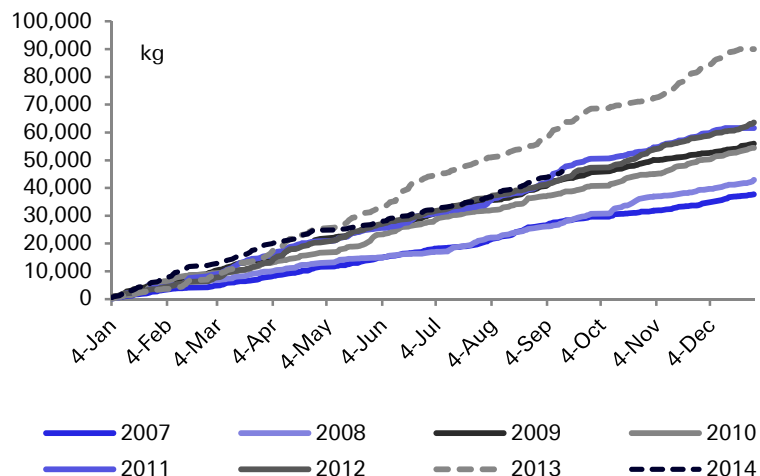
2013 was an excellent year for Chinese jewellery demand, but we expect this year to be slightly more muted. As a rough indication of Chinese jewellery demand, trading on the Shanghai Gold exchange is well down on 2013 volumes, and is tracking in line with 2011, in itself a decent year.

The China/Hong Kong jewellery chains have reported a tough H1'14, but there were signs of an improvement in August. Chow Sang Sang's SSSG (Same Store Sales Growth) reported negative numbers in July, with Hong Kong down 30% in H1'14. In August, the SSSG was flat YoY for China, but there was double digit growth for non-gold jewellery. Our China Luxury Goods analyst Anne Ling, remains positive on the industry and believe consumers will continue to trade up from gold jewelry to gem-sets – which have a higher margin and entry barriers – as middle class income rises. This is supported by Tiffany's Asia Pacific sales, up 3.4% in 2Q14 (May-July; 17% in 1Q14). This is a marginal positive for platinum demand as consumers are far more willing to use platinum in gem-sets.





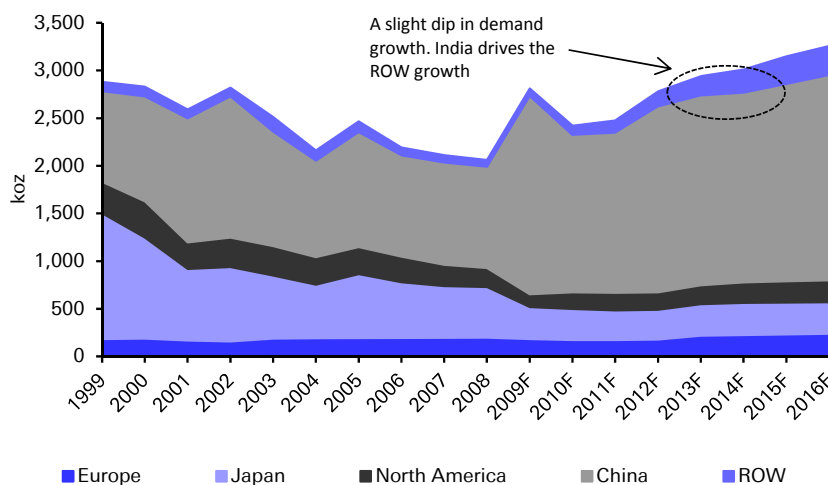
Figure 27: Cumulative traded Pt volumes on the SGE (annual)



Source: SGE, Deutsche Bank

We continue to see demand growth in the jewellery sector, driven by China and to a lesser extent India. We are forecasting gross demand growth in 2014 at 2.4%, compared to the 5.8% growth in 2013. On a net basis (post recycling) we expect growth of 4.6% in 2014E, versus 10.1% in 2013. India is the region with the most upside having a cultural propensity for jewellery and in particular gold as a store of value, and a favourable demographic profile. If platinum is accepted as a store of value, there could be upside in demand. A metal trading house is introducing 1oz platinum bars in time for Diwali, which could be a catalyst to see this trend.

Figure 28: Platinum gross jewellery demand by region



Source: JMAT, SFA Oxford, Deutsche Bank

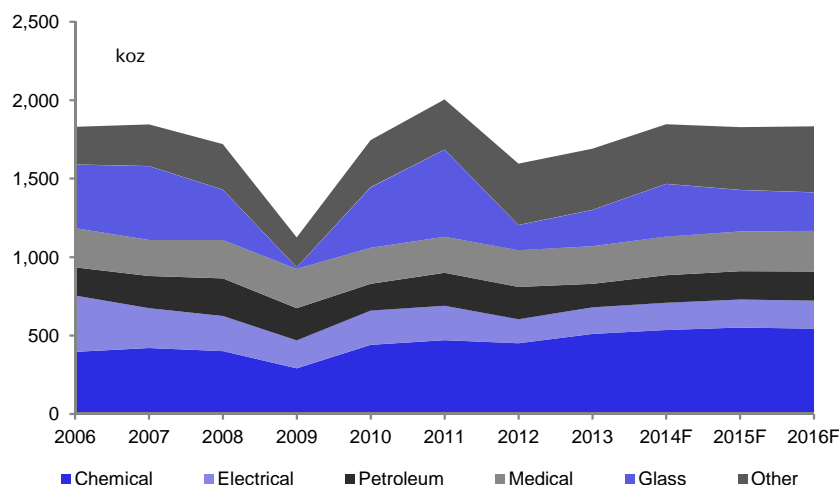
#### Industrial demand – a near-term lift from the Glass industry

Industrial demand growth (stripping out glass demand) has been very modest (1 -2% p.a.), but stable over the past 10 years, except for 2009 at the height of the global financial crisis. We are forecasting a CAGR of 1% from 2006 – 2016, excluding glass demand. Glass demand does however add an element of cyclicity to the broad demand category. As facilities are built, platinum (and



other PGM's) are used in the moulds, but capacity additions tend to come in bursts. We are forecasting Glass demand to be at a cyclical peak in 2014F, as a number of facilities are completed in China and South East Asia.

Figure 29: Industrial demand in platinum



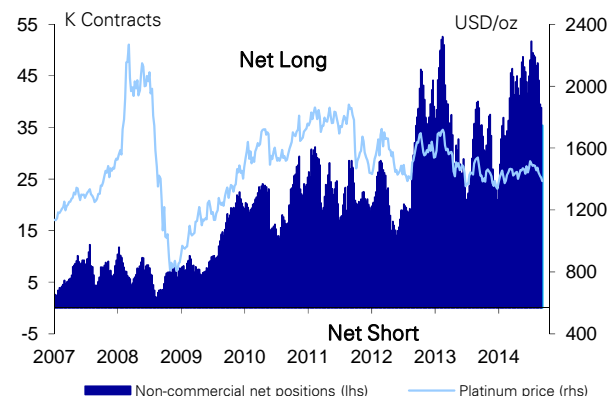
*Glass demand introduces an element of cyclicity to an otherwise stable demand category*

Source: JMAT, SFA Oxford, Deutsche Bank

Investment demand remains robust, and positioning is less extreme in platinum.

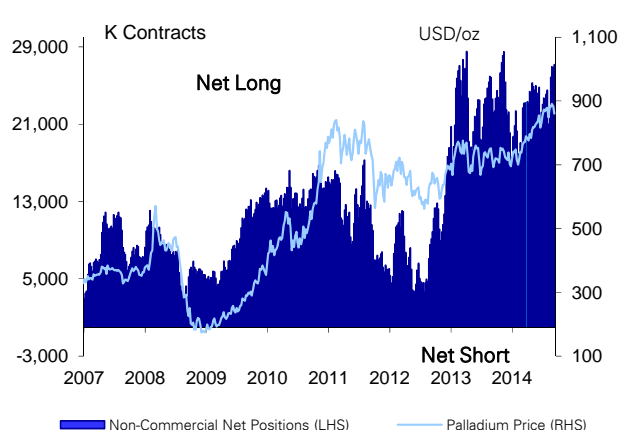
The contrast in "non commercial" positioning on the Nymex between platinum and palladium is indicative of the sentiment towards these two metals. Net long positions in platinum have fallen sharply since mid August, with the South African producers reporting a solid production ramp-up post the strikes, denting sentiment. The down-draught from gold has clearly not helped platinum either. The net long position in platinum is at 67% of the previous peak, whilst the net long position in palladium is now at 95% of the previous peak. The net long position in palladium has kept rising, despite a fall in prices, with strong US and Chinese Auto sales and the ongoing Ukrainian crisis maintaining investor sentiment.

Figure 30: Non commercial net positions on the Nymex - platinum



Source: CFTC, Reuters, Deutsche Bank

Figure 31: Non commercial net positions on the Nymex - palladium

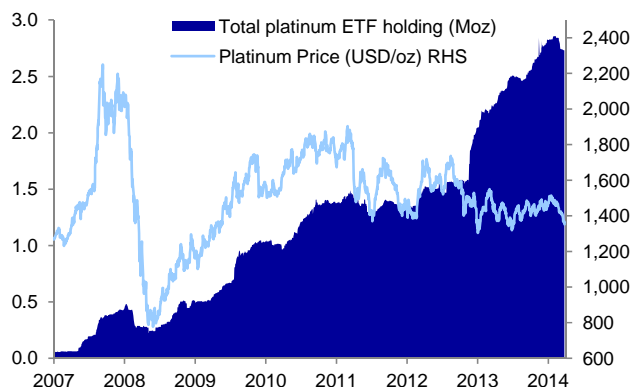


Source: CFTC, Reuters, Deutsche Bank



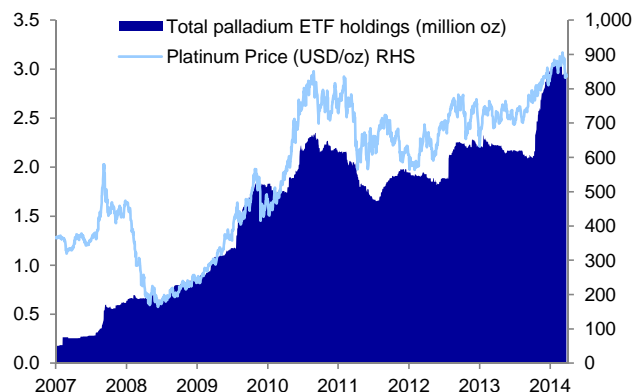
Although ETF holdings have been quite “sticky”, there have been some outflows over the past six weeks in palladium and platinum. The combined platinum ETF holding have seen outflows of c.130koz and palladium 145koz. These outflows have been widespread, with the exception of the South African ETFs, which have continued to attract metal into the ETF. Our view is that this is mostly “profit-taking” from many investors who are “in the money” from positions taken earlier in the year. Rhodium holdings in the Deutsche Bank ETC have been far more sticky, with only 2koz of outflows over the past month.

Figure 32: Total platinum ETF holdings



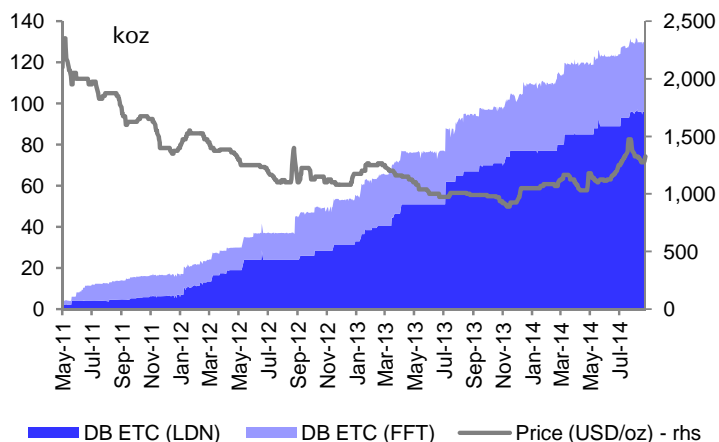
Source: Bloomberg Finance LP, Deutsche Bank

Figure 33: Total palladium ETF holdings



Source: Bloomberg Finance LP, Deutsche Bank

Figure 34: Deutsche Bank ETC Rhodium holdings



Source: Bloomberg Finance LP, Deutsche Bank

#### Trying to assess the new “normal” for production

Post the crippling strike, the South African producers are trying to ramp up production to “normal” levels. The producers are in a difficult position, with a full complement of workers, low absenteeism but sub-optimal production, which is having a detrimental impact on cashflows. There is a short-term imperative to generate cash given the weakened balance sheets. Most of the producers are undergoing strategic reviews, which we think will result in capacity rationalization, given the poor profitability of many of the UG2 areas. However the outcome and timing of these strategic reviews is still uncertain. There is however a high probability of further strike action should mass retrenchments be an outcome of the strategic reviews.

*South African producers –  
between a rock and a hard  
place*

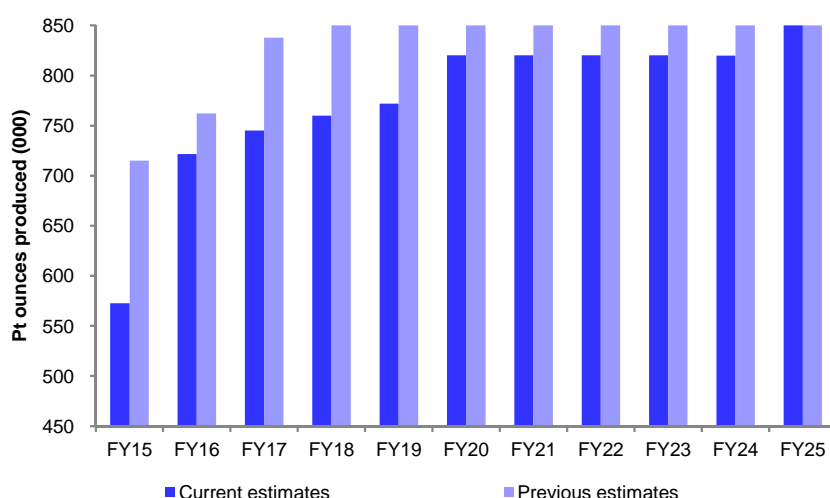


### Impala – delays to the replacement shafts

The ramp-up is on-track (100% by October), but a strategic review under way (outcome due in December 2014) places a question mark over medium-term production. This is compounded by a 1 to 2-year delay guided for the 3 new shafts. A further short-term challenge is the loss of up to 70koz of high-margin ounces in FY15 from Bimha mine (Zimplats), where ground conditions have deteriorated. While operations excluding the Lease Area performed well, the outlook for FY15 is challenging. The Lease Area is expected to lose a further 140koz on ramp-up and Impala guided to production of 575koz for FY15. Bimha mine closure will result in further ounces being lost. We have adjusted our production estimates for the delay on the 3 shafts and are cautious on medium-term production estimates until the strategic review is concluded.

The previous target for 850kozpa of platinum by 2018 seems unlikely, in our view. While we await the outcome of the strategic review (December 2014), we estimate the production profile over the medium term by beginning with the previous profile (850kozpa by 2018) and adjusting for deferred production. Ounces of production deferred are estimated from the delays to the triple build-up shafts. Figure 35 shows the change in production profile (DBe) as a result of the delays to the three shafts in build-up.

Figure 35: Lease Area production ramp-up estimates, then and now

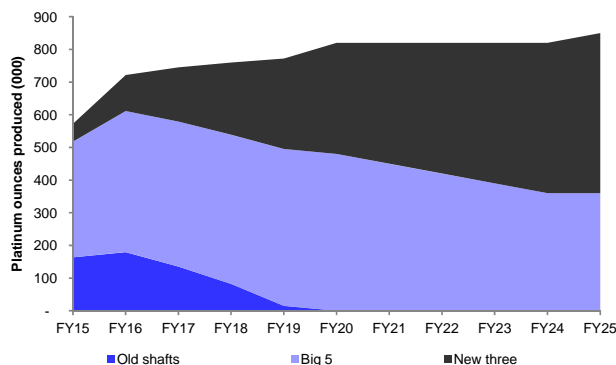


Source: Impala Platinum, Deutsche Bank

The profile is elongated under our new assumptions, building up to 850kozpa in 2025. The projects are staggered over the new forecast horizon. Under this profile, the Lease Area produces 820kozpa from FY20 onwards. Our assumed profile from the Old Shafts, the Big 5 and the New Three under the new, delayed, profile is shown in Figure 36. The previous profile is shown in Figure 37.

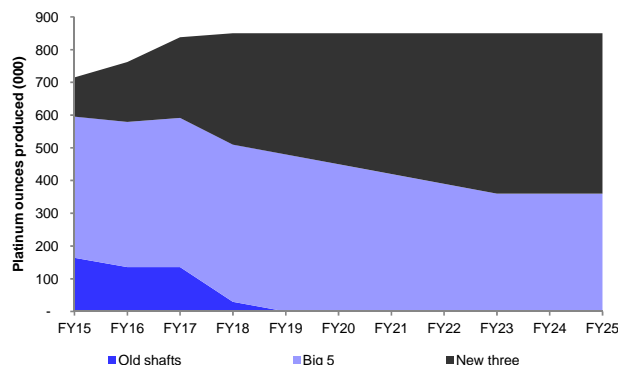


Figure 36: Delayed profile: production sources



Source: Deutsche Bank, Company data

Figure 37: Old profile ramped up more quickly



Source: Deutsche Bank, Company data

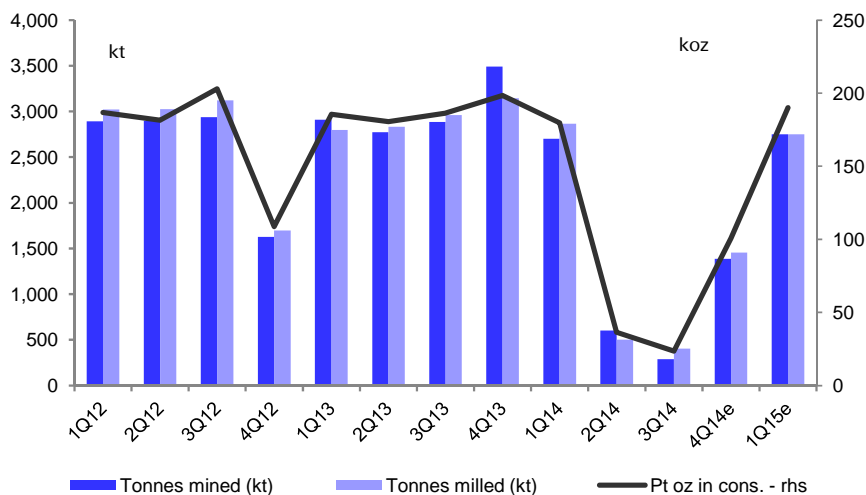
### Lonmin – been there, done that

Lonmin's ramp-up is going well and we maintain our view that the group is well placed and prepared to continue back to a normal output level. 3Q14 results increased our confidence that Lonmin is managing its balance sheet well and that it can afford its pipeline rebuild given flexibility and headroom. Lonmin ramped-up beyond expectations (and even its own renewal plan) post the Marikana strike in 4Q12. The elements which supported the ramp-up appear to be in place, with ore-reserve availability high (c.18 months) and 90% attendance of employees (the normal level taking into account leave and other absences). Lonmin has completed the medicals and other induction programs, and has commenced mining again.

The company stated it was at c.30% production currently and was expecting to be at c.80% by the end of its fiscal year (end September).

We are comfortable with this ramp-up guideline, given Lonmin's past success in this regard. Quarterly production records and DBe for the next two quarters are shown in Figure 38.

Figure 38: Lonmin's quarterly production trends



Source: Lonmin, Deutsche Bank



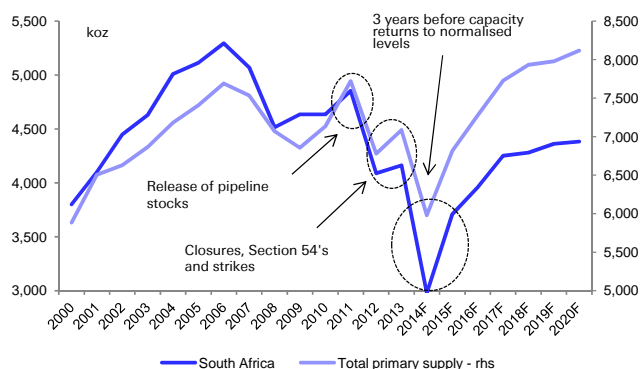
In 1Q13 Lonmin was able to recover from the strike in the preceding quarter and mining production was essentially back to normal in 1Q13. Although the 2014 strike has been much longer in duration, we are encouraged by the company being at 30% of normal within two weeks, the high-level of attendance reported and the ore-reserve availability position. We have production normalising in 1Q15e (run-rate of 750kozpa).

#### Amplats - Mogalakwena remains the focus

The Amplats ramp-up seems to be going fairly well based on channel checks, but we will need to wait for the Q3 production results to gain a better impression. Mogalakwena very much remains the focus for Amplats and achieved record production of 185koz of platinum in the period. Amplats continues to target 420kozpa by 2017 with incremental capital spend and highlighted the potential for further expansion beyond this point to c.600kozpa. However, this would require significant investment in processing capacity, particularly to handle the high base-metal content of the platreef, and this capital decision would not be made unless economic to do so. We would thus expect limited announcements on this part of the portfolio shift until the incremental changes have been bedded down.

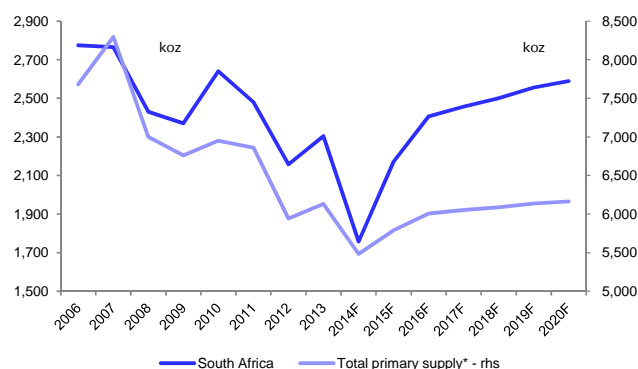
We outline our forecasts for the recovery in South African PGM production, post the strikes. These forecasts are in the absence of any curtailments as a result of the strategic reviews. In platinum, the new “normal” is around the 4Moz level, but we only forecast South African supply to get there by 2016F. We expect a similar profile in palladium, where production will recover to c.2.3Moz by 2016F, gradually increasing to c.2.5Moz by the end of the decade.

Figure 39: Primary platinum supply



Source: Deutsche Bank

Figure 40: Primary palladium supply

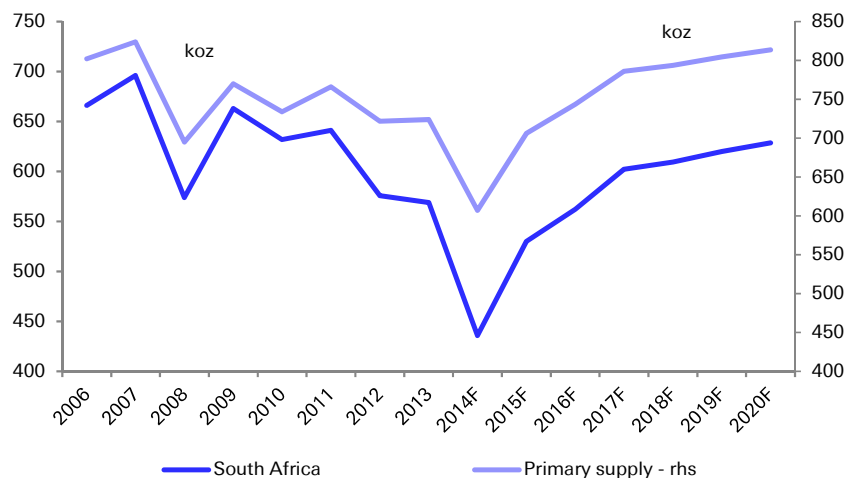


Source: Deutsche Bank, \*includes Russian stockpile sales

In Rhodium, we forecast the new “normal” South African output to be around 550 – 600koz, with a return to the 560 – 570koz level in 2016F.



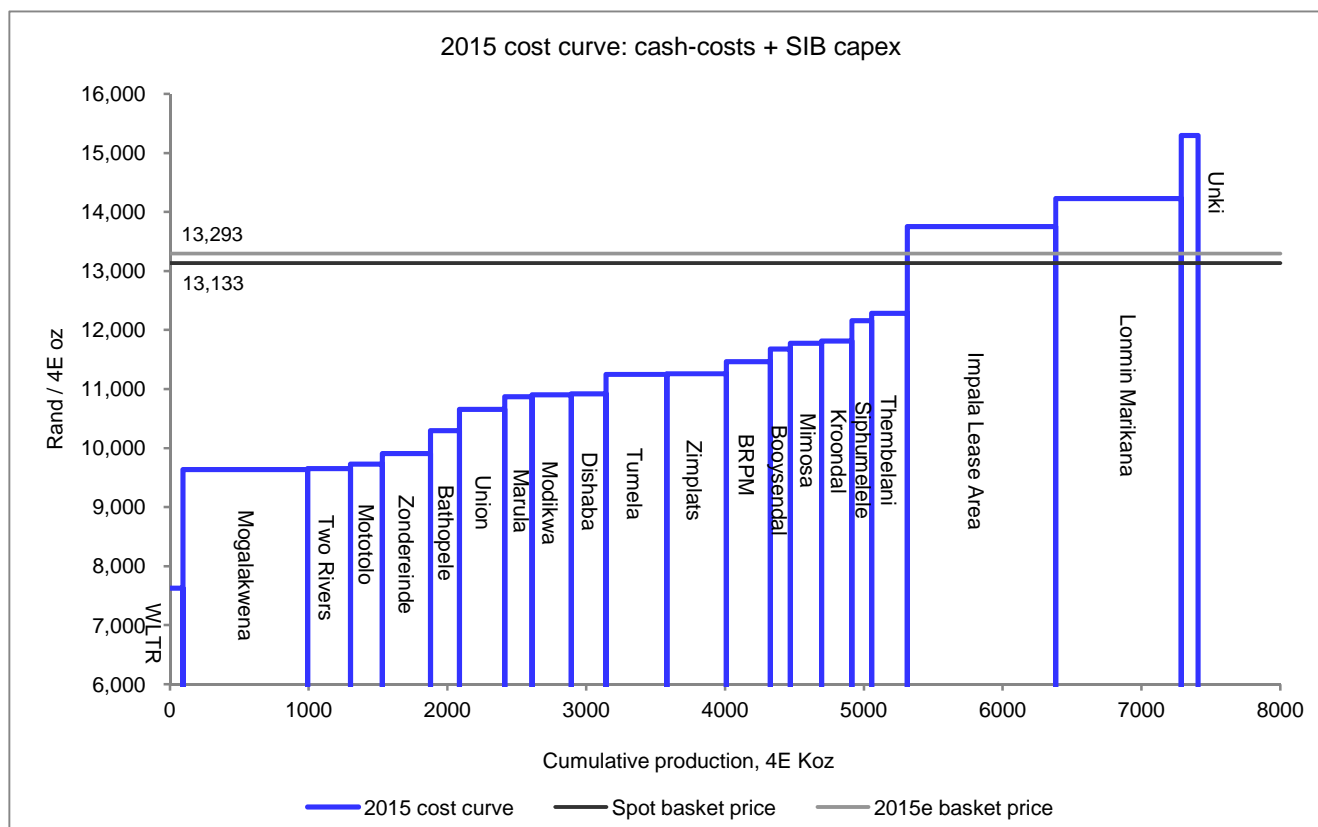
Figure 41 Rhodium supply recovery post the South African strikes



Source: Deutsche Bank

Post the recent company results and better clarity around the ramp-up post the strikes, we have lowered our disruption allowances in each of the PGMs. In platinum; we have lowered the negative production adjustment from 500koz to 300koz, in palladium we have lowered the negative production adjustment from 300koz to 100koz, and from 70koz to 50koz in Rhodium.

Figure 42: Southern African cost curve in 2015E



Source: Company reports, Deutsche Bank





### Supply – demand balances

We have updated our supply–demand balances to reflect the more severe impact of the strike in South Africa, but also the recovery in production from 2016E onwards. We have made very modest adjustments to our demand expectations.

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Figure 43: Platinum supply – demand balance

Platinum		2008	2009	2010	2011	2012	2013	2014F	2015F	2016F	2017F	2018F	2019F	2020F
South African supply	koz	4,515	4,635	4,635	4,855	4,090	4,163	2,976	3,708	3,957	4,252	4,281	4,361	4,384
North American supply	koz	325	260	200	350	310	340	328	310	310	295	300	300	300
Russian production	koz	805	785	825	835	800	740	760	760	760	760	760	760	760
Zimbabwe	koz	180	230	280	340	340	402	384	352	420	442	442	442	442
Other	koz	115	115	110	100	110	200	205	195	200	205	210	215	220
Autocat recycling	koz	1,245	945	1,085	1,240	1,130	1,240	1,326	1,490	1,627	1,773	1,939	1,900	2,009
<b>Total supply</b>	<b>koz</b>	<b>7,070</b>	<b>6,855</b>	<b>7,135</b>	<b>7,720</b>	<b>6,780</b>	<b>7,086</b>	<b>5,979</b>	<b>6,815</b>	<b>7,275</b>	<b>7,727</b>	<b>7,932</b>	<b>7,978</b>	<b>8,116</b>
<b>Supply growth</b>	<b>%</b>	<b>-6.2</b>	<b>-3.0</b>	<b>4.1</b>	<b>8.2</b>	<b>-12.2</b>	<b>4.5</b>	<b>-15.6</b>	<b>14.0</b>	<b>6.7</b>	<b>6.2</b>	<b>2.7</b>	<b>0.6</b>	<b>1.7</b>
<b>Total demand</b>	<b>koz</b>	<b>7,295</b>	<b>6,215</b>	<b>7,160</b>	<b>7,270</b>	<b>7,130</b>	<b>7,780</b>	<b>7,737</b>	<b>7,724</b>	<b>7,892</b>	<b>8,132</b>	<b>7,935</b>	<b>7,967</b>	<b>8,216</b>
<b>Demand growth</b>	<b>%</b>	<b>-4.0</b>	<b>-14.8</b>	<b>15.2</b>	<b>1.5</b>	<b>-1.9</b>	<b>9.1</b>	<b>-0.6</b>	<b>-0.2</b>	<b>2.2</b>	<b>3.0</b>	<b>-2.4</b>	<b>0.4</b>	<b>3.1</b>
Autocatalyst	koz	3,655	2,185	3,075	3,185	3,190	3,180	3,300	3,441	3,521	3,608	3,723	3,809	3,902
Chemical	koz	400	290	440	470	450	510	535	551	543	549	553	559	565
Electrical	koz	230	180	220	220	155	170	175	180	180	179	175	168	158
Glass	koz	315	10	385	555	160	230	335	265	245	295	295	295	295
Investment	koz	555	660	655	460	455	830	375	150	160	170	-170	-160	-150
Jewellery	koz	1,365	2,245	1,685	1,665	1,890	2,080	2,215	2,305	2,378	2,429	2,434	2,363	2,506
Medical & Biomedical	koz	245	250	230	230	235	240	247	253	260	266	273	280	287
Petroleum	koz	240	205	170	210	205	150	175	180	185	196	192	193	194
Other	koz	290	190	300	275	390	390	380	400	420	440	460	460	460
Market balance	koz	-225	640	-25	450	-350	-694	-1,757	-908	-617	-405	-3	11	-100
Annual average price	US\$/oz	1,576	1,205	1,612	1,721	1,553	1,487	1,425	1,513	1,575	1,680	1,800	1,900	2,000
<b>Market balance excl. investment demand</b>		<b>330</b>	<b>1,300</b>	<b>630</b>	<b>910</b>	<b>105</b>	<b>136</b>	<b>-1,382</b>	<b>-758</b>	<b>-457</b>	<b>-235</b>	<b>-173</b>	<b>-149</b>	<b>-250</b>

Source: Johnson Matthey, SFA Oxford, Deutsche Bank



Figure 44: Palladium supply – demand balance

Palladium		2010	2011	2012	2013	2014F	2015F	2016F	2017F	2018F	2019F	2020F
South African supply	koz	2,640	2,480	2,157	2,304	1,757	2,171	2,406	2,457	2,501	2,555	2,589
North American supply	koz	590	900	895	928	976	969	951	944	938	931	924
Zimbabwe	koz	220	265	265	331	270	293	321	338	338	338	338
Russian production	koz	2,720	2,705	2,630	2,650	2,650	2,650	2,650	2,650	2,650	2,650	2,650
Russian stockdraw	koz	1,000	775	260	250	100	0	0	0	0	0	0
Russian sales	koz	3,720	3,480	2,890	2,900	2,750	2,650	2,650	2,650	2,650	2,650	2,650
Other mine	koz	185	155	160	150	180	180	180	180	180	180	180
Secondary Supply		1,315	1,695	1,670	1,792	1,926	2,044	2,172	2,314	2,470	2,643	2,837
<b>Total supply</b>	<b>koz</b>	<b>8,670</b>	<b>8,975</b>	<b>8,037</b>	<b>8,405</b>	<b>7,859</b>	<b>8,307</b>	<b>8,681</b>	<b>8,883</b>	<b>9,076</b>	<b>9,298</b>	<b>9,518</b>
<b>Supply growth</b>	<b>%</b>	<b>7.5</b>	<b>3.5</b>	<b>-10.4</b>	<b>4.6</b>	<b>-6.5</b>	<b>5.7</b>	<b>4.5</b>	<b>2.3</b>	<b>2.2</b>	<b>2.4</b>	<b>2.4</b>
<b>Total demand</b>	<b>koz</b>	<b>9,195</b>	<b>7,870</b>	<b>9,350</b>	<b>9,377</b>	<b>10,162</b>	<b>9,757</b>	<b>9,823</b>	<b>9,987</b>	<b>10,174</b>	<b>10,355</b>	<b>10,520</b>
<b>Demand growth</b>	<b>%</b>	<b>24.5</b>	<b>-14.4</b>	<b>18.8</b>	<b>0.3</b>	<b>8.4</b>	<b>-4.0</b>	<b>0.7</b>	<b>1.7</b>	<b>1.9</b>	<b>1.8</b>	<b>1.6</b>
Autocatalyst	koz	5,580	6,155	6,705	7,102	7,512	7,885	8,076	8,362	8,660	8,943	9,215
Dental	koz	595	540	530	460	450	445	430	415	403	390	375
Electronics	koz	970	895	760	690	601	511	441	373	306	241	176
Chemical	koz	370	440	530	510	510	551	553	560	567	575	584
Jewellery	koz	495	295	255	240	189	135	89	40	-3	-43	-82
Investment	koz	1,095	-565	470	275	800	130	128	126	124	122	120
Other	koz	90	110	100	100	100	101	106	111	117	127	133
<b>Market balance</b>	<b>koz</b>	<b>-525</b>	<b>1,105</b>	<b>-1,313</b>	<b>-972</b>	<b>-2,303</b>	<b>-1,450</b>	<b>-1,143</b>	<b>-1,103</b>	<b>-1,098</b>	<b>-1,057</b>	<b>-1,001</b>
Annual average price	US\$/oz	525	733	644	726	816	863	950	1,000	1,100	1,000	1,000
<b>Market balance without investment demand</b>	<b>koz</b>	<b>570</b>	<b>540</b>	<b>-843</b>	<b>-697</b>	<b>-1,503</b>	<b>-1,320</b>	<b>-1,015</b>	<b>-977</b>	<b>-974</b>	<b>-935</b>	<b>-881</b>

Source: Johnson Matthey, SFA Oxford, Deutsche Bank

Figure 45: Rhodium supply – demand balance

		2010	2011	2012	2013	2014F	2015F	2016F	2017F	2018F	2019F	2020F
<b>Total supply</b>	<b>Koz</b>	<b>975</b>	<b>1,043</b>	<b>974</b>	<b>996</b>	<b>904</b>	<b>1,008</b>	<b>1,070</b>	<b>1,138</b>	<b>1,191</b>	<b>1,227</b>	<b>1,261</b>
Supply growth	%	1.9	7.0	-6.6	2.3	-9.2	11.5	6.2	6.3	4.6	3.0	2.8
South African supply	koz	632	641	576	569	436	510	552	592	619	630	638
North American supply	koz	10	23	23	24	24	26	26	26	26	26	26
Zimbabwe	koz	19	29	30	31	37	31	37	39	39	39	39
Other	koz	3	3	3	20	30	40	41	41	42	42	43
Russian sales	koz	70	70	90	80	80	79	78	78	78	78	78
Secondary	koz	241	277	252	272	297	322	337	362	387	412	437
<b>Total demand</b>	<b>Koz</b>	<b>887</b>	<b>908</b>	<b>966</b>	<b>1,036</b>	<b>1,088</b>	<b>1,126</b>	<b>1,135</b>	<b>1,205</b>	<b>1,281</b>	<b>1,308</b>	<b>1,336</b>
Demand growth	%	23.9	2.4	6.4	7.3	4.9	3.6	0.8	6.2	6.3	2.1	2.1
Autocat	koz	727	715	782	819	841	915	941	1013	1081	1099	1117
Chemical	koz	67	72	81	79	75	80	70	75	80	86	92
Electrical	koz	4	5	6	7	6	6	5	4	4	2	1
Glass	koz	68	78	31	40	65	40	43	46	49	52	56
Investment	koz	0	0	36	60	60	40	30	20	20	20	20
Other	koz	21	38	30	31	40	45	46	47	48	49	50
<b>Market balance</b>	<b>Koz</b>	<b>88</b>	<b>135</b>	<b>8</b>	<b>-40</b>	<b>-183</b>	<b>-118</b>	<b>-65</b>	<b>-67</b>	<b>-91</b>	<b>-82</b>	<b>-76</b>
Annual average price	US\$/oz	2,442	1,990	1,274	1,067	1,152	1,250	1,400	1,700	1,900	2,500	4,000

Source: SFA Oxford, Johnson Matthey, Deutsche Bank



## #11 Industrial Metals

### The tall shadow of the Chinese property market

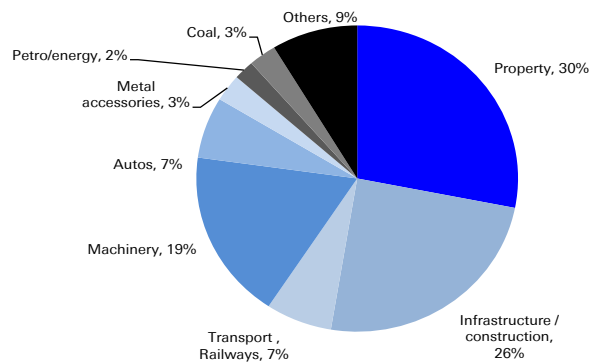
- We retain our relatively more bullish view on the base metals, especially **Nickel, Zinc and Lead**, given the more limited exposure to the Chinese property sector. This view is also borne out by investor positioning in nickel and zinc, with money manager positions being the most net long for these two metals. Ultimately it is the supply side dynamics that are driving the individual performance of the metals. Nickel stocks (both ore and metal) have remained stubbornly high, but we think it is a matter of time before the market moves to a significant deficit. Copper has been tight for the first half of the year, but we expect mined supply to finally catch up and tip the market into a surplus in the final quarter of the year. The outlook for aluminium has certainly improved with significant closures globally, and in particular our view of a less over-supplied market in China, given the higher than expected project cancellations. However, we think it is a matter of price before capacity restarts balance the market once more.
- We are seeing the first, albeit tentative signs of a cyclical recovery in the Chinese property sector. However, we think that this cycle may be more protracted than previous cycles given the reluctance of property developers to cut prices significantly. The **Steel-making materials** are most exposed to this sector, and hence we expect the demand outlook to remain weak. That being said, we do believe that the structural drivers for property are still intact and that steel consumption will remain positive in China for the next few years at least. The current iron ore price is below any sensible marginal cost support level, but there has been a reluctance to cut capacity up to now. Although we expect some seasonal restocking in Q4, and a rebound in prices, the effect may be more muted than in previous years. Met Coal prices seem to have found a floor, but we believe further cuts are required for prices to start appreciating.

### The Chinese property market remains the key short-term risk

The Chinese property / real estate construction sector remains the biggest downside risk to metals demand, which up to now has remained fairly robust, especially in base metals. Floor space sold is down 34% y/y, after a very strong 2013. Building starts, as measured by Gross Floor Area, are also down 28% y/y up to the end of August. We outline the exposure to the Chinese real estate sector for each of the base metals and steel in the charts below. Steel has the biggest direct exposure at c.30%, although property and infrastructure combined comprises 56% of steel consumption. At the opposite end of the spectrum, lead has negligible exposure to the China property sector, and zinc only 13%. On a global basis, 19% of stainless steel which in turn is c.80% of nickel demand is consumed in construction. We think a reasonable estimate for Chinese nickel consumption in residential property is in the region of 10 – 12%. Although construction only comprises 9% of Chinese copper demand according to Antaika, the global construction exposure is c.30%. We would put Chinese construction demand closer to 20% of the overall copper demand. Construction activity contributes c.27% of aluminium demand, but residential demand is likely to be lower at c.14 – 15%.

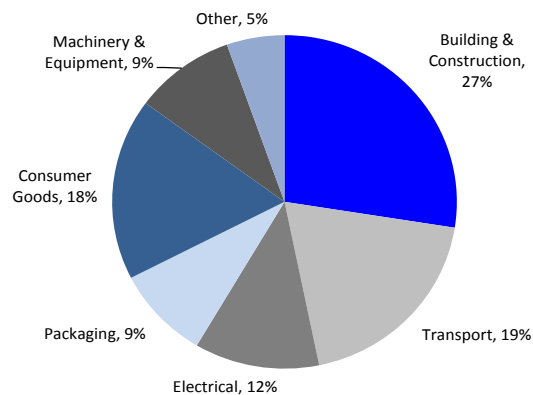


Figure 1: Chinese steel consumption by category in 2014E



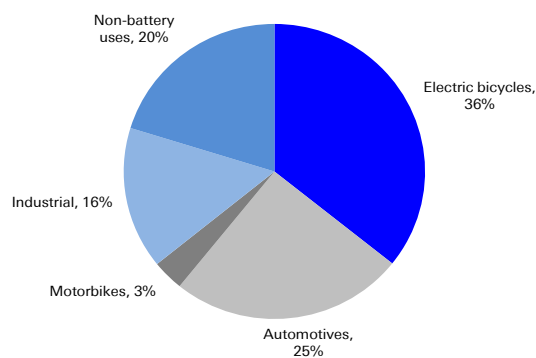
Source: Deutsche Bank

Figure 2: Chinese aluminium consumption by category in 2014E



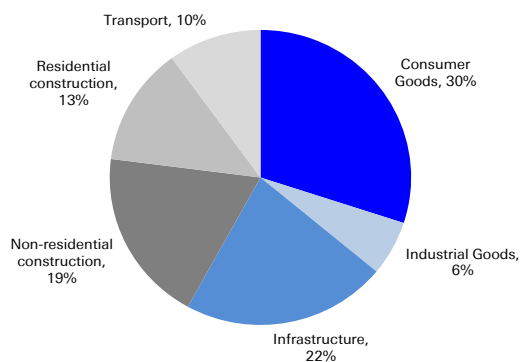
Source: Wood Mackenzie, Deutsche Bank

Figure 3: Chinese lead consumption by category in 2014E



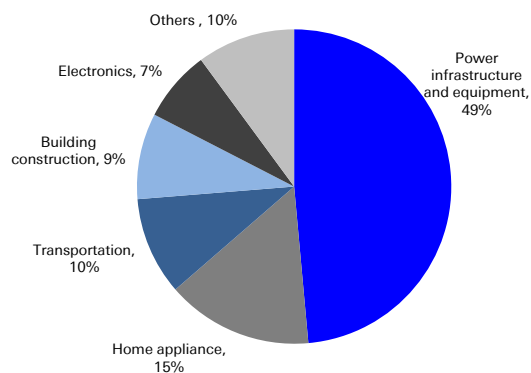
Source: Wood Mackenzie, Deutsche Bank

Figure 4: Chinese zinc consumption by category in 2014E



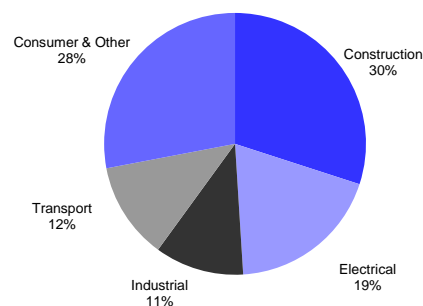
Source: Wood Mackenzie, Deutsche Bank

Figure 5: Chinese copper consumption by category in 2014E



Source: Antaike, Deutsche Bank

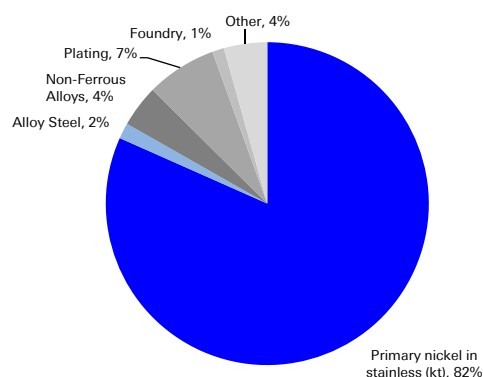
Figure 6: Global copper demand by end sector in 2014E



Source: Wood Mackenzie, Deutsche Bank

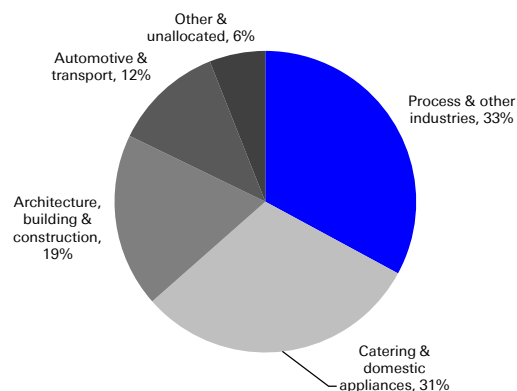


Figure 7: Chinese nickel demand by primary application in 2014E



Source: Wood Mackenzie, Deutsche Bank

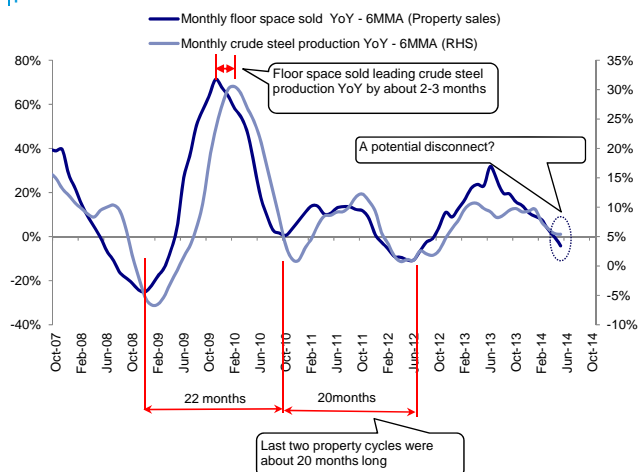
Figure 8: Global stainless steel demand by end sector in 2013



Source: Wood Mackenzie, Deutsche Bank

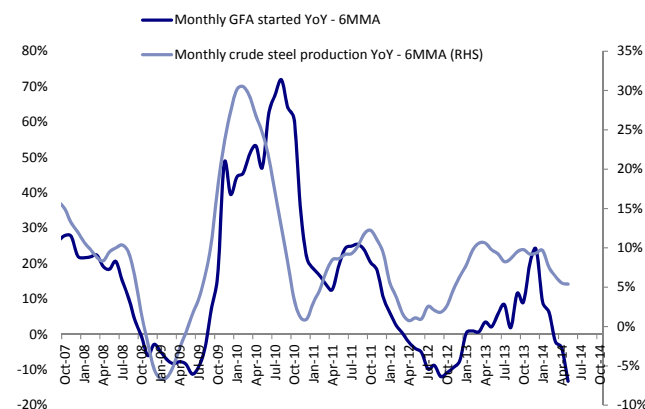
The importance of the Chinese property sector is highlighted by the chart below, where Chinese crude steel lags property sales by 2 – 3months. The current fall in property sales has led crude steel production down to low single digit growth. There is a risk that a further contraction in property sales will result in a further slowdown of crude steel production. Although not as reliable a lead indicator, the sharp fall in property starts is also a potential headwind for crude steel production.

Figure 9: Chinese property sales versus crude steel production



Source: NBS, WIND, Deutsche Bank

Figure 10: Chinese property starts versus crude steel production



Source: NBS, WIND, Deutsche Bank

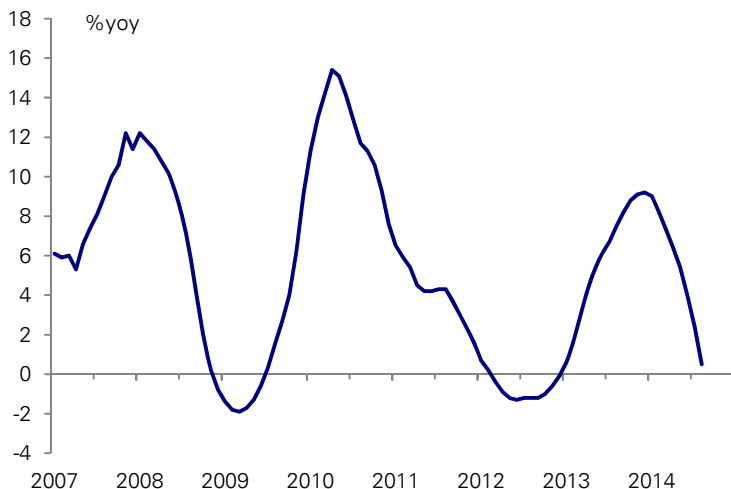
### Is this a structural or cyclical downturn?

A key discussion point with investors; is whether the current malaise in the Chinese property market is cyclical or structural. The Deutsche Bank view is that this is a cyclical downturn, which has been rather more protracted than expected given the reluctance by property developers to cut prices.



We estimate that the average rate of property price increases in China's 70 largest cities peaked at the end of last year at 9.2%yoy. Monthly price changes have been slowing since late last year, and May saw property prices fall for the first time in two years.

Figure 11: Property prices in China



Sources: Wind and Deutsche Bank Research. This chart plots the calculated YoY change in our constructed monthly property price index derived from the published National Bureau of Statistics' report of MoM changes in average selling prices of new residential property in 70 cities.

As Figure 11 shows, this marks the third cyclical downturn in about six years. So the prospect of declining prices is certainly not unprecedented. Moreover, this past cycle seems to have been a little more moderate – price increases peaked at 12.2% in January 2008 and 15.4% in April 2010. So our first observation about the property cycle in China is simply that there is a cycle and that Chinese investors have seen this before. That's reassuring because it allows us to infer from these past recent cycles how developers and investors might behave this time around.

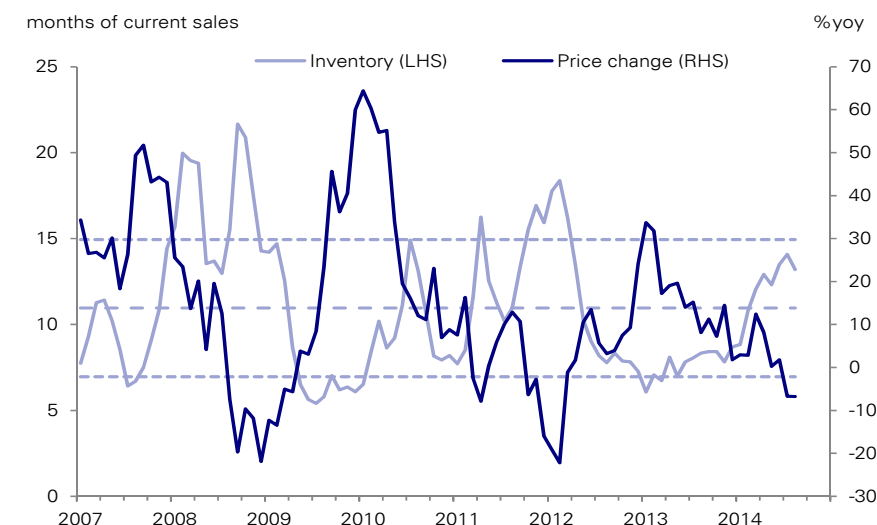
To illustrate market dynamics, we focus on the Tier 1 cities because we have relatively long time series for data for these cities as compared with smaller cities. In Figure 12 we plot the YoY change in the average selling prices across these four cities against the average level of inventories of unsold, completed, units measured in months of 3mma sales. The horizontal lines are the average and one standard deviation band for the inventory ratio. So, as of April, the data show a YoY change in average selling prices of 8.2%, down from a recent peak of 31.8% in February 2013. Readers will observe that the Tier 1 city prices lead the 100 city (or NBS 70 city) averages by about six months.

*We have included an extract from the note entitled Global Economic Perspectives: China's Property Cycle, dated the 6th of June by Hooper, Spencer et al.*

*Chinese investors have seen this before, so the past can guide our view of the future*



Figure 12: Property prices and inventories in Tier 1 cities



Source: Soufun and Deutsche Bank Research. Average selling prices and inventories (relative to the 3mma of unit sales) for Beijing, Guangzhou, Shanghai, and Shenzhen.

Since the recent peak in price changes, the inventory ratio has risen from a relatively low 6 months at the beginning of 2013 to nearly 13 months in April. Inventory has peaked at c.15 months, with a slight tick down in August.

As we observed with respect to Figure 12, the recent cycle even in Tier 1 cities has been a little less extreme than the previous cycles, which saw price rises hit 52% (2007) and 64% (2010). Similarly, the supply/demand imbalance reflected in the unsold inventory is –so far, at least – far below previous peaks of about 20 months.

But what we take away from this chart is that the property market appears to behave normally. The past two cycles resolved themselves after prices had declined about 20%. And very quickly after prices began to decline inventories began to decline. Within nine months, inventories were back at their historical averages and prices were rising.

#### Making the case for a continuation of the structural trend

We continue to think that the property sector could remain an important driver of growth for many more years. The housing stock that was suddenly granted to residents in the mid-1990s was, by today's standards, very inferior. Pre-reform apartments are generally small and often residents share kitchens and bathroom facilities. More worryingly, the government estimates that because of the poor quality of construction, these buildings have an average life of only 25 years.

But survey evidence suggests that even after 15 years of rapid growth in residential investment, about half the urban population still lives in pre-reform housing (Figure 13). The developers – building “commodity housing” – have housed about one-third of the urban population while the government has build “social housing” for half as many. But of the 50% of the population living in older housing, many of them – 20% of the total urban population – are living in housing that is more than 25 years old (Figure 14). That is, one-fifth of the population is living in housing that the government estimates should already have been torn down.

*Measured by prices or inventories, this cycle was less pronounced than the last two.*

*20% price cuts coincided with a decline in inventories in the past.*

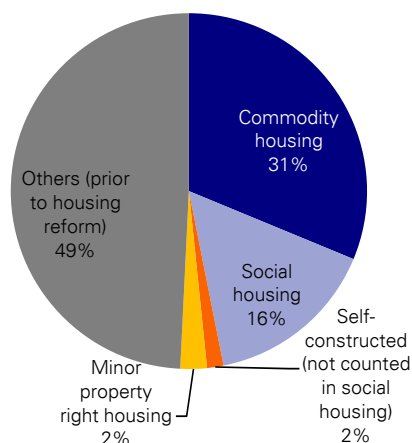
*The government estimates apartment buildings last only 25 years. “Upgrading” is a key driver of demand.*

*Half the urban population still lives in pre-reform housing; 20% in housing older than 25 years*



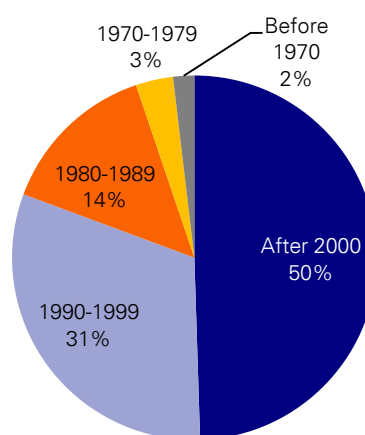


Figure 13: Type of urban housing



Sources: CEIC, NBS, MoHURD, MoF and Deutsche Bank Research

Figure 14: Construction date of urban housing



Sources: CEIC, NBS, MoHURD, MoF and Deutsche Bank Research

We think this replacement or upgrading demand coupled with the migration of at least another 150mn people to the cities could support urban residential construction at about last year's level for many more years. However, it should not be necessary to continue building rural property at the rate it has been built in recent years. While a somewhat higher proportion of the rural population is in inadequate housing, the fact is this population is already shrinking. It is not necessary to rebuild all of these old rural homes.

#### Conclusion – a recovery in Q1/2 next year given the appropriate level of price cuts

China's property market has been an important driver of growth since the late 1990s. Much of this has been replacement demand, something much less important in mature markets. This explains why sales of existing properties are less than 20% of turnover: Property developers have re-housed a third of the urban population in less than 20 years. The government has re-housed maybe half of that. Such rapid re-building of the housing stock explains why residential construction has been such a large share of GDP – we estimate the direct and indirect contributions of housing at almost 13% of GDP. This high level of construction activity could continue for another couple of decades or more in China's cities. Not so in rural areas, though.

Around this positive structural view will inevitably be cyclical rises and declines in prices as developers and the government try – but will occasionally fail – to predict and accommodate demand. Along the way, as well, some housing will be built in the wrong places just as developers will fail to gauge demand for styles and features. The less involved the government is, the better we think the market will sort itself out. Its urbanization policy is a key source of uncertainty. The government prefers that future migrants not move to Tier 1 cities – its urbanization strategy sees smaller cities driving growth. Migrants, however, may rationally prefer to move to larger cities. The offer of a hukou and improved infrastructure might sway them. But the uncertainty over where they will be allowed to live freely – with children in formal schools and with proper access to health care and other services – could lead to inefficient choices about where to build housing.

*Housing accounts for about 13% of GDP in direct and indirect contributions and this could continue for many more years.*

*The market will always fluctuate around the trend. But the government could help by clarifying its urbanization strategy – especially the hukou policy.*

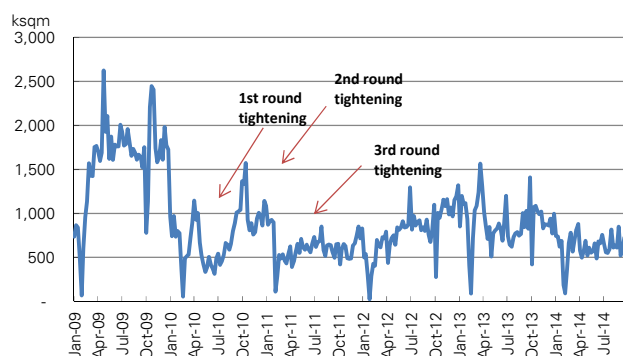


### Tentative signs of recovery

Our China property team's view is that the current downturn is cyclical, and with the appropriate level of price cuts, property sales will recover. Both central and local government policies are also being relaxed to facilitate the easing of the China property market. Since July, about 37 out of the 46 cities with home purchase restrictions (HPRs) have already relaxed or removed these restrictions, while more banks have started to loosen on mortgages (faster mortgage approval processes and/or lower mortgage interest rates for first-time homebuyers). Some market participants have argued that such relaxations have not resulted in market recovery but, in our team's view, this has been due to the July to mid-Aug (together with Feb) seasonal slowdown for property sales. This happens every year due to the aftermath of a major sales rush in June, summer vacations, and company reporting seasons, etc), hence the impact of such relaxations is not being reflected in the latest national sales numbers. However, with the upcoming new launches especially with the more flexible pricing strategies, sales in Sep and Oct should show much stronger momentum, in the view of our China property analyst Tony Tsang.

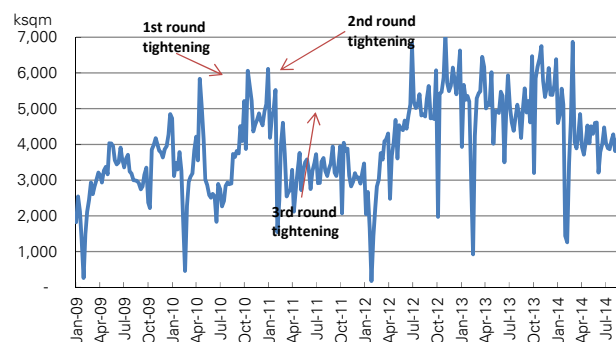
The latest data has indicated that this is the case. In the week of 15-21 September, total sales volume in the 40 major cities recorded a solid 15.4% WoW rebound, to 5.417msqm, the second week of sales volumes were above 5msqm in the past four weeks. On a YoY basis, the sales volume among the 40 cities remained flat. Total sales volume in the 40 major cities in September MTD rose by 4%, to 14.685msqm. Meanwhile, the YTD total sales volume in the 40 major cities fell 17% YoY, to 182.1 msqm.

Figure 15: Weekly transaction volumes of Tier-1 cities in China



Source: Soufun, Deutsche Bank

Figure 16: Weekly transaction volumes of Tier-2/3 cities in China



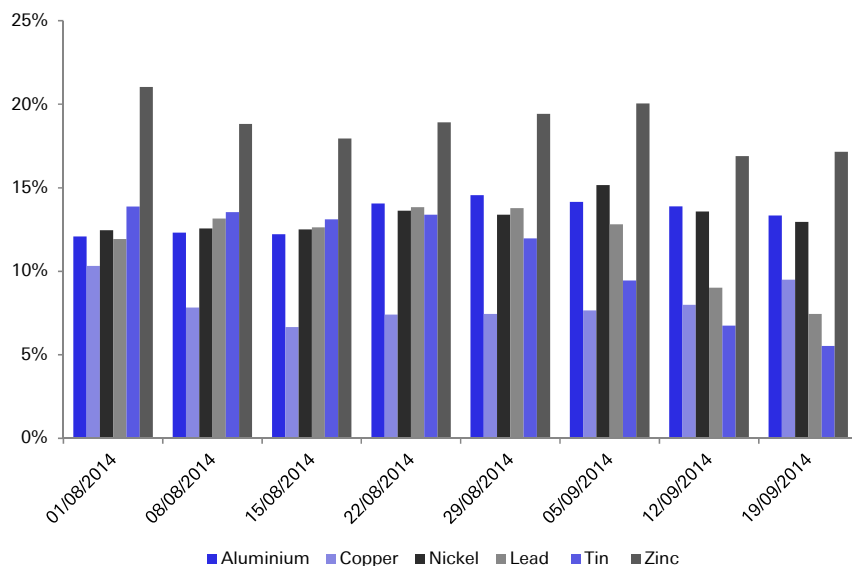
Source: Soufun, Deutsche Bank

### Dissecting the LME's Commitment of Traders report

In an attempt to improve transparency, the LME has started to publish positioning amongst various categories of market participants on the LME. Although by no means a perfect measure, we think the positioning of the Money Manager category provides the best gauge of investor sentiment towards the various base metals. Investor sentiment seems to be most predisposed to zinc, followed by aluminum and then nickel. Copper, lead and tin are the least preferred. We also note that net long positioning has declined over the past two to three weeks as the sentiment towards China has waned.



Figure 17: Net long position of the Money Manager category, expressed as a percentage of the open interest

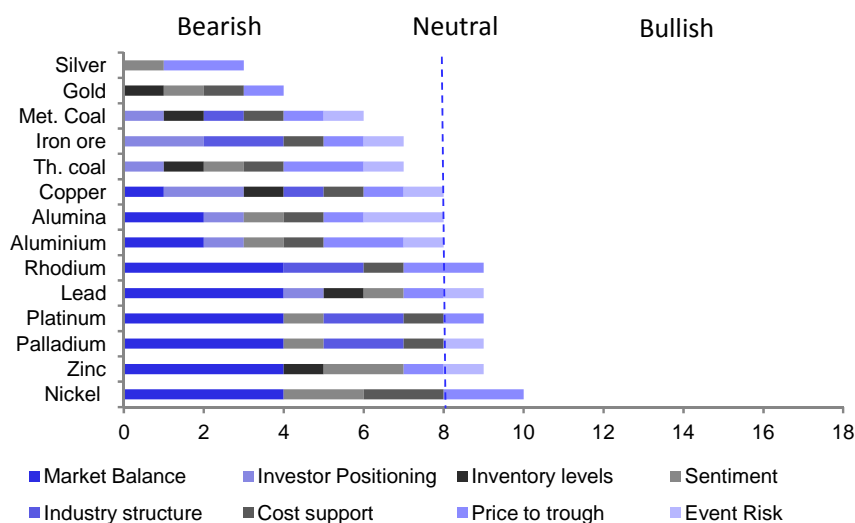


Source: LME, Deutsche Bank

### Commodity preferences

We highlight our commodity preference framework below, based on a mix of fundamental and technical parameters in the chart below. We remain more cautious on the bulk commodities and gold/silver versus the PGM's. We remain positive on the PGM's, nickel, zinc and lead, but given the relative price movements over the quarter, we have moved zinc and platinum up the ranks. Likewise, we have moved iron ore up the ranks as well given the sharp fall in price over the quarter.

Figure 18: Deutsche Bank's commodity preference framework



Source: Deutsche Bank

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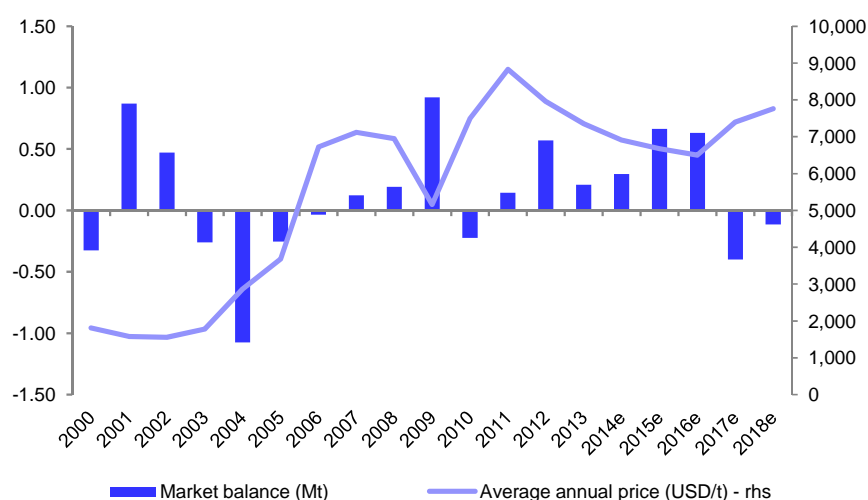
## Copper: Pricing in a second half surplus

- We have been forecasting a 2014 surplus in the copper market for over two years, predicated on the continued momentum in mined supply growth. This surplus has remained elusive for most of this year, with the Chinese SRB soaking up excess material early on in the year; a slower than expected ramp-up of new Chilean mines; a temporary concentrate ban from Indonesia; technical issues in the Chinese smelting sector, and a continued tightness in the scrap market, all contributing to a deficit so far this year. Many of these factors have begun to reverse in the second half of the year, with an improvement in both concentrate availability and Chinese smelter capacity, likely to push the market into a second half surplus. However, given the recent price correction, we think that some of the building surplus is already reflected in the price.
- We reiterate our view on the copper market and still forecast three years of modest surpluses, as the mined supply surplus is ultimately converted into refined metal. After which, we forecast the market to turn into a deficit market, due to limited new mine investments. Ultimately we think that the market awareness of the longer-term shortages will limit the downside in pricing. We peg this price support level at the 90th percentile of the “all in sustaining cost curve” which we estimate to be 280c/lb (USD6,170/t).

### Building tension between physical tightness and the anticipated surplus

Our view of the copper market remains essentially unchanged. To reiterate, we expect the market to register three years (2014E – 2016E) of modest surpluses which will drive prices modestly lower over the next few years. However, the extent of these surpluses is modest, which in our view will allow the market to absorb the subsequent inventory build. The expectation of future deficits beyond 2016, should translate into SRB support over the medium term. Furthermore, marginal all-in cash costs (including sustaining capex) should provide some support at USD6,000 – USD6,200/t.

Figure 19: Copper supply – demand summary



Source: Wood Mackenzie, Deutsche Bank

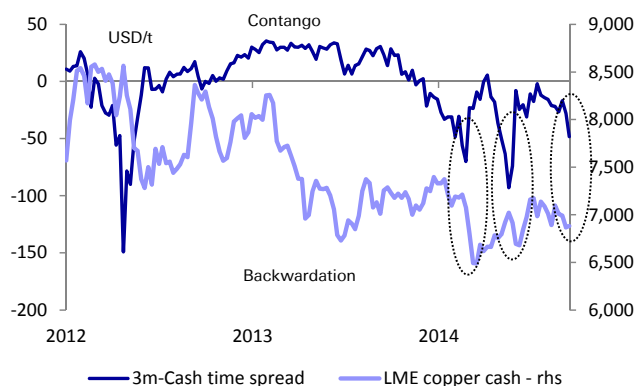
However, our forecast of a deficit has certainly not materialized in the first half of the year. The International Copper Study group has reported an H1 refined



copper deficit of 470kt (seasonally adjusted), or 390kt post a Chinese bonded stock adjustment, versus our expectation of a surplus of 300kt for the full year. The deficit market is certainly borne out by physical indicators over the first half of the year, with robust regional premiums, a near-term backwardation in the market and falling global inventories.

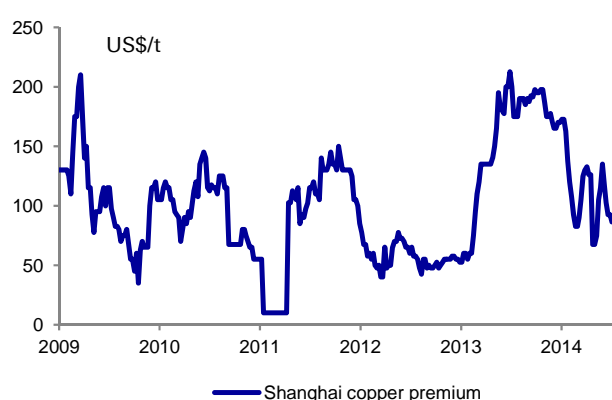
We do however note the sharp fall in European premiums, suggesting that the strong demand in H1 has not carried through into H2. Global inventories have however continued to fall in the second half of the year, although not as rapidly in H1. We estimate a decline of c.170kt in global stocks so far this year. We think that a combination of slightly weaker than expected Chinese demand in H2, and the increase in mined supply from the ramp-up of two new mines, Caserones and Sierra Gorda will push the copper market into a surplus for H2.

Figure 20: Copper cash – 3-month spread



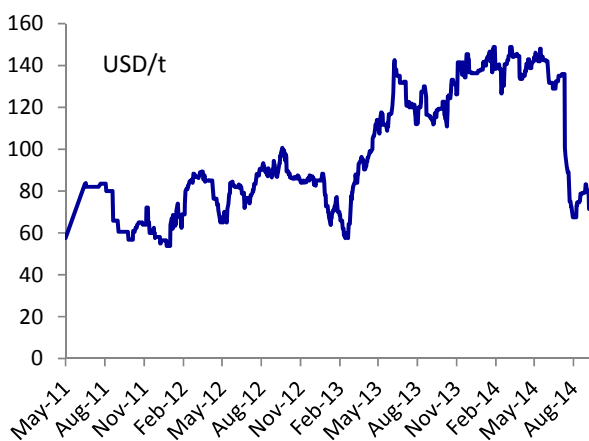
Source: Bloomberg Finance LP, Deutsche Bank

Figure 21: Chinese (Shanghai) copper premiums



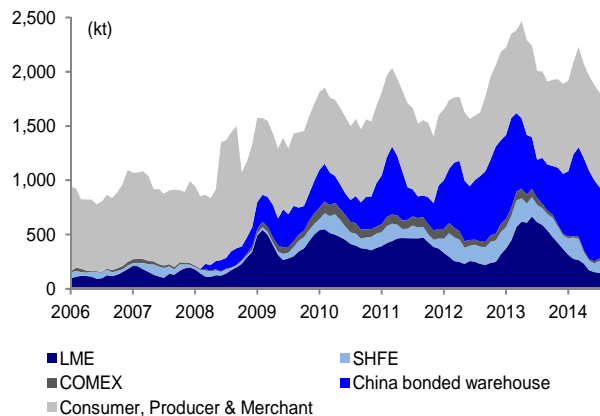
Source: Bloomberg Finance LP, Deutsche Bank

Figure 22: European (Rotterdam) copper premiums



Source: Bloomberg Finance LP, Deutsche Bank

Figure 23: Falling global inventories



Source: Bloomberg Finance LP, ICSG, Deutsche Bank

#### Demand risks on the rise: China and substitution

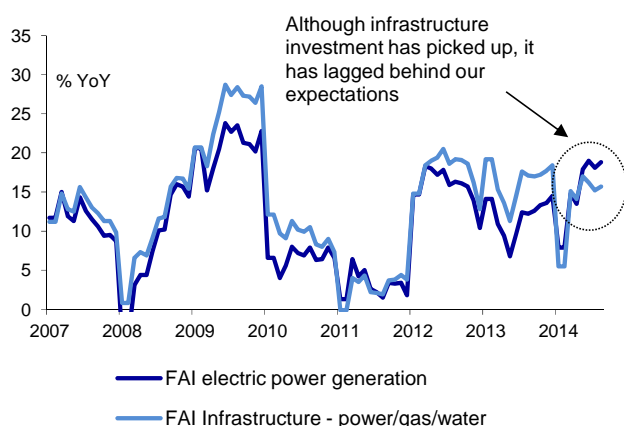
We continue forecast above-trend growth in refined copper demand for the next three years, but are cognizant of some medium-term risks to our forecasts, particularly from Chinese demand and increasing substitution risk from aluminium.



The risks to Chinese copper demand are starting to rise in our view. The ongoing retreat in China's property market, with housing starts falling through H1 is a portent of tougher times, as copper is installed late in the build programme. The weakness in the construction sector as a whole may have a follow-through demand impact given the follow through in power cable orders. Energy cable production saw sharp growth in H1, but fell back in July and August. Part of the disappointing trend can be ascribed to much tighter scrutiny on the award of tenders by the State Grid. Furthermore, the State Grid has adopted new standards which allows for the greater use of aluminium cables. Although the adoption of these new standards may be slow, the price difference between copper and aluminium will certainly spur the construction companies to investigate the possibility.

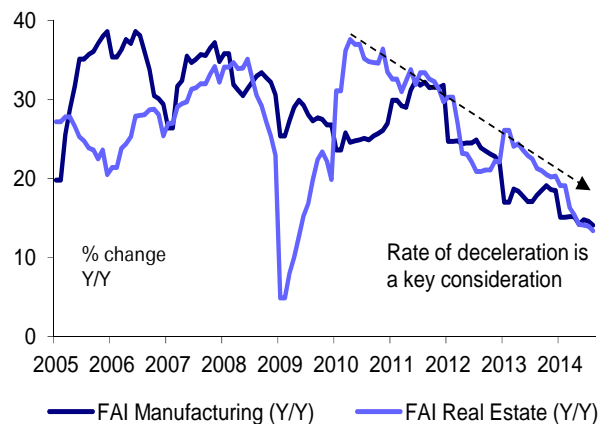
In reviewing a number of the Chinese macro-economic indicators which are skewed towards copper, these confirm the more bottom-up anecdotal reports of slowing demand, with the exception of perhaps Fixed Asset Investment in power generation and infrastructure. Both of these indicators have held up relatively well, with August's data registering a modest pick-up. However, FAI in manufacturing and real estate continue the downward slide as the Chinese authorities continue their re-balancing efforts. Industrial Production in both power generation and copper processing products, although still in positive territory have a negative momentum. Given the weak IP growth number of 6.8% in August, it is unsurprising that our China copper inventory model suggests a continuation of destocking, which started off in June.

Figure 24: Chinese FAI growth – power generation and infrastructure



Source: CEIC, Deutsche Bank

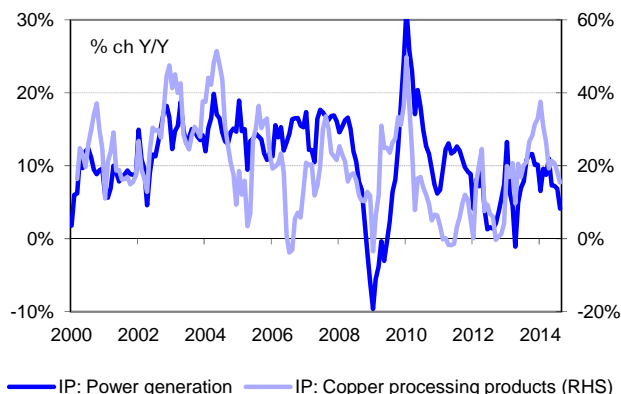
Figure 25: Chinese FAI – manufacturing and real estate.



Source: CEIC, Deutsche Bank

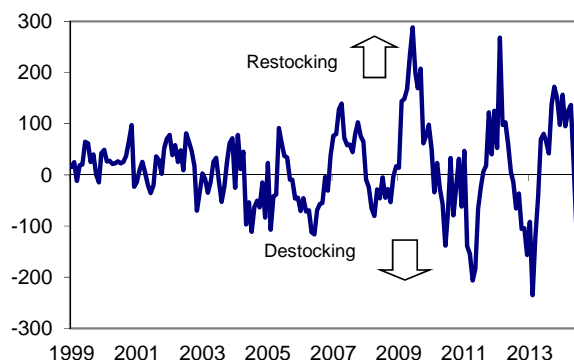


Figure 26: Chinese IP constituents: Power generation versus copper processing products



Source: Deutsche Bank, CEIC

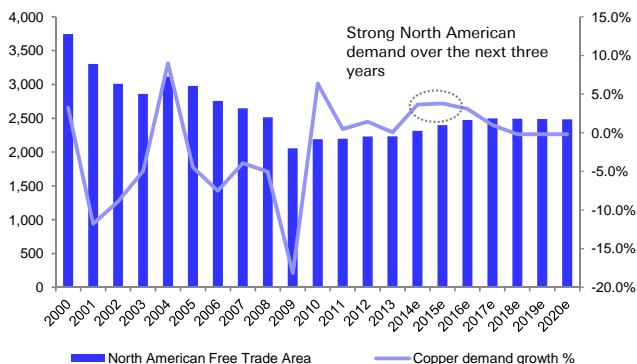
Figure 27: China copper inventory model



Source: Deutsche Bank, Bloomberg Finance LP, NBS

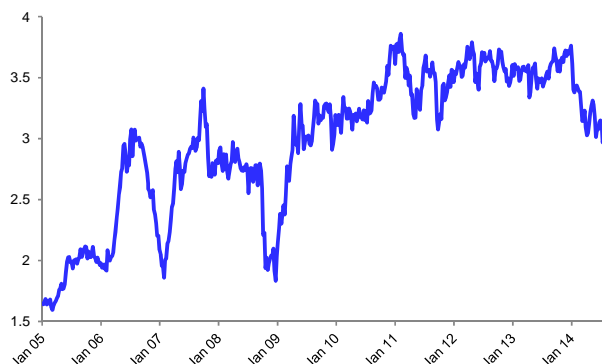
Despite positive macroeconomic indicators, US copper wire rod production and brass mill output were up only 1.1% in the first seven months of the year. The recovery in construction has not quite translated into a strong resurgence in copper demand. At least part of the reason for this disconnect, is due to substitution into aluminium. Aluminium is gaining market share in higher voltage cables that run power into flats and multiple dwelling units. Encore Wire opened up its first dedicated aluminium wire plant in 2012, and is planning to expand production given the success in sales. Although the copper - aluminium price ratio has fallen to 2.9x, this remains an attractive ratio to encourage switching.

Figure 28: NAFTA (US, Canada and Mexico) annual demand forecasts



Source: Wood Mackenzie, Deutsche Bank

Figure 29: Copper – aluminium price ratio (includes US premiums)



Source: Bloomberg Finance LP, Deutsche Bank

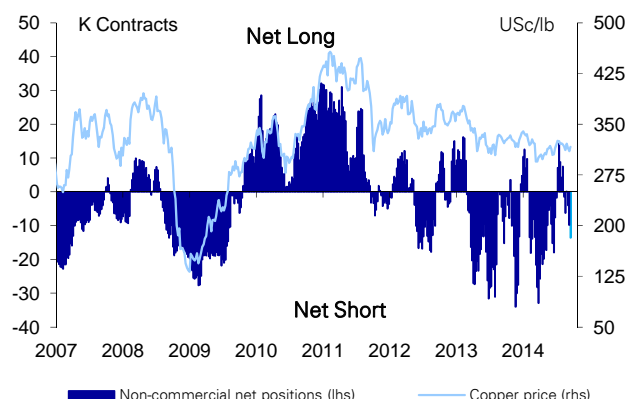




### Investor positioning – staying cautious

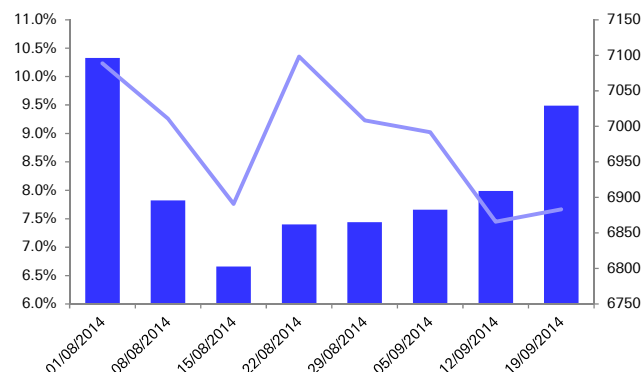
Investor positioning in copper remains relatively cautious with non commercial positions extending their net short positions on the Comex. However, the current positioning is well of the record short positioning seen in November last year and March this year. On the LME, money managers have remained net long, but when expressed as percentage of open interest, copper is one of the lowest among the base metals. We note that over the recent week, long positions have increased, suggesting that money managers are becoming more positive on the outlook, post the price correction.

Figure 30: Copper Non-commercial net positions on the Comex



Source: Bloomberg Finance LP, CFTC, Deutsche Bank

Figure 31: Net Money Manager positions on the LME – % of open interest



Source: LME, Bloomberg Finance LP, Deutsche Bank

### Mined supply growth – a rush towards the finish line

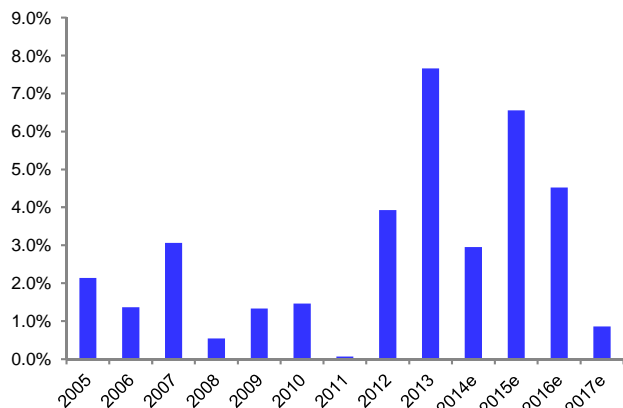
There has been a false start to the expected increase in mined supply so far in 2014. However, we expect the ramp-up of many of the mines to gain momentum in Q4, with Sierra Gorda and Caserones having being commissioned. KGHM's Sierra Gorda mine started production at the end of July and is expected to reach full capacity by early 2015. Codelco's Ministro Hales mine has found a solution for its high arsenic material by blending high arsenic concentrate with clean concentrate from third party trader Ocean Partners, which has a facility in Taiwan. Similarly, we think Toromocho has also solved its high arsenic problem through blending with clean concentrates from traders. There is also a possibility of the early start-up of First Quantum's Sentinel mine in Zambia.

Furthermore, Newmont Mining gained permission from the Indonesian government to restart exports of concentrate from Batu Hijau. The permit is for the export of 350 kt of concentrates over three years, with 160kt allowed in 2014. Higher amounts are conditional on progress towards building a smelter. The permission came after Newmont agreed to lodge a US\$25 million assurance bond with the government relating to intended process capacity. Newmont had withdrawn its international arbitration filing against the Indonesian government earlier in the month and had agreed to pay an export tax of 7.5% on copper concentrates and a royalty of 4%. The Batu Hijau mine has not been operating since June. Newmont previously indicated that the mine can become fully operational six to eight weeks, after receiving an export permit. The Batu Hijau export permit follows on from the Grasberg permit, with the expected surge of spot TC/RC's.



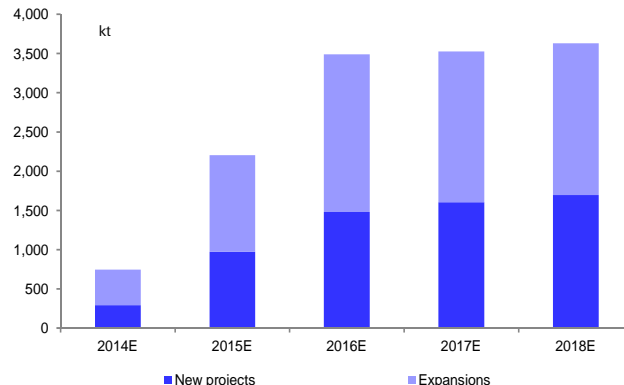
We continue to forecast a 3% mined supply growth in 2014E, despite the slow start to the year. Many of the mines that have been commissioned in 2014 will be in full ramp-up mode for 2015E, hence we forecast a 6.6% growth in mined supply, tapering slightly to a 4.5% growth rate in 2016E. We estimate a potential increase of c.3.5Mt between 2013 and 2016E in projects under construction and expansions of existing operations alone, with a 40 – 60% split between new projects and expansions

Figure 32: Mined supply growth estimates, including a disruption allowance



Source: Deutsche Bank, Wood Mackenzie

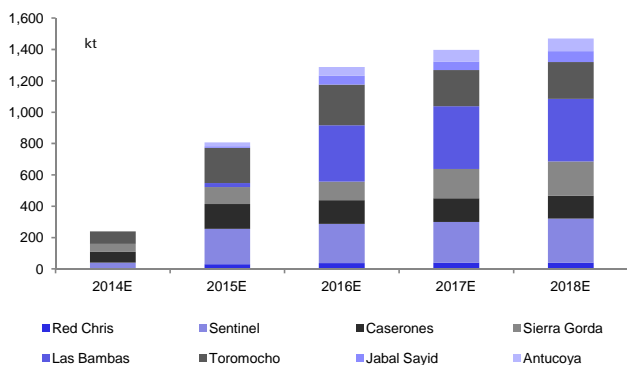
Figure 33: Mined supply cumulative increases from new projects and expansions



Source: Deutsche Bank, Wood Mackenzie

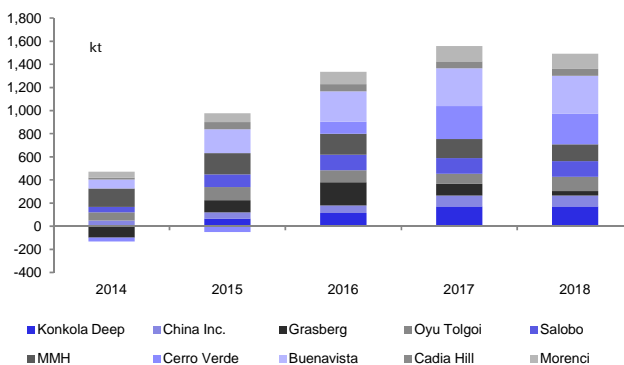
We outline the main projects which will contribute to the increase in mined supply over the next three years. The rate of additional capacity slows down dramatically after 2016E.

Figure 34: Mined supply additions from new projects (top 8)



Source: Deutsche Bank, Wood Mackenzie

Figure 35: Mined supply additions from expansions (top 10)



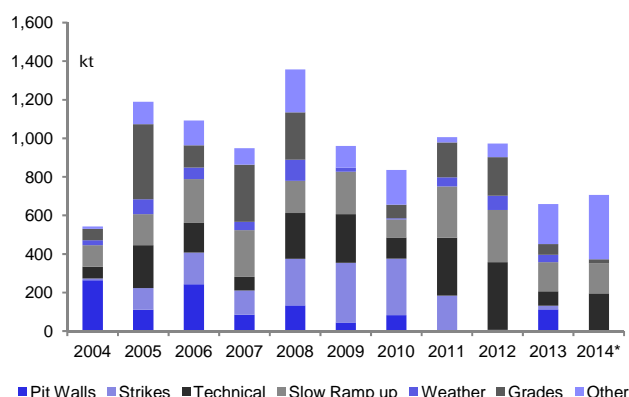
Source: Deutsche Bank, Wood Mackenzie

There have also been some early “disruption” events in 2014, with the start of commercial production at the Caserones project in Chile being delayed by 5 months to June, a slower than expected ramp-up at Oyu Tolgoi. Due to the Indonesian proposed export tax on copper concentrate both Freeport’s Grasberg and Newmont’s Batu Hijau mines had been running at c.40 capacity, although both operations are now ramping up. Additionally, continued technical problems at Vedanta’s Zambian operations, the suspension at Mount Polley, following a tailings dam failure and the closure of Mount Lyell after an



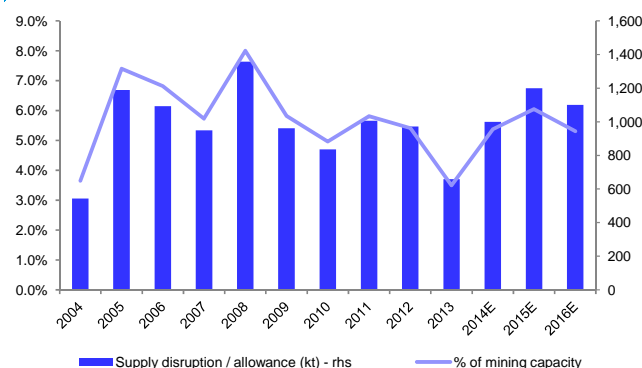
underground accident have also added to the disruption in copper production for 2014E. This equates to 3.6% of our expected mine production forecast at the beginning of the year, and is a total of 710kt. Our full year disruption forecast is 1,000kt, which we think is still achievable, especially in light of further potential disruptions; Grupo Mexico's Buenavista mine which has been flooded and Escondida on a two day strike.

Figure 36: Mined copper disruptions by category



Source: Wood Mackenzie, Deutsche Bank

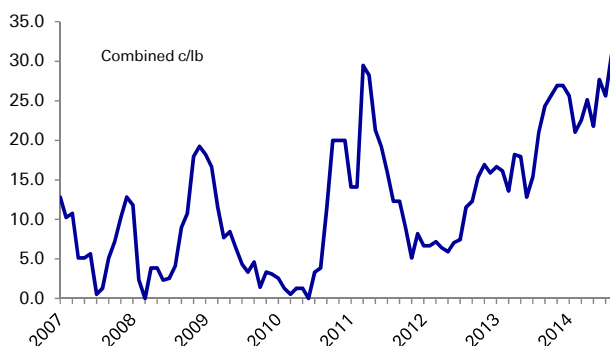
Figure 37: Mined copper disruptions as a percentage of demand including DB forecasts



Source: Wood Mackenzie, Deutsche Bank

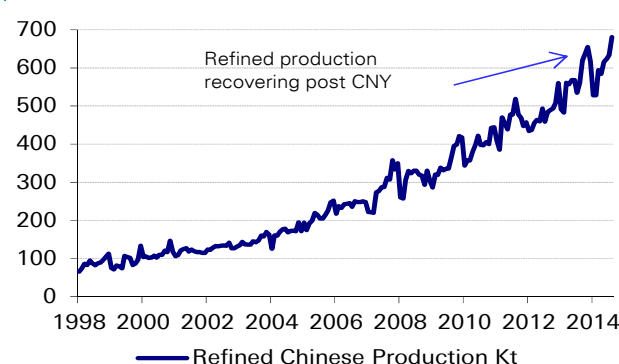
We expect the sharp increase in mined supply to translate into a strong refined supply increase too. China's available smelter-refinery capacity in H2 will be significantly improved over H1, with Jinchuan's Fangcheng plant (400ktpa) and the Gansu plant (350ktpa) being operational once more. With the resumption of copper concentrate exports from the two major mines in Indonesia, the spot copper concentrate market has seen the high treatment and refining charges continue over the past week as availability of spot material increases. TC/RCs for clean standard grade material continued at \$110-\$115 per tonne and 11-11.5 cents per lb. Most of the concentrate sold was not through the tender process, but was sold privately between mines and traders. Chinese refined copper production increased 7.4% month on month in August which is a record. We would expect the momentum to continue given the favourable TC/RC terms.

Figure 38: Copper TC/RC's Far East spot CIF – another leg up



Source: Wood Mackenzie, Deutsche Bank

Figure 39: Chinese refined copper production

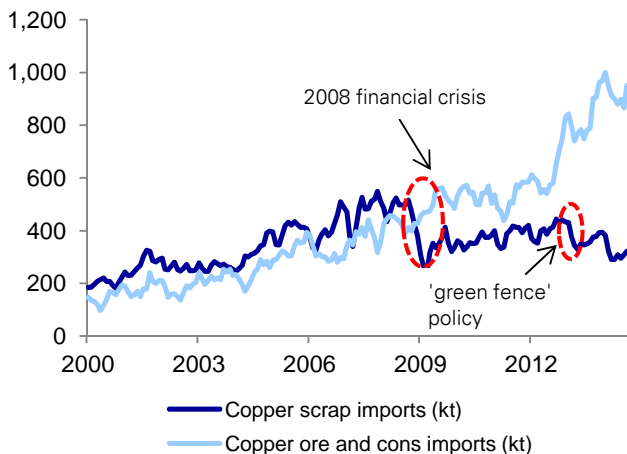


Source: NBS, Deutsche Bank



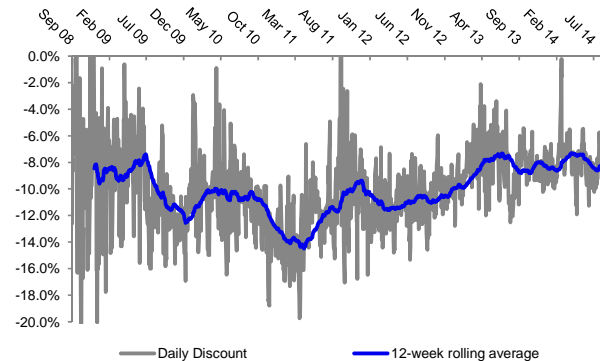
There is little change in the divergence between Chinese scrap and concentrate imports, with scrap imports down 12% YTD, whilst concentrate imports are up 19%. Higher TC/RCs have also increased the attractiveness of using mined feed. Scrap discounts remain in a tight range of 7 to 10% versus the LME.

Figure 40: Chinese copper scrap and concentrate imports (6MMA)



Source: NBS, Deutsche Bank

Figure 41: Scrap (Birch CIF Asia) discount to LME copper



Source: Thomson Financial Datastream, Deutsche Bank



Figure 42: Global copper supply & demand model

		2010	2011	2012	2013	2014e	2015e	2016e	2017e
Chile production	Mt	5.47	5.30	5.52	5.86	6.11	6.23	5.67	5.56
Production Growth		2.9%	-3.2%	4.2%	6.2%	4.2%	1.9%	-8.9%	-2.0%
Chile share of global production		34%	33%	33%	32%	31%	30%	27%	26%
<b>Global Mine Production</b>	<b>Mt</b>	<b>16.14</b>	<b>16.16</b>	<b>16.78</b>	<b>18.13</b>	<b>18.71</b>	<b>19.94</b>	<b>20.70</b>	<b>20.60</b>
World Mined Production Growth	%	0.4%	0.1%	3.8%	8.1%	3.2%	6.6%	3.8%	-0.5%
Copper smelting capacity	Mt	17.69	18.10	18.90	19.61	20.47	22.28	22.51	22.16
Utilisation		72%	70%	70%	73%	72%	71%	74%	75%
Anode production	Mt	14.74	15.40	15.82	16.40	17.22	18.34	19.21	19.04
Production Growth		26.4%	4.5%	2.7%	3.7%	5.0%	6.5%	4.8%	-0.9%
Total scrap consumption	Mt	4.10	4.47	4.92	4.73	4.52	4.71	4.85	4.83
Consumption Growth	%	22.5%	9.3%	9.9%	-3.9%	-4.3%	4.0%	3.1%	-0.3%
Total SxEw Production	Mt	3.3	3.4	3.6	3.7	3.9	4.1	4.0	4.0
<b>Global Copper Supply</b>	<b>Mt</b>	<b>18.95</b>	<b>19.75</b>	<b>20.15</b>	<b>20.82</b>	<b>21.81</b>	<b>23.14</b>	<b>23.98</b>	<b>23.87</b>
Global Supply Growth	%	3.7%	4.2%	2.0%	3.3%	4.8%	6.1%	3.6%	-0.5%
Chinese Consumption (real)	Mt	7.20	7.82	8.20	9.16	9.73	10.28	10.83	11.50
Consumption Growth	%	10.8%	8.5%	5.0%	11.7%	6.2%	5.7%	5.4%	6.1%
Western Europe	Mt	3.38	3.20	2.93	2.89	2.95	3.04	3.04	3.05
growth	%	11.6%	-5.4%	-8.5%	-1.2%	2.0%	3.0%	0.0%	0.2%
USA	Mt	2.19	2.20	2.23	2.23	2.31	2.40	2.47	2.50
growth	%	6.4%	0.5%	1.4%	0.0%	3.7%	3.8%	3.1%	1.0%
Japan	Mt	1.06	1.00	0.99	0.99	1.00	1.02	1.04	1.05
growth	%	21.1%	-5.4%	-1.8%	0.1%	1.5%	2.0%	1.5%	1.0%
Big 3 mature economies	Mt	6.63	6.40	6.15	6.11	6.27	6.46	6.55	6.59
Consumption Growth	%	11.2%	-3.4%	-4.0%	-0.5%	2.5%	3.1%	1.4%	0.6%
Other mature economies	Mt	1.57	1.37	1.21	1.23	1.23	1.25	1.26	1.25
growth	%	4.6%	-12.8%	-11.4%	1.7%	-0.4%	2.2%	0.3%	-0.4%
Other developing economies	Mt	3.25	3.30	3.36	3.76	4.03	4.38	4.63	4.87
growth	%	13.0%	1.7%	1.9%	11.8%	7.3%	8.6%	5.8%	5.2%
Brazil/India/Russia Consumption	Mt	1.42	1.63	1.60	1.61	1.61	1.58	1.64	1.71
Consumption Growth	%	10.1%	14.1%	-1.8%	0.9%	-0.3%	-2.0%	4.2%	4.1%
Other	Mt	-0.42	-0.31	-0.27	-0.50	-0.36	-0.49	-0.62	-0.81
Consumption Growth	%	-4.0%	-26.7%	-11.6%	81.7%	-26.5%	35.0%	25.3%	31.1%
<b>Global Consumption</b>	<b>Mt</b>	<b>19.17</b>	<b>19.60</b>	<b>19.58</b>	<b>20.61</b>	<b>21.52</b>	<b>22.47</b>	<b>23.35</b>	<b>24.27</b>
<b>Market balance</b>	<b>Mt</b>	<b>-0.22</b>	<b>0.14</b>	<b>0.57</b>	<b>0.21</b>	<b>0.30</b>	<b>0.66</b>	<b>0.63</b>	<b>-0.40</b>
Average LME cash price	USD/t	7,498	8,829	7,953	7,354	6,911	6,675	6,500	7,400
Average LME cash price	USc/lb	340	401	361	334	314	303	295	336

Source: Deutsche Bank, Wood Mackenzie, ICSG, WBMS



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## Nickel: Waiting patiently for the deficit

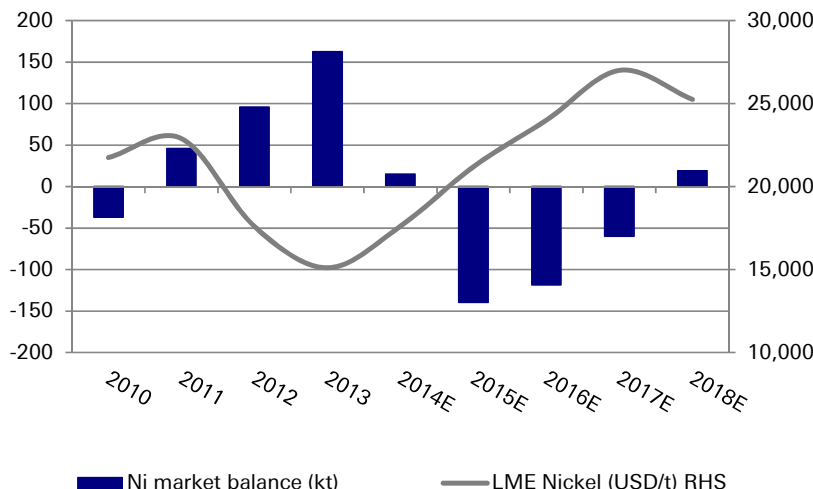
- In the near-term, the nickel market remains in a surplus, with rising LME inventories, net exports of refined metal out of China and rising Chinese laterite port stocks all indicative of the current surplus. In our assessment, the market may have to wait until the beginning of 2015 for signs of “real” scarcity to emerge. Potential catalysts for the next leg up in nickel prices would be falling LME stocks, an acceleration in the decline of Indonesian ore stocks at the Chinese Ports and a sharp fall in Chinese NPI production due to a shortage of ore. The run-up in nickel prices at the beginning of the year, was pre-empted by increasing nickel ore prices. Rising ore prices may once again prove to be the pre-cursor to rising LME prices.
- The slower than expected draw-down of Indonesian laterite ore stocks in China and there being only tentative signs of a let-up in Chinese nickel pig iron production has led us to revise up our 2014 and 2015 Chinese NPI production estimates. Channel checks suggest that Indonesian mined production has been higher historically and hence the stockpiles of ore are also higher. In absolute terms, Chinese ore stockpiles have increased due to rising Philippine imports. Chinese NPI producers have also managed to stretch their high grade ore stocks by blending in lower grade Philippine ore.
- In our assessment, the nickel market will be in a modest surplus of 15kt (previously a 5kt deficit) in 2014, but will be in a significant deficit of c.130kt (previously a 110kt deficit) in 2015. The stronger than expected stainless steel production in most regions for H1'14, especially China has also led to a modest increase in our nickel demand forecasts, and we expect momentum to continue in Q4. We expect nickel demand to grow by 4.1% in 2014E and by 1.8% in 2015E, as higher nickel prices are likely to lead to substitution and potentially some demand destruction. We have only made modest changes to our price forecasts.

### A small surplus for 2014, but significant deficit in 2015

Despite the greater longevity of China's ore stockpiles, global stainless steel production has been robust, and as a result, we remain bullish on the medium-term outlook. In order to balance the market after the ban of Indonesian ore, smelting capacity will have to be built to access this ore once again. Given the lead time to build capacity, especially when taking into account power constraints, we only expect a critical mass of capacity in 2017E, leading to three years of deficits.



Figure 43: Nickel market balance with price forecasts

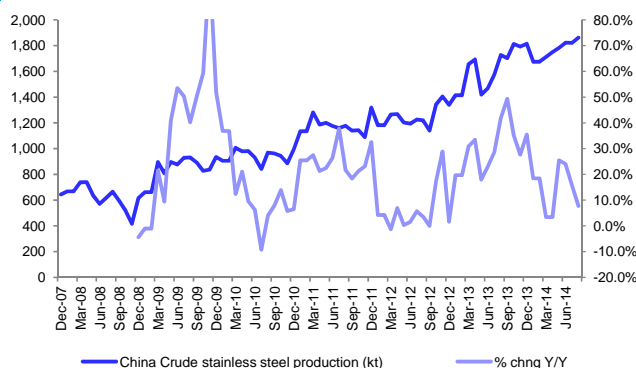


Source: Wood Mackenzie, Deutsche Bank

#### Strong global stainless steel demand; momentum slows into Q4

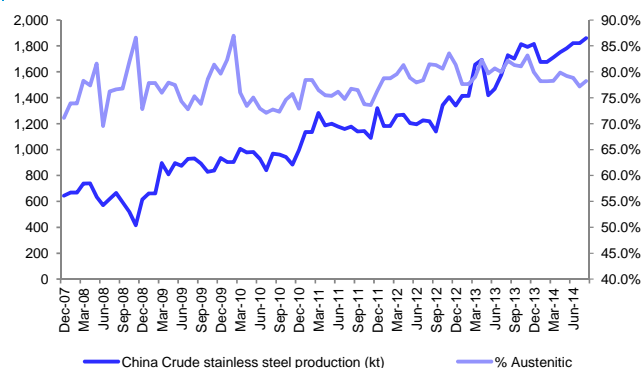
The key driver of nickel demand, global stainless steel production has been robust over the first eight months of 2014, with the US leading the charge, up 20.6% for H1'14. The June production figure of 217kt reported by the AISI was the highest since March'11. Furthermore, Chinese production has increased 14% y/y, recovering well in May and June, after some lacklustre production stats in March and April. Preliminary indications are that much of this growth can be attributed to substantial increases in output at Tisco, which produced 1.9Mt stainless melt in the first half of the year, and at Tsingshan's two new facilities, Fuan and Guangxin. We note however that the percentage of Austenitic (nickel bearing) grades remains below 80%. We expect the pace of Chinese production growth to slow in H2, with some signs of deceleration already. We have nudged up our China stainless steel production to 8.5% to reflect the strong start to the year. NPI producer Shandong Shengyang Group commissioned its 600ktpa mill in August, which should start to contribute meaningfully to demand in 2015.

Figure 44: Chinese crude stainless steel production (monthly)



Source: Bloomberg Finance LP, Deutsche Bank

Figure 45: Chinese crude stainless steel production versus % Austenitic grades



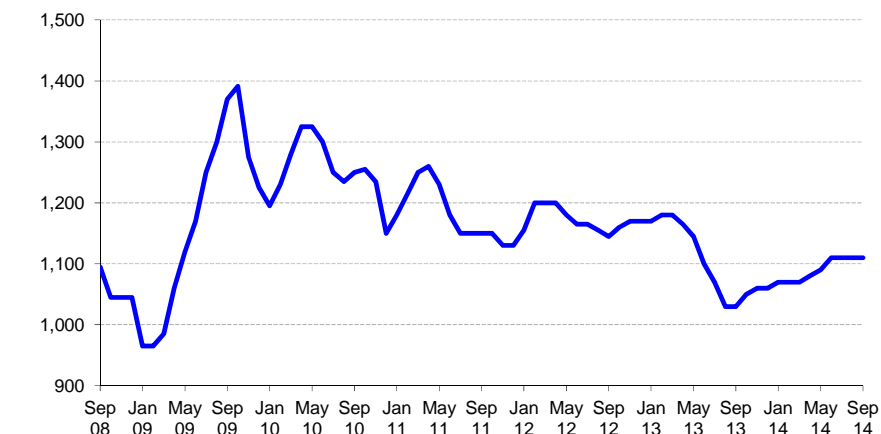
Source: Bloomberg Finance LP, Deutsche Bank



European stainless steel demand has also increased in H1'14, with restocking (partly driven by the rise in Nickel prices) adding to apparent demand. Although Q3 should be sequentially weaker, we see the base price stability (above E1,100/t) as sign for a recovery and forecast full year slab production to increase by 2.8% and expect apparent demand for CRC to grow by 5.5% this year.

Figure 46: Grade 304, 2mm - Germany (Base price)

*German base prices have stabilized over the past few weeks*



Source: Deutsche Bank, CRU

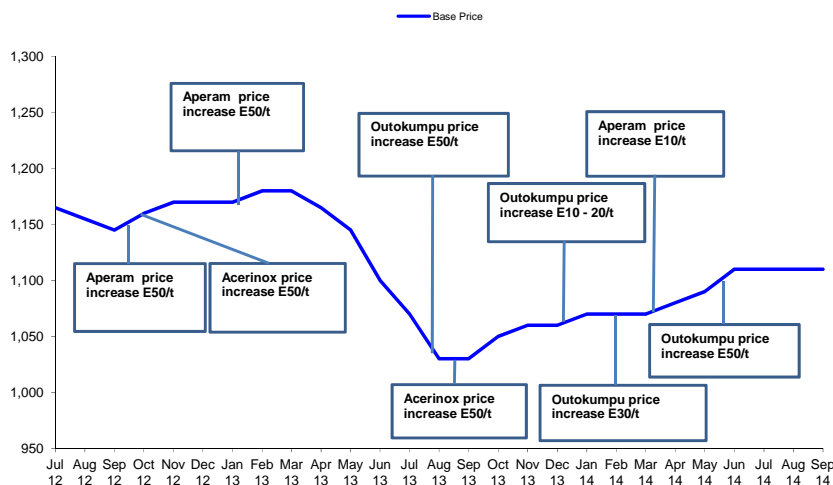
#### Price momentum has stalled

Although plateauing throughout the summer break, our recent CRU stainless price update shows base prices remain stable around E1110/t in September, up from E1043/t average price in Q3 2013. This price recovery was partially driven by seasonal and nickel driven restocking; however, all players confirmed seeing good underlying demand as well (mostly Automotive but also other segments besides capital goods), which is good news for the European stainless industry. Due to traders' risk aversion on volatile nickel prices, we think the actual restocking component should have been low while lead times continue to be at normal levels. Even though we believe Outokumpu (now the market leader) might have struggled to push through its earlier attempt to increase prices (E50/t for September deliveries) and would not rule out inventory driven volatility, we view the price stability throughout the summer break as a sign of strong underlying demand.





Figure 47: European base prices (E/t for CRC 304, 2mm) vs. attempts to increase prices



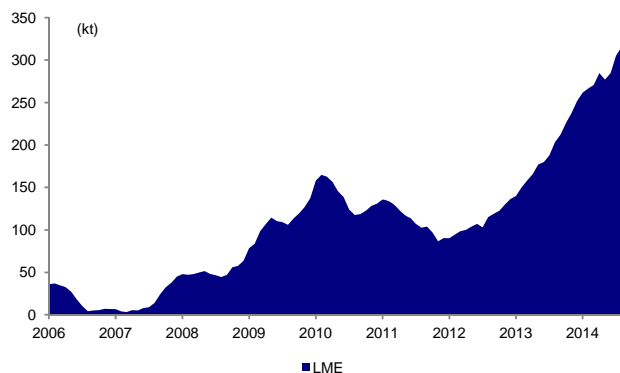
Source: Deutsche Bank, CRU

The Aerospace industry is expected to continue its current growth trajectory of c.5% per year through to 2019. A key driver of mid-term growth in the aerospace sector is the expansion of the commercial aircraft segment as the both emerging market and traditional mature market fleets are both expanded and replaced, both of which are positive for nickel alloys demand over the same period.

#### Stocks continue to climb – in all forms

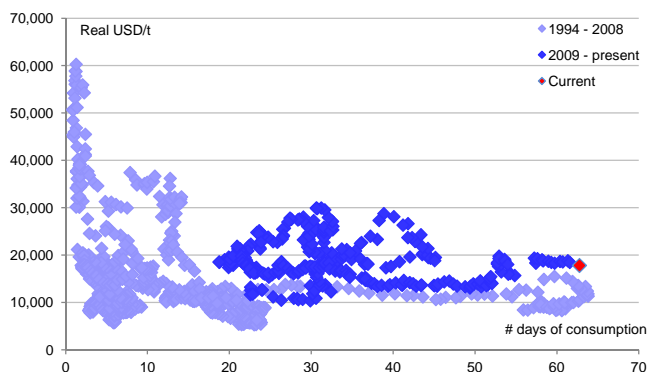
Perhaps the clearest indication that the nickel market is still in a surplus is the rising inventories of both refined metal and Chinese port ore stocks. LME stocks continue to climb and are at a record level of 330kt. Although in terms of days of consumption, the current price to stock ratio does not look out of alignment.

Figure 48: LME nickel inventories



Source: Bloomberg Finance LP, Deutsche Bank

Figure 49: Nickel pinch-point chart



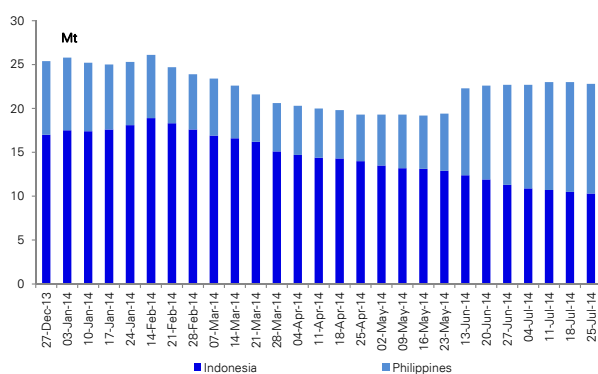
Source: Thomson Financial Datastream, Deutsche Bank

Chinese laterite port stocks are also not showing signs of declining rapidly, with the latest data showing an uptick in total inventories. However, we would point out that stocks of the higher grade Indonesian ore have been declining since the ore ban was announced, perhaps not quite at the rate we were



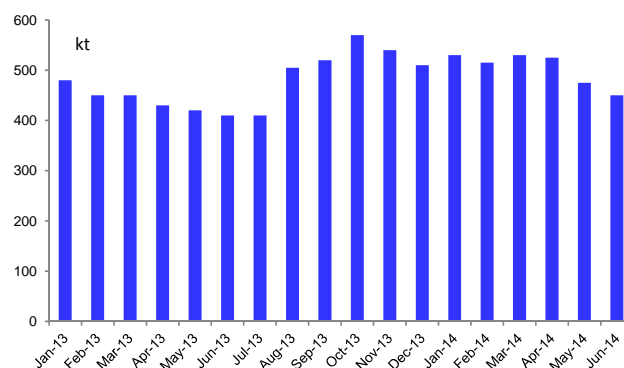
anticipating. Chinese NPI producers have been blending medium-grade ore from the Philippines with high-grade Indonesian ore to extend the NPI production. In addition, NPI producers and traders who held back stock in anticipation of higher nickel prices are now being forced to sell into the market due to liquidity constraints. If the rate of drawdown continues at its current pace, we would forecast stocks of the high grade Indonesian ore to be depleted by mid January 2015. Given the robust demand outlook and the ample stocks, we have increased the Chinese NPI production forecasts in 2014 and 2015E. The latest Chinese NPI production output only shows a very modest decline in output.

Figure 50: Chinese nickel ore stocks by origin



Source: Royal Nickel presentation, Deutsche Bank

Figure 51: Chinese NPI production



Source: Royal Nickel presentation, Deutsche Bank

### The net export of Chinese refined nickel is a reflection of ample stocks

Chinese ore imports are down 22% y/y due to the Indonesian ore ban, but within that, Philippine ore imports have increased by 27% y/y. Channel checks have indicated that the Philippine producers have focused their production on medium grade ore in favour of low grade ore due to the favourable price movement. CRU report that the price of 1.4% - 1.6% nickel ore at Chinese ports is currently c.USD92/t CIF, compared to USD34/t fob at the start of the year, nearly a three-fold increase.

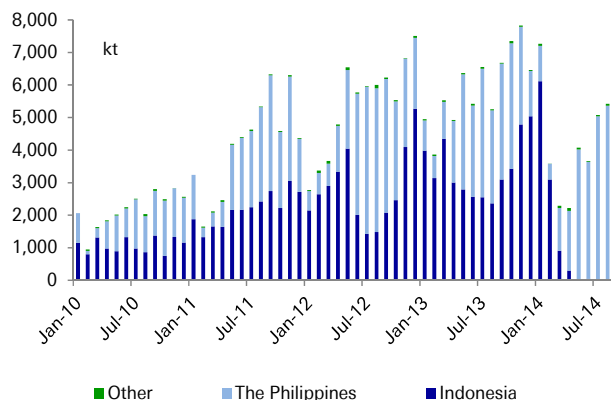
We could however see some disruption to the shipment of medium-to-high grade ore from the Philippines. The Environmental Management Bureau of the Department of Environment and Natural Resources in Central Luzon (EMB 3) suspended the transport of ore operations of four nickel mines after nickel sediment was discovered in agricultural land and coastal areas. As a result, almost all of the producers in the Philippines that produced ore grading higher than 1.5% Ni in 2013 are now suspended. The infringements that lead to these suspensions was as a result of incorrect mining methods which lead to environmental damage from laterite sedimentation on agricultural land and coastal areas. A member of the House Committee of Natural resources has called on the Mines Bureau to permanently cancel mining permits. In our view, these developments have a far greater potential impact on Philippine supply compared to the proposed ban on ore exports, which is likely to take a number of years to implement.

The surprise in June's trade data was China's first ever net export of refined nickel, which continued into July and August. August was a record net export of 8kt. Given the Indonesian situation, this would seem totally counter-intuitive. A possible explanation offered by Wood Mackenzie is that the



exported nickel is linked to the warehousing irregularities at Qingdao, and because it is financed, has merely been transferred to the LME warehouses in the region. The mechanics of trade flows notwithstanding, this is simply a reflection of ample inventory in our view.

Figure 52: Chinese Nickel Ore imports



Source: Bloomberg Finance LP, Deutsche Bank

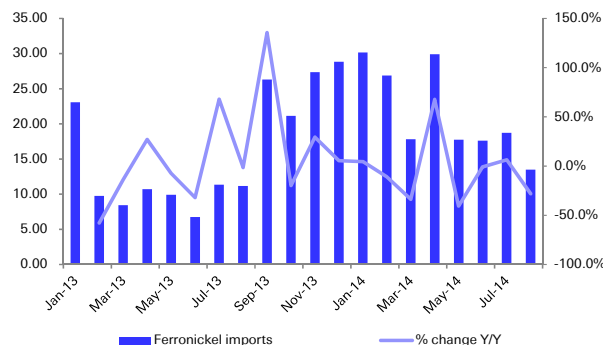
Figure 53: Chinese refined nickel (net) imports



Source: NBS, Deutsche Bank

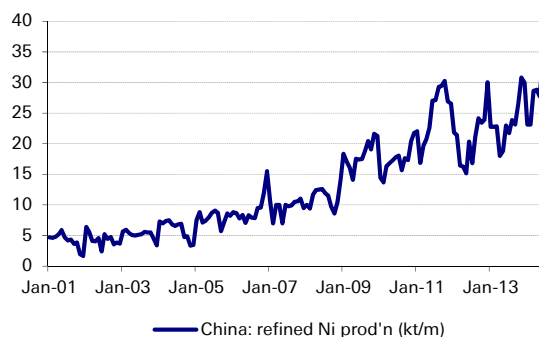
Chinese Ferronickel imports are however up 90% y/y in the first eight months of the year, which is certainly an indication that there is an expectation of shortages on the horizon. Although the August data shows a decline month on month, this is still up 21% on last year. Similarly, Chinese refined nickel production reached a record of 34kt in August, which is up 8% month-on-month.

Figure 54: Chinese Ferronickel imports (kt)



Source: NBS, Deutsche Bank

Figure 55: Chinese refined nickel production



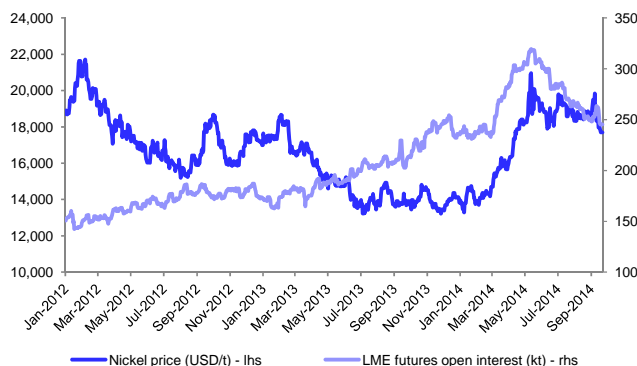
Source: NBS, Deutsche Bank

### Positioning remains long, but open interest has declined

The futures open interest on the LME peaked at 320kt in mid May, propelling the nickel price to a high of USD21,000/t for the year. The decline in the open interest has dragged the LME nickel price lower, with a sharp liquidation over the past two weeks pushing the price below USD18,000/t. The LME has provided its first Commitment of Traders Report, with the Money Manager category having the biggest influence on short-term price movements. We highlight the net long position of the money managers as a percentage of the open interest, highlighting the recent fall in prices coinciding with the reduction on net longs by the Money Managers.

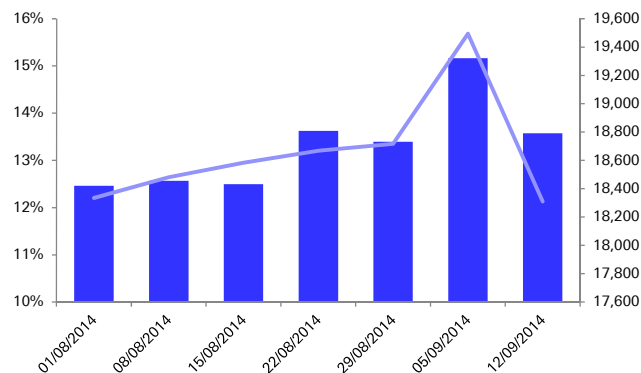


Figure 56: LME nickel prices versus Open Interest



Source: Bloomberg Finance LP, Deutsche Bank

Figure 57: Net positioning of Money managers

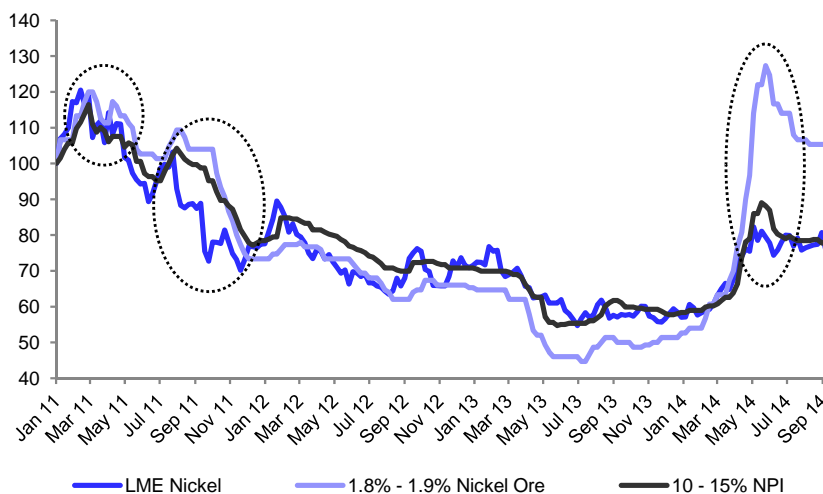


Source: LME, Deutsche Bank

### Chinese pricing indicators – Ore prices remain elevated relative to NPI and LME

Before the Indonesian ore ban, NPI, laterite ore and LME refined Nickel prices roughly tracked each other, although the LME price has tended to lead NPI and Ore prices, especially on the way down. After it became apparent that the ban was permanent, ore prices led both LME and NPI prices up. However, LME prices peaked at the beginning of May, whilst NPI and Ore prices peaked at the end of May. We note that NPI prices and Ore prices have drifted lower, whilst LME prices have tended to find a level of support around the USD18,000/t level. On a relative basis however, ore prices remain elevated relative to both the LME Nickel price and NPI prices. This has put pressure on the NPI producers' margins, and we would argue that Ore prices (being the tightest part of the supply chain) are now being determined by NPI profitability.

Figure 58: LME Nickel, NPI and nickel ore prices rebased to 100



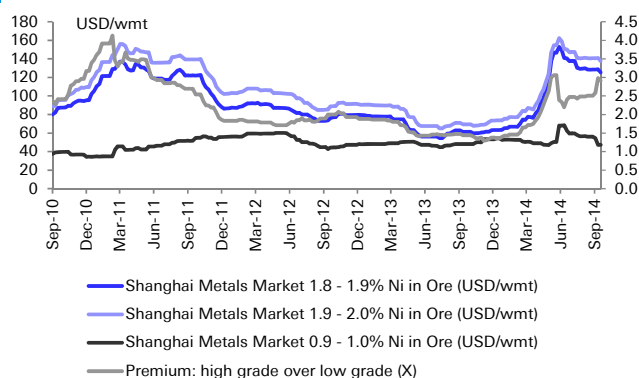
Source: Bloomberg Finance LP, Deutsche Bank

Chinese NPI prices (10-15% grade) are currently at RMB1,327/t (USD216/t), down from RMB1,465 per nickel unit (USD235/t) at the end of May. The trends in NPI prices have also been reflected in nickel ore prices within China. Nickel



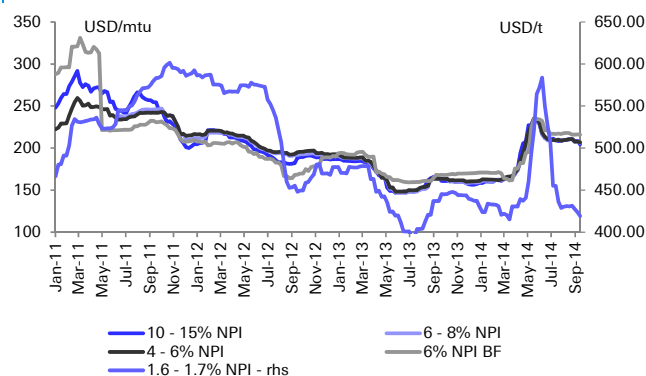
ore prices for 1.8-1.9% grade, which is most preferred for RKEF and EAF producers, have eased to RMB7700/mtu (USD125/t) from a high of RMB955/mtu (USD152/t) at the end of May. Low grade ore (0.9-1.0% grade nickel ore) has been much more stable trading around RMB290/t (USD47/t), at the beginning of the year, before climbing to RMB425/t (USD68/t) in the middle of May. Currently prices are back at the RMB290/t level, seen at the beginning of the year. This suggests limited Blast Furnace demand, and confirms the blending of low and high grade ores. Despite the decline in ore prices, the ratio between high grade and low grade prices has increased in favour of high grade ore.

Figure 59: Nickel ore prices landed in China



Source: Bloomberg Finance LP, Deutsche Bank

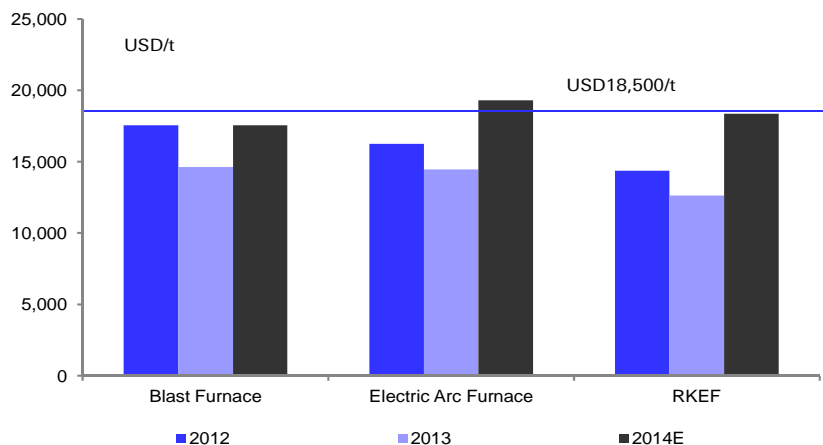
Figure 60: Chinese Nickel Pig iron prices (Shanghai Metals Market)



Source: Bloomberg Finance LP, Deutsche Bank

Based on current spot ore prices, estimates of Chinese power prices and current coking coal prices, we have estimated the cash costs for each of the main categories of NPI production in China. At the current nickel price, margins are slim at best for the NPI producers, given the relative price rises of ore versus metal prices. It is unlikely that any of the NPI producers are fully exposed to the spot ore price however. Although the Blast Furnace route was the more expensive in 2013 and 2012, the relative under-performance of low grade ore versus high grade and the sharp fall in coking coal prices has meant that there is little to choose between the various production routes.

Figure 61: Cash costs for the three methods of producing NPI (Nickel Pig iron)



Source: Wood Mackenzie, Deutsche Bank



Figure 62: Global nickel supply and demand model

		2010	2011	2012	2013	2014E	2015E	2016E	2017E
Australia mine production	kt	180.9	191.2	237.3	272.7	221.8	215.3	237.3	215.4
Production growth		2.7%	5.7%	24.1%	14.9%	-18.7%	-2.9%	10.2%	-9.3%
New Caledonia mine production	kt	130	129	138	137.3	179.5	217.2	243.8	257.9
Production growth		40.0%	-0.5%	7.1%	-0.7%	30.7%	21.0%	12.2%	5.8%
Canada mine production	kt	154.7	215.3	200.3	198.9	219.3	247.8	254.0	244.6
Production growth		18.7%	39.1%	-6.9%	-0.7%	10.2%	13.0%	2.5%	-3.7%
Russia mine production	kt	278.8	274.3	259.3	245.1	236.1	237.6	232.4	216.7
Production growth		2.7%	-1.6%	-5.5%	-5.5%	-3.7%	0.6%	-2.2%	-6.8%
Brazil mine production	kt	55.0	95.4	125.6	86.2	103.0	112.8	127.1	137.1
Production growth		24.7%	73.4%	31.7%	-31.4%	19.6%	9.4%	12.7%	7.9%
Indonesia mine production	kt	293.2	465.1	545.9	639.3	109.6	268.9	524.4	522.6
Production growth		28.7%	58.6%	17.4%	17.1%	-82.9%	145.4%	95.0%	-0.4%
Philippines mine production	kt	175.1	205.9	220.0	195.9	310.7	336.7	348.2	349.3
Production growth		23.7%	17.6%	6.8%	-11.0%	58.6%	8.4%	3.4%	0.3%
Estimated Ni in Ore - for Ni Ptg Iron	kt	363.3	570.7	664.6	770.5	344.0	518.5	789.4	799.2
Production growth		30.8%	57.1%	16.5%	15.9%	-55.4%	50.7%	52.3%	1.2%
World mine production - base case	kt	1,656	1,991	2,175	2,287	1,785	1,988	2,143	2,214
World mine production growth rate		14.1%	20.3%	9.3%	5.1%	-22.0%	11.4%	7.8%	3.3%
Possible projects					0	13	49	67	88
Disruption allowance						-30	-60	-64	-66
Total world mine production	kt	1,656	1,991	2,175	2,287	1,768	1,978	2,145	2,235
Total Smelter output	kt	1,507	1,685	1,811	2,007	1,916	1,791	1,939	2,030
Implied smelter recovery	%	91%	85%	83%	88%	108%	91%	90%	91%
Total refinery capacity	kt	2,224	2,679	2,960	3,203	3,284	3,320	3,372	3,317
Implied utilisation	%	65.9%	61.8%	59.7%	62.2%	58.4%	54.5%	55.6%	60.8%
Base case refinery output	kt	1,465	1,655	1,767	1,992	1,915	1,755	1,776	1,872
Possible projects						3	53	99	143
Total refined availability / Output	kt	1,465	1,655	1,767	1,992	1,918	1,808	1,875	2,015
World refined availability growth rate		9.4%	12.9%	6.8%	12.7%	-3.7%	-5.7%	3.7%	7.5%
Implied Refinery recovery from mined ore	%	88.5%	83.1%	81.2%	87.1%	108.5%	91.4%	87.4%	90.2%
Global stainless production	mt	33.0	34.6	35.5	38.7	41.0	43.1	45.3	47.5
Growth		26.0%	4.6%	2.7%	9.0%	6.0%	5.2%	5.1%	4.8%
Austenitic stainless demand	mt	23.9	25.1	26.1	28.8	30.3	31.7	33.0	34.9
Austenitic ratio		72.4%	72.6%	73.5%	74.4%	74.0%	73.5%	72.8%	73.5%
Total nickel demand for stainless	kt	1,714	1,788	1,807	1,987	2,077	2,155	2,235	2,357
Nickel content		7.2%	7.1%	6.9%	6.9%	6.9%	6.8%	6.8%	6.8%
Nickel scrap consumption	kt	722	715	704	734	779	841	883	943
Scrap ratio		42.1%	40.0%	39.0%	36.9%	37.5%	39.0%	39.5%	40.0%
Primary Nickel in Stainless	kt	992	1073	1103	1253	1298	1315	1352	1414
Primary Nickel in Non-Stainless	kt	510	536	568	576	605	623	642	661
Total world nickel consumption	kt	1,502	1,609	1,671	1,829	1,903	1,938	1,994	2,075
World nickel consumption growth	%	16.7%	7.1%	3.9%	9.4%	4.1%	1.8%	2.9%	4.1%
Adjustments									
Balance	kt	-36.7	45.8	95.7	162.7	14.9	-130.0	-118.7	-59.9
Reported stocks	kt	136.9	182.7	278.4	441.1	456.0	326.0	207.4	147.5
Stock to consumption ratio	w ks	4.74	5.90	8.66	12.54	12.46	8.75	5.41	3.70
Annual Average Prices	USD/t	21,745	22,888	17,591	15,102	17,680	21,400	24,000	27,000
Annual Average Prices	USD/lb	9.87	10.38	7.98	6.85	8.02	9.71	10.89	12.25
Estimated Global stocks									
Days of consumption		98	102	119	141	139	112	87	73

Source: Deutsche Bank, Wood Mackenzie



## Aluminium: Maintaining discipline so far

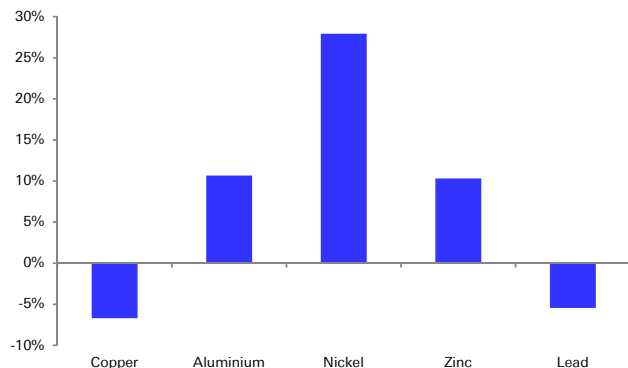
- Aluminium is one of the top base metal performers YTD, with prices up 10%. The combination of strong demand, especially the US, combined with supply discipline is forecast to result in a deficit market ex-China of 600kt in 2014E. Although semi-fabricated product exports out of China have increased, the rate of increase still remains modest, which is also indicative of better than expected supply discipline. Although investor interest was piqued, as evinced by bullish positioning on the LME in the beginning of August, the momentum has waned on the back of weak Chinese macro data. We think it will only take modest price increases from current levels for capacity reactivation to gain momentum, which is likely to dent investor confidence in the short-term.
- The weak pricing since July 2013, has lead to over 2Mtpa capacity curtailments outside of China, although no further announcements have been made since March this year. Similarly a combination of stretched balance sheets and poor profitability has lead to c.3Mtpa of capacity in China being postponed or cancelled in 2014. However, there have already been some capacity restarts in China, with c.600kt of subsidy driven restarts being announced. In our assessment, the current all-in aluminium price is close to the point where restarts make commercial sense. So far, supply discipline has held, but we expect restart announcements could be on the cards should the aluminium price increase by a further USD100/t. We have made reasonably significant changes to our forecasts, upgrading 2014 forecasts by 4% and 2015 forecasts by 5%. We expect prices to average USD1,883/t in 2014 and USD1,988/t in 2015.
- Aluminium inventories remain at historically high levels and are estimated at c.10Mt, with half on the LME. We think the fear of rising interest rates unlocking financing trades is overdone, and it is more likely the closing time spreads which will lead to the flow of metal out of the LME warehouses. However, the flattening of the curve is most likely to happen during periods of strong physical demand. The biggest risk to the downside in aluminium pricing is weaker than expected demand from China, which could lead to increased exports in semi fabricated products.

### Physical tightness starts to ease slightly, investors lose confidence

Aluminium has been the surprise package in the quarter to date, up 5% and out-performing the other base metals. Furthermore we have seen premiums recover and head back up to the record levels of January, most notably the US MidWest premium, up USD20/t since the beginning of July. Falling LME inventories, now at 4.8Mt, down from the peak of 5.5Mt, and the brief forays into backwardation and tight spreads, albeit easing just recently, certainly indicate a tight physical market. Although in absolute terms, inventories are still high by historical standards with at least as much inventory held off the LME.

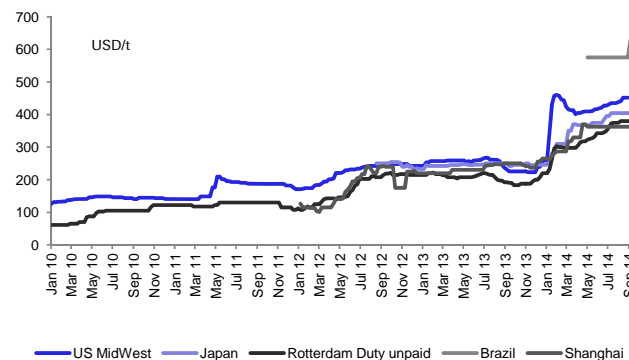


Figure 63: Base metal performance since the beginning of 2014



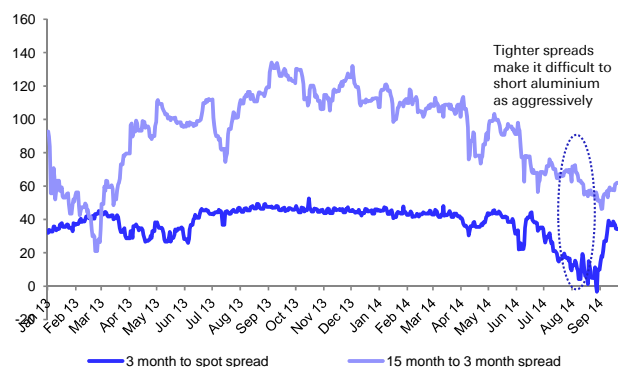
Source: Thomson Reuters datastream, Deutsche Bank

Figure 64: Regional aluminium premiums



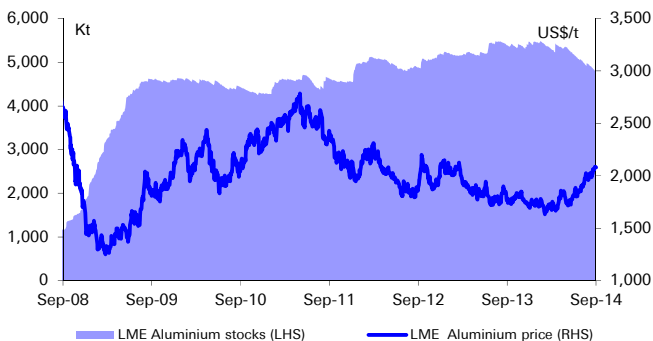
Source: Bloomberg Finance LP, Deutsche Bank

Figure 65: Aluminium time spreads



Source: Bloomberg Finance LP, Deutsche Bank

Figure 66: LME stocks being drawn down



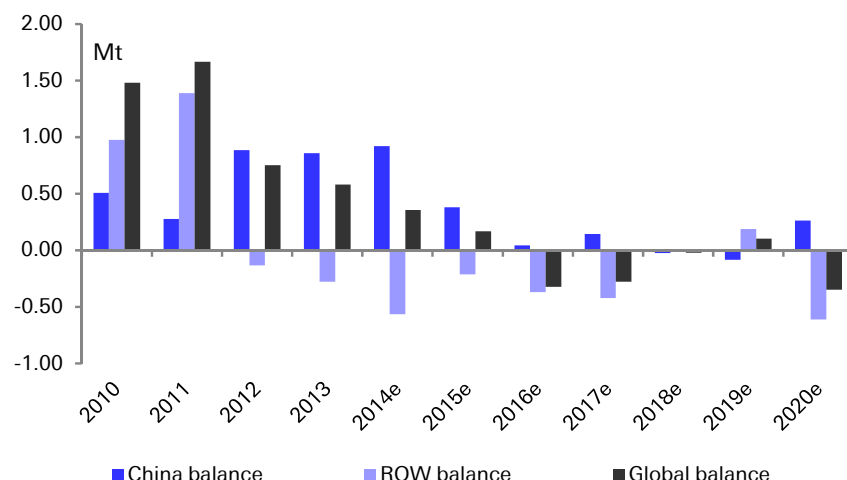
Source: Thomson Reuters datastream, Deutsche Bank

We think the strong performance is driven by three factors: firstly strong demand in the world ex-China especially the US, with the deficit in the world ex China now largely being accepted as a given by the market. We think that market expectations of increasing deficits are building. Secondly, the supply cuts that have been announced (2Mtpa since August 2013) are still holding, with limited reports of restarts. Similarly, we see greater than expected supply cuts in China, although here there are reports of restarts in light of the improving price. We think it is a matter of price before capacity reactivations cap the upside in price. Lastly, investor positioning has become more bullish in aluminium with a combination of light - weighting and supply discipline (aggressively marketed by the producers such as RUSAL) turning sentiment more in favour of the metal. Furthermore the tighter spreads make it more difficult to short the metal aggressively, although we note that the cash to 3 month spread has opened up once more. We think that the price momentum is limited to a further USD100 – 150/t upside provided US demand indicators remain positive. However, the increase in price will draw further metal from China which we think is still in a surplus, and ultimately lead to capacity restarts. This could trigger a sharp correction in pricing as the bullish sentiment toward the metal stalls.





Figure 67: Aluminium balance: China and ex-China



*We estimate the world ex-China will be in a deficit of c.300 – 600ktpa over the next few years.*

Source: Wood Mackenzie, Deutsche Bank

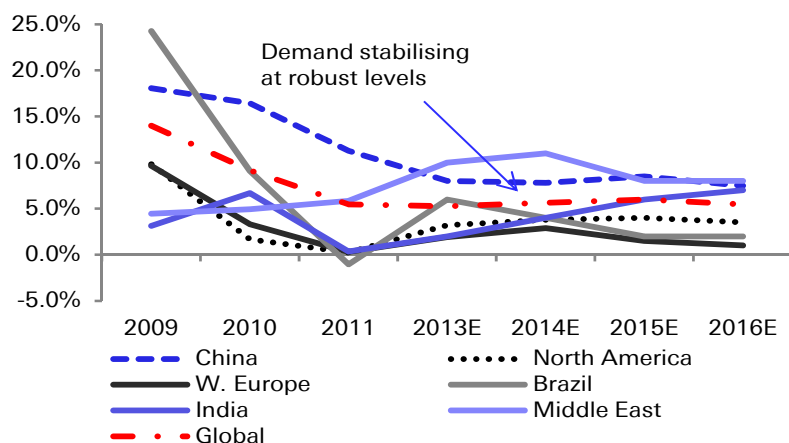
### Strong demand pull from the US

The US has been at the forefront of the demand pull in aluminium. The US flash HSBC PMI rose to 58.0 in August from 55.8 in July reaching its highest level since April 2010. The strong rebound in the manufacturing activity post-summer slowdown shows that demand in the aluminium intensive sectors such as transportation and building and construction is likely to be sustainable. The recovery in the building and construction industry coupled with pent up demand from delayed projects due to the harsh winter continues to support the North American extrusions market. Housing starts in July came at a seasonally adjusted annual rate (SAAR) of 1.093 million units up 15.7% from June and 21.7% from July 2013. At the same time the leading indicator of new housing starts, building permits in July were at 1.05 million units up by 8.1% from the June rate and up 7.7% from July 2013, suggesting that the rebound in the US housing market has some momentum. The August U.S. light vehicle SAAR came in at 17.4MM in August; the highest level since January 2006. Sales increased 9.3% yoy, adjusted for one fewer selling day. The SAAR now stands at 16.3MM YTD (16.7MM excluding the low, weather impacted, levels seen in Q1).

Strong demand in the US has been mirrored by decent demand in Japan and the EU. Japanese demand for aluminium fabricated products in H1 showed a strong growth mainly due to the pre-buy ahead of April's increase in sales tax. Rolled product shipments in H1 were up by 7.9% to 515kt YTD as Japanese producers benefited from increased demand for can sheet owing to growing demand for aluminium bottles. European Auto sales growth has been pedestrian in W. Europe, over the past few months. Although not necessarily bad, the market is still ~20% below pre-crisis levels. July W. European registration grew by 5% (source: LMC) and is in line with the recent few months. YTD volumes have reached 7.4mn, +5%. SAAR reached 12.2mn/yr in line with our estimate for the full year (12.1m). The increase in aluminium intensity in Auto's provides a bit of a boost, with Wood Mackenzie forecasting that consumption of automotive body sheet in Europe will increase by 22% in 2014, following an increase of 29% in 2013 to reach 563kt by 2018.



Figure 68: Aluminium demand growth forecasts 2014E onwards

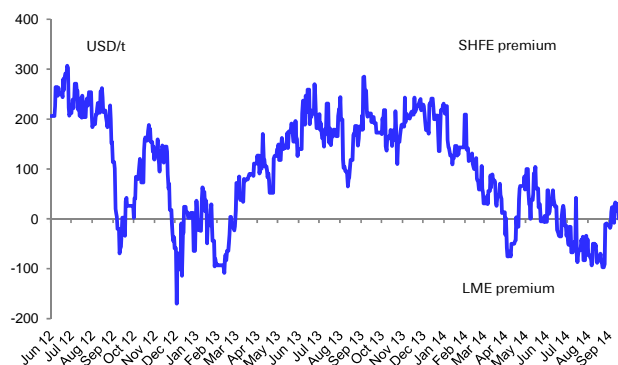


Source: Deutsche Bank

We forecast aluminium demand growth of 5 – 6% over the next few years

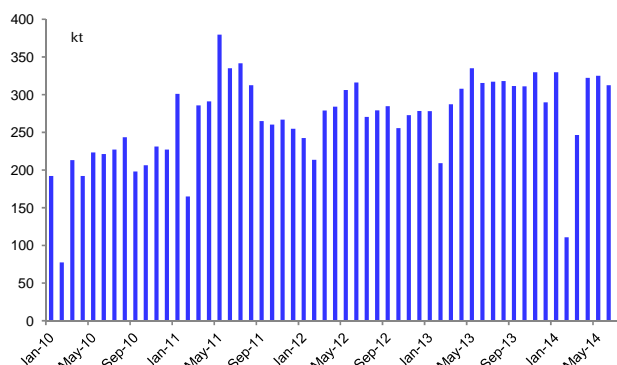
The HSBC Chinese PMI in August fell to 50.3 from July's 18-month high of 51.7 while official index slipped to 51.1 from 51.7 a month ago. Both output and new order sub-indexes came at three month lows suggesting that both domestic and export demand has weakened. The performance of downstream aluminium industry has been reasonably robust, helped by a sharp increase in exports of both flat rolled and extrusion products. China's semis exports hit a three-year high of 379kt in July, up 19% YoY although YTD figures are relatively flat. The strong growth in Chinese exports has been fuelled by the narrowing of SHFE/LME differential during the past two months. Wood Mackenzie estimate that after adjustment of the current SHFE price by 13% export rebate on total expected average parcel price (LME + conversion margin), the SHFE/LME differential for commonly exported extrusion and flat rolled products would give a Chinese exporter an advantage of \$130/t. If we include simple ingot premiums, the difference between Chinese and LME prices is only USD160/t, even before a VAT adjustment. Despite the recent closing of the LME premium, the export rebate on semi-fabricated products still makes it worthwhile for Chinese producers to continue exporting.

Figure 69: LME – SHFE aluminium price arbitrage (VAT adjusted 17%)



Source: Bloomberg Finance LP, Deutsche Bank

Figure 70: Chinese semi-fabricated exports



Source: NBS, Deutsche Bank

Our conclusion is that the strong demand in the US is having a ripple into the broader market. High premiums are attracting metal into the region, especially

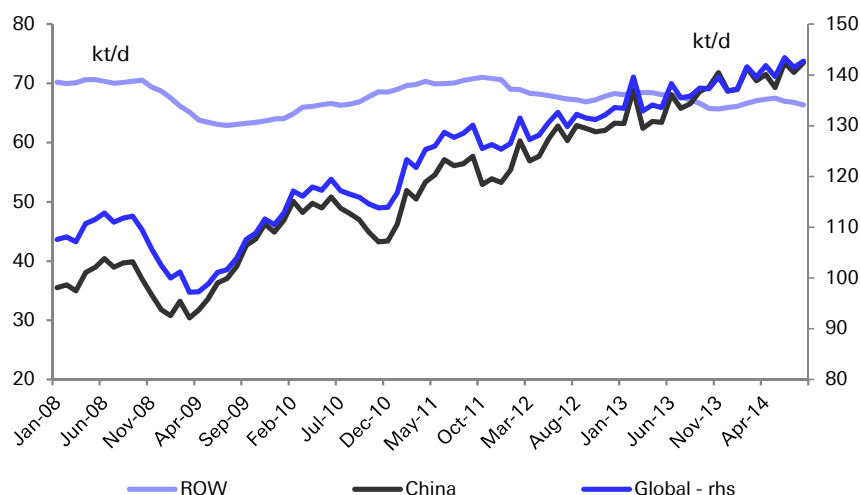


given the near 750kt of North American capacity shutdowns, and elevated LME prices continue to draw metal from China. However, the flow from China can only be in the form of semi-fabricated products and due to varying specifications globally, the flow is somewhat limited. US demand looks to be sustainable, but we do expect Chinese semi-fabricated products to grow over the course of the year, but there is unlikely to be a flood of metal.

#### Supply discipline – can it hold?

Supply discipline in the world ex-China has been well documented with c.2.7Mtpa of closures since October 2011. Since March, the announcements of closures have slowed down. These closures offset the production increases from the Middle East and India, with the world ex-China's production falling to 66.4ktpd, down modestly in August according to the latest IAI data.

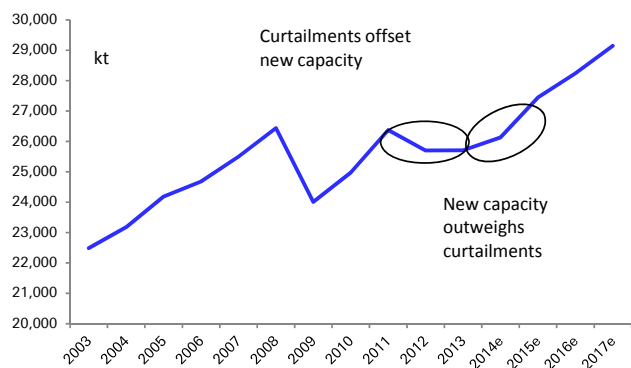
Figure 71: International aluminium institute monthly production trends



Source: IAI, Deutsche Bank

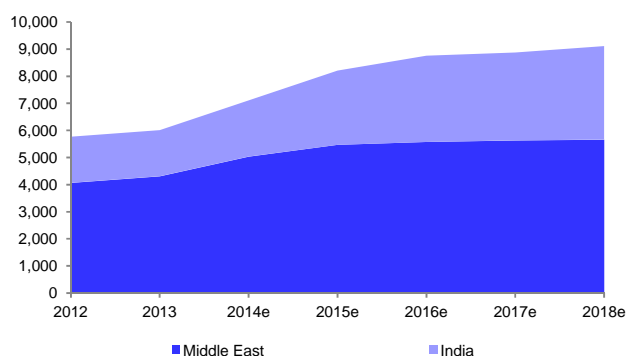
We are forecasting a modest 1.7% increase in production for 2014E in the world ex-China, but expect that to increase to 5% as Indian production (Hindalco and Vedanta) ramps up in 2015E.

Figure 72: Ex-China production growth



Source: Wood Mackenzie, Deutsche Bank

Figure 73: Indian and Middle East production



Source: Wood Mackenzie, Deutsche Bank



Chinese production growth has been more muted, with the July NBS data showing a 7.5% production increase versus the annual growth rate of 11.4% for 2013. There have however been reports of capacity reactivations, such as Guangxi Yin Hai Aluminum's 250ktpa Laibin smelter, which re-started production in July with a subsidized power rate granted by the provincial government. The initial goal is to achieve 180kt/a by the end of August and a decision to fully re-start capacity by October would be taken then. There have been previous reports on similar subsidy-driven re-starts in Guizhou and Gansu provinces that accounted for 400ktpa. These restarts have been confirmed by the August production data, up 9% Y/Y. This takes the YTD production increase in China up to 8.7%

The aluminum demand-supply picture in China (Figure 74) has however been improving with slower-than-expected new capacity additions, thanks to:

- (1) Capital constraints: 40-50% of aluminum producers are making cash losses at 1H14 aluminum price levels. Some aluminum producers are turning their focus to upstream and downstream businesses, including alumina and processed products. At the same time, aluminum makers in general have almost 200% net gearing. Negative cash margins and/or poor balance sheet quality has seen closures and delayed /cancelled new capacity additions.
- (2) Policy restriction: due to industry oversupply and underperformance by aluminum producers, the central government and local governments are taking more stringent actions to reduce over-expansion in this already saturated market. As for now, new capacity additions will not be permitted in several provinces, including Xinjiang, Inner Mongolia, Shanxi, Hebei, etc.

Figure 74: China primary aluminum demand-supply model

		2011	2012	2013	2014E	2015E
Smelter capacity	kt	-	26,850	30,270	32,760	34,760
New addition	kt	-	2,015	4,420	3,740	2,000
Closure	kt	-	785	1,000	1,250	-
Capacity growth YoY	%	0%	6%	13%	8%	6%
Utilization rate		0%	78%	77%	78%	80%
Aluminium consumption	kt	19,167	21,043	23,362	25,629	27,963
YoY growth	%	16%	10%	11%	10%	9%
Average LME cash price_DB Global*	USD/t	2,423	2,041	1,889	1,816	1,894
Current LME price	USD/t	-	-	-	2,000	na
YoY growth	%	11%	-16%	-7%	-4%	4%

Source: Deutsche Bank estimates, Shanghai Metals Market, Wood Mackenzie, Bloomberg Finance LP. \*: Deutsche Bank Global Commodity Research team

In early 2014, around 5,530kt new capacity was expected to be launched in FY 2014. However, according to SMM, only c.3,740kt will be launched (Figure 75), with the rest cancelled/delayed.



Figure 75: New smelter capacity in 2014

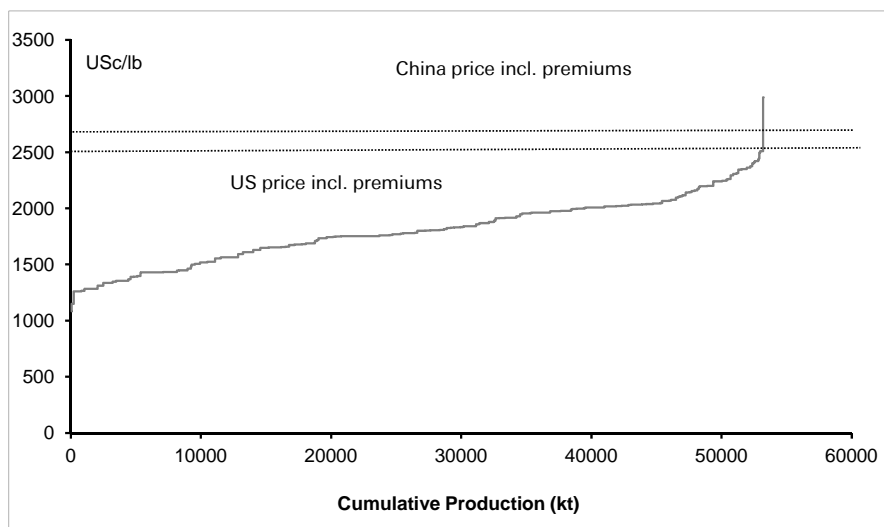
Region	Province	Company	Launch time	New capacity (kt)
East, China	Shandong	China Hongqiao	June	400
North, China	Inner Mongolia	Jinlian Aluminium 1	July	100
North, China	Inner Mongolia	Jinlian Aluminium 2	Q3	200
North, China	Inner Mongolia	Baotou Aluminium	July	150
North, China	Inner Mongolia	Huomei Hongjun	Q4	50
Northeast, China	Liaoning	Liaoning Zhongwang	Q4	250
Northwest, China	Gansu	Dongxing Aluminium	July	450
Northwest, China	Xinjiang	East Hope	Q3	450
Northwest, China	Xinjiang	Xinfa 1	May	350
Northwest, China	Xinjiang	Xinfa 2	Q3	200
Northwest, China	Xinjiang	Tianshan	Q4	450
Northwest, China	Xinjiang	Shenhua Aluminium 1	January	140
Northwest, China	Xinjiang	Shenhua Aluminium 2	July	400
Northwest, China	Xinjiang	Jiarun	March	150
Total				3,740

Source: Deutsche Bank, company data, SMM

Further into 2015, our estimate for new capacity addition is c.2,000kt, with newly approved capacity additions from provinces other than Xinjiang, Inner Mongolia, etc; and delayed capacity additions (from 2014) from the whole country.

The key question is how long will the supply discipline hold? At current spot prices and premiums, most of the smelters on the cost curve are cash positive. This in our view is likely to entice restarts:

Figure 76: Aluminium cost curve



Source: Wood Mackenzie, Deutsche Bank

At an all in aluminium price of USD2,500/t, we estimate that a high cost smelter with a unit cash cost of USD2,200/t will generate an IRR of 14%, assuming a capacity of 200ktpa, and a start-up capex of USD120m. For every additional USD100/t on the price, the IRR will increase by 10%. If we assume that premiums stay at current levels, then an additional USD200/t on the aluminum price will prove to be too enticing and invite capacity reactivations.



This will give some leeway for lower premiums, which we expect to decline over time as inventories slowly flow out of LME warehouses.

Figure 77: Estimating the IRR of a high cost smelter restart

Parameters

Capacity	200
Cash cost	2200
Start-up capex	120
LME price	2050
Premium	450
Sustaining capex	5
Tax rate	30%

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Production	100	180	200	200	200	200	200	200	200	200
Revenue	250	450	500	500	500	500	500	500	500	500
Cash cost	3080	2640	2200	2200	2200	2200	2200	2200	2200	2200
Costs	308	475.2	440	440	440	440	440	440	440	440
EBITDA	-58	-25.2	60	60	60	60	60	60	60	60
Depreciation	18	18	18	18	18	18	18	18	18	18
EBIT	-76	-43.2	42	42	42	42	42	42	42	42
Tax	22.8	12.96	-12.6	-12.6	-12.6	-12.6	-12.6	-12.6	-12.6	-12.6
Capex	-120									
Sustaining Capex	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
FCF	-160.2	-17.2	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4

IRR **14%**

Source: Deutsche Bank

Are the inventories a concern?

The sustained contango and low financing costs in the aluminium market has meant that the opportunity cost for holding aluminium has been very low. This has enabled traders and other market participants to buy the physical metal and store it on the LME, and sell a three month future to hedge the exposure. In cases where preferential storage fees have been negotiated, it actually pays to hold aluminium. The only risk that the market participant takes is premium risk which is more difficult to hedge. This explains the general nervousness when there is the expectation of falling premiums, such as when the LME mooted its rule change. We have outlined a few examples of the cost or payment in storing a tonne of aluminium on the LME. It is the ability to negotiate favourable storage rates or the shape of the curve that will significantly influence the economics of holding a tonne of aluminium. Changes in interest rates, are less of a factor.

Figure 78: Storage cost of aluminium on LME (1 tonne)

Metrics	Units	Full storage charge	Reduced storage charge	Interest rate hike	Flattening of the spread
Price	USD/t	2000	2000	2000	2000
3 month spread	USD/t	46	46	46	10
Borrowing costs		1%	1%	3%	3%
Storage costs	USD/t/day	0.5	0.1	0.1	0.1
Borrowing costs	USD/t	5	5	15	15
Storage costs	USD/t	45	9	9	9
<b>Net cost</b>	<b>USD/t</b>	<b>4</b>	<b>-32</b>	<b>-22</b>	<b>14</b>

Source: Deutsche Bank

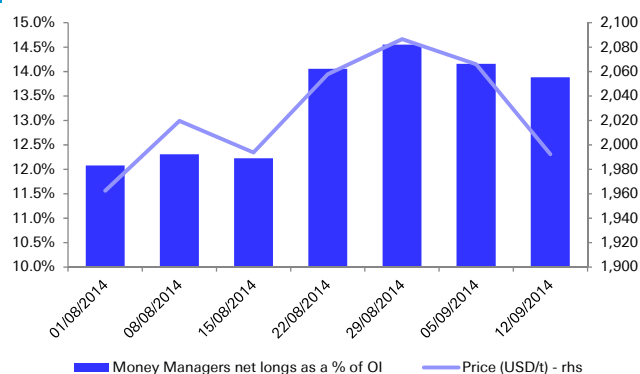


Although there are many influencing factors, the fact that consistent outflows from the LME have been seen since the end of May, which coincides with the tightening of the spreads would suggest that some of the metal being held in financing trades has become more freely available. However, we would argue that the only reason spreads have tightened is due to strong near-term demand putting upward pressure on the near term part of the curve. Hence we believe the concerns of rising interest rates leading to a deluge of metal are overblown.

#### The bullish positioning in aluminum has started to reverse

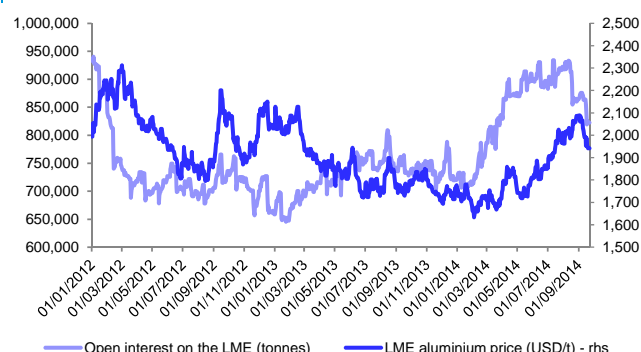
Investors have undoubtedly become more bullish on aluminum, with the open interest rising by c.200kt from the beginning of March. The rise in open interest was accompanied by a rise in aluminium prices suggesting a net long position building. The sharp fall in open interest at the beginning of August was due to the closing of short positions, but the subsequent fall was simply due to the liquidation of net longs. We note that in the COTR (Commitment of Traders Report), that Money Managers have been building net long positions, especially in the last two weeks of August. However, over the course of August, both the open interest and the Money manager position as a percentage of open interest has started to fall.

Figure 79: Money managers net position as a % of open interest



Source: LME, Deutsche Bank

Figure 80: LME aluminium versus open interest



Source: Bloomberg Finance LP, Deutsche Bank

#### Alumina's recovery has been sluggish with some near-term headwinds mounting

We remain bullish on the medium term outlook for alumina, and expect modest cost inflation in long-term **alumina** cash costs, as the bauxite producers capture more of the rent, and the utilization of lower quality ores increases power and reagent consumption. Capex intensity is also likely to be higher as capacity expansions are more globally widespread, as opposed to being so China-centric. The Indonesian bauxite ban will also add to inflationary pressures in the medium-term. The Australian spot price finally started to show some signs of life, up 8% since the beginning of the quarter to c.USD340/t. Alumina prices remains "cheap" relative to aluminum right up until the end of August. The spot alumina price was at a record low (since December 2010) at 12.8% of the all-in aluminium price (including premiums). However, the subsequent fall in the aluminium price has seen this ratio increase to 14.1%, certainly not expensive, but no longer as attractive to Chinese buyers.

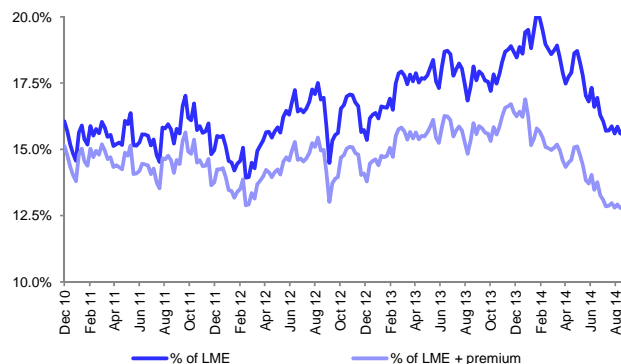


Figure 81: Spot alumina prices – Australia FOB (USD/t)



Source: Bloomberg Finance LP, Deutsche Bank

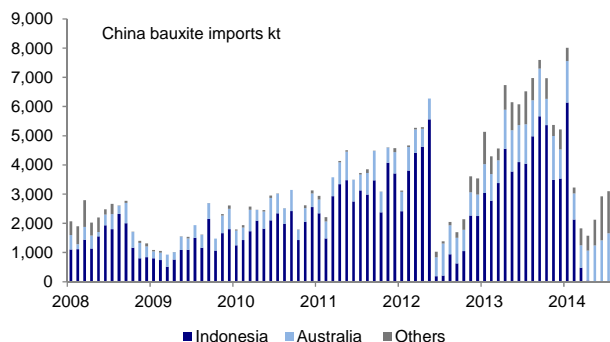
Figure 82: Alumina price as a percentage of aluminium prices



Source: Bloomberg Finance LP, Deutsche Bank

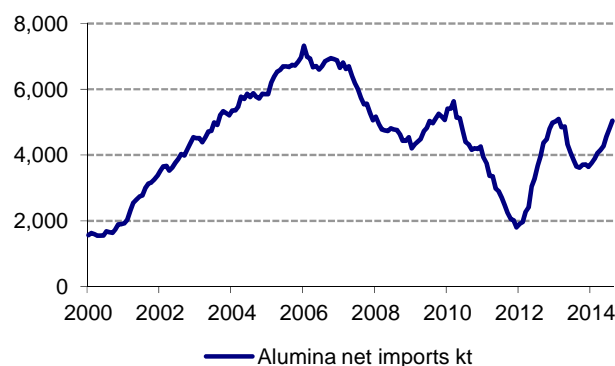
The latest China import and production stats highlight a number of trends. Bauxite imports are down 43% post the Indonesian ban, although a 6% increase m/m was recorded in July. In contrast, alumina imports have increased significantly, up 74% YTD, with discounts being offered from the over-supplied Atlantic market.

Figure 83: Chinese bauxite imports by region



Source: NBS, Deutsche Bank

Figure 84: Chinese alumina imports



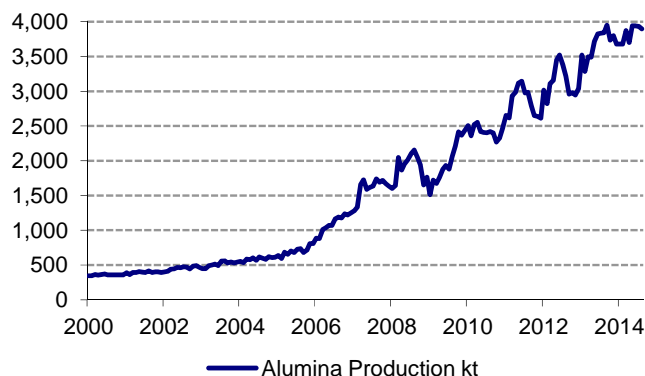
Source: NBS, Deutsche Bank

Likewise, Chinese domestic alumina production remains at near record levels (4Mt per month) showing limited impact from the bauxite ban. Production is up 6% YTD, which has kept imports below 10% as a percentage of apparent consumption.



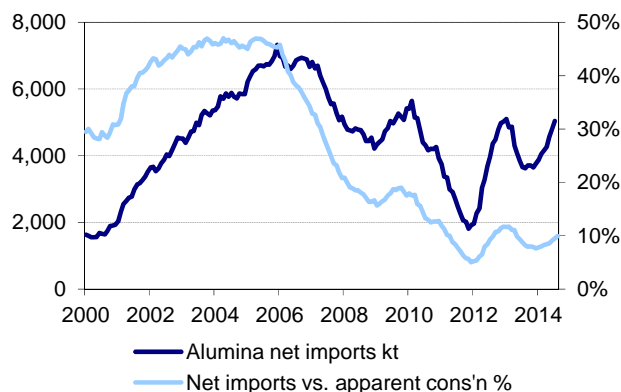


Figure 85: Chinese alumina production (monthly)



Source: NBS, Deutsche Bank

Figure 86: Imports as a percentage of apparent consumption



Source: Bloomberg Finance LP, Deutsche Bank

Whilst the recent rally in alumina spot prices is encouraging, we continue to see some headwinds in the near term:

- The pull back in aluminium prices does make spot alumina purchases more expensive when viewed as a % of overall costs. This may result in some delays in purchases.
- Although Rio Tinto's Gove refinery (2.7Mtpa) is now closed, the 1.5Mtpa Utkal refinery in India is still ramping up, and the 1.8Mtpa Ma'aden refinery is preparing for a Q4 commissioning start. The new capacity balances out the Gove closure, which leaves the alumina market in need of further curtailments.
- Domestic Chinese production remains robust, with no signs that an imminent bauxite shortage will impact pricing.

A sustainable alumina price bounce requires a sustained global aluminium price move, as well as improved market balances and improving Chinese import numbers. Ultimately we expect further alumina curtailments to follow aluminium curtailments and the increased cost of bauxite to feed through into the alumina price.



Figure 87: Deutsche Bank's Global Alumina supply – demand balance

		2010	2011	2012	2013	2014e	2015e	2016e	2017e
<b>Alumina</b>									
China alumina production	Mt	31.0	39.2	43.0	47.2	50.4	53.6	54.7	57.8
growth	%	30%	26%	10%	10%	7%	6%	2%	6%
Oceania alumina production	Mt	20.1	19.6	21.6	21.8	20.6	20.5	21.0	21.2
growth	%	-1%	-2%	10%	1%	-5%	-1%	3%	1%
LatAm	Mt	13.6	15.0	14.2	13.6	14.3	15.0	15.3	16.3
growth	%	3%	10%	-5%	-4%	6%	5%	2%	7%
North America	Mt	5.3	5.7	6.1	6.8	6.6	6.6	6.9	7.0
growth	%	25%	7%	6%	12%	-2%	0%	5%	0%
India	Mt	3.6	3.9	3.8	3.7	5.1	5.8	6.7	7.5
growth	%	-2%	8%	-3%	-1%	38%	13%	15%	12%
Europe	Mt	8.2	8.6	8.1	8.3	8.5	8.6	8.9	8.9
growth	%	23%	5%	-6%	3%	2%	1%	3%	0%
Russia	Mt	2.9	2.8	2.7	2.7	2.6	2.7	2.8	3.0
growth	%	2%	-1%	-4%	-2%	-2%	4%	3%	5%
Other Regions & projects	Mt	3.5	3.4	3.2	3.3	2.9	4.1	5.1	9.2
growth	%	6%	-3%	-5%	1%	-11%	41%	25%	81%
<b>Global alumina production</b>	<b>Mt</b>	<b>88.2</b>	<b>98.2</b>	<b>102.6</b>	<b>107.3</b>	<b>111.1</b>	<b>117.0</b>	<b>121.4</b>	<b>130.8</b>
growth	%	13%	11%	5%	4%	4%	5%	4%	5%
<b>Global alumina consumption (total)</b>	<b>Mt</b>	<b>89.2</b>	<b>97.0</b>	<b>100.6</b>	<b>105.5</b>	<b>111.0</b>	<b>117.7</b>	<b>123.1</b>	<b>130.0</b>
growth	%	15%	9%	4%	5%	5%	6%	5%	6%
Alumina used for industrial applications	Mt	6.0	6.5	6.5	6.9	7.2	7.8	8.2	8.5
growth	%	26%	8%	0%	6%	5%	8%	5%	4%
Smelter grade alumina (SGA) consumptic	Mt	83.2	90.5	94.1	98.7	103.8	110.0	115.0	121.5
growth	%	14%	9%	4%	5%	5%	6%	5%	6%
Ratio to Al production		1.97	1.96	1.96	1.95	1.97	1.97	1.97	1.97
<b>Alumina market balance</b>	<b>Mt</b>	<b>-0.97</b>	<b>1.24</b>	<b>2.03</b>	<b>1.73</b>	<b>0.06</b>	<b>-0.75</b>	<b>-1.75</b>	<b>0.86</b>
Avg spot alumina price	\$/t	333	374	318	329	326	354	375	398

Source: Wood Mackenzie, Deutsche Bank



Figure 88: Deutsche Bank's Global Aluminum supply –demand balance

		2010	2011	2012	2013	2014e	2015e	2016e	2017e
<b>Primary Aluminium</b>									
Chinese Production	Mt	17.2	19.8	22.4	24.8	26.6	28.6	30.2	32.6
growth	%	27%	15%	13%	11%	7%	8%	5%	8%
Russia Production	Mt	3.9	4.0	4.0	3.7	3.5	3.6	3.9	4.2
growth	%	4%	1%	1%	-7%	-7%	4%	7%	7%
Middle East Production	Mt	3.1	3.9	4.1	4.3	5.2	5.5	5.6	5.6
growth	%	25%	26%	5%	5%	22%	5%	2%	1%
Europe & N. American Production	Mt	8.5	9.0	8.5	8.5	8.1	8.3	8.7	9.1
growth	%	0%	6%	-6%	0%	-4%	3%	5%	4%
<b>Global Production</b>	<b>Mt</b>	<b>42.2</b>	<b>46.1</b>	<b>48.1</b>	<b>50.5</b>	<b>52.7</b>	<b>55.8</b>	<b>58.4</b>	<b>61.7</b>
growth	%	12.5%	9.3%	4.3%	4.9%	4.4%	5.9%	4.6%	5.7%
check		42.3	46.2	48.1	50.3	53.7	56.9	59.5	62.3
Global Capacity	Mt	50.2	52.9	56.2	62.3	66.9	70.1	72.7	74.2
utilisation rate	%	84%	87%	86%	81%	79%	80%	80%	83%
<b>Primary Aluminium Consumption</b>									
China Consumption	Mt	16.7	19.5	21.5	23.9	25.9	27.9	30.2	32.5
growth	%	18.1%	16.4%	10.4%	11.3%	8.0%	7.8%	8.5%	7.5%
China net imports (exports)	Mt	-0.4	-0.5	0.0	-0.3	-0.2	-0.7	0.1	-0.1
Developing economies (ex China)	Mt	9.8	10.6	10.8	11.1	12.0	12.5	13.1	13.8
growth	%	11%	8%	2%	2%	8%	4%	5%	5%
North America	Mt	5.3	5.4	5.9	5.9	6.1	6.4	6.6	6.8
growth	%	9.8%	2.9%	8.8%	0.2%	3.2%	3.8%	4.0%	3.5%
Europe (EU-27)	Mt	7.9	8.3	8.3	8.4	8.6	8.8	9.0	9.2
growth	%	11%	6%	0%	1%	2%	3%	2%	2%
OECD Consumption	Mt	13.7	14.0	14.5	14.4	14.7	15.1	15.5	15.8
growth	Mt	12%	2%	3%	-1%	2%	3%	2%	2%
<b>Global Consumption</b>	<b>Mt</b>	<b>40.7</b>	<b>44.5</b>	<b>47.3</b>	<b>49.9</b>	<b>52.5</b>	<b>55.5</b>	<b>58.8</b>	<b>62.1</b>
check		40.7	44.5	47.3	49.9	53.4	57.0	60.7	64.4
growth	%	14.0%	9.3%	6.3%	5.5%	5.3%	5.7%	6.0%	5.5%
Production adjustments	Mt				0	0	-300	-800	-1,000
<b>Market balance</b>	<b>Mt</b>	<b>1.48</b>	<b>1.61</b>	<b>0.77</b>	<b>0.57</b>	<b>0.17</b>	<b>0.31</b>	<b>-0.48</b>	<b>-0.39</b>
<b>Avg. LME cash price</b>									
	\$/t	2,191	2,423	2,052	1,889	1,883	1,988	2,200	2,354
	c/lb.	99	110	93	86	85	90	100	107

Source: Wood Mackenzie, Deutsche Bank



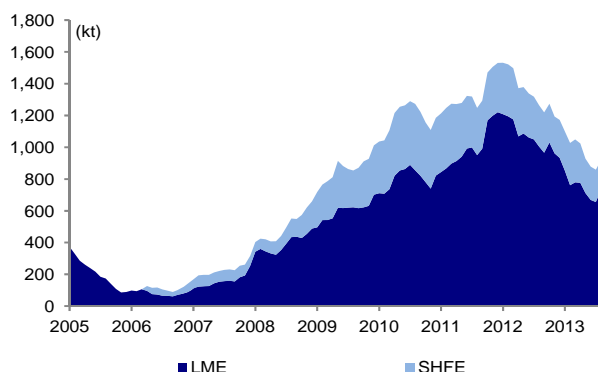
## Zinc: Sustained deficits for three years

- Zinc market fundamentals remain favourable in our view, with three years of deficits likely. Even post 2016, the market is likely to be balanced to only slightly over-supplied at worst. The demand outlook remains positive with a 15% YTD growth in Chinese galvanised steel production. Zinc remains less exposed to the Chinese property sector than some of the other metals and Chinese mined and refined production growth remains fairly muted. We temper our bullish stance over the next two years as we believe the Chinese smelting industry will respond to improving Zinc TC's and ultimately the Chinese zinc mining industry will recover its growth momentum.
- Although we forecast a fairly modest deficit of 150kt in 2016E, we recognise that there is upside (ie a higher deficit) potential. We include 720kt of possible and probable zinc capacity into our mined supply forecast. In our long-term pricing study we identified 800kt of potential new capacity, but we acknowledge that some of this capacity may be delayed or remain unfunded. This is a further reason for our bullish stance on zinc.

### The first signs of physical tightness easing, but this is temporary

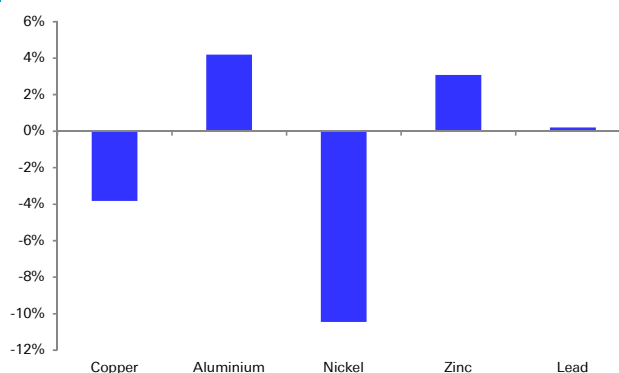
Despite the recent pull-back in metal prices, zinc's performance has remained reasonably robust, up 3% in the quarter. However, there are tentative signs that the physical tightness over the past two quarters is easing slightly. The LME saw an inflow of 100kt of metal, mostly in the New Orleans warehouses. The steady fall in exchange inventories since the end of 2012 have been punctuated by periodic inflows of metal. Given our forecast of a deficit market in zinc over the next three years, we think the downward trend in exchange inventories will resume once more.

Figure 89: Exchange stocks show a modest inflow of stocks



Source: Bloomberg Finance LP, Deutsche Bank

Figure 90: Q3 base metal performance

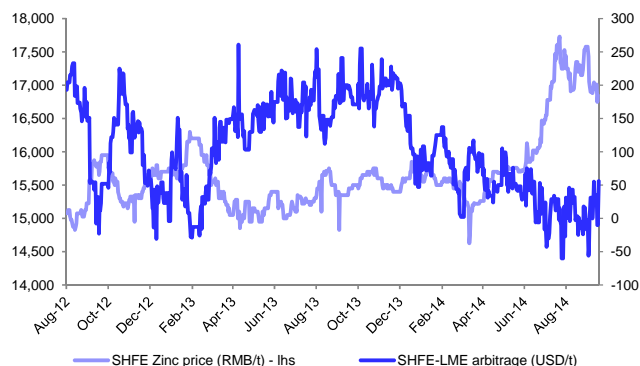


Source: Bloomberg Finance LP, Deutsche Bank

Perhaps further indications of the easing physical market are the declining zinc premiums which have ticked lower in July and August, whilst still remaining at decent levels. The 5% fall in the Chinese domestic zinc price since the peak in July, has meant that the arbitrage to import zinc has remained relatively unattractive. There were brief periods where the LME price was more attractive and this resulted in refined zinc exports of 21kt in August, the highest since July'07. Although the contango remains relatively modest, there have been fewer excursions into backwardation territory over the past month.

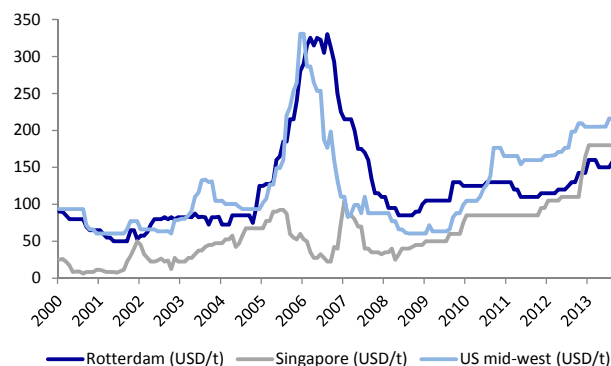


Figure 91: Domestic Chinese zinc price versus the LME arbitrage



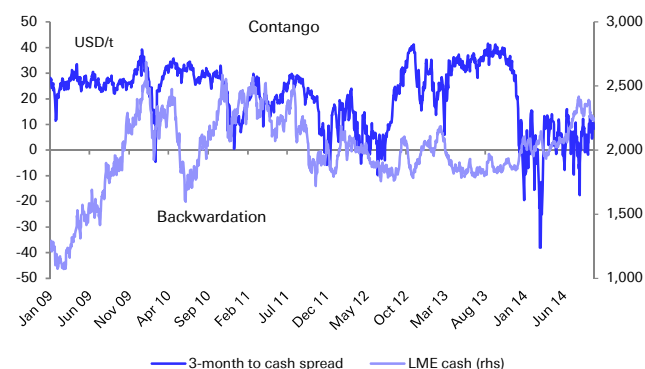
Source: Bloomberg Finance LP, Deutsche Bank

Figure 92: Zinc physical premiums



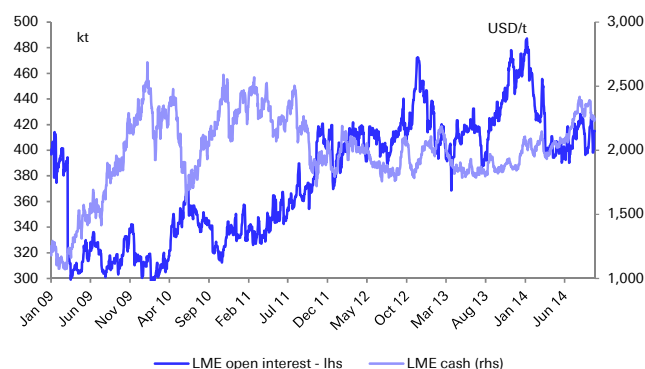
Source: Wood Mackenzie, Deutsche Bank

Figure 93: 3-month to cash spread vs the LME price



Source: Bloomberg Finance LP, Deutsche Bank

Figure 94: Zinc open interest versus price



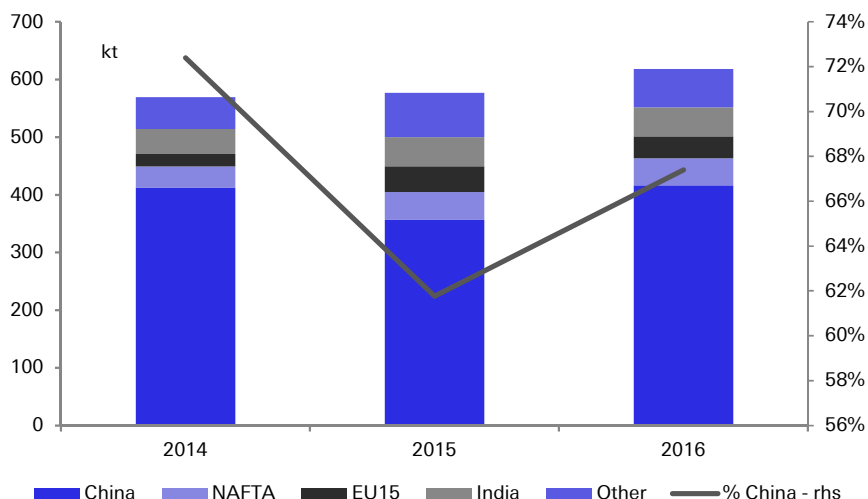
Source: Bloomberg Finance LP, Deutsche Bank

### Demand indicators remain solid

Despite concerns over Chinese residential construction, the remaining zinc demand indicators remain robust. We are forecasting zinc demand growth of 4.3% over the next three years which amounts to 570 – 620kt of additional zinc each year, over the next three years. This equates to a new Mount Isa and McArthur River mine combination. We forecast China to contribute two-thirds of the demand growth over the next three years, with North America, Europe and India being the other key regions driving growth. As China is the key region for demand (47% of demand in 2014E) and the key driver of growth, the outlook for demand is key.



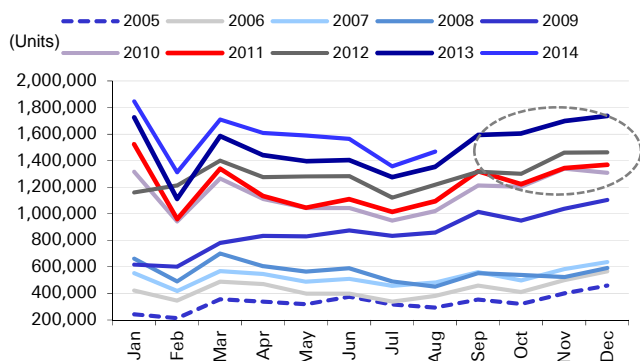
Figure 95: Zinc demand growth by region in absolute tonnes



Source: Deutsche Bank

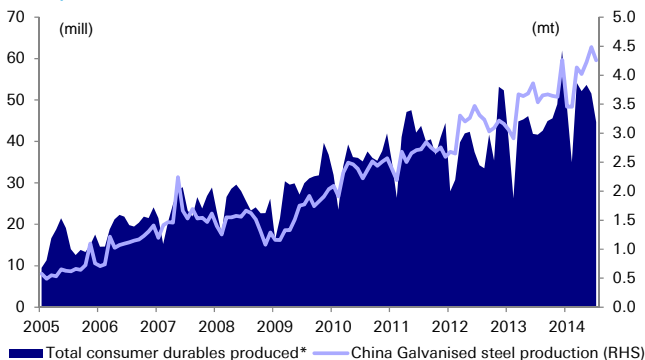
Despite the slight dip in consumer durables in July, down 13% month on month, output is still up 18% YTD. Similarly Auto production and sales continue to be robust, with production up 9.5% YTD to 13.5M units, and passenger sales up 10.6%. Our China Auto team continues to forecast sales growth of c.9-10% over the next three years. Given these strong demand indicators it is perhaps unsurprising that China's galvanised sheet steel output is up 15% y/y at 28.0Mt. Although Industrial goods and residential construction, only account for c.20% of China's zinc demand, fixed asset investment in both these sectors continued to slow, with FAI Real estate and FAI Manufacturing at 14% growth y/y for the month of July.

Figure 96: China passenger vehicle sales



Source: Deutsche Bank, CAAM

Figure 97: China consumer durable sales vs galvanised steel production

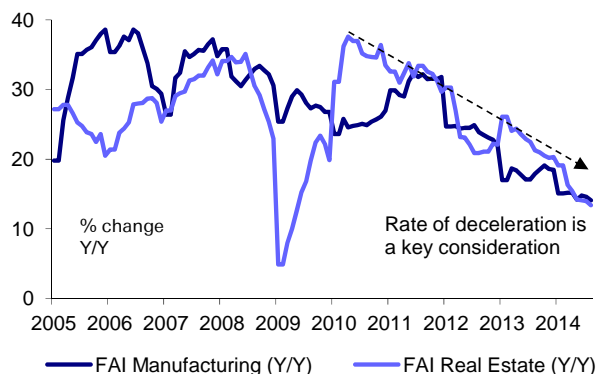


Source: Bloomberg Finance LP, NBS, Deutsche Bank, \*Washing machines, oven, Air conditioners and Refrigerators

The net result is that Chinese apparent zinc demand is up 7.4% y/y for the first seven months of the year, which is slightly ahead of our real demand growth forecast of 6.8%.

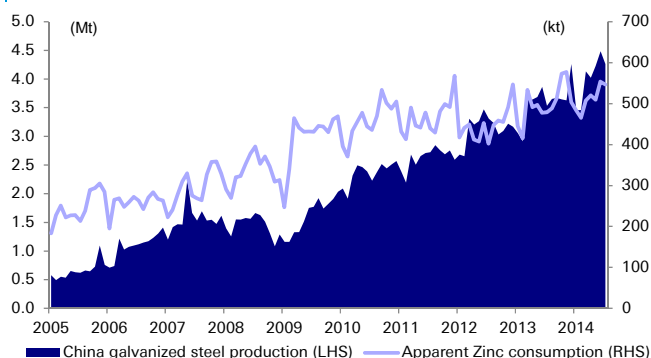


Figure 98: China's Fixed Asset Investment in Manufacturing and Real estate



Source: CEIC, Deutsche Bank

Figure 99: Chinese galvanized steel production versus apparent\* zinc consumption

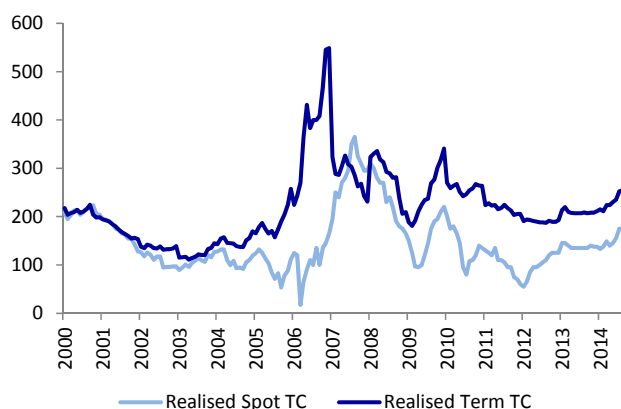


Source: Bloomberg Finance LP, NBS, Deutsche Bank, \*Apparent zinc consumption = refined production plus net imports

### We think the Chinese smelting bottleneck will be resolved

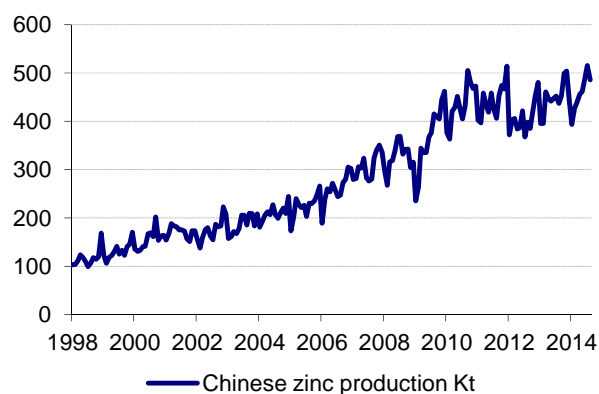
The zinc market first moved into a deficit in deficit in 2012, with the main contributing factor being a surprise decline in Chinese refined output (down 8% y/y), although the growth rate had slowed quite significantly in 2011 already. But up until then, refined production had grown very strongly. After a strong rebound in 2013, only back to 2011 levels, output growth has slowed once more to c.2.4%. This growth rate is lagging our forecast 6.8% demand growth forecast, suggesting that a combination of weak domestic mined supply, environmental scrutiny and poor profitability is continuing to restrain domestic output. We note however, that spot zinc TC's have started to tick up (USD30/t since June), which suggests that the profitability outlook will improve. Although the environmental scrutiny remains in place, improving profitability will enable the Chinese smelters to more readily afford environmental abatement equipment.

Figure 100: Zinc TC's (USD/t of conc.)



Source: Wood Mackenzie, Deutsche Bank

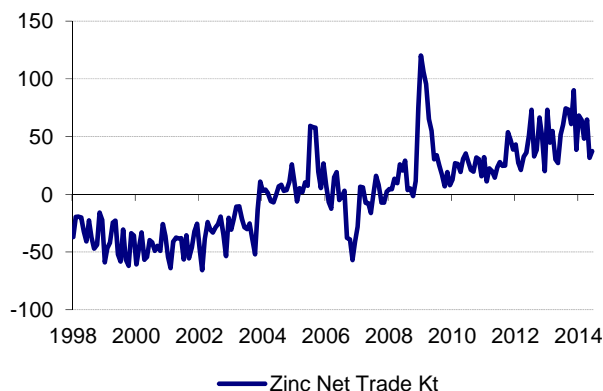
Figure 101: Chinese refined zinc output



Source: NBS, Deutsche Bank

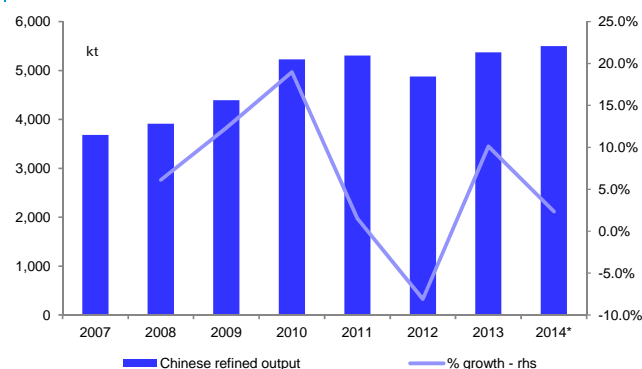


Figure 102: Chinese refined zinc net imports



Source: NBS, Deutsche Bank

Figure 103: Chinese refined production on an annual basis



Source: NBS, Deutsche Bank, \* Annualised

### ...but mined supply needs to improve in tandem

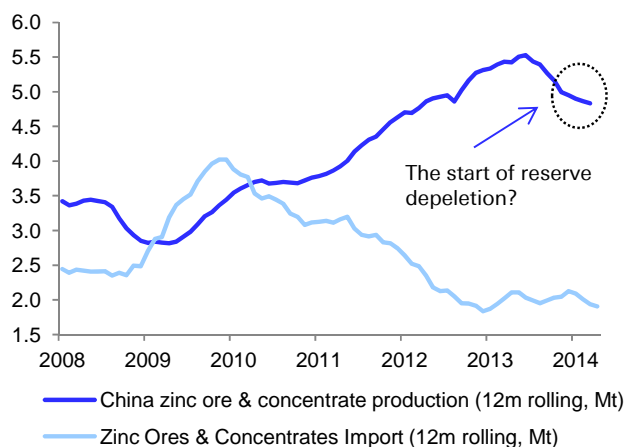
We maintain our view that the initial bottleneck in Chinese smelting may have been caused by environmental shutdowns, but that the continued restraint is due to a lack of concentrate, or more correctly profitable concentrate. We made the point that Zinc TC's have started to improve which should ease the pressure on the smelters. We think the easing of the concentrate tightness comes about in 2015. However we continue to forecast another year of modest mined supply growth for 2014 of 1.2%. Wood Mackenzie report that Chinese mine production of 3.145Mt for the first seven months which is flat y/y, versus our expectation of a 3.3% mined supply growth in China. We continue to forecast some growth in Chinese mined output, but this is predicated on improving prices and Inner Mongolia's ability to continue expanding. We note that there are a number of expansion plans in progress in China, and that exploration efforts have started to reverse the reserve decline. The largest reserve increases are in Yunnan (+25% in 2012) and Inner Mongolia (+22%), which will be the drivers of mined supply growth in the future.

In the producing regions outside of China, we have made limited changes in this review, and expect production from all the main zinc producing regions in 2015E to outweigh declines from Australia, in particular the Century closure. In 2016E, production from projects, both probable and possible is required to ensure a reasonable balance. Clearly there is some downside risk to our mined supply growth estimate of 5.9% in 2016E, if some of the zinc projects are not advanced.



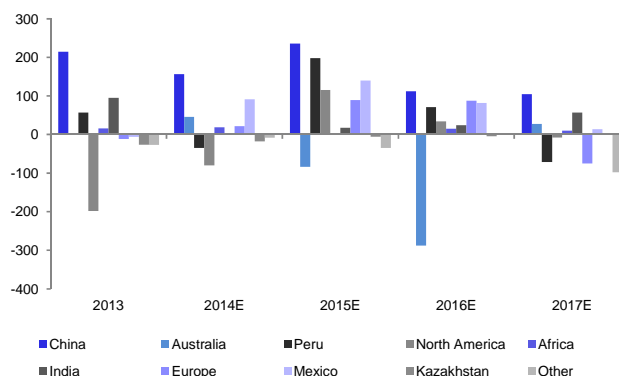


Figure 104: Chinese mined production versus imports



Source: Deutsche Bank, Wood Mackenzie

Figure 105: Regional supply changes in Zinc



Source: Wood Mackenzie, Deutsche Bank

Figure 106: Chinese zinc mine expansions

Company	Capacity	Comments
Dongshenmiao Mining	1mtpa of ore	Operational by the end of 2014
Hualian Zinc	3Mtpa of ore	Expansion fully operational in 2014
Zhongjijun Lingnan NonFerrous	0.75Mtpa	Raising RMB1.3bn to upgrade the Fankou mine and the expansion of the Panlong mine in Guangxi
Zijin Mining		Trial mining at the Dongshenmiao Mine in Inner Mongolia
Funing Mining	0.3Mtpa	Trial mine in Yunnan
Xiangrong Mining	0.5Mtpa	Puding mine in Guizhou with first production in 2015

Source: Wood Mackenzie

### Assessing the next raft of projects

In our recent study on the base metals (see the note entitled "FITT report for investors: Setting a new Base Line", dated the 16th of September), we have modeled 40 projects, totaling 3.0Mt of zinc production or 4.9Mt of zinc equivalent production. 29 of these projects are Greenfield and 11 are brownfield. The average "new" zinc mine size is 60ktpa, at an average capex intensity of USD4,339/t, and costing USD557m. The median cash cost is 97c/lb pre by-products and 33c/lb post by-products. The new raft of zinc mines tends to be polymetallic, which means that "by-products" are quite influential. This means that our sample of new projects has a cash cost c.23c/lb lower than the current cost curve.

In this study we have identified c.800kt of new zinc capacity which could come on line by 2016E. We have factored in 720kt of new capacity in our 2016 mined supply forecast, a high proportion of the potential 800kt, which highlights the potential risk in a greater than forecast deficit. We summarise the main parameters of the study in the table below:



Figure 107: Zinc project summary

	Zinc prod (kt)	Zinc equiv. prod (kt)	Capex (US\$m)	Capex intensity (US\$/t)	Incentive price (c/lb)	Cash cost pre-by products (c/lb)	Cash cost post-by products (c/lb)
Total	3,044	4,872	22,263	173,558			
Average	76	122	557	4,339	104	138	15
High	194	332	1,850	13,515	172	891	100
Low	11	26	44	591	26	57	-167
<b>Median</b>	<b>60</b>	<b>102</b>	<b>425</b>	<b>3,668</b>	<b>105</b>	<b>97</b>	<b>33</b>

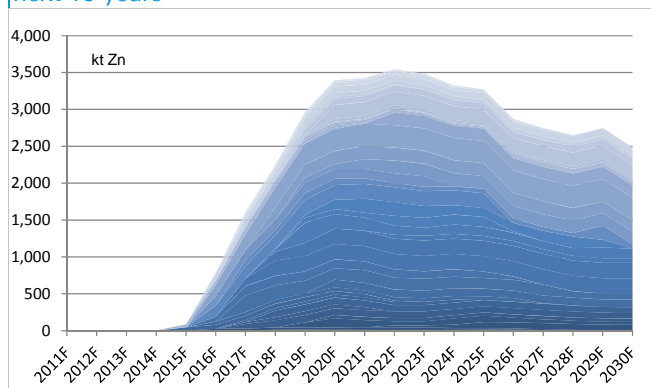
Source: Deutsche Bank

Zinc's incentive price is  
105c/lb

Mines developed between 1995 and 2013 have a weighted average capital intensity of USD4,146/t of zinc production, or USD1,892/t of zinc-equivalent production. Capex intensity is likely to increase by 2.29x in our sample versus the average over the previous period, to USD4,339/t.

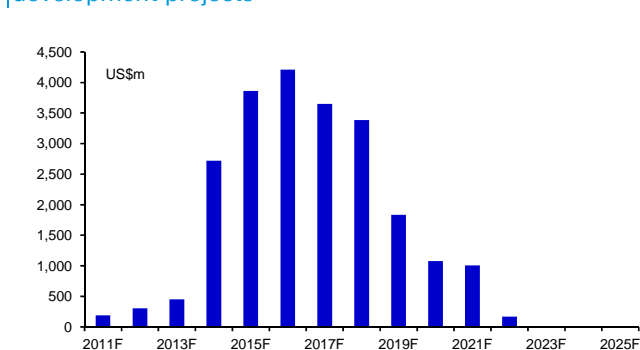
Our sample of projects has the potential to deliver 3.3Mtpa of zinc production in 2025F, with the peak production of 3.5Mt in 2022F. Peak capex is likely to be USD4.2bn in 2016F should all the projects be built, tapering off from 2019F onwards.

Figure 108: Potential zinc production growth over the next 15 years



Source: Deutsche Bank, Wood Mackenzie

Figure 109: Capex profile of our sample of pre-development projects



Source: Deutsche Bank, Wood Mackenzie



Figure 110: Global zinc supply & demand model

		2010	2011	2012	2013	2014E	2015E	2016E	2017E
China mine production	Mt	3.7	4.3	4.5	4.7	4.9	5.1	5.2	5.3
China mine production growth	%	16%	15%	6%	5%	3.3%	5%	2%	2%
Australia mine production	Mt	1.5	1.5	1.5	1.5	1.5	1.4	1.2	1.2
Australia mine production growth	%	13%	0%	0%	0%	3%	-5%	-20%	2%
Peru mine production	Mt	1.4	1.2	1.2	1.2	1.2	1.4	1.5	1.4
Peru mine production growth	%	-2%	-15%	0%	5%	-3%	16%	5%	-5%
North America mine production	Mt	1.9	2.0	2.0	1.8	1.8	2.0	2.2	2.2
North America mine production growth	%	1%	5%	0%	-10%	1%	14%	6%	0%
India mine production growth	Mt	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9
India mine production growth	%	4.6%	3.5%	-1.7%	13.0%	0.3%	2.1%	2.9%	6.5%
European mine production	Mt	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.0
European mine production growth	%	3.2%	0.9%	1.4%	-1.3%	2.3%	9.6%	8.6%	-6.8%
<b>World Mine Production</b>	<b>Mt</b>	<b>12.11</b>	<b>12.57</b>	<b>12.78</b>	<b>12.89</b>	<b>13.05</b>	<b>13.82</b>	<b>14.63</b>	<b>15.35</b>
World Mine Production Growth	%	7%	3.8%	1.7%	0.9%	1.2%	5.9%	5.9%	4.9%
Concentrate for smelting	Mt	12.11	12.57	12.78	12.89	13.05	13.82	14.63	15.35
Secondary & other zinc	Mt	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3
Losses	Mt	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
<b>Total Refined output</b>	<b>Mt</b>	<b>12.71</b>	<b>12.97</b>	<b>12.45</b>	<b>12.92</b>	<b>13.43</b>	<b>14.12</b>	<b>14.96</b>	<b>15.79</b>
World refined availability growth	%	14%	2.0%	-4.0%	3.7%	4.0%	5.1%	5.9%	5.6%
China Refined Consumption	Mt	4.7	5.3	5.6	6.1	6.5	6.8	7.2	7.7
Consumption growth	%	14.8%	11.7%	6.6%	8.2%	6.8%	5.5%	6.1%	5.6%
US Refined Consumption	Mt	1.2	1.3	1.4	1.4	1.4	1.5	1.5	1.6
Consumption growth	%	6%	5.9%	6.2%	0.1%	2.6%	3.4%	3.1%	2.9%
Europe Refined Consumption	Mt	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9
Consumption growth	%	20.5%	3.1%	-7.9%	-0.3%	1.2%	2.5%	2.1%	1.8%
Brazil/India/Russia Refined Consumption	%	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.3
Consumption growth	%	15.9%	7.8%	4.3%	2.0%	0.7%	3.9%	4.7%	5.2%
<b>World Refined Consumption</b>	<b>Mt</b>	<b>11.69</b>	<b>12.55</b>	<b>12.83</b>	<b>13.32</b>	<b>13.90</b>	<b>14.49</b>	<b>15.11</b>	<b>15.71</b>
World Refined Consumption Growth	%	15.7%	7.3%	2.2%	3.9%	4.4%	4.2%	4.3%	4.0%
<b>Market balance</b>	<b>Mt</b>	<b>1.02</b>	<b>0.42</b>	<b>-0.37</b>	<b>-0.40</b>	<b>-0.47</b>	<b>-0.37</b>	<b>-0.15</b>	<b>0.08</b>
Exchange stocks	Mt	3.48	3.90	3.52	3.12	2.65	2.29	2.14	2.21
Reported-stock-to-consumption ratio	Wks	15.5	16.1	14.3	12.2	9.9	8.2	7.4	7.3
<b>Annual average LME cash prices</b>	<b>USD/t</b>	<b>2,158</b>	<b>2,212</b>	<b>1,965</b>	<b>1,940</b>	<b>2,151</b>	<b>2,345</b>	<b>2,450</b>	<b>2,529</b>
<b>Annual average LME cash prices</b>	<b>US\$/lb</b>	<b>98</b>	<b>100</b>	<b>89</b>	<b>88</b>	<b>98</b>	<b>106</b>	<b>111</b>	<b>115</b>

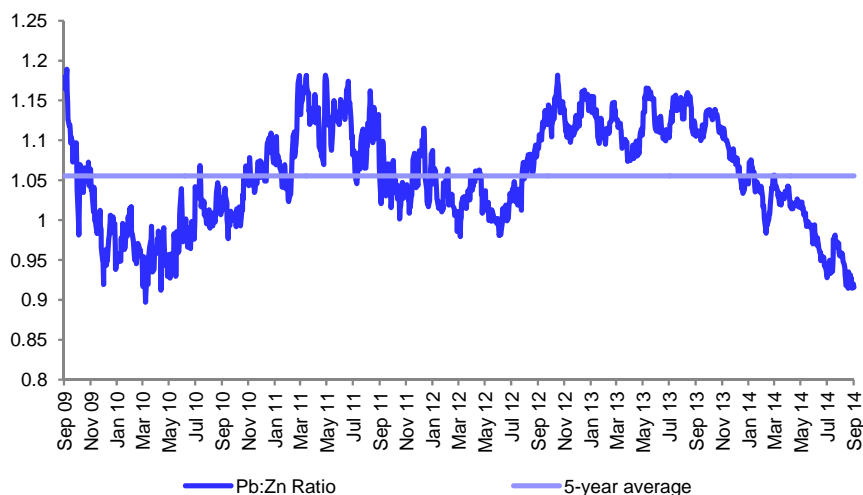
Source: Deutsche Bank, Wood Mackenzie



## Lead: Lacklustre demand weighs on the short term

- Given the strong primary supply side inter-dependence between zinc and lead (lead is effectively a by-product of zinc mining), we would expect the lead to perform in line with zinc over the medium term. Limited investment in new mined supply outside of China, and declining grades in China, should keep the mined growth rates down at very low single digits for the next few years. The environmental scrutiny on secondary smelting and the lack of raw material due to the decline in the Chinese e-bike sector should also limit the growth in secondary supply. However, high battery inventories and weak replacement demand has meant that demand has fallen short of our expectations, making the metal vulnerable to the broader correction in metal prices. We continue to forecast a tighter market in 2015 and forecast deficits between c.300kt for the next two years. We expect prices to recover in Q4 from current spot levels, and average close to USD2,300/t in 2015.

Figure 111: Five year Lead – Zinc ratio



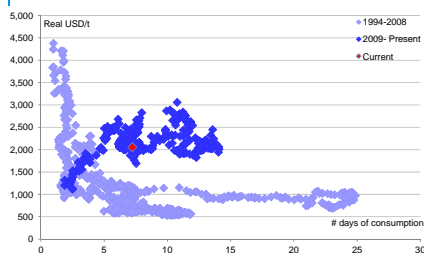
Source: Thomson Reuters datastream, Deutsche Bank

Lead has proved to be just as vulnerable as many of the other base metals to the recent sell-off in commodities. The metal has under-performed the broader base metal complex, especially versus its sister metal zinc, and now trades at a c.USD180/t discount to zinc. Short-term demand indicators have highlighted the slightly weaker outlook with rising LME stocks, cancelled warrants almost at zero (2% of LME inventory), and even a small downward move of the robust US premiums to below USD300/t. Premiums in Europe have fallen over the weak summer period, and are now USD20 – 50/t Rotterdam, with channel checks suggesting some offers at lower levels. The fourth quarter is however a seasonally strong period for lead, due to restocking before the winter. We expect a modest price recovery from current spot levels due to the restocking event.

*Lead has under-performed zinc since the beginning of 2014. The supply side drivers are inter-linked, hence we think lead could play catch-up in 2015*

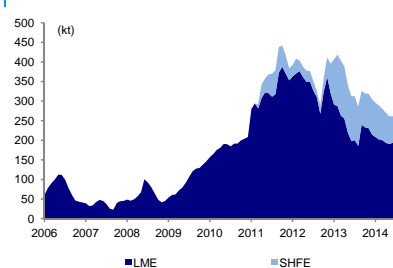


Figure 112: Lead inventory (days consumption) vs prices



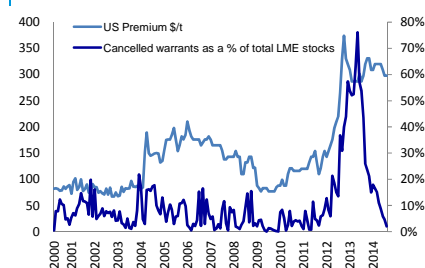
Source: Deutsche Bank, Bloomberg Finance LP

Figure 113: Lead exchange inventory



Source: Deutsche Bank, Bloomberg Finance LP

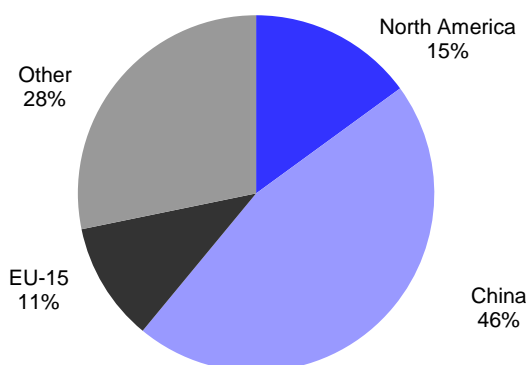
Figure 114: US lead premium vs LME cancelled warrants as % of total



Source: Deutsche Bank, Bloomberg Finance LP

We remain positive on the medium term outlook for the lead market, a function of limited new mine production in the world ex-China and tighter environmental scrutiny on both primary and secondary production in the Chinese refined lead industry. However, the demand has been somewhat disappointing, despite strong Auto sales figure in the US and China.

Figure 115: Lead demand by region (2014E)



*North America and China account for over 60% of global lead demand*

Source: Deutsche Bank

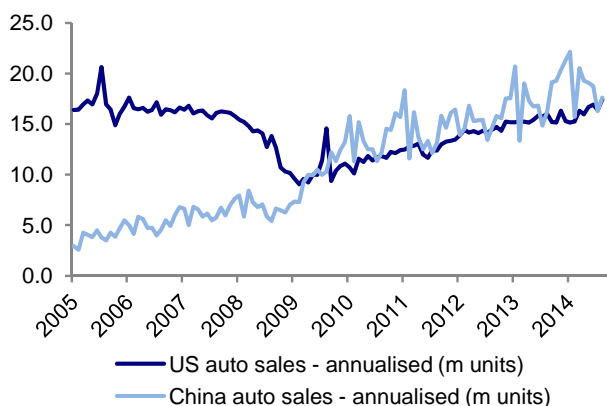
The August U.S. light vehicle SAAR came in at 17.4MM in August; the highest level since January 2006. Sales increased 9.3% yoy, adjusted for one fewer selling day. The SAAR now stands at 16.3MM YTD (16.7MM excluding the low, weather impacted, levels seen in Q1). If the current momentum continues, the SAAR could be around 16.5MM unit for the year with an exit rate in the high 16MM to low 17MM unit range, suggesting some upside to the current Deutsche Bank Auto team forecasts. However with US auto lending hitting all-time highs in first half of 2014, there are building concerns that the current momentum is unsustainable. The strong increase in Auto sales has translated to strong OE battery shipments increasing by 7.6%, to 10.5M units. However due to the cooler summer, replacement demand has been weaker than anticipated, only up 1.4% in H1'14.



The demand story in China remains one of strong demand from the mobile telecoms sector as the 4G network is being built out, reasonable demand from the Auto sector, offset by falling demand from the e-bike sector, which was a key driver a few years ago. China's auto output growth in the first seven months of the year was 13.5M units, 9.5% higher than a year ago, with the combined commercial and passenger vehicle output growth in low double digits. We think these Y/Y growth rates are unsustainable however, given the tough base effect in the second half of the year. Cumulative output for the top 50 e-bike producers totaled 5.4M units in H1 2014, 2.3% lower year on year. Output in June was 1M units, 6.4% lower year on year and 6.2% lower than in May 2014.

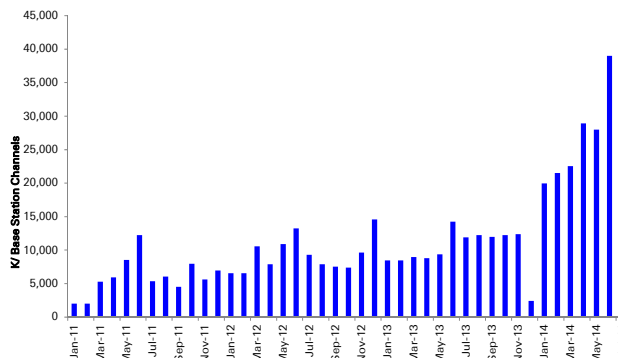
The strong build-out of base stations in China continues, with July's 37.7M channels close to an all time record. The YTD production is 210M channels which is double that of 2013. Total combined 3G and 4G penetration stands at 40% at the end of June, with 486.5M 3G users and 14M 4G users (Official estimates are that total Chinese 4G users will increase to 50M by the year end). The current growth rate may not be sustainable given that the new operators will most likely collaborate so as not to duplicate infrastructure.

Figure 116: US and China auto sales



Source: Deutsche Bank, Bloomberg Finance LP

Figure 117: China base station output



Source: NBS, Deutsche Bank

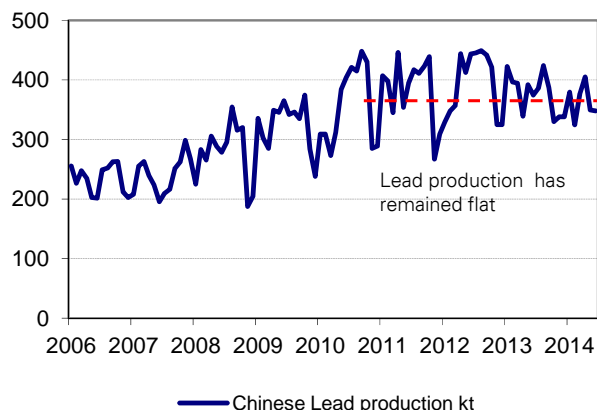
Lead's supply growth remains muted, with constraints on both the mining and smelting parts of the value chain. China's primary output has contracted by 4% YTD, with secondary output down more at 13%. Lead ore / concentrate imports have risen sharply, up 23% YTD to July, offsetting part of the drop in domestic supply. We note that spot TC's have increased by USD20/t over the course of August, which suggests that there may be some relief for the weak primary smelter profitability. However, the utilisation rate at secondary lead smelters continues to decrease due to environmental inspections and tight physical availability of feed material. Secondary smelter utilisation rates are below 50%, versus 60% a year ago, and are likely to remain low, with the bulk of their exposure to the e-bike sector. Given the contraction in the sector, both recycled material as a feed stock and sales are declining. Outside of China, the La Oroya smelter in Peru remains closed, which continues to impact the US market.

We continue to forecast global mine growth to slow substantially from 10% to 3% in 2014 and 2% in 2015, due to a combination of zinc mine closures (Lead is an important by-product) in the world ex-China, and declining ore grades in China. However, we note that there has been a slow trickle of restart



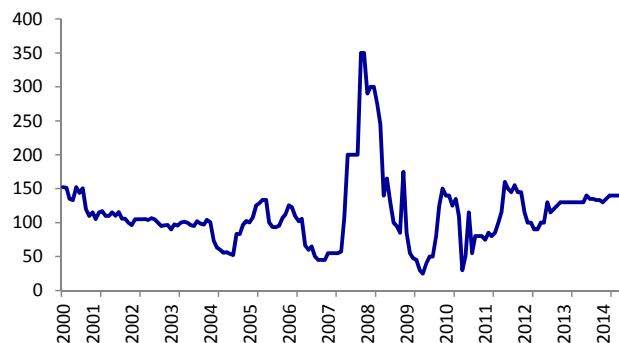
announcements with the partial re-opening of the Gorubso mine in Bulgaria being the latest announcement. The mine has a potential to supply 12ktpa of zinc and 20ktpa of lead.

Figure 118: China refined lead production (Kt)



Source: Deutsche Bank, National Statistic Bureau

Figure 119: Lead TCs (USD/t)



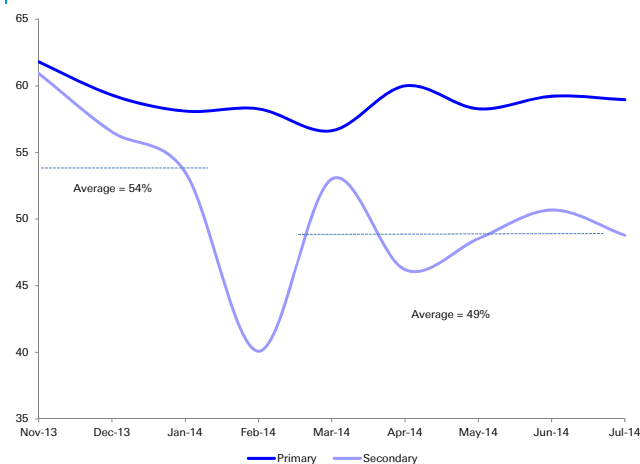
Source: Deutsche Bank, Brook Hunt

Figure 120: Chinese mined lead production versus concentrate imports



Source: NBS, Deutsche Bank

Figure 121: China's primary and secondary smelter utilization rates



Source: Wood Mackenzie, Deutsche Bank



Figure 122: Deutsche Bank Global lead supply & demand model

		2010	2011	2012	2013	2014e	2015e	2016e
China mine production	Mt	1.8	2.4	2.5	2.8	2.9	2.9	2.9
China mine production growth	%	30%	28%	6%	13%	3%	0%	0%
Australia mine production	Mt	0.6	0.6	0.6	0.7	0.7	0.7	0.5
Australia mine production growth	%	19%	-11%	-1%	15%	11%	1%	-33%
Peru mine production	Mt	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Peru mine production growth	%	-13%	-11%	7%	9%	1%	6%	2%
North America mine production	Mt	0.6	0.6	0.6	0.6	0.6	0.6	0.7
North America mine production growth	%	-2%	3%	2%	-3%	3%	9%	4%
<b>World Mine Production</b>	<b>Mt</b>	<b>4.02</b>	<b>4.63</b>	<b>4.81</b>	<b>5.31</b>	<b>5.42</b>	<b>5.58</b>	<b>5.64</b>
World Mine Production Growth	%	14%	15%	4%	10%	2%	3%	1%
Losses	Mt	0.27	0.29	0.30	0.33	0.31	0.36	0.37
Scrap	Mt	1.0	1.0	0.8	0.8	0.9	1.0	1.0
Production at Primary Refineries	Mt	4.7	5.1	5.2	5.7	6.0	6.1	6.3
Secondary refined production capability	Mt	5.1	5.3	5.6	5.6	5.6	5.8	6.1
<b>Total Refined Availability</b>	<b>Mt</b>	<b>9.81</b>	<b>10.47</b>	<b>10.86</b>	<b>11.24</b>	<b>11.64</b>	<b>11.96</b>	<b>12.42</b>
World refined availability growth	%	6%	7%	4%	3%	4%	3%	4%
China Refined Consumption	Mt	4.1	4.3	4.8	5.0	5.4	5.6	5.9
Consumption growth	%	14%	4%	11%	5%	7%	5%	6%
NAFTA (US, Canada, Mexico)	Mt	1.7	1.7	1.8	1.7	1.8	1.8	1.8
Consumption growth	%	1%	3%	2%	-2%	3%	2%	2%
Japan	Mt		0.2	0.2	0.2	0.2	0.2	0.2
Consumption growth	%		-2%	9%	1%	2%	2%	2%
EU (15)	Mt		1.3	1.3	1.3	1.3	1.3	1.3
Consumption growth	%		2%	-3%	0%	1%	2%	1%
Brazil/India/Russia Refined Consumption	Mt	0.9	0.9	1.0	1.1	1.2	1.3	1.5
Consumption growth	%	12%	5%	12%	8%	10%	9%	9%
<b>World Refined Consumption</b>	<b>Mt</b>	<b>9.82</b>	<b>10.17</b>	<b>10.79</b>	<b>11.18</b>	<b>11.76</b>	<b>12.26</b>	<b>12.78</b>
World Refined Consumption Growth	%	9%	4%	6%	4%	5%	4%	4%
<b>Market balance</b>	<b>Mt</b>	<b>-0.01</b>	<b>0.30</b>	<b>0.07</b>	<b>0.06</b>	<b>-0.13</b>	<b>-0.30</b>	<b>-0.36</b>
Exchange stocks	Mt	1.17	1.33	1.46	1.52	1.39	1.10	0.74
Reported-stock-to-consumption ratio	Wks	6.2	6.8	7.0	7.1	6.2	4.6	3.0
<b>Annual average LME cash prices</b>	<b>USD/t</b>	<b>2,171</b>	<b>2,391</b>	<b>2,074</b>	<b>2,156</b>	<b>2,136</b>	<b>2,281</b>	<b>2,325</b>
<b>Annual average LME cash prices</b>	<b>US\$/lb</b>	<b>98.5</b>	<b>108.5</b>	<b>94.1</b>	<b>97.8</b>	<b>96.9</b>	<b>103.5</b>	<b>105.5</b>

Source: Wood Mackenzie, Deutsche Bank

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## #12 Steel-Making Materials: Waiting for the cyclical recovery

- We continue to think that the property sector will be a positive contributor to steel demand for a number of years. Continuing urbanization as well as replacement demand (due to inferior build quality) and upgrading (due to larger families) will drive growth. Although there are tentative signs of a recovery in the Chinese property sales volumes, the current levels of inventories may take 6-9 months to clear. This is likely to weigh on Chinese **steel** demand, and as a result we have trimmed back our 2015E China production estimates to 2.0%. However, we think the subsequent recovery in the property sector will drive Chinese steel production to 3.6% in 2016E, which is an upgrade to our previous forecast
- A combination of seasonal destocking, a bumper Q2 production for the major **iron ore** producers and weak domestic demand in China, has pushed the benchmark iron ore price below USD80/t, its lowest level since June 2009. Although we continue to view the Chinese property market weakness as cyclical and not structural, we think the recovery from a steel demand perspective may only emerge well into 2015. This will keep the pressure on domestic steel prices and iron ore prices. Although we estimate that 28% of the industry is loss-making, there has been limited evidence of curtailments. In our view there is cost curve support at USD105/t, but this would fall to USD94/t should royalties and taxes be waived for the Chinese domestic producers. We see the most likely response as a combination of cost cuts and curtailments, and as a result we have cut our price forecasts by 3.3% in 2014 to USD101/t and by 5% in 2015 to USD91/t.
- The USD1/t drop in quarterly contract pricing is probably a fair reflection of the current state of the **Coking Coal** market. Annualized closures of c.20Mt have been sufficient to stabilize prices, especially in the premium hard coking coal category. However, the market remains finely balanced in our view, and either further production curtailments are required or demand needs to pick up quite substantially for a price recovery, our base case 2015. We continue to forecast the seaborne demand to be flat y/y, not only due to weaker than expected Chinese steel consumption, but also due to strong domestic supply resulting in increasing Coke exports. It is therefore down to further closures in the US, Australia and potentially China, that could spark a slow price recovery. We expect further closure announcements from the US over Q4, and potentially some out of Australia given that 13% of HCC producers are cash negative. However the price recovery is likely to be quite muted, hence we have downgraded price forecasts by 3% over the next few years.

### Steel outlook: A more protracted recovery in the China property cycle

Global steel production is up 3.7% YTD, at 1,093Mt. Production growth momentum is however slowing, with August down 1.7% versus July. In absolute terms, this equates to 59Mt of additional steel production globally on an annualized basis. Regionally, the growth is still being driven by China, up 5% YTD, Europe, up 3.9%, the Middle East up 7.6% and North America, up 2.1%. South America (Brazil) and Russia are the only regions which have registered a decline, down 1.1%. In absolute terms, China is likely to contribute the most steel production growth at 32Mt in 2014E.

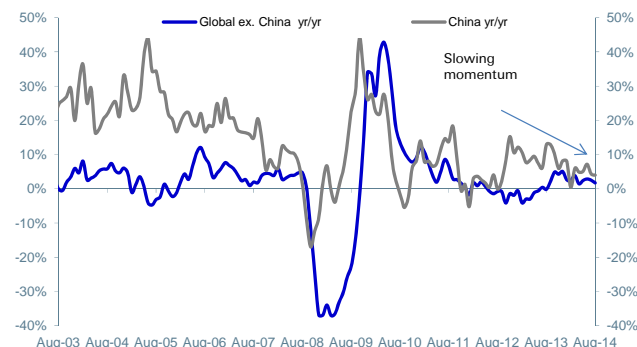


Figure 1: Monthly global crude steel production y/y



Source: WSA, Deutsche Bank

Figure 2: Monthly global crude steel production, ex China y/y

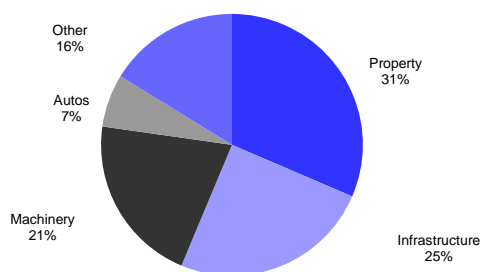


Source: WSA, Deutsche Bank

We continue to forecast Chinese steel production growth at c.4% for 2014E, but this implies a slowdown in growth in Q4, to c.3.4%. We recognize some upside risk to this number as Chinese steel profitability remains relatively good, due to the sharp fall in iron ore prices. A steel production growth rate of 4% perhaps disguises the weak underlying apparent demand growth, which we estimate closer to 1.3%. This is due to the c.3% fall in steel demand from the property sector (c.31% of total demand). In the absence of reasonably positive infrastructure spend, apparent consumption may have been closer to zero. Steel production has however remained above consumption due to a sharp pick-up in exports.

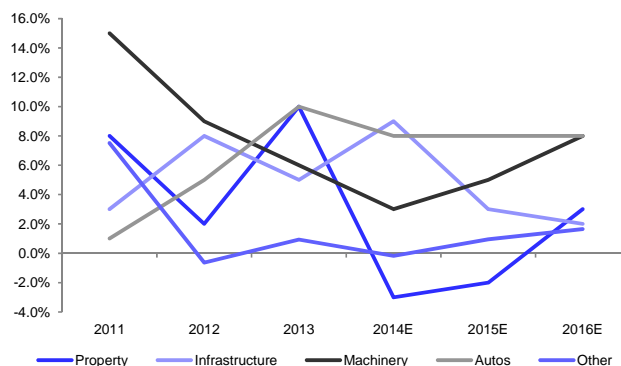
*A protracted recovery in the China property sector, leading to a downgrade in Chinese Steel consumption estimates for 2015E.*

Figure 3: Chinese steel consumption by category in 2014E



Source: Deutsche Bank

Figure 4: Chinese steel consumption growth by category



Source: Deutsche Bank

Although we are seeing the first signs of inventory declines in the Chinese property sector, we think there needs to be further price declines before sales volumes pick up meaningfully. The process of inventory clearing could take a further 6-9 months. We expect that this will translate into another year of negative steel consumption for the Chinese property sector, with our expectation of a second half pick-up. Momentum should carry through to 2016, resulting in a 3% steel demand growth for the sector. As a result of the slower than expected property market recovery, we have cut our China steel production forecasts for 2015E, by c.17Mt to 833Mt, or a 2.0% growth y/y. We only expect exports to increase modestly in 2015, due to the



threat of anti-dumping reviews from the rest of the world. We expect a modest uptick in consumption growth in 2016E to 4.0%, which equates to a 3.6% growth in production based on an improvement in property demand. We outline our China supply – demand forecasts in the table below:

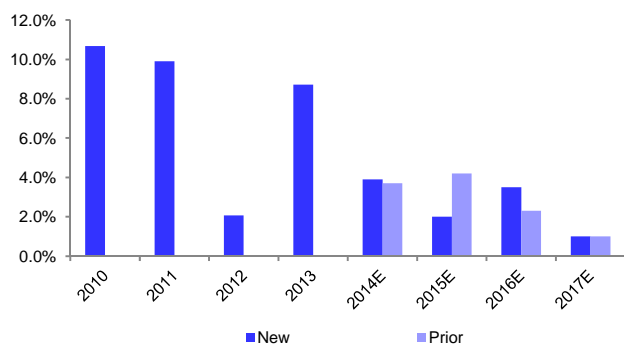
Figure 5: China Crude Steel supply and demand

(Mt)	2006	2007	2008	2009	2010	2011	2012	2013	2014E	2015E	2016E
Capacity	488	545	660	718	800	863	932	993	1003	998	997
+ Net/Gross addition			115	58	82	63	69	69	35	10	9
- Phase out								8	25	15	10
Capacity growth %	13.0%	11.7%	21.1%	8.8%	11.4%	7.9%	8.0%	6.6%	1.0%	-0.5%	-0.1%
<b>Production</b>	<b>419</b>	<b>489</b>	<b>503</b>	<b>572</b>	<b>637</b>	<b>685</b>	<b>724</b>	<b>779</b>	<b>810</b>	<b>826</b>	<b>856</b>
Production growth	18.7%	16.7%	2.8%	13.7%	11.4%	7.5%	5.6%	7.6%	4.0%	2.0%	3.6%
Capacity utilization	91.1%	94.7%	83.5%	83.0%	84.0%	82.4%	80.7%	80.9%	81.2%	82.5%	85.8%
Net import (export)	-33	-52	-45	-8	-26	-33	-42	-48	-70	-75	-75
<b>Total apparent consumption</b>	<b>386</b>	<b>437</b>	<b>458</b>	<b>564</b>	<b>611</b>	<b>652</b>	<b>682</b>	<b>731</b>	<b>741</b>	<b>751</b>	<b>781</b>
<b>Apparent consumption growth</b>	<b>9.5%</b>	<b>13.3%</b>	<b>4.7%</b>	<b>23.2%</b>	<b>8.3%</b>	<b>6.7%</b>	<b>4.6%</b>	<b>7.2%</b>	<b>1.3%</b>	<b>1.4%</b>	<b>4.0%</b>

Source: Deutsche Bank

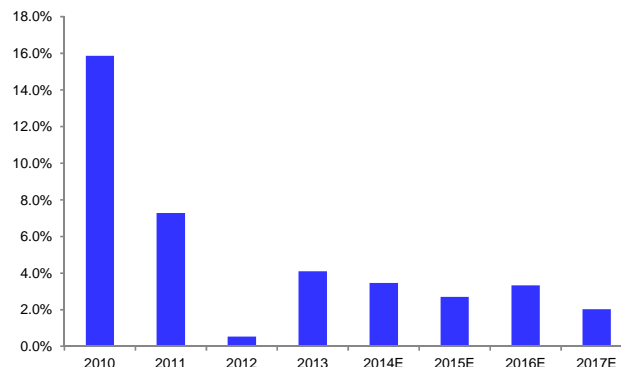
The downgrades to the China steel production forecasts, drag down our global steel production growth forecasts to 2.7% in 201% but given our view of a delayed recovery in the China property sector, we have upgraded our forecast to 3.3% in 2016E.

Figure 6: Changes to our China Steel production growth rates



Source: NBS, Deutsche Bank

Figure 7: Global steel production growth rates

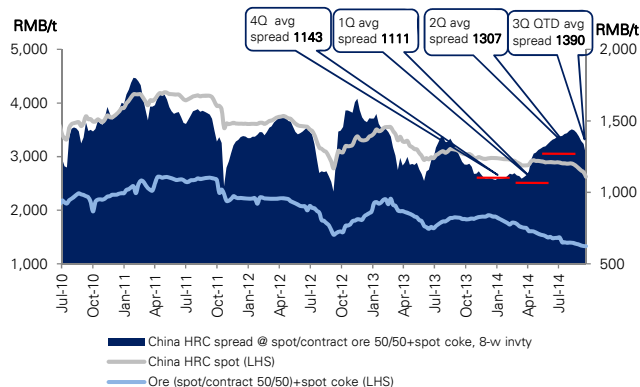


Source: WSA, Deutsche Bank

Chinese steel prices have continued to fall, and are now at multi-year lows. The current Rebar price has dipped below RMB3,000/t, whilst the HRC price is RMB3,069/t. The falling steel price have not discouraged production cuts, because the sector profitability has improved, but virtue of the raw material prices falling faster than steel prices. Although we have seen the usual seasonal destocking from the traders, inventory levels are normal for this time of the year. We expect to see the usual Q1 restocking ahead of the Chinese New Year. Steel inventories at the large and medium steel mills have come down from the February peak, but have stabilized at a much higher level than previously. Given the muted outlook on the property market, we expect a more measured steel restocking cycle this year. This combined with our view of stabilizing and even modest raw material price increases, will ultimately lead to slower steel production growth in the near term, and into 2015.

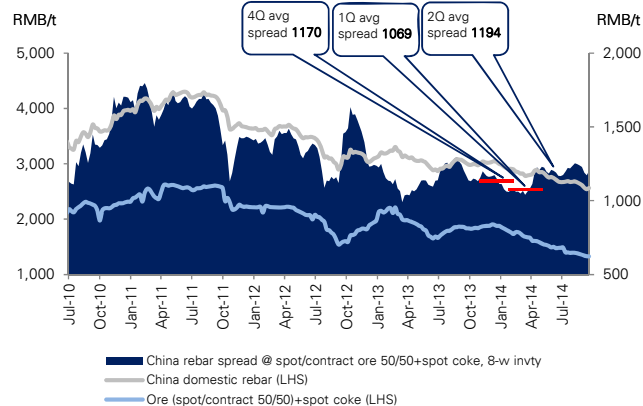


Figure 8: China HRC spread – 8-week lag



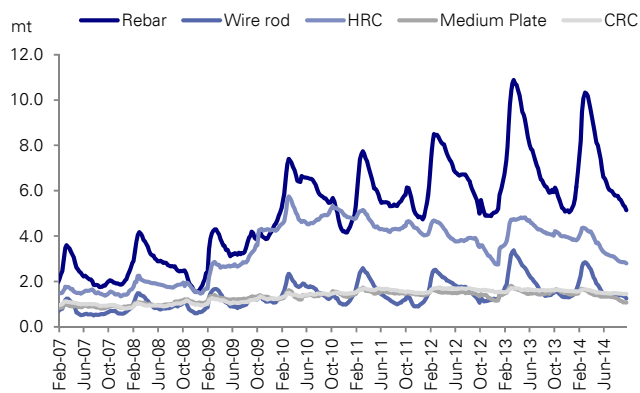
Source: Bloomberg Finance LP, Deutsche Bank

Figure 9: China Rebar spread – 8 week lag



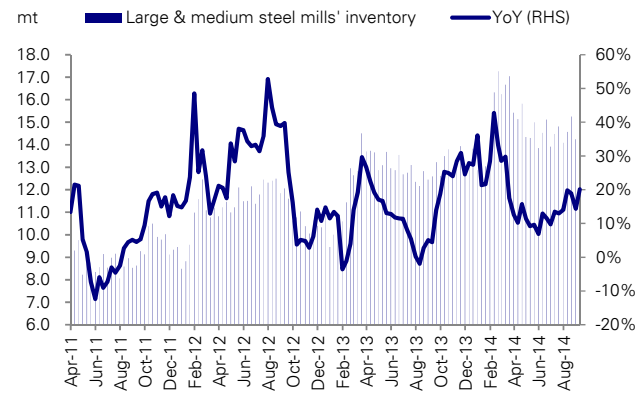
Source: Bloomberg Finance LP, Deutsche Bank

Figure 10: Steel inventories at trades – 26 major cities



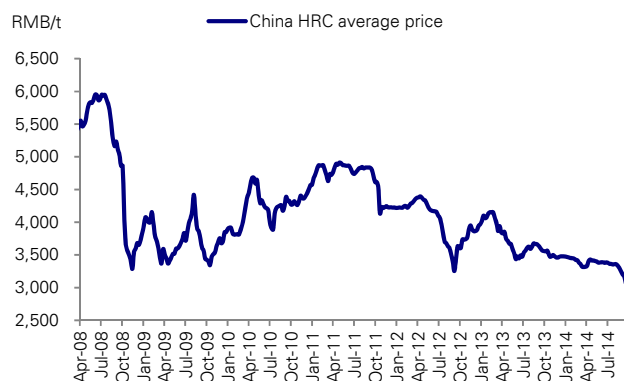
Source: Wind, Mysteel, Deutsche Bank

Figure 11: Steel inventories – large & medium mills



Source: CISA, Deutsche Bank

Figure 12: Average HRC price in China



Source: Bloomberg Finance LP, Deutsche Bank

Figure 13: Average rebar price in China



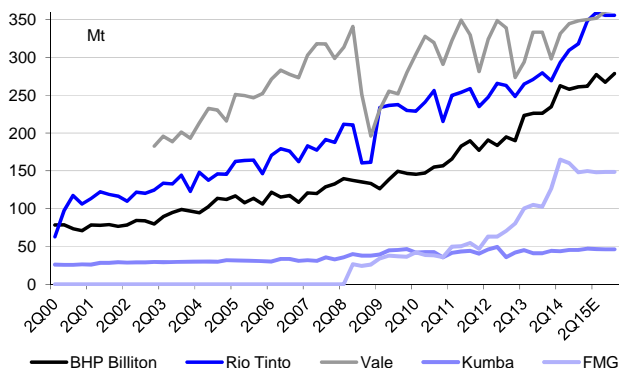
Source: Bloomberg Finance LP, Deutsche Bank



### Iron ore outlook: Supply will keep coming, but at a slower rate

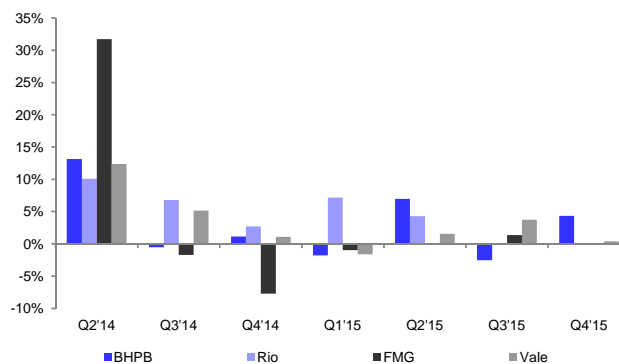
The Q2 production results from the major iron ore producers, confirmed the big step-up in production, in particular from FMG. The QoQ increase from the big four (BHPB, Rio, FMG and Vale) was 13%, after an already strong first quarter. We forecast the supply momentum to continue over the next six quarters but at a much slower rate. We expect an average 2% QoQ increase for the big five producers for the next four quarters.

Figure 14: Iron ore supply for the big five - annualized



Source: Company reports, Deutsche Bank

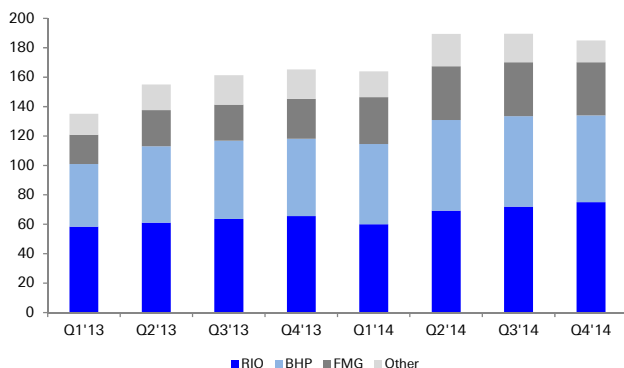
Figure 15: QoQ supply additions for the big four



Source: Deutsche Bank, Company reports

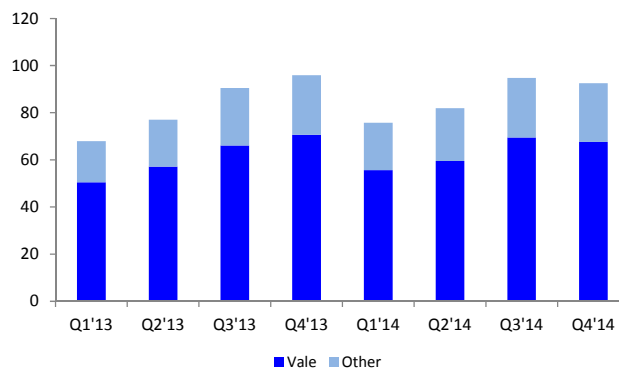
We outline Wood Mackenzie's expectations of Australian and Brazilian iron ore exports over the course of the year, highlighting a similar trend of stabilizing Australian exports, but a recovery in Brazilian exports.

Figure 16: Australian Iron ore exports



Source: Wood Mackenzie

Figure 17: Brazilian Iron ore exports



Source: Wood Mackenzie

The price weakness has so far resulted in very limited curtailment or delay announcements. Indeed Hancock Prospecting's Roy Hill project has passed the 50% completion stage, building up a stockpile of 0.5Mt, with first shipment on track for late 2015. The curtailment announcements so far amount to 16Mtpa from mainly Australian and Canadian juniors. We would expect the Chinese marginal producers to be feeling the pinch at the current iron ore prices, but production data so far has given no indication of cutbacks, up 8.6% YTD. Given the current price weakness, it would seem unlikely that the increase is from an increasing proportion of lower grade producers. Imports continue to be strong however, with the current run rate of 77Mt per month likely to be sustained until the end of the year.



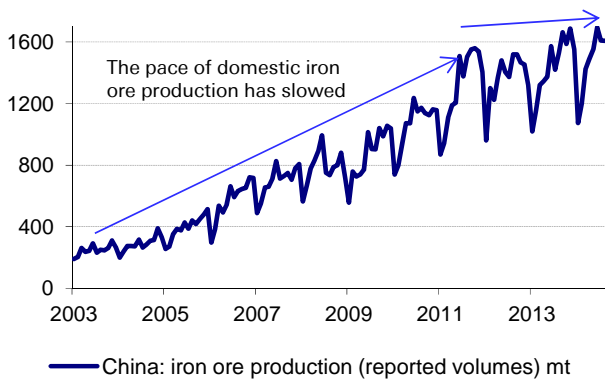
Figure 18: Mine production cuts

Country	Company	Asset	Date	Reason/Impact	Prod'n (Mtpy)
Australia	Kimberley Metals	Ridges	Jul-14	Price related production cut	1.7
Australia	IMX Resources	Cairn Hill	Jun-14	Placed into administration - likely closure	1.6
Australia	Noble Resources	Frances Creek	Jul-14	Price related mine closure	1.5
Australia	Shree Minerals	Nelson Bay River	Jun-14	Price related mine closure	0.1
Brazil	MMX	Serra Azul	Aug-14	30 day closure - price and environmental	6
Canada	Labrador Iron Mines	Stage 1 (Schefferville)	Jul-14	Price related mine closure	1.7
Canada	Cliffs	Wabush (Scully)	Feb-14	Price/cost related mine closure	1.5
Russia	IRC	Kuranakh	Aug-14	Profit warning - possible closure.	1
Guinea	Bellzone	Forecariah	Aug-14	Lack of finance - likely closure in Q4'14.	0.5
<b>Total annualised production</b>					<b>15.6</b>

Source: Wood Mackenzie

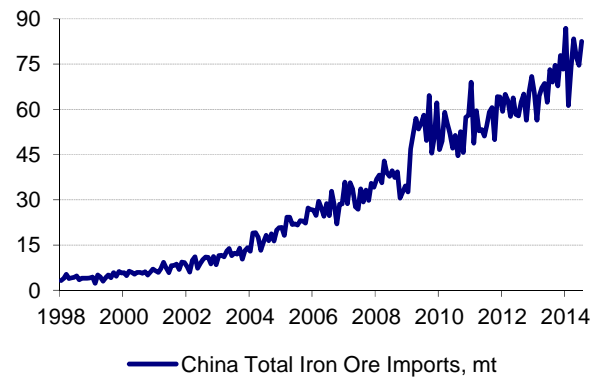
Although the rate of domestic volumes increases has slowed, the continued increase does represent a risk to the seaborne market.

Figure 19: Chinese iron ore production



Source: NBS, Deutsche Bank

Figure 20: Chinese iron ore imports (monthly)

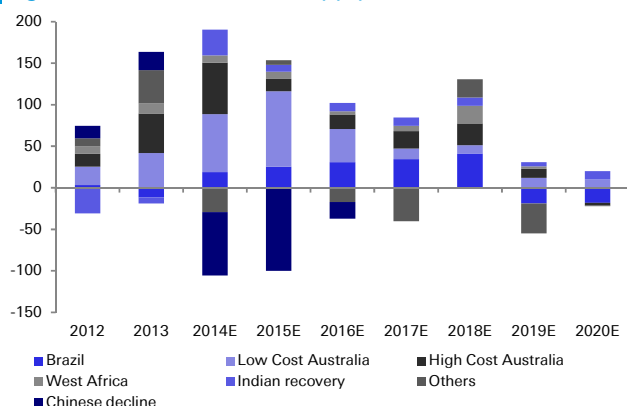


Source: NBS, Deutsche Bank

In our view, further curtailments are required to bring the iron ore market back to a balance. In our base case, we estimate that an additional 440 Mt of production could be commissioned, mostly from the big four producers. We have assumed that c.250Mt of production will be cut, 200Mtpa from the high cost Chinese producers, and 50Mtpa from elsewhere. This still leaves an annual surplus of c.70Mtpa, some of which will have to be cut to ensure a limited build-up of inventory.

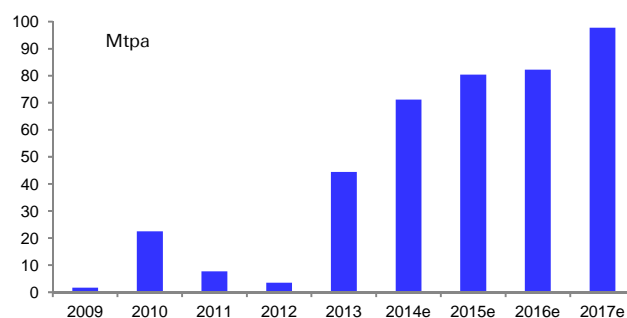


Figure 21: Iron ore mined supply additions and cutbacks



Source: Deutsche Bank

Figure 22: Global iron ore balance



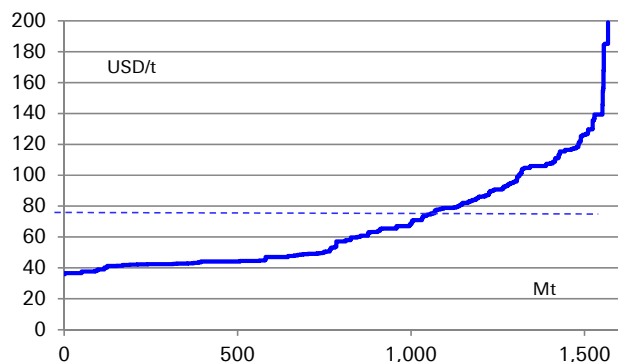
Source: Deutsche Bank

### Finding the pressure points on the cost curve

The current spot iron ore price is well below any marginal cost support level. We estimate that c.28% of the current producers are cash negative, of which a significant proportion are in China. This amounts to c.440Mt of 62% equivalent capacity. In metallurgical coal, the market was in a similar position with large parts of the market being loss-making about 18-months ago. However, cost cutting initiatives led to a falling marginal cost and prices continued to fall. We think the loss-making position in iron ore will evoke a similar response. The Chinese producers include royalties and local taxes, known as "grey" costs in their cost structure. However, if these are cut in order to keep iron ore producers in business, this would lower the Chinese cost curve across the board. We estimate that at 300Mt (75th percentile on the China iron ore cost curve), the difference between the costs with and without grey costs is USD12/t. If all grey costs were removed, this would put the cash costs at USD94/t. At 200Mt (50th percentile on the cost curve), the difference between the two cost curves contracts to USD10/t, taking costs down from USD90/t to USD80/t. It is perhaps no coincidence that we think the Chinese iron ore industry needs to contract by half to accommodate new seaborne supply. An alternative perspective is that the removal of grey costs makes another 50Mt of Chinese production economic at the current spot price.

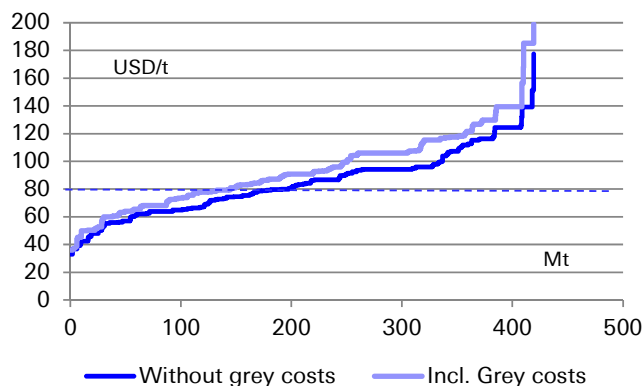


Figure 23: Iron ore cash cost curve – 62% equivalent, CFR Tianjin Port or Ex-mine



Source: Wood Mackenzie, Deutsche Bank

Figure 24: Chinese Iron ore cost curve – 62% equivalent

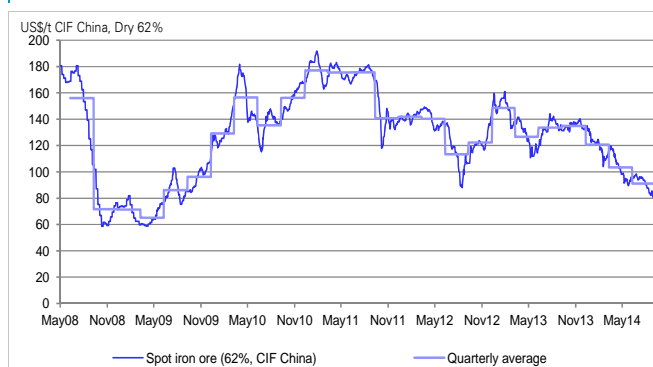


Source: Wood Mackenzie, Deutsche Bank

#### Iron ore breaks USD80/t, we continue to forecast a Q4 bounce

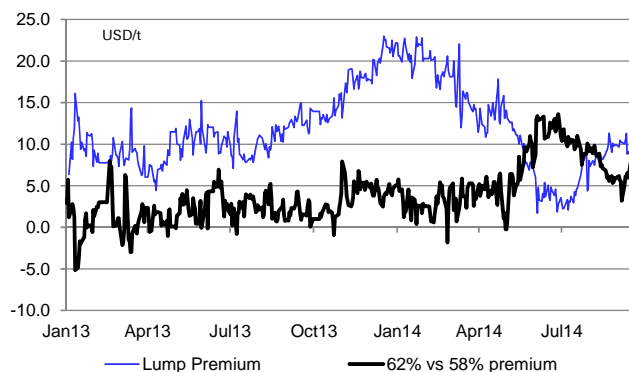
The benchmark 62% iron ore price fell to USD78.6/t at the end of September, down 41% since the beginning of the year. This is also the lowest price since June 2009. The TSI 62% index registered a low of USD59.1/t in March 2009, at the height of the Global Financial Crisis. We note that the premiums for lump have recovered to a more normal level of c.USD10/t, and that the premium for 62% over 58% fine product has returned back to a more “normal” USD5/t. The glut of low grade 58% fines from FMG was the main reason that the 58% iron ore discount moved to c.USD12/t at the peak. The return to normal levels would suggest that the market has cleared itself of the low grade material.

Figure 25: Spot iron ore price, China Dry CIF 62%



Source: Datastream, Deutsche Bank

Figure 26: Iron ore product premiums



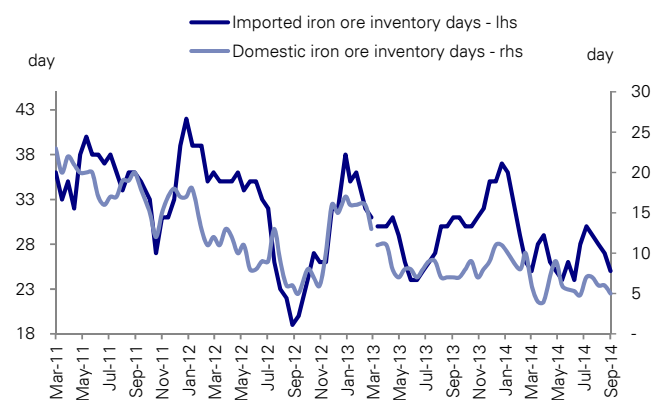
Source: Datastream, Deutsche Bank

Q4 is normally a strong seasonal period for iron ore demand, with restocking ahead of the Chinese winter and the Southern Hemisphere monsoon. We continue to forecast a Q4 recovery to USD92/t but concede that should the property sector continue to remain weak, there could be some downside risk to our forecast. Chinese iron ore port inventories have started to rise once more over the past month to 106Mt. However, iron ore inventory levels at the steel mills have fallen to relatively low levels. Overall the inventory situation in China remains comfortable, which also presents some further downside risk to our base case of a Q4 price recovery.



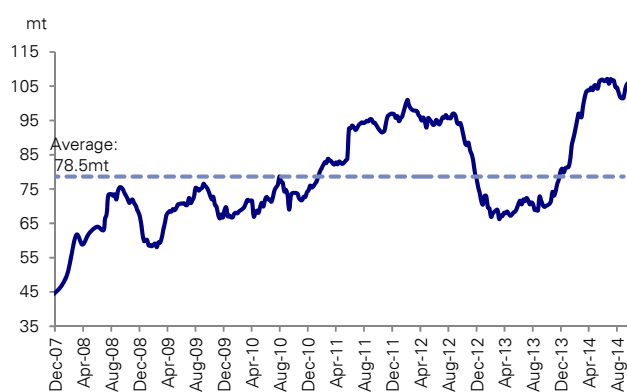


Figure 27: Imported iron ore inventory at the steel mills



Source: CEIC, Wind, Deutsche Bank

Figure 28: Iron ore port inventories



Source: Bloomberg Finance LP, Deutsche Bank



Figure 29: Deutsche Bank Global Iron Ore supply – demand model

Supply		2009	2010	2011	2012	2013	2014e	2015e	2016e	2017e
Brazil	Mt	285	349	373	372	366	390	438	474	508
growth	%	-12%	22%	7%	0%	-2%	6%	12%	8%	7%
Australia	Mt	370	404	449	496	584	681	740	784	806
growth	%	16%	9%	11%	10%	18%	17%	9%	6%	3%
South Africa	Mt	55	61	57	59	63	65	67	67	68
growth	%	12%	12%	-7%	4%	6%	3%	3%	1%	1%
India	Mt	202	192	164	133	126	157	165	175	185
growth	%	3%	-5%	-15%	-19%	-5%	25%	5%	6%	6%
China	Mt	237	310	340	355	376	300	200	180	180
growth	%	-21%	31%	10%	4%	6%	-20%	-33%	-10%	0%
CIS incl. Russia	Mt	161	181	189	192	197	207	216	223	239
growth	%	-6%	12%	5%	2%	3%	5%	4%	4%	7%
North America	Mt	66	91	98	99	105	110	114	118	120
growth	%	-32%	37%	8%	1%	6%	4%	4%	3%	1%
West Africa	Mt	11	11	14	23	35	43	52	56	62
growth	%	2%	-1%	23%	67%	53%	25%	20%	7%	11%
Other regions	Mt	96	113	137	136	156	160	175	184	187
<b>Total iron ore supply</b>	<b>Mt</b>	<b>1,484</b>	<b>1,713</b>	<b>1,820</b>	<b>1,864</b>	<b>2,008</b>	<b>2,113</b>	<b>2,167</b>	<b>2,262</b>	<b>2,356</b>
growth	%	-5.7%	15.5%	6.2%	2.4%	7.8%	5.2%	2.5%	4.4%	4.2%
Demand		2009	2010	2011	2012	2013	2014e	2015e	2016e	2017e
Global steel production (crude steel)	Mt	1,235	1,430	1,534	1,543	1,606	1,661	1,706	1,763	1,799
Global BOF production	Mt	850	968	1,037	1,043	1,101	1,139	1,164	1,201	1,215
growth	%	-1.4%	13.9%	7.1%	0.6%	5.5%	3.5%	2.2%	3.1%	1.2%
% BOF	%	69%	68%	68%	68%	69%	69%	68%	68%	68%
European steel production (crude steel)	Mt	168	206	217	209	205	208	211	214	215
European BOF production	Mt	88	112	112	109	109	110	110	109	108
growth	%	-30%	28%	0%	-3%	0%	1%	1%	-1%	-1%
% BOF	%	52%	54%	52%	52%	53%	53%	52%	51%	50%
Japan steel production (crude steel)	Mt	88	110	108	107	111	112	113	113	113
Japan BOF production	Mt	68	86	83	82	85	86	87	87	86
growth	%	-23%	26%	-4%	0%	3%	2%	1%	0%	0%
% BOF	%	78%	78%	77%	77%	77%	77%	77%	76%	76%
India steel production (crude steel)	Mt	64	69	74	78	81	87	94	102	111
India BOF production	Mt	24	25	25	26	27	29	33	37	43
growth	%	3%	2%	1%	3%	5%	9%	12%	13%	16%
% BOF	%	38%	36%	34%	33%	33%	34%	35%	36%	38%
China steel production (crude steel)	Mt	577	639	702	717	779	809	826	854	863
<b>China steel production (BOF)</b>	<b>Mt</b>	<b>521</b>	<b>572</b>	<b>631</b>	<b>644</b>	<b>700</b>	<b>727</b>	<b>739</b>	<b>763</b>	<b>766</b>
growth	%	16%	10%	10%	2%	9%	3.8%	1.7%	3.3%	0.5%
% BOF	%	90%	90%	90%	90%	90%	90%	89%	89%	89%
<b>Iron Ore</b>										
China	Mt	824	910	996	1050	1137	1176	1192	1227	1229
growth	%	13%	10%	10%	5%	8%	3%	1%	3%	0%
Japan	Mt	109	134	132	132	136	138	139	139	138
growth	%	-22%	23%	-2%	0%	3%	2%	1%	0%	0%
S. Korea & Taiwan & other	Mt	63	79	95	93	95	91	97	102	106
growth	%	-12%	24%	21%	-2%	2%	-5%	7%	6%	4%
Europe	Mt	123	158	158	153	155	159	158	156	155
growth	%	-30%	28%	0%	-3%	1%	2%	-1%	-1%	-1%
India	Mt	93	97	102	106	111	119	128	139	152
growth	%	3%	4%	5%	4%	5%	7%	8%	8%	10%
Brazil	Mt	38	47	50	41	40	41	43	45	47
growth	%	-29%	23%	8%	-19%	-3%	3%	5%	6%	5%
CIS	Mt	118	127	131	134	134	138	144	150	153
growth	%	-12%	8%	3%	2%	0%	3%	5%	4%	2%
<b>Total iron ore demand</b>	<b>Mt</b>	<b>1,482</b>	<b>1,691</b>	<b>1,812</b>	<b>1,860</b>	<b>1,964</b>	<b>2,022</b>	<b>2,066</b>	<b>2,129</b>	<b>2,158</b>
growth	%	-4.36%	14.07%	7.20%	2.64%	5.56%	2.95%	2.20%	3.06%	1.34%
Implied scrap ratio	%	25%	26%	26%	25%	24%	24%	24%	25%	25%
Disruption allowance	Mt						20	20	50	100
<b>Notional market balance</b>	<b>Mt</b>	<b>2</b>	<b>22</b>	<b>8</b>	<b>3</b>	<b>44</b>	<b>71</b>	<b>80</b>	<b>82</b>	<b>98</b>
<b>China imported fines (62% CFR)</b>	<b>USD/t</b>	<b>79.8</b>	<b>146.6</b>	<b>167.0</b>	<b>123.8</b>	<b>130.0</b>	<b>101.0</b>	<b>91.3</b>	<b>90.0</b>	<b>88.0</b>

Source: AME, CRU, CEIC, Deutsche Bank

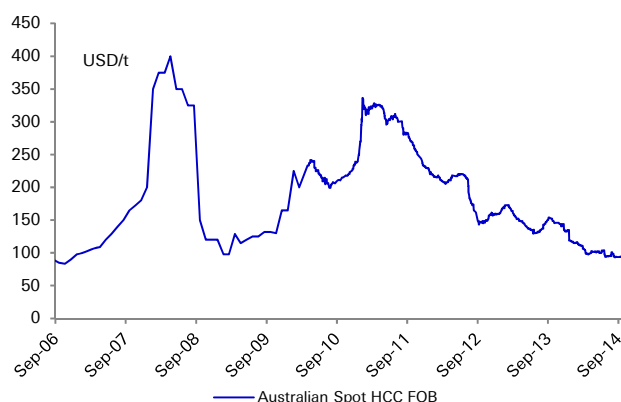


### Metallurgical Coal: Stabilizing prices, but demand remains a drag

Channel checks suggest that the Q4 contract coking coal price between the Japanese steel producers and the Australian coking coal suppliers has been settled at USD119/t, which is USD1/t down from the Q3 settlement. The Australian spot FOB price has eased lower to c.USD94/t (down USD6/t since July), with the latest CIF price at USD108/t (a slight recovery from mid July). According to some channel checks, some premium grades have been trading around USD112 – 115/t. In this context, the contract settlement seems to be quite a good outcome. The USD1/t drop is a reflection of the slightly weaker spot prices, but also recognition from the steel producers that pushing too hard for lower prices, may simply result in another swathe of closure announcements.

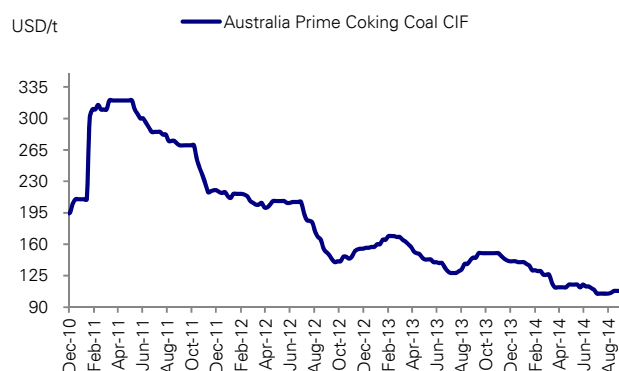
*A tentative stabilization in prices, but demand needs to improve.*

Figure 30: Spot Hard Coking coal prices FOB East Coast Australia



Source: Thomson Financial datastream, Argus Coal, Deutsche Bank

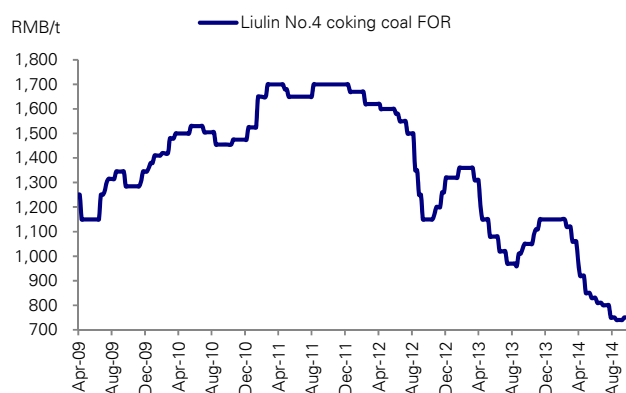
Figure 31: Australian prime coking coal CIF China



Source: Deutsche Bank

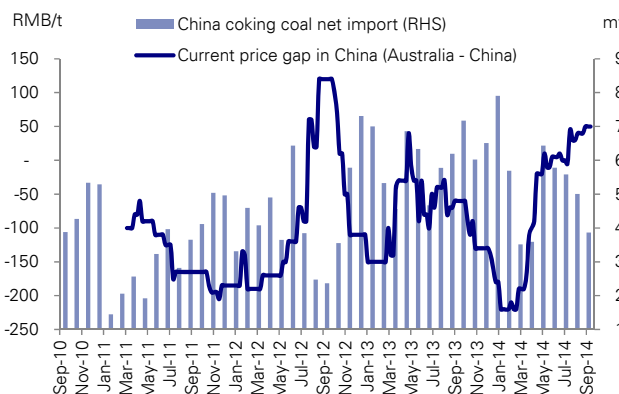
Chinese domestic prices (Liulin No.4 FOR) prices have also stabilized since the sharp drop in July. There has even been a small uptick to RMB750/t in September. Australia imports are however still more expensive (by c.RMB50/t) versus domestic coal taking VAT, rail and transport costs into account. It is therefore unsurprising that Chinese coking coal exports have been so weak this year.

Figure 32: China domestic coking coal price (Liulin No.4 FOR)



Source: Sxcoal, Deutsche Bank

Figure 33: Price parity vs. net import: Australia ex-tank vs. Shanxi Liulin No. 4



Source: Wind, Sxcoal, Deutsche Bank



Second tier coking coal prices have also remained under pressure PCI and semi soft prices in the low USD90/t and mid USD70/t respectively, well below their respective quarterly contract prices of USD100/t and USD89/t.

#### Limited new supply cuts announced

The momentum in new supply cuts has slowed, with our estimate of 20Mt, only up c.1Mt from last quarter. Alpha Natural resources did however issue a WARN (Worker Adjustment and Retraining Notification Act) to 1100 workers, putting them on notice that if market conditions did not improve, further closures were likely by October this year. The impact if these closures were announced would be c.2Mtpa of coking coal production.

Figure 34: Coking Coal closures announced YTD

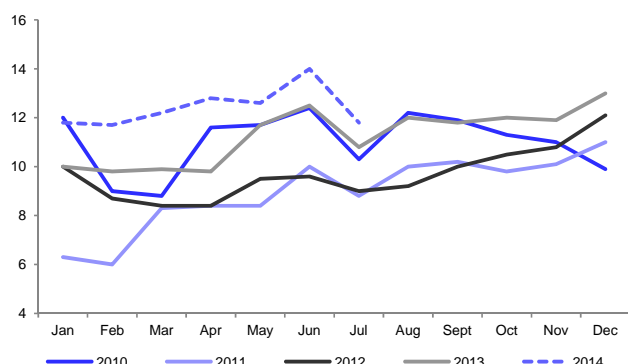
Company	Country	Mines	Region	Annualised volume impact (Mt)	Coal type	Announcement date	Notes
Alpha Natural Resources	USA		Capp	1.4	Low, mid and high vol	May-14	Lowered sales guidance by 1.4Mt
Arch Coal	USA	Cumberland River, Sentinel, Beckley & others	Capp	1.6	high vol	Apr-14, Jul-14	Sales guidance lower by 1.1Mt, half from lower output, half from switch into thermal. Further closures announced at Cumberland River
Beacon Hill	Mozambique		Tete	0.8	high vol	May-14	Will not resume sales until prices recover
Cliffs	USA	Pinnacle	Capp	2.6	low-vol	Jun-14	Idle for 6 months, A restart announced in July
CONSOL	USA	Buchanan	Capp	0.5	low vol	Apr-14	Sales guidance in Q1 results
CONSOL	USA	Bailey, Enlow Fork	Napp	0.3	high vol	Apr-14	Sales guidance in Q1 results
Drummond	USA	Shoal Creek	Alabama	0.3	mid vol	Apr-14	Idling longwall for 6 weeks
Glencore Xstrata	Australia	Ravensworth	New South Wales	2.1	semi-soft	Mar-14	Production will be suspended in Sept .
Mechel Bluestone	USA	No35, 58, 65, Coal Mountain No. 1, Red Fox Surface	Capp	1.6	Low vol, mid vol, high vol	Apr-14	Suspended operations
Patriot Coal	USA	Wells Complex (Black Stallion, CC10 mines & Wells prep plant)	Capp	1.3	high vol	Apr-14	Aligning production with sales
Rio Tinto	Australia	Hail Creek	New South Wales	0.3	semi soft	Apr-14	Shifting production from Hail Creek into the thermal coal market
Solid Energy	NZ	Stockton	NZ	0.5		Jun-14	Cut staff with production going from 1.9 - 1.4Mtpa
Vale	Australia	Integra Mine	NSW	1.5	Premium semi-hard, semi-soft	May-14	Idling 2 mines, with coal being sub-economic. 500 jobs lost
Walter Energy	Canada	Brazion (Brule & Willow Creek) & Wolverine mine	British Colombia	3.6	mid vol, low vol PCI, HCC	Apr-14	Wolverine idled in April, remainder idled by July
Yancoal	Australia	Duralie/Stratford	Queensland	0.33	Mid Vol	Jun-14	Suspended operations
Borneo Lumbung Energi	Indonesia	Asmin Koalindo Tuhup		1.1			
<b>Total</b>				<b>19.83</b>			

Source: Doyle Trading Consultants, AME, Wood Mackenzie, Deutsche Bank

After a record June, there was a slowdown in exports from the Australian producers. Exports of metallurgical coal fell from 16.3Mt to 14.8Mt, with most of the fall being attributed to Queensland, with Hay Point, Dalrymple Bay and Gladstone all seeing small decreases. Annualized exports are running at 179Mt, which is in line with our forecast for 2014E. We forecast a slight increase of c.6Mt in 2015E to 186Mt.

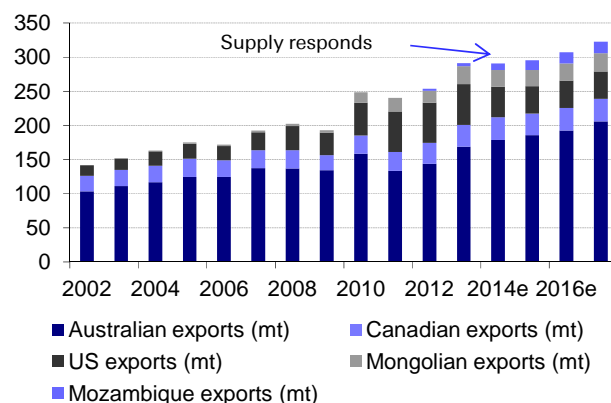


Figure 35: Queensland Metallurgical coal exports



Source: Wood Mackenzie, Deutsche Bank

Figure 36: Exports from the key regions

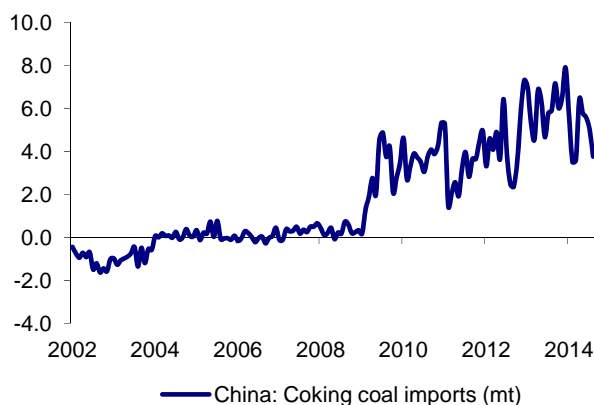


Source: Deutsche Bank

### The seaborne market has been weighed down by weak Chinese imports, and strong Coke exports

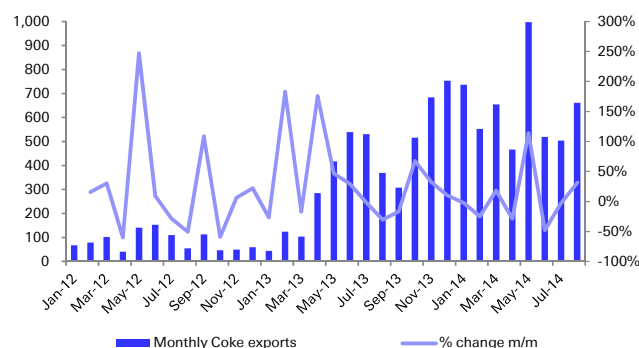
Not only are Chinese coking coal imports down 15% YTD at 39Mt, but Coke exports are up 111% to 5Mt. In January 2013, the Chinese authorities removed the Coke export tax, which has allowed the domestic producers to find alternative end markets in the face of strong domestic competition. Chinese Coke exports averaged between 12 – 14Mtpa, so 2014 is still likely to be down from these peak levels (8Mtpa annualized). At a ratio of 1.4:1, this amounts to 20Mtpa of seaborne metallurgical coal exports, assuming of course all of the Chinese exports are supplied using domestic metallurgical coal.

Figure 37: Chinese Coking Coal imports (monthly)



Source: NBS, Deutsche Bank

Figure 38: Chinese Coke exports

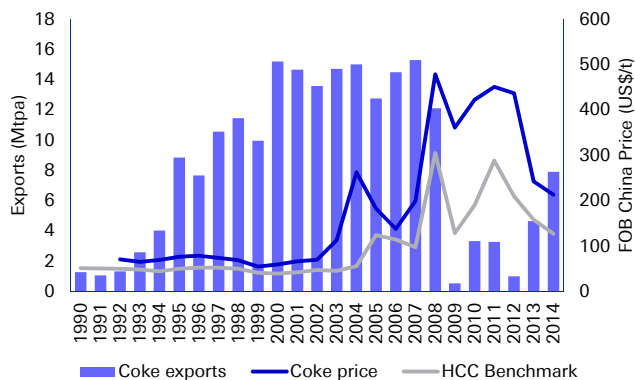


Source: NBS, Deutsche Bank

The Japanese steel producers have taken advantage of the situation and Coke imports have increased significantly. However, this is likely to be a temporary situation, with the Japanese steel-makers not wanting to be overly reliant on one source of a critical raw material.

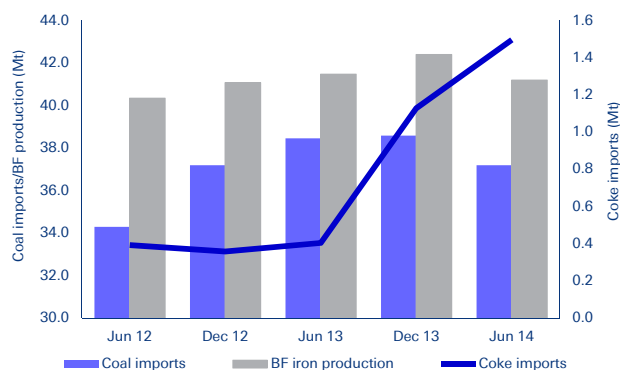


Figure 39: Chinese Coke price versus the HCC benchmark



Source: Wood Mackenzie

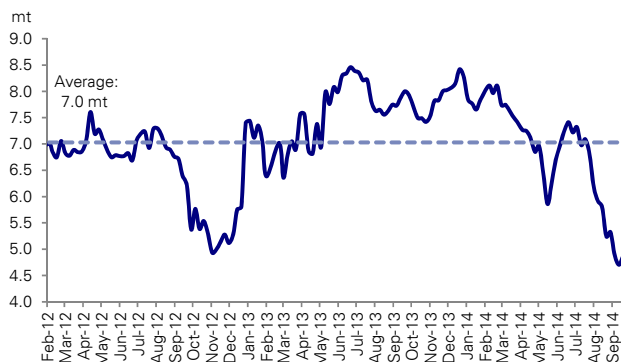
Figure 40: Japanese coal/coke imports versus Blast Furnace production



Source: Wood Mackenzie

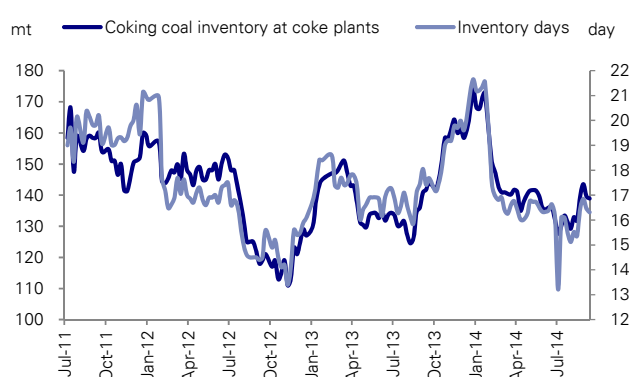
Inventories of imported coal in China have fallen sharply with the slow imports over Q2. The arbitrage between imported coal and domestic coal closed sharply in the beginning of Q2, and since then domestic coal has remained cheaper. The low levels of imported coal may however lead to a slight recovery in imports despite the unfavourable arbitrage. However, we would need to see a slight improvement in domestic prices in our view. Stocks at the major Coke plants have been stabilized at normalized levels, which means that any price recovery is likely to be fairly modest.

Figure 41: Imported coking coal at four major ports



Source: Mysteel, Deutsche Bank

Figure 42: Coking coal inventory at coke plants



Source: Mysteel, Deutsche Bank

### Margins remain under pressure

At current spot hard coking coal prices, the Australian producers are still experiencing a margin squeeze. Although total cash costs and total cash costs plus sustaining capex are down an estimated 13% Y/Y to AUD102/t, prices are down further. The estimated operating margin is down 58% to AUD15.29/t, or AUD9/t post sustaining capex. Wood Mackenzie estimate that 13% of Australian producers are cash negative. In our view, we may need to see further price weakness to force more closures, especially in light of a weakening Australian dollar.



Figure 43: Australian producers - Hard Coking Coal margins

Period	C1 cash cost and carbon tax	Royalty	Total cash cost	Sustaining capital	Total cash cost + sustaining capital	Product price (USD/t)	Operating margin	Operating margin including sustaining capital	% cash negative	Benchmark HCC price	AUD:USD FX
2013	97.76	12.75	110.51	7.20	117.71	147.11	36.60	29.41	7%	164.84	0.96
2014 (Current)	87.33	8.75	96.08	6.21	102.29	111.37	15.29	9.08	13%	133.33	0.90
change Δ	-10.43	-4.00	-14.43	-0.99	-15.42	-35.75	-21.32	-20.33	6%	-31.51	-0.06
change %	-11%	-31%	-13%	-14%	-13%	-24%	-58%	-69%	86%	-19%	-6%

Source: Wood Mackenzie

Figure 44: Deutsche Bank Metallurgical Coal supply – demand balance

		2009	2010	2011	2012	2013	2014e	2015e	2016e	2017e
Australian exports	Mt	134	158	134	144	169	179	186	193	206
growth	%	-2%	18%	-16%	8%	17%	6%	4%	4%	7%
Canadian exports	Mt	22	27	28	31	32	33	32	33	33
growth	%	-18%	23%	2%	11%	4%	3%	-3%	3%	0%
US exports	Mt	33	48	59	59	60	45	40	40	40
growth	%	-7%	45%	24%	0%	1%	-24%	-11%	0%	0%
China exports	Mt	4	5	8	7	6	6	6	6	6
growth	%	-59%	39%	45%	-17%	-8%	0%	0%	0%	0%
Other supply	Mt	43	63	59	74	72	83	88	89	92
Disruption allowance			-20	-20	-15	-20	-20	-20	-15	-15
<b>Global traded coking coal supply</b>	<b>Mt</b>	<b>236</b>	<b>281</b>	<b>268</b>	<b>300</b>	<b>318</b>	<b>326</b>	<b>332</b>	<b>346</b>	<b>362</b>
growth	%	1%	19%	-5%	12%	6%	2%	2%	4%	5%
Japanese imports	Mt	66	77	69	72	71	75	75	76	76
growth	%	9%	17%	-11%	4%	0%	5%	1%	0%	0%
Korea & Taiwan imports	Mt	25	34	38	40	40	41	43	45	46
growth	%	-23%	36%	13%	4%	0%	4%	4%	3%	3%
European imports	Mt	46	52	53	53	54	54	54	53	53
growth	%	-30%	14%	2%	0%	0%	0%	0%	-1%	-1%
China imports	Mt	34	47	45	71	75	63	48	69	69
growth	%	912%	37%	-5%	58%	7%	-16%	-23%	43%	0%
India imports	Mt	31	34	34	37	43	46	49	53	58
growth	%	17%	11%	-1%	8%	16%	7%	8%	8%	10%
Brazil imports	Mt	11	14	13	11	13	13	14	15	16
growth	%	-32%	20%	-4%	-16%	19%	3%	5%	6%	5%
Other imports / inventory adjustment	Mt	12	20	24	21	21	19	22	23	24
<b>Global traded coking coal demand</b>	<b>Mt</b>	<b>221</b>	<b>274</b>	<b>271</b>	<b>295</b>	<b>310</b>	<b>304</b>	<b>300</b>	<b>327</b>	<b>334</b>
growth	%	-4%	24%	-1%	9%	5%	-2%	-1%	9%	2%
<b>Notional market balance</b>	<b>Mt</b>	<b>15</b>	<b>7</b>	<b>-3</b>	<b>5</b>	<b>9</b>	<b>22</b>	<b>32</b>	<b>19</b>	<b>28</b>
<b>Contract Hard Coking Coal</b>	<b>USD/t</b>	<b>129</b>	<b>195</b>	<b>289</b>	<b>210</b>	<b>159</b>	<b>126</b>	<b>131</b>	<b>157</b>	<b>165</b>

Source: McCloskey's, AME, Wood Mackenzie, CEIC, Deutsche Bank Research

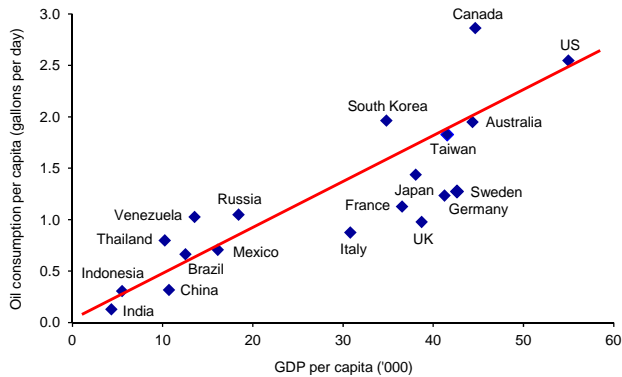
Grant Sporre, (44) 20 7547 3943  
[grant.sporre@db.com](mailto:grant.sporre@db.com)



## Commodities Chartbook

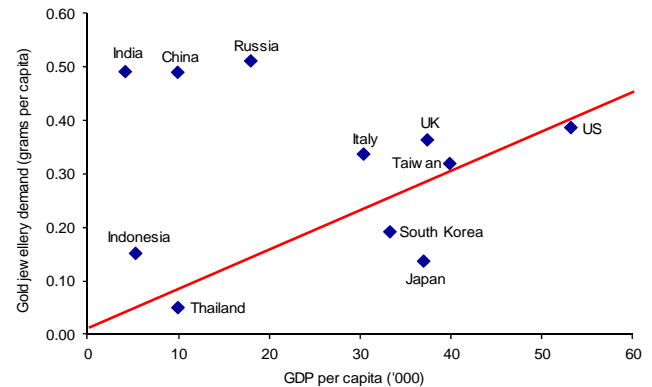
### Commodity consumption around the world relative to per capita income

Figure 1: Oil consumption intensity



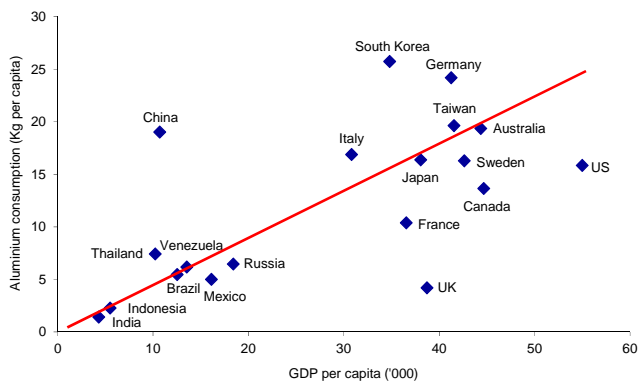
Source: DB Global Markets Research, IMF, IEA (2014)

Figure 2: Gold consumption intensity



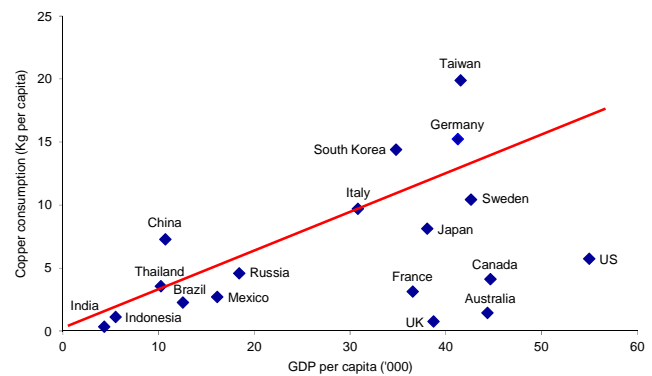
Source: DB Global Markets Research, IMF, World Gold Council (2013)

Figure 3: Aluminium consumption intensity



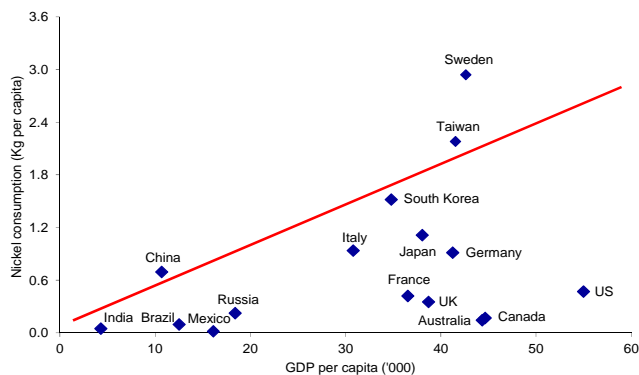
Source: DB Global Markets Research, IMF, Brook Hunt (2014)

Figure 4: Copper consumption intensity



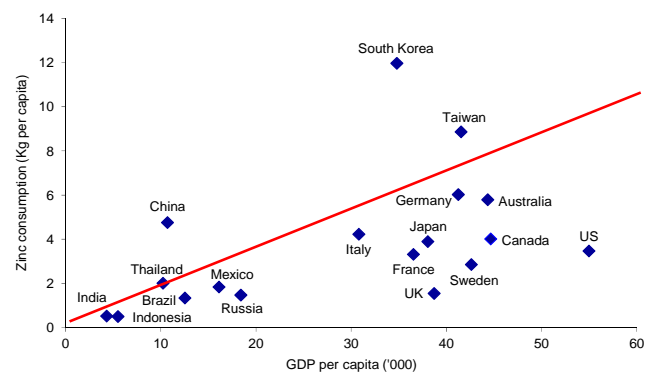
Source: DB Global Markets Research, IMF, Brook Hunt (2014)

Figure 5: Nickel consumption intensity



Source: DB Global Markets Research, IMF, Brook Hunt (2014)

Figure 6: Zinc consumption intensity



Source: DB Global Markets Research, IMF, Brook Hunt (2014)

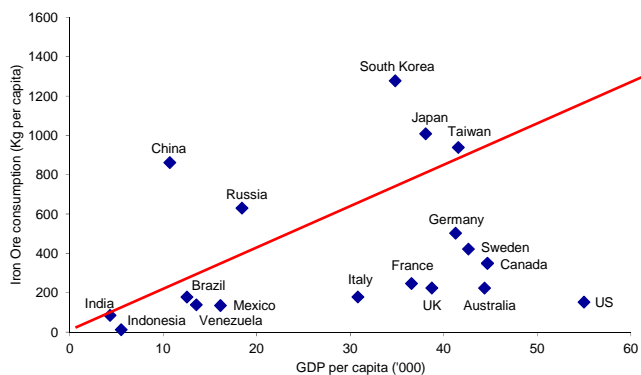




## Commodities Chartbook

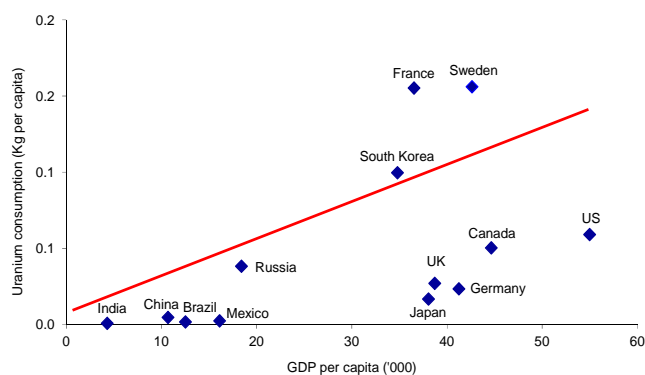
### Commodity consumption around the world relative to per capita income

Figure 7: Iron ore consumption intensity



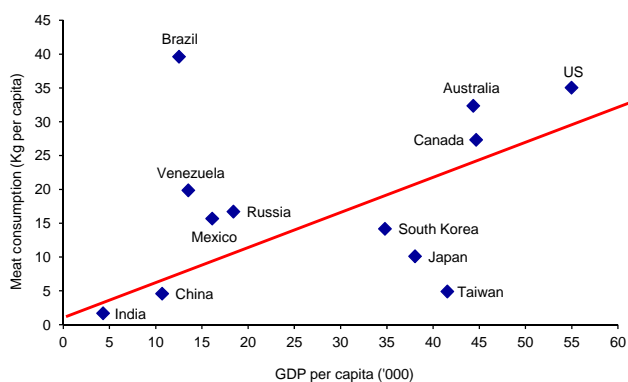
Source: DB Global Markets Research, IMF, BH (2014)

Figure 8: Uranium consumption intensity



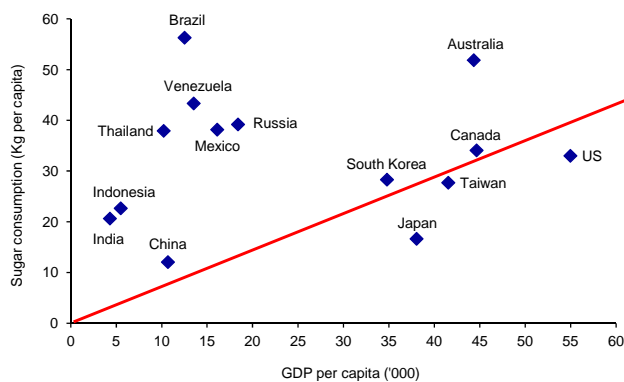
Source: DB Global Markets Research, IMF, WNA (2014)

Figure 9: Meat consumption intensity



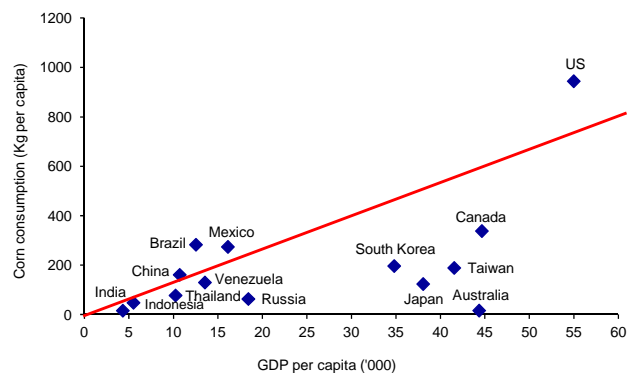
Source: DB Global Markets Research, IMF, USDA (2014)

Figure 10: Sugar consumption intensity



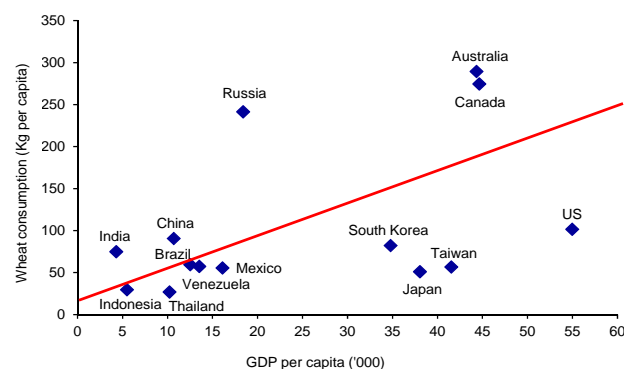
Source: DB Global Markets Research, IMF, USDA (2014)

Figure 11: Corn consumption intensity



Source: DB Global Markets Research, IMF, USDA (2014)

Figure 12: Wheat consumption intensity



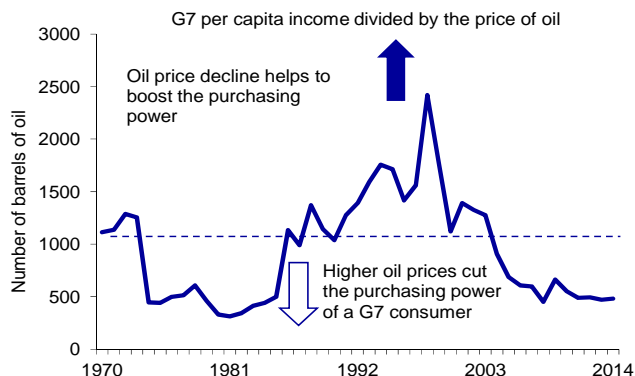
Source: DB Global Markets Research, IMF, USDA (2014)



## Commodities Chartbook

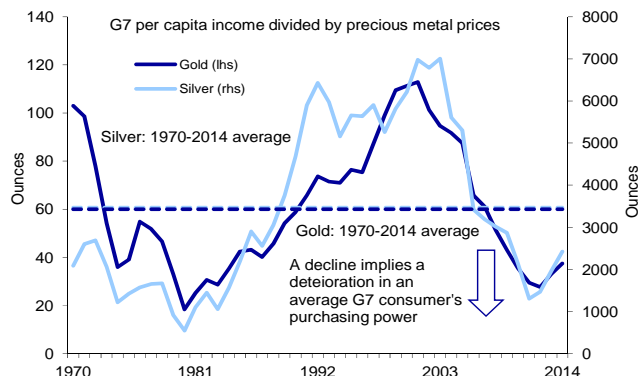
### Commodities relative to G7 per capita income

Figure 1: Crude oil prices relative to per capita income



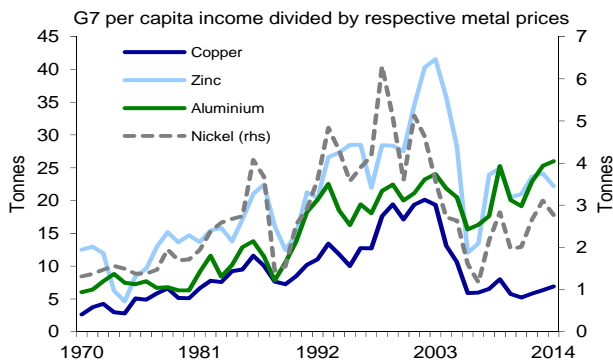
Source: DB Global Markets Research, IMF

Figure 2: Gold & silver prices relative to per capita income



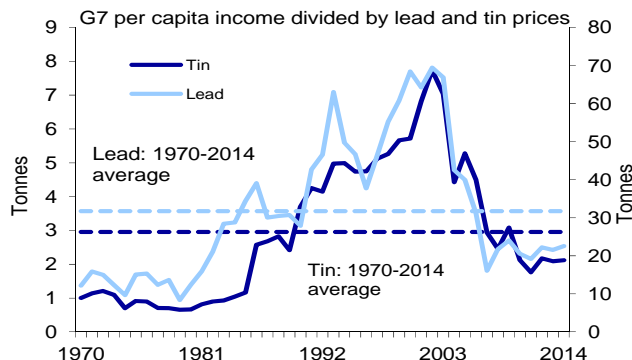
Source: DB Global Markets Research, IMF

Figure 3: Industrial metal prices relative to per capita income



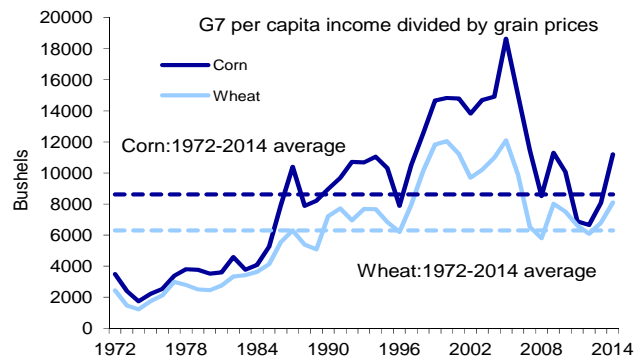
Source: DB Global Markets Research, IMF

Figure 4: Lead & tin prices relative to per capita income



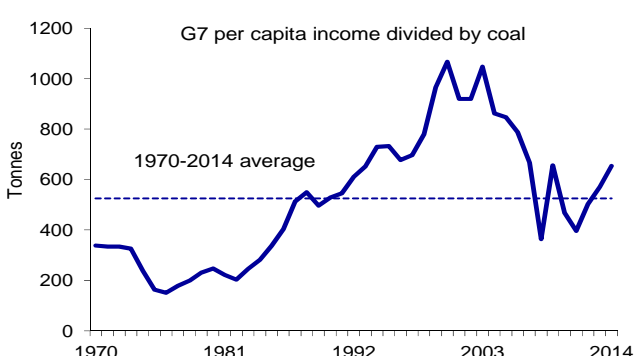
Source: DB Global Markets Research, IMF

Figure 5: Grain prices relative to per capita income



Source: DB Global Markets Research, IMF

Figure 6: Coal prices relative to per capita income



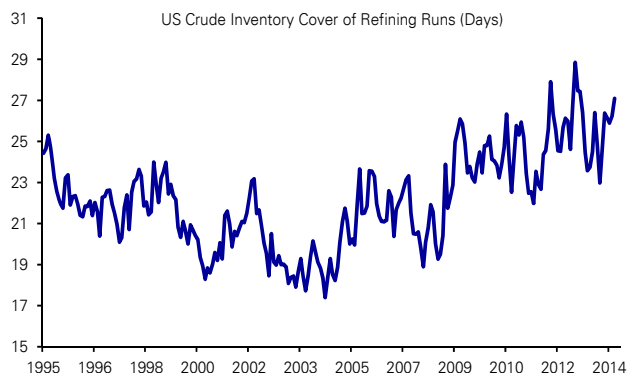
Source: DB Global Markets Research, IMF



## Commodities Chartbook

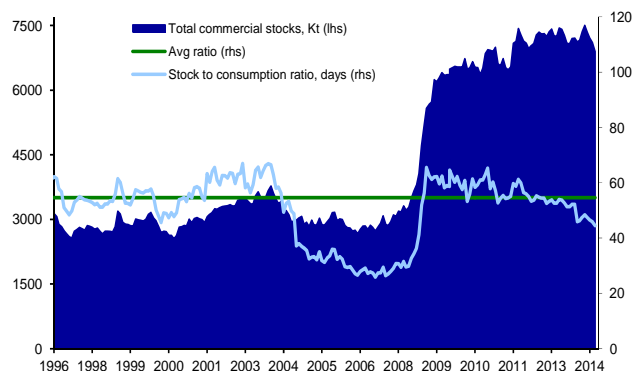
### Commodity inventory-to-use ratios

Figure 1: US oil inventory-to-use ratio



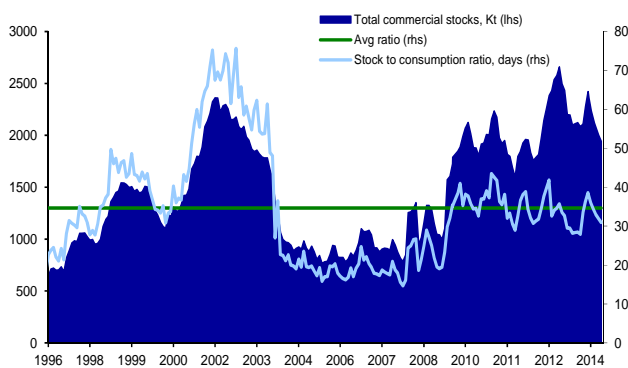
Source: IEA

Figure 2: Aluminium stock-to-consumption ratio



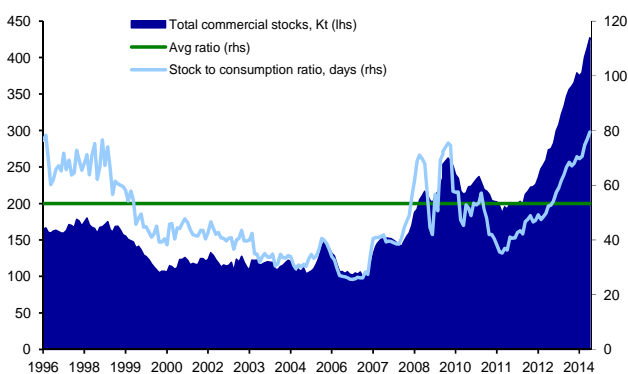
Source: Reuters, WBMS

Figure 3: Copper stock-to-consumption ratio



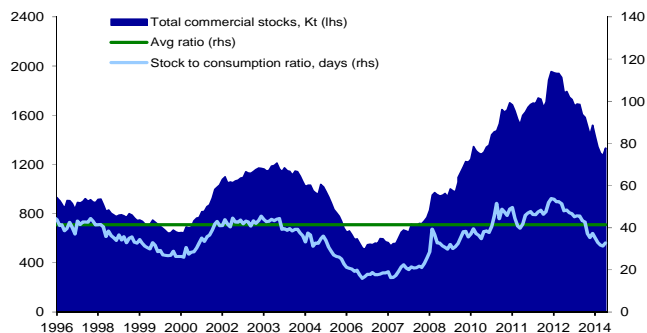
Source: Reuters, ICSG, WBMS

Figure 4: Nickel stock-to-consumption ratio



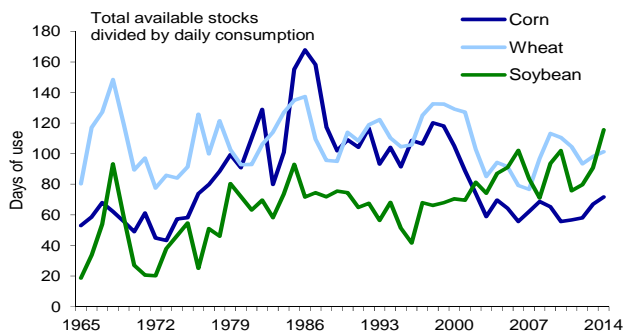
Source: Reuters, INSG, WBMS

Figure 5: Zinc stock-to-consumption ratio



Source: Reuters, ILZSG

Figure 6: Corn, soybeans & wheat stock-to-consumption ratio



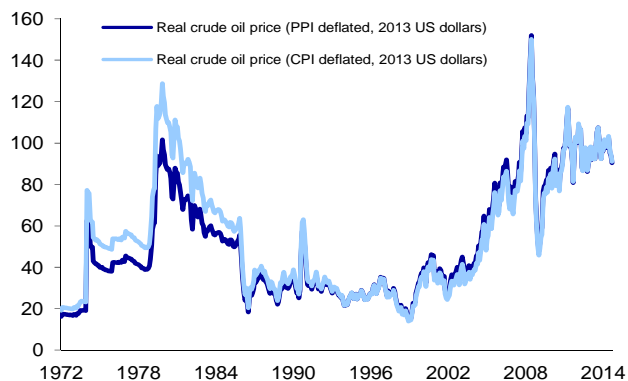
Source: USDA, Deutsche Bank



## Commodities Chartbook

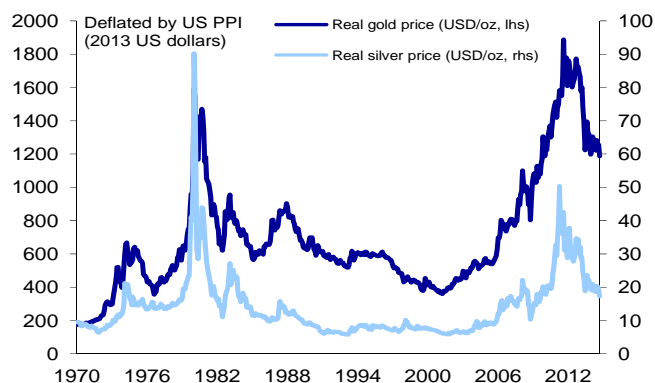
### Commodities prices in real terms

Figure 1: Crude oil prices in real terms



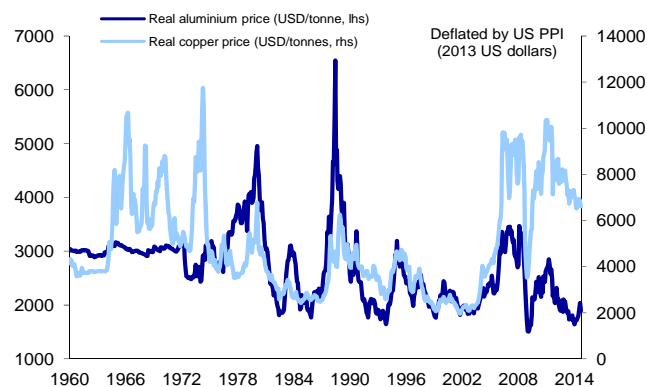
Source: IMF, Bloomberg Finance LP

Figure 2: Precious metal prices in real terms



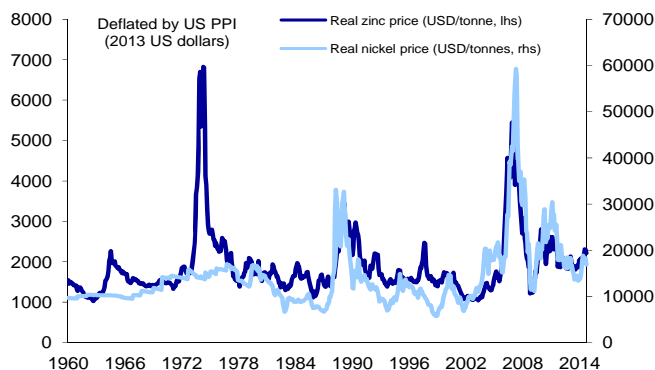
Source: IMF, Bloomberg Finance LP

Figure 3: Aluminium & copper prices in real terms



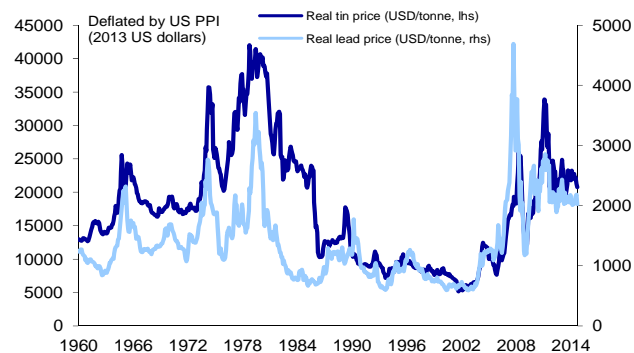
Source: IMF, Bloomberg Finance LP

Figure 4: Nickel & zinc prices in real terms



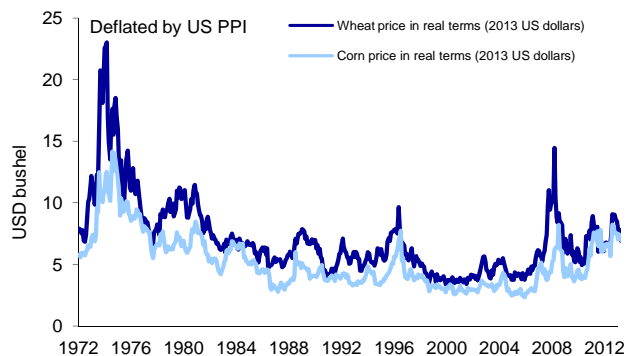
Source: IMF, Bloomberg Finance LP

Figure 5: Lead & tin prices in real terms



Source: IMF, Bloomberg Finance LP

Figure 6: Corn & wheat prices in real terms



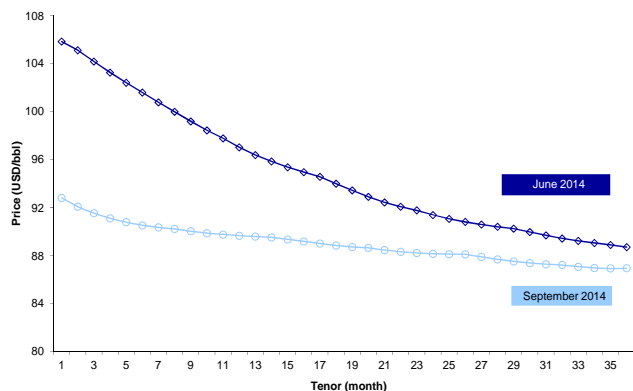
Source: IMF, Bloomberg Finance LP



## Commodities Chartbook

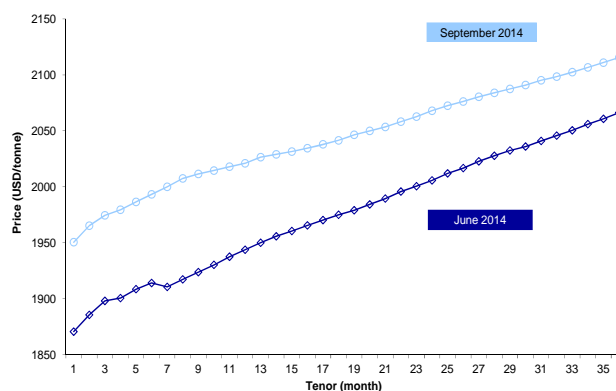
### Commodity Forward Curves

Figure 1: WTI crude oil forward curve



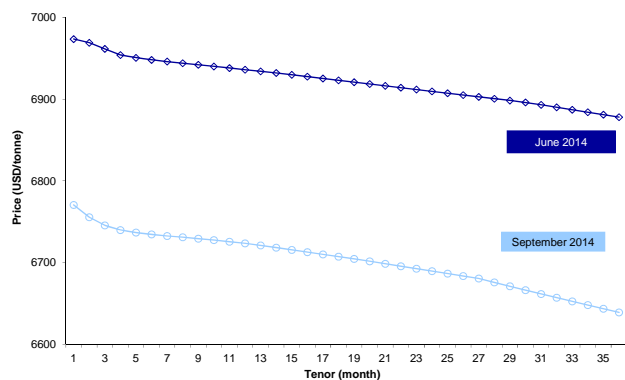
Source: DB Global Markets Research

Figure 2: Aluminium forward curve



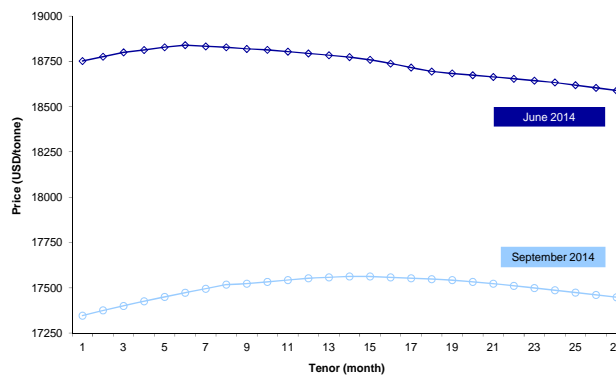
Source: DB Global Markets Research

Figure 3: Copper forward curve



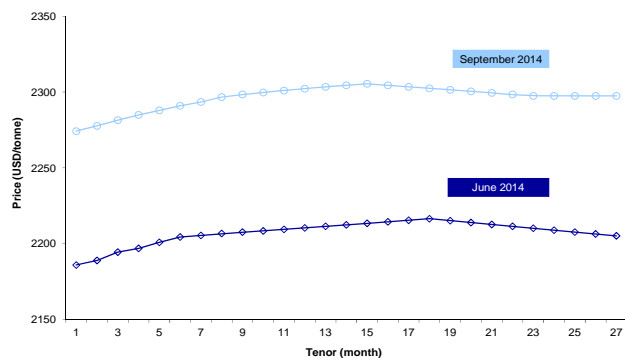
Source: DB Global Markets Research

Figure 4: Nickel forward curve



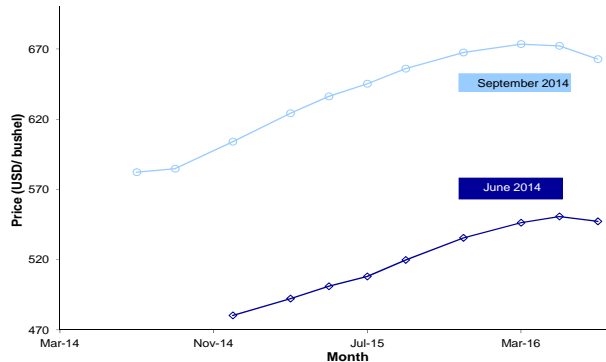
Source: DB Global Markets Research

Figure 5: Zinc forward curve



Source: DB Global Markets Research

Figure 6: Wheat forward curve



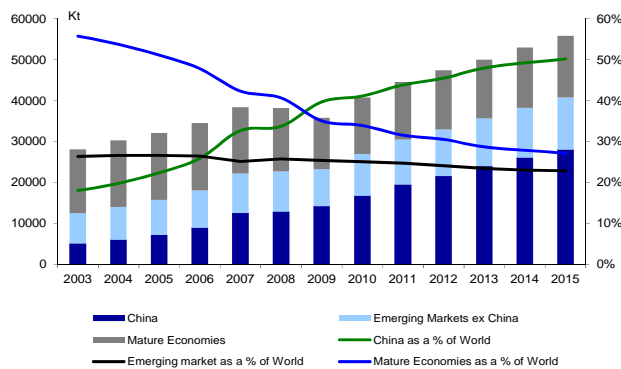
Source: DB Global Markets Research



## Commodities Chartbook

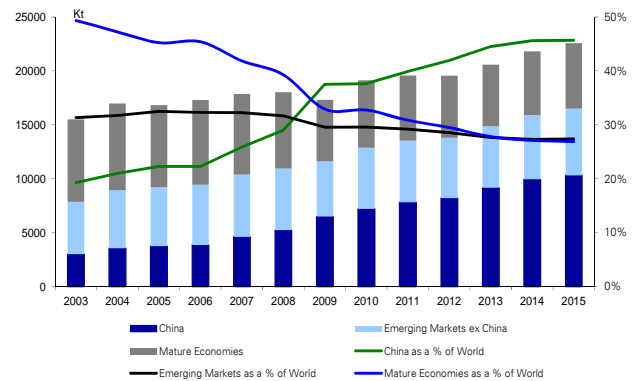
### BRIC & OECD commodity demand

Figure 1: Aluminium demand



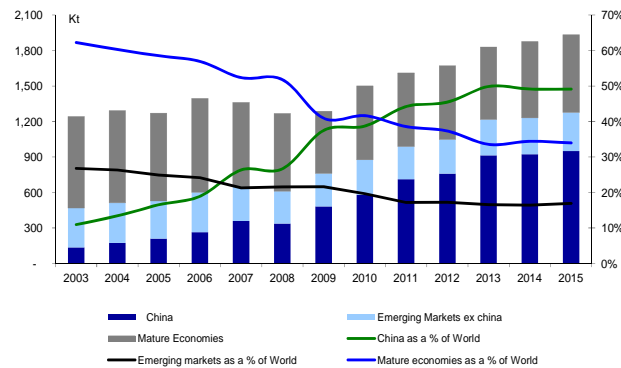
Source: DB Global Markets Research, Brook Hunt

Figure 2: Copper demand



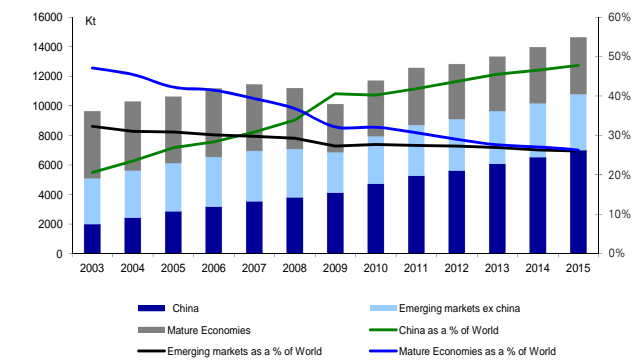
Source: DB Global Markets Research, Brook Hunt

Figure 3: Nickel demand



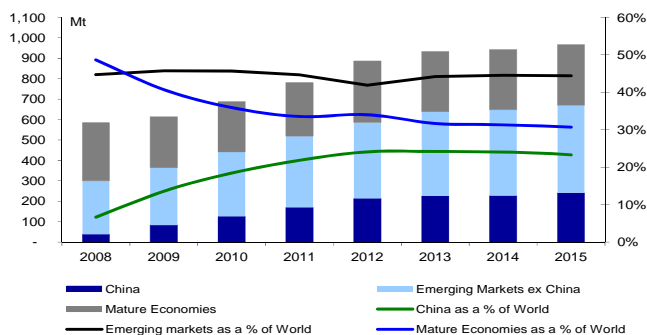
Source: DB Global Markets Research, Brook Hunt

Figure 4: Zinc demand



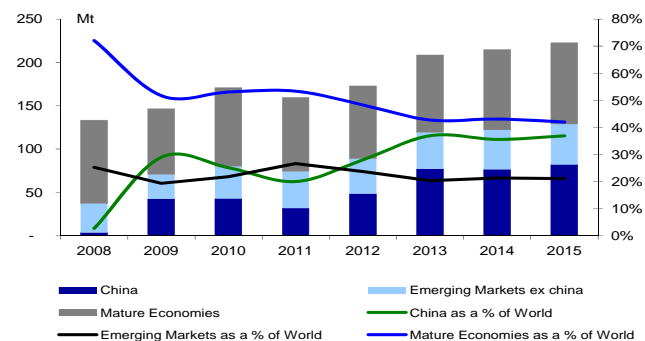
Source: DB Global Markets Research, Brook Hunt

Figure 5: Thermal coal demand



Source: DB Global Markets Research, Brook Hunt

Figure 6: Metallurgical coal demand



Source: DB Global Markets Research, Brook Hunt



## Commodity Price Forecasts

### Energy Commodities Price Forecasts

USD	Q3 14	Q4 14	2014	Q1 15	Q2 15	Q3 15	Q4 15	2015	2016	2017
<b>WTI (bbl)</b>	97.39	94.00	98.25	93.00	93.00	92.00	91.00	92.25	89.25	95.00
% Change from previous forecast		-8.7%	-4.3%	-7.0%	-4.1%	-3.2%	-2.2%	-4.2%	-0.8%	0.0%
<b>Brent (bbl)</b>	103.69	103.00	106.08	104.00	104.00	103.00	102.00	103.25	100.75	105.00
% Change from previous forecast		-7.2%	-3.9%	-4.6%	-2.8%	-2.8%	-2.9%	-3.3%	-1.2%	0.0%
<b>RBOB gasoline (g)</b>	2.75	2.50	2.76	2.50	2.70	2.60	2.50	2.58	2.50	2.75
% Change from previous forecast		-10.7%	-4.7%	-7.4%	-6.9%	-7.1%	-3.8%	-6.4%	-3.8%	0.0%
<b>Heating oil (g)</b>	2.83	2.80	2.90	2.80	2.80	2.80	2.80	2.80	2.80	2.85
% Change from previous forecast		-6.7%	-3.1%	-6.7%	-6.7%	-3.4%	-3.4%	-5.1%	0.0%	0.0%
<b>IPE gasoil (t)</b>	865.51	858.00	885.90	872.00	875.00	875.00	875.00	874.25	863.00	885.00
% Change from previous forecast		-7.7%	-3.6%	-5.7%	-4.9%	-3.8%	-2.8%	-4.3%	-1.9%	0.0%
<b>Singapore Jet (bbl)</b>	116.68	115.00	118.23	115.00	115.00	115.00	115.00	115.00	117.00	120.00
% Change from previous forecast		-6.5%	-3.1%	-5.7%	-5.0%	-3.4%	-2.5%	-4.2%	0.0%	0.0%
<b>US Natural Gas (mmBtu)</b>	3.94	4.00	4.31	4.20	4.00	4.00	4.05	4.06	4.25	4.50
% Change from previous forecast		-16.7%	-8.5%	-16.0%	-10.1%	-8.0%	-11.0%	-11.4%	-10.5%	-8.2%
<b>Thermal Coal - Japanese Guide Price (JFY)</b>	82.00	82.00	85.25	82.00	79.00	79.00	79.00	79.75	85.03	87.59
% Change from previous forecast		0.0%	0.0%	0.0%	-4.8%	-4.8%	-4.8%	-3.6%	-3.5%	-4.0%
<b>API4 (Richard's Bay) FOB (t)</b>	70.38	72.00	73.44	71.00	72.00	73.00	73.00	72.25	80.00	81.46
% Chg from previous forecast		-6.5%	-2.9%	-7.8%	-7.7%	-7.6%	-8.8%	-8.0%	-2.4%	-4.1%
<b>Newcastle FOB (t)</b>	69.06	72.00	73.66	73.00	74.00	75.00	75.00	74.25	82.00	84.46
% Chg from previous forecast		-7.7%	-2.9%	-6.4%	-7.5%	-7.4%	-8.5%	-7.5%	-3.5%	-4.0%
<b>Uranium (U3O8) (lb) [term]</b>	48	52	49	55	56	57	57	56	58	61
% Change from previous forecast		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: Deutsche Bank, Figures are period averages

### Precious Metals Price Forecasts

USD/oz	Q3 14	Q4 14	2014	Q1 15	Q2 15	Q3 15	Q4 15	2015	2016	2017
<b>Gold</b>	1284	1195	1265	1175	1175	1150	1150	1163	1125	1150
% Chg from previous forecast		-0.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	-2.2%	2.2%
<b>Silver</b>	20	19	20	19	19	19	19	19	19	19
% Chg from previous forecast		-7.5%	-2.1%	-5.0%	-5.0%	-2.6%	-2.6%	-3.8%	-2.6%	0.0%
<b>Platinum</b>	1438	1400	1429	1450	1500	1540	1560	1513	1575	1680
% Chg from previous forecast		-8.5%	-2.6%	-5.8%	-3.8%	-2.5%	-3.7%	-4.0%	-4.5%	-4.0%
<b>Palladium</b>	865	830	814	835	855	860	900	863	950	1000
% Chg from previous forecast		1.2%	2.7%	0.0%	4.9%	0.0%	0.0%	1.2%	0.0%	0.0%
<b>Rhodium</b>	1288	1150	1154	1200	1300	1300	1200	1250	1400	1700
% Chg from previous forecast		0.0%	4.7%	0.0%	0.0%	0.0%	-20.0%	-5.7%	0.0%	0.0%

Source: Deutsche Bank, Figures are period averages



## Industrial Metals Price Forecasts

Cash price	Q3 14	Q4 14	2014	Q1 15	Q2 15	Q3 15	Q4 15	2015	2016	2017
<b>Aluminium</b>										
US\$/lb	91.2	88.5	85.7	86.2	90.7	90.7	93.0	90.2	99.8	106.8
USD/t	2010	1950	1888	1900	2000	2000	2050	1988	2200	2354
% Chg from previous forecast		5.4%	4.0%	2.7%	6.7%	5.3%	5.1%	5.0%	0.0%	-1.9%
<b>Copper</b>										
US\$/lb	317.0	313.1	313.6	306.3	306.3	301.7	297.2	302.9	294.9	335.8
USD/t	6986	6900	6913	6750	6750	6650	6550	6675	6500	7400
% Chg from previous forecast		1.5%	1.2%	1.5%	0.0%	0.0%	0.0%	0.4%	0.0%	2.8%
<b>Lead</b>										
US\$/lb	99.7	95.3	96.9	102.1	103.2	102.1	106.6	103.5	105.5	109.6
USD/t	2197	2100	2136	2250	2275	2250	2350	2281	2325	2415
% Chg from previous forecast		-2.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%
<b>Nickel</b>										
US\$/lb	850.2	862.1	804.9	907.4	934.7	998.2	1043.6	971.0	1088.9	1225.0
USD/t	18739	19000	17740	20000	20600	22000	23000	21400	24000	27000
% Chg from previous forecast		-0.9%	0.2%	-4.8%	0.0%	3.9%	4.5%	1.0%	0.0%	0.0%
<b>Tin</b>										
US\$/lb	998.2	998.2	1017.5	1020.9	1043.6	1066.2	1088.9	1054.9	1115.0	1093.6
USD/t	22000	22000	22425	22500	23000	23500	24000	23250	24575	24103
% Chg from previous forecast		-6.4%	-3.1%	-3.7%	-4.1%	-2.9%	-1.9%	-3.1%	0.0%	-3.8%
<b>Zinc</b>										
US\$/lb	105.1	99.8	97.8	100.7	103.9	107.5	113.4	106.4	111.2	114.7
USD/t	2316	2200	2155	2220	2290	2370	2500	2345	2450	2529
% Chg from previous forecast		3.3%	3.7%	0.0%	0.0%	0.0%	4.2%	1.1%	2.5%	2.8%

Source: Deutsche Bank, Figures are period averages

## Bulk Commodities Price Forecasts

USD	Q3 14	Q4 14	2014	Q1 15	Q2 15	Q3 15	Q4 15	2015	2016	2017
<b>Iron Ore Spot Landed Fines Price in China CIF (t)</b>										
	90.68	92.00	101.44	98.00	90.00	85.00	92.00	91.25	90.00	88.00
% Chg from previous forecast		-7.1%	-2.9%	-1.0%	-5.3%	-7.6%	-5.2%	-4.7%	0.0%	0.0%
<b>Hard Coking Coal JFY (t)</b>										
	120.00	120.00	125.75	130.00	125.00	130.00	140.00	131.25	150.00	157.28
% Chg from previous forecast		-7.7%	-2.9%	-3.7%	-3.8%	0.0%	-3.4%	-2.8%	-3.2%	-1.7%
<b>Low-volatile PCI JFY (t)</b>										
	100.00	100.00	104.50	110.00	105.00	110.00	120.00	111.25	130.00	133.32
% Chg from previous forecast		-4.8%	0.0%	0.0%	0.0%	4.8%	0.0%	1.1%	4.0%	2.6%

Source: DB Global Markets Research

## Minor Metals Price Forecasts

USD	Q3 14	Q4 14	2014	Q1 15	Q2 15	Q3 15	Q4 15	2015	2016	2017
<b>Molybdenum (lb)</b>										
	13.27	12.70	12.34	12.70	12.50	12.50	12.00	12.43	12.00	13.00
% Chg from previous forecast		1.6%	1.0%	-2.3%	-7.4%	0.0%	0.0%	-2.5%	0.0%	0.0%

Source: Deutsche Bank, Figures are period averages





## Key Economic Forecasts

	GDP growth (% yoy)			CPI inflation (% yoy)			Current Account (% of GDP)			Fiscal Balance (% of GDP)		
	2014F	2015F	2016F	2014F	2015F	2016F	2014F	2015F	2016F	2014F	2015F	2016F
<b>Advanced economies</b>												
US	2.3	3.4	3.1	1.8	2.2	2.4	-2.6	-2.7	-2.9	-2.9	-2.5	-2.9
Japan	1.1	1.2	1.4	2.8	1.6	1.8	0.4	1.3	2.1	-7.0	-5.9	-4.6
Euroarea	0.7	1.0	1.4	0.5	1.1	1.5	2.5	2.1	1.6	-2.6	-2.5	-2.1
Germany	1.5	1.5	1.4	0.9	1.5	1.8	7.2	6.7	6.6	0.2	-0.1	-0.2
France	0.4	0.9	1.5	0.6	0.9	1.5	-1.8	-1.8	-1.5	-4.4	-4.3	-3.8
Italy	-0.4	0.4	0.7	0.2	0.8	1.2	1.6	1.6	1.5	-3.0	-2.9	-2.7
Spain	1.2	1.9	1.8	-0.1	0.8	1.4	0.4	0.5	0.7	-5.6	-4.6	-3.3
Netherlands	0.7	1.7	1.1	0.5	1.1	1.5	10.9	11.4	11.5	-2.5	-2.0	-1.9
Belgium	1.0	1.0	1.6	0.7	1.3	1.5	-1.0	-0.8	-0.5	-2.5	-2.3	-2.2
Austria	0.8	1.3	1.8	1.5	1.7	1.7	2.7	2.9	3.1	-3.0	-1.8	-1.2
Finland	-0.4	0.6	1.6	1.1	1.2	1.4	-2.0	-1.7	-1.3	-2.4	-1.8	-1.1
Greece	-0.2	2.1	2.7	-1.0	0.4	0.9	1.0	1.5	1.5	-1.8	-0.6	0.1
Portugal	1.0	1.1	1.7	-0.1	0.9	1.3	1.0	1.0	1.0	-4.2	-3.3	-2.7
Ireland	3.7	2.5	3.7	0.4	1.1	1.6	6.5	7.0	7.0	-4.0	-2.7	-2.5
United Kingdom	3.1	2.5	2.3	1.7	1.9	2.0	-4.0	-3.2	-3.0	-4.6	-3.5	-2.1
Denmark	1.0	2.0	1.8	1.0	1.5	2.0	6.7	6.4	6.0	0.0	-1.0	-2.0
Norway	2.4	2.5	2.5	1.8	2.2	2.0	11.0	10.5	10.0	7.0	6.7	6.5
Sweden	2.2	2.6	2.5	0.2	1.5	2.0	6.0	5.5	5.0	-1.5	-1.0	-0.5
Switzerland	1.3	1.8	2.0	0.0	0.3	0.6	12.0	11.0	10.5	0.0	0.2	0.5
Canada	2.5	3.2	2.8	2.0	2.2	1.9	-2.0	-1.4	-1.1	-0.8	0.0	0.3
Australia	3.1	2.7	3.9	2.4	2.0	2.5	-3.0	-3.2	-2.2	-2.5	-1.4	-0.7
New Zealand	3.6	2.6	2.3	1.4	1.8	2.2	-4.1	-6.5	-5.8	-0.5	0.3	0.7
<b>EEMEA</b>	1.9	2.7	3.0	5.6	5.4	5.0	1.6	0.9	0.4	-0.3	-1.2	-1.4
Czech Republic	2.4	2.6	2.8	0.4	1.8	2.0	-1.5	-1.4	-1.5	-2.6	-2.5	-2.4
Egypt	2.2	3.7	3.8	10.1	12.0	9.0	-1.1	-1.7	-2.3	-12.0	-10.5	-10.5
Hungary	3.4	2.7	3.0	0.3	2.7	3.3	1.8	1.8	1.5	-2.9	-2.7	-2.8
Israel	2.7	3.0	3.3	0.5	1.2	2.1	2.4	2.6	2.7	-3.0	-3.1	-2.6
Kazakhstan	5.4	5.2	5.0	6.1	6.7	5.2	2.0	1.5	1.2	5.3	3.3	2.9
Poland	3.1	3.5	3.8	0.4	1.5	2.3	-1.8	-2.0	-2.2	4.3	-2.9	-2.8
Romania	2.5	3.2	3.2	1.6	3.0	3.2	-1.0	-1.2	-1.3	-2.2	-1.9	-2.3
Russia	0.5	1.0	1.4	7.3	6.2	5.8	2.7	1.7	1.4	0.2	0.3	-0.4
Saudi Arabia	4.4	4.1	3.8	3.0	3.2	3.5	14.8	11.7	9.0	6.0	3.7	2.7
South Africa	1.5	3.4	3.9	6.1	5.1	5.3	-4.6	-4.4	-4.0	-4.0	-3.5	-3.2
Turkey	3.0	3.3	3.7	8.9	6.3	6.8	-5.4	-5.3	-4.9	-1.7	-1.7	-1.2
Ukraine	-6.9	0.5	2.7	10.3	12.8	5.6	-3.0	-2.1	-1.8	-5.5	-4.5	-3.4
United Arab Emirates	3.8	3.6	3.6	2.2	2.5	2.8	14.2	11.6	9.0	6.1	4.9	3.9
<b>Asia (ex-Japan)</b>	6.4	6.9	6.8	3.5	3.9	3.9	2.1	2.0	1.7	-2.3	-2.0	-2.0
China	7.8	8.0	8.0	2.2	3.0	3.0	2.3	2.5	2.3	-2.1	-1.5	-1.8
Hong Kong	2.8	3.6	3.1	4.0	3.2	3.0	-0.7	3.9	2.9	2.6	3.4	3.0
India	5.5	6.5	6.5	7.7	7.1	7.0	-1.6	-2.5	-2.4	-4.5	-4.2	-4.0
Indonesia	5.2	5.5	5.5	5.8	4.7	5.2	-3.0	-2.8	-2.8	-2.5	-2.7	-2.5
Korea	3.6	3.8	3.6	1.5	2.3	2.5	5.6	4.5	4.3	0.2	0.0	0.0
Malaysia	5.5	5.6	5.3	3.2	3.5	2.4	4.0	7.2	6.0	-3.7	-3.2	2.5
Philippines	6.6	6.8	6.5	4.4	3.6	4.1	4.7	4.7	3.7	-1.3	-2.2	-2.4
Singapore	3.0	4.0	3.5	1.5	2.1	2.6	18.5	17.7	18.4	6.9	6.8	7.0
Sri Lanka	7.5	7.5	7.5	4.0	6.3	6.0	-3.4	-3.1	-3.0	-5.5	-5.0	-5.0
Taiwan	3.7	3.8	3.6	1.6	1.5	1.8	12.9	11.9	10.8	-2.0	-1.8	-1.8
Thailand	1.5	5.0	3.5	2.1	2.4	2.7	1.8	1.2	0.5	-2.8	-2.5	-2.0
Vietnam	5.6	6.0	6.3	5.0	6.4	8.2	3.8	0.5	-3.2	-4.5	-4.4	-4.2
<b>Latin America</b>	1.1	2.1	3.0	12.5	11.7	10.6	-2.6	-2.4	-2.7	-3.8	-3.5	-3.0
Argentina	-1.9	-1.4	3.3	38.1	34.4	24.7	-1.9	-1.5	-2.0	-4.9	-4.7	-3.5
Brazil	0.3	1.2	1.9	6.3	6.1	5.8	-3.7	-3.4	-3.7	-4.2	-3.6	-3.4
Chile	2.1	3.1	3.5	4.2	3.3	3.3	-1.7	-1.8	-2.5	-1.9	-2.1	-1.3
Colombia	5.0	4.8	4.5	2.8	3.2	2.9	-3.9	-3.0	-3.2	-2.4	-2.2	-2.2
Mexico	2.3	3.5	3.8	4.0	3.8	3.5	-2.1	-2.2	-2.3	-4.2	-4.0	-3.1
Peru	4.0	6.0	5.5	3.2	2.6	2.2	-4.8	-4.5	-4.6	0.2	0.2	0.0
Venezuela	-3.1	0.1	1.0	70.0	70.0	75.4	2.9	3.4	3.0	-4.0	-4.8	-4.8
<b>G7</b>	1.8	2.5	2.4	1.7	1.8	2.1						
<b>Advanced economies</b>	1.8	2.4	2.4	1.5	1.8	2.0						
<b>EM economies</b>	4.6	5.3	5.5	5.4	5.4	5.2						
<b>Global</b>	3.2	3.9	4.0	3.5	3.7	3.7						

Source: Deutsche Bank Research, National Statistical Authorities



## Key Economic Forecasts

QUARTERLY GDP*	(% yoy)											
	Q1 2014	Q2 2014	Q3 2014F	Q4 2014F	Q1 2015F	Q2 2015F	Q3 2015F	Q4 2015F	Q1 2016F	Q2 2016F	Q3 2016F	Q4 2016F
US	1.9	2.6	2.3	2.4	3.7	3.4	3.3	3.2	2.5	2.5	2.4	2.4
Japan	2.7	0.0	0.4	1.3	0.1	2.4	2.0	0.5	1.0	1.2	1.1	2.3
Euroarea	0.9	0.7	0.8	0.6	0.6	1.0	1.2	1.4	1.5	1.5	1.4	1.4
Germany	2.2	1.3	1.4	1.1	0.7	1.3	1.3	1.5	1.5	1.3	1.0	0.9
France	0.8	0.1	0.4	0.3	0.5	0.8	1.1	1.4	1.4	1.6	1.7	1.7
Italy	-0.4	-0.2	-0.3	-0.5	-0.2	0.2	0.6	0.9	0.9	0.8	0.7	0.5
United Kingdom	3.0	3.2	3.1	3.0	2.8	2.5	2.3	2.3	2.2	2.2	2.1	2.1
Canada	2.1	2.5	2.5	2.5	2.5	2.5	2.5	2.8	3.2	3.2	3.1	3.1
Australia	3.4	3.1	3.1	2.8	2.4	2.6	2.8	3.1	3.5	3.8	4.0	4.3
EEMEA	2.2	1.5	1.5	1.2	1.4	2.0	2.5	2.7	2.6	2.6	2.7	2.8
Poland	3.4	3.2	2.9	3.0	2.8	3.2	3.8	3.9	4.0	3.9	3.7	3.9
Russia	0.9	0.8	0.4	-0.2	0.4	0.7	1.2	1.4	1.2	1.3	1.6	1.8
South Africa	1.6	1.0	2.0	1.7	2.9	3.3	3.6	3.8	3.8	3.9	3.8	3.9
Turkey	4.7	2.1	2.4	2.9	2.0	3.3	3.9	4.0	3.8	3.6	3.6	3.7
Asia (ex-Japan)	6.3	6.6	6.5	7.1	7.1	7.4	7.1	6.7	6.1	6.3	6.6	6.9
China	7.5	7.7	7.6	8.3	8.7	8.5	7.8	7.0	6.8	6.8	7.0	7.4
India	4.6	5.7	5.3	6.2	5.0	6.5	7.1	7.3	5.3	6.4	7.1	7.2
Indonesia	5.2	5.1	5.0	5.5	5.0	5.0	5.6	6.4	6.0	6.0	5.6	6.4
Korea	3.9	3.5	3.4	3.6	3.4	3.9	4.2	3.8	3.9	3.6	3.3	3.7
Taiwan	3.2	3.7	4.3	3.6	3.6	4.1	3.9	3.8	3.8	3.5	3.5	3.4
Latin America	1.6	-0.1	0.6	0.7	1.1	1.7	1.7	2.2	2.6	2.8	2.9	3.1
Argentina	-0.2	-1.5	-2.8	-3.0	-2.0	-2.0	-2.0	0.8	2.5	3.4	3.9	4.0
Brazil	1.9	-0.9	0.2	0.2	0.5	1.5	1.4	1.4	1.7	1.9	2.0	2.2
Mexico	1.9	1.6	2.5	3.0	3.2	3.5	3.5	3.7	3.7	3.8	3.8	3.9
G7	1.9	1.8	1.8	1.8	2.3	2.6	2.5	2.3	2.1	2.0	2.0	2.1
Advanced economies	1.8	1.7	1.7	1.8	2.2	2.4	2.4	2.2	2.1	2.1	2.0	2.1
EM economies	5.0	4.8	4.8	5.3	5.4	5.7	5.6	5.4	5.1	5.3	5.5	5.8
Global	3.3	3.2	3.2	3.4	3.7	4.0	3.9	3.8	3.5	3.6	3.7	3.9

Source: Deutsche Bank Research, National Statistical Authorities

## Correlation Matrix

	CL	LCO	XB	HO	LGO	NG	MAL	MCU	MPB	MNI	MZN	TSIPO62	GC	PL	SI	PA	W	C	S	DBLCI	DBLCI-MR	GSCI-TR	EUR	GBP	NOK	CAD	AUD	JPY	ED	ECU 3m	AUD 3m	SHCOMP Index	SPX	IBOX
Light Crude		0.72	0.54	0.57	0.39	- 0.11	0.16	0.14	0.10	0.15	- 0.03	0.06	0.35	0.26	0.25	0.17	0.01	- 0.07	- 0.14	0.78	0.51	0.79	0.19	0.14	0.12	- 0.03	0.12	- 0.22	- 0.14	0.15	- 0.09	- 0.12	0.10	0.07
Brent	0.72		0.78	0.87	0.52	- 0.13	- 0.01	0.12	0.10	0.19	- 0.04	0.03	0.25	0.27	0.13	0.20	0.12	- 0.05	- 0.03	0.81	0.54	0.91	0.21	- 0.03	- 0.05	- 0.18	0.25	- 0.17	- 0.24	0.14	- 0.06	- 0.12	0.02	0.29
Unleaded Petrol	0.54	0.78		0.78	0.48	- 0.01	- 0.13	0.02	0.07	0.24	- 0.06	0.05	0.21	0.17	- 0.05	0.16	0.02	- 0.05	- 0.04	0.63	0.36	0.78	0.04	0.03	- 0.01	- 0.00	0.08	- 0.02	- 0.07	0.12	- 0.21	0.01	- 0.13	0.26
Heating Oil	0.57	0.87	0.78		0.59	- 0.08	- 0.14	- 0.01	0.04	0.15	- 0.18	0.06	0.24	0.21	0.10	0.13	0.07	- 0.06	- 0.01	0.73	0.46	0.85	0.10	- 0.10	0.02	- 0.04	0.20	- 0.09	- 0.08	0.08	- 0.02	- 0.03	0.01	0.32
Gas Oil	0.39	0.52	0.48	0.59		0.17	- 0.03	- 0.09	0.17	0.15	- 0.05	- 0.06	0.28	0.22	0.12	0.17	0.01	0.04	0.08	0.49	0.30	0.60	- 0.06	- 0.06	- 0.03	- 0.01	0.27	- 0.16	- 0.11	0.18	0.00	- 0.05	- 0.05	0.28
Natural Gas	0.11	- 0.13	- 0.01	- 0.08	0.17		- 0.10	- 0.06	- 0.16	- 0.01	- 0.13	0.09	- 0.08	- 0.09	- 0.03	0.01	0.16	0.15	0.08	- 0.04	- 0.00	0.03	0.04	- 0.19	0.20	0.07	- 0.04	- 0.13	0.04	- 0.00	- 0.18	- 0.11	0.08	- 0.13
LME Al	0.16	- 0.01	- 0.13	- 0.14	- 0.03	- 0.10		0.52	0.67	0.47	0.67	0.07	0.01	0.18	0.12	0.18	0.11	0.04	0.07	0.24	0.40	0.07	0.01	0.04	0.11	- 0.05	0.15	- 0.26	- 0.21	0.11	0.28	0.01	0.27	- 0.10
LME Cu	0.14	0.12	0.02	- 0.01	- 0.09	- 0.06	0.52		0.56	0.49	0.59	0.26	- 0.09	0.08	0.10	0.21	0.02	0.03	0.08	0.14	0.18	0.13	0.19	0.07	0.15	0.22	0.08	- 0.17	- 0.18	0.01	0.14	0.17	0.19	- 0.08
LME Lead	0.10	0.10	0.07	0.04	0.17	- 0.16	0.67	0.56		0.48	0.74	0.30	0.02	0.12	0.02	0.20	0.14	0.16	0.15	0.27	0.39	0.18	0.11	0.13	- 0.04	- 0.06	0.19	- 0.29	- 0.13	0.20	0.22	0.26	0.18	0.16
LME Nickel	0.15	0.19	0.24	0.15	0.15	- 0.01	0.47	0.49	0.48		0.53	0.27	0.14	0.24	0.14	0.36	0.16	0.02	0.04	0.27	0.31	0.25	0.00	- 0.10	0.13	- 0.13	0.31	- 0.17	- 0.01	- 0.02	0.16	0.13	0.15	0.10
LME Zinc	0.03	- 0.04	- 0.06	- 0.18	- 0.05	- 0.13	0.67	0.59	0.74	0.53		0.17	- 0.12	- 0.04	0.02	0.18	0.02	0.07	0.12	0.05	0.18	- 0.01	- 0.02	- 0.01	- 0.00	- 0.07	0.15	- 0.15	- 0.16	0.12	0.19	0.27	0.17	- 0.03
Iron Ore	0.06	0.03	0.05	0.06	- 0.06	0.09	0.07	0.26	0.30	0.27	0.17	1.00	- 0.08	0.11	0.11	0.25	0.29	0.28	- 0.02	0.16	0.25	0.13	0.29	0.15	0.03	0.17	0.09	- 0.22	0.15	0.12	0.19	0.40	0.09	- 0.13
Comex Gold Future	0.35	0.25	0.21	0.24	0.28	- 0.08	0.01	- 0.09	0.02	0.14	- 0.12	- 0.08		0.71	0.67	0.30	- 0.02	0.20	- 0.02	0.39	0.37	0.27	0.04	0.05	0.02	- 0.29	0.20	- 0.46	- 0.14	- 0.01	0.12	- 0.36	- 0.15	0.24
NYMEX Platinum	0.26	0.27	0.17	0.21	0.22	- 0.09	0.18	0.08	0.12	0.24	- 0.04	0.11	0.71		0.57	0.46	0.03	0.22	0.14	0.36	0.37	0.26	0.24	0.13	- 0.03	- 0.36	0.34	- 0.44	- 0.17	- 0.05	0.33	- 0.23	- 0.02	0.15
Comex Silver	0.25	0.13	- 0.05	0.10	0.12	- 0.03	0.12	0.10	0.02	0.14	0.02	0.11	0.67	0.57		0.38	0.05	0.20	0.09	0.29	0.31	0.19	0.15	- 0.00	- 0.01	- 0.22	0.11	- 0.39	- 0.21	- 0.02	0.16	- 0.25	0.01	- 0.05
NYMEX Palladium	0.17	0.20	0.16	0.13	0.17	0.01	0.18	0.21	0.20	0.36	0.18	0.25	0.30	0.46	0.38	1.00	0.18	0.25	0.04	0.31	0.34	0.26	0.26	0.08	- 0.27	- 0.28	0.40	- 0.44	- 0.21	0.04	0.32	- 0.04	0.12	0.16
Wheat CBOT	0.01	0.12	0.02	0.07	0.01	0.16	0.11	0.02	0.14	0.16	0.02	0.29	- 0.02	0.03	0.05	0.18		0.48	0.09	0.40	0.63	0.24	- 0.01	- 0.16	0.13	0.21	0.12	- 0.18	0.17	- 0.12	0.01	0.05	- 0.08	0.07
Corn	0.07	- 0.05	- 0.05	- 0.06	0.04	0.15	0.04	0.03	0.16	0.02	0.07	0.28	0.20	0.22	0.20	0.25	0.48		0.24	0.27	0.56	0.09	- 0.19	- 0.13	- 0.02	0.04	0.03	- 0.07	- 0.13	- 0.25	- 0.17	0.10	0.08	0.08
Soy beans	0.14	- 0.03	- 0.04	- 0.01	0.08	0.08	0.07	0.08	0.15	0.04	0.12	- 0.02	- 0.02	0.14	0.09	0.04	0.09	0.24		0.00	0.05	- 0.01	0.04	- 0.16	- 0.18	0.03	0.04	- 0.03	- 0.01	- 0.09	0.02	0.23	0.10	- 0.26
DBLCI	0.78	0.81	0.63	0.73	0.49	- 0.04	0.24	0.14	0.27	0.27	0.05	0.16	0.39	0.36	0.29	0.31	0.40	0.27	0.00		0.88	0.93	0.11	- 0.01	0.06	- 0.02	0.26	- 0.32	- 0.18	0.06	- 0.05	- 0.10	0.13	0.22
DBLCI-MR	0.51	0.54	0.36	0.46	0.30	- 0.00	0.40	0.18	0.39	0.31	0.18	0.25	0.37	0.37	0.31	0.34	0.63	0.56	0.05	0.88		0.70	- 0.02	- 0.06	0.10	0.03	0.25	- 0.33	- 0.17	- 0.07	0.02	- 0.03	0.15	0.21
GSCI-TR	0.79	0.91	0.78	0.85	0.60	0.03	0.07	0.13	0.18	0.25	- 0.01	0.13	0.27	0.26	0.19	0.26	0.24	0.09	- 0.01	0.93	0.70		0.15	- 0.01	0.05	- 0.04	0.26	- 0.23	- 0.14	0.09	- 0.10	- 0.04	0.11	0.24
EUR	0.19	0.21	0.04	0.10	- 0.06	0.04	0.01	0.19	0.11	0.00	- 0.02	0.29	0.04	0.24	0.15	0.26	- 0.01	- 0.19	0.04	0.11	- 0.02	0.15		0.30	- 0.33	- 0.32	0.19	- 0.47	- 0.11	0.58	0.17	- 0.04	0.13	- 0.16
GBP	0.14	- 0.03	0.03	- 0.10	- 0.06	- 0.19	0.04	0.07	0.13	- 0.10	- 0.01	0.15	0.05	0.13	- 0.00	0.08	- 0.16	- 0.13	- 0.16	- 0.01	- 0.06	- 0.01	0.30		- 0.21	- 0.24	0.12	- 0.02	0.11	0.40	0.07	0.02	0.09	- 0.09
NOK	0.12	- 0.05	- 0.01	0.02	- 0.03	0.20	0.11	0.15	- 0.04	0.13	- 0.00	0.03	0.02	- 0.03	- 0.01	- 0.27	0.13	- 0.02	- 0.18	0.06	0.10	0.05	- 0.33	- 0.21		0.35	- 0.21	0.13	0.08	- 0.35	- 0.08	0.05	- 0.12	0.02
CAD	0.03	- 0.18	- 0.00	- 0.04	- 0.01	0.07	- 0.05	- 0.22	- 0.06	- 0.13	- 0.07	0.17	- 0.29	- 0.36	- 0.22	- 0.28	0.21	0.04	0.03	- 0.02	0.03	- 0.04	- 0.32	- 0.24	0.35		- 0.47	0.41	0.16	- 0.01	- 0.04	0.30	- 0.18	- 0.20
AUD	0.12	0.25	0.08	0.20	0.27	- 0.04	0.15	0.08	0.19	0.31	0.15	0.09	0.20	0.34	0.11	0.40	0.12	0.03	0.04	0.26	0.25	0.26	0.19	0.12	- 0.21	0.47		- 0.55	- 0.05	- 0.14	0.26	0.09	0.23	0.30
JPY	- 0.22	- 0.17	- 0.02	- 0.09	- 0.16	- 0.13	- 0.26	- 0.17	- 0.29	- 0.17	- 0.15	- 0.22	- 0.46	- 0.44	- 0.39	- 0.44	- 0.18	- 0.07	- 0.03	- 0.32	- 0.33	- 0.23	- 0.47	- 0.02	0.13	0.41	- 0.55		0.08	- 0.11	- 0.25	0.15	- 0.08	- 0.17
ED	- 0.14	- 0.24	- 0.07	- 0.08	- 0.11	0.04	- 0.21	- 0.18	- 0.13	- 0.01	- 0.16	0.15	- 0.14	- 0.17	- 0.21	- 0.21	0.17	- 0.13	- 0.01	- 0.18	- 0.17	- 0.14	- 0.11	0.11	0.08	0.16	- 0.05	0.08		0.02	0.07	0.32	- 0.13	0.06
ECU 3m	0.15	0.14	0.12	0.08	0.18	- 0.00	0.11	0.01	0.20	- 0.02	0.12	0.12	- 0.01	- 0.05	- 0.02	0.04	- 0.12	- 0.25	- 0.09	0.06	- 0.07	0.09	0.58	0.40	- 0.35	- 0.01	- 0.14	- 0.11	0.02		0.13	- 0.04	- 0.05	- 0.16
AUD 3m	- 0.09	- 0.06	- 0.21	- 0.02	0.00	- 0.18	0.28	0.14	0.22	0.16	0.19	0.19	0.12	0.33	0.16	0.32	0.01	- 0.17	0.02	- 0.05	0.02	- 0.10	0.17	0.07	- 0.08	- 0.04	0.26	- 0.25	0.07	0.13		0.01	0.00	
SHCOMP Index	- 0.12	- 0.12	0.01	- 0.03	- 0.05	- 0.11	0.01	0.17	0.26	0.13	0.27	0.40	- 0.36	- 0.23	- 0.25	- 0.04	0.05	0.10	0.23	- 0.10	- 0.03	- 0.04	- 0.04	0.02	0.05	0.30	0.09	0.15	0.32	- 0.04	0.02	1.00		- 0.10
SPX	0.10	0.02	- 0.13	0.01	- 0.05	0.08	0.27	0.19	0.18	0.15	0.17	0.09	- 0.15	- 0.02	0.01	0.12	- 0.08	0.08	0.10	0.13	0.15	0.11	0.13	0.09	- 0.12	- 0.18	0.23	- 0.08	- 0.13	- 0.05	0.01	0.06	1.00	
IBOXX Euro Corp All	0.07	0.29	0.26	0.32	0.28	- 0.13	- 0.10	- 0.08	0.16	0.10	- 0.03	- 0.13	0.24	0.15	- 0.05	0.16	0.07	0.08	- 0.26	0.22	0.21	0.24	- 0.16	- 0.09	0.02	- 0.20	0.30	- 0.17	0.06	- 0.16	0.00	- 0.10	- 0.09	1.00

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# Appendix 1

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