

# Aluminium in critical conditions

## Lowering aluminium price and premia forecasts

We are lowering our average 2015 aluminium price forecast by 7.8% to \$1,818/t (82c/lb); in fact, we see a risk that aluminium will touch \$1,650/t (74c/lb) in the coming weeks. We are also lowering our global average premium forecast to \$300/t this year. These downgrades are driven by a confluence of factors. Most notably perhaps, aluminium semi exports from China have remained at elevated levels, partially because authorities are reluctant to tackle shipments that illegitimately attract tax rebates. At the same token, trading on the London Metals Exchange has continued to normalise, reflected in declining queues at warehouses in Detroit and Vlissingen. Flatter forward curves have in recent months also challenged financing deals, increasing the availability of metal.

## China's semis exports remain high

Given that aluminium smelting is power intensive and considering that China's power endowment is relatively poor, authorities imposed a 15% export tax on primary aluminium a few years back, making refined metal shipments uneconomic. Yet, some semi-manufactured products receive a 13% tax rebate, which can make exports profitable. Given an oversupplied domestic Chinese aluminium market and rallying LME prices, it is not surprising that product shipments have increased and remain at very high levels. The bulk of China's semi shipments is genuine. Yet, a fair share of primary aluminium has left the country disguised as semis, which has eased some of the tightness in World ex-China. We follow the situation in China closely and maintain a cautious stance until clearer evidence emerges that shipments of semi-finished products subside; having said that, a possible removal of further export taxes on semis would exacerbate the current weak fundamental backdrop in World ex-China.

## Trading on LME is normalising

Further to Chinese semi exports, aluminium availability has also increased as trading on LME has normalized. This dynamic has been visible in a host of metrics, including shorter queues at warehouses in Detroit and Vlissingen. An announcement by the LME earlier this week suggests that the exchange is intent to further reduce waiting times at its warehouses. Acknowledging that LME distortions were driving the tightness of physical markets in World ex-China to a large extent, we believe that global premia have now peaked. Changing tack slightly, it is also worth noting that forward curves were somewhat flatter, which in turn affected the economics of financing deals and increased metal availability.

## Higher cost smelters under pressure

With prices and premia falling in recent weeks, higher cost smelters have once again come under pressure. Margin compression and likely pursuant production curtailments are reasons we believe a complete collapse especially of LME quotations is unlikely. Global demand should also rebound into 2Q15.

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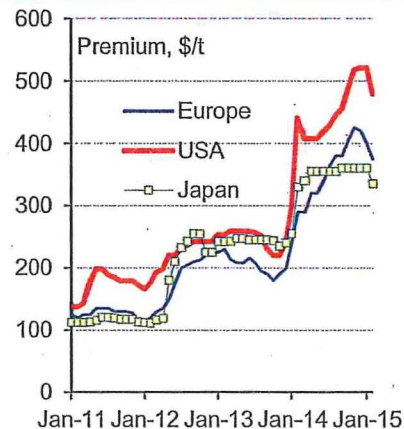
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Chart 1: Physical premia are falling in all the regions



Source: CRU, BofA Merrill Lynch Global Commodity Research

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## Aluminium in critical conditions Updating aluminium price forecast

We are lowering our aluminium price and premia<sup>1</sup> forecasts on a confluence of headwinds, including persistent elevated levels of aluminium semi exports from China and a normalisation of trading on LME (more on this below). Table 1 picks up on this, suggesting that average 2015 aluminium prices will be 7.8% lower at \$1,818/t (84c/lb).

Table 1: New aluminium price forecasts

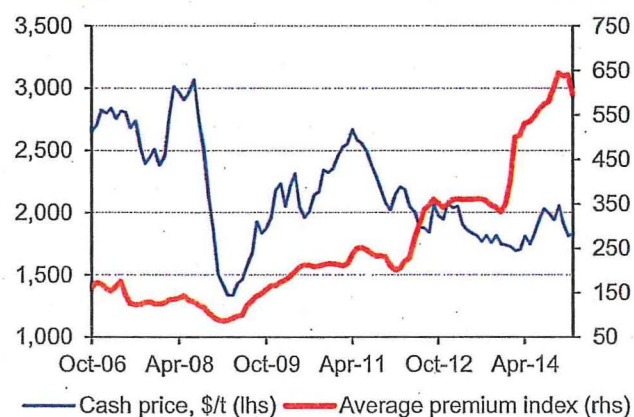
		2Q15E	3Q15E	4Q15E	1Q16E	2Q16E	2015E	2016E	2017E
Aluminium	US\$/t	1,750	1,800	1,850	1,800	1,800	1,818	1,850	1,900
	USc/lb	79	82	84	82	82	82	84	86
	Pct chge	-8.8%	-10.0%	-11.9%	-18.2%	-18.2%	-7.8%	-15.9%	-19.3%
Average premium	\$/t	333	267	200	200	200	300	200	200

Source: BofA Merrill Lynch Global Commodity Research

## Prices and premia both under pressure

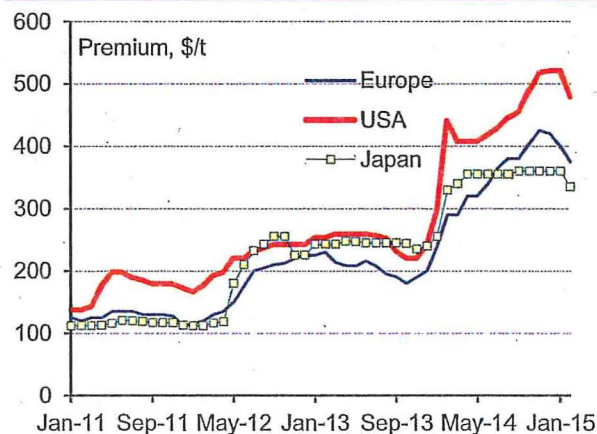
Aluminium prices and premia have fallen in recent weeks (Chart 2 and Chart 3), highlighting that last year's bull market has gradually subsided.

Chart 2: Aluminium prices and premia have been under pressure



Source: Bloomberg, CRU, BofA Merrill Lynch Global Commodity Research

Chart 3: Premia have been falling in all the key aluminium consumption regions



Source: Bloomberg, CRU, BofA Merrill Lynch Global Commodity Research

In our view, the headwind to prices was driven by a confluence of factors, including the following:

- China has continued to export substantial tonnages of semi-finished products. Of course, while the majority of these semis are genuine, some really are primary aluminium disguised as a product to attract tax rebates.
- In addition, queues at LME warehouses after the Financial Crisis contributed to a substantial tightening of the physical market. Yet, trading on the exchange has gradually normalised.

<sup>1</sup> Physical premia have to be paid on top of the quoted LME price; they can include items such as transportation cost and insurance. However, they are also an indicator for the tightness of regional markets

## Chinese supply in particular remains an issue

Picking up on the first bullet and looking at supply, Table 2 shows a spectacular divergence in supply trends between much of World ex-China and China. Most notably, smelters in World ex-China (with the exception of the Middle East) have curtailed production by more than 1mt last year, while China actually boosted output by 2.6mt.

**Table 2: Aluminium production trends between China and World ex-China have been diverging**

	Jan-Dec 2014	Jan-Dec 2013	YoY change	Annualised Jan-15	Annualised Jan-14	YoY change	Annualised Dec-14	MoM change
Africa	1,746	1,811	-3.6%	1,684	1,837	-153.1	1,672	0.7%
North America	4,585	4,918	-6.8%	4,557	4,698	-141.3	4,545	0.3%
Latin America	1,530	1,905	-19.7%	1,366	1,849	-482.7	1,401	-2.5%
Asia	2,430	2,439	-0.4%	2,779	2,378	400.3	2,743	1.3%
West Europe	3,514	3,525	-0.3%	3,615	3,403	211.9	3,603	0.3%
East/Central Europe	3,765	3,995	-5.8%	3,780	3,744	35.3	3,803	-0.6%
Oceania	2,035	2,106	-3.4%	1,966	2,072	-106.0	1,966	0.0%
Middle East	4,832	3,887	24.3%	5,016	4,168	847.7	5,028	-0.2%
China	27,540	24,936	10.4%	28,482	26,351	2,131.1	29,212	-2.5%
Other non-IAI nations	1,080	1,080	0.0%	1,060	1,060	0.0	1,060	0.0%
IAI ex-China	25,517	25,666	-0.6%	25,821	25,209	612.3	25,821	0.0%
IAI Total	53,057	50,602	4.9%	54,303	51,559	2,743.4	55,033	-1.3%

Source: IAI, BofA Merrill Lynch Global Commodity Research

## Disincentive to Chinese exports of primary

Not surprisingly, the sharp increase of domestic Chinese aluminium output led to a substantial supply overhang in refined metal in the country. Of course, the surplus in refined metal was not exported because the government imposes a 15% export tax, which makes shipments uneconomic (Chart 4). Incidentally, the export tax was originally driven by authorities looking to slow the expansion of energy intensive, but low value adding aluminium smelters, given China's poor power endowment. In our view, the government's approach to the industry has hardly changed, which was partially highlighted in recent measures that were aimed at closing high cost smelters buying electricity from the grid and encouraging operators to invest in power plants and grids.

**Table 3: 2015 import and export taxes, percent**

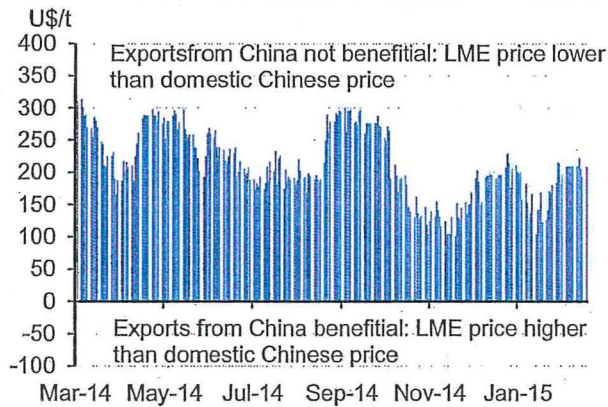
	Import	Export
Primary Aluminium	0	15
Aluminium Alloy	7	15
Non alloy aluminium rod and bar	5	15
Aluminium alloy rod and bar >=210mm	5	15
Aluminium alloy rod and bar <210mm,	5	5
Non alloy sheet and plate, 0.3mm <= thickness <=0.036	4	0
Converted foil	3	0

Source: CRU

Meanwhile, authorities have taken a more nuanced stance towards semi-manufactured products. These can qualify for tax rebates, which in turn make shipments beneficial, a point that is also picked up by and Chart 5.

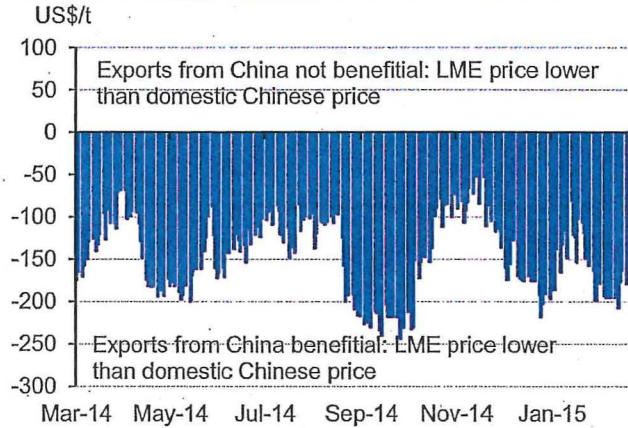
04 March 2015

**Chart 4: Exports of primary aluminium are not profitable, given a 15% export tax**



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

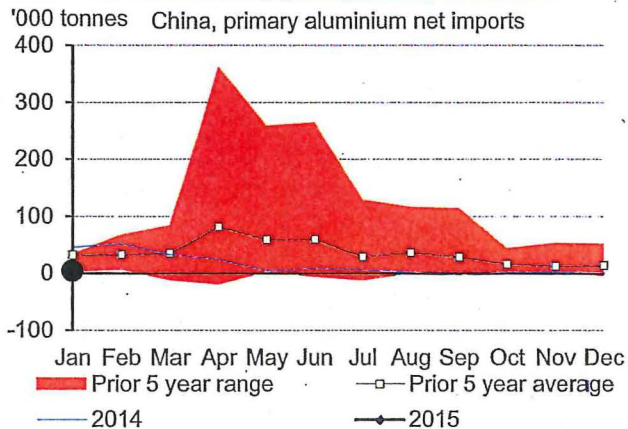
**Chart 5: Some aluminium semis qualify for a 13% VAT rebate, so shipments become profitable**



Source: Bloomberg, CRU, BofA Merrill Lynch Global Commodity Research

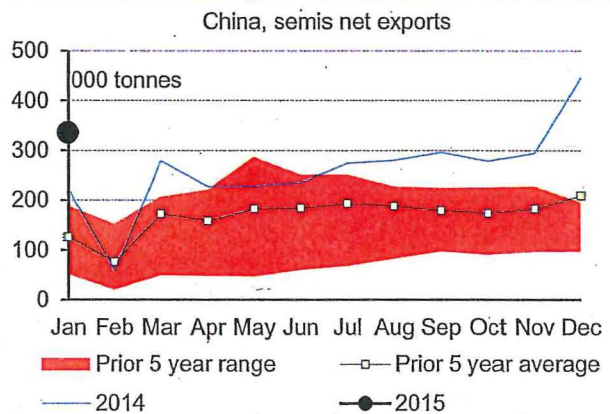
Not surprisingly, China's aluminium industry has shipped increasing amounts of semi-finished products outside the country (Chart 6 and Chart 7).

**Chart 6: China barely exports primary aluminium...**



Source: Antaike, BofA Merrill Lynch Global Commodity Research

**Chart 7: ... but semi shipments have spiked**



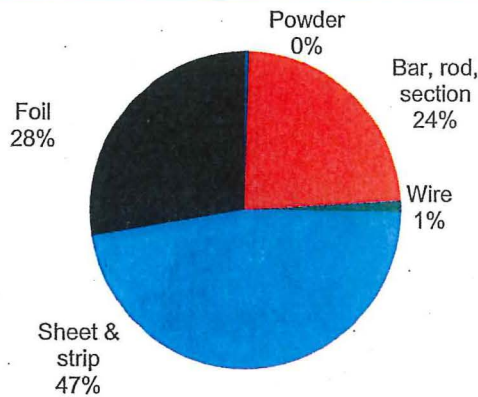
Source: Antaike, BofA Merrill Lynch Global Commodity Research

Most of the semis leaving China are genuine product exports. Yet, there is also strong anecdotal evidence that some primary aluminium leaves the country disguised as semis.

Chart 8 picks up on this, showing that sheet and strip accounted for 47% of shipments in 2014, which is maybe not surprising considering that rolled products receive a 13% VAT rebate. Continuous cast coils fall within this segment and metal shipped in this shape can be re-melted at the destination, effectively becoming a substitute for primary material. Having said all of that, it is worth noting that most of these semis have been destined for nations in China's immediate neighbourhood, which has to some extent sheltered markets like the US and Europe.

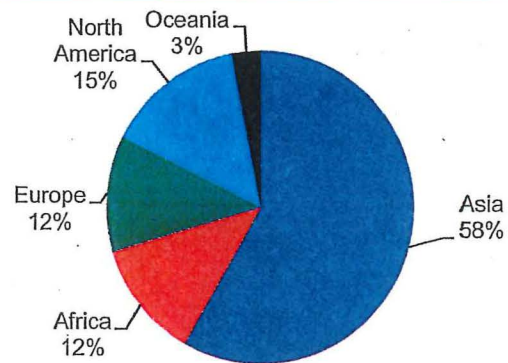
04 March 2015

**Chart 8: Much of the aluminium has left China in the form of sheet and strip**



Source: Antaike, BofA Merrill Lynch Global Commodity Research

**Chart 9: Most of China's semis exports have been destined to Asia, with Vietnam, Malaysia and Korea key recipients**

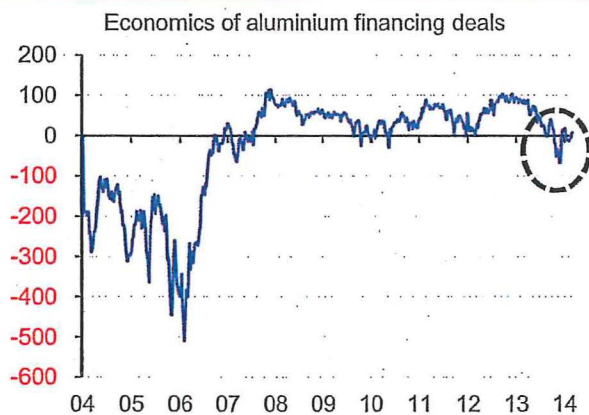


Source: CEIC, BofA Merrill Lynch Global Commodity Research

## Normalisation on LME continues Queues are shortening

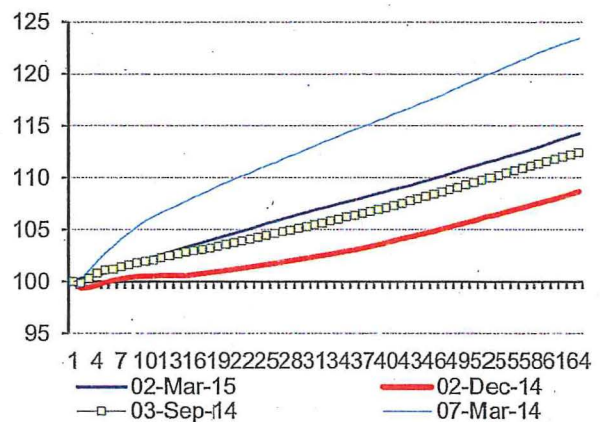
Physical market tightness and record premia in the wake of Financial Crisis were heavily influenced by financing deals. In these transactions, the buyer, typically a financial institution or trader purchases metal for instance at cash prices and simultaneously sells forward for instance at 3-months prices. If forward curves are in contango<sup>2</sup>, returns from these transactions can be positive, especially if reduced warehouse rents (aluminium needs to be stored) can be negotiated; of course, as the position needs to be funded, interest rates matter as well, but they remain quite low.

**Chart 10: The PnL of financing deals has deteriorated**



Source: Bloomberg, LME, BofA Merrill Lynch Global Commodity Research

**Chart 11: Forward curves have flattened**

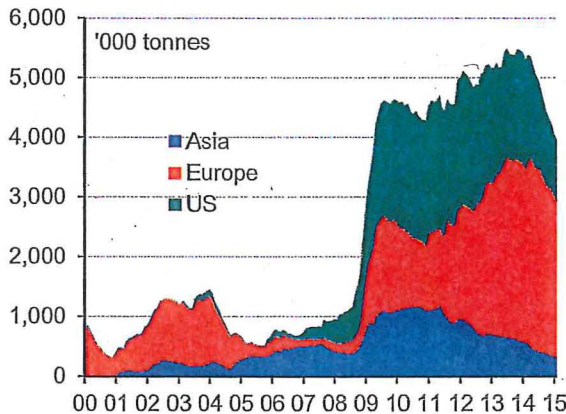


Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

<sup>2</sup> Forward prices can be calculated through a cost-of-carry model, i.e. the cash price is the starting point, and holding costs (such as expenses for storage in warehouses or interest) are added. Holding benefits (e.g. from lending a metal) are deducted. Forward curves are normally in contango, i.e. future prices are higher than the cash price. However, future prices can fall below cash prices when markets are extremely tight. In such a situation, metal consumers are prepared to pay a convenience yield, i.e. spend more to have metal available immediately.

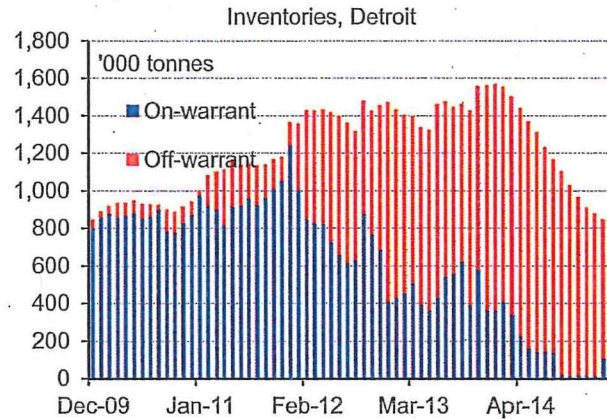
The economics of these transactions are also mirrored by Chart 10, which shows that the PnL of financing deals has been positive since 2008. Yet flatter forward curves in recent weeks have contributed to an increase in metal availability in World ex-China.

**Chart 12: Reported aluminium inventories have declined**



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

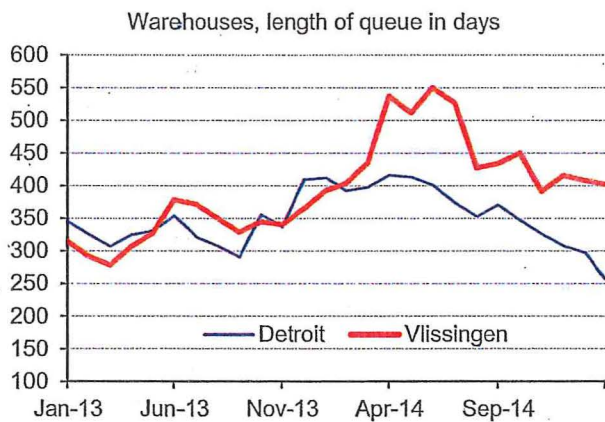
**Chart 13: Hardly any metal is available at warehouses in Detroit**



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

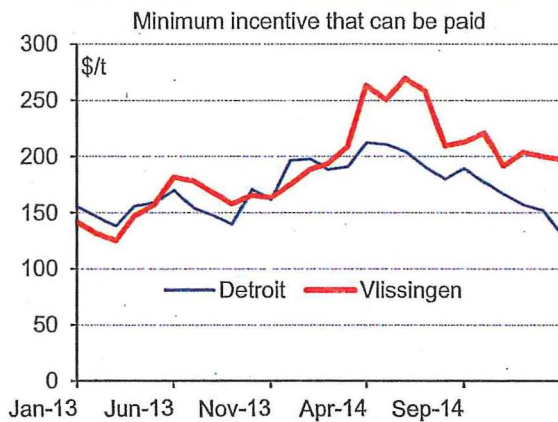
Further to these market dynamics, changes to LME regulations have also increasingly contributed to a normalisation of trading on the exchange. Perhaps, this has been most visible in a shortening of warehouse queues (Chart 14), which has various implications. Most notably, for every day metal is held in a queue, owners need to pay rent, which could in the past be used by warehouses to pay an incentive to attract metal (Chart 15). Partially because queues are getting shorter, the scope to pay incentives has declined, reducing the importance of warehouses as a competitor to purchase material. It is worth noting that the LME has recently announced intentions to reduce the length of queues further and is running a consultation until the end of March.

**Chart 14: Changes to LME regulations have shortened warehouse queues**



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

**Chart 15: Warehouse no longer bid aggressively for metal**



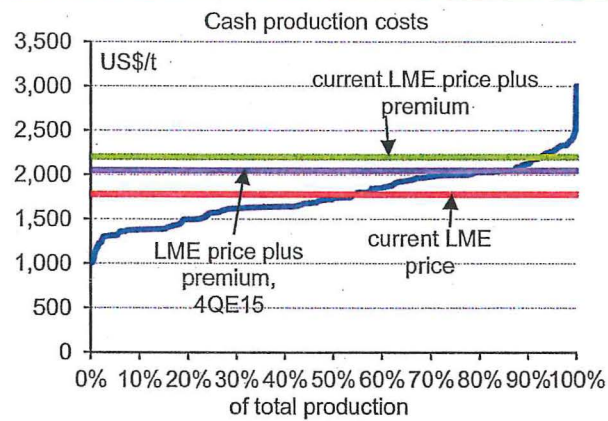
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

As such, we believe global premia have peaked.

## Complete collapse unlikely

Having said all of that, we believe a complete collapse in the aluminium market is unlikely for various reasons. Most notably perhaps, further declines in prices and premia will in all likelihood lead to further production curtailments which may ultimately rebalance the market. Also sharp pressure on nearby prices would steepen the contango, which would in turn increase the economics of financing deals.

**Chart 16: The pressure on global aluminium producers should prevail**



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

**Table 4: Much of the global surpluses accrue in China; World ex-China is actually in deficit**

'000 tonnes	2010	2011	2012	2013	2014E	2015E
Global production	42315	46187	48169	50494	53312	56502
Change YoY	14.0%	9.2%	4.3%	4.8%	5.6%	6.0%
Global consumption	40443	44030	46823	49404	52858	55890
Change YoY	16.6%	8.9%	6.3%	5.5%	7.0%	5.7%
Balance	1872	2156	1346	1090	454	612
Market inventories	6335	6864	7305	7042	7496	8108
LME Cash (\$/t)	2201	2402	2021	1847	1867	1818
LME Cash (c/lb)	100	109	92	84	85	82

Source: Woodmac, CRU, IAI, BofA Merrill Lynch Global Commodity Research

## Appendix

Table 5: Price forecasts, fundamental drivers and risks

Metal	2015E	2016E	Fundamental drivers	Risks (D = downside; U = upside)
Aluminium	\$1,818/t 82c/lb	\$1,850/t 84c/lb	<ul style="list-style-type: none"> <li>Changes to LME regulations are thawing metal flows out of warehouses which may lift prices</li> <li>Premia should decline further.</li> <li>Producers in World ex-China have curtailed production and flatter cost curve suggests restarts are unlikely as prices rise.</li> <li>We forecast a surplus for 2014 and 2015.</li> </ul>	<ul style="list-style-type: none"> <li>D: Instead of a thawing on LME, there is a metal glut</li> <li>D: Production discipline in World ex-China subsides</li> <li>D: China exports more metal from an oversupplied domestic market</li> <li>U: Smelter restraint and/or production disruptions reduce output.</li> <li>U: Stronger than anticipated demand growth</li> </ul>
Copper	\$6,425/t 291c/lb	\$5,864/t 266c/lb	<ul style="list-style-type: none"> <li>Demand growth to be more balanced between China and World ex-China; events in the US and Europe to remain market relevant.</li> <li>China has been destocking through most of 2014; and end to destocking could lift imports.</li> <li>Whilst we anticipate increased mine supply, a glut is unlikely, in part because metal's OPEC may show production restraint.</li> <li>We forecast a small deficit for 2014 and a balanced market in 2015.</li> </ul>	<ul style="list-style-type: none"> <li>D: China re-exports metal</li> <li>D: Recovery of global demand subsides</li> <li>U: Strong restocking through the supply chain on improved confidence</li> <li>U: Continued production disruptions in coming quarters</li> </ul>
Lead	\$2,142/t 97c/lb	\$2,582/t 117c/lb	<ul style="list-style-type: none"> <li>The scrap market has been tight, secondary smelters globally are unlikely to find sufficient feed.</li> <li>Demand to hold up and expand at a steady pace in 2014 on continued recovery of the auto industry.</li> <li>We forecast deficits in 2014/15.</li> </ul>	<ul style="list-style-type: none"> <li>D: Destocking in China or higher lead exports from the country.</li> <li>U: Supply squeeze continues especially on the scrap market.</li> </ul>
Nickel	\$17,750/t 805c/lb	\$22,250/t 1009c/lb	<ul style="list-style-type: none"> <li>Indonesia has implemented an export ban, affecting 15% of global nickel supply.</li> <li>Demand in World ex-China is rebounding</li> <li>We anticipate a balanced market in 2014 and deficits in 2015.</li> </ul>	<ul style="list-style-type: none"> <li>D: NPI producers don't close shop; ore inventories last for longer and more ores are imported from the Philippines.</li> <li>D: Faster ramp-up of Indonesian NPI production</li> <li>D: Stainless steel demand remains subdued</li> </ul>
Zinc	\$2,314/t 105c/lb	\$2,498/t 113c/lb	<ul style="list-style-type: none"> <li>Zinc surpluses have fallen consistently since 2009, a trend we believe will continue, given a lack of mine supply growth</li> <li>China's mines may restart production, but this will be a reaction to rallying prices, i.e. any restart is unlikely to pre-empt rallies.</li> <li>We forecast deficits in 2014/15</li> </ul>	<ul style="list-style-type: none"> <li>D: Unreported inventories exist on the zinc market. More metal could become available.</li> <li>D: The zinc market is fragmented. There is evidence that miners consider further output increases.</li> <li>U: Continued pressure on Chinese smelters.</li> </ul>
Gold	\$1,238/oz	\$1,300/oz	<ul style="list-style-type: none"> <li>We reinforce our view that gold prices are stabilising this year.</li> <li>Sustained demand growth from EM and lack of selling from investors in World ex-China are supportive. India may revise import duties</li> <li>Mine supply growth to remain subdued.</li> <li>Concerns over asset price bubbles, low volatility and an eventual correction should bring buyers back into the market.</li> </ul>	<ul style="list-style-type: none"> <li>D: Deterioration of investor sentiment</li> <li>D: Real rates become less negative; strong equity markets</li> <li>D: High gold prices deter buyers of physical gold; increased scrap supply.</li> </ul>
Platinum Palladium	\$1,340/oz \$813/oz	\$1,600/oz \$900/oz	<ul style="list-style-type: none"> <li>Production in South Africa remains challenged; around 1moz in PT supply has been lost on the back of the strike. Further losses are our base case as miners ramp production.</li> <li>PT in particular remains a proxy trade on Europe's car industry; so recent weakness in Europe is a concern.</li> <li>Rebound of demand from jewellers and auto catalyst producers to drive prices in 2014. We forecast deficit in PT and PD for 2014/15.</li> </ul>	<ul style="list-style-type: none"> <li>D: Jewellery demand suffers due to rising prices.</li> <li>D: In palladium, the risk of deliveries from Russian stockpiles has not gone away</li> <li>D: Demand from key buyers like Europe not increasing</li> <li>U: Production disruptions reduce availability of PT and PD</li> </ul>
Iron Ore	\$70/t CIF	\$65/t CIF	<ul style="list-style-type: none"> <li>The global iron ore market remains oversupplied as production increases.</li> <li>To restore normality on the iron ore market, production curtailments are essential. We forecast a surplus in 2014</li> </ul>	<ul style="list-style-type: none"> <li>D: China's steel production slowing sharply</li> <li>U: Stronger Chinese demand, for instance due to restocking</li> <li>U: Mine closures/ slowdown in production increases</li> </ul>
HCC Thermal coal	\$125/t \$65/t	\$140/t \$72/t	<ul style="list-style-type: none"> <li>We believe the worst is not yet over for the thermal seaborne coal market given continued crippling oversupply and subdued demand.</li> <li>Low prices might be necessary for longer to force production cuts and project reviews. We forecast a surplus in 2014.</li> </ul>	<ul style="list-style-type: none"> <li>D: Lack of supply discipline</li> <li>U: Chinese steel production stronger (HCC)</li> <li>U: mine closures</li> </ul>
WTI and Brent crude oil	\$44.8/bbl \$44.5/bbl	\$57/bbl \$57/bbl	<ul style="list-style-type: none"> <li>The term structure of oil continues to weaken and inventories keep piling up. This frames the stage for lower prices in 1Q15.</li> <li>With oil having to "balance itself" going forward, OPEC has given up on its traditional role of keeping supply and demand in check. The cartel is now effectively dissolved. The consequences of this shift in OPEC policy are profound and long-lasting.</li> <li>The only way to balance an oversupplied market in the absence of a cartel is to destroy market-based supply or encourage incremental demand via lower prices. We forecast 2015 Brent and WTI crude oil prices to average \$52 and \$50/bbl.</li> <li>We see a growing risk of WTI hitting \$32/bbl near term and Brent slipping to \$31/bbl as global oil inventories build sharply from here. To find a floor, the oil market needs to see (1) non-OPEC supply curtailments, (2) OPEC output cuts, or (3) stronger global demand.</li> <li>Since crude oil is a very cyclical commodity and demand and supply are inelastic in the short run, OPEC's formalized policy shift will mean much more volatile oil prices going forward, with a range of possibly \$80/bbl.</li> </ul>	

Source: BofA Merrill Lynch Global Commodity Research



## Key Market Data

Table 6: Commodity prices, exchange rates, equity indices, yields and inventories

Base metals	Cash, \$/t	3-month, \$/t	Cash, WoW change	3-month, WoW change
Aluminium	1,791	1,805	1.1%	0.8%
Copper	5,918	5,882	4.1%	3.7%
Lead	1,745	1,760	-0.1%	-0.3%
Nickel	14,323	14,350	1.8%	1.6%
Tin	18,068	18,050	0.7%	0.4%
Zinc	2,056	2,072	1.2%	1.3%
LMEX	2,723		1.2%	

	Cash, c/lb	3-month, c/lb
Aluminium	81	82
Copper	268	267
Lead	79	80
Nickel	650	651
Tin	820	819
Zinc	93	94

Other commodities, freight, exchange rates, equities and yields	Spot	WoW change
Gold, \$/oz	1,209	0.7%
Silver, \$/oz	16.58	1.8%
Platinum, \$/oz	1,175	1.1%
Palladium, \$/oz	811	3.0%
Iron ore, China fines cfr \$/dmt	62.7	-0.1%
Molybdenum, canned molybdic oxide, \$/lb	8.00	0.0%
Brent, \$/bbl	61.07	3.7%
Baltic Dry Index	524	2.3%
EUR/USD	1.1206	-1.1%
Dow Jones Industrial Average	18,200	0.5%
10-year US Treasury yield	1.983	-3.6%
ML Commodity index, ER	320.694	2.1%
ML Commodity index Industrial Metals, ER	142.589	1.2%
ML Commodity index Precious Metals, ER	159.763	0.2%
ML Commodity index Energy, ER	390.003	3.3%

Exchange stocks and cancelled warrants	Stocks, tonnes	WoW change	Canc. warrants, tonnes	Canc. warr., of stocks
<b>Aluminium</b>				
LME	3,954,375	0.2%	2,207,350	55.8%
Shanghai	188,842	0.0%		
Total aluminium	4,143,217	0.2%		
<b>Copper</b>				
LME	295,025	-1.6%	30,125	10.2%
Comex	16,429	0.8%		
Shanghai	154,671	0.0%		
Total copper	466,125	-1.0%		
<b>Lead</b>				
LME	213,650	1.0%	13,475	6.3%
Shanghai	49,029	0.0%		
Total lead	262,679	0.8%		
<b>Nickel</b>	427,596	0.6%	100,968	23.6%
<b>Tin</b>	10,905	-4.5%	1,725	15.8%
<b>Zinc</b>				
LME	569,025	-1.3%	173,350	30.5%
Shanghai	102,787	0.0%		
Total zinc	671,812	-1.1%		

Source: BofA Merrill Lynch Global Commodity Research

## Price forecasts

Table 7: Base and precious metal price forecasts

		Current	1Q15E	2Q15E	3Q15E	4Q15E	1Q16E	2Q16E	2015E	2016E	2017E	2018E	LT price
<b>Base metals</b>													
Aluminium	US\$/t	1,781	1,874	1,750	1,800	1,850	1,800	1,800	1,818	1,850	1,900	2,000	2,798
	US\$/lb	81	85	79	82	84	82	82	82	84	86	91	127
Aluminium premium	US\$/t		400	333	267	200	200	200	300	200	200		
Copper	US\$/t	5,842	5,700	6,350	6,900	6,750	6,175	5,700	6,425	5,864	7,500	8,000	7,300
	US\$/lb	265	259	288	313	306	280	259	291	266	340	363	331
Lead	US\$/t	1,739	1,900	1,962	2,205	2,500	2,500	2,609	2,142	2,582	2,645	2,563	2,458
	US\$/lb	79	86	89	100	113	113	118	97	117	120	116	111
Nickel	US\$/t	13,615	15,500	16,500	17,500	21,500	21,500	20,000	17,750	22,250	16,754	17,037	22,553
	US\$/lb	618	703	748	794	975	975	907	805	1,009	760	773	1,023
Zinc	US\$/t	2,009	2,150	2,205	2,403	2,500	2,491	2,500	2,314	2,498	2,750	2,577	2,287
	US\$/lb	91	98	100	109	113	113	113	105	113	125	117	104
<b>Precious metals</b>													
Gold, nominal	US\$/oz	1,205	1,250	1,150	1,250	1,300	1,300	1,300	1,238	1,300	1,400	1,400	1,508
Gold, real	US\$/oz		1,250	1,150	1,250	1,300	1,268	1,268	1,238	1,268	1,333	1,300	1,300
Silver, nominal	US\$/oz	16.31	18.00	16.50	19.00	20.00	19.00	19.00	18.38	19.00	25.00	24.98	23.19
Silver, real	US\$/oz		18.00	16.50	19.00	20.00	18.54	18.54	18.38	18.54	23.80	23.19	20.00
Platinum	US\$/oz	1,190	1,260	1,300	1,400	1,400	1,550	1,550	1,340	1,600	1,775	1,834	2,001
Palladium	US\$/oz	832	750	800	850	850	900	900	813	900	1,000	1,076	1,053

Source: BofA Merrill Lynch Global Commodity Research

Table 8: Bulk commodities, exotic commodities and steel price forecasts

		Current	1Q15E	2Q15E	3Q15E	4Q15E	1Q16E	2Q16E	2015E	2016E	2017E	2018E	LT price
<b>Bulk Commodities</b>													
Hard coking coal	US\$/t fob		120.0	120.0	130.0	130.0	140.0	140.0	125.0	140.0	145.0	151.7	169.1
Low vol PCI	US\$/t fob		98.4	98.4	106.0	105.3	110.6	110.6	102.0	110.6	111.7	114.6	123.5
Semi-soft	US\$/t fob		85.8	85.8	93.0	93.0	96.6	96.6	89.4	96.6	98.6	100.4	106.5
Thermal Coal	US\$/t fob	62.65	64.0	64.0	66.0	66.0	72.0	72.0	65.0	72.0	82.0	86.8	98.7
Iron ore fines, spot	US\$/t CIF	62.28	77.5	72.5	60.0	70.0	70.0	65.0	70.0	65.0	70.0	75.0	87.0
<b>Exotic commodities</b>													
Uranium	\$/lb	39.50	35.00	35.00	38.00	38.00	40.00	40.00	36.50	43.75	55.00	59.28	69.55
Molybdenum	\$/lb	8.13	9.50	9.50	10.00	10.00	10.00	10.00	9.75	10.50	12.00	12.00	12.30
Ilmenite	US\$/t								210	245	245	247	256
Rutile	US\$/t								1,138	1,350	1,470	1,400	1,292
Zircon	US\$/t								1,325	1,400	1,300	1,252	1,185
<b>Steel, HRC</b>													
HRC, Europe	US\$/t		547	547	547	547	555	555	547	555	565	576	
HRC, US	US\$/t		689	689	689	689	662	662	689	662	662	662	
HRC, China	US\$/t		490	490	490	490	504	504	490	504	523	0	

Source: BofA Merrill Lynch Global Commodity Research

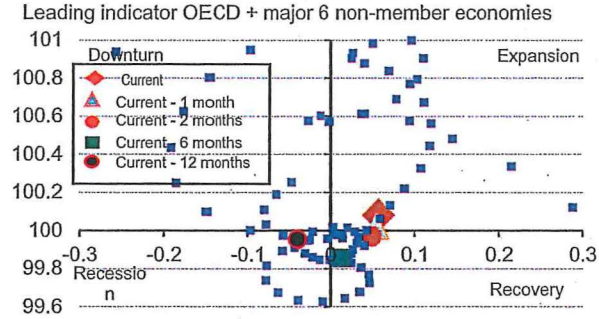
Table 9: Energy price forecasts

Energy		Current	1Q15E	2Q15E	3Q15E	4Q15E	1Q16E	2Q16E	2015E	2016E	2017E	2018E	LT price
Brent	US\$/bbl	60.4	31.0	43.0	47.0	57.0	58.0	58.0	44.5	58.0	79.8	95.0	95.0
WTI	US\$/bbl	50.6	32.0	43.0	47.0	57.0	57.0	57.0	44.8	57.0	74.8	90.0	90.0
Henry Hub	US\$/MMBtu	2.72	3.85	3.70	3.95	4.15	4.25	4.25	3.91	4.25	4.36	4.47	4.70

Source: BofA Merrill Lynch Global Commodity Research

## Macro, momentum and market indicators

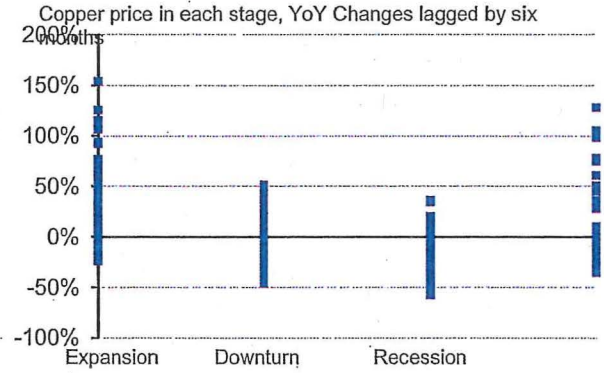
Chart 17: Global cycle dial



Leading indicator OECD + major 6 non-member economies, MoM change

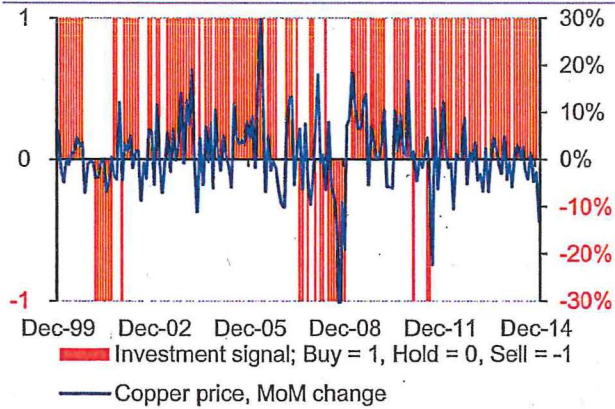
Source: Reuters Ecowin Pro, BofA Merrill Lynch Global Commodity Research

Chart 18: Copper prices relative to cycle stage



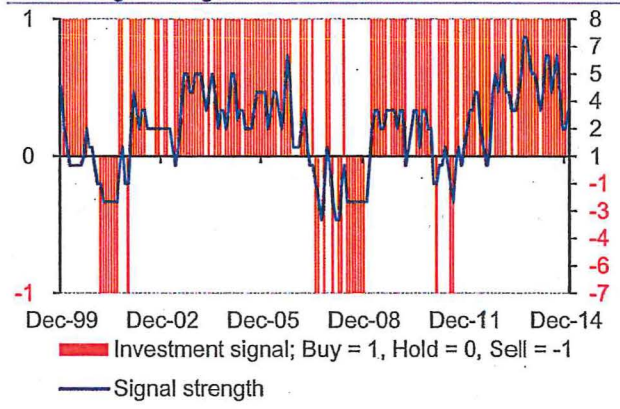
Source: Reuters Ecowin Pro, BofA Merrill Lynch Global Commodity Research

Chart 19: Pressure Indicator



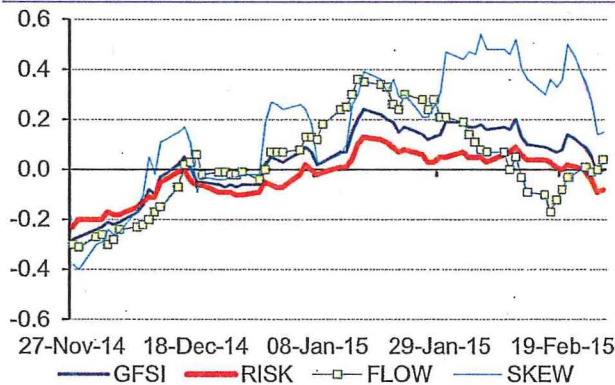
Source: Reuters Ecowin Pro, BofA Merrill Lynch Global Commodity Research

Chart 20: Signal strength of Pressure Indicator



Source: Reuters Ecowin Pro, BofA Merrill Lynch Global Commodity Research

Chart 21: Global Financial Stress Index and sub-index



Source: Reuters Ecowin Pro, BofA Merrill Lynch Global Commodity Research

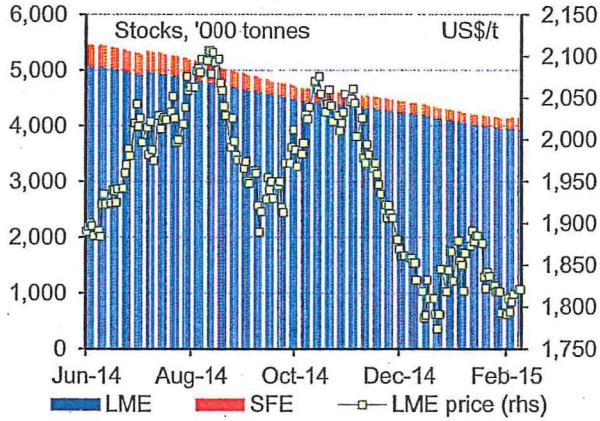
Chart 22: GFSI and copper prices



Source: Reuters Ecowin Pro, BofA Merrill Lynch Global Commodity Research

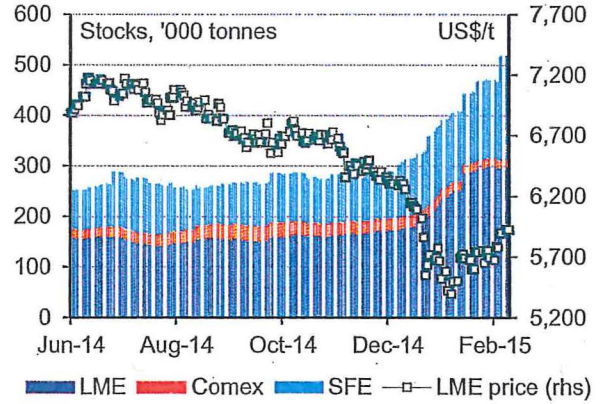
## Exchange inventories and prices

Chart 23: Aluminium



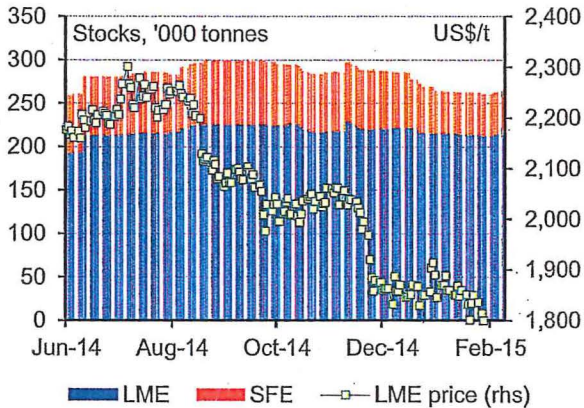
Source: Bloomberg

Chart 24: Copper



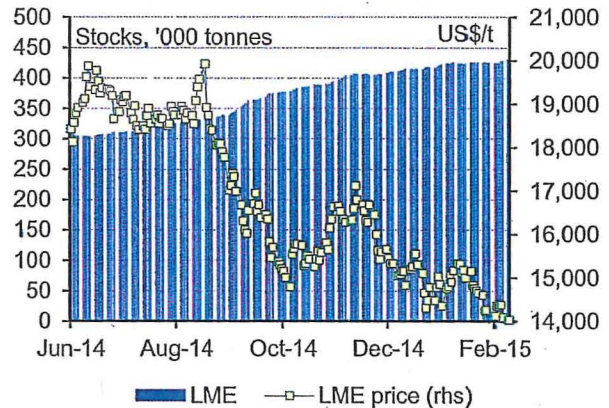
Source: Bloomberg

Chart 25: Lead



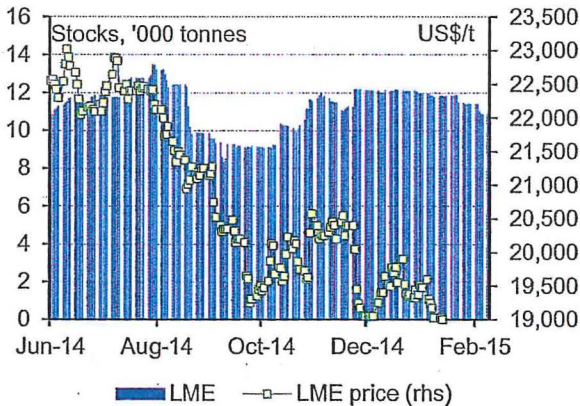
Source: Bloomberg

Chart 26: Nickel



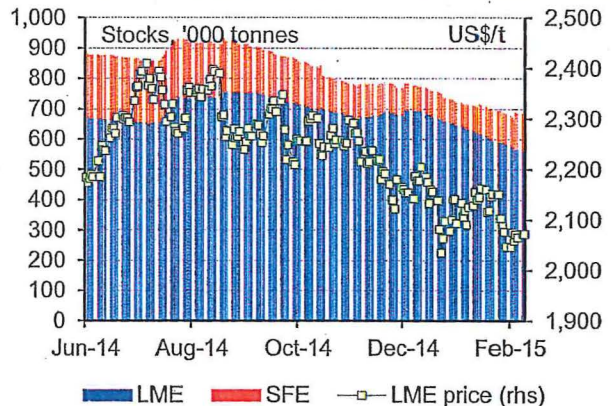
Source: Bloomberg

Chart 27: Tin



Source: Bloomberg

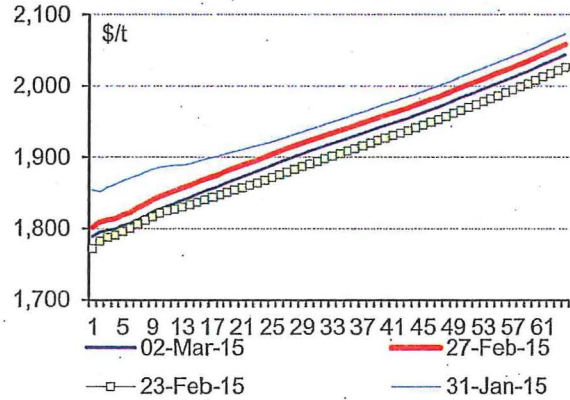
Chart 28: Zinc



Source: Bloomberg

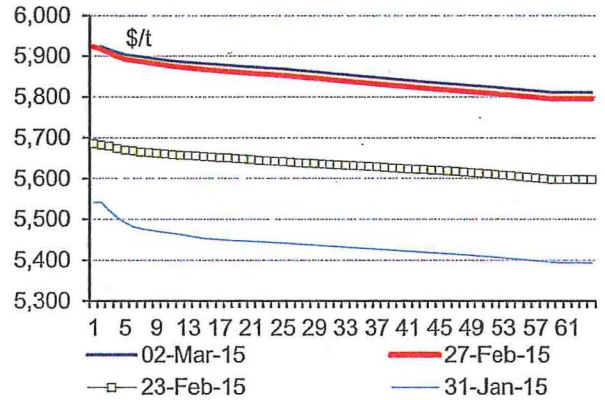
## Forward curves

Chart 29: Aluminium



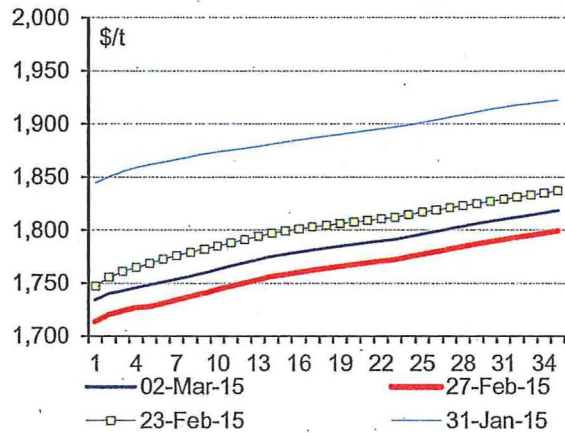
Source: Bloomberg

Chart 30: Copper



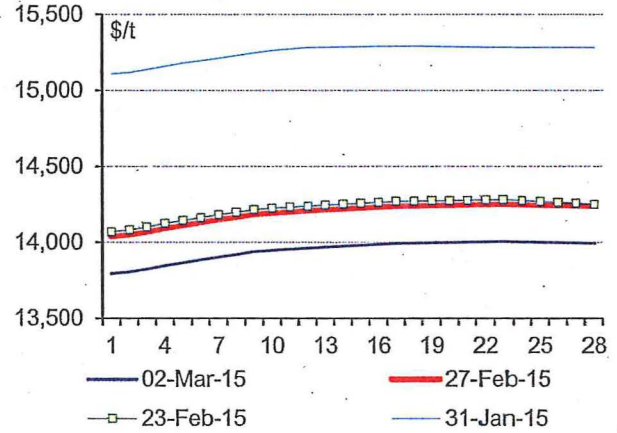
Source: Bloomberg

Chart 31: Lead



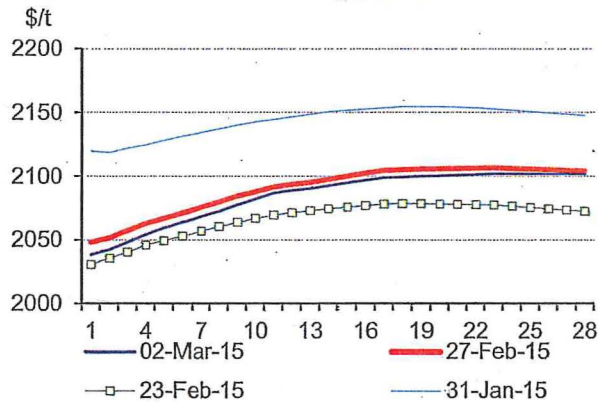
Source: Bloomberg

Chart 32: Nickel



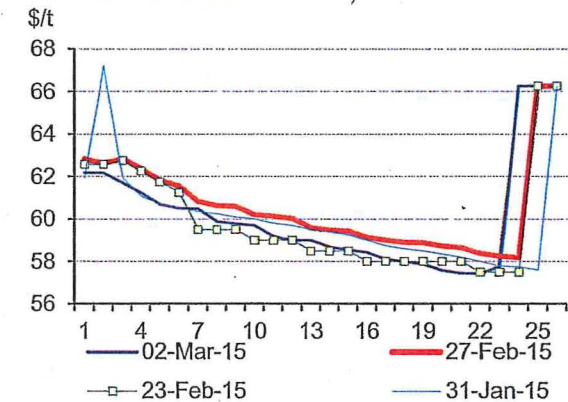
Source: Bloomberg

Chart 33: Zinc



Source: Bloomberg

Chart 34: Iron ore

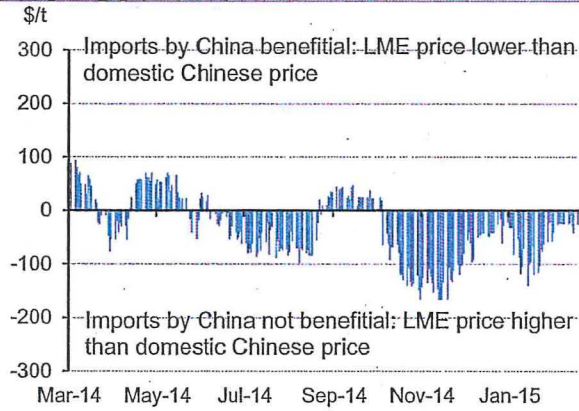


Source: Bloomberg

## Arbitrage domestic Chinese and LME prices

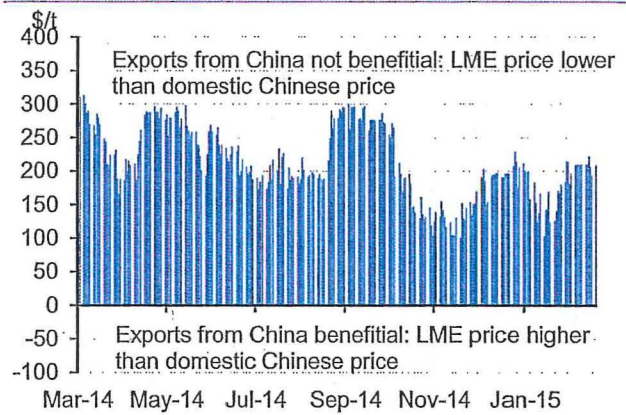
Note: arbitrage includes adjustments for VAT and import/export taxes/duties

**Chart 35: Aluminium, imports**



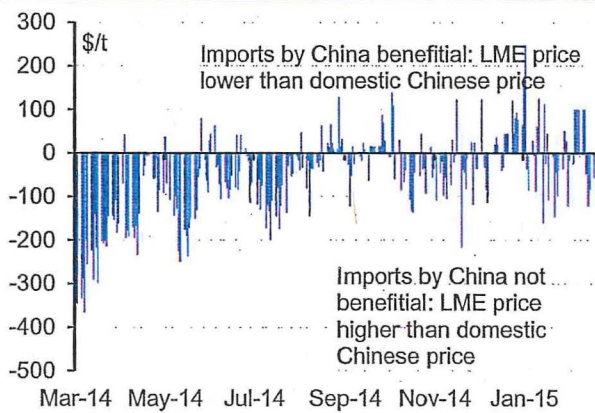
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

**Chart 36: Aluminium, exports**



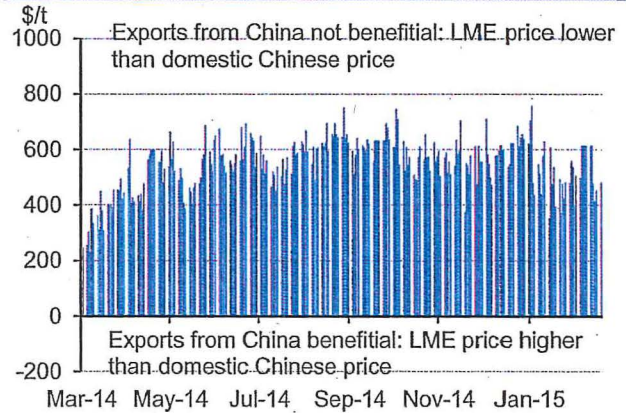
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

**Chart 37: Copper, imports**



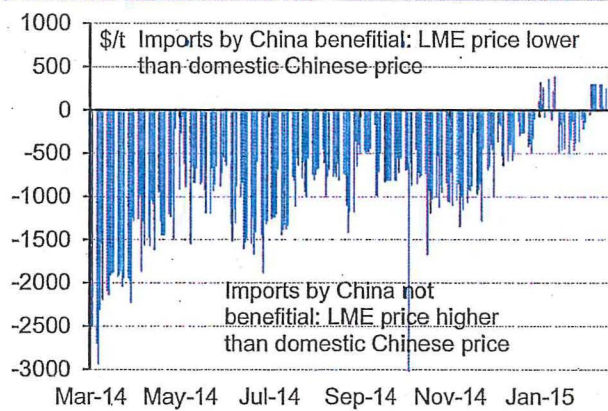
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

**Chart 38: Copper, exports**



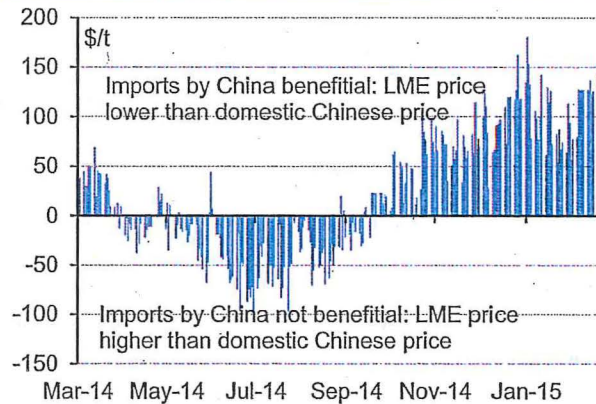
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

**Chart 39: Nickel, imports**



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

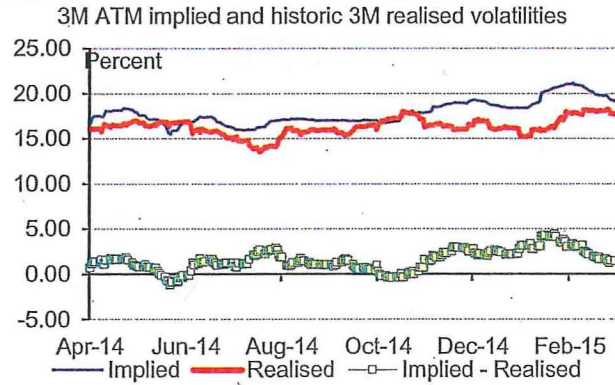
**Chart 40: Zinc, imports**



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

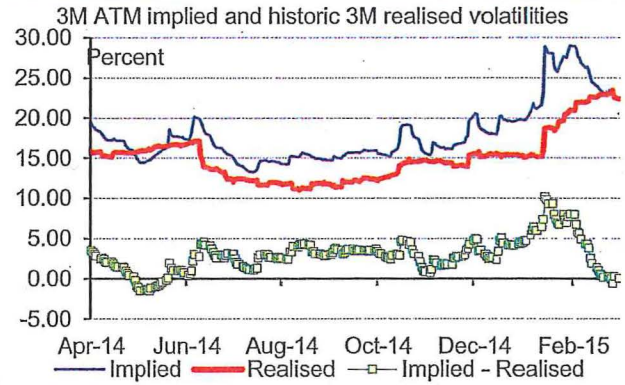
## Implied and realised ATM volatility

Chart 41: Aluminium



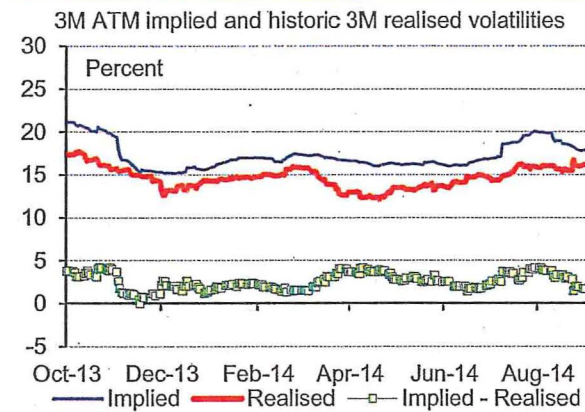
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 42: Copper



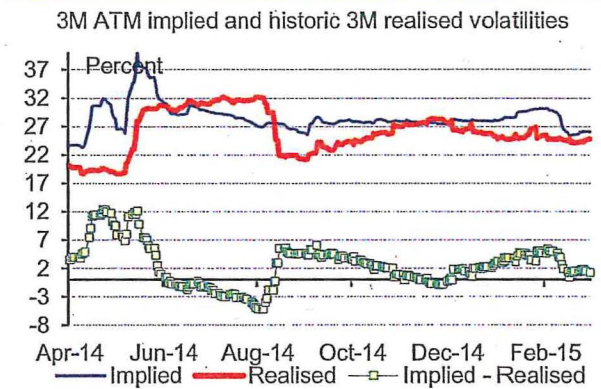
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 43: Lead



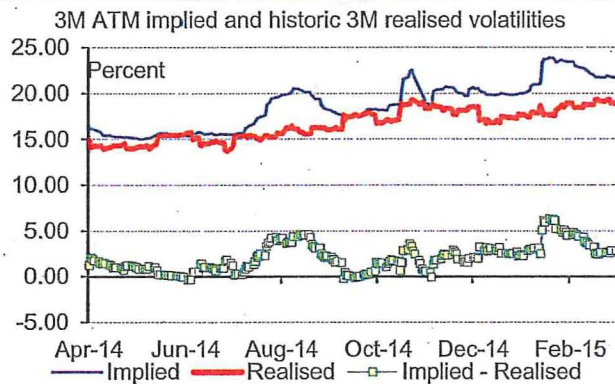
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 44: Nickel



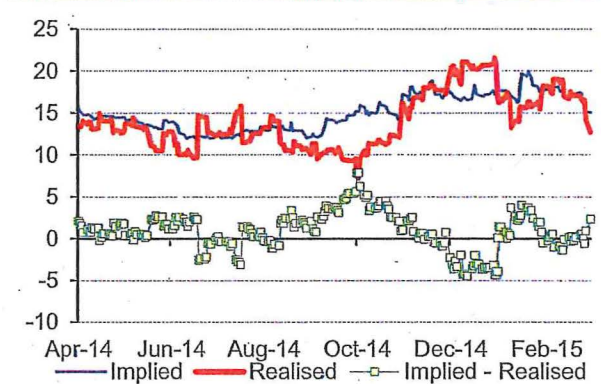
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 45: Zinc



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 46: Gold

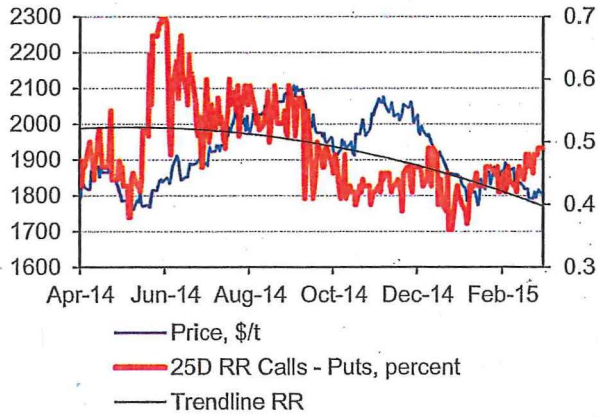


Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

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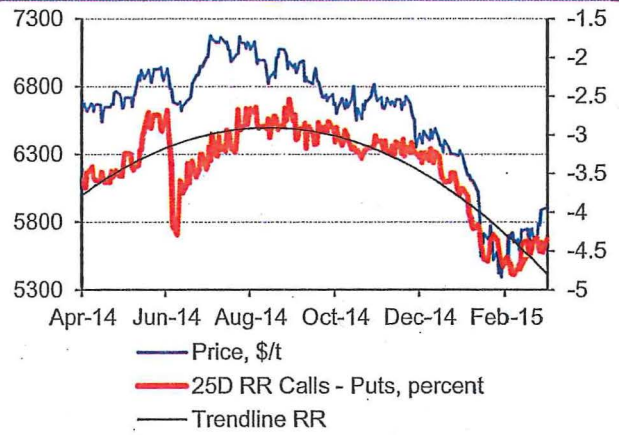
## Metal skews

Chart 47: Aluminium



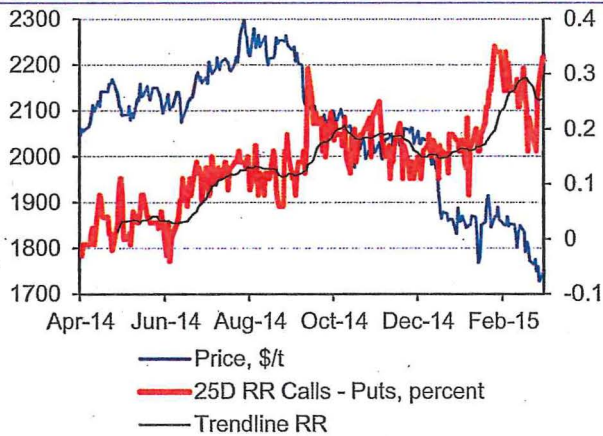
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 48: Copper



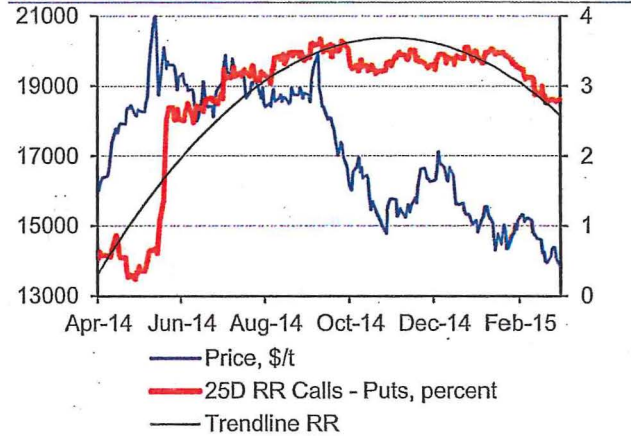
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 49: Lead



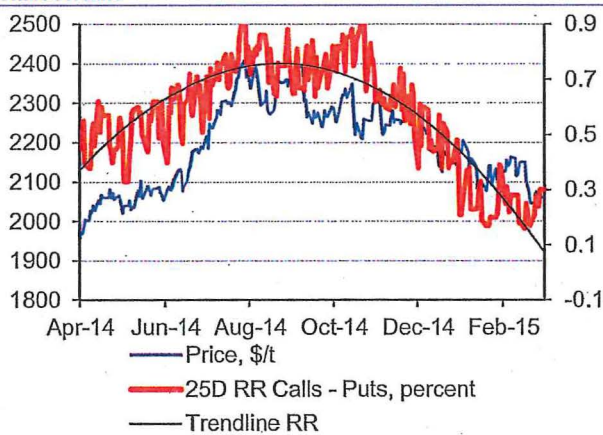
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 50: Nickel



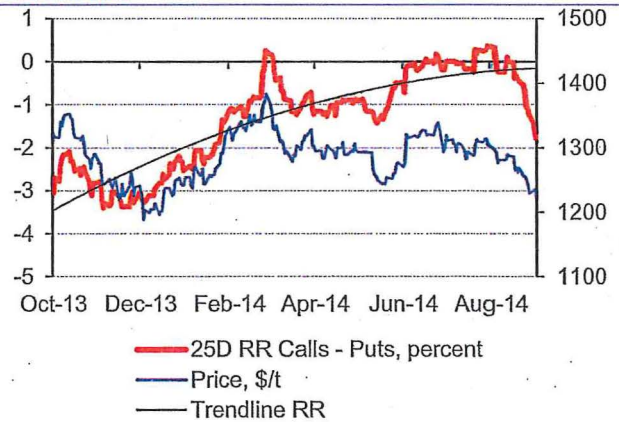
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 51: Zinc



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 52: Gold

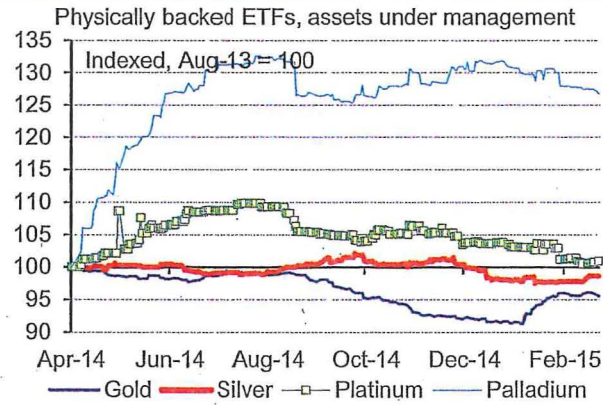


Source: Bloomberg, BofA Merrill Lynch Global Commodity Research



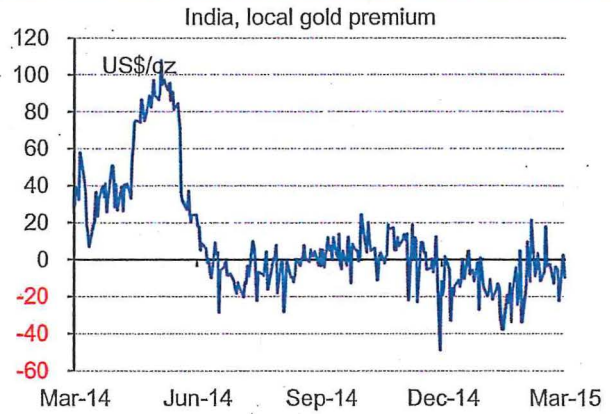
## Precious metals

Chart 53: ETFs



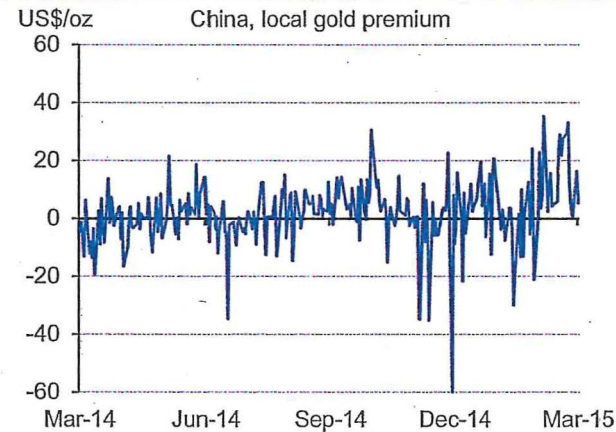
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 54: India, gold premium



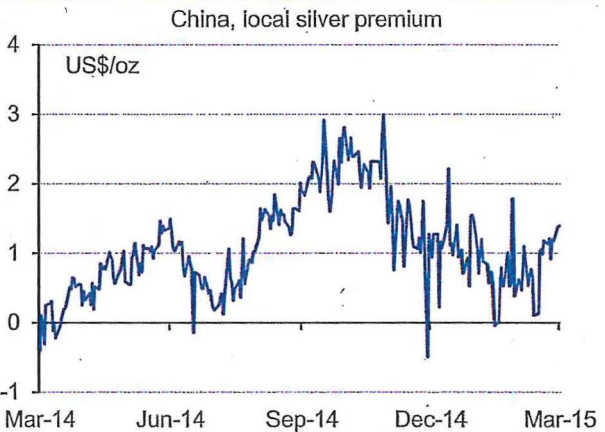
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 55: China, gold premium



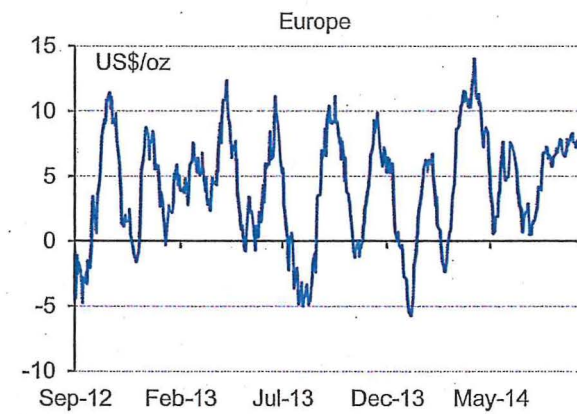
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 56: China, silver premium



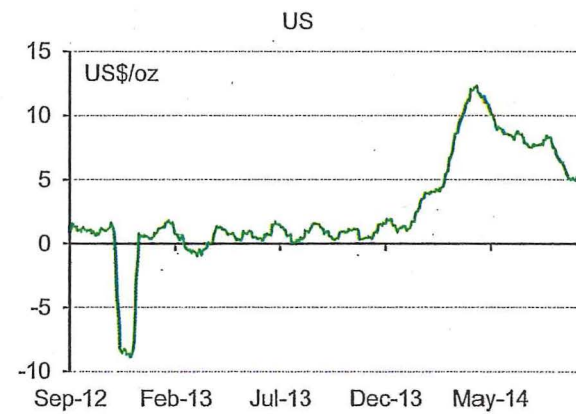
Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 57: Platinum, sponge differential



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

Chart 58: Platinum, sponge differential



Source: Bloomberg, BofA Merrill Lynch Global Commodity Research

04 March 2015

Table 10: Global Commodity Research Publications - Past Topics\*

Date	Publication	Title
02-Mar-15	Commodity Portfolio Monthly	Commodity alpha reloaded
27-Feb-15	Global Metals Weekly	The long view: Metals before China and after
27-Feb-15	Global Energy Weekly	Heating oil holding crude
20-Feb-15	Global Energy Weekly	Oil drop set to feed into US gas
18-Feb-15	Global Metals Weekly	On the cusp of a gold bull market
13-Feb-15	Global Energy Weekly	Floating oil
06-Feb-15	Global Metals Weekly	China's power sector still electrifies copper demand
06-Feb-15	Global Energy Paper	Medium term oil outlook
02-Feb-15	Commodity Portfolio Monthly	Gold Singularity
30-Jan-15	Global Energy Weekly	Battle of wills for oil suppliers
30-Jan-15	Global Metals Weekly	Metals in a world run by central banks
23-Jan-15	Global Energy Weekly	Peak oil demand on ice
20-Jan-15	Global Metals Weekly	No synchronized global growth = no upside to base metals
15-Jan-15	Global Energy Weekly	Cash is king for oil
09-Jan-15	Global Metals Weekly	China's aluminium product exports cap LME prices
06-Jan-15	Global Energy Weekly	How low can oil go?
02-Jan-15	Commodity Portfolio Monthly	Flying cows and sinking barrels
19-Dec-14	Global Metals Weekly	Extracting alpha out of metals
19-Dec-14	Global Energy Weekly	Oil refiners running hard
12-Dec-14	Global Energy Weekly	Propane hits a wall
05-Dec-14	Global Metals Weekly	Oil collapses, metals hold up
04-Dec-14	Global Energy Weekly	Saudi put no more
01-Dec-14	Commodity Portfolio Monthly	2015 Commodity index rebalancing
27-Nov-14	Global Energy Weekly	The end of OPEC
25-Nov-14	Commodity Strategist	2015 Commodity Outlook
24-Nov-14	Global Energy Strategist	2015 Energy Outlook
24-Nov-14	Metals Strategist	2015 Metals & Bulk Outlook
20-Nov-14	Global Energy Weekly	Saudinomics for beginners
14-Nov-14	Global Metals Weekly	Gold and central bank disparity
14-Nov-14	Global Energy Weekly	Diesel cracks up on oil
07-Nov-14	Global Metals Weekly	Copper and global growth momentum
07-Nov-14	Global Energy Weekly	A liquid gas surplus
03-Nov-14	Commodity Portfolio Monthly	Rethinking commodity sectors
31-Oct-14	Global Energy Weekly	Coal mine Canary says \$55 risk
24-Oct-14	Global Metals Weekly	Swiss Gold referendum: impact on gold, FX and rates
23-Oct-14	Global Energy Weekly	The tail in US shale
15-Oct-14	Global Metals Weekly	Long base metals, short coal / iron ore
14-Oct-14	Global Energy Weekly	A new normal for oil
09-Oct-14	Global Energy Weekly	Fragmented gas
07-Oct-14	Global Metals Weekly	Ranking Precious Metal fundamentals
03-Oct-14	Global Energy Weekly	Digesting a lighter crude slate
02-Oct-14	Commodity Portfolio Monthly	Commodities against the dollar
26-Sep-14	Global Metals Weekly	Macro versus micro: the metals heat grid
24-Sep-14	Global Energy Weekly	Sinking in the North Atlantic
18-Sep-14	Global Metals Weekly	Zinc rebalancing continues, but near-term risks
18-Sep-14	Global Energy Weekly	Forward oil price guidance
12-Sep-14	Global Metals Weekly	Macro cross-currents haven't drowned bullish fundamentals
09-Sep-14	Global Energy Weekly	Does Saudi want \$85 oil?
05-Sep-14	Global Metals Weekly	Nickel on track for deficit
04-Sep-14	Global Energy Weekly	Too much of a good thing
02-Sep-14	Commodity Portfolio Monthly	Contrarian positioning
29-Aug-14	Global Metals Weekly	Gold over copper on Europe
28-Aug-14	Global Energy Weekly	Condensed view of condensate
22-Aug-14	Global Metals Weekly	China will not wreck the global aluminium market
18-Aug-14	Global Energy Weekly	Oil after US hegemony
14-Aug-14	Global Metals Weekly	Physical copper market weakness
12-Aug-14	Global Energy Weekly	OPEC discord and oil stability
06-Aug-14	Global Energy Weekly	Steady as she goes
04-Aug-14	Commodity Portfolio Monthly	Chasing commodity alpha tails
30-Jul-14	Global Energy Weekly	Summertime sadness
24-Jul-14	Global Metals Weekly	Deriving price signals from forward curves
20-Jul-14	Global Energy Weekly	Revisiting our oil forecast

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Table 10: Global Commodity Research Publications - Past Topics\*

Date	Publication	Title
15-Jul-14	Global Metals Weekly	Gold is a rock
15-Jul-14	Global Energy Weekly	Brent contango set to hit WTI
10-Jul-14	Global Energy Weekly	A dim light in the coal shaft
10-Jul-14	Metals Strategist	Commodities look past China
03-Jul-14	Global Energy Weekly	The United Petrostates of America
01-Jul-14	Commodity Portfolio Monthly	Consistent Congestion
27-Jun-14	Global Metals Weekly	Platinum in deficit; producer stocks depleted
27-Jun-14	Global Energy Weekly	Uptight oil
22-Jun-14	Global Energy Weekly	Beware of seasonality in LNG
18-Jun-14	Global Metals Weekly	Aluminium sees remarkable improvement of fundamentals
15-Jun-14	Global Energy Weekly	Iraq on fire once again
11-Jun-14	Global Metals Weekly	Copper's Waterloo is not in Qingdao
06-Jun-14	Global Energy Weekly	Is America full of hot air?
02-Jun-14	Commodity Portfolio Monthly	Selling vol in a low vol regime
29-May-14	Global Metals Weekly	Back in the black
23-May-14	Global Energy Weekly	A new anchor for global gas
21-May-14	Global Metals Weekly	What miners think
16-May-14	Global Energy Weekly	American liquids breaking bad
09-May-14	Global Energy Weekly	Swimming in summer gasoline
07-May-14	Global Metals Weekly	Spend a nickel to make a dime
02-May-14	Global Energy Weekly	The long and the short of US nat gas
01-May-14	Commodity Portfolio Monthly	The inflation hedge that pays
28-Apr-14	Global Metals Weekly	Tighter emission standards boost aluminium demand
24-Apr-14	Global Energy Weekly	Decomposing WTI
20-Apr-14	Global Metals Weekly	Nickel the new cop in town, not copper
10-Apr-14	Global Energy Weekly	Exporting American Energy
10-Apr-14	Global Energy Weekly	Heavy oil backwardation
07-Apr-14	Global Metals Weekly	Kicking aluminium (can) down the road
02-Apr-14	Global Energy Weekly	Grounded jet
02-Apr-14	Commodity Portfolio Monthly	Spot price mean reversion
31-Mar-14	Global Metals Weekly	Taking stock on China's copper and iron ore inventories
27-Mar-14	Global Energy Weekly	Solid Gas
20-Mar-14	Global Metals Weekly	China gets serious about reforms
20-Mar-14	Global Energy Weekly	Another bad year for king coal
14-Mar-14	Global Metals Weekly	Mining: going back to the roots
14-Mar-14	Global Energy Weekly	One last year of LNG tightness
04-Mar-14	Global Metals Weekly	Hedging China trust default with copper
04-Mar-14	Global Energy Weekly	The Ukraine energy face off
03-Mar-14	Commodity Portfolio Monthly	Curve Alpha Carry
26-Feb-14	Global Energy Weekly	Heat up the World Cup
21-Feb-14	Global Metals Weekly	Gold rises as the world stumbles
17-Feb-14	Global Energy Paper	Medium term oil outlook
12-Feb-14	Global Energy Weekly	The end of US gasoline
11-Feb-14	Global Metals Weekly	Lead rebalancing, but time spreads have moved too early
05-Feb-14	Global Energy Weekly	North American oil reigns supreme
03-Feb-14	Commodity Portfolio Monthly	Hedging inflation under a strong USD
03-Feb-14	Global Metals Weekly	Aluminium at critical crossroads
29-Jan-14	Commodity Derivatives Insights	Natural Convexity
27-Jan-14	Global Energy Weekly	US nat gas at crucial juncture
23-Jan-14	Global Metals Weekly	Indonesia's export ban: impact on copper...
22-Jan-14	Global Energy Weekly	WTI set to test \$100
17-Jan-14	Global Metals Weekly	China New Year: bullish copper
15-Jan-14	Global Energy Weekly	All eyes on Saudi
09-Jan-14	Global Metals Weekly	Gold and silver: headwinds persist for now
08-Jan-14	Global Energy Weekly	Polar pig leaves US nat gas cold
02-Jan-14	Commodity Portfolio Monthly	Commodities lag equities by most in 15 years
20-Dec-13	Commodity Derivatives Insights	Delta-hedged strangle selling
20-Dec-13	Global Metals Weekly	No silver lining as Fed tapers

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