National Australia Bank

BASE METALS MARKET

2017 IN REVIEW & 2018 OUTLOOK

December 2017

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SUMMARY

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What a year 2017 has been for the base metals market. The base metals complex outperformed expectations for the second consecutive year, with some metals exceeding expectations, some performing largely as expected and some disappointing.

Aluminium has been the biggest surprise this year, with price rises of 23% year to date on Chinese capacity cuts, when a year ago analysts were forecasting a supply glut and price declines. Dr. Copper also surprised on the upside, reflecting overall better-than-expected Chinese and global economic conditions, as well as significant supply reductions earlier this year. Zinc and lead performed largely as expected, with the former continuing to be supported by a lack of mined supply and further price rises expected in 2018. While nickel experienced the biggest price volatility during 2017, it underperformed market expectations, with only modest gains year to date despite significant supply uncertainty in the Philippines earlier this year.

In this note, we review each metal's performance in the past year and present the outlook for 2018. Zinc continues to be our top pick, while other metals might experience some price pull-back from current elevated levels. Forecasting nickel price movements will continue to be difficult given the hype around car battery demand and policy uncertainty in key supplying countries.

Detailed price forecasts can be found on the last page.

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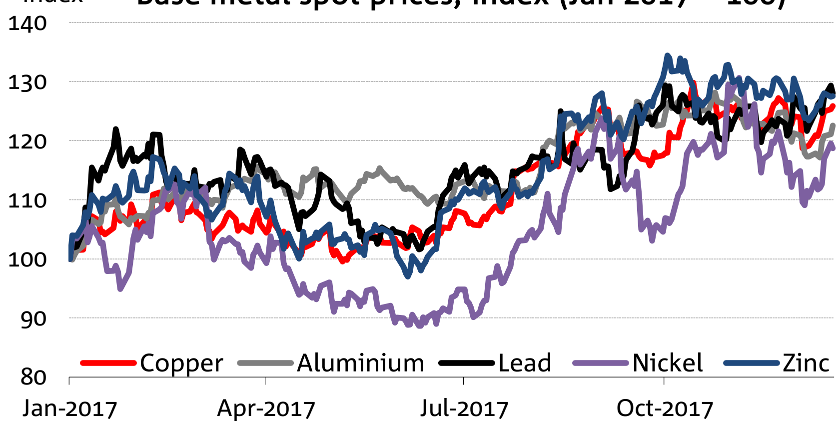
Base metal spot prices, index (Jan 2017 = 100)



Source: Bloomberg

2017 Relative Performance

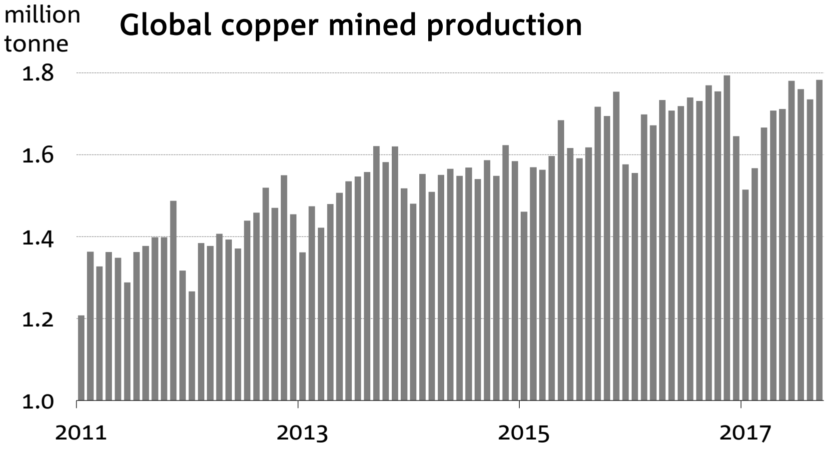
Rank	YTD gain	Biggest price swing
1	Zinc (+28%)	Nickel
2	Lead (+27%)	Zinc
3	Copper (+26%)	Copper
4	Aluminium (+23%)	Lead
5	Nickel (+17%)	Aluminium

Note:
Price swing is measured by relative standard deviation.
Source: Bloomberg

COPPER

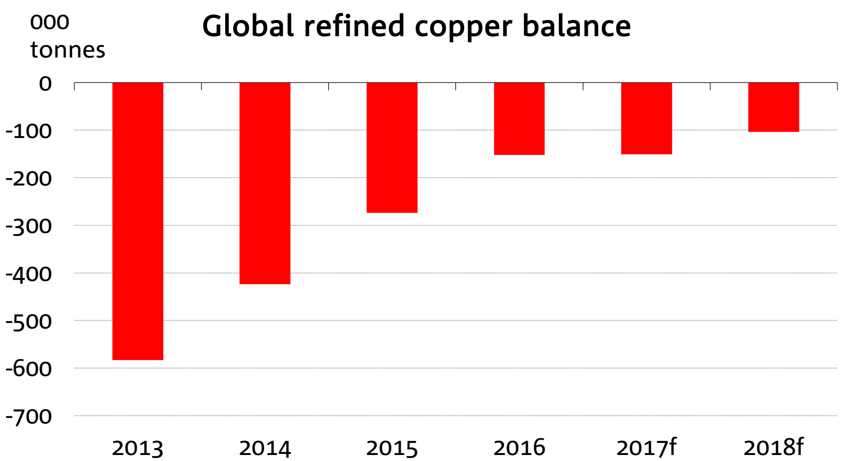
2017 Surprised on the upside. Small deficit expected in 2018

CONCENTRATES SUPPLY TOOK A HIT EARLIER THIS YEAR



Source: Bloomberg

SMALL MARKET DEFICIT EXPECTED IN 2018



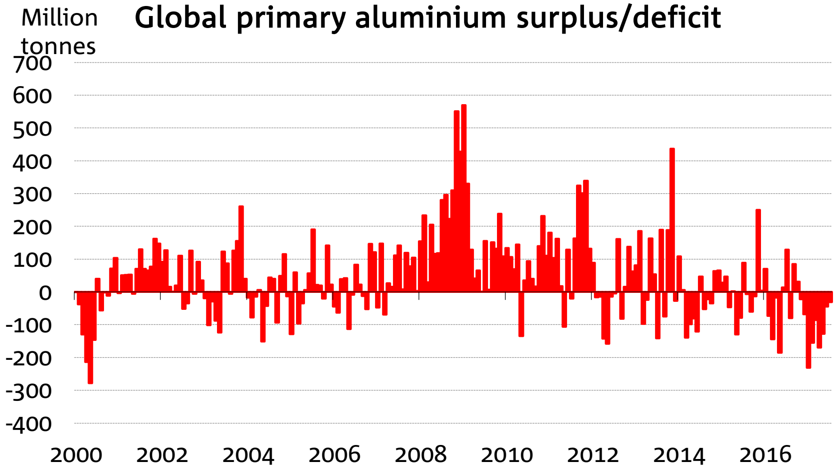
*China apparent usage basis
Source: International Copper Study Group, NAB

- Copper exceeded expectations in 2017 as demand proved stronger than expected while supply suffered some major disruptions. LME copper prices were up 26% year to date, reaching $6906/t on 19 December. This beats the consensus forecast a year ago expecting price declines through the year to reach $5191/t.
- Looking back, copper demand, especially from China, turned out to be better than expected. China's housing market proved resilient, while global economic growth also strengthened over the year. There were more surprises on the supply side. Earlier this year, two of the biggest copper mines, Escondida in Chile and Grasberg in Indonesia both experienced prolonged disruptions, while other producers also suffered cutbacks due to declining ore grades and weather factors.
- While labour disputes and weather factors continue to pose a risk to supply going forward, we do not expect supply cuts to be as severe as what we've seen earlier this year. Combined with capacity restarts in the Democratic Republic of Congo and Zambia and to a lesser extent additional output from new projects/expansions, we expect to see world mine production increase slightly in 2018.
- Better availability of copper concentrates should see refined production increase as well in 2018. That will however be limited to some extent by China's recent ban on scrap imports.
- On the demand side, Chinese demand growth is expected to be slow but stable, while the pickup in global activity should support copper demand. Downside risks remain around China's property market outlook, where lower population growth, tighter credit conditions and weaker price growth could see real estate investment growth slow.
- Overall, we expect a small market deficit in 2018, with prices averaging $6645/t. There is a risk the deficit could widen beyond 2018 should currently proposed new projects not go ahead.

ALUMINIUM

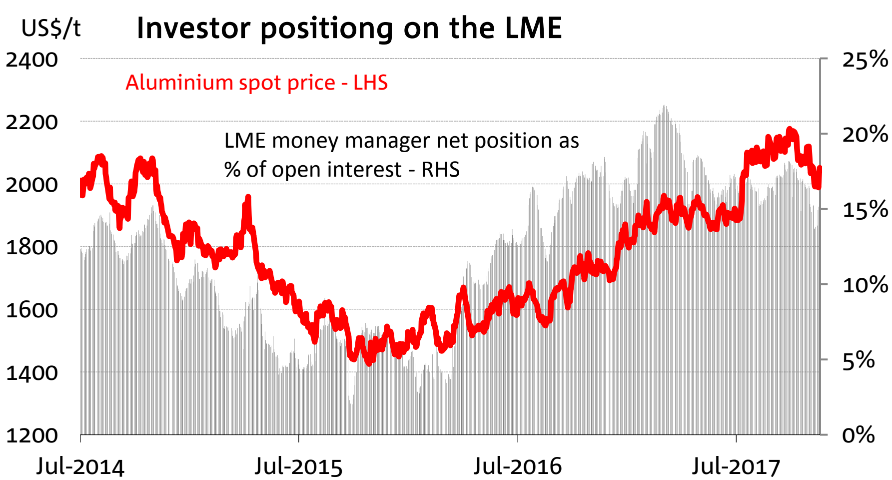
Who would have thought?

GLOBAL PRIMARY ALUMINIUM MARKET IN DEFICIT



Source: Bloomberg

INVESTOR POSITIONING REMAINS BULLISH, ALTHOUGH PARED BACK



Source: Bloomberg

- As if forecasting market fundamentals was not hard enough, throw in the policy uncertainty, and we have the surprise of the year – aluminium. Widely tipped to suffer price falls a year ago given anticipated significant capacity additions in China, aluminium outperformed everybody's expectation on Chinese government capacity curtailment policies. Prices were up 22% year to date, to reach $2081/t on 19 December. This is well above consensus expectation a year ago of $1666/t and more than $100/t higher than even the most bullish forecast.
- We highlighted in last year's note that the aluminium industry had been singled out by the Chinese government as "severely over capacitated" in its new five year plan for the non-ferrous metals sector and that a joint statement was issued with the US post the G20 meeting in September to tackle global excess supply. However no one anticipated the seriousness or extent of the Chinese government effort. We had only expected the impact to be a less severe global supply glut at the time.
- Short term aluminium prices will continue to receive support from the winter production cuts currently under way in China, until March at least when the country finishes its winter heating season and economic activity resumes post the Chinese New Year. From Q1 onward, some price pullback can be expected, as producers might look to capture market share and take advantage of the elevated prices and newer capacity using cleaner and more efficient technology replaces older capacity.
- Overall, the global aluminium market is expected to be largely balanced in 2018, with prices averaging $2085/t with downside risks.

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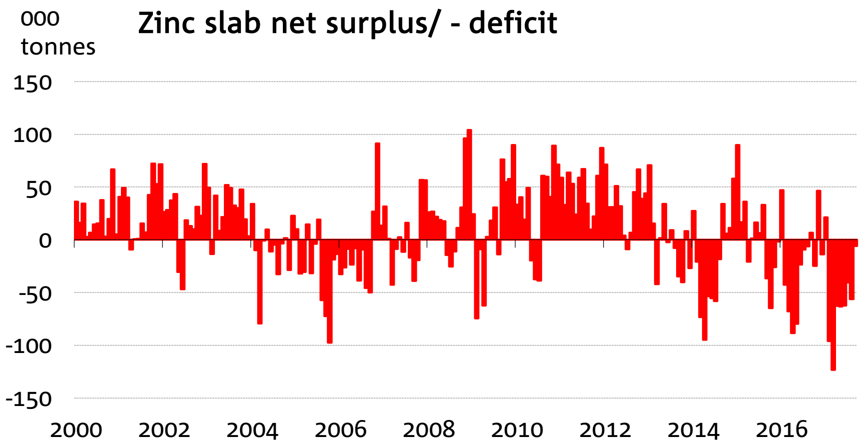
ZINC

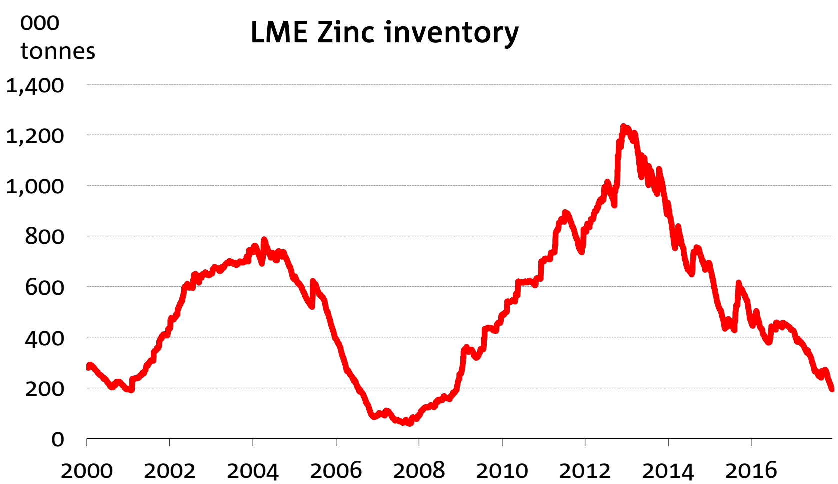
Top performer of 2017 & top pick of 2018- no prize for guessing this one

MARKET DEFICIT LIKELY TO PERSIST



Source: Bloomberg

ZINC INVENTORY AT LOW LEVELS



Source: Bloomberg

- As expected, zinc has been the best performer within the base metals complex, up 28% year to date to be around $3190/t at the time of writing. The bullish forecast by many a year ago has proven to be a correct call (including your scribe who won the LME Down Under Zinc forecasting trophy, a special high grade zinc slab too heavy to carry home). The market remains in deficit coming into the end of 2017, as neither expected new China mined supply nor restarts by Glencore came to the rescue.

- The high prices have seen Glencore announce the phased restart of the Lady Loretta zinc mine in Northern Queensland in 2018. The addition to global mined supply will be marginal though (around 1%) and smaller than many expected. The company forecasts global zinc production to decline by 15,000 tonnes in 2018 and only increase slightly in 2019.

- In addition, Chinese mined supply growth will likely be subdued, as the country enforces stricter environmental controls and inspections. Bloomberg estimates Chinese zinc mined supply declined by 475,000 tonnes this year, and expects an increase of only 200,000 in 2018.

- Overall, the global zinc market is likely to remain in deficit in the years to come, as new mined supply and restarts are unable to offset previous capacity closures. LME zinc inventories continue to decline, now at the lowest level since December 2018, indicating market tightness. AME estimates that deliverable stocks on the LME and SHFE now only cover around 3.3 days of demand. As a result, the tight zinc market conditions will continue to support prices, with average price for 2018 expected at $3270/t.

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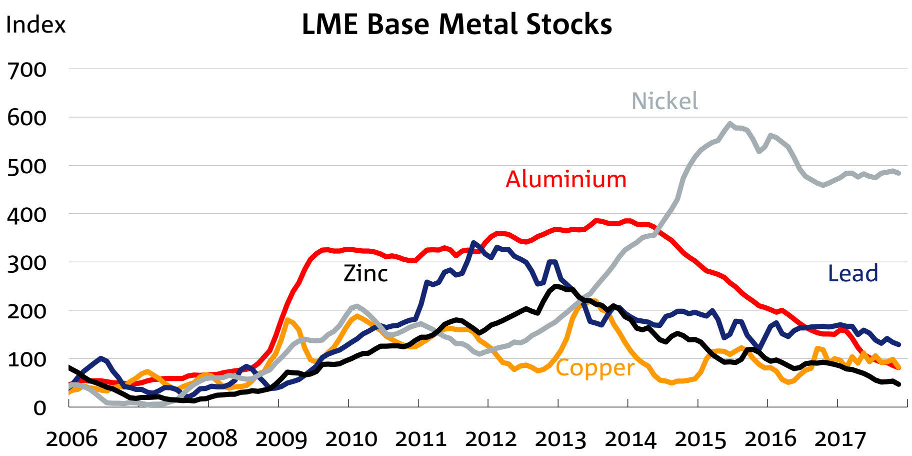
NICKEL & LEAD

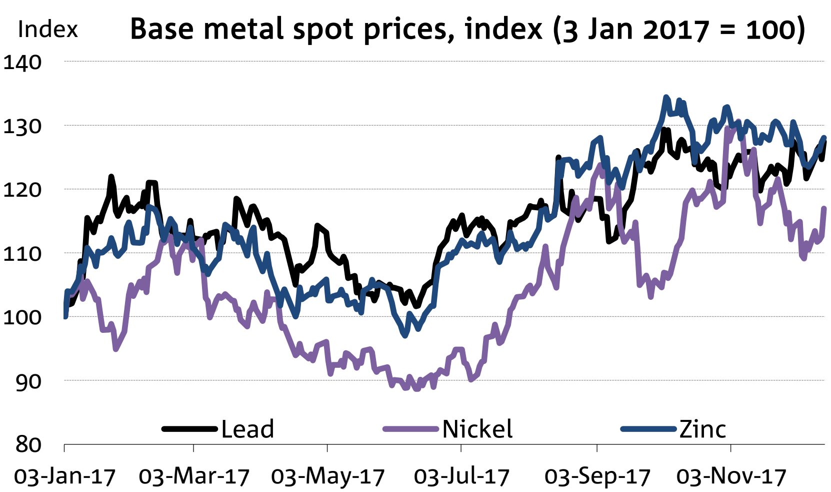
A story about batteries?

NICKEL INVENTORY REMAINS AT HIGH LEVELS



Sources: Datastream; NAB

LEAD PRICES PERFORMED LARGELY AS EXPECTED



Source: Bloomberg

- **Nickel** has been the most exciting (and difficult) metal to forecast in 2017, and has also experienced the biggest price volatilities. Environmental audits earlier this year in the Philippines, the world's largest nickel producer, produced significant supply uncertainty and resulted in a price rally. However the proposed ban on open cut mining did not eventuate, and consequently prices retreated. Another major nickel producing country Indonesia has also relaxed its restrictions on nickel ores exports, adding further to supply.
- On the demand side, the biggest story would have to be the potential increase in nickel demand from electric vehicle batteries. This significantly boosted sentiment and pushed prices to new highs. There have been talks about companies taking actions to capitalise on this new development, with BHP expected to revisit the sale of its Nickel West unit and the restart of the Savannah mine by Panoramic.
- However, battery demand for nickel is still comparatively low and unlikely to change the fundamental picture. While several governments have issued ambitious policies to promote electric vehicles, the uptake and the eventual phasing out of traditional fossil fuel vehicles is likely to be a gradual process. In the meantime, demand from the Chinese stainless steel sector has declined, especially as the country heads into winter with capacity curtailments. Nickel inventory levels remain high, indicating abundant supply at this stage. **As a result, we forecast a surplus nickel market in 2018 with some price declines but concede that prices could be volatile again.**
- **Lead** prices performed largely as expected in 2017. While demand from the automotive sector will remain supportive for prices, new generation lithium-ion batteries will likely see lead batteries being phased out eventually. We forecast a well supplied lead market in 2018, with prices averaging $2450/t..

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NAB FORECASTS

NAB Forecasts - Quarterly Average Terms

US$/tonne	Spot 19/12/17	Actual Sep-17	Forecasts Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19	Dec-19
Aluminium	2081	2010	2110	2110	2090	2070	2070	2070	2070	2070	2070
Copper	6906	6350	6800	6730	6660	6590	6590	6590	6590	6590	6590
Lead	2559	2330	2490	2490	2460	2440	2410	2410	2410	2410	2410
Nickel	11698	10540	11540	11430	11310	11310	11310	11310	11310	11310	11310
Zinc	3192	2960	3230	3250	3260	3280	3290	3290	3290	3290	3290

Sources: Thomson Reuters; NAB Economics

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