RFC Ambrian

The Alchemist

Issue 29:

Zinc

The Alchemist looks at how zinc should benefit from rising commodity prices, production cuts, minimal new mine development and growth in demand. There is only limited opportunity for equity exposure.

Zinc — An Attractive Investment Destination

INTRODUCTION

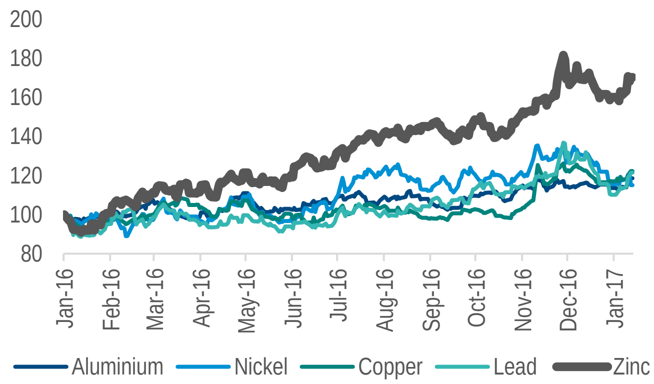
The zinc market ended 2016 in deficit, with its spot price having risen 61% over the course of the year; this represented a dramatic turnaround for perhaps the most unloved of the base metals during the commodities downturn.

This issue of *The Alchemist* examines the reasons why this has happened and whether the current strong fundamentals are likely to be sustained over the medium term. It also reviews what the opportunities are for investors to obtain exposure to zinc miners.

STRONG PRICE IN 2016

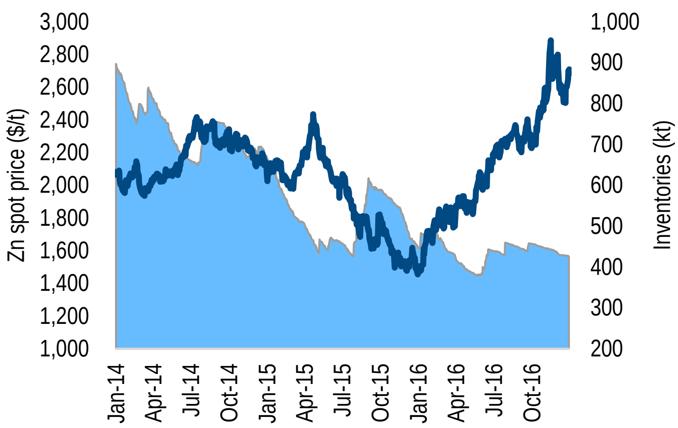
Spot prices for zinc increased by 61% over the course of 2016, making it the best performing base metal for the year. As we discuss below, RFC Ambrian believes that this reflects a combination of supply-driven and demand-driven factors. The price reached a peak of US$2,907/t in November 2016, which represented a nine-year high. A fall in the spot price due to a sell-off prior to the year-end has been recovered over the first part of January 2017.

Figure 1 Base Metal Spot Prices 2016 (rebased)



Source: FactSet

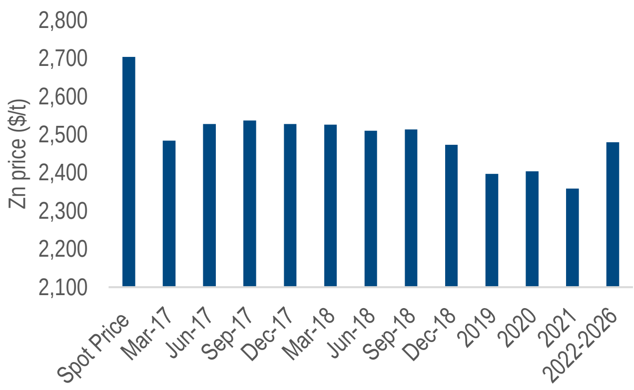
Figure 2 LME Inventories and Spot Prices



Source: SNL

Market analysts have forecast that prices will remain strong in 2017 and 2018, with consensus long-term forecasts sitting at around US$2,400/t.

Figure 3 Consensus Pricing Forecasts



Source: EMCF

These levels are reflective of structural changes in the zinc supply and demand equation — most notably production cuts — which we consider unlikely to be unwound in the near term.

MINE PRODUCTION SIGNIFICANTLY REDUCED

The last three years have seen significant production capacity reductions through mine closures, including Vedanta's Lisheen mine and MMG's Century mine (which itself accounted for approximately 4% of global annual zinc production). In 2015 Glencore announced production cuts of some 500,000tpa. Nyrstar's decision to withdraw from zinc mining means that its mining assets will ultimately be in the hands of other owners, and their appetite for restarts is unknown. Analysts have estimated that over 1Mtpa of zinc production was removed from the market during the course of 2015-16. Selected production cuts included:

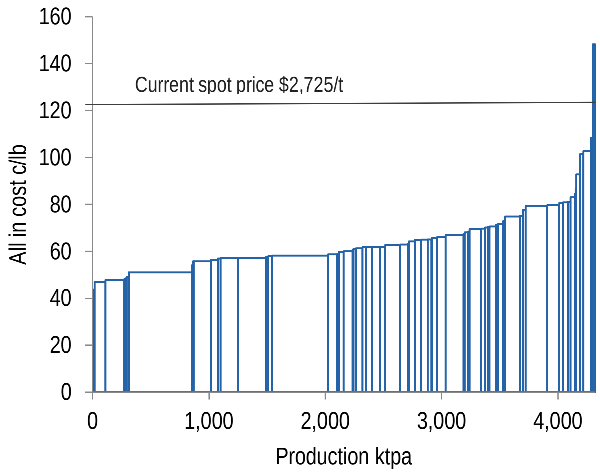
Mine	Location	Operator	Zn prod cuts (ktpa)	Notes
Mount Isa	Australia	Glencore	380	Temporary closure
McArthur River	Australia	Glencore	135	Temporary closure
Iscaycruz	Peru	Glencore	80	Temporary closure
Kazzinc	Kazakhstan	Glencore	40	Temporary closure
Century	Australia	MMG	500	End of life
Lisheen	Ireland	Vedanta	165	End of life
Campo Morado	Mexico	Nyrstar	22	Care and maintenance
Middle Tennessee	US	Nyrstar	47	Intended restart 1Q16
Endeavour	Australia	CBH Resources	53	70% drop in output
Broken Hill	Australia	Perilya	25	30% drop in output

Some decisions to close were a supply response to the long-term zinc price, but many just reflected the natural end of older mines. Additional announced production cuts over the next two years, the largest of which is Vedanta's Skorpion mine in Namibia during 2018 (about 100,000t production in 2016), mean that the trend for reducing global production appears likely to continue. Other potential closures include Jaguar in Australia (which produced about 40,000t Zn in 2016) during 2017, and Pomorzany in Poland (60,000t in 2016) and Bracemac in Canada (50,000tpa in 2016), both during 2018.

In October 2016 it was also announced that production from Rampura Agucha, the world's largest zinc mine, fell 37% YoY in 1H16 as a result of the difficulties in transitioning from the open pit to underground production (albeit operations have been ramping up in 2H16).

These production cuts appear to have significantly improved the fundamentals for remaining producers. The impact of the tightening market has seen estimated spot treatment charges decline significantly (down 45% for the year to September 2016), providing an additional margin buffer to miners as smelters compete for concentrate.

Figure 4 Zn Producer Cost Curve (ex-China)



Source: SNL, RFC Ambrian

At current spot prices, only a relatively small part of the cost curve is producing at or below the margin, and of these the majority are small-scale Chinese producers. The bulk of current producers will generate strong cashflows in 2017 and beyond; should the strong current price environment persist, the incentive for new mine development should be sufficiently strong for current advanced exploration and development assets to be financed and built. However, it is likely that an extended period of attractive commodity pricing will be required before confidence returns.

Chinese production remains something of an unknown factor in the supply equation (and we note that Chinese production data is not included in the chart above). Domestic mine production has been hit by the government's forced shutdown of mines in the Hunan Province as part of a renewed effort to enforce environmental and health and safety standards. There was also some recognition that the industry will benefit from the removal of excess capacity and that rationalisation will improve efficiency.

The 'population' of significant zinc producing companies is distinguished by the fact that zinc is not the dominant component of the diversified metals that they produce, and it is notable that Nyrstar is scaling back its ownership of mines. It seems likely that the availability of capital for new zinc mines will be limited for the foreseeable future.

NEW MINE DEVELOPMENTS FEW AND FAR BETWEEN

The list of potential new mines is relatively short, reflecting the lack of exploration and development work that has taken place while zinc remained out of favour, and the fact that, historically, discoveries of high-quality zinc deposits have been limited. The lead time for bringing new projects on line can be significant; Nevsun Resources made its first concentrate shipment from the Bisha mine in Eritrea in September 2016, but the process of starting zinc production was eased by the existing copper/gold mine infrastructure. Selected new mine developments are shown below.

Project name	Operator	Location	Dev't stage	Est prod (ktpa)	Capex US$m
Dugald River	MMG	Australia	Cons't started	210*	1,200
Gamsberg	Vedanta	South Africa	Cons't started	250*	400
Shalkiya	Shalkiya Zinc Ltd	Kazakhstan	Care and maintenance	160**	480
Woodlawn	Heron Resources	Australia	Feasibility complete	40*	109
Citronen	Ironbark Zinc	Greenland	Feasibility complete	180	429
Castellanos	First Quantum	Cuba	Feasibility	N/A	300
Gorno	Energia	Italy	Feasibility	N/A	50

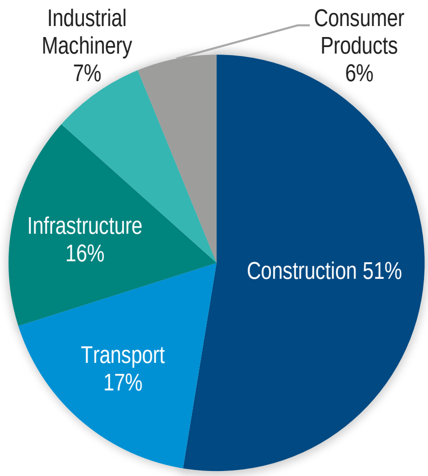
*2018; **2017; Source: RFC Ambrian, SNL

The biggest risk to the zinc price therefore appears to be restarts, such as Glencore and Nyrstar's idled capacity, and small-scale Chinese production, which has dropped out of the market, should the government-led reductions in domestic production be reversed. The appetite for restarts is shown by the fact that Nyrstar announced in October 2016 that it would reopen its Middle Tennessee mines in the US in 1Q17, but it seems unlikely that a significant proportion of closures will be reversed in the short term.

MODERATE DEMAND GROWTH

The fundamentals of zinc consumption appear to be sound, with 2016 seeing a 3.7% rise in global refined zinc use to 11.6Mt. Demand from the Chinese market increased 9.3%, which more than offset a 14% fall in US consumption (source: ILZSG). Key demand drivers are considered to be the construction sector and the use of galvanised steel in cars, with China the world's largest car market and India rapidly growing.

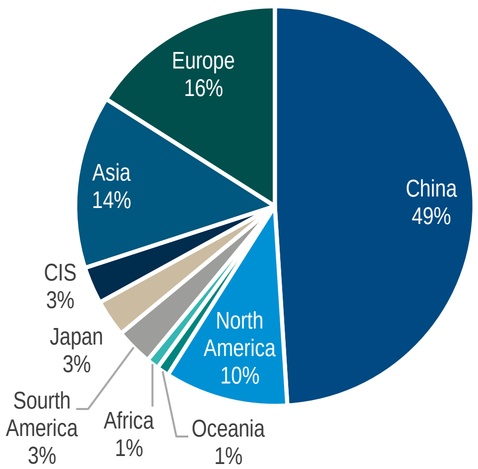
Figure 5 Zn End-market Sectors



Source: AME

Chinese demand for zinc is likely to be underpinned by the fact that galvanised steel as a percentage of total steel consumption lags significantly behind the rest of the world. This suggests that a slowing in total steel consumption may be offset by an increase in the proportion of galvanised steel. This trend is expected to be followed by other south-east Asian countries that have become key markets for Chinese steel makers.

Figure 6 Zn End-market Countries

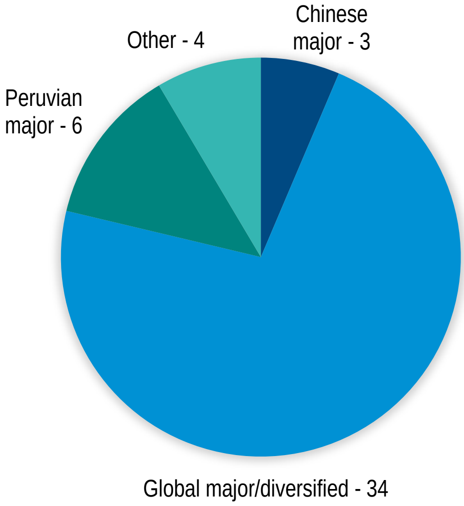


Source: AME

LIMITED OPPORTUNITIES FOR EXPOSURE THROUGH EQUITIES

There is not really a ‘pure play’ producing zinc company — most zinc is produced by the large diversified miners. Figure 7 below illustrates the ownership of the world’s producing zinc mines.

Figure 7 Producing Zn Mine Ownership



Source: RFC Ambrian

There are relatively few zinc development and exploration projects, and the bulk of these are also held by the majors; zinc has not been a strategic focus for them and the pipeline of development projects ready to be constructed is therefore thin.

The funding constraints imposed by recent market conditions on junior companies has meant that development work has been very limited in recent years and, unless market confidence significantly improves, it seems unlikely that many junior company projects will be brought into operation in the near term. This also means, however, that if the strong market for zinc does persist then the junior space may quickly become attractive as investment capital seeks exposure to the segment and the majors aim to fill their project pipeline.

CONCLUSION

The fundamentals for zinc appear strong: market imbalance has been generated by growing global consumption underpinned by strong demographic trends, whilst a significant proportion of global supply, which is unlikely to be fully replaced in the medium term, has fallen out of the market. Zinc is not a strategic focus for the major mining companies, suggesting that the availability of capital for large-scale new projects will be limited.

In our opinion continued strong commodity pricing will generate renewed interest in junior zinc companies as investors seek commodity exposure and the majors begin to pursue opportunities to refill the pipeline of zinc production.

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