Research
Macquarie Wealth Management

GLOBAL

LME cash price

	US$/tonne	% change day on day
Aluminium	1,656	-0.9
Copper	4,654	0.0
Lead	1,974	-0.5
Nickel	10,251	-1.9
Tin	19,455	-0.2
Zinc	2,262	0.7
Cobalt	28,000	-0.9
Molybdenum	14,816	-1.7

Other prices

		% change day on day
Gold (US$/oz)	1,255	0.2
Silver (US$/oz)	17.40	-0.4
Platinum (US$/oz)	932	-0.4
Palladium (US$/oz)	635	-0.6
Oil WTI	49.75	-0.8
USD:EUR exchange rate	1.100	0.0
AUD:USD exchange rate	0.763	0.0

LME/COMEX stocks

	Tonnes	Change
Aluminium	2,083,250	-6,225
LME copper	345,800	-3,275
Comex copper	64,496	41
Lead	189,800	0
Nickel	362,478	1,770
Tin	3,250	-70
Zinc	455,650	-250

Source: LME, Comex, Nymex, SHFE, Metal Bulletin, Reuters, LBMA, Macquarie Research, October 2016

17 October 2016

Commodities Comment

Nickel and the Philippines – the die is cast for Chinese ore tightness

Feature article

- We review the latest developments in Indonesia and the Philippines. The decision by the Indonesia government not to allow nickel ore exports to resume means that the ball is now in the Philippines' court. We do not expect widespread closures in 2017 but still see an emerging extreme tightness in nickel ore supply in China to develop during the upcoming low-shipping season (for weather reasons) and think nickel prices could spike in 1Q17.

Latest news

- **Chrome ore** prices have continued their accelerating upward trajectory, with latest offers quoted at more than $240/t CFR China. This is up 10% on the previous week and compares with just $100/t in March. As we highlighted in a recent note, the drop in South African chrome ore production, coupled with a global stainless output recovery, makes a raw material constraint much more likely. We would expect some response from South African supply to destock into higher prices, but with ore stocks in China low the likelihood of elevated pricing into 2017 persists.
- Indian **thermal coal** imports hit a 31-month low in September, according to preliminary port data, at just 112mtpa. This is down from 2015 full-year imports of 164mt and a Jan–Aug average monthly run rate of 153mtpa. September tends to be a seasonally weak month owing to the monsoon, but even on a YoY basis volumes were down 12% in the month, bringing the 9M16 YoY decline to 10%. This comes at a time when domestic coal production from major producers, CIL and SCCL, has also fallen over the past two months, down 5–10% YoY, illustrating a material deterioration in underlying demand conditions. Coal-fired power generation has recently seen negative YoY growth, and producer coal stocks are up ~25% over the same time last year. Indian **met coal** imports are more resilient, running at 51mtpa in September, versus both 2015 full-year imports and a Jan–Aug average monthly run rate of 48mtpa. Imports were also up 14% YoY in the month, for a YTD gain of 2%. Indian pig iron production has moved from no growth at the start of the year to close to 10% YoY growth over the past quarter.
- One reason for **iron ore** prices continuing to see good support is sluggish export performance from Australia and Brazil. Weekly port data we track shows that since the start of September to the week ending 16 October combined shipments have been running down ~1% YoY. Shipments so far this month are also down 1–2% from September run rates.
- The significant rally in **manganese ore** prices continues, contrary to our expectations. The latest Metal Bulletin assessment for 44% Mn ore (CIF Tianjin) is up $0.65/dmtu WoW to $6.52/dmtu. These are the highest price levels since early-2011 and mean YTD gains are now 250%, bigger than even the rise in coking coal! Both price rises are supply-driven, but we maintain the view that manganese is more vulnerable to normalisation, since its supply cuts were mainly temporary shutdowns ex China, most of which have now returned to market, and inventories are now being replenished.

Can the Philippines turn the nickel market?

- Last week the Indonesian government confirmed that it would most likely NOT ease its ban on exporting nickel ore. The ban was implemented in January 2014. Up until 2014, Indonesian high-grade ore exports (averaging 1.8–2.0% Ni) were the main feed source for Chinese nickel pig iron production. The aim of the Indonesian ban was to encourage investment in nickel processing in Indonesia. The Indonesian government has reported that there has indeed been significant investment in nickel pig iron capacity and any easing of the ban would have had a direct negative impact on the pace of investment and an impact on its economics (by potentially driving up domestic ore prices in Indonesia and driving LME nickel prices lower).
- In the wake of the Indonesian ban in 2014, LME nickel prices rose dramatically, up 60% between January and May 2014. This rise was not sustained due to a significant build of Indonesian nickel ore stocks in China ahead of the ban (to an estimated 300kt of nickel in ore, equal to nine months of use at the 2013 rate), but, more important, this was due to a major rise in exports of nickel ore from the Philippines in 2014 and 2015. Exports of nickel ore to China rose from 40.5mt in 2013 to 50.5mt in 2014 and around 47mt in 2015.
- The nickel content grew even faster due to a big rise in mid-grade (1.3–1.5% Ni) and high-grade (1.8% Ni) exports relative to low-grade (0.8–1.2% Ni), of which the Philippines had traditionally been a large supplier. The recoverable nickel content of exports rose from around 180kt in 2013 to 340kt in 2014 and 390kt in 2015. This rise in supply, combined with weak demand growth in global nickel demand from 2H14 and the end of 1Q16, led to a collapse in nickel prices, with prices falling from a peak of $21,200/t in May 2016 to $7,710/t in February 2016.
- Since then, nickel prices have risen more than 20% from large production cuts in nickel globally (cuts so far in 2016 are equal to around 10% of 2015 refined output), a strong recovery in nickel demand in China and, more recent, concerns about disruptions to nickel ore supply from the Philippines.
- Developments in the Philippines really matter for nickel – last year the Philippines produced around 440kt of recoverable nickel, accounting for 22% of global production. Around 400kt of nickel in ores were exported to finished nickel producers in Australia (QNI, which was shut down in March 2016), Japan (three ferronickel producers) and China (the main source for Chinese nickel pig iron production). In addition 51.7kt of nickel in nickel/cobalt sulphides was produced by two domestic plants, Coral Bay and Taganito, for export to Japan for processing into nickel metal at Sumitomo Metal Mining's Niihama nickel refinery.
- A new government took office at the start of July 2016, and the newly appointed Minister of Environment and Natural Resources, Regina Lopez, ordered a comprehensive review of the Philippines' mining industry. Upon her appointment at the start of July, Ms Lopez ordered an audit of all existing mines in the Philippines and a moratorium on new mining projects (DMO 2016-01 dated July 8). Within weeks, four nickel mines had been reported as being suspended for violating environmental standards (BenguetCorp Nickel Mines Incorporated, Eramen Minerals Incorporated, LNL Archipelago Minerals Incorporated, and Zambales Diversified Metals Corporation). Subsequently four other mines were also suspended (Emir Minerals, Citinickel, Claver Mining and Berong Mining).
- The mines suspended accounted for around 7.9% of reported nickel ore production in 2015 (of 32.3mt on a dry basis and around 48.2mt on a wet basis) and 9.9% of reported nickel in ore output (415,366t). Four of the suspended mines produced no nickel in 2015. These are officially reported numbers and excluded production in the Tawi Tawi area of the Philippines, which is an autonomous region in Muslim Mindanao and is not under the control of the Philippines' government. We estimate that Tawi Tawi nickel ore output was around 6.8mt wet basis (4.6mt dry), containing around 63kt of nickel.
- On 27 September, the government announced that it has completed a review of all 41 mines in the Philippines (producing nickel, silver, copper, gold, iron ore and chromite) and that the results of the audit were that in addition to 10 mines already suspended (including 8 nickel mines), a further 20 (including 14 nickel) were recommended for suspension. These additional mines were not immediately suspended, and the companies were given seven days to respond to the audit reports before a final decision was made. At time of writing the audit reported had not been received by the companies. These nickel mines (excluding those already suspended) produced 15.5mt of nickel ore (dry basis, equal to 23.1mt wet basis), equal to 48% of 2015 output and 175,810t of contained nickel (42.3% of reported production).

- In summary, the mines suspended and under threat of suspension produced a reported 216,906t last year, equal to 52.5% of reported Philippines nickel mine production (excluding Tawi Tawi). Assuming a loss of around 10% (from ore to finished nickel), the total “at risk” production was 195kt Ni, equal to 10% of total world supply.
- We do not precisely agree with all the government numbers, which are a combination of production and shipment numbers (including significant destocking), and some numbers differ markedly from company reported numbers. However, they are the numbers upon which decisions are being made and are, in aggregate, reasonably close to the actual industry size.

Fig 1 Summary of 2015 Philippines' nickel mining industry (MT (million tonnes) and ‘000t Ni)

	Dry ore MT	Wet ore MT	Contained Ni '000t	Average Grade %
Mines already suspended				
Berong Mining Corp.	0.87	1.30	15.70	1.81
Zambales Diversified Metals Corporation/CRAU	0.00	0.00	0.00	
Benguet Nickel Corporation	0.00	0.00	0.00	
Citinickel Mines and Development Corp	1.13	1.69	17.00	1.50
Claver Mining/Shenzhou Mining Group Corporation	0.00	0.00	0.00	
Eramen Minerals Inc	0.40	0.59	5.99	1.50
LNL Archipelag Minerals Inc	0.16	0.24	2.41	1.53
Emir Mining	0.00	0.00	0.00	
Sub-total	2.56	3.82	41.10	1.61
% of reported	7.9%	7.9%	9.9%	
% of total	6.9%	6.9%	8.6%	
Mines under notice of suspension				
Hinatuan Mng. Corp./Nickel Asia	2.30	3.43	24.16	1.05
Surigao Integrated ResourcesCorporation - CTP	2.00	2.98	29.99	1.50
Carrascal Nickel Project (ExCTP)	2.72	4.06	24.90	0.91
SR Metals, Inc.	2.53	3.77	34.13	1.35
Marcventures Mining and Development	1.89	2.83	19.43	1.03
AAM-PHIL Natural Resources Exploration	0.26	0.39	1.15	0.44
Oriental Synergy Mining	0.10	0.16	1.51	1.44
Adnama Mining Resources Ltd	0.59	0.88	8.60	1.47
Sinosteel Philippines HY Mining Corp	0.00	0.00	0.00	
Agata Mining Ventures Inc	1.26	1.89	14.83	1.17
Westernshore Nickel Corporation	0.29	0.43	3.21	1.11
Wellex Mining Corporation	1.11	1.66	7.11	0.64
Oriental Vision Mining	0.44	0.66	6.80	1.53
Century Peak	0.00	0.00	0.00	
Subtotal	15.50	23.14	175.81	1.13
% of reported	48.0%	48.0%	42.3%	
% of total	42.1%	42.1%	36.8%	
Mines that passed audit	14.24	21.26	198.46	1.39
% of reported	44.1%	44.1%	47.8%	
% of total	38.6%	38.6%	41.5%	
Total reported all mines (MGB)	**32.30**	**48.22**	**415.37**	**1.29**
plus				
Tawi (estimated)	4.56	6.80	63.00	1.38
gives				
Total Philippines	**36.86**	**55.02**	**478.37**	**1.30**

Source: MGB (Mines and Geosciences Bureau), Macquarie Research, October 2016

- Macquarie recently visited Manila and met the main nickel producers and also Chinese traders who are the main buyers of nickel ore. The producers were still waiting to receive copies of the audit results so are still in the dark regarding next steps. We also met a representative from the DENR (Department of Environmental and Natural Resources).

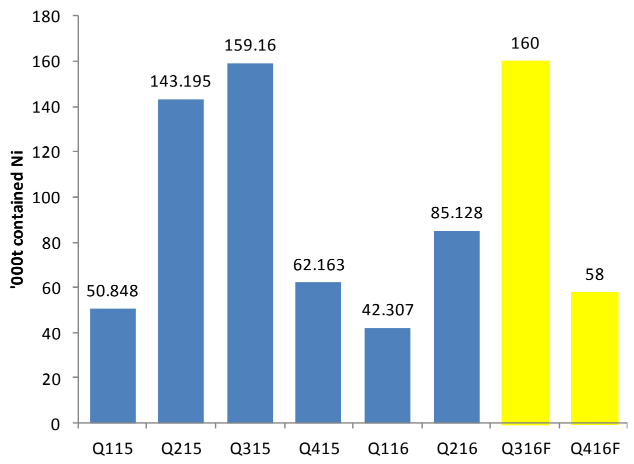
- There was general agreement that provided “politics” did not intervene, there was a strong chance that most mines should be able to comply with the requirements and that in 2017 the bulk of mines under suspension or threat of suspension could operate. The main issues requiring attention during the audit included:
  - ⇒ Silting to coastal waters.
  - ⇒ Inefficient drainage system.
  - ⇒ Indiscriminate mining methods (no benching, etc).
  - ⇒ Operating without tree-cutting permits.
  - ⇒ Violation of environmental compliance certificates.
  - ⇒ Outdated mining plans.
- Unfortunately, politics remains an issue, with some bad blood remaining between the elements of the industry and elements of the government. It may well be that some mines will be unable or unwilling to comply with all demands from the audit. The biggest challenges are in the Zambales region, where mines are close to each other, and it may not be easy to remedy some of the issues – however, Zambales only accounted for around 6% of 2015 output. Palawan is another hot bed of environmental opposition, and the operators of two mines closed (Citinickel and Berong) believe that they will be able to reopen in 2017 (around 6% of exports last year).
- Equally as important as disruptions from the review, however, is that actual mine production has collapsed in 2016, according to official government numbers (see Fig 2). According to MGB data, production fell 29.8% YoY in the first half of 2016 on a gross ore basis and 34.3% on a nickel contained basis (as the average ore grade mined fell 6.5% YoY). The year-on-year fall just in the first half alone was 66.6kt Ni. It should be emphasized that this data related to the period prior to the taking office of the new government in July and prior to any government-ordered suspensions.

Fig 2 Reported Philippines's nickel mine production by quarter (MT ore and ‘000t Ni)

	Dry ore MT	Wet ore MT	Contained Ni '000t	Average Grade %
Q115	3.71	5.53	50.85	1.37%
Q215	11.17	16.68	143.20	1.28%
1H 2015	14.88	22.21	194.04	1.30%
Q116	3.35	5.00	42.31	1.26%
Q216	7.10	10.60	85.13	1.20%
H1 2016	10.45	15.60	127.44	1.22%
% change 2016/15				
Q1	-9.6%	-9.6%	-16.8%	-8.0%
Q2	-36.5%	-36.5%	-40.6%	-6.4%
H1	-29.8%	-29.8%	-34.3%	-6.5%

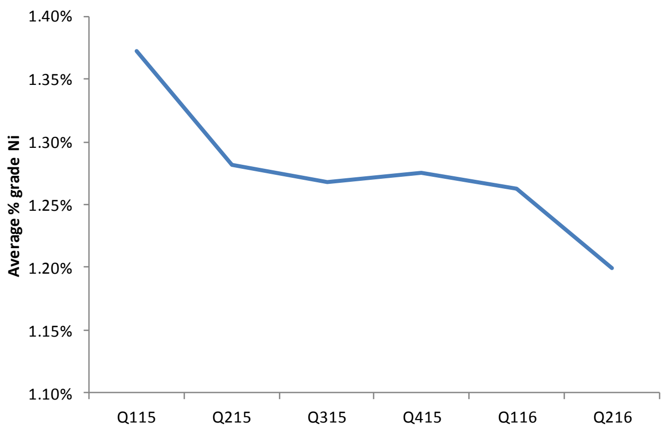
Source: MGB (Mines and Geosciences Bureau), Macquarie Research, October 2016

Fig 3 Reported Philippines nickel mine output by quarter (excluding Tawi Tawi)



Source: MGB, Macquarie Research, October 2016

Fig 4 Calculated average nickel grade of reported Philippines' mine output has declined sharply

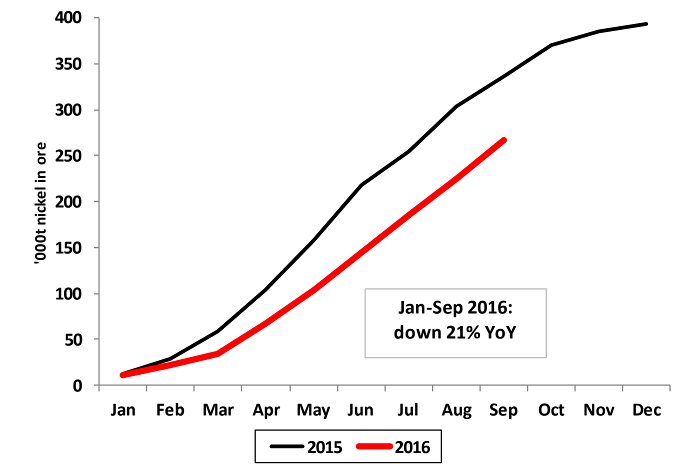


Source: MGB, Macquarie Research, October 2016

- The actual decline was probably even more than these numbers due to a collapse in exports from the Al Tawi mine, where reserves are now exhausted. During the first half of 2016, exports of high-grade nickel ore (mostly from Tawi Tawi) fell almost 80% YoY.
- What has caused these losses? The following main factors have been at work:
  - ⇒ Closure of high-grade section of Tawi Tawi's high-grade mine (Tumbuggan) due to reserve depletion. There is a replacement mine, but it will most likely not start until next year.
  - ⇒ Low nickel prices caused some mines to cut production due to loss-making. For example, Global Ferronickel, which has not been affected by suspensions, shipped 30% less in 1H16, while Nickel Asia shipped 12% less.
  - ⇒ Extremely bad weather this year due to La Niňa, which has caused rains to continue well beyond the normal rainy season of November–March. Exports of nickel in ore in May and June, normally the peak shipping months of the year, were down 31% and 26% YoY, respectively, this year.
  - ⇒ Grade depletion and mix of grades shipped has changed. The only grade growing this year has been low grade (containing 0.8–1.2% Ni) – up 15% YoY in 1H16. This is due to some mid-grade mines shifting to lower-grade material and also strong demand in China for low-grade material in blast furnaces. Mid-grade (1.4–1.5% Ni) exports were down 32% YoY in 1H16, while high-grade exports were down 78% YoY.
- The recovery in nickel and nickel ore prices meant that the third quarter was significantly better. We do not have actual data yet, but port statistics show that exports of nickel ore in the third quarter rose 4% YoY and 11% quarter on quarter in the July–September period. Nickel Asia, the largest exporter, reported its third-quarter sales rose 31.7% quarter on quarter and 5.8% year on year in 3Q16.
- Latest estimates from industry sources (producers and traders) in the Philippines are that nickel ore exports to China will end up down from around 47mt last year to ±40mt this year; we forecast that total exports of nickel in ore will fall from 390kt in 2015 to 315kt this year, 75kt lower.
- Looking forward to 2017, the ongoing grade declines at many mines and reserve exhaustion are critical. There is likely to be a continuing of the existing moratorium on new permits. High-grade (1.8% is down due to the closure of Tawi Tawi), while many mines selling medium-grade (1.3–1.5%) report that shipments this year are averaging closer to 1.45% compared with 1.5% last year and that this is likely to fall further in 2017/18.
- There is a replacement for Tumbuggan Island (Al Tawi Tawi's high-grade mine). However, the new mine (Langguanan on the mainland) is likely to produce less than half the old mine (2–3mtpa) and may be a mixture of high and mid grades.

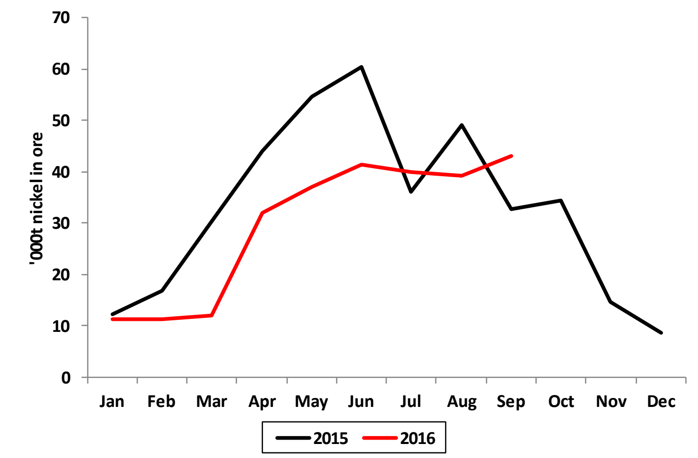
- The industry is not optimistic that total supply will show significant growth in 2017 on 2016's levels (suggesting exports of around 315kt of recoverable Ni in ore, of which 10kt would go to Japan and 305kt to China). This assumes that some mines will close and that many of the others will continue to experience a decline in grades.

Fig 5 Exports of nickel in ore from Philippines by month cumulatively in 2015 and 2016 (to September)



Source: Nickel Asia, Port statistics, Macquarie Research, October 2016

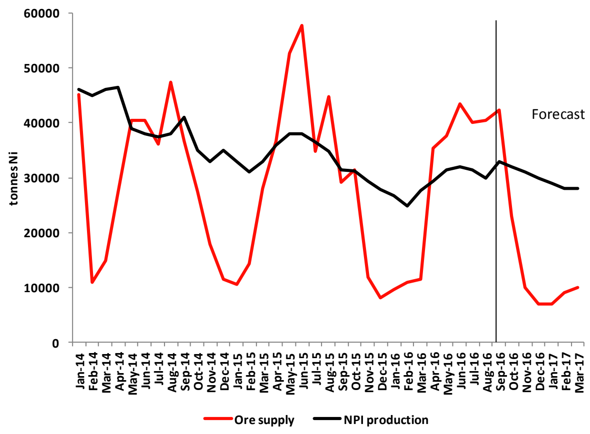
Fig 6 Exports of nickel in ore from the Philippines by month in 2015 and 2016 – note the acute seasonality



Source: Nickel Asia, Port Statistics, Macquarie Research, October 2016

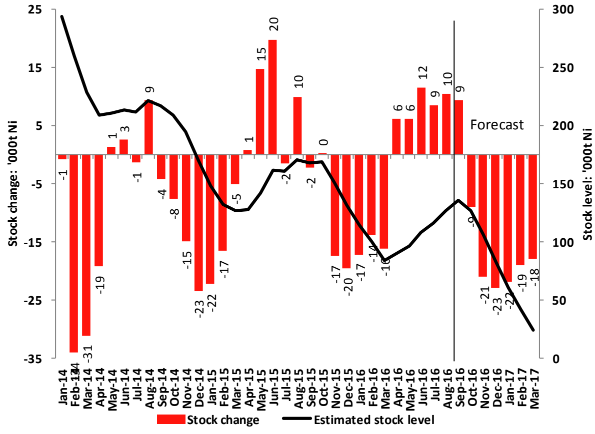
- Our own assumptions remain slightly more optimistic, with growth of 5% or so more likely, especially as nickel ore and nickel prices are now at more attractive levels than they were earlier this year. This should allow some YoY growth in 2017, but obviously if a few larger mines are closed and flat YoY picture is still possible.
- The critical issue for ore buyers is the seasonality of supplies from the Philippines due to the normal rainy season, which runs from October–March, when exports fall sharply due to the impossibility of sustaining mining operations during the heavy rains (Fig 6). Ore buyers normally have to build large stocks ahead of this period to survive, but this may be impossible this year.
- The main challenge is for the Chinese nickel pig iron producers, which account for the vast bulk of exports from the Philippines. Up to 2014, Chinese NPI producers had little reliance on the Philippines except for low-grade ores for their blast furnace nickel pig iron production (for low grade NPI [1.5–2%, used mainly to make 200 series stainless steel]). Pretty much all of the feed for electric furnace nickel pig iron production came from Indonesian high-grade nickel ore containing 1.8–2% nickel to produce 10–12% Ni nickel pig iron (Fig 7). Since 2014, the Chinese NPI producers have relied on large stocks of high-grade Indonesian material, which has been supplemented with imports of mainly mid-grade (1.4–1.5%) nickel ores from Indonesia. However, use of 1.4–1.5% ni ore only yields an NPI product containing 8% nickel.
- We estimate that at the start of 2014, stocks of nickel in ores in China were around 300kt ni (over 30mt of nickel ore) and that by the end of September 2016 those stocks were around 130–140kt. However, during the typical seasonal slowdown in ore exports (starting from October, stocks fall by 90–100kt). Due to mine suspensions in this year in areas that normally ship during the low season (especially Palawan), the projected fall from October to March is around 110kt (see Fig 8).
- As Fig 8 shows, this suggests that ore stocks could fall to around 20–30kt Ni (2–3mt of ore) by March 2017, well below normal operating levels and the lowest on record. These levels would be too low to sustain Chinese nickel pig iron production at recent production rates of 30–33ktpm.
- The Chinese nickel pig iron producers have started to react to this threat by diversifying their feed sources to some extent, led by China's leading NPI producer, Tsingshan. Ore imports have recently started from New Caledonia (but at a low rate of 6–10ktpa Ni), and some imports are likely from Guatemala (perhaps 10–20ktpa Ni).
- Tsingshan and other producers started adding calcined nickel sulphide concentrate to its operations last year and is also adding mixed nickel hydroxides from Australia this year. More recently, we have also heard that many producers have started blending pure nickel cathode into the NPI mix to bring the nickel content in NPI up from 8% to 10%.

Fig 7 Supply of nickel in ore to Chinese nickel pig iron industry and NPI production



Source: Customs data, Antaike, Macquarie Research, October 2016

Fig 8 Implied monthly ore stock levels and changes since 2014 (in '000t recoverable Ni)



Source: Customs data, Antaike, Macquarie Research, October 2016

- It could well be that 20–30kt of nickel units for the Chinese nickel pig iron industry will be obtained from non-Filipino sources, according to some industry estimates, with maybe 10–20kt coming from nickel metal. However, the market for nickel concentrates and hydroxides has tightened significantly, and we have heard that this material may well find a buyer who is willing to pay much higher prices (as a percent of the nickel price) in 2017.
- As ore prices rise, the cost of making nickel pig iron will also rise, and other NPI cost inputs are rising strongly (coal and coke). We estimate that the breakeven level for Chinese RKEF NPI producers are already close to $10,000/t, and in early-2017 this could well rise above $11,000/t as ore and carbon prices rise – this is a major factor likely to push nickel prices higher.
- We expect Indonesian nickel pig iron production to grow from 28kt last year to 98kt this year and then to 170–180kt next year. Tsingshan has already commissioned 90ktpa of NPI capacity (30kt last year and 60kt this year), and another 60ktpa is due early next year. PT Megah Surya Pertwi/Xinxing Pipes has commissioned a 20ktpa plant in 2H16, Virtual Dragon/Delong is starting a 60ktpa plant towards the end of the year, and PT Shenwu Titan plans to start a 35ktpa plant in 2017. In addition to this more than 20ktpa of smaller plants will start in 2H16/2017.

Fig 9 Global nickel supply/demand balance

`000t	2015	2016f	2017f
Total SS production	42137	44749	45596
% Change	-1.8%	6.2%	1.9%
300-series SS prod.	23581	25536	26299
% Change	1.4%	8.3%	3.0%
Use of purchased ni in scrap	698	719	736
% change	-1.6%	3.0%	2.3%
Primary nickel consumption	1877	2013	2072
% Change	-0.6%	7.3%	2.9%
Nickel Supply	1979	1943	1972
% Change	-0.7%	-1.8%	1.5%
(of which NPI)	(428)	(458)	(500)
World Market Balance	102	-70	-100
Estimated total stocks	908	838	738
Weeks' world demand	25.2	21.7	18.5

Source: INSG, Macquarie Research, October 2016

- The other factor impacting the nickel supply/demand balance is demand, which has risen strong this year, driven by a sharp rise in Chinese stainless steel production, especially of high-grade nickel (8%) 300 series grades. Growth in China looks set to be close to 10% YoY in this grade this year. Our latest supply/demand balance shows a deficit of 70kt this year and 100kt next year, even with an expected 42kt YoY rise in combined nickel pig iron production in Indonesia and China.
- The still high level of total stocks hanging over the market will restrict price rises in 2017, but we now think that prices could easily move into the $11,000–12,000/t range in 1Q17 as nickel ore stocks fall to extremely low levels during the quarter. Any major disruption to supplies from the Philippines (another year-on-year fall from 2016 levels) would be icing on the cake to the pricing outlook. We would be looking to buy into any price dips below $10,000/t.

Monday 17 October 2016

Prices

	Closing price * 17-Oct-16 US$/tonne	17-Oct-16 US¢/lb	Closing price * 14-Oct-16 US$/tonne	14-Oct-16 US¢/lb	% ch. day on day	2016 YTD US$/tonne	Ave 2015 US$/tonne
LME Cash							
Aluminium	1,656	75	1,672	76	-0.9	1,576	1,661
Aluminium Alloy	1,531	69	1,572	71	-2.6	1,555	1,724
NAASAC	1,729	78	1,745	79	-0.9	1,701	1,767
Copper	4,654	211	4,655	211	0.0	4,727	5,495
Lead	1,974	90	1,984	90	-0.5	1,794	1,784
Nickel	10,251	465	10,447	474	-1.9	9,270	11,807
Tin	19,455	882	19,486	884	-0.2	17,206	16,070
Zinc	2,262	103	2,246	102	0.7	1,974	1,928
Cobalt	28,000	1,270	28,250	1,281	-0.9	24,481	28,613
Molybdenum	14,816	672	15,069	684	-1.7	14,246	14,837
LME 3 Month							
Aluminium	1,661	75	1,675	76	-0.9	1,583	1,680
Aluminium Alloy	1,545	70	1,585	72	-2.5	1,579	1,736
NAASAC	1,740	79	1,755	80	-0.9	1,722	1,790
Copper	4,675	212	4,675	212	0.0	4,730	5,487
Lead	1,989	90	1,998	91	-0.5	1,800	1,793
Nickel	10,290	467	10,485	476	-1.9	9,316	11,858
Tin	19,405	880	19,450	882	-0.2	17,142	16,030
Zinc	2,274	103	2,258	102	0.7	1,979	1,939
Cobalt	28,000	1,270	28,250	1,281	-0.9	24,603	28,702
Molybdenum	15,000	680	15,250	692	-1.6	14,268	14,870

**** LME 2nd ring price - 1700 hrs London time. Year-to-date averages calculated from official fixes.***

	17-Oct-16	14-Oct-16	% ch. day on day	2016 YTD	Ave 2015
Gold - *LBMA Gold Price (US$/oz)*	1,255	1,252	0.2	1,260	1,159
Silver - *LBMA Silver Price (US$/oz)*	17.40	17.47	-0.4	17.15	15.67
Platinum - *London 3pm price (US$/oz)*	932	935	-0.4	1,000	1,051
Palladium - *London 3pm price (US$/oz)*	635	639	-0.6	594	690
Oil WTI - *NYMEX latest (US$/bbl)*	49.75	50.16	-0.8	41.77	48.68
EUR : USD exchange rate - *latest*	1.100	1.100	0.0	1.116	1.110
AUD : USD exchange rate - *latest*	0.763	0.763	0.0	0.744	0.752

Exchange Stocks

(tonnes)	17-Oct-16	14-Oct-16	Change since last report Volume	Percent	Cancelled warrants	End-15 stocks	Ch. since end-15
LME Aluminium	2,083,250	2,089,475	-6,225	-0.3%	822,350	2,889,550	-806,300
Shanghai Aluminium	84,655	84,655	0	0.0%	0	297,037	-212,382
Total Aluminium	**2,167,905**	**2,174,130**	**-6,225**	**-0.3%**	**822,350**	**3,186,587**	**-1,018,682**
LME Copper	345,800	349,075	-3,275	-0.9%	98,325	236,225	109,575
Comex Copper	64,496	64,455	41	0.1%	-	64,184	312
Shanghai Copper	121,439	121,439	0	0.0%	-	177,854	-56,415
Total Copper	**531,735**	**534,969**	**-3,234**	**-0.6%**	**98,325**	**478,263**	**53,472**
LME Zinc	455,650	455,900	-250	-0.1%	34,775	464,400	-8,750
Shanghai Zinc	165,614	165,614	0	0.0%	-	200,428	-34,814
Total Zinc	**621,264**	**621,514**	**-250**	**0.0%**	**34,775**	**664,828**	**-43,564**
LME Lead	189,800	189,800	0	0.0%	29,825	191,650	-1,850
Shanghai Lead	32,058	32,058	0	0.0%	-	12,074	19,984
Total Lead	**221,858**	**221,858**	**0**	**0.0%**	**29,825**	**203,724**	**18,134**
Aluminium Alloy	13,680	13,680	0	0.0%	20	15,140	-1,460
NASAAC	75,380	74,820	560	0.7%	60	47,060	28,320
Nickel	362,478	360,708	1,770	0.5%	115,356	441,342	-78,864
Tin	3,250	3,320	-70	-2.1%	1,870	6,140	-2,890

Source: CME, LBMA, LME, Reuters, SHFE, Macquarie Research

Important disclosures:

Recommendation definitions

Macquarie - Australia/New Zealand
Outperform – return >3% in excess of benchmark return
Neutral – return within 3% of benchmark return
Underperform – return >3% below benchmark return

Benchmark return is determined by long term nominal GDP growth plus 12 month forward market dividend yield

Macquarie – Asia/Europe
Outperform – expected return >+10%
Neutral – expected return from -10% to +10%
Underperform – expected return <-10%

Macquarie – South Africa
Outperform – expected return >+10%
Neutral – expected return from -10% to +10%
Underperform – expected return <-10%

Macquarie - Canada
Outperform – return >5% in excess of benchmark return
Neutral – return within 5% of benchmark return
Underperform – return >5% below benchmark return

Macquarie - USA
Outperform (Buy) – return >5% in excess of Russell 3000 index return
Neutral (Hold) – return within 5% of Russell 3000 index return
Underperform (Sell)– return >5% below Russell 3000 index return

Volatility index definition*

This is calculated from the volatility of historical price movements.

Very high–highest risk – Stock should be expected to move up or down 60–100% in a year – investors should be aware this stock is highly speculative.

High – stock should be expected to move up or down at least 40–60% in a year – investors should be aware this stock could be speculative.

Medium – stock should be expected to move up or down at least 30–40% in a year.

Low–medium – stock should be expected to move up or down at least 25–30% in a year.

Low – stock should be expected to move up or down at least 15–25% in a year.
* Applicable to Asia/Australian/NZ/Canada stocks only

Recommendations – 12 months
Note: Quant recommendations may differ from Fundamental Analyst recommendations

Financial definitions

All "Adjusted" data items have had the following adjustments made:
Added back: goodwill amortisation, provision for catastrophe reserves, IFRS derivatives & hedging, IFRS impairments & IFRS interest expense
Excluded: non recurring items, asset revals, property revals, appraisal value uplift, preference dividends & minority interests

EPS = adjusted net profit / efpowa*
ROA = adjusted ebit / average total assets
ROA Banks/Insurance = adjusted net profit /average total assets
ROE = adjusted net profit / average shareholders funds
Gross cashflow = adjusted net profit + depreciation
*equivalent fully paid ordinary weighted average number of shares

All Reported numbers for Australian/NZ listed stocks are modelled under IFRS (International Financial Reporting Standards).

Recommendation proportions – For quarter ending 30 September 2016

	AU/NZ	Asia	RSA	USA	CA	EUR	
Outperform	47.26%	55.50%	38.46%	45.47%	59.09%	48.21%	(for US coverage by MCUSA, 8.20% of stocks followed are investment banking clients)
Neutral	38.01%	29.31%	42.86%	48.77%	37.88%	36.79%	(for US coverage by MCUSA, 8.25% of stocks followed are investment banking clients)
Underperform	14.73%	15.19%	18.68%	5.76%	3.03%	15.00%	(for US coverage by MCUSA, 8.00% of stocks followed are investment banking clients)

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