

OUTLOOK FOR METALS AND MINERALS

Full Year Results 2007

13 February 2008

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Summary

The following paper sets out the views of Rio Tinto's Chief Economist, Vivek Tulpulé, on the economic outlook for 2008.

- In 2008 resource markets are set for a fifth straight year of cyclical strength.
- Virtually all minerals and metals prices remain significantly above historical trend and many prices have now increased well above start-of-year levels.
- It is arguable that even as negative sentiment in relation to the US economy and credit markets has continued to increase during 2008, the market's perceptions about the fundamentals in most resource markets do not appear to have been much affected.
- Looking forward, it is entirely possible that some commodity prices have yet to reach their cyclical peaks.
- Our positive views on the market remain unchanged.
 - Global GDP growth is expected to be firm in 2008 with rapid growth in China and other developing countries.
 - This is expected to reduce any drag on commodity demand from slower growth in OECD countries.
 - Chinese growth is not expected to be significantly affected by any further slowing of US economic activity. Its GDP growth is expected to be around 10 per cent and even in the scenario of a sharp US recession, Chinese growth is expected to remain strong in the 9 to 10 per cent range.
 - Such conditions should create an environment for continued strong underlying commodity demand.
 - Growth in the supply of a number of commodities is expected to remain relatively constrained and marginal production costs will face upward pressure.
 - In some instances lead times for the delivery of key equipment have doubled suggesting that it will continue to take longer for new projects to come on stream to meet growing demand.
 - A range of disruptions such as power disruptions in southern Africa and China are continuing to affect supply across a range of commodities including aluminium and copper.
 - We remain mindful of the macro-economic risks arising from credit market conditions and slower consumer demand in OECD countries.
 - But given expected supply and demand conditions our view is that the price for most commodities will remain strong in 2008.
- Case studies are presented for a range of commodities:

Aluminium

- Global primary aluminium consumption increased in 2007 at its fastest rate in recent history, up around 10 per cent y-o-y to about 38 million tonnes. China accounted for most of the growth in demand last year, offsetting weakness in North America.
- Higher costs across a range of inputs and a stronger currency have increased the marginal costs of production in China. As a result, exports of primary aluminium for marginal Chinese smelters are believed to have become increasingly unattractive.
- The aluminium forward curve continues to rise, which suggests the market is expecting stronger prices going forward.

Copper

- Reduced US copper demand in 2007 was easily offset by growth in China, which already consumes more than twice as much copper as the US.
- Mine supply has grown slowly and has consistently fallen short of expectations for several years, due to a variety of factors including strikes, disruptions, and slower than expected ramp up at new mines.
- Constrained supply conditions in the context of above average demand growth in 2008 and low metal and raw material stocks mean that copper prices are expected to remain elevated well above trend levels this year.

Iron Ore

- Rapid growth in Chinese demand for iron ore has led to sharp increases in the spot price. After taking into account freight rates, Australian and Brazilian ores now trade at substantial discount to these spot prices.
- Growth in supplies from high cost producers, which have filled the increasing gap between demand and low cost seaborne production, are expected to slow in 2008. Chinese production has been affected by falling grades and Indian export growth is limited by port capacity.
- On the demand side, given ongoing strength in fixed asset investment growth in China and other developing countries, steel production is expected to grow strongly.
- In this environment of strong demand growth and constrained supply, the iron ore markets can be expected to remain and perhaps become increasingly tight.

Molybdenum

- Molybdenum oxide averaged just over \$30/lb in 2007 - about 10 times higher than prices achieved in the early part of the decade. Supply growth looks likely to lag demand growth in 2008, suggesting another period of strong prices.
- Molybdenum is used in many high specification steels, and demand has been buoyed by their use in oil field goods. In chemicals demand is growing strongly, partly driven by use in catalysts used to sweeten sour oils, which are becoming a larger proportion of total oil supply.

Pacific seaborne Thermal coal

- Recent flooding at key Queensland coal mines contributed to prices for Pacific seaborne thermal coal reaching record levels.
- A positive demand setting for coal in the context of high oil and gas prices, ongoing port constraints and the expectation of reduced net exports from China suggests that the market for thermal coal can be expected to remain tight this year.

Continued strong price outcomes expected in 2008

In 2008 resource markets are set for a fifth straight year of cyclical strength. Virtually all minerals and metals prices remain significantly above historical trend and many prices have now increased well above start-of-year levels. Indeed, it is arguable that even as negative sentiment in relation to the US economy and credit markets has continued to increase over 2008, the market's perceptions about fundamentals in most resource markets do not appear to have been much affected.

Looking forward, our broad assessment from November last year has not changed.

- Global GDP growth is expected to be firm in 2008 with rapid growth in China and other developing countries expected to reduce any drag on commodity demand from slower growth in OECD countries.
- At the same time, Chinese growth is not expected to be significantly affected by any further slowing of US economic activity.
- Such conditions should create a basis for continued strong underlying commodity demand.
- Growth in the supply of a number of commodities is expected to remain relatively constrained and marginal production costs will face upward pressure.
- We remain mindful of the macro-economic risks arising from credit market conditions and slower consumer demand in OECD countries.
- But in the context of expected supply and demand conditions our central case is for strong price outcomes across most commodities.
- It is entirely possible that some commodity prices may not have reached their cyclical peaks as yet.

Over the longer run, it is expected that sufficient commodity supply growth will be induced to cause prices to revert down toward more sustainable long-run levels. But ongoing strength in demand, as developing economies urbanise and industrialise, and persistent supply constraints suggest that it will most likely take longer for commodity prices to return to long-run levels than would have been the case if historical reversion rates had applied. Also expected shifts in industry cost structures mean that long-run prices and in some instances margins are expected to be significantly higher than would be implied by historical trends.

Many of the broad long term issues affecting commodity markets were discussed in our November 2007 outlook paper. In this paper there is a greater focus on short to medium term themes – in particular our assessment that Chinese growth will not be affected significantly by a US slowdown and on supply constraints facing the industry.

Solid economic growth supports firm demand for metals and minerals in 2008

Consensus forecasts for GDP growth in major economies are shown in the table below. The broad theme is slower activity in OECD economies - especially the US; and fast ongoing growth in developing economies - with GDP growth of around ten per cent forecast for China.

Recent data flow from OECD countries is mixed but on balance suggests that downgrades to consensus forecasts for the developed world growth are possible. However, given the overwhelming importance of developing countries as drivers of resource demand, the broad outlook sets the scene for continued firm demand growth for metals and minerals demand through 2008.

Indicators of World Economic Activity

	2008 Real GDP Growth* (Recent change)	2009 Real GDP Growth*		2008 Real GDP Growth* (Recent change)	2009 Real GDP Growth*
China	10.4 (-)	9.8	USA	2.0 (-)	2.7
Rep of Korea	4.9 (.)	5.0	Canada	2.1 (-)	2.5
Taiwan	4.4 (+)	4.7	UK	1.8 (-)	2.0
Malaysia	5.7 (.)	5.9	Australia	3.6 (.)	3.5
Thailand	4.8 (-)	4.9	Japan	1.5 (.)	2.0
Indonesia	6.2 (+)	6.1	Germany	1.8 (-)	1.9
India	8.2 (+)	8.4	France	1.7 (-)	1.9
Brazil	4.7 (.)	4.5	Russia**	6.6 (+)	6.3

* Latest Consensus Forecasts, ** Global Insights Forecast

The Chinese economy grew by 11.4 per cent in 2007 – the fastest rate of growth recorded in 13 years. Fixed asset investment growth was around 25 per cent, industrial production grew by about 18 per cent and retail sales grew by almost 17 per cent. Inflation accelerated to around 6.5 per cent by the end of the year driven mainly by increased food prices. The government is attempting to constrain growth in economic activity to reduce the risk of structural inflation. To this end it has raised interest rates and bank reserve ratios. The consensus is that GDP will grow at around 10 per cent in 2008 even in the face of slowing demand growth from OECD economies and likely further efforts by the Chinese government to reduce inflationary pressures. The recent severe snowstorms that have affected parts of China are expected to reduce economic activity only slightly during the first quarter but expenditures on disaster relief and related infrastructure spending are expected to offset this in later months¹.

Growth in the US slowed sharply in Q4 2007 to 0.6 per cent as slower growth in consumer spending, falling residential construction and increased credit constraints associated with the sub-prime mortgage crisis weighed on economic activity. Recent large cuts in US interest rates and the introduction of a fiscal stimulus package are expected to aid economic recovery during the second half of 2008 and recovery in US commodity demand toward the end of the year and into 2009².

European GDP growth is expected to slow compared with the relatively high growth rate of 2.8 per cent seen in 2007. The slowdown is expected to apply broadly with investment, consumption and exports affected by tighter credit conditions, weaker consumer sentiment and the strength of the Euro³.

The Japanese economy continues to grow slowly mainly because slow growth in wages has discouraged faster consumer demand growth. GDP growth in 2008 is expected to be similar to or a little less than this year's outcome. But a possible rebound in construction during 2008 - following the inadvertent negative effects of new planning regulations in 2007 - could add up to half a percentage point to Japanese GDP during the year⁴.

GDP growth in India is expected to be strong again in 2008 after growth of around 9.4 per cent in 2006 and 8.8 per cent in 2007. The latest five year plan for the Indian economy suggests it is possible to sustain growth at levels approaching 10 per cent over the next five years with increased investment in overall productive capacity and ongoing policy reforms. This process is expected to lead to some acceleration in Indian commodity demand over time⁵.

Growth through the ASEAN region is expected to remain strong in the range of 6 to 7 percent. As in the cases of China and India, the principle drivers are expected to be ongoing high levels of investment in infrastructure and capacity development⁶.

The economies of the Middle East are experiencing significant growth given high oil prices and the mobilization of earnings from oil into domestic investment projects. Even countries in the region such as Egypt that are not oil rich have grown strongly due to increasing investment and increasing benefits from international and regional trade. Most economies in the region are expected to grow at between 5 and 6 per cent in 2008. Growth in fixed capital formation is generally expected to be higher than GDP growth resulting in strong commodity demand prospects for the region⁷.

The Chinese economy and commodity demand are unlikely to be significantly affected by a sharper US slowdown.

From a resource market perspective growth in China is the most important current driver of market outcomes. Therefore in the context of the growing risks related to US economic growth, there has been some concern about knock on effects in the Chinese economy. This is motivated by the fact that the US is an important market for Chinese exports and that exports are a large part of overall Chinese economic activity. Our assessment is that this concern is exaggerated and the impact on Chinese economic activity from a potential US recession would be small.

The direct impact on China of a US recession is reduced US import demand for Chinese goods. If the US were to go into a sharp recession US GDP could be about 2.5 percentage points lower than would have been the case otherwise. The demand reduction would be felt even more strongly on the import side taking into account multiplier effects and could lead to a six per cent fall in US imports below the outcome in a normal year. That is approximately a \$110 billion reduction in US demand, based on the 2006 national accounts. About 15 per cent of US imports come from China. If the reduction in US demand is uniform across markets then the direct hit on China from the hypothetical US slowdown would be less than \$20 billion. Such a reduction would have large negative effects on exporters linked closely to US markets, but the number is small as a proportion of overall Chinese GDP – only about 0.6 to 0.7 per cent. It is also a small number in the context of an economy that has been growing at between 10 and 11 per cent per year for many years⁸.

While the direct effect of reduced US import demand on Chinese GDP is expected to be small, there would also be some offsetting positive internal resource reallocation effects. For example, it is unlikely that all of the resources left idle from a reduction in US demand for Chinese goods would be left unemployed. In a dynamic economy like China's at least some of the resources would probably find re-employment at some level elsewhere. This would reduce the size of any negative direct trade impact on China. At the same time a reduction in export growth would allow a reduction in the growth of imported inputs with a positive GDP effect.

In addition to the trade effects, shifts in international financial flows could be important determinants of the impact of a US recession on China. In a US recession, there would need to be less investment in that country than would otherwise be the case. The excess funds would therefore be released for investment in other countries. Indeed, it is possible that a large portion of these could find their way into emerging markets such as China with positive effects on GDP. Various analyses suggest that such financial flows could offset the direct trade loss in a US recessionary scenario.

Our analysis also shows a number of other positive and negative effects from a US slowdown. These are related to real exchange rate movements, shifts in terms of trade, consumption multipliers and various indirect trade effects from other countries back into China. But on balance we find it difficult to obtain a negative impact from a US recession on Chinese GDP that exceeds one percentage point. This means that the economy could still grow at a rapid 9 to 10 per cent even with a sharp US recession this year.

As with GDP, Chinese commodity demand is also expected to be insulated from any US downturn. A case study may help illustrate the point. Copper tube takes about a fifth of Chinese copper consumption. It is probably the most trade exposed of China's copper consuming sectors, so it is arguable that copper tube would be highly exposed in the event of a sharp US downturn.

But 82 per cent of the copper tube produced in China is consumed domestically. About 18 per cent is exported, and a third of that is sent to the US. So the exposure of this sector to the US is only about 5 per cent. Of course copper tube is used to make air conditioners and China is a major supplier to world markets. But over the last three years only 15 per cent of Chinese air conditioners were sold into the US and the Chinese home market has remained dominant. At the same time, in the case of both tube and air conditioners, the US has become a progressively less important source of demand growth. For example in the first ten months of last year, total Chinese tube exports grew by 11.4 per cent while exports to the US grew by only about 1.4 per cent. The broad implication is that even in a metals sector that is likely to be heavily exposed to trade the effect of a US slowdown on aggregate demand would appear be relatively limited⁹.

Finally, it is important to recognise that governments and central banks in countries affected by any US slowdown could boost economic activity through monetary and fiscal responses. It has been noted that such economic pump priming would favour construction and infrastructure. In China's case a range of comments from officials and leading scholars suggest that the Chinese government is prepared and fiscally able to introduce policy measures to ameliorate any negative effects associated with a US slowdown¹⁰.

US dollar weakness has supported commodity prices

Still on the macroeconomic front, over 2007 the US dollar has weakened appreciably against most other currencies driven by perceptions of increased riskiness in US asset returns in the wake of the sub-prime mortgage crisis; and expectations that the US Federal Reserve may cut interest rates to address growth concerns while other central banks may raise rates to combat inflationary pressures.

Over 2008, market based exchange rates are likely to fluctuate on ever-shifting speculation about relative interest rate policies and ongoing concerns about risk and structural imbalances and commodity prices in the case of large commodity exporters. In the case of managed currencies, policy and economic pressures on governments or the emergence of unsustainable foreign exchange flows will have the greatest influence on outcomes. For example, over this period the Chinese authorities have progressively allowed the currency to appreciate in nominal terms against the US dollar. Pressure on the RMB to strengthen further is expected to continue, both to address political frictions associated with the trade surplus and constraints on monetary policy associated with a managed currency. Since the start of this year, the rate of appreciation in the RMB relative to the US dollar has accelerated.

The currencies of many commodity exporting countries have also been affected by upgrades to market expectations about future commodity prices and M&A activity. The Australian dollar has gained about 12 per cent against the US dollar since the start of 2007. The

Chilean peso has gained about 12 per cent, the Brazilian real has gained 20 per cent, the Canadian dollar has appreciated by about 16 per cent and the Indian rupee has appreciated by 12 per cent. Such exchange rate shifts would have increased average US dollar production costs for many commodities. But at the same time, it could be argued that US dollar weakness would provide some support to prices of commodities that are denominated in US dollars but with large non-US consumption and cost bases. For example, appreciation in the Chinese and Indian currencies have increased marginal costs of aluminium and iron ore production, thereby increasing the underlying cost basis for prices. These cost pressures can be expected to continue – especially in relation to the Chinese currency while it remains significantly undervalued¹¹.

Commodity supplies remains stretched

The supply side has become increasingly stretched in its attempt to meet stronger demand for metals and minerals. Supply across a range of commodities has underperformed relative to demand and relative to expectations for a range of reasons.

- Production increases at brownfield expansions and new mines have in some cases been slow or slower than planned because of increased lead times for the delivery of key equipment.
- There have bottlenecks at various points in the supply chain such as at ports in Queensland.
- Unanticipated supply disruptions including: floods, earthquakes, cyclones, power supply disruption, strike action, wars, civil disturbances and unplanned maintenance.

Illustrating the difficulties associated with achieving expansions at a faster rate the following data show that projected delivery lead times for key equipment have doubled in some instances. At the same time, recent cost increases for key equipment are likely to have placed unplanned cost burdens on some new projects which could affect their viability. Cost increases have also occurred for operating inputs including labour and contractor rates contributing to mining cost inflation.

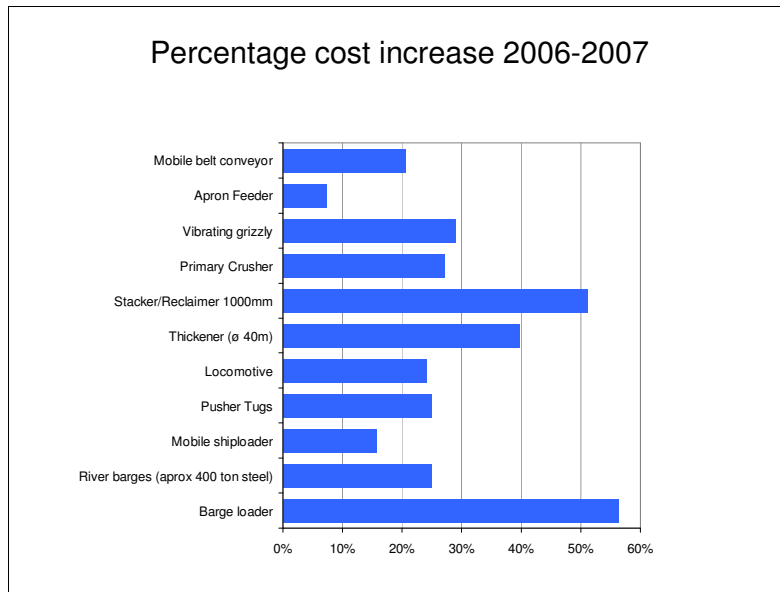
Indicative lead time for key equipment – aluminium smelting

Key Equipment	Forecast Lead Time (Months)	Normal Lead Time (Months)
Refractories, Anode Baking Furnace	24 to 30	12 – 15
Substation & Electrical equipment	36	24 - 30
Carbon (Paste) Plant	24	21
Potshells & Superstructure	30	15

Indicative lead time for key mining equipment – Australia and Africa

Equipment	Forecast Lead Time (Months)	Normal Lead Time (Months)
Rail Turnouts	24	12
Power transformers	12	6
Crushers	24	12
Mine Stackers and Reclaimers	36	18
Locomotives	30	24
Port Stackers, Ship loaders and Reclaimers	36	24
Grinding Mills	44	24

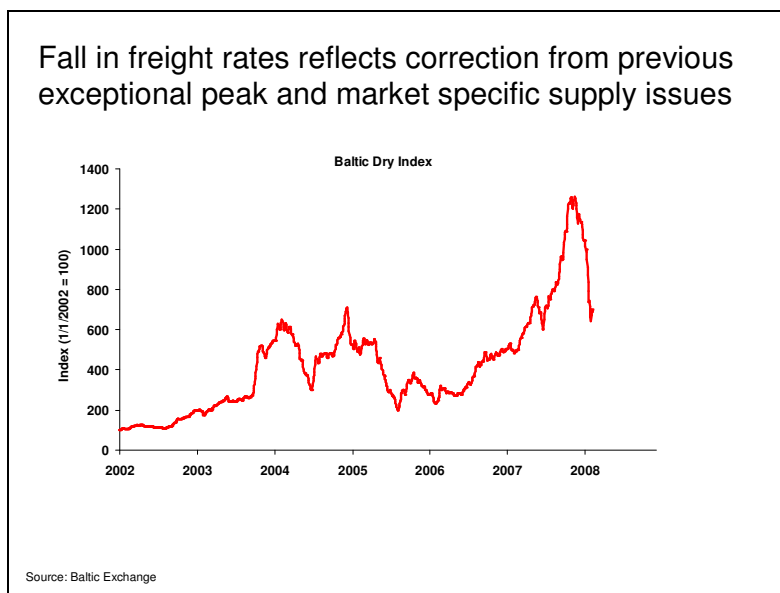
Source: Rio Tinto Procurement estimates



Source: Rio Tinto Procurement estimates

Constraints of various types have also affected freight markets leading in recent years to increased bulk shipping freight rates that at their peak were at ten times their historical average. This has fed through into the delivered prices of a number of bulk commodities. The underlying source of increased freight rates has been increased trade in bulk commodities and delays in the construction of new shipping capacity and port infrastructure. During 2007 large shipping queues on the Australian east coast built up – an issue explored in somewhat greater detail in the later discussion on thermal coal. This effectively cut the productivity of the capesize shipping fleet. As the shipping queues cleared with de-bottlenecking at the ports, freight rates have fallen. Early this year, unexpected reductions in Brazilian iron ore exports due to various accidents and disruptions to Indonesian coal exports due to heavy rains created excess shipping capacity in a period that is normally slow for bulk shipping due to seasonal agricultural trade patterns. This contributed to sharp falls in freight rates, with the speed of decline possibly exaggerated by paper trade. Rates have now recovered a little as trade in bulks has recovered following the earlier unexpected reductions and they remain elevated at levels many times higher than the historical average.

As noted above, shifts in freight rates affect the prices of bulk commodities because freight rates affect the absolute and relative costs of trade to and from different locations. But in the past there has also been a relationship between freight rates and exchange traded metal prices. This observation has led to many macro economists to include freight in their predictive models for economic activity generally. But statistical analysis of the direct causal relationship between freight rates and metal prices suggests that in recent years, as freight markets have tightened, monthly movements in freight rates have become poor leading indicators of commodity price outcomes. This should not be surprising given the preceding discussion which suggests that freight rates can be affected by a range of influences especially when those markets are fundamentally tight. In particular the falls in freight rates since the middle of 2007 were attributable to de-bottlenecking of infrastructure constraints and supply side influences rather than shifts in commodity demand and a freight market-specific correction from the very large increases seen in the first half of the year.



The supply constraints reflected in equipment delivery lead times and costs will not be resolved quickly contributing to tight markets in many cases. Additionally, with low stocks in a number of commodities, the expectation of continued supply disruptions can be expected to support prices.

Commodity case studies

The following case studies illustrate the implications of the more general discussion for key commodities.

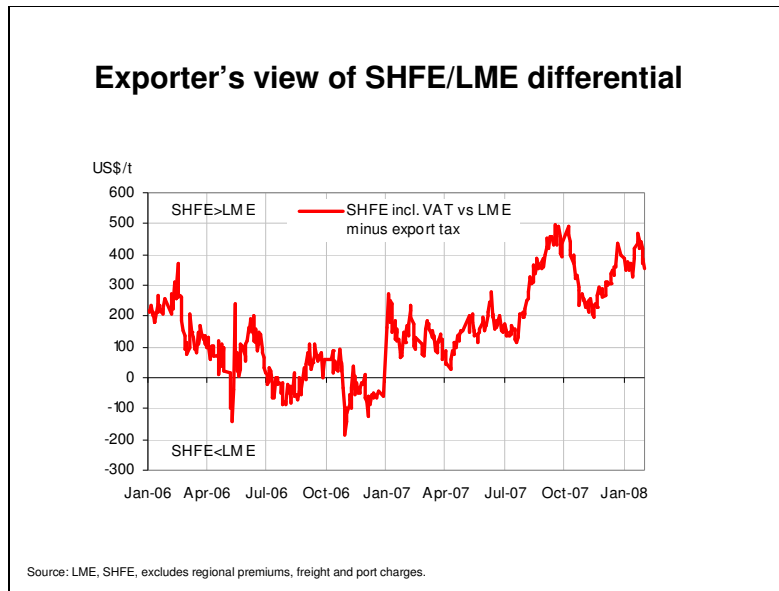
Aluminium

Global primary aluminium consumption increased in 2007 at its fastest pace in recent history, up around 10 per cent y-o-y to about 38 million tonnes. China accounted for most of the growth in demand last year, offsetting weakness in North America. Chinese consumption now accounts for about one third of the global primary aluminium market and is expected to continue rising by 15 per cent p.a. over the next 5 years. On a global level, demand growth in 2008 is forecast to remain above the past 5-years' average growth trend of 8 per cent¹².

The increased availability of alumina in 2007 allowed primary aluminium production to catch up with demand and the market switched into a modest surplus as a result. Nevertheless, reported stocks remained close to historically low levels by the end of 2007, representing about 5.3 weeks of western world shipments, as increases in exchange stocks were partly offset by falling producers inventories. Most of the production growth occurred in China with rising domestic alumina supplies enabling the commissioning of idled new capacity. However new aluminium capacity in China is expected to be heading toward the top of the global cost curve, adding further support to current price levels¹³.

Alumina prices have recovered strongly in 2007 from close to \$200/t at the end of 2006 to more than \$400/t in recent months. Supply disruptions and strong demand have resulted in a tight market. Meanwhile rising energy prices and higher delivered bauxite prices for non-integrated refineries had a significant impact on the production cost at marginal refineries. Aluminium prices softened slightly over the second half of 2007 although the average for the year was up slightly from 2006 at around \$2,650/t. By the end of 2007 costs at Chinese

smelters were under pressure from higher alumina prices and a continued strengthening of the Chinese RMB. As a result, exports of primary aluminium for marginal Chinese smelters are believed to have become increasingly unattractive in recent months^{14,15}.



As with demand, production growth is expected to remain strong in 2008 with the aluminium market expected to be relatively well supplied. However the recent curtailing of capacity due to power shortages in China and southern Africa shows the aluminium industry is not immune from supply disruptions. In China power outages related to the worst snowfalls in more than decade, which put pressure on tight transportation systems and exacerbated coal shortages, has led Chalco to shut two smelters with a combined capacity of 430kt in January 2008. An estimated additional 500kt of capacity is believed to have been curtailed in central and southern China by the end of that month. Meanwhile growing imbalances between power demand and supply in South Africa have forced Eskom to restrict power supplies to industrial users. Smelters in South Africa and neighbouring Mozambique curtailed some ten per cent of their combined 1.5 million tpy capacity towards the end of January. Aluminium prices have responded to these production cuts, bouncing back to their highest level in six months. By the start of February prices were again trading slightly above 2007 average levels.

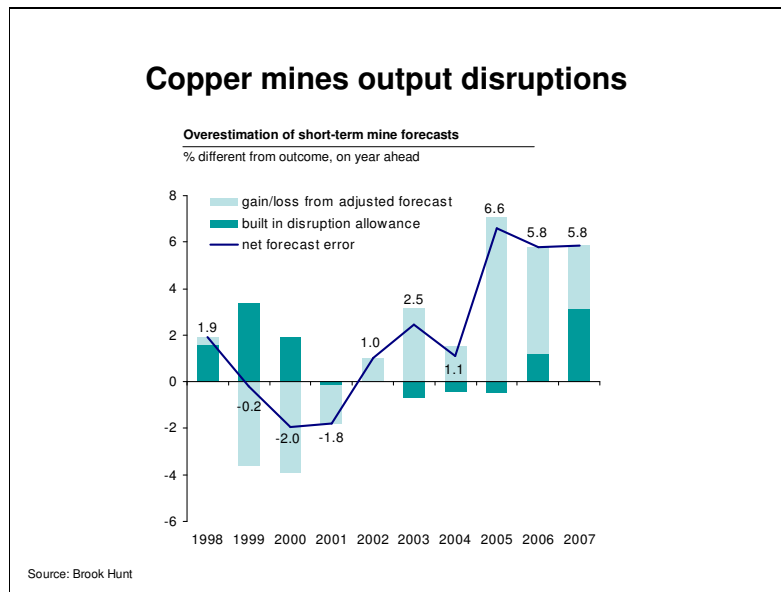
Although some of the recent severe power shortages in China are likely to be temporary, they have brought focus to the power availability and costs for smelters, particularly those which do not rely on self-generated or truly stranded sources of power. Underinvestment in power markets such as South Africa and Europe, where several smelters are relying on purchased power, have become more apparent. Meanwhile in rapidly developing and urbanising countries such as China the opportunity cost of power for industrial users is rising especially as power grids become more integrated. Such trends are likely to continue to put pressure on the industry's marginal cost of production in the long term and force the relocation of some capacity to regions with more stranded and competitive power sources. However even in the regions targeted by new projects the opportunity cost of energy and therefore power rates available for greenfield capacity are also rising, making the development of new capacity more difficult and costly. Market expectations about these types of developments are reflected in the fact of rising forward prices for aluminium on the London Metals Exchange.

Copper

Over the last two years the copper price has been driven by the failure of supply to match higher demand growth. This growth has been the result of above average global economic growth and industrialisation in developing countries. The market has been brought back toward balance by high prices which have encouraged substitution away from copper in some uses and intermittent destocking. Copper stocks have fallen again this year, having built up in the second half of 2007, and remain close to critically low levels. Prices have fluctuated in a range from 300c/lb to 360c/lb, since the middle of 2006, with the exception of the sharp fall in the first quarter of 2007¹⁶.

While weakness in the broader US economy has emerged only recently, US copper demand had already been reduced by the downturn in the housing sector over the course of 2007. But this reduction has easily been made up by growth in China, which already consumes more than twice as much copper as the US, and where demand rose very sharply last year having been depressed by destocking in 2006.

Mine supply has grown slowly and has consistently fallen short of expectations for several years, due to a variety of factors including strikes, disruptions, and slower than expected ramp up at new mines. This underestimation has persisted even though forecasters have recently been increasing their assumed allowances for disruption and production slippage.



Relatively slow growth in mine production has meant that availability of raw materials is tight. Annual contract treatment and refining charges for concentrate have fallen from \$60/t and 6c/lb last year to \$45/t and 4.5c/lb this year. At the same time stocks of raw materials have been drawn down to grow cathode production faster than mine output in recent years¹⁷.

In contrast scrap supply has grown strongly in response to higher copper prices and improvements in the scrap supply chain. Some of this scrap has been processed to refined copper, but a larger portion has been used by fabricators as a substitute for cathode, particularly in China. This increase in scrap has filled some, but not all, of the gap created by

the shortfall in mine output. More recently scrap availability has tightened on renewed Chinese buying.

The sulphuric acid market is very tight with 2008 contract prices cfr North Chile recently settled at \$180-200/t. High prices and a tight market could have a knock on effect on SXEW mine output, which relies on acid as an input. Production at recently developed North American SXEW operations has been held back by poor acid availability due to strikes in Mexico¹⁸.

Recent signs suggest that mine production is likely to undershoot expectations again, having underperformed by around 6 per cent in recent years. This is because of the possibility of further problems with power availability in Africa, the ongoing potential for labour disputes in an environment of high prices and disruptions related to mine production being stretched to its limits. Such supply conditions in the context of above average demand growth in 2008 and low metal and raw material stocks mean that copper prices are expected to remain elevated well above trend levels this year.

Molybdenum

Molybdenum oxide averaged just over \$30/lb in 2007, with prices of \$30-35/lb since May last year. Even without disruptions supply growth looks likely to lag demand growth in 2008, suggesting another period of strong prices¹⁹.

Demand growth has been strong and, unlike other metals where prices have risen well above historical levels, there are no signs of substitution. Molybdenum is used in small quantities in many high specification steels, and demand has been buoyed by their use in oil field goods and a number of tough environments. In chemicals, the main non-steel sector, demand is growing strongly, partly driven by use in catalysts used to sweeten sour oils, which are becoming a larger proportion of total oil supply.

Molybdenum mine supply can be broken into three main parts: Chinese output, largely from main-product molybdenum mines; non-Chinese main-product mines; and by-product mine output.

By-product output is the largest segment, accounting for 50 to 60 per cent of production, and is currently stalled or even falling modestly. By-product mine grades fluctuate much more than the copper grades. Following a peak in 2005 grades at several important mines have been on a downtrend which is continuing this year. These declines have been only partly offset by some production from newly installed circuits and expansions.

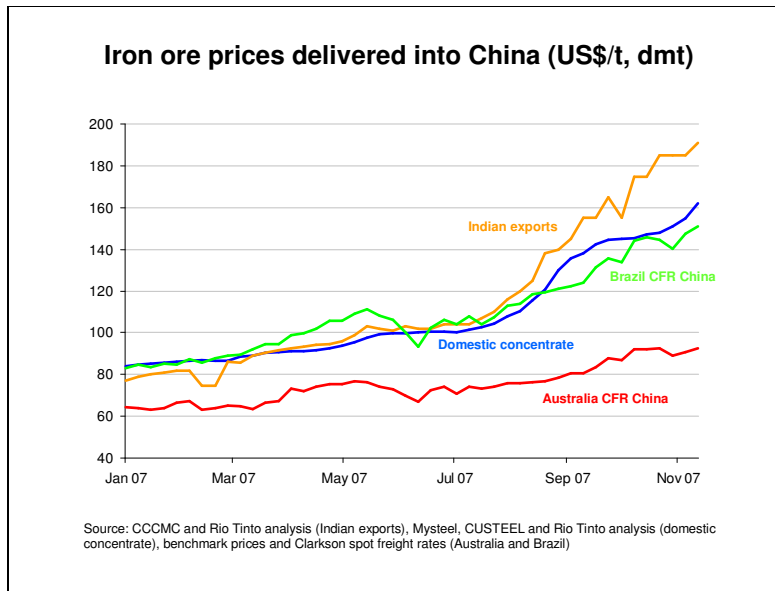
Main product output from outside China is a relatively small part of the total, accounting for about 20 per cent of global output. In the short term this is not likely to change significantly.

The key source of supply growth is Chinese output which now accounts for about 25 per cent of world mine production. Mine output is continuing to recover after the sharp cuts imposed in 2004-5, as the industry invests more and consolidates. China's share of global production probably peaked in 2004 at around 30 per cent and fell back to 20 per cent at its low point. The government has encouraged consolidation and imposed export controls and taxes which are currently restricting supply growth to the global market.

Iron ore

Rapid growth in Chinese demand for iron ore has led to sharp increases in the spot price. Indian iron ore fines are now selling in China for a spot price of around \$180/tonne, double

their level at the start of 2007. After taking into account freight rates, Australian fine ores sold at benchmark prices (of around \$50/tonne fob) now trade at substantial discount to these spot prices. Brazilian ores, which have higher transportation costs to the growing Asian market, sell at a smaller, but still significant, discount²⁰.



Demand growth for seaborne iron ore continues to exceed the output growth of low cost producers. In 2007 China imported 384mt of seaborne iron ore and produced around 490mt of crude steel. This means China's domestic iron ore industry had to produce around 350mt (in high-grade equivalent terms, c. 60% Fe) to satisfy the total domestic requirement. Much of this was produced at increasingly high cost with the bulk of incremental output coming from remote areas in Liaoning and Inner Mongolia. The strengthening RMB also added to US dollar costs for Chinese producers^{21,22}.

Growth in supplies from high cost producers, which have filled the increasing gap between demand and low cost seaborne production, are expected to slow in 2008. With falling grades and increasing costs, domestic Chinese output growth fell to around five per cent year on year in November 2007. It appears unlikely that domestic production can expand at rates achieved over the last few years. Similarly India, the other high cost supplier to Chinese markets, is believed to have out-stretched its ore export capacity in 2007 and is therefore unlikely to increase exports significantly without large capital investments. Indeed, Chinese steel production slowed late in the year mainly due to the limited availability of iron ore.

On the demand side there is little indication the growth in steel consumption is about to slow. Despite a new tax on exports, China's steel output increased by around 16 per cent in 2007. The domestic price of Hot Rolled Coil also increased by around 17 per cent over the same period and the export priced increased by 39 per cent (although this includes the additional levies), taking it to a new record. The price growth indicates strong demand for the incremental output²³.

Strong demand for iron ore is not limited to China. Annual Japanese crude steel output hit a 33-years' record level in 2007. In Germany production exceeded the industry's expectations. The only softening of conditions is in North America, where production declined by two per cent last year and more cuts are expected this year as economic activity slows. The US slowdown has not had a direct material impact on the seaborne iron ore market as nearly all domestic production relies on either domestic ores or scrap.

In a broad setting of strong demand growth and constrained supply, the iron ore markets can be expected to remain and perhaps become increasingly tight.

Pacific seaborne thermal coal

Recent flooding at key Queensland coal mines contributed to a rapid escalation in Pacific seaborne thermal coal prices to record levels. But even as flood affected production recovers the underlying fundamentals for 2008 suggest a continuation of strong market conditions.

Gas prices have tended to follow oil prices higher and this has led to many customers electing to receive only their required take or pay contracted minimums. This has, in turn, ensured that thermal coal demand remains strong.

On the supply side, port infrastructure constraints have continued to hamper exports from eastern Australia. In June 2007, a record of 79 ships were waiting off Newcastle to load, this represented ten per cent of the world's Capesize and five per cent of Panamax sized ships. This substantial diversion of the world's freight contributed to high freight rates, which passed through to high coal C&F prices.

Significant port expansions are underway and planned in NSW and Queensland that look likely to address infrastructure issues in the medium term to long term. However, despite these port expansions there remain a number of significant constraints in the shorter term, particularly in NSW with regard to thermal coal. In addition, a fragmented and decentralised approach to infrastructure development means that port capacity is only part of the constraint and rail infrastructure must be developed in conjunction with port expansions to relieve the export supply bottleneck.

Again on the supply side China's position as a net exporter of thermal coal continues to diminish. China's coal trade was nearly balanced in 2007 (until end November, 1Mt exports). In terms of thermal coal, China remains a net exporter (around 27Mt until end November) but considerably lower than in 2006. It appears increasingly likely that electricity shortages in China and reduced production growth from small mines will necessitate increasing imports – especially into the south. At the same time, there could be increasing pressure to ensure that domestic coal needs are satisfied before export demand is met.

A positive demand setting in the context of high oil and gas prices, ongoing port constraints and the expectation of reduced net exports from China suggests that the market for thermal coal can be expected to remain tight this year.

Conclusion - faster long run average demand growth, extended medium term price elevation and higher long run prices

It is important to remain mindful of macro-economic risks relating to OECD growth and especially relating to US housing and credit markets. However it is also important not to exaggerate these risks as our modelling suggests that they should not have a significant impact on the developing economies that have been the growth engines of commodity demand.

Indeed, continued firm global economic activity led by rapid resource intensive growth in China is expected to support strong increases in demand for most metals and minerals over 2008. At the same time, supply growth is expected to remain relatively constrained. The implication is that prices can be expected to remain well above long run trend in 2008 and some prices may not yet have peaked.

Footnotes:

- 1: Global Insight, Country intelligence – China, January 2008
- 2: Global Insight, Country intelligence – United States, January 2008
- 3: Consensus Forecasts, January 2008
- 4: Capital Economics, Asian Economics Weekly, February 2008
- 5: Global Insight, India key macro-economic indicators, February 2008
- 6: Asia Pacific Consensus Forecasts, January 2008
- 7: Global Insight, Middle East and North Africa economic growth outlook, February 2008
- 8: Vivek Tulpulé, Australian Financial Review, January 2008
- 9: Vivek Tulpulé, Pilbara media visit presentation, January 2008
- 10: Yu Yongding, Director, Institute of World Economics and Politics, Chinese Academy of Social Sciences (CASS)
- 11: Financial Times
- 12: CRU, Aluminium Quarterly, January 2008
- 13: CRU, Aluminium Monitor, January 2008
- 14: CRU, Alumina Monitor, January 2008
- 15: Ecwin database for aluminium prices and Chinese exchange rates
- 16: Ecwin database for copper prices
- 17: Brook Hunt, Copper Metal Service, January 2008
- 18: CRU
- 19: CRU, Nickel chrome molybdenum Monitor, January 2008
- 20: Steel Business Briefing, February 2008
- 21: China Metals for iron ore import data, January 2008
- 22: IISI for crude steel production data, February 2008
- 23: Steel Business Briefing, February 2008

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