

# Overview of the Global Metal Markets

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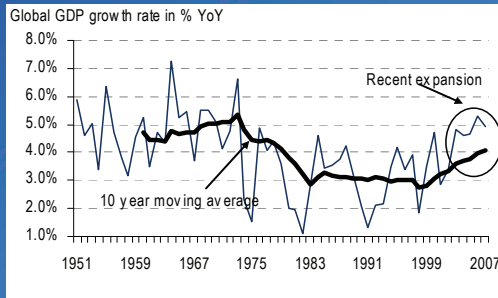


Good morning Ladies and Gentlemen!

I would like to give you an overview of the metals market and the environment that we are in at the moment, briefly going into the markets themselves as well and then give some specifics on aluminium and copper in particular.

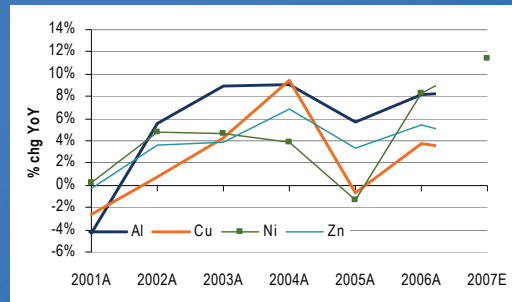
## The metals sector is dealing with burgeoning demand...

We are currently witnessing the strongest global economic cycle since the 1960s



Source: Angus Maddison

Strong economic growth, particularly in the emerging markets, is driving up global demand for metals



Source: Merrill Lynch Commodity Research

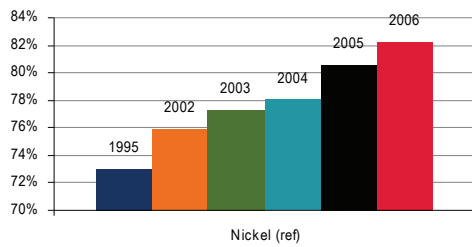
### Metals undertake a structural price shift

We have obviously been seeing quite a sharp lift in prices over the past couple of years. We believe this has been a structural price shift in the metals markets.

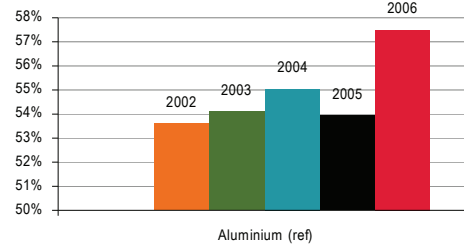
We have experienced some of the strongest global demands in some time, as you can see from the chart on the left. The recent expansion has not been seen since the 1960s. The strong economic growth has obviously driven up global demand for metals, particularly copper and aluminium have seen strong growth rates over the last couple of years.

## ...at a time of rapid industry consolidation

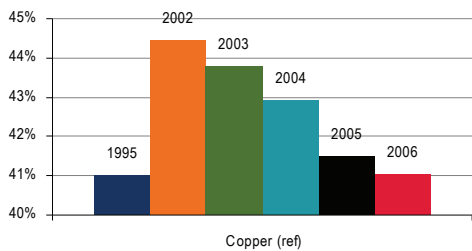
Market share of top 10 nickel producers



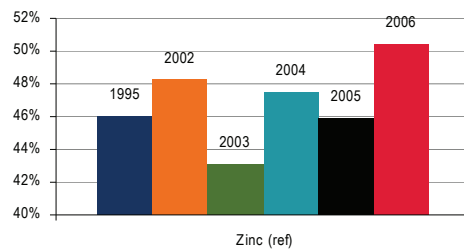
Market share of top 10 aluminium producers



Market share of top 10 copper producers



Market share of top 10 zinc producers

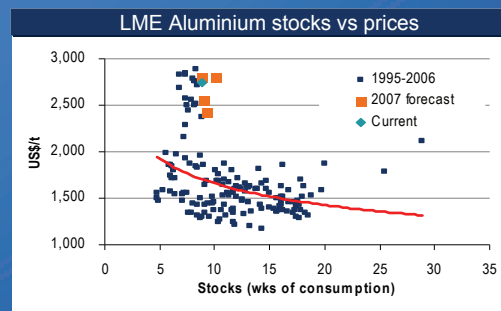
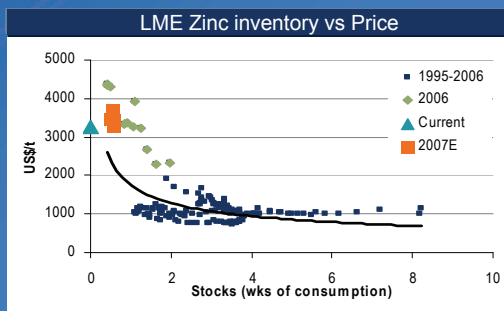
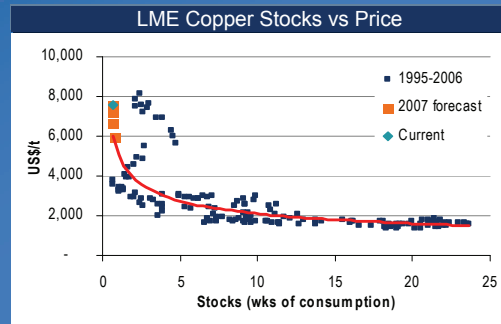
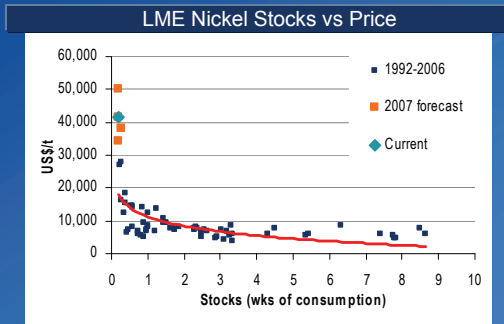


Source: Brook Hunt, Companies, Merrill Lynch Commodity Research estimates

Source: Brook Hunt, Companies, Merrill Lynch Commodity Research estimates

This growth has come at a time of rapid industry consolidation. As you can see the market shares of the top ten producers of nickel, aluminium and zinc in particular have increased significantly. Strangely enough the market share of the top ten copper producers has fallen over the past few years. But in general we can see that consolidation allows producers to actually control the way they react to this demand. It obviously helped to keep these markets relatively well fed, but not oversupplied.

## Inventories still struggling to build



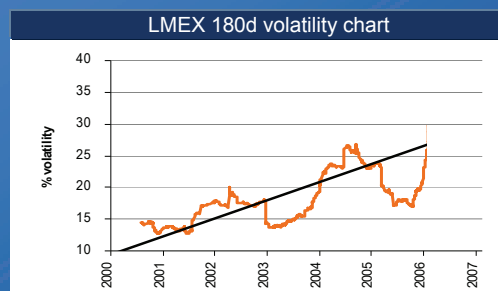
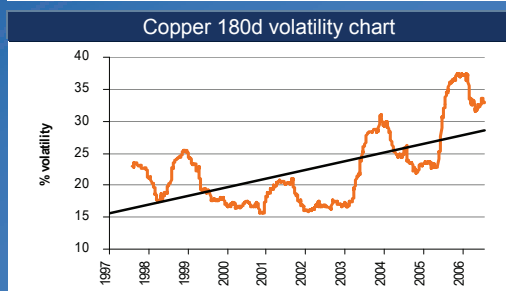
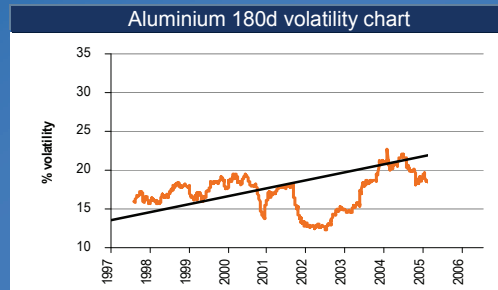
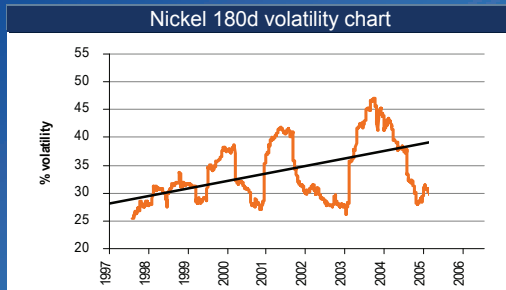
Source: LME, Merrill Lynch

Source: LME, Merrill Lynch

During these times inventories have struggled to build. These charts show stocks in terms of weeks of consumption which is a good indicator of how price reacts to the level of stocks.

As you can see from the orange points on the charts, representing 2007, at these levels of stocks, we are seeing at the moment, prices can range quite drastically. For example, copper prices at the current stock levels, theoretically on this basis, could range anywhere from \$5000 a ton to \$8000 or even \$10000.

## Volatility remains exceptionally high



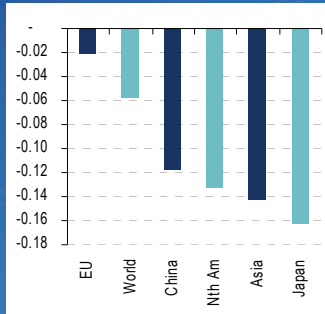
Source: Bloomberg

Source: Bloomberg

So at these critically low levels of stocks, prices will remain quite volatile. We see this volatility increase. The nickel, aluminium and copper markets have seen volatility over the past 20 years increase significantly. With that low inventory level we will see this trend to continue for some time.

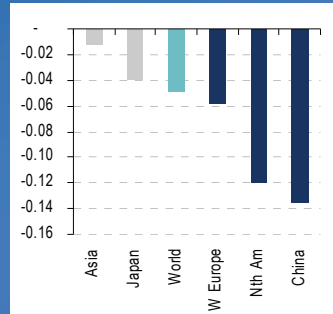
## Consumers have absorbed high metals prices

Price elasticity of aluminium demand



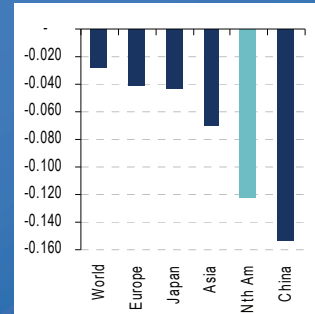
Source: Merrill Lynch Commodity Research NOTE: light blue columns refer to one-year lagged

Price elasticity of copper demand



Source: Merrill Lynch Commodity Research NOTE: light blue column refers to one-year lagged elasticities, light grey to non-significant elasticities

Price elasticity of zinc demand

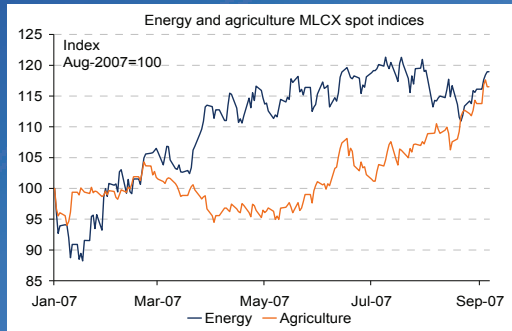


Source: Merrill Lynch Commodity Research NOTE: light blue column refers to one-year lagged elasticities

Interestingly, in this current cycle the consumers absorb these high metals prices. Normally, you would see margins either contract or prices passed on to consumers and demand affected accordingly. But when we ran some analysis on the price elasticity of demand for several markets, we noticed that the high levels of prices have not affected the end user consumption. So, that has really driven, I suppose, the demand growth we are seeing at the moment, despite these high prices.

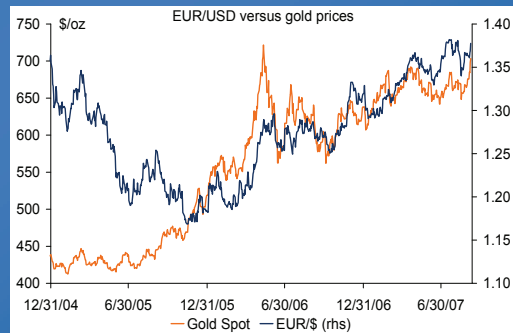
## Commodities have so far weathered the credit crunch...

Energy and agriculture markets have barely noticed the credit crunch



Source: Merrill Lynch Commodity Research

Precious metals, particularly gold, are profiting from a high risk aversion and weak USD environment



Source: Bloomberg, Merrill Lynch Commodity Research

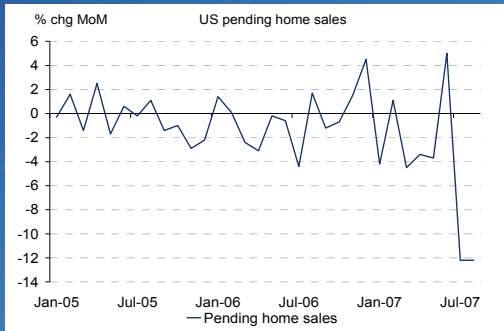
### Have commodities escaped the credit crunch?

Obviously, at the moment we are going through quite a volatile time in the markets. This has been primarily driven by the tight credit market in the USA.

So far the commodities have actually weathered this crunch quite well. When you look at the energy and agriculture markets, prices had a slight dip in August when the issue first raised its head, but since then have grown strongly. Precious metals, in particular gold, actually profited from this environment of high risk aversion and a weak US dollar. They have increased significantly over this period.

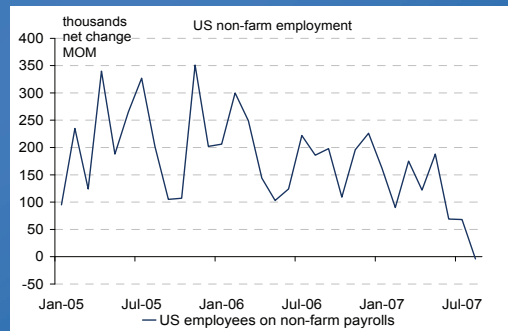
## ...but there is a growing risk that the US economy will fall

Pending home sales, a key indicator to actual home sales, plunged in August



Source: Conference Board, Merrill Lynch

Non-farm payrolls declined for the first time since 2003, suggesting that economic activity could contract going forward



Source: Bloomberg, Merrill Lynch Commodity Research

But there is a growing risk that the US economy will fall. If you look at the pending home sales, they actually plummeted in August. Many believe that the US housing market will soon be in a dire state.

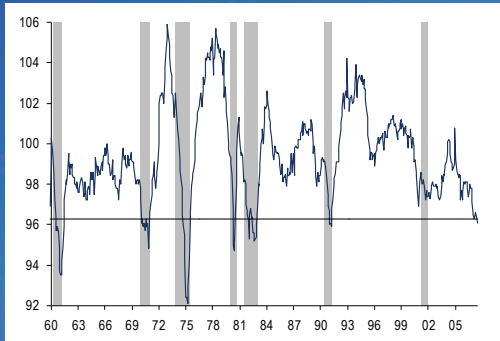
Non-farm payrolls declined for the first time since 2003.

How does this shock effect commodities?



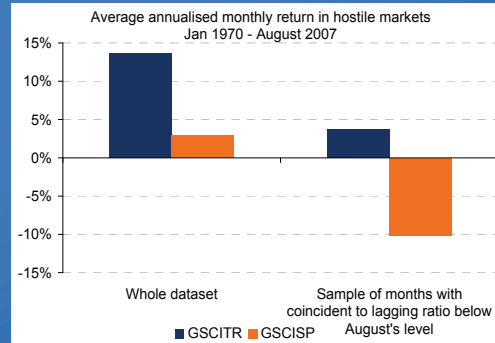
## How is this shock likely to affect commodities?

**Economic indicators point to a further slowing in US growth** (Ratio of the coincident to lagging composite index, 1996=100)



Source: Conference Board, Merrill Lynch Economic Research  
Shaded areas represent periods of US recession

Going back in time, such depressed levels in the leading indicators had grave implications for commodity returns



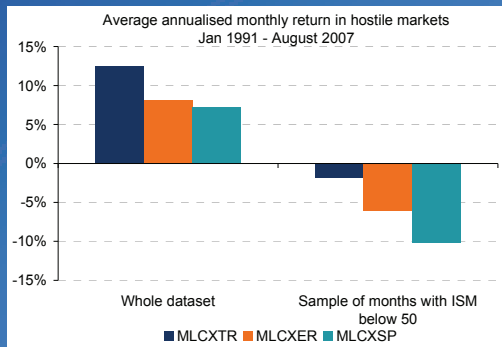
Source: Bloomberg, Merrill Lynch Commodity Research

Economic indicators point to further slowing in US growth.

You can see on the chart on the left, the composite index there, with the shaded areas showing periods of US recession, suggests that we are coming to that point once again. But going back in time, since 1970 the return on commodities has been relatively good, in the double digits percentage figures. But when you look at the periods of US recessions, as shown in those shaded areas, the return is significantly lower, in fact, spot returns for the GSCI commodity index are actually negative during those periods.

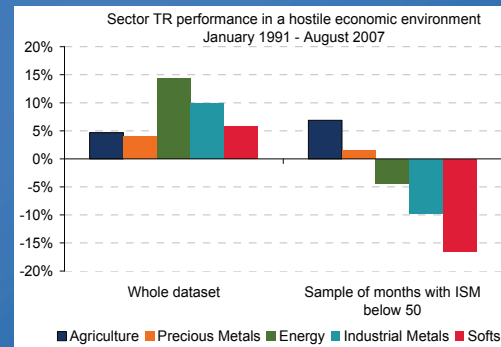
## A deceleration in the US industrial economy is a negative...

If the US industrial sector starts to decelerate, pushing the ISM below 50, spot commodity prices could fall



Source: Merrill Lynch Commodity Research

Agriculture and precious metals tend to outperform other commodities when the ISM is below 50



Source: Bloomberg, Merrill Lynch Commodity Research

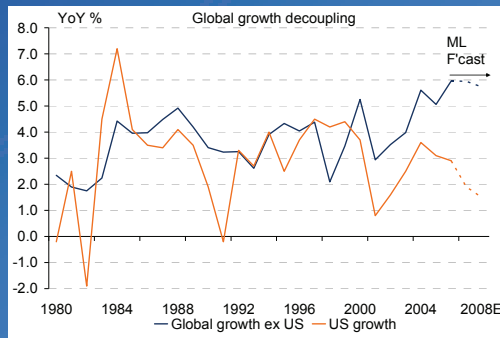
A deceleration in the US industrial economy is a negative, despite what many in the market seem to be suggesting.

As you can see on the chart on the left we have a whole data set of returns since 1991. Once again, when the ISM is below 50, on the right hand side, you can see returns are negative.

But interestingly, during these periods agriculture and precious metals actually showed positive returns. The worst affected were industrial metals and soft commodities.

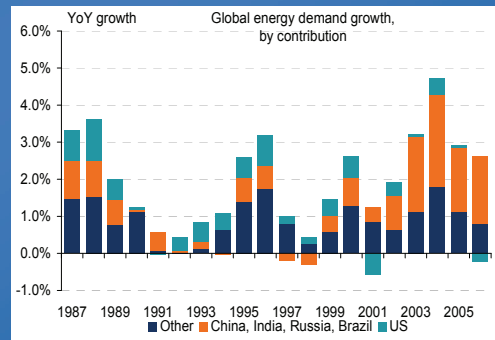
## To some extent, commodities have also decoupled from the US...

As our Global Economics Team points out, global economic activity no longer relies so much on the US economy



Source: Bloomberg, Merrill Lynch Commodity Research

Split down by major regions, world energy demand growth now hardly depends on the United States



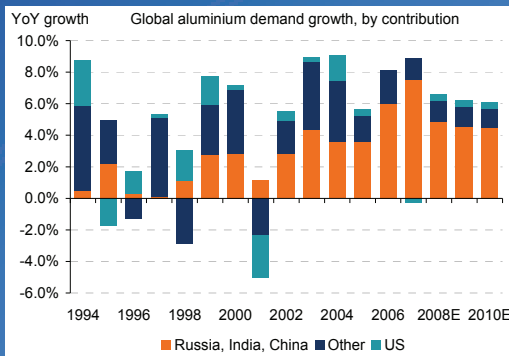
Source: Brook Hunt, Merrill Lynch Commodity Research

So far, to some extent commodities have actually escaped this weak US economy. We are seeing strong demands from the emerging markets, primarily driven by domestic demand this time. Thus, the world seems to be less reliant on the US economy and the US consumer.

In terms of demand, it certainly doesn't seem that the US is a major factor as it was 20 to 30 years ago. At the right hand side you can see the world energy demand split into major regions. For 2006 the BRIC economies of **Brazil, Russia, India and China** provided a huge part of that demand growth. In fact, last year the US provided negative growth in energy demand. This is most relevant for the industrial metals market.

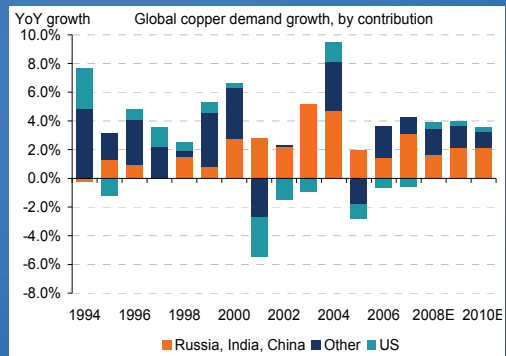
## ...and this is even more relevant for industrial metals markets

The intense urbanisation and vast amount of infrastructure projects in EM has exponentially increased demand for aluminium



Source: Brook Hunt, Merrill Lynch Commodity Research

Copper is perhaps most at risk among the various industrial metals

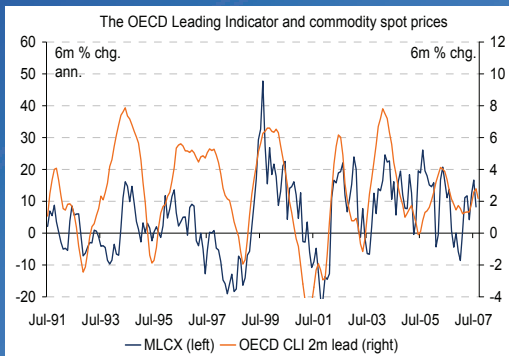


Source: Brook Hunt, Merrill Lynch Commodity Research

On the left hand side we see the aluminum demand growth by contributions. Once again the BRIC economies provide a large part of demand in aluminium. Copper is probably one market which is most exposed to the US housing sector in the US economy. Thus, you can see, it is more effected by a slower US, but overall copper still relies on the BRIC economies as well.

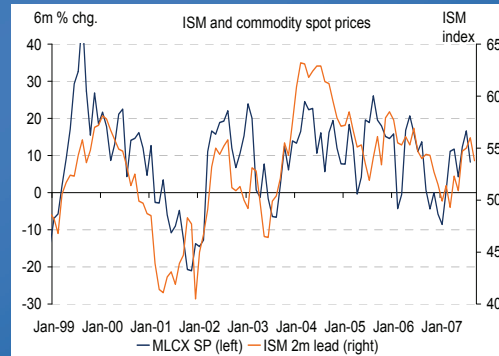
## The ISM is a guide to potential commodity weakness

The OECD predicts MLCX spot price changes usually by a two-months lag



Source: Datastream, Merrill Lynch Commodity Research

The ISM has a slightly closer fit, particularly over the past few years and is the timelier indicator



Source: Bloomberg, Merrill Lynch Commodity Research

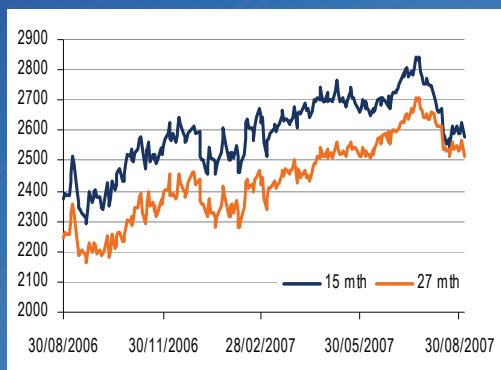
We are starting to see that ISM turns down. Once we see it pass through 50, we would suggest that we start to get into dangerous territory.

Now, I would like to just go briefly into each of the commodity markets for the base metals.

# ALUMINIUM

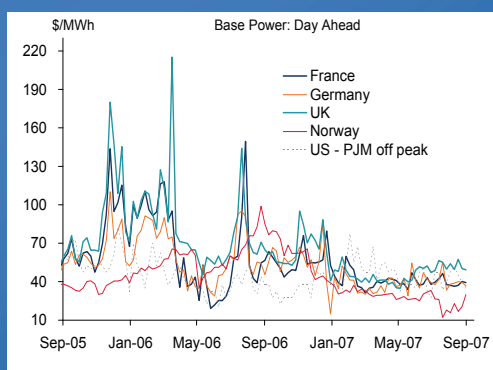
## Short term weakness as market tightness eases...

Far dated aluminium prices have pushed higher, despite a stagnant spot price



Source: Bloomberg, Merrill Lynch Commodity Research

At the same time, spot power prices have fallen substantially in major aluminium producing regions



Source: Reuters, Merrill Lynch Commodity Research

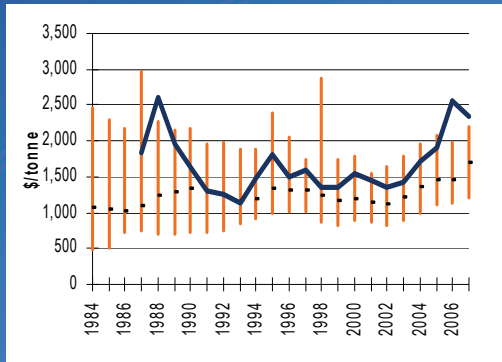
### The outlook for individual base metals markets

In aluminium we actually see a bit of short term weakness in the market as this tightness ceases. One particular issue over the past 6 months has been the spot prices for power, in particular in Europe and the US. Aluminium being somewhat of a high energy consumer, energy prices are an important part of production. While we were seeing 5-dated contracts for aluminium increased significantly over the past 18 months, spot prices for power were actually falling. This creates an environment where aluminium producers who had previously suspended supply can start to bring some of that back.

# ALUMINIUM

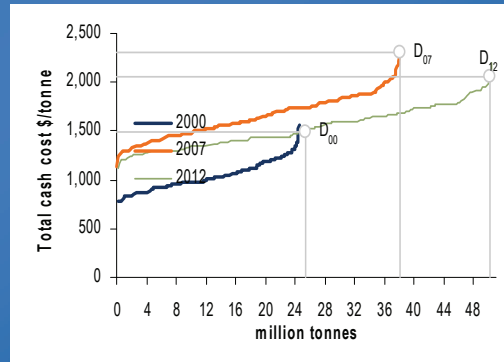
## ...but aluminium remains underpinned by high costs

The aluminium price traditionally sits around the highest cost producer during times of market tightness



Source: Brook Hunt, Merrill Lynch Commodity Research

Prices of +\$2,000/t are required to keep the market supplied for the next five years



Source: Brook Hunt, Merrill Lynch Commodity Research

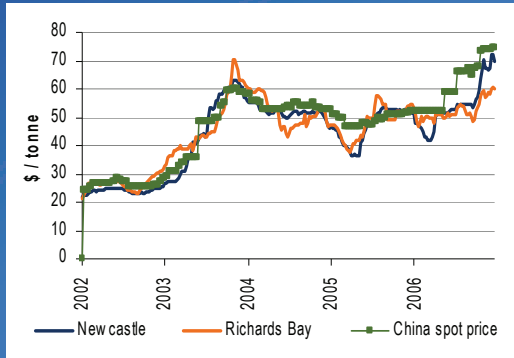
But aluminium is one market that is very much underpinned by the high cost of the industry. Traditionally during periods of market tightness the prices have tended to hover around the high cost producer. At the moment, we think, that level is quite close to the current price.

If you look on the right hand side chart, the orange line shows the cost of production for 2007. In order to meet the demand, producers at the top end of the cost curve (at around the \$2400 mark) are required to produce aluminium. So, at the current prices we are not far off that.

# ALUMINIUM

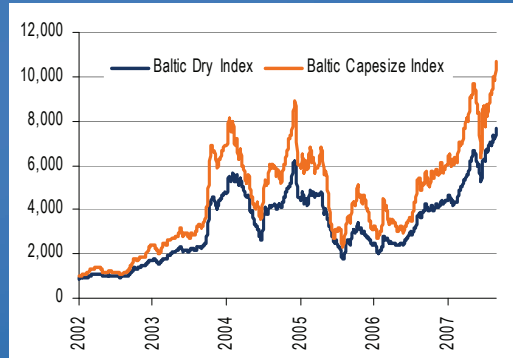
## Surging coal prices yet to be factored in

Thermal coal prices have risen around the world...



Source: McCloskey, Bloomberg

...while record freight rates have pushed landed prices even higher



Source: Bloomberg

One issue which has really not come through into aluminium is surging coal prices. Coal is a significant source of energy used in the aluminium industry, particularly China. China has a regulated market for energy at the moment. Those rising coal prices are putting pressure on costs in China.

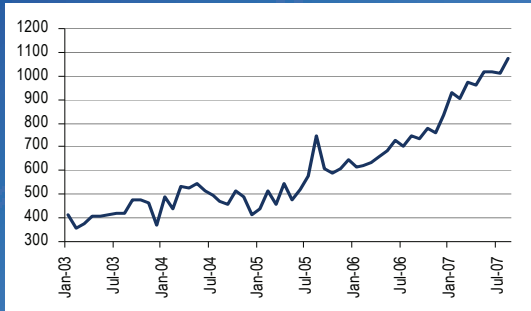
Combined with the record high freight rates we are seeing this issue of surging coal prices which will start to have an effect on aluminium production in China soon.



# ALUMINIUM

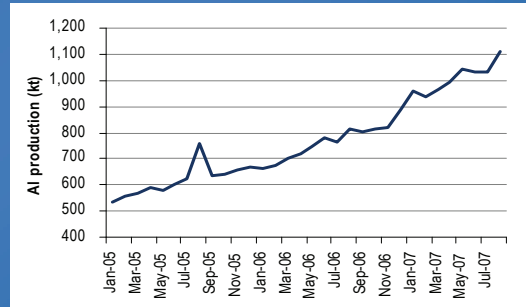
## Chinese demand well beyond expectations

China's apparent consumption of aluminium remains strong...



Source: China Customs, NBS, Antaika

...as does its aluminium production



Source: China Customs, NBS, Antaika

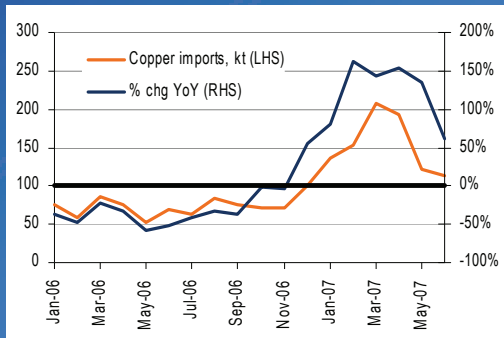
What has really kept the market tight is China's demand for aluminium. It has exceeded all expectations so far and it continues to move strongly. But the risk does remain regarding its aluminium production. It has increased significantly as well and while it will obviously not be a risk for the down side in terms of production, clearly the space must be watched closely.

## COPPER

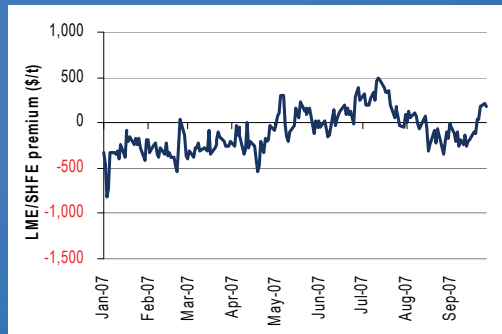
### The Chinese consumer remains the key driver...

Due to an aggressive de-stock last year, refined copper imports fell dramatically in China

Any short term trading support will be undermined by the LME copper price moving back to a \$200/t premium over SHFE



Source: China Customs, Merrill Lynch Commodity Research



Source: China Customs, LME, Merrill Lynch Commodity Research

The copper market is called by some people bearish, some call it bullish. We believe that the market is well supplied at the moment. There seems to be plenty of copper around. But clearly the Chinese consumer has been the key driver of prices so far this year.

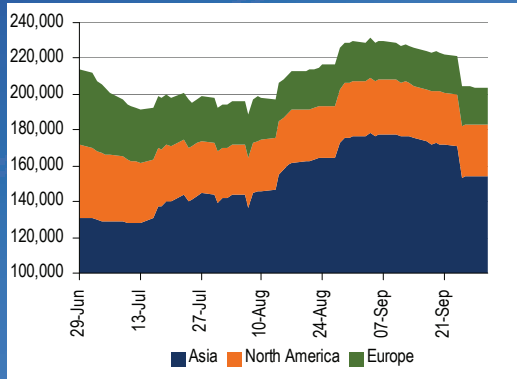
We saw imports decrease significantly at the earlier part of this year, after the Chinese undertook a significant de-stock last year and the price fell accordingly. But they returned light in mid-2007, import increased significantly and the price surged ahead.

Partly, this is the result of the trading support of a premium of Shanghai prices. But as you can see, just recently that premium has moved to a negative in terms of Shanghai. Traders in China arbitrated that opportunity.

## COPPER

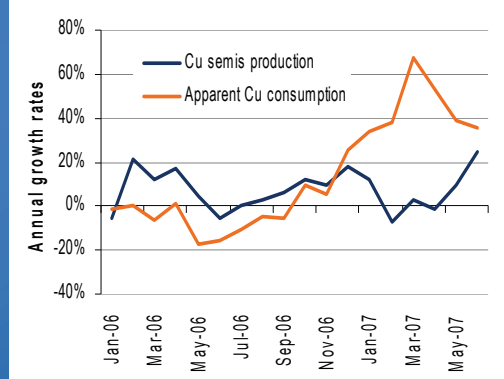
### ...as tightness in the copper market eases

Exchange inventories have been rising, particularly in North America and Europe



Source: LME, Comex, SHFE, Bloomberg

In China, apparent consumption has been running well ahead of semis production in 2007



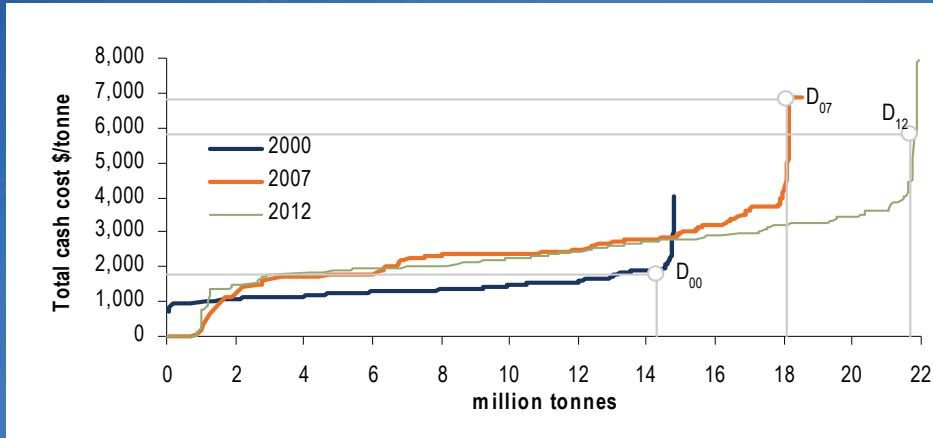
Source: China Customs, Antaike, Merrill Lynch Commodity Research

Inventories have been rising particularly in Asia and North America and Europe despite the LME inventories in North America showing decreases.

As you can see on the right hand side, we feel that there is a certain disconnect between the Chinese consumption of copper and the production of copper semis. As can be shown by the orange line, the apparent consumption line is basically a figure of production plus net imports. That is significantly higher than the production of copper semis, which is the first end use of copper, which suggests that the Chinese have actually been restocking quite aggressively. There seems to be plenty of copper in that market.

## COPPER ...and the cost of production is rising

Despite costs remaining consistent over the next five years, strong demand growth could well push prices higher



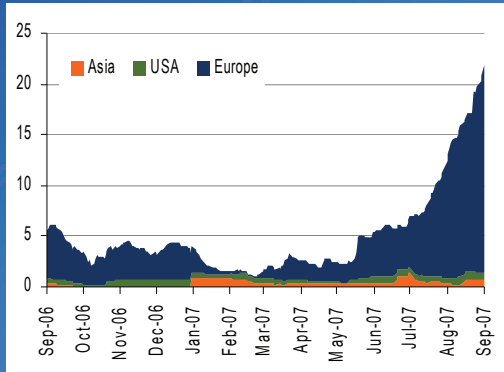
Source: Brook Hunt, Merrill Lynch Commodity Research

Copper is also experiencing cost pressures. As this chart shows in 2007 with demand increasing significantly the high cost producers become more reliant. Prices in the vicinity of \$6000 to \$7000 a ton are required to get supply to meet demand at current level.

## NICKEL

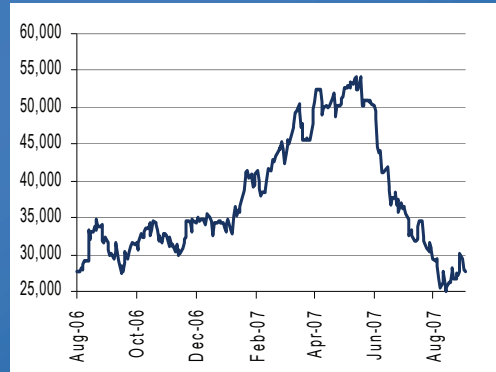
### End in sight to stainless de-stock

The build up in nickel inventories has occurred predominantly in Europe...



Source: Bloomberg, LME

...which has resulted in prices falling over 50% from their high in June



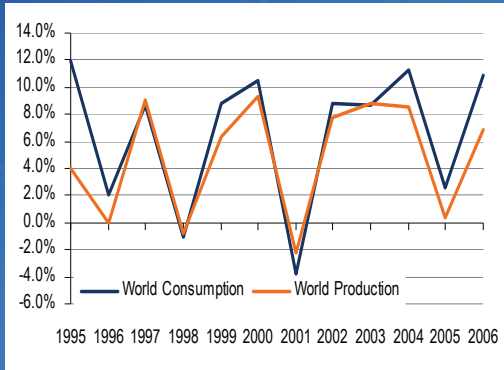
Source: Bloomberg, LME

Nickel has obviously seen some quite dramatic price volatility over the past year. This is partly being due to the stainless steel industry going through a significant de-stock period. This resulted in inventories building up, particularly in Europe, as you can see on the left hand side. Stock piles in the US and in Asia, in fact, remained relatively flat. This built-up in inventories obviously pushed prices significantly lower, some 50% from their June high. But we see an end to this de-stock. Stainless steel producers are starting to reenter the nickel market and producers who had production cuts over the past few months are starting to take those off. So, while we are expecting to see inventories increase for another one to two months, nickel does start to look a bit more positive over the next 6 to 12 months.

# NICKEL

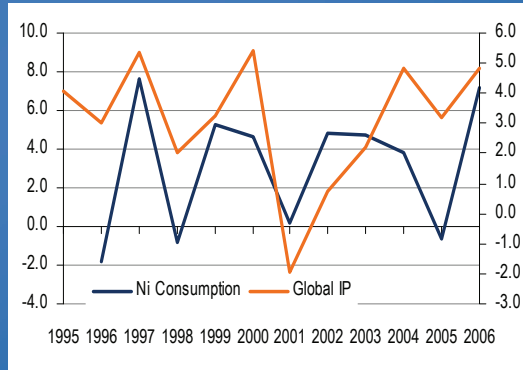
## Underlying stainless steel demand remains strong...

Growth in Stainless Steel Production/Consumption



Source: Brook Hunt, Merrill Lynch estimates

Global IP vs Nickel Demand



Source: Brook Hunt

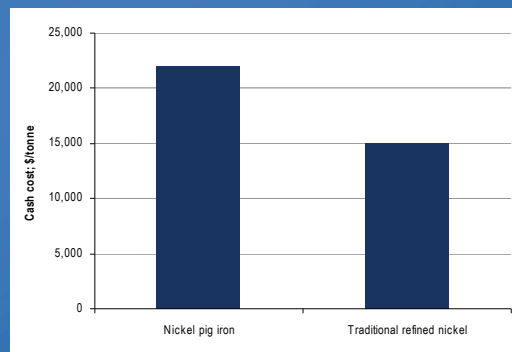
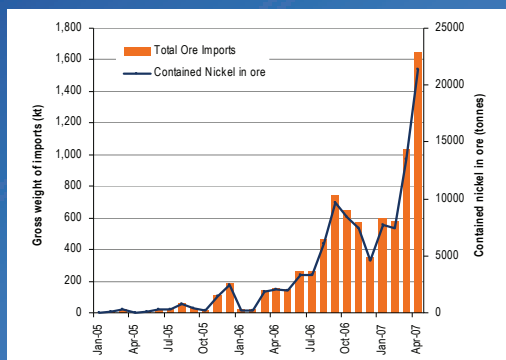
The underlying stainless steel demand remains strong. Global IP is strong and stainless steel consumption follows this quite closely. So, we expect demand for stainless steel and thus nickel to remain relatively high.

# NICKEL

## Nickel pig iron providing a floor to prices

High nickel prices spurred all blast furnaces to import nickel ore to produce Ni pig iron

The estimated cost of production of nickel pig iron is around \$22,000/t



Source: Brook Hunt, Merrill Lynch estimates

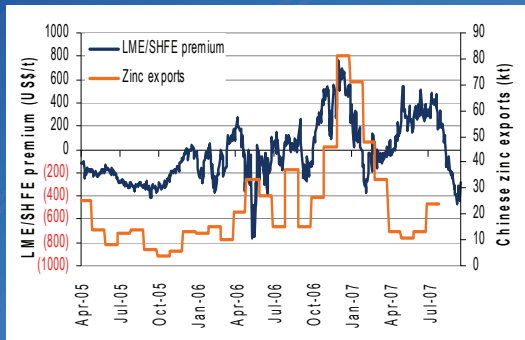
Source: Brook Hunt

Once again, cost pressures in the nickel market provide a strong floor for prices. Nickel pig iron has been a particular issue which has come about in the nickel industry. The producers, in particular in China, producing a nickel pig iron product through low grade nickel alloy have been able to supply stainless steel mills with relatively cheap nickel, but their costs are relatively high. As you can see on the right hand chart the estimated cost of production of nickel pig iron is around \$22,000 a ton. This compares to the higher cost producers of \$15,000 a ton. So, it is quite significantly higher. This has provided a support to prices. We saw nickel fall to \$25,000 a ton just recently. As that happened, nickel pig iron producers in China started to reduce production and the prices rebounded.

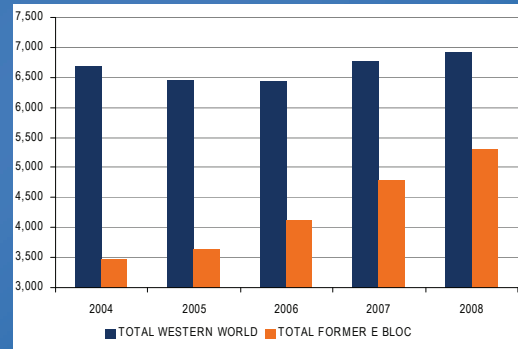
# ZINC

## Tight market but risks remain

Chinese zinc exports on the rise again but for how long?



Western world supply finally reacting to prices



Source: Bloomberg

In zinc we see a tight market remaining there, but risks remain. Zinc exports from China have been on the rise again. They have the potential to flood the market, but for how long? At the moment we see a LME premium existing in the market over Shanghai. This should encourage more exports into the international market. We have seen the Chinese being quite reactive to this change, and if this does move back to a discount, then exports are likely to fall again.

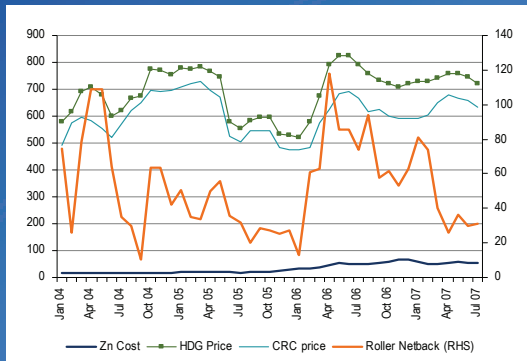
We also see rising supplies from the Western world, finally reacting to prices. We have seen production from Western world countries fall over the past few years, but this year we see the first increase. We expect to see that to continue for the next few years.



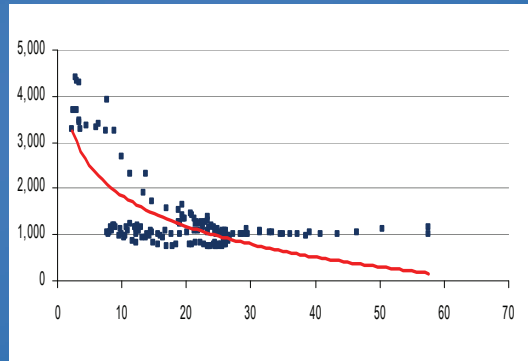
## ZINC

### And while demand issues remain, stocks are low

Low margins for galvanisers could hurt demand



But inventories remain low



Source: Merrill Lynch

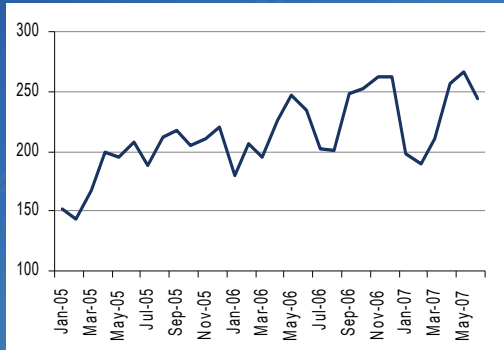
But demand issues do remain. In an issue which is similar to the stainless steel industry and nickel, we are seeing galvanisers being hurt by the high zinc price. At current levels some zinc galvanisers are actually losing money. The threat of reduction in demand is significant. But at the same time inventories remain low. So, we expect prices to be relatively high.

As you can see on the left hand side chart, stocks are actually down below 10 days of consumption and that prices remain volatile and relatively high.

## LEAD

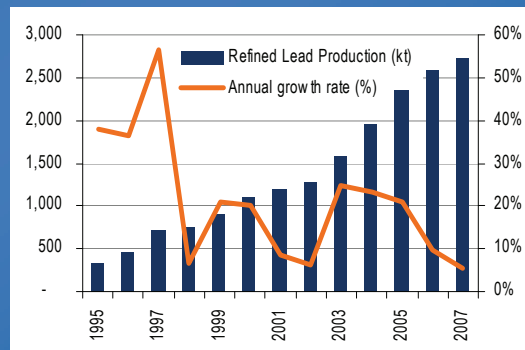
### Short term fundamentals look strong...

Lead production has been up and down in China...



Source: China Customs, NBS, Merrill Lynch Commodity Research

...but has clearly been below expectations over the past 18 months



Source: China Customs, NBS, Merrill Lynch Commodity Research

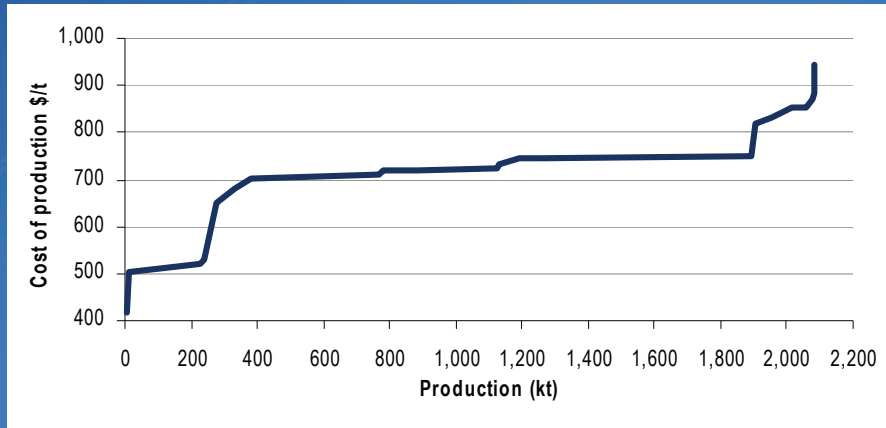
In lead the short term fundamentals look strong. Lead production in China has been well below expectations. China, at these times of market tightness, has traditionally been the country that has responded, but this time production has only increased in the vicinity of 5% so far this year. This has also leads to the market being particularly tight as demand has grown strongly.



## LEAD

### Cost of production well below current prices

The lead industry cost curve is well below current prices

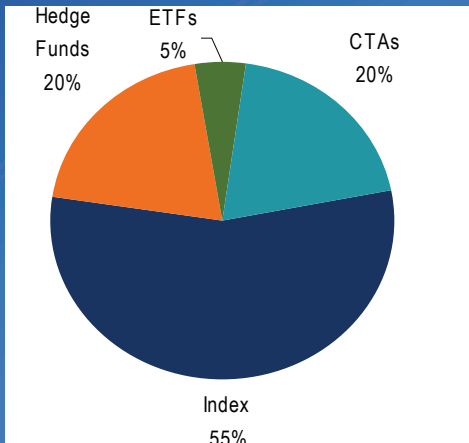


Source: Brook Hunt, Merrill Lynch Commodity Research

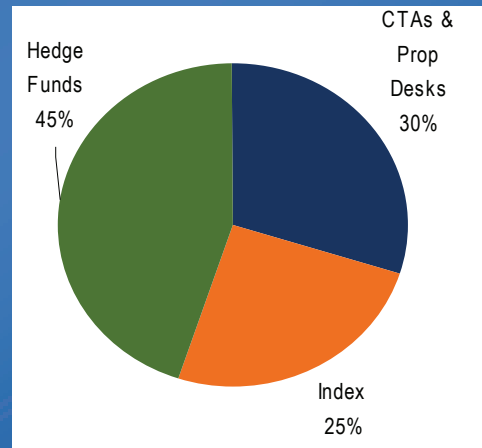
For lead the cost of production is well below current prices. The lead market is not supported by the cost structure of the producer. With the high marginal cost producer still well below \$1000 a ton, the current prices of \$2500 a ton in lead are unlikely to be sustainable over the long run.

## Investment Market Composition

Estimates of investment funds in commodities range between \$200bn and \$300bn



The amount invested in Base Metals is approximately \$50bn

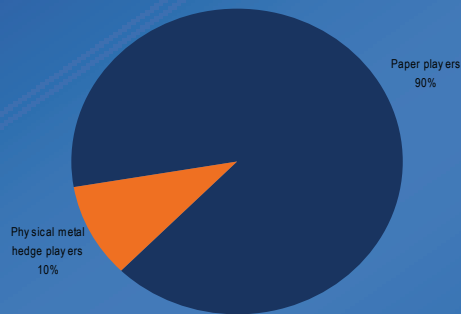


### **Fundamentals vs. Technicals: Why short terms drivers can't be ignored**

While fundamentals are important, particularly for medium to long term views, you cannot ignore the technical factors. We estimate that investment funds in commodities range between \$200bn and \$300bn. A large part of that is money that is flowing into commodity industries. In base metals we estimate approximately \$50bn of this is invested in this market. But interestingly, hedge funds provide a bigger share of that money compared to the overall commodity markets. Thus, the way that these funds invest does have a significant effect on the price in the short term.

## What makes metal markets move

Paper players – could now represent 90% or more of market flows



- Passive funds, largely pensions
- Active pension funds
- Hedge funds
- CTAs
- Private Equity
- Asset/Equity

- Producers
- Consumers/corporates
- Merchants/Traders

In these days 90% of the market flow comes from paper players, i.e. passive funds, largely pensions, active pension funds, hedge funds, CTAs, private equity and asset equity. The rest of 10% stems from producers, consumers/corporates and merchants/traders. Thus, being able to see what those funds are doing, is important in terms of the day-to-day volatility of prices.

An interesting case study which really highlights the effects of the hedge funds in these markets happened in nickel earlier this year, as can be seen in the next slide .

While we obviously see technical factors being important in the short term, ultimately fundamentals do hold true over the long run. The arguments can be viewed on the final slide.

Thank you!

## Fundamentals vs Technicals

### Nickel Jan-Jul 07 – a case study

#### •Fundamental perspective

- > Oct-06 'Nickel is still in grip of supply disruption...remains our preferred commodity'
- > Dec-06 'Nickel has the most best fundamentals...however risk of stainless steel de-stocking in Q1'
- > Feb-07 'US stainless inventories at record levels; restocking has ended in Europe'

#### •Meanwhile, in the underlying market

- > Large hedge fund long consistently supports market against several large hedge fund shorts. Consumer interest wanes above \$35,000. CTAs follow trend and add to length on technical breaks
- > Specs and hedge funds sell rallies in the \$35,000 - \$40,000 on way up as expectation of market weakness on Q1 fundamental view, and overbought conditions.
- > Market increasingly bearish in 2Q07 has inventory build continues, but longs keep up momentum and force top pickers to stop out.
- > With technical momentum waning long turns position around in the \$50,000 area. Large clips of material arrive in warehouse.
- > 6th June – LME announces amendment to lending rules, backwardation collapses and bears gain confidence. CTAs begin to exit position on trend reversal. Hedge funds establish large shorts.

## Fundamentals vs Technicals

#### •Fundamentals ultimately hold true but technical factors make picking timing difficult

- > LME stocks may rise, but short term may not be true barometer of physical market
- > Import/export data is not necessarily a barometer of consumption
- > Nearby spread trade between cash and benchmark 3m contract may be tight but that may not indicate physical shortage
- > Conversely, the market can still go up if the market is easy in the front month, e.g. tin move this week in environment of increasing LME inventories and contango in cash – 3m
- > Large positions are monitored by the LME to avoid nearby 'squeeze' but liquidity constraints and magnitude of positions in the sector can lead to distortions in particular spreads and vols
- > Technical factors have led to increased volatility and therefore increased opportunity to leverage view
- > Futures speculative flows are not flagged by the LME (spec positions only show on much smaller Comex copper market). Larger volumes trading in the OTC space, therefore transparency on fund positions remains anecdotal.

**Markets can trade at significantly different levels with no significant change in fundamentals – essential to see flows through the markets from the major players**