MACROECONOMIC IMPACTS ON THE COPPER INDUSTRY AND COPPER MARKETS IN 2011-2012

September 2011

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GLOBAL ECONOMY – PERFECT STORMS

Euro area

- New turmoil in euro area
- Tension on government bonds
- Negative for banks
- Financial market tension
- Drag on real economy
- New fiscal austerity
- Spillover from Europe
- Spillover from US

United States

- Oil, Japan earthquake
- Debt Ceiling Tea Party
- Hit to supply chains, consumers
- Uncertainty weighs on confidence
- Financial market tension
- Drag on real economy
- New fiscal austerity

Rest of the World
US CONSUMER SPENDING SLOWED SHARPLY IN H1

Source: Global Insight, SG Cross Asset Research/Economics
CENTRAL BANKS TO KEEP ACCOMMODATIVE MONETARY CONDITIONS

Fed funds rate vs. Taylor Rule

- Red line: Fed Funds Rate
- Red dashed line: Fed Funds Target, with QE
- Gray line: Standard Taylor Rule, Fed’s NAIRU
- Black line: Standard Taylor Rule, higher NAIRU
- Light gray line: Empirical, post 1987 fit, Fed’s NAIRU

Source: Global Insight, SG Cross Asset Research/Economics
US AUSTERITY COMING … BUT LIKELY TO BE BACK-END-LOADED

Source: SG Cross Asset Research/Economics
ASIA EX-JAPAN: GROWTH DESCENDING, BUT NOT CRASHING

- Exports, production, investments to cool further
- Consumption and affordable housing to hold up

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% yoy, 3mma except for the latest figure; PMI, Consumer Confidence, Leading Index in level term
Color assigned relative to historical average levels

Source: CEIC, Bloomberg & SG Cross Asset Research / Economics
EURO AREA: CATALYSTS FOR STABILISATION

September
- German Constitutional Court
- Fifth review of Greece
- Ratification of EFSF
  
  France & Germany due by end September

October
- Oct.3: Eurogroup

November
- Nov.7: Eurogroup

December
- Nov. 29: Eurogroup
- Oct.17/18 EU Summit
- Dec. 9 EU Summit

- The keystone is EFSF ratification
- In the interim, the ECB will continue SMP if necessary
GLOBAL ECONOMY - CLOSE TO STALL-SPEED …
…EURO DEBT CRISIS RESOLUTION HOLDS THE KEY

- Near stall-speed growth in US and Europe
- Bumpy landing in China
- EM to see growth moderation, but no crash
- US / Europe economy is frail, but recession needs a trigger
  1. Sharp intensification of the euro area debt crisis is the top risk.
  2. Renewed financial instability triggered by asset quality concerns
  3. Sharper fiscal austerity in US
  4. Policy accident triggers China hard landing
  5. Escalation of geopolitical tension (Middle East triggers oil price supply-shock)
## Economic Forecast Summary

### SG Growth and Inflation Outlook

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### CPI

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### G5

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### Other advanced

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### Emerging economies

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*P* = previous forecast
COPPER DEMAND – FOCUS IS ON EMERGING MARKETS RATHER THAN WESTERN WORLD

Index

- World copper demand
- World GDP
- Copper demand, World excluding China

97 98 99 00 01 02 03 04 05 06 07 08 09 10 11f

SOCIETE GENERALE
Cross Asset Research
SG PROPRIETARY NEWSFLOWS ARE WORRYING FOR THE BRICS

- Disappointments on growth (lower) and inflation (higher)

Source: Dow Jones, SG Newsflow Watch
FIXED ASSET INVESTMENT HAS BEEN THE KEY DRIVER FOR CHINAS METAL CONSUMPTION.. BUT WILL THIS CONTINUE?

China’s investment boom…

- Infrastructure boom largely financed by banks lending aggressively to local governments
- Local government debt now stands at CNY 10.7 trillion (25% of GDP)
- Public mood over infrastructure projects souring as a result of local government land grabs / public safety concerns

Source: CEIC, SG Cross Asset Research
CONTROLLING LOAN GROWTH IN CHINA REMAINS CHALLENGING

- Efforts are nonetheless paying off – expect to see slowing FAI as restricted bank lending bites

Source: Datastream, Bloomberg, SG Cross Asset Research
CHINA’S MANUFACTURING IS SHOWING CLEAR SIGNS OF SLOWING

Source: NBS, SG Cross Asset Research
CHINESE COPPER SEMIS PRODUCTION GROWTH HAS SLOWED DRAMATICALLY IN 2011…
...AND THE STORY IS NOT PARTICULARLY POSITIVE ELSEWHERE

US semis production has been weak...

.. While Japan is yet to see a post earthquake pick-up...

yoy % chg.

yoy % chg
CHINA’S Refined Imports Continue to Disappoint…

Chinese monthly refined copper imports

tonnes

Jan-05 Apr-05 Jul-05 Oct-05 Jan-06 Apr-06 Jul-06 Oct-06 Jan-07 Apr-07 Jul-07 Oct-07 Jan-08 Apr-08 Jul-08 Oct-08 Jan-09 Apr-09 Jul-09 Oct-09 Jan-10 Apr-10 Jul-10 Oct-10 Jan-11 Apr-11 Jul-11
.. PARTLY AS CHINA GROSS DOMESTIC RINED PRODUCTION, BUT ALSO SIMPLY A FACTOR OF NORMALISING DEMAND GROWTH

---

**Chinese monthly copper concentrate production**

---

**Chinese monthly copper concentrate imports**

---

**Chinese monthly refined copper production**
SUBSTITUTION IS ERODING COPPER DEMAND – ALUMINIUM IS INCREASINGLY USED IN LOW/MEDIUM VOLTAGE CABLING IN CHINA

Copper/aluminium price ratio

Ratio

1.0
1.5
2.0
2.5
3.0
3.5
4.0

91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11

04/10/2011
IF CHINA SLOWS DOWN, COMMODITIES OUTLOOK WEAKENS

Chinese growth is key factor for base metals

Basic industries a proxy for Chinese growth

USD rebound vs. euro suggests declining energy prices

Source: Reuters, Ecowin, MSCI, Datastream, Bloomberg, SG Cross Asset Research
DOLLAR VS. EURO – NOW NO LONGER COPPER PRICE SUPPORTIVE

LME copper price and USD effective exchange rate

- LME Copper
- USD effective exchange rate

USD Index ($/ tonne)

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000

91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11

65 70 75 80 85 90 95 100 105 110 115 120

70 80 90 95 100 105 110 115 120

65 70 75 80 85 90 95 100 105 110 115 120
Copper prices should drop on weakening demand and rising mining output. Production issues continue to dominate headlines and have provided support for copper prices.

The market continues to focus on the production disruptions at copper mining complexes, in Chile and Indonesia in particular, as the key source of price support.

However, even allowing for production losses due to well-publicised disruptions, slow project ramp-ups, etc., we project mine supply will grow by 2.4% this year rather than the flat picture painted in some corners, with growth coming from Mexico, the US, China, and Africa.

Looking forward to 2012, we continue to expect a pick-up in mine production, with mine supply growth accelerating to 8.4%, even allowing for a significant disruption allowance.

Mine supply outlook – strong growth expected

Copper market balance (million tonnes)
HEDGE FUNDS /SPECULATIVE INVESTORS LOOKS AT COMMODITY MARKETS FROM A FUNDAMENTAL SUPPLY DEMAND PERSPECTIVE....

Preliminary data points to pick-up in investor outflows in August/September driven by energy and base metals

“Traditional” considerations

Supply

Demand

Inventories

Macro-economics

“Additional” considerations

Market composition

Relative value

Exit strategy

Investor sentiment

Market liquidity

Investment Thesis
SLOWING CHINA, US/EUROPE MACRO UNCERTAINTY PROMPTED A FUND SELL OFF SINCE JULY…
LME OPEN INTEREST DATA SUGGESTS MOVES TO SHORT COPPER EMERGED LATE AUGUST AS THE MACRO PICTURE DARKENED.

LME Copper open interest vs 3-month price

- Rising
- Falling
- New Longs
- New Shorts
- Short Covering
- Long Liquidation

Open Interest

Price


$/t

230000 250000 270000 290000 310000 330000


3000 4000 5000 6000 7000 8000 9000 10000 11000

Copper OI Copper 3m price

Societe Generale
Cross Asset Research

04/10/2011 25
INVESTOR FLOWS GENERALLY SLOWED DURING H1 – JULY PICK-UP LARGELY RELATED TO PRECIOUS METALS

Preliminary data points to pick-up in investor outflows in August/September driven by energy and base metals.
The main issues which to-date have inhibited the launch/success of base metals ETFs relate to:

**Logistics**

- Metal used to back the ETF needs to be obtainable without paying a premium, and of an LME grade so it can be easily to the metals markets if investors wish to exit the investment.
- Warehouses to store metal used to back an ETF need to be located in areas close to metal producers/consumers, and close to LME warehouses to minimise the cost of delivery.

**Costs**

- LME warehousing costs are around 35 cents/t per day (close to $130/t per year). With copper at $8,000/t, rent, Insurance and other costs would absorb around 4-5% of the cost of copper per year.
- At current gold prices ($1,790/oz), 1 tonne of gold = $57,550,000. This is the equivalent of 24,000 t of Aluminium, 6,300 t of Copper, and 2,630 t of nickel. It is easy to see why precious ETFs have been a success!
## SG Copper Forecasts

### World Mine Capacity

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<th>Year</th>
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<th>2012f</th>
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<tr>
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### Capacity Utilisation (%)

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<tr>
<td>%</td>
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### World Mine Production

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### World Copper-in-Concentrates Production

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### Blister/Concentrate Stock Increase

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<td>-0.32</td>
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### World Refined Production

- **Mine-through-smelter/refinery**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | 12.47 | 12.29 | 12.70 | 12.99 | 13.18 | 13.62 |
- **Mine/leach/SX-EW**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | 3.11  | 3.19  | 3.33  | 3.36  | 3.53  | 3.84  |
- **Secondary**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | 2.53  | 2.65  | 2.33  | 2.35  | 2.56  | 2.68  |

### World Refined Consumption

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011f</th>
<th>2012f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt</td>
<td>18.01</td>
<td>17.90</td>
<td>17.42</td>
<td>18.78</td>
<td>19.40</td>
<td>19.96</td>
</tr>
</tbody>
</table>

### Implied Balance

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011f</th>
<th>2012f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt</td>
<td>0.11</td>
<td>0.23</td>
<td>0.94</td>
<td>-0.08</td>
<td>-0.12</td>
<td>0.19</td>
</tr>
</tbody>
</table>

### Chinese Official Stocks Change

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011f</th>
<th>2012f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt</td>
<td>0.25</td>
<td>0.00</td>
<td>0.23</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### Reported Stocks

- **Change**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | -0.10 | 0.13  | 0.27  | -0.14 | 0.12  | 0.10  |
- **Level**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | 1.03  | 1.16  | 1.43  | 1.29  | 1.41  | 1.51  |
- **Weeks’ Consumption**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | 3.0   | 3.3   | 4.3   | 3.6   | 3.8   | 4.0   |

### LME Cash Price

- **$/tonne**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | 7,125 | 6,945 | 5,155 | 7,535 | 9,145 | 8,710 |
- **c/lb**
  | Year | 2007  | 2008  | 2009  | 2010  | 2011f | 2012f |
  | Mt   | 323.2 | 315.0 | 233.8 | 341.8 | 414.8 | 395.1 |
Concerns over European sovereign debts issues will remain a dominant theme impacting investor attitudes towards metals over the next 12 months.

The US dollar is expected to continue to rebound vs. the Euro – not positive for dollar denominated commodity prices.

Worries about slowing Chinese growth are expected to drive more fundamental market related concerns.

Added to a slowing demand side, it is becoming apparent that concerns over lack of mine supply growth appear to be easing, with mine supply expected to pick up for most metals into 2012.

ETF impact on base metals likely to be very limited going forward. We see little prospect of large scale ETF products being launched in the short to medium term.
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