

COPPER'S SECOND COMING

Still part of the money game

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In our last report on the state of the copper industry, which we wrote in November last year, we made the case that it was not industry fundamentals which were driving copper prices, but the activities of banks and others. These institutions buy physical material, mostly warehoused outside the reporting system, against which they issue sophisticated paper products which are sold to their retail clients such as pension funds, in much the same way that they operated with mortgages and other instruments. As went those markets, so will copper and other base metals go probably also to end in tears, because the rationale of holding physical base metals in a volatile and deflationary environment simply makes little, if any, logical sense. This is just another case of hubris on the part of banks and others.

Integral to these operations is the drive by some regulators, politicians and others to reform the structure of the banking sector. Legislation is wending its way through Congress, which is designed to divorce proprietary trading and other activities from deposit taking banks. It is unclear how the new 'Financial Reform Act' will evolve into law, but there is enough momentum and critical mass to suggest that some fundamental change is coming, which might well preclude these banks from operating in the way they have in recent years. Some form of derivative of Glass-Steagall is a likely outcome.

In fact, a leading indicator of how tough this bill is likely to be resonates with the statement on Bloomberg in mid-May that JP Morgan and Deutsche Bank will not acquire the assets of Sempra Metals. The former was in the process of takeover; the latter was the apparent under-bidder. The reason why this deal is such a good leading indicator is that these banks will have a good idea of what will come out of Congress. Clearly, the new bill will restrict banks' ability to operate in commodity markets in the way that they have in recent years.

A taste of how regulators perceive the future can be gauged by the following story to use the words, not of the author of this report, but no less than those of Andrew Haldane, Director Financial Stability, the Bank of England, in a recent speech entitled "The \$100 Billion Question".

"The car industry is a pollutant. Exhaust fumes are noxious by-products. Motoring benefits those producing and consuming travel services – the private benefits of motoring. But it also endangers innocent bystanders within the wider community – the social costs of exhaust pollution.

Public policy has increasingly recognised the risks from car pollution. Historically, they have been tackled through a combination of taxation and, at times, prohibition. During this century, restrictions have been placed on poisonous emissions from cars – in other words, prohibition. This is recognition of the social costs of exhaust pollution. Initially, car producers were in uproar.

The banking industry is also a pollutant. Systemic risk is a noxious by-product. Banking benefits those producing and consuming financial services – the private benefits for bank employees, depositors, borrowers and investors. But it also risks endangering innocent bystanders within the wider economy – the social costs to the general public from banking crises.

Public policy has long-recognised the costs of systemic risk. They have been tackled through a combination of regulation and, at times, prohibition. Recently, a debate has begun on direct restrictions on some banking activities – in other words, prohibition. This is recognition of the social costs of systemic risk. Bankers are in uproar.”

The outcome of this debate is very fundamental to the future direction of copper and other commodity prices, if not the entire financial sector. A foretaste as to what lies in front of banks and others is the decision by the US Justice Department to start criminal investigations against J P Morgan Chase in regard to trading in precious metals’ markets together with the CFTC who have begun a civil investigation, according to reports.

The problem of the global economy is an important ingredient to the use of copper and its pricing. This report is, therefore, divided into three parts.

- Economic Background
- Copper’s Fundamentals
- Pricing Structure & Outlook.

Economic Background

The pace of global economic growth experienced in the first four months of the year is unlikely to be sustained in the second half. The recovery has been helped by the huge monetary and fiscal steroids that have been pumped into the system; they are now starting to evaporate. Moreover, there has been ample inventory replenishment within the supplier and distribution channels needed after these chains were emptied of stocks for balance sheet reasons. For the most part, this process is now complete for many products and nearly so for others. And moreover, in Asia, the loose monetary policies, aided by the influx of funds from outside the region, have fuelled consumer spending and asset prices.

As we look around the world we see structural headwinds over the medium term and slowing economic growth in the second half of this year in the USA, Europe and Asia.

Professors Rogoff and Reinhardt, in their exhaustive analysis of financial crises, found that banking crises are almost invariably followed by sovereign debt crises. This is where we are today. Yesterday's banking crises have morphed into today's sovereign debt crisis. Though Greece is a minnow, it is the first of highly indebted countries to be scrutinised by markets. It has exposed the risk of contagion to other highly indebted countries, not just in the EU, but spreading to the UK, USA and Japan. Sovereign debt is the foundation for the second credit crisis which we believe will start around 2012.

The EU/ECB/IMF package has brought relief to markets, if only temporary, but questions still remain whether the plan will actually get off the ground and, if it does, how sustainable it will be? Will Germany be prepared to accede to the demands of the other political leaders in Brussels? The involvement of the ECB in buying government bonds poses significant stability risks said Axel Weber, the head of the Germany's central bank. Both of Germany's directors on the board of the ECB voted against the move. There is bound to be a political backlash in Germany, which has only just started with the population now starting to question the viability of remaining in the EU. There is a risk that with such a revolt by the country's electorate that Ms Merkel will be forced to see that fundamental changes are made to the package, if not to the structure of the Eurozone. The potential big risk is that Germany's parliament refuses to ratify its commitment to the package with the Constitutional Court yet to make its final judgement.

What is at stake is not just Greece, Spain, Portugal and maybe Italy, but the whole concept of the Eurozone. The incompatibility of deficit loving Mediterranean countries living alongside conservative surplus northern countries under one currency regime is now being fully exposed. Greece is insolvent and probably Spain as well. The latter's private sector debt is 300% of GDP, most of which will have to be transferred to the public sector. Its banks are not allowing real estate to be cleared by preventing prices from falling; and, like Greece, the country's households don't pay taxes. Both governments are corrupt. This Latin culture hardly mixes with the more Calvinistic culture of northern Europe. This incompatibility must be a question being asked in Berlin. Why should we use our hard won surpluses to finance the spend-thrift Mediterranean countries?

Hard choices will have to be made. For Germany, the choice is going to be whether to give up fiscal sovereignty to Brussels or to give up the Euro or to restructure the Euro into its core countries which have similar cultures.

For Greece and Spain – and perhaps some other countries – the choice is between being condemned to years of austerity, deflation, recession and circa 20% unemployment as the price for staying in the Eurozone, or of quitting the exchange rate bloc. The former will be socially unacceptable and the

latter will be difficult to achieve. However, it will be the electorates which will demand change. Existing governments will be voted out of office. New governments won't buy austerity and will opt out of the Eurozone with this perhaps happening in 2012, if not sooner.

In short, the austerity programmes being imposed by foreigners on Greece and, soon to be on Spain, will not work. The deficits will widen and these two countries and others will be saddled with even more debt in two years time. To use the words of Simon Johnson, the ex-research director of the IMF, "Greece must clearly end up restructuring its debt. The IMF program makes that obvious – how can Greece make a total of 19% of GDP cuts, only to end with 149% of GDP in debt, and a perpetual bill to pay German, French and foreign holders roughly 10% of income each year to cover interest?"

These developments create uncertainty for businessmen; investment will suffer. Growth will slow and consumers in the previous fast growing PIIG countries will be retrenching. Exports to those countries will dry up. Europe is likely to be back in recession by year end.

Highly indebted nations are not confined to Europe; it is a global phenomenon as Professors Reinhart and Rogoff illustrate so well in their book "This Time Is Different" (Figure 1).

Figure 1: The Cost of The Banking Crisis (Reinhart & Rogoff estimates)

	Deficit (% of GDP)	Projected Bond Issuance (\$billion)
IMF Estimate	27%	\$10,239
Rogoff, Best Case	40%	\$15,309
Rogoff, Average	86%	\$33,029

Source: CIA World Fact Book, IMF, Rogoff & Reinhart
Taken from Niels Jensen, Absolute Return Partners LLP

The projected global bond issuances by governments are staggering leading one to question both the cost of such issuances and the ability of governments to raise the required funds. What is now going on in the EU shows that highly indebted governments are finding that they are being frozen out of markets.

The EU in its present form will be restructured, but sovereign debt contagion will spread to other countries, to the UK, to the USA and to Japan over the coming few years. Throwing money at problems is the Davos crowd's answer as it is of politically weak countries. Global banks like this solution because it provides opportunities to inflate asset values. But, as we have discussed earlier, legislation is winding its way through Congress which is likely to limit these financial institution's ability to play these markets. We may yet see Paul Volker winning this war.

"The largely untold story of sovereign debt issuance is that it is sucking up 25% of available world savings and that will squeeze the ability of the private sector to invest in productive opportunities',

wrote David Roche in his new book, **Sovereign Discredit**. It curbs long-term growth and adds to the risk of debt defaults.

In short, rather than helping to resolve the issues on sovereign debt within the Euro area, the politicians have opened up the whole question of the Eurozone's future. Will Germany and others allow fiscal and monetary authority to move to Brussels? And will indebted countries accept the austerity programs demanded by Berlin and the IMF? We suggest NO to both questions.

It is not just the EU where growth will stall, but in the USA and in Asia as well.

In the USA, growth has been largely statistical, part being inventory driven and part coming off official stimulus which is starting to fade. The pickup in US consumer spending has been driven by transfer payments and tax cuts and not by income growth. As such the improvement is unsustainable and likely to dissipate. In fact, April's same store retail sales rose by only 0.5% compared with the same month in 2009 when they had fallen by 2.7% YoY. Some recovery!

M3, as tracked by John Williams of Shadow Government Statistics, has been falling sharply and is now down by 3.7% year-to-year and by 5.8% in inflation adjusted terms. This measure has been a reliable leading indicator of future business activity. It is telling us that slower growth, if not recession, lies ahead.

Some of the other negative developments, which are likely to prove difficult headwinds in the second half of the year, are:-

- The housing market remains in serious trouble, despite the apparent recent gains in house prices and starts. The number of vacant housing units being held off the market for various reasons rose by 131K to 3.628 million units in March, making the real inventory number more like 16 months of demand.
- Real final sales have grown by only 1.6% in the past three quarters.
- The real level of unemployment, or U6, has reached 17.1%
- The University of Michigan's consumer sentiment survey for April fell to 69.5 from 73.6 in March and the expectation index slumped to a level last seen in March 2009, suggesting that further purchases of consumer goods will be weak in coming months.

Thus, growth should slow in the second half of 2010 in the USA.

The third major pillar to the global economy is China. The State Council has clearly become worried by asset inflation, housing affordability and the speculative fever embedded in the economy. It is tightening with more measures likely to be introduced in the near term, which we expect will include an increase in interest rates.

There are a number of reasons why China's growth will slow.

- Credit is being tightened. Anecdotal evidence indicates that it is difficult for the private sector to get loans and that starting in May car and household appliance sales have fallen sharply.
- The real estate sector is slowing and thus construction. Steel mills are talking about a difficult second half. Therefore, all inputs to the construction sector will weaken from steel, to cement, to glass and to base metals.
- Expo 2010 created booming conditions for the construction industry with expenditures by Shanghai more than double those of Beijing's Olympic Games (anything you can do I can do better!). That has ended and so have all the inputs into that construction boom.
- Local government debt is making it difficult for some infrastructure projects to be fully financed.
- The government's subsidy schemes for appliances for the rural sector and urban households have caused a high level of purchasing. But in schemes of this nature much of the purchasing will have been borrowed from the future. Sales are likely to slow as 2010 unfolds and into 2011.
- There is a serious intent by government to defuse much of the speculative activity in the economy. This means that we should see inventories of finished and semi-fabricated goods being liquidated over the summer which will impact industrial production and demand for materials.
- The surge in export orders will slow in the second half in line with the economies of N America, Europe and Japan together with the rest of Asia.
- We hear that part of the leadership's rationale for taking a pre-emptive strike at the speculative nature of the economy is because they fear a second global credit crisis and a renewed dive into recession. Thus, they want to be in a position to reflate when that moment comes.

Many private sector economists and strategists have warned of bubbles being pricked, but, until now no such warnings have come from the official sector. Just a few days ago, the OECD issued its monthly Composite Leading Indicators. It carried a salutary warning, "*...some evidence of a potential halt in expansion is emerging in China and Brazil*". For China, the year-on-year percentage change in the LEI shows January up by 10.8%, February by 6.4% and March by only 3.5%.

We, along with many others, find China's official GDP numbers to be less than reflective of the real economy. We find that we come to a much better reflection of what we hear on the ground by correlating electricity production to GDP. Figure 2 shows electricity production by quarter starting in 2007 and up to the first quarter of this year. We show too the year-on-year and quarter-on-quarter percentage changes.

Figure 2: China's Electricity Production by Quarter

	Billion KwH	% Change	
		YoY	QoQ
2007:1	644.0	na	na
2007:2	776.9	na	20.2
2007:3	866.6	na	11.6
2007:4	842.9	na	-2.8
2008:1	813.4	26.2	-3.6
2008:2	877.4	12.8	7.9
2008:3	936.2	8.0	6.7
2008:4	799.8	-5.0	-14.6
2009:1	780.9	-4.0	-2.5
2009:2	863.3	-1.6	10.5
2009:3	1013.0	8.2	17.4
2009:4	982.8	22.9	-3.0
2010:1	958.0	22.7	-2.5
April	331.6	22.3	1.5

Source: National Bureau of Statistics

This gives us a GDP growth of 8.9%, not the official 9.6% for 2008, but only 5.2%, not the official 8.7% for 2009. However, the quarter-on-quarter electricity production data shows that real growth peaked in the third quarter of last year, fell by 3% in the last quarter of 2009, declined by 2.5% in this year's first quarter and rose by just 1.5% in April, compared with March.

For 2010, the head of the State Electricity Regulatory Commission forecast that China's power consumption would rise by 7% implying a real increase in GDP of around 6% this year.

The purpose of this rather detailed economic background is to show that the rebound in growth in the first half of this year is unsustainable and that growth will slow in the second half of 2010. Our current assumption is that a year of modest global growth should be experienced in 2011, but that starting in 2012 we will see the emergence of a second global credit crisis followed by recession. This cycle could last until circa 2018. There will, of course, be periods of recovery, but they will be short-lived and relatively weak. Around 2018, the world will start to emerge into a new period of sustainable growth having, in a Schumpeterian sense, destroyed weak industries and financial institutions.

It is against this background that we look at the copper industry.

Copper's Fundamentals

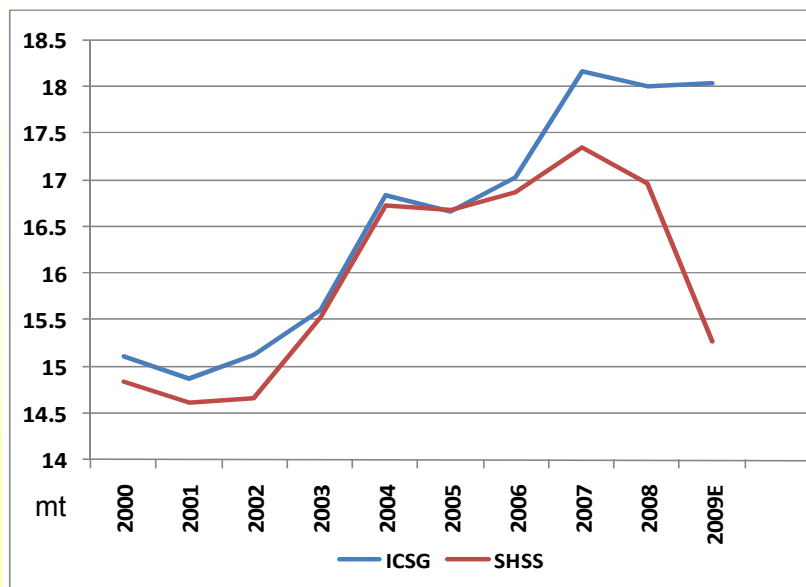
This economic scenario is not conducive to a strong trend growth in world copper consumption let alone to its declining intensity of use, a result of high and volatile copper prices. Moreover, copper's end users, together with their fabricators, are fully aware that prices have not been driven by real fundamentals, but by the growing intrusion of the financial sector into treating copper, as for other base metals, as an alternative investment, a subject we will return to later.

The fundamental issue is the meaning of two simple words: demand and consumption. Nearly everyone uses the word demand either because they understand the real meaning of the word or because they think that demand is synonymous with consumption, which, of course, is rubbish. Consumption is material which goes into a furnace to make a copper or copper alloy semi of some description. Demand is material which goes into a furnace but is also sold by producers to the financial sector and others, but which can also end up being warehoused outside the reporting system. The latter definition is integral to the structure of the industry as set out earlier in this note.

In using the word demand and all that the word entails, the real fundamentals of the industry become grossly distorted, suggesting that markets are in deficit or in a surplus smaller than they really are. Figure 3 provides a rough guide to the size of the distortion and means that probably around 1.5 million tonnes to 2 million tonnes of physical copper is being held by banks and others.

Figure 3:

**Global ICSG Usage versus SHSS
Global Refined Consumption
2000-2009 MT-Cu**



This may sound like a ridiculous tonnage, but looking at history it makes very good sense. Way back in the early 1980s, we were told by the chief economist of a major mining house that they had estimated that the tonnage being held outside the reporting system by financial institutions and others for investment purposes was at least 1 million tonnes. In those days, this author had a large US chemical company as a client. After the event, the director in charge of buying admitted that they alone had bought 200kt as a hedge against inflation and a falling US dollar, but lost money on the trade. Today many banks' clients will suffer a similar if not worse fate because when they come to liquidate their holdings, the market will already be falling.

That is history, but today's real fundamentals are even worse.

They are worse not just because of a future economic scenario that is not conducive to robust copper consumption, but to ongoing substitution which will outweigh new uses which are being developed, some of which will have difficulty being commercialised because of the high and volatile copper price. It is in the wire and cable sector, which accounts for some 65% of global copper consumption, where most copper consumption will be lost.

The first phase of substitution in the wire and cable sector has already been ongoing since 2006. This has been the replacement of copper by aluminium in power and other cables as well as in wiring harnesses for cars. As discussed in our last report (*ExposAsia* No 8, **Copper – Part of the money game**, 15 December 2009), by the end of this year around 1 million tonnes of copper will have been lost to copper according to industry sources.

The next stage is the replacement of both copper and aluminium by new materials, mostly high temperature super conductors, carbon nanotubes and graphite film. We discussed these developments in our last report, but new data emerging from industry sources gives us a better schedule of how these developments will take place. The tonnages set out in Figure 4 should be viewed in a directional sense and not as precise numbers, but they emphasise that copper's intensity of use will fall.

Figure 4: Lost Copper Tonnage Per Annum Based on 2008 Consumption - Kt-Cu

Telecom	
2000-2010	750-1000
2010-2020	500
Power Cable	
2010-2015	120
2015-2020	600
2020-2025	1200
Auto Wiring	
2010-2015	160
2015-2025	400
LV	
2010-2015	100
2015-2025	350

Source: SHSS

These are very significant tonnages; they exclude what is already taking place with aluminium in MV and some HV cables and ongoing substitution in the brass mill sector. There will, of course, be some offsetting new uses, but these will be dwarfed by substitution, whether through improved designs that reduce the copper content of a product, or by using alternative materials.

In summary, in the four major uses of copper in the wire and cables sector significant substitution will be seen:-

- Telecom/Communication Cables: Optical Fibre
- HV/MV Power Cables: HTS super conducting cable
- Automobile Wiring: aluminium & optical fibre
- LV, including Building Wires: Carbon Nanotubes & Graphite Film

Global investors continue to view China as the saviour of the world, both in a macro sense and especially for copper and other metals. Some very strange consumption numbers continue to pour out of the country in support of this thesis. Our data, based on the experience of visiting mills in China regularly since 1993 and from our macro work suggests that copper consumption in the country has not grown as rapidly in recent years as most analysts assume (Figure 5) and, in consequence, the total refined copper being consumed is a lesser figure.

Figure 5: China's Refined Consumption by Sector – Kt-Cu

	2007	2008	2009	2010	2011	2012
Construction	950	900	1077	970	1050	962
Infrastructure	1730	1870	2000	2200	2385	2500
Industrial Equipment	300	275	290	280	290	280
Consumer Goods	1260	1220	1200	1250	1200	1100
Rest	200	158	140	130	135	130
Total	4440	4423	4303	4830	5010	4972
Growth rate % Change per annum	-	-0.4	6.4	2.6	3.7	-0.8

Source: SHSS

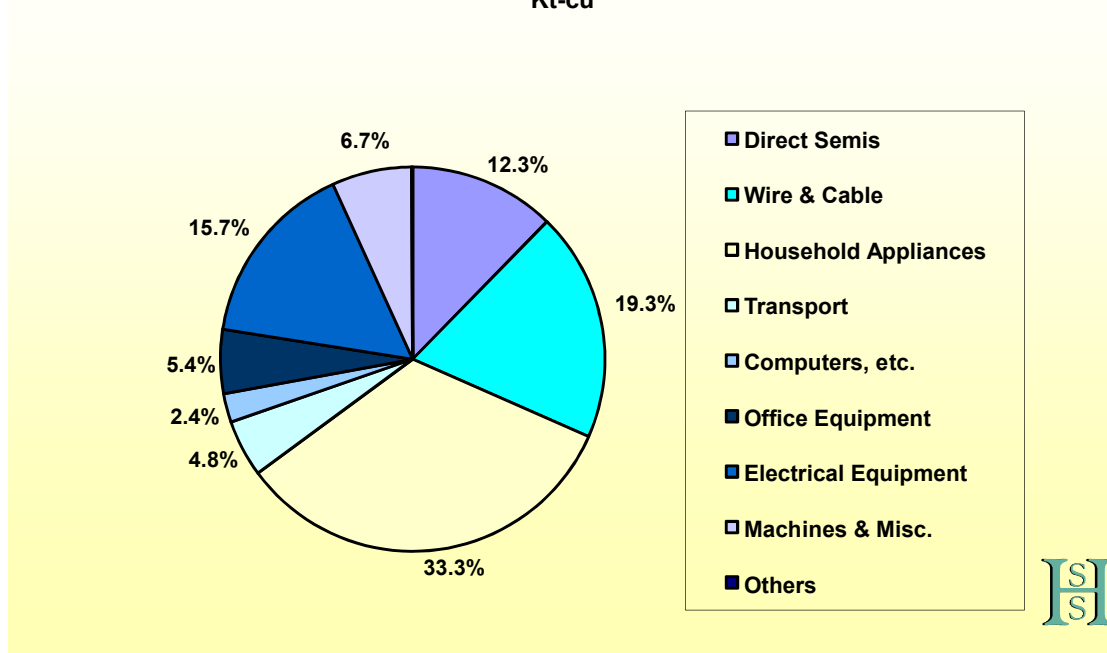
Two developments should be noted about China's copper consumption, as opposed to demand. The first is that in 2007 there was a large build up of semi-product inventory as a speculation on prices, which was liquidated the following year as prices collapsed. Thus, some of 2007's growth borrowed from the following year's consumption. No analyst that we have seen has computed this development in their consumption data. Second, as in the rest of the world, high and volatile prices are encouraging substitution. For instance, in the second half of last year, Power Supply Bureaus began specifying aluminium for MV cables, a market which accounts for almost 10% of total consumption in China. Other examples are connecting tubes for aircons and copper-clad aluminium in some cable applications, such as data cable.

Moreover, about 35% of China's consumption consists of copper being exported in one form or another (Figure 6), either as a direct semi or contained in the export of a finished product, such as an aircon. Around 16%, or 300kt, was lost through exports last year, implying that domestic consumption would have to increase by some 7% just for overall consumption to stand still.

Figure 6:

China % Breakdown of Copper in the Export of Goods

% Breakdown of Copper Content in the Export of Goods
Kt-cu



There has, of course, been a recovery in exports so far this year, which most analysts are assuming is sustainable. As noted earlier that will probably be a false assumption so that exports, where copper is concerned, will become an increasing drag on copper consumption in the country.

China's economic growth is already slowing after the heady rise in recent quarters because government belatedly fears the perils of an overheated economy and is concerned about the risk of a second global credit crisis and renewed recession. Further measures are likely to be taken to cool the economy. These will impact the construction sector and also consumer spending.

About 60% of China's refined consumption is accounted for by construction and infrastructure and 30% by consumer goods, but of the latter around one half of appliance production is for export.

Over the last six months or so, many fabricators have deliberately produced more than they sold to build up inventories as a price speculation, reminiscent of 2007. As we see global copper prices trending down for the rest of this year much of this semis inventory will be liquidated at the expense of new production. Most analysts have assumed that the experience of the first quarter will reflect business conditions for the rest of the year.

The impact of Shanghai's building for Expo 2010 should not be ignored. Shanghai spent some \$95 billion on preparations, including infrastructure spending, for the event, more than twice Beijing's spending on the 2008 Olympic Games. This will have contained a lot of copper tonnage from power cables, to ACR tubing, to sheet/strip etc. and for the copper contained in the aircons and other appliances for the public buildings and new hotels.

Our friends tell us that power cable demand is now very weak, falling by around 15% versus a year ago. We think that this decline will be representative of the change for the full year, not just because of a weakening construction sector, but because the State Electricity Company, which accounts for some 85% of the country's cable business, is being restructured. Moreover, as earlier mentioned, aluminium is now starting to be specified for MV cables (Figure 7).

Figure 7: Copper Usage - Kt-cu

	2007	2008	2009	2010
LV	702	762	815	675
MV	374	406	432	360
HV	56	62	71	85
Total	1132	1230	1318	1120

Source: SHSS

This weakness in the electrical sector is not confined to power cables, but extends into equipment such as transformers and generators. Order books for transformer windings are very weak for a loss of some 100kt/cu this year.

The 30% of copper consumption accounted for by consumer goods has been robust so far this year. This has been due to a strong pick up in exports, which are now likely to weaken, to the robust sales of housing units, which are also falling rapidly, and to the incentives being given by government to both rural and urban households to buy consumer goods and cars.

Production of appliances was massive in the first quarter, as Figure 8 shows. From what we hear, however, sales of cars and appliances have begun to fall sharply this month. Consumer confidence will not be helped by further sharp falls within China's equity markets, which we expect to continue until the autumn.

Figure 8: Production of Selected Appliances - % Change

	MOM	Jan-March YOY
Washing machines	29	41
Refrigerators	9	27
Aircons	24	30
Mobile Sets	26	37
Colour TV's	6	40

Source: NBS

Moreover, far more cathode was imported last year than was needed (Figure 9). In fact, China is being used as a depository for the metal bought by investment banks and others with most of the material being warehoused outside the reporting system. We understand that there is around 1.25 million tonnes of copper held by these institutions in China. In addition, Chinese investors, whether private individuals, private companies outside the copper industry and Chinese financial institutions have bought very large tonnages of copper because copper is seen as “a good store of value”.

Figure 9: China: Cathode Flow Sheet - 2009

	Kt-Cu
Supply:	
Production	3780
Net Imports	3110
Total	6890
Demand:	
Consumption	4400
Scrap Replacement	307
SRB	235
Total	4942
Surplus:	1948
Of Which:	
Foreign Owned	1250
Chinese Owned	698

Source: SHSS

Growth of China's refined consumption will really be quite modest over the next three years (Figure 10), a function of a slowing global economy, weaker business activity within China, destocking and substitution.

Figure 10: China's Refined Copper Consumption – Kt-Cu

	2007	2008	2009	2010	2011	2012
Wire Rod	3315	3363	3547	3595	3860	3920
Tubes	820	830	810	900	870	860
Rod	130	140	135	145	150	147
Sheet/Strip	325	330	335	370	395	400
Total Copper Semis	4590	4663	4827	5010	5275	5327
Copper Alloy Semis						
Sheet	400	410	390	425	420	410
Tube	175	190	200	220	225	220
Rod	480	450	430	450	475	470
Wire	135	145	140	150	160	165
Total Alloy Semis	1190	1195	1160	1245	1280	1265
Castings	105	85	95	95	100	100
Total Semis	5790	5908	6082	6350	6655	6692
Less Scrap	1350	1485	1375	1520	1645	1720
Refined Consumption	4440	4423	4707	4830	5010	4972
Growth Rate - %	18.4	-0.4	6.4	2.6	3.7	-0.8

Source: SHSS

The fundamental problem is not a shortage of production for real consumption, (see Figure 11 in Appendix 1) but weak global consumption because of the economic environment and substitution. World refined consumption is unlikely to grow by more than 1-2% a year over the coming five years compared with the average of 0.9% a year in the ten years 2000-2010 (Figure 12).

Figure 12: World Refined Consumption - Kt – Cu

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Western Europe	3513	3348	2630	2800	2900	2754	2690	2740	2810
North America	2682	2472	2042	2110	2155	2135	2025	2055	2095
Asia	8378	8300	8296	8662	8863	8669	8461	9110	9587
Middle East	710	749	805	855	930	950	910	910	915
Africa	265	281	284	310	331	340	320	337	353
S America	546	590	522	562	584	588	558	545	557
Oceania	146	145	130	135	140	138	135	140	145
Rest of World	1211	1130	804	856	885	876	804	787	834
World	1624	1588	1470	1543	1590	1557	1500	1583	1646
	0	5	0	4	3	4	9	7	2
% Change	3.4	-2.5	-9.9	5.0	3.0	-2.0	-3.3	4.5	4.0

Source: SHSS

It is the financial sector which has picked up so much of the real surplus. This is demand which at some point will be released into the market. There will be fat surpluses until this event occurs as shown in Figure 11.

Copper's Pricing Structure & Outlook

Copper's pricing structure contains two basic elements: the validity of buying physical copper or some sophisticated piece of paper against someone's physical stock and the new pricing structure. Both are fundamental to what happens to copper prices.

The initial attraction of these markets was to find an investment which was uncorrelated or even negatively correlated to equity and bond markets and which was an attractive hedge against inflation and a falling US dollar.

However, the players have become so numerous and the sums thrown at commodity markets, like copper, are so vast that they totally overwhelm the normal functions of users' and fabricators' ability to hedge. As a result, the copper– and other raw materials – market has become highly correlated to both equity and the dollar market. And the size of this outside investment often drives the market into negative carries.

Everyone has their own views on whether a deflationary or inflationary environment is likely over the next five years or so. The meticulous work undertaken by Carmen Reinhart and Kenneth Rogoff illustrates that periods of sovereign debt defaults follow credit crises and that these are years of

deleveraging and deflation. In the USA, for instance, despite soaring public sector debt, private sector debt has collapsed even more, a sure sign that inflation won't be around anytime soon.

The trading volumes on the world's principal exchanges, such as the LME, Comex and SHFE, are a fraction of what is traded in the global unregulated OTC markets. These unregulated markets have an additional impact on regulated markets by reducing physical volumes and in the process creating more volatility.

The main vehicles for trading in OTC markets are three: Dark Pools of Liquidity, High Frequency Trading and Trading Arcades.

Dark Pools of Liquidity: This is a recognised off-exchange function where large commercial companies, especially banks, create hidden pools of bids and offers in order to shift massive orders. A recent development is that the major players have converted their dark pools into Multilateral Trading Facilities, which are regulated by the FSA, and which can still have the same function.

High Frequency Trading (HTS): This has grown out of the success of algorithmic trading and uses plug-in systems to execute trades at certain prices. Very sophisticated software and almost light-speed computers enable trades to be executed faster than the human brain can follow. When a price limit is triggered it can send prices rocketing giving the appearance of high liquidity and volatility when in fact it is only someone with an HTF program and a large order. These algorithms are sophisticated "wire-tapping" programs that process real-time market data and order entry feeds in milliseconds and front run orders or trigger stops. The efficiency of floor trading has been sacrificed on the altar of cost and greed one could say.

Trading Arcades: These pull together smaller traders and non-professionals into one group so enabling them to have a significant presence in the market. They have become hugely popular in India and Dubai.

This changing pricing structure has impacted how copper and other commodities are traded and priced. The exchanges are no longer the single most important pricing unit of metals; it is the OTC markets with their size and their unregulated presence.

It is this market which sponsors of some bills going through the Senate and Congress wish to see regulated. A proposal in the Senate by Jeff Merkley and Carl Levin would force banks to sell off their proprietary businesses and financial institutions that do not take deposits to set aside more capital. This proposal has been endorsed by Paul Volker. Should this or something like this proposed bill come into law it will restrict the ability of banks in their commodity activities. The question then will be whether the UK authorities will follow the lead of their American counterparts.

In short, copper, like other commodities, has become just another piece of paper for financial institutions to trade; the industry simply just does not have the resources to counter these activities. It is why consumers are spending on R&D to at best design copper out of their systems or at least to reduce its content. Dr Copper retired about five years ago because of the activities of the banks and others.

Copper's pricing story is, therefore, a simple one. Prices are dictated by derivative, equity and currency markets. In line with our economic scenario, outlined earlier, copper prices should be in a falling though volatile trend to the end of the year; they should rally strongly in 2011 and into 2012; prices are then likely to fall very sharply and stay low for some years.

The second credit crisis is forecast to start in or around 2012. It will force much of the copper held off the market by financial institutions and others to be liquidated, much the same as what happened in the 1980s. In other words, what helped to push copper prices to exalted levels will drive prices to levels last seen in the early 2000s.

Our price targets for the next 10 years are shown in Figure 13.

Figure 13: SHSS copper price targets per tonne

Mid-2010	\$5000
End-2010	\$4000
End-2011	\$8000
End 2012	\$5000
End 2015	\$2000
2017-18	\$1500

Source: SHSS

The bottom line is that copper is a trading instrument and not an investment vehicle.

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Figure 11: World copper production, consumption & balances – Summary – Kt-Cu, 2001-2015

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1. Concentrate Supplies															
- W World	8533	8274	8298	9098	9511	9361	9670	9704	9749	9950	10556	11056	11606	11800	12200
- China	592	573	609	700	720	920	950	1070	1000	1100	1200	1250	1250	1400	1500
- ROW	1939	1978	1985	2006	1956	1931	1873	1668	1751	1900	1944	1944	2144	2254	2360
TOTAL	11064	10825	10892	11804	12187	12212	12493	12442	12500	12950	13700	14250	15000	15454	16060
2. Available Smelter Capacity (i)															
- W World	8132	7882	7904	8105	8416	8828	8860	8929	9390	9626	9793	9934	10145	10408	10500
- China	1157	1164	1344	1540	1866	1994	2294	2773	3150	3400	3500	4100	4400	4950	5050
- ROW	1833	1913	1909	1951	1921	1904	1863	1934	1960	2013	2015	2035	2135	2160	2170
TOTAL	11122	10959	11157	11596	12203	12726	13017	13636	14500	15039	15308	16069	16680	17518	17720
3. Concentrate Balance	-58	-134	-265	208	-16	-514	-524	-1194	-2000	-2089	-1608	-1819	-1680	-2064	-1660
4. Implied Smelter Production	11064	10825	10892	11596	12187	12212	12493	12442	12500	12950	13700	14250	15000	15454	15820
5. Changes Blister & Other Stocks	233	22	85	-64	0	0	0	-236	0	0	0	0	0	0	0
6. Less Direct Use of Blister	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
7. World Smelter Production (Rec.Fine Copper)	10892	10458	10583	11116	11750	11770	12100	12228	12190	12480	13210	13740	14480	14910	15260
8. Add: SxEw	2615	2690	2751	2740	2194	2842	2992	3088	3259	3520	3700	4000	4400	4500	4700
9. Add: Secondary	2024	2037	1996	2070	2176	2613	2742	2828	2919	2900	3152	2880	2890	2900	3000
10. Add: Matte/reverbs - China	0	0	0	0	0	70	110	90	30	80	100	100	120	140	150
11. World Refined Production (ii)	15531	15185	15330	15926	16120	17295	17944	18234	18398	18980	20162	20720	21890	22450	23110
12. Refined Consumption	14613	14655	15534	16717	16671	16874	17451	17015	15513	16200	16788	16450	15903	16624	17298
13. BALANCE	918	530	-204	-791	-551	421	493	1219	2885	2780	3374	4270	5987	5826	5812

May 2010

Note:

- (i) The concentrate balances are based on smelter capacity. In practice not all smelters operate at capacity throughout the year, especially in the current environment.
- (ii) The table is not a forecast of refined production. It is based on known data as we go to press and this illustrates the degree to which producers must cut production to bring about a balanced