

Chinese copper trade and consumption data examined for any evidence of changes in unreported stocks

Concerns have apparently been expressed that refined copper may have been exported to China in recent years in excess of requirements for consumption and that the excess represented an unreported build up of copper stocks in that country. BME has compiled statistics to shed light on the matter and in this report readers can judge for themselves, but our interpretation of the figures is that they imply very large-scale reductions, not increases, in unreported stocks of refined copper in China in 2005 and 2006. The conspiracy theorists leave us baffled.

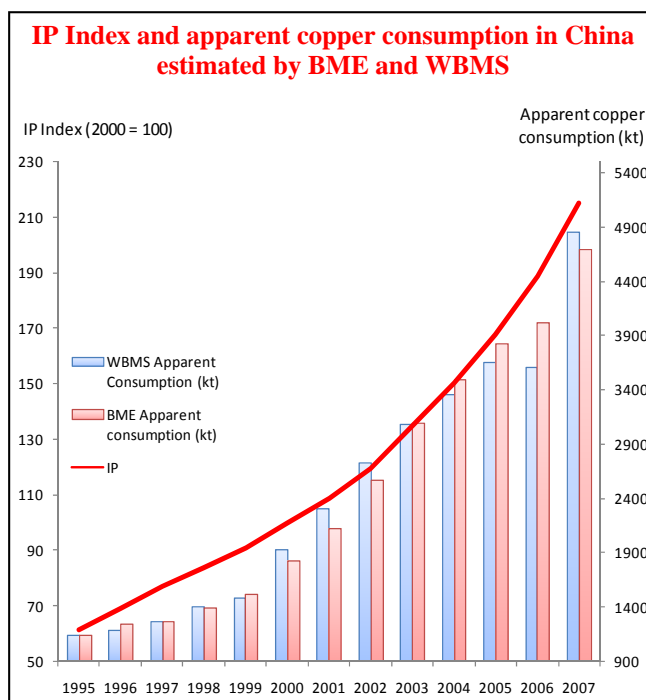
Basic Concepts

Chinese consumption of refined copper and, further downstream, of copper and copper alloy semi-manufactures are both growing rapidly. The country's production of refined copper and of semi-manufactures of copper and copper alloys (such as brass and bronze) is inadequate for its end-use requirements, and each year there are large scale net imports of refined copper and of copper and copper alloy semi-manufactures into China.

Figures for both production and trade in refined copper are published by two independent statistical agencies, namely the World Bureau of Metal Statistics (WBMS) and the International Copper Study Group (ICSG). Both organisations also publish figures for refined copper stocks on the Shanghai Futures Exchange, but not for other refined copper stocks within China, such as those of the Strategic Reserve Bureau (SRB), or those held by producers, consumers or merchants, or material in transit within the country. Both organisations publish figures for China's apparent consumption, which they define as being equal to production plus imports minus exports plus known starting stocks minus known finishing stocks. Their figures for apparent consumption will differ from actual consumption to the extent of any changes in unreported stock.

The statistical agencies do publish figures for production and trade in copper and copper alloy semi-manufactures. However, they do not publish figures for stocks of semi-manufactures nor for apparent consumption, though users of their data can calculate apparent consumption of semi-manufactures from the formula apparent consumption equals production plus imports minus exports. These figures will differ from the actual consumption of semi-manufactures to the extent that there have been changes in stocks.

In this report, we bring together figures for China's overall economic growth, for apparent consumption of refined copper and for the production and apparent consumption of semi-manufactures. Disparities between these growth rates provide a good indicator of errors in the apparent consumption calculations and, therefore, of changes in unreported stocks, which are what create the



differences between apparent and actual consumption.

Various key growth rates compared for China

As shown in Table A opposite, growth in Chinese industrial production (IP) averaged 12.1% over the years 2002-2007. During the same period, growth in the apparent consumption of refined copper, as reported by WBMS, averaged 13.7% p.a. and growth in Chinese output of semi-manufactures averaged 14.5%. A comparison of those growth rates establishes a trend for slowly rising intensity of use of copper in Chinese industrial production, and makes good sense against anecdotal information on the metals-intensive nature of Chinese growth. The averages make sense.

When one looks at the figures for 2006 as an individual year, they are very puzzling and do imply large scale changes in stocks of refined copper. In 2006, Chinese IP growth was 12.5% whilst production of copper and alloy semi-manufactures was 14.1%. That relationship looks very similar indeed to the picture shown by the averages over 2002-2007. However, apparent consumption of refined copper, as calculated by the WBMS, fell by 1.3% in 2006. That is totally out of line with growth in Chinese industrial production and in output of semi-manufactures. Since refined copper is consumed to make semi-manufactures, the difference between +14.1% and -1.3% is striking. As mentioned above, anomalies in apparent consumption in any one year are likely - because of the formula by which the figures are calculated - to be due to changes in unreported stocks. If one considers that the growth in Chinese industrial activity and in production of copper and alloy semi-manufactures in 2006 were both

above the 2002-2007 average, one might have expected above average refined copper consumption growth: say 14%. The apparent consumption figure for the year (-1.3%) is thus anomalously low by around 15.3%, or 560,000 tonnes of copper. Readers can make up their own minds, but in BME's view these published figures indicate that during 2006, there was a huge reduction of refined copper stocks in China, the complete opposite of the suggestion that stocks were imported into China to be hidden away, in 2006 particularly.

If one wishes not to go beyond the published official data and fairly straightforward inferences from them, one could stop there. However, BME and various other metals market analysis companies do their best to correct the apparent consumption figures by incorporating anecdotal information on changes in stocks in categories which the statistical agencies have no data for. BME's

calculations are set out in Table B. During 2006, we estimate that SRB stocks were reduced by 275 kt, and other unreported stocks (consumer, producer, merchant and in transit) were reduced by around 65 kt. The total reduction in unreported stocks that year we thus estimate as 340 kt. That gives BME a consumption growth figure for 2006 of just 5.2%, still very low vis-à-vis growth in industrial activity, but higher than the WBMS figure.

Using either WBMS or BME figures, the conclusion that seems to us as inevitable is that there was no increase in unreported stocks in China during 2006, instead there was a very large-scale reduction. From our calculations, 2005 was also a year of draw-down of unreported stock.

In 2007, we believe that there was some re-building both of SRB stocks and unreported commercial stocks.

Peter Hollands 18th March 2008

Table B: WBMS and BME calculations of Chinese apparent consumption of copper

WBMS	Production	Imports	Exports	Starting	Finishing	Apparent
				SHFE Stocks	SHFE Stocks	Consumption
	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)
2003	1836	1357	64	75	121	3083
2004	2199	1200	124	121	32	3364
2005	2600	1222	140	32	58	3656
2006	2999	827	243	58	31	3610
2007	3497	1496	126	31	26	4872

BME	Production	Imports	Exports	Starting	Finishing	Starting	Finishing	Starting	Finishing	Apparent
				SHFE Stock	SHFE stock	SRB stock	SRB stock	Other stock	Other Stocks	Consumption
	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)	(Kt)
2003	1835	1357	64	75	121	700	650	391	423	3100
2004	2200	1200	124	121	32	650	425	423	513	3500
2005	2605	1222	140	32	58	425	325	513	449	3825
2006	3000	827	243	58	31	325	50	449	310	4025
2007	3550	1495	120	31	26	50	150	310	440	4700

Table C: Apparent consumption of semi-manufactures in China (source: ICSG)

	Production	Production	Production	Imports	Imports	Imports	Exports	Exports	Exports	App. Cons	App. Cons	App. Cons
	Copper	Alloy	Total	Copper	Alloy	Total	Copper	Alloy	Total	Copper	Alloy	Total
	Semis	Semis	Semis	Semis	Semis	Semis	Semis	Semis	Semis	Semis	Semis	Semis
Amount	(kt)	(kt)	(kt)	(kt)	(kt)	(kt)	(kt)	(kt)	(kt)	(kt)	(kt)	(kt)
2003	2681	1227	3908	616	247	863	72	53	125	3225	1421	4646
2004	2930	1327	4257	659	300	959	124	77	201	3465	1550	5015
2005	3234	1434	4668	568	326	894	152	94	245	3650	1666	5317
2006	n/a	n/a	5324	528	332	860	190	106	296	n/a	n/a	5888
2007	n/a	n/a	6288	n/a	n/a	1046	n/a	n/a	418	n/a	n/a	6916
% change												
2004	9.3	8.1	8.9	7.0	21.5	11.1	72.2	45.3	60.8	7.4	9.1	7.9
2005	10.4	8.1	9.7	-13.8	8.7	-6.8	22.6	22.1	21.9	5.3	7.5	6.0
2006	n/a	n/a	14.1	-7.0	1.8	-3.8	25.0	12.8	20.8	n/a	n/a	10.7
2007	n/a	n/a	18.1	n/a	n/a	21.6	n/a	n/a	41.2	n/a	n/a	17.5