COMMERZBANK

Commodity Spotlight Base Metals

6 February 2014

Pricing on iron ore market in state of flux

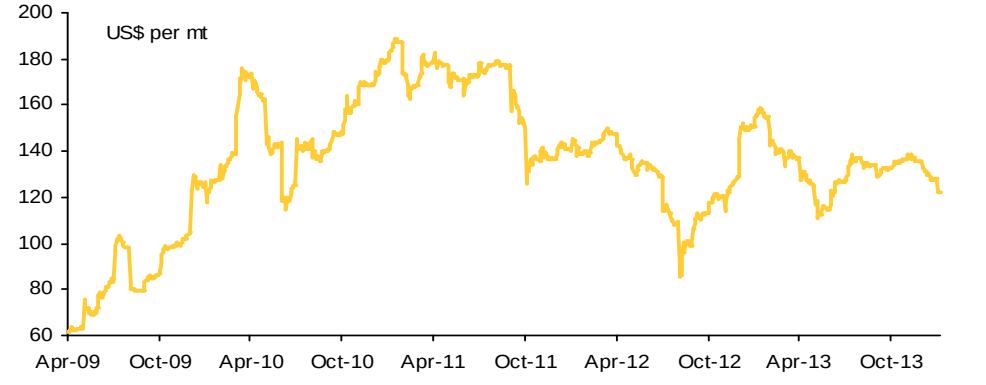
Swap trading is becoming increasingly popular on the iron ore market. Swaps are being used more and more to hedge against price risks, partly because there is currently no liquid trading of steel futures. In this Commodity Spotlight we will be shedding light on the factors that are influencing the iron ore market and outlining the development of pricing and tradability of iron ore, in which China is playing a key role. The plentiful supply situation means that the iron ore price is unlikely to regain its previous highs.

Before we look in more detail at iron ore, let us turn our attention to the steel market – or rather to the development of steel trading on the London Metal Exchange (LME). After all, the low levels of liquidity there have played a major part in the emergence of iron ore trading.

Market participants are increasingly keen – and indeed increasingly need – to safeguard their commodities demand and/or production, especially in times of considerable volatility. There has long been a number of tried and tested ways to achieve this in the energy and metal sectors. At the end of April 2008, the LME attempted to apply the successful metal trading concept to steel by launching a steel future – initially with considerable success. The trading volume grew from just shy of 16,000 contracts in 2008 to nearly 220,000 contracts in 2011. The success story came to an abrupt end when more and more market players lost confidence in LME steel trading, however. Within just two years, the trading volume collapsed to just under 72,000 contracts. By the end of last year, only a good 1,000 steel contracts per month were still being traded on the LME.

So what happened? First, let us remember that the LME steel contract is based on steel billets that are predominantly used in the construction industry. As such, however, they are only suitable for other sectors to a limited extent. For major car manufacturers, for instance, trading with this steel type was not an option because they require higher quality steel. Large-scale steel producers also had little interest in participating in LME trading. Even in 2011, when trading reached its peak, only around 1% of global steel production was traded – namely 14.2 million tons. By way of comparison, that same year saw 33 times the annual production of aluminium – the most-traded metal – traded. The real problem, however, lies in the way the steel is stored, for nearly the entire quantity of steel that is kept physically available for futures trading is stored in US warehouses, particularly in Detroit – the figure was 95% at the end of 2013. The great majority of participants in LME steel trading come from Europe, the Middle East and North Africa, however, giving rise to a considerable geographical discrepancy. Because it is too expensive to transport the material from the US warehouses, steel trading on the LME almost came to a standstill.

CHART 1**: Performance of iron ore swap price in Singapore since its introduction**



Source: SGX AsiaClear, Bloomberg, Commerzbank Corporates & Markets

Commerzbank Forecasts 2014

	Q1	Q2	Q3
Base metals			
Copper	7200	7500	7800
Aluminium	1775	1825	1900
Nickel	13750	13950	14350
Lead	2150	2175	2250
Zinc	1950	1950	2025
Tin	22600	23300	23900
Iron ore	130	125	115

US$ per mt

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LME attempting to reverse the trend

The LME is now attempting to reverse this trend by switching the focus in future steel trading to Europe. With this aim in mind, all non-European warehouses are to be removed from the list of LME-inspected storage sites by the end of April and stocks transferred to European warehouses. Furthermore, the minimum load-out rates will be increased. Depending on the size of the warehouse, warehouse operators are required to release between 800 and 3,000 tons of steel per day. Although these are steps in the right direction, it will take a long time for the lost confidence of market participants to be restored.

Price hedging of iron ore as alternative to steel for consumers

Because the LME's attempt to offer accepted and properly functioning steel futures trading has failed initially, and because there is no proper means of hedging steel prices, at least for the time being, more and more steel consumers are opting to hedge their steel demand via iron ore swaps. After all, price risks during steel production are normally passed on directly to consumers because most steel producers incorporate clauses into their contracts that allow raw material costs to be adjusted. This also explains why producers have little interest in taking part in stock exchange trading of steel. Many consumers therefore seek to hedge the steel price risk. For some months now, a market for the trading of iron ore swaps has been emerging, the SGX AsiaClear exchange in Singapore playing a pioneering role. Trading with iron ore is growing extremely rapidly there.

Benefits for producers, too

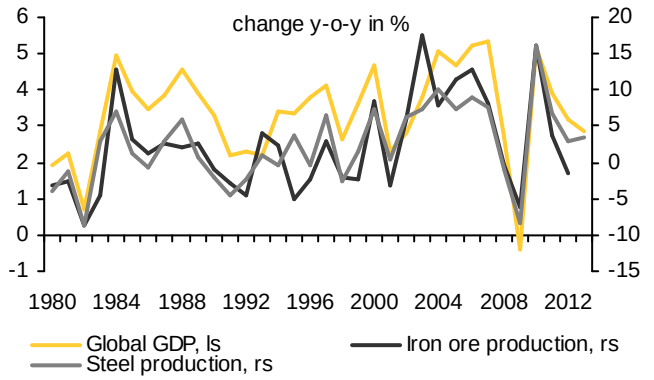
Opportunities for iron ore trading also offer benefits for steel producers, however: they can secure a fixed price to cover their demand over a longer period, and thus have the peace of mind of fixed raw material costs. In addition, the risk of volatile iron ore prices can be reduced while at the same time maintaining security of supply. In turn, iron ore producers can secure a long-term fixed price for their production via the exchange, which allows them to plan with greater certainty. There is also the possibility to hedge against falling iron ore prices without relinquishing control over mining production. Last but not least, exchange trading of iron ore also gives traders themselves opportunities to hedge their physical stocks.

Iron ore linked to steel and economic cycles

Because iron ore is needed almost solely for the production of steel, its price responds relatively easily to changes in industrial demand and global economic conditions. After all, there is a close correlation between the development of the global economy and global iron ore and steel production (Chart 2). As Chart 3 additionally shows, iron ore prices were subject to greater volatility than other commodities in the past and also fluctuated much more markedly in the long term.

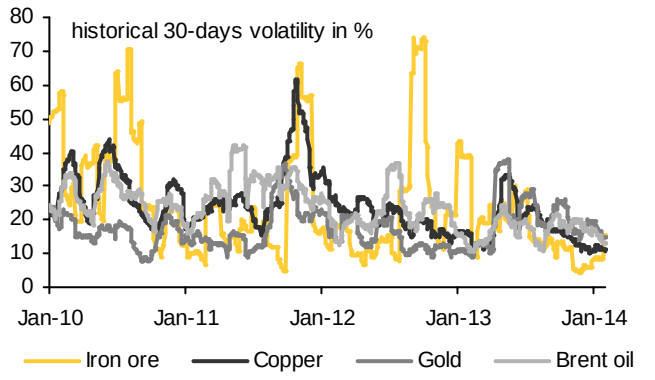
Before we turn to the tradability of iron ore, the following section will first focus on the supply and demand situation on the iron ore market.

CHART 2: **Close correlation between global economy, iron ore and steel production**



Source: IMF, BREE, Commerzbank Corporates & Markets

CHART 3: **Iron ore more volatile than other commodities**



Source: Bloomberg, Commerzbank Corporates & Markets

TABLE: **The world's biggest iron ore producers in 2012**

	Production in million tons	Reserves in million tons	Average iron content
China	1300	23000	31%
Australia	525	35000	49%
Brazil	375	29000	55%
India	245	7000	64%
Russia	100	25000	56%
Total	3000	170000	47%

Source: USGS, Commerzbank Corporates & Markets

Supply situation

China is biggest producer, Australia and Brazil are biggest exporters

Iron ore reserves can be found in all the world's continents and are therefore mined in many countries. According to statistics supplied by the U.S. Geological Survey (USGS), the leading countries – in terms of both their production and their reserves – include, in this order, China, Australia, Brazil, India and Russia. In 2012, these five countries accounted for 85% of the world's iron ore production, China alone producing 1.3 billion tons. In Australia and Brazil, the two largest export countries, 525 million and 375 million tons of iron ore were mined respectively (see table). According to the USGS's figures, the known reserves would last for 57 years at a global production rate of 3 billion tons (not quality-adjusted). New reserves are being found all the time, however. USGS estimates global resources at more than 800 billion tons of iron ore, with all kinds of different grades. In terms of ore quality, there are big differences between the individual countries – Brazilian and Australian iron ore for instance is regarded as high-quality. In India, the reserves even boast an average ore grade of 64%. Iron ore in China, on the other hand, is of lower quality with an average ore grade of 31%.

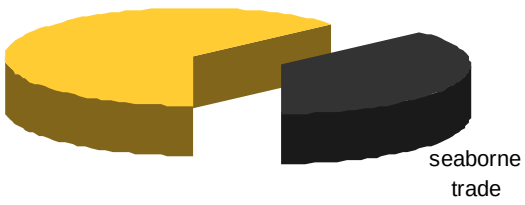
Continuous growth in seaborne trade of late

Because for example in China more or less the entire production volume remains in the country and is consumed there – in other producer countries smaller volumes remain in the country – and is thus not available to the world market, any analysis of the market must focus particularly on what is known as seaborne trade. This shows how much material was traded and/or transported between the countries concerned. According to data from the United Nations Conference on Trade and Development (UNCTAD), seaborne trade in 2012 had a volume of 1.11 billion tons, though this only accounted for less than 40% of global production (Chart 4). In recent years, seaborne trade of iron ore has seen continuous growth (Chart 5).

Oligopoly on the business side

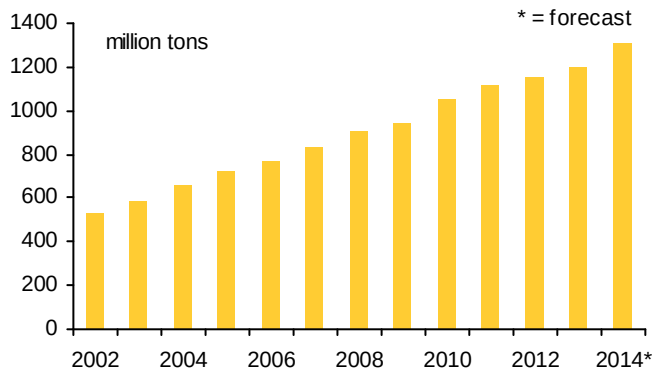
On the business side, the market is essentially divided up between three producers: Vale from Brazil and the two British-Australian commodities giants Rio Tinto and BHP Billiton. With a production volume of 320 million tons, Vale was in the leading position in 2012. Rio Tinto produced 199 million tons and BHP Billiton just shy of 161 million tons. In other words, the "big three" combined accounted for somewhat more than 60% of seaborne trade.

CHART 4: **Seaborne trade accounts for only small proportion of global production**



Source: USGS, UNCTAD, RMG, Commerzbank Corporates & Markets

CHART 5: **Steady growth in global iron ore trading**



Source: BREE, Commerzbank Corporates & Markets

Iron ore in steel production

Iron ore is the main constituent of steel produced in what is known as a blast furnace. Iron ore is a mixture of chemical iron compounds and rock that does not contain iron. Iron ore is mainly extracted from open-pit mines. Once mined, the iron ore is processed at the mining site, with most of the rock that does not contain iron being separated off. Next it is transported by rail up to 1,000 km or more to specific export terminals from where it is finally shipped to steel producers in Asia and Europe. In the blast furnace, a chemical reaction with carbon and carbon monoxide removes the oxygen and other oxides from the iron oxide. This results in pig iron, which is then used to manufacture steel.
According to the World Steel Association, 1.5 tons of iron ore are typically needed to produce one ton of steel using the blast furnace method.

Sharp increase in production in coming years

In its latest quarterly report, Australia's national Bureau of Resources and Energy Economics (BREE) estimated that iron ore production in Australia was likely to grow by nearly 20% year-on-year to around 664 million tons in fiscal 2013/14, primarily because the mining companies Fortescue Metals Group, BHP Billiton and Rio Tinto are investing in new mining projects in the iron ore-rich Pilbara region in the west of the country, where production is now getting underway. Since port capacities are also being expanded, exports are also expected to increase by a good 23% to 650 million tons. BREE likewise envisages much higher exports in 2014 than last year in Brazil, at 352 million tons (Chart 6) – also on the back of expanded production, in this case by Vale. At the end of last year, however, India's supreme court extended the mining ban that was introduced in the state of Goa in 2012, meaning that India will continue to be largely absent from the world market as a supplier. Three years ago, India had still exported more than 100 million tons of iron ore. According to UNCTAD, new projects with a total volume of 771 million tons are set to go into operation worldwide between 2013 and 2015. If figures dating back to May 2012 are factored into the equation, the volume increases to 896 million tons. According to UNCTAD, 40% of these are viewed as "certain", 26% as "probable" and 34% as "possible". In terms of region, Australia and Latin America together are home to a good 60% - i.e. the majority – of the projects.

Demand situation

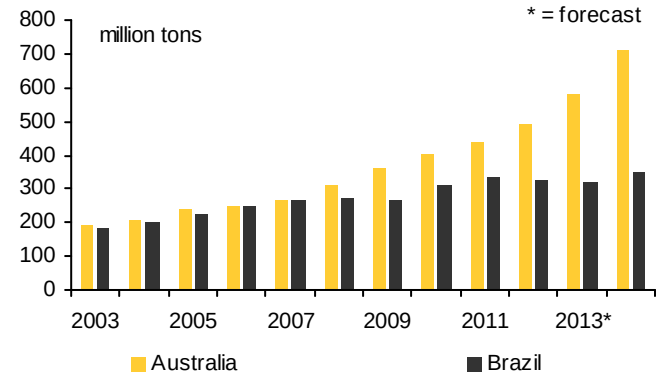
Steel industry main consumer of iron ore

Because iron ore is needed almost solely for the production of steel, major steel-producing countries dictate the level of demand and influence the price. According to data from the World Steel Association, 1.61 billion tons of steel were produced globally in 2013. With a 49% share, China was by far the biggest steel producer (Chart 7), followed by Japan, the US, India, Russia and South Korea. Unlike the iron ore market, the steel market is highly fragmented in terms of manufacturers. In 2012, the ten largest steel manufacturers accounted for "only" 28% of the total market.

China imports large quantities of iron ore despite high levels of domestic production

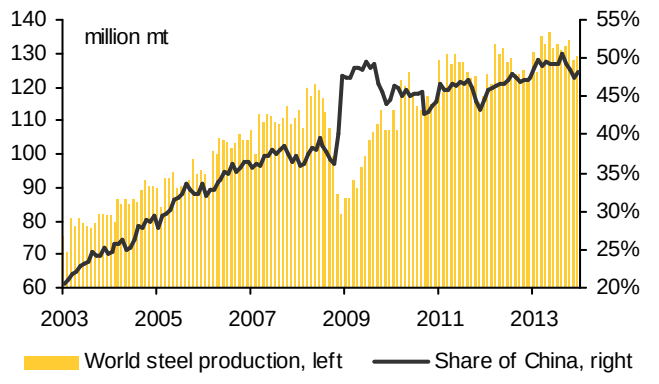
Since the major steel-producing nations do not produce iron ore themselves, or not in sufficient quantities, they import iron ore to meet their demand. Even China, despite a high level of domestic iron ore production, is dependent on imports – because of the low quality of the iron ore it produces itself. According to figures from the customs authorities, China imported 745

CHART 6: **Iron ore exports noticeably expanded**



Source: BREE, Commerzbank Corporates & Markets

CHART 7: **China dominates the steel market …**



Source: WSA, Bloomberg, Commerzbank Corporates & Markets

million tons of iron ore in 2012, 8.5% more than in the previous year. Thus China absorbed a good two-thirds of all seaborne traded iron ore. In 2013, the country even imported 820 million tons of iron ore (Chart 8). Because efforts are being undertaken in China to produce more higher-quality steel in future, the country is likely to continue importing high-grade iron ore in the coming years. This is also suggested by the fact that many steelworks are located close to coastal areas, making seaborne supply more attractive than the more expensive domestic transport from regions in the country's interior. That said, considerable stocks have meanwhile accumulated again at the country's ports. After iron ore stocks initially declined – according to data supplier Shanghai Steelhome – from their record high of around 100 million tons in July 2012 to 75 million tons in April 2013, they currently find themselves above 92 million tons again (Chart 9).

More scope for Chinese steel manufacturers when it comes to iron ore imports

At the start of the second half of 2013, China revolutionized its decades-old import system. Ever since, brokers no longer have to be engaged for imports – meaning that commission no longer has to be paid. What is more, there is no longer any need to obtain an import permit in advance from state authorities such as the China Iron & Steel Association. This liberalization not only saves costs for Chinese steel manufacturers but also allows them to gear their operations to the market to a greater extent and gives them a wider choice when it comes to procuring raw material. As Chart 8 illustrates, this already had an impact on China's imports in the second half of the year – imports in the second half of the year were a good 13% higher than in the first six months.

Demand continues to grow

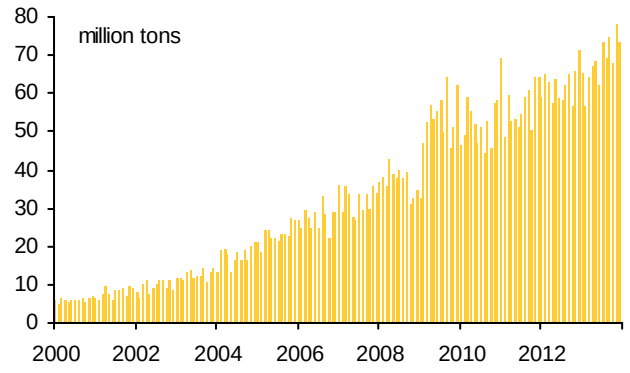
BREE expects Chinese iron ore imports to grow further in 2014 to over 850 million tons. The reasons it cites for this growth are increased steel production in China and the low ore grade of local iron ore reserves. Furthermore, the National Development and Reform Commission in China anticipates that the country will be dependent on iron ore imports in the long term. By contrast, iron ore imports to the EU, Japan and South Korea have stagnated of late or were only marginally higher. According to figures from UNCTAD, global iron ore demand in 2012 totalled 1.86 billion tons. In 2013, demand looks set to grow by 3.7% to 1.93 billion tons and to exceed the 2 billion ton mark for the first time in 2014.

Pricing / tradability

Abolishing the decades-old benchmark system

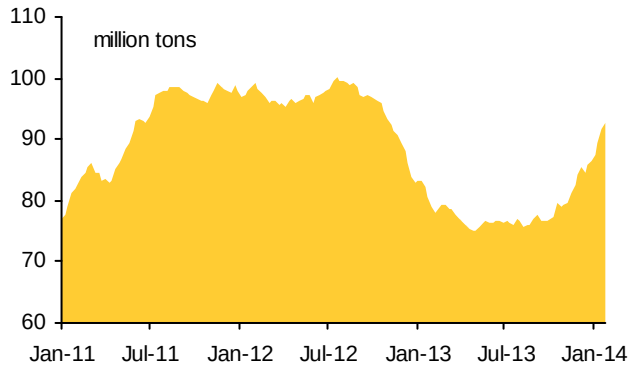
For around 40 years, prices on the iron ore market were determined by what was known as the benchmark system, where each year iron ore producers would bilaterally negotiate with steel manufacturers and agree on a fixed price that would apply from 1 April for the next twelve months. The first contracts concluded for the year served as the "benchmark" for the industry and were largely accepted by market participants. Following efforts by the major iron ore producers, however, the decades-old benchmark system was abolished in the spring of 2010, for iron ore producers had been forced to supply their customers with iron ore at the low prices fixed in advance despite the fact that prices had risen sharply in the second half of 2009 and in the first months of 2010. As a result, iron ore producers lost tens of billions worth of revenues.

CHART 8: **… and imports record quantities of iron ore**



Source: China Customs, Bloomberg, Commerzbank Corporates & Markets

CHART 9: **Iron ore stocks replenished in China**



Source: Shanghai Steelhome, Bloomberg, Commerzb. Corporates & Markets

Index pricing currently predominates

Following fierce resistance at first, especially from Chinese steel manufacturers, and political disputes that then ensued between the Chinese and Australian governments, steel manufacturers ultimately capitulated and grudgingly accepted shorter-term contracts. Quarterly contracts became the norm, thus marking the start of index pricing. The agreed iron ore prices are based on the average spot price from the previous quarter. Put simply, index providers gather daily-updated figures from market participants – for example by telephone, e-mail or via website input – about actual transactions and then use this data to calculate a volume-weighted average. This is then normalized on the basis of the ore grade and freight rates, allowing the index to be created. According to UNCTAD, index pricing is now widespread among iron ore producers and steel manufacturers and is used for 70-75% of all contracts. Thus annual price agreements now account for only 10-15%, while the remainder is attributable to spot trading (10-20%). As such, the iron ore market is increasingly coming to resemble other developed metal markets. Although the indices upon which pricing is based are largely accepted, prejudices have also emerged – some indices for instance are seen as prone to arbitrary events or manipulation.

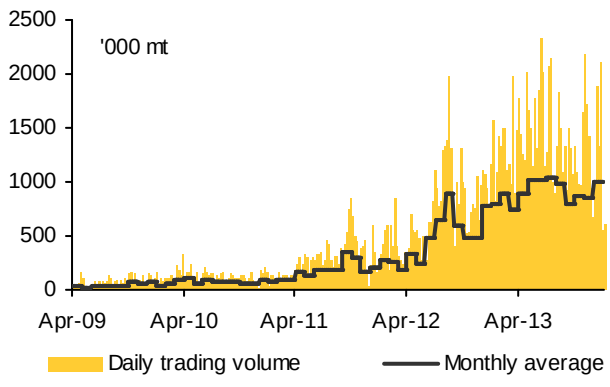
Introduction of iron ore swaps in Singapore

In response to increased interest and growing demand among companies in the industries concerned that wish to trade and deal in iron ore swaps, and because of the preconceptions about index pricing, the SGX AsiaClear exchange in Singapore had introduced trading of iron ore swaps at the end of April 2009. By its own account, the exchange – which has played a pioneering role in this area – handles more than 90% of the global iron ore swap volume. Iron ore supplied to China with an ore grade of 62% serves as the underlying. The prices for this iron ore are provided by data supplier The Steel Index (TSI). One lot comprises 500 tons of iron ore, and swaps have a term of up to 48 months. At the end of each month, a cash settlement is carried out for the contract, based on the arithmetic average iron ore reference price from TSI. Following some initial hesitation, swaps are now becoming increasingly popular. To date, the peak volume of iron ore traded on one day amounted to just shy of 2.5 million tons (Chart 10). In 2013 as a whole, approx. 230 million tons of iron ore changed ownership – twice as much as a year before (108.9 million tons). This makes exchange trading of iron ore more significant than LME steel trading was even at its peak. Nonetheless, trading with swaps so far accounts for only a small proportion of seaborne traded iron ore. Apart from swaps, the SGX AsiaClear also offers trading in iron ore futures. Liquidity could increase markedly in future because a number of state Chinese steel producers have been given permission to trade iron ore derivatives abroad. The companies concerned have already undertaken their first attempts to trade iron ore in Singapore.

Competition for Singapore from Dalian, China

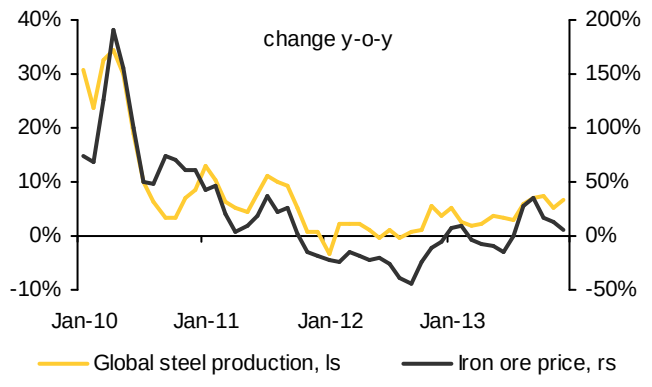
In the middle of last October, the commodities exchange in Dalian, a port city in the northeast of China, likewise began trading in iron ore futures – thus entering into competition with the SGX AsiaClear in Singapore. A lot there comprises 100 tons of iron ore, contracts are denominated in CNY and the ore grade is 62%. Contracts are physically backed and the exchange resorts to stocks kept at the country's ports and to material stored by steel manufacturers. Foreign companies can participate in trading in Dalian via business units registered in China. According to the exchange operator, 338,700 contracts (corresponding to 33.87 million tons of iron ore) were traded on the very first day of trading of the new futures. Since then, however, the trading volume has exceeded 300,000 contracts on only one other day. Since the iron ore futures were

CHART 10: **Sharp increase in iron ore swap trading**



Source: SGX AsiaClear, Bloomberg, Commerzbank Corporates & Markets

CHART 11: **Iron ore price depends on steel production**



Source: WSA, Bloomberg, Commerzbank Corporates & Markets

launched, the average volume has been around 90,000 contracts per day, which also means that considerably more iron ore is traded in Dalian than in Singapore. From mid-October to the end of 2013, the total was 4.38 million contracts or 438 million tons of iron ore – nearly twice as much as was traded in Singapore in the whole of last year. Since the beginning of 2014, 2.32 million contracts have already been traded in Dalian – thus the exchange in Dalian could advance in the foreseeable future to set the benchmark for iron ore pricing.

Price index for iron ore in China

In order to gain even more influence over the pricing of iron ore, China introduced a price index for iron ore at the beginning of this year that is published daily by the China Iron & Steel Association. Calculation of the index takes into account the prices for both domestic and imported iron ore. The index is in clear competition with the indices published by the other data suppliers Platts, TSI and Metal Bulletin.

Summary

Iron ore market in flux

Due to the hitherto limited tradability of iron ore, its price in the past was determined first and foremost by supply and demand, giving a realistic picture of the market situation. What is more, because iron ore correlates strongly with industrial demand, the price performance of this commodity gives us a good insight into the way the global economy is developing. In our view, trading with iron ore is likely to expand further and become more important in the next few years. This is suggested not only by the global growth in steel production, which entails higher demand for iron ore – iron ore trading is also likely in the future to develop into regulated stock exchange trading with financial actors, which would generate additional liquidity.

Iron ore price expected to follow general sideways trend

As with many other commodities, China also plays a key role when it comes to iron ore. The slowing pace of economic growth in China will in future be reflected in less sharply rising steel production than in recent years. This will have corresponding effects on demand for iron ore and, by extension, on its price (Chart 11, Page 6). On the other hand, we have iron ore production being noticeably expanded, above all in Australia. For these reasons alone, the price is unlikely to make any major leaps upwards. Because we expect the global economy to recover, however, the price is also likely to be well-supported. We see the iron ore price moving largely within a trading corridor of between $120 and $140 per ton over the course of the year – any spikes in either direction should be fairly short-lived.

At a glance

TABLE 1: **Our forecasts**

		Current									Yearly average		
	Unit	06.02.	Q1 14	Q2 14	Q3 14	Q4 14	Q1 15	Q2 15	Q3 15	Q4 15	2013	2014	2015
Copper	US$/ton	7058	7200	7500	7800	8000	8150	8250	8350	8500	7353	7650	8300
	USc/pound	320	327	340	354	363	370	374	379	386	334	347	376
Aluminium	US$/ton	1701	1775	1825	1900	1950	2000	2050	2050	2100	1888	1875	2050
	USc/pound	77	81	83	86	88	91	93	93	95	86	85	93
Lead	US$/ton	2098	2150	2175	2250	2325	2400	2450	2450	2500	2156	2225	2450
	USc/pound	95	98	99	102	105	109	111	111	113	98	101	111
Tin	US$/ton	22130	22600	23300	23900	24350	24750	24900	25150	25400	22309	23500	25100
	USc/pound	1004	1025	1057	1084	1104	1123	1129	1141	1152	1012	1066	1139
Zinc	US$/ton	1968	1950	1950	2025	2100	2150	2200	2200	2250	1940	2000	2200
	USc/pound	89	88	88	92	95	98	100	100	102	88	91	100
Nickel	US$/ton	13910	13750	13950	14350	14550	14900	15050	15300	15550	15098	14200	15200
	USc/pound	631	624	633	651	660	676	683	694	705	685	644	689
Iron ore	US$/ton	122	130	125	115	125	120	120	120	120	135	125	120

*Quarterly averages, 3months contracts (LME) (*previous day) Source: Commerzbank Corporates & Markets, Bloomberg*

TABLE 2: **Inventories**

	current	1 day	1 week	1 month	1 year	52 week high	52 week low
Aluminium LME	5392800	-0.1%	-0.7%	-1.1%	5%	5492325	5138775
Aluminium Shanghai	207865	-	4.2%	14.4%	-51%	509988	181644
Copper LME	309250	-0.6%	-2.2%	-13.2%	-20%	678225	309250
Copper COMEX	19034	-0.8%	-1.2%	18.2%	-74%	86175	14925
Copper Shanghai	148581	-	5.4%	18.1%	-25%	247591	122189
Lead LME	206925	-0.2%	-1.0%	-3.8%	-29%	289900	180425
Lead Shanghai	87352	-	0.3%	-3.2%	-25%	140750	84873
Nickel LME	265992	0.1%	-0.3%	2.0%	77%	266718	150672
Tin LME	8940	0.6%	0.6%	-7.4%	-33%	15440	8855
Zinc LME	833725	-0.6%	-2.7%	-9.7%	-30%	1209550	833725
Zinc Shanghai	246241	-	0.8%	3.2%	-24%	329404	228058

Source: Bloomberg, Commerzbank Corporates & Markets

TABLE 3: **History**

current		Percentage change				Historical development							
	US$/mt	1 week	1 month	ytd	1 year	Q1 12	Q2 12	Q3 12	Q4 12	Q1 13	Q2 13	Q3 13	Q4 13
Aluminium	1701	-1.6	-4.6	-5.5	-19.0	2219	2018	1954	2022	2039	1871	1828	1813
Copper	7058	-0.5	-3.6	-4.1	-14.4	8327	7829	7732	7925	7954	7187	7104	7168
Nickel	13910	0.7	2.6	0.1	-24.1	19724	17220	16424	17043	17370	15024	14025	13972
Zinc	1968	-0.8	-3.2	-4.2	-9.2	2042	1932	1909	1983	2054	1876	1897	1933
Lead	2098	-0.8	-3.1	-5.5	-13.4	2118	1985	1995	2205	2306	2066	2117	2137
Tin	22130	0.5	1.9	-1.0	-10.9	22995	20580	19324	21592	24065	20936	21327	22909
Iron ore	122	-4.9	-7.8	-10.2	-21.4	142	140	113	118	149	127	131	135

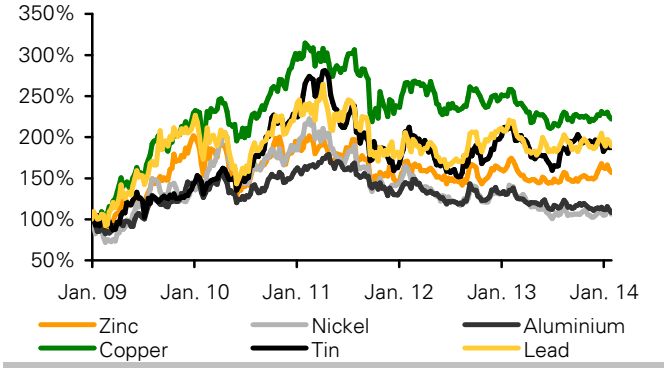
Source: Bloomberg, Commerzbank Corporates & Markets

TABLE 4: **Upcoming events**

12.02. / 08.03.	CHN	Imports & Exports, January / February
14.02. / 17.03.	USA	Industrial Production, January / February
19.02. / 18.03.	USA	Housing Starts & Building Permits, January / February
20.02. / 24.03.	CHN	HSBC Flash Manufacturing PMI, February / March
27.02. / 26.03.	USA	Durable Goods Orders, January / February
01.03.	CHN	Manufacturing PMI, February
03.03.	USA	ISM Manufacturing, February
13.03.	CHN	Fixed Assets Investments, February
13.03.	CHN	Industrial Production, February

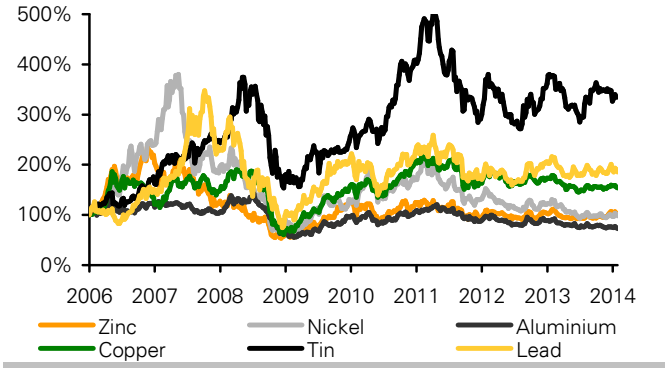
Source: Bloomberg, Commerzbank Corporates & Markets

CHART 14: **Performance industrial metals: Since 2009**



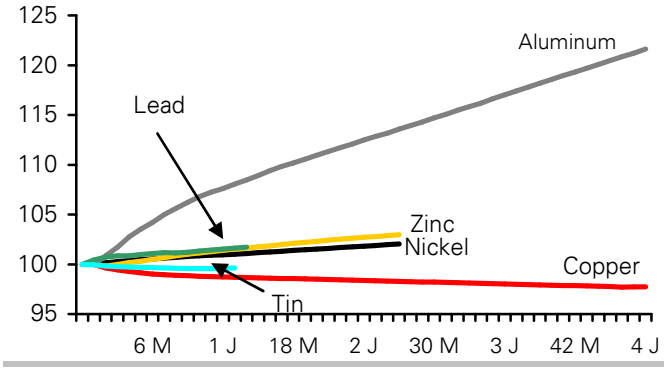
Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 15: **Performance industrial metals: Since 2006**



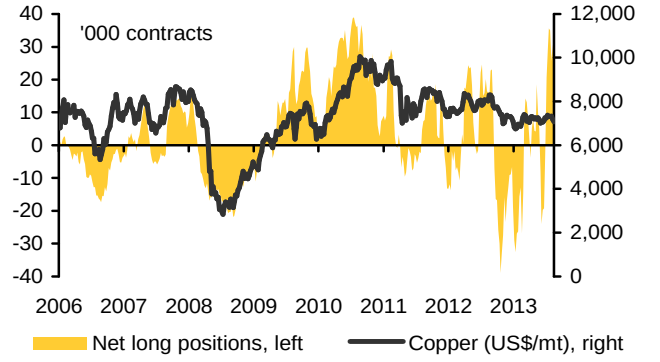
Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 16: **Forward curves industrial metals**



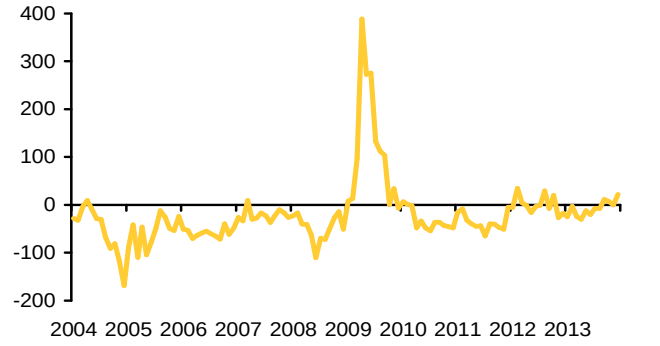
Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 17: **Copper: managed money (COMEX)**



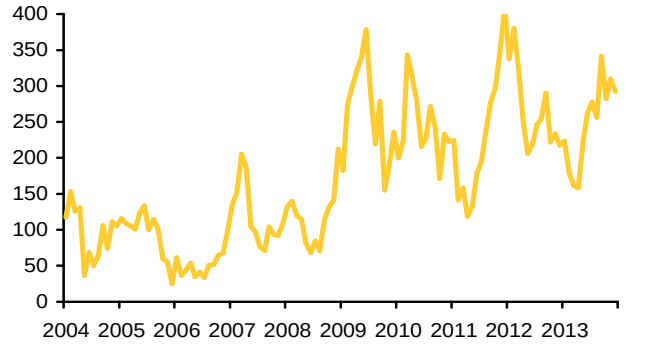
Source: CFTC, COMEX, Bloomberg, Commerzbank Corporates & Markets

CHART 18: **Aluminium: net imports China ('000 mt)**



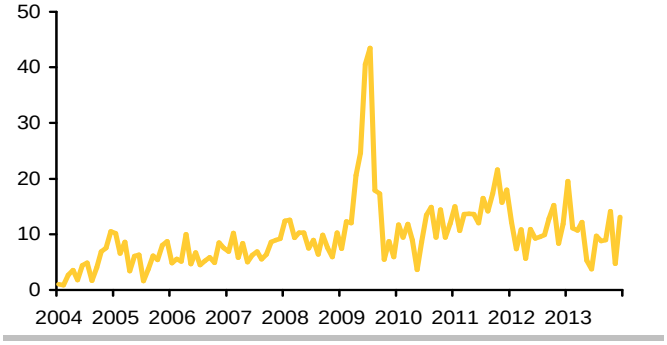
Source: China Customs, Bloomberg, Commerzbank Corporates & Markets

CHART 19: **Copper: net imports China ('000 mt)**



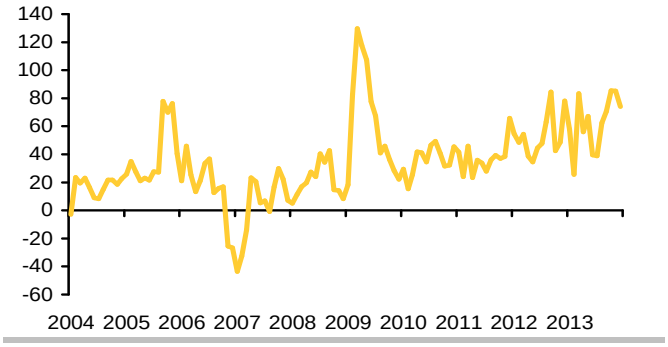
Source: China Customs, Bloomberg, Commerzbank Corporates & Markets

CHART 20: **Nickel: net imports China ('000 mt)**



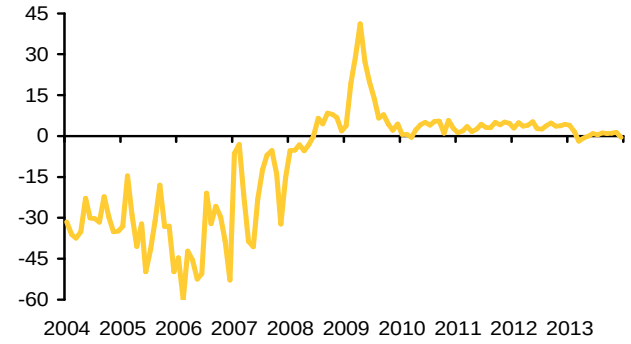
Source: China Customs, Bloomberg, Commerzbank Corporates & Markets

CHART 21: **Zinc: net imports China ('000 mt)**



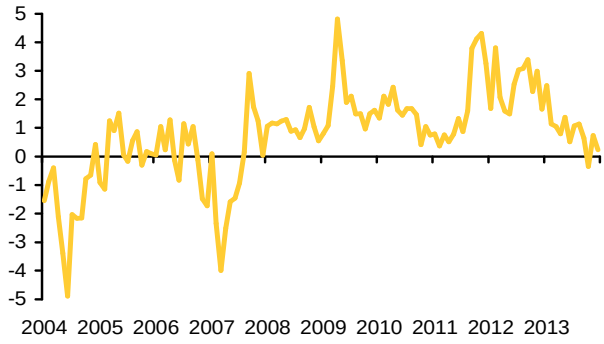
Source: China Customs, Bloomberg, Commerzbank Corporates & Markets

CHART 22: **Lead: net imports China ('000 mt)**



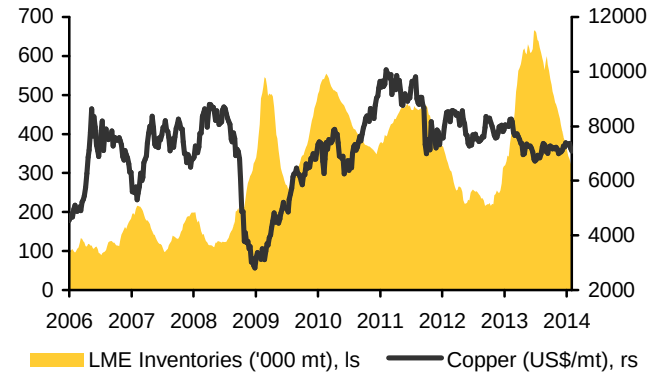
Source: China Customs, Bloomberg, Commerzbank Corporates & Markets

CHART 23: **Tin: net imports China ('000 mt)**



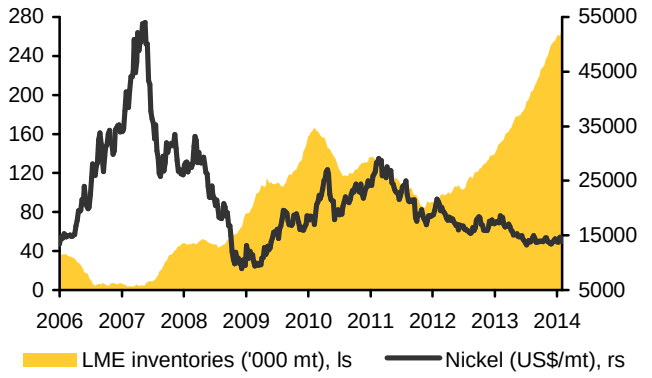
Source: China Customs, Bloomberg, Commerzbank Corporates & Markets

CHART 24: **Copper: LME inventories**



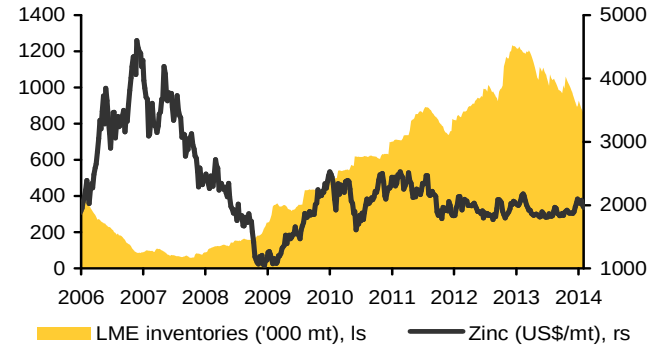
Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 25: **Nickel: LME inventories**



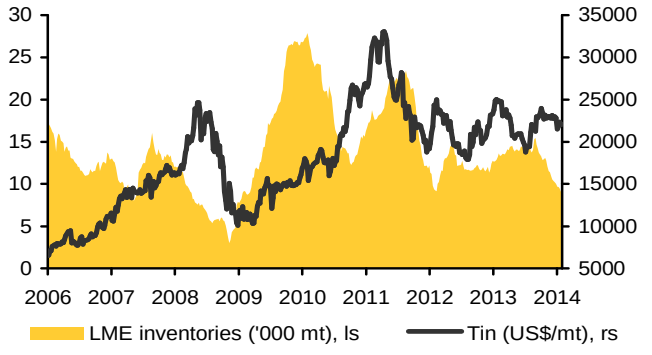
Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 26: **Zinc: LME inventories**



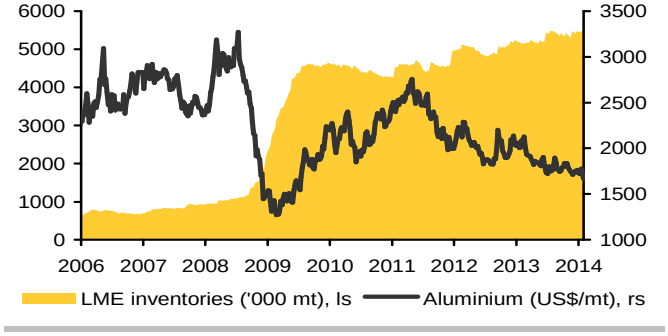
Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 27: **Tin: LME inventories**



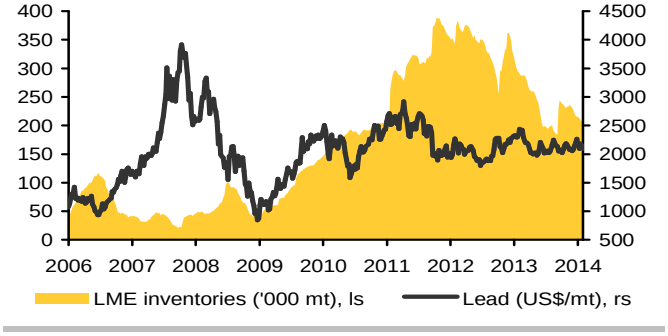
Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 28: **Aluminium: LME inventories**



Source: LME, Bloomberg, Commerzbank Corporates & Markets

CHART 29: **Lead: LME inventories**



Source: LME, Bloomberg, Commerzbank Corporates & Markets

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