

From Commodities Supercycle to Unicycles

2Q 2013 Commodities Market Update

- **Commodity performance during 1Q was even weaker than most analysts had forecast.** Virtually all of the main traded commodities saw prices fall and in many cases fall significantly, most by more than 5% and some by more than 10%.
- **Notable exceptions could be explained by specific fundamentals.** The US-based energy complex rose the most; natural gas because of temporarily stalling production and cold weather, gasoline because of refinery shortfalls in the Atlantic Basin and Hurricane Sandy, and WTI crude because of de-bottlenecking of logistical impediments. The only other notable commodity gaining in price was cotton, and that too was specific to the cotton market and expectations about Chinese imports and the persistence of robust US weekly export sales.
- **The quarter ahead looks more likely to continue the trends established in 1Q, with many more losers than winners, and this appears to be a precursor for the year ahead.** Citi sees price declines looming in virtually all base metals, save for nickel; for all precious and PGM group metals except for palladium; for thermal coal and iron ore; for most other hydrocarbons, except for US natural gas and for most of the grains complex.
- **Gold provides a lynchpin for understanding the underlying trends for commodities as a whole as well as for the new regime emerging to explain commodity performance.** As equity markets gained momentum in the first quarter, gold lost its luster as a safe haven against systemic risk in an environment in which low to negative interest rates, global uncertainties over QE momentum and the potential for sovereign defaults seemed less compelling amid renewed US dollar strength. Now that there are ways to earn returns in the real economy, the questions over gold and some overly securitized commodities like copper relate to whether their recent robustness is bubble-like and about to burst.
- **Citi expects 2013 to be the year in which the death bells ring for the commodity supercycle after its duly noted sunset, ushering in a new decade of opportunities based on how individual commodities will perform against one another and against broader market indicators such as equities or currencies.** It will be a period of focus on individual commodity “unicycles” and new relations emerging between and among commodities and other asset classes from fixed income to foreign exchange to global stock markets.

- Commodities
- Quarterly
- Global Macro

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See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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Supercycle to Unicycles

- The second quarter should provide another affirmation that the so-called commodity supercycle has finally ended and should usher in the first “normal” year in over a decade in which, broadly, commodity prices end the year lower than when the year started. As Citi’s metals and mining team noted, the [Commodity Supercycle Sunset](#) appeared on the horizon shortly after the recovery from the 2008-09 recession and the Supercycle Funeral started to be celebrated in 2011, with 2013 perhaps ushering in a [Supercycle Funeral Afterparty](#) in which investors could start reveling in new opportunities; taking advantage of rapidly unfolding commodity diversification.
- The first quarter provided a clear precursor of what’s likely to come – the majority of commodities saw prices fall across the board, and those that rose did so for commodity-specific reasons: US natural gas brought the highest returns of any commodity for the first time in a half decade on the temporary stall in production growth and a measurably colder winter, ending 1Q with a solid month of unusual residential/commercial and power demand; cotton prices rose sharply as well, partly in response to the 18% drop in 2012 but largely on the basis of uncertainty about Chinese buying ahead of reduced plantings; US gasoline rose to record winter levels largely as the residual impacts of 2012’s shuttering of Atlantic Basin refining, a significant collapse in Venezuela’s refining system (which turned the country from being a structurally long exporter to a structurally short importer of the key transportation fuel), and of course because of the devastation of Hurricane Sandy on the US East Coast; and US-based WTI was finally a winner due to de-bottlenecking of logistic systems in the US while waterborne crude stream markets remained firm.
- For the next few years, each commodity looks more likely to be sitting on its individual supply/demand fundamentals than on more general factors affecting all of them. This means that as either their separate long-term and short-term cyclical logistics take over, for some prices will rise while for others they will decline, and investors across commodities will be able to take advantage of alpha return strategies focusing on long versus short positions, other relative value relations across the commodity space as well as across time spreads, changes in momentum and volatility.
- Differentiation amongst investment cycles is likely to become more pronounced over the next few years as well, with deferred investments in oversupplied copper and other base metals markets today turning into tight markets a couple of years down the road, while the downward march of costs in North American and global gas and rising demand maintaining the production boom of the last half decade for perhaps decades to come.
- The recent separation of commodities from equity markets is in many respects a return to normalcy, given the sensitivity of commodity prices to coincident conditions and of equities to anticipatory economic changes. The denomination effects of changes in the relative value of the US dollar is likewise going to continue to impact commodities, and Citi’s long-term bullish view of the US dollar is likely to place an even further drag across the asset class this year. But to the degree that commodity-producing countries depend on specific commodity exports, differentiated conditions should impact the FX values of different commodity currencies in variegated ways as well, providing further opportunities for investors.
- The supercycle decade focused investor attention on supply conditions and prices provided an opportunity for rewarding returns both for commodity producers and for financial investors who, for the first time in history, were able to gain exposure to underlying commodity values without the inconveniences of holding, storing and exposing commodities to degradation and spoilage.
- In the decade ahead, we believe investors will need to gain a greater understanding of demand conditions. Shifts in underlying investment patterns in China and other emerging markets are a critical source of change for aggregate consumption as China and other EM growth shifts from more commodity-intensive fixed asset investments and industrial production growth to household-based and service sector growth. But policies are likely to move in the same direction as subsidies for food and fuel come under fiscal pressures and as environmental policies play a role.



- As Citi's energy commodities strategy team has pointed out, significant underlying trends are underway that are bringing the once unimaginable drop in oil demand into an attainable global reality. A recent study by Quantum Reservoir Impact, Inc. shows that in 2011, the US consumed some 3.11-billion barrels of gasoline (8.5-m b/d) with an average fleet efficiency of 23 mpg and with no electric vehicles. Under new Obama administration fuel efficiency standards, that level of consumption might drop to 1.74-billion barrels (4.77-m b/d), with a fleet efficiency of 40mpg if electric vehicles reached 20% of the fleet (even in the face of an increase in the vehicle fleet from 251 million to 305 million). That's a drop of 3.73-m b/d or 44%.
- But the real challenge to oil's dominance of the transportation fuel market comes from natural gas, and the challenge is not only in the US but in global markets. A recent Citi study has shown that up to 20-million b/d of petroleum product demand could be challenged by natural gas in a decade, and about half of that is LNG substituting for diesel demand in truck and rail use in the OECD and of bunker fuel in global markets.

Edward L. Morse

Global Head of Commodities Research

Benchmark Commodities Price Outlook

Figure 1. Citi Commodities Price Forecast*

		Point Prices			Q1 2012	Q2 2012	Q3 2012	Q4 2012	2012	Q1 2013	Q2 2013E	Q3 2013E	Q4 2013E	2013E	2014E
		0-3M	6-12M												
Energy				5Y Cyclical											
NYMEX WTI	USD/bbl	85.0	90.0		103.0	93.3	92.2	88.2	94.1	94.4	85.0	90.0	90.0	90.0	83.0
ICE Brent	USD/bbl	100.0	103.0	85.0	118.4	108.8	109.4	110.1	111.7	112.6	100.0	105.0	100.0	104.0	93.0
Henry Hub Natural Gas	USD/MMBtu	4.30	4.65	N/A	2.47	2.27	2.87	3.39	2.75	3.48	4.30	4.60	4.70	4.30	4.50
Base Metals				LT Price											
LME Aluminum	USD/MT	1,900	2,100	2,200	2,216	2,019	1,944	2,017	2,049	2,042	1,935	1,940	1,985	1,975	1,930
LME Copper	USD/MT	7,200	6,800	6,200	8,314	7,833	7,711	7,921	7,945	7,964	7,600	7,400	7,100	7,515	6,775
LME Lead	USD/MT	2,100	2,300	2,200	2,118	1,987	1,984	2,200	2,072	2,314	2,150	2,100	2,200	2,190	2,200
LME Nickel	USD/MT	18,200	21,000	20,000	19,721	17,228	16,383	17,036	17,592	17,387	17,000	18,500	19,250	18,035	20,900
LME Tin	USD/MT	23,500	24,500	20,000	22,986	20,619	19,281	21,547	21,108	24,128	23,500	23,000	23,500	23,530	23,625
LME Zinc	USD/MT	1,950	2,100	2,100	2,040	1,933	1,902	1,979	1,963	2,057	1,950	1,975	2,000	1,995	2,050
Precious Metals				LT Price											
COMEX Gold	USD/T. oz	1,600	1,450	1,050	1,691	1,613	1,654	1,718	1,669	1,632	1,580	1,555	1,455	1,555	1,435
Silver	USD/T. oz	29	26	16.5	32.6	29.6	29.9	32.6	31.2	30.1	28.0	27.8	26.5	28.1	25.9
Platinum	USD/T. oz	1,515	1,555	1,531	1,604	1,505	1,500	1,600	1,552	1,634	1,515	1,523	1,530	1,550	1,625
Palladium	USD/T. oz	790	900	680	683	630	613	653	645	741	790	825	875	810	950
Bulk Commodities				5Y Cyclical											
Hard Coking Coal (benchmark Asia)	USD/MT	172	185	200	235	215	225	170	211	165	172	165	180	171	190
Thermal Coal Asia (NEWC)	USD/MT	88	91	105	113	88	88	86	94	91	88	88	90	89	94
Iron Ore Spot (TSI)	USD/MT	130	123	81	142	139	112	121	128	148	130	115	120	128	122
Agriculture															
CBOT Corn	USd/bu	630	500	N/A	641	618	783	737	695	715	630	600	515	615	500
CBOT Wheat	USd/bu	700	720	N/A	643	641	870	846	750	738	700	720	720	720	775
CBOT Soybeans	USd/bu	1,350	1,175	N/A	1,272	1,426	1,675	1,485	1,465	1,448	1,350	1,300	1,175	1,320	1,150
CBOT Rice	USD/cw t	15.4	15.3	N/A	14.3	14.8	15.3	15.1	14.9	15.3	15.4	15.4	15.2	15.3	15.0
NYB-ICE Cotton	USd/lb	85	90	N/A	93	81	73	73	80	82	85	85	90	86	N/A
Sugar#11	USd/lb	18.0	18.0	N/A	24.5	21.2	21.0	19.6	21.6	18.4	18.0	18.0	18.0	18.1	N/A
ICE Coffee	USd/lb	145	155	N/A	205	171	172	152	175	144	150	150	155	150	N/A
ICE Cocoa	USD/MT	2,200	2,400	N/A	2,308	2,221	2,440	2,420	2,348	2,176	2,200	2,425	2,475	2,320	N/A

Source: Citi Research, *subject to revision

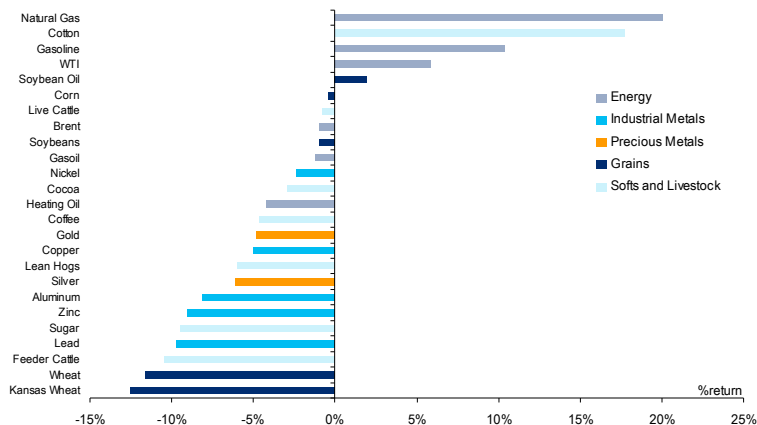
Notes: 2013 oil prices are marked-to-market and revised up \$5 for both US and North Sea streams — maintaining the WTI-Brent spread at -\$14/bbl with expectations of greater takeaway capacity from the US mid-continent coming online through 2H'13 and beyond. US natural gas prices are adjusted upwards on colder winter weather, expectations of low hydro generation and tighter balances at a given price in the power generation sector (i.e. coal-fired plant retirements). Bellwether base metals including copper and aluminum are downgraded versus our prior forecast whereby price action year-to-date has affirmed our early bearish calls. Gold levels are forecast at \$1,555/t oz.; ~ \$120 cut from our previous downgrade in January with 4Q'13 price target at \$1,455. Bulk commodity price revisions are mixed with both upgrades and downgrades. Staple cereal price conviction calls and the theme of global grains easing discussed throughout 1Q'13 remain intact with US back-to-trend yields and record acreage allocation for corn and beans, large loading programs in Latin America, and stronger wheat production in the Black Sea bloc and Europe in 2013 versus last year. There are no significant changes to prior soft commodities forecasts except for a 2.5 cent reduction to the sugar price outlook.

Macro

Commodity Returns a Mixed Bag but Generally Weak

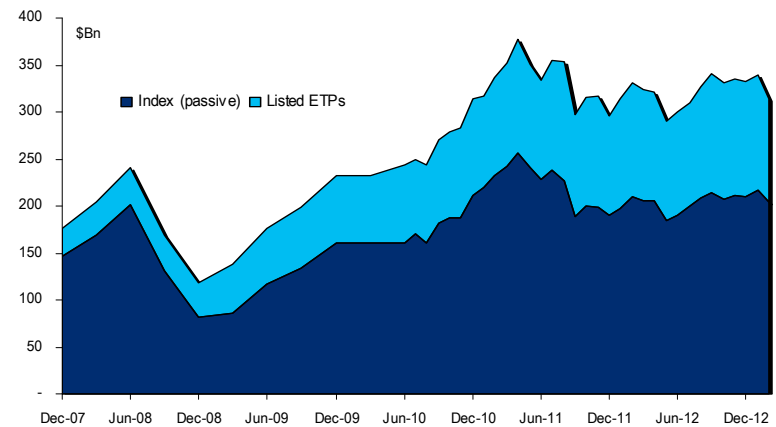
- During 1Q'13, most metals, 'ags' and bulks posted negative returns, while energy performance was more mixed. The biggest energy sector movers have been US natural gas, up 20% due to a colder March; followed by a 10% 1Q'13 run-up in gasoline. Base metals have declined significantly per our expectations: lead down 10%, zinc down 9% and aluminum off 8%. Retrenchment in precious metals—despite ongoing monetary easing globally—seemed to be the real story, however, with gold declining 5% and silver by 6%. Downside was also seen across the softs although most of the losses in grains came at the tail-end of the quarter upon release of bearish quarterly USDA reports. Compared to 1Q'12, when positive returns were spread more broadly across most energy, metals and ag markets, we have seen an almost complete reversal in single commodity returns amid a decrease in volatility across different sectors, which has generated a relatively tapered market.
- Final month-end February estimates for retail and institutional commodity assets under management (AUM) affirm a sharp retrenchment in market size after an uptick in January albeit a modest rebound is expected once March data are fully assessed. February AUM declined 7.1% m/m and 5% y/y to \$315Bn (excluding structured/enhanced alpha index). This figure is at least \$65Bn shy of the April 2011 peak when commodity AUM soared to over \$380Bn during the Libyan civil war and MENA spring. The \$24Bn decrease in commodity AUM compares to an average monthly net increase of \$3Bn during 2012. CFTC and equity flow trading data suggest that the market capitalization of commodity ETFs dropped \$10.7Bn m/m to \$111Bn while passive index market valuation declined 6% m/m to \$204Bn. A muted rebound for March AUM is bound to be driven by index-swaps since gold-linked funds represent ~80% of the ETF market and bullion redemptions and sentiment has continued to struggle into 2Q. To be sure, despite a 1% total return for benchmark indices in March—driven by strength in crude oil and US natural gas markets and bull-spreading across row crop structure in advance of quarterly USDA reports—AUM for commodity exchange-traded products actually dropped 0.5% in the month to \$109.5Bn. Going forward we suspect commodity AUM may continue to be weighed down by more bearish fundamentals given expectations of global grain prices easing, ongoing weakness across the precious and base metals complex and lower petroleum prices into 2013 year-end.

Figure 2. 1Q'13 Nominal Commodity Price Returns



Source: Bloomberg, Citi Research

Figure 3. Retail and Institutional Commodity Assets Under Management*

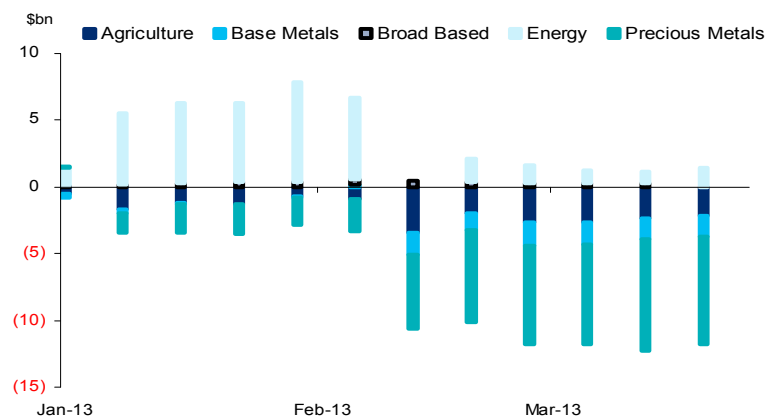


Source: Citi Research, *excludes ~\$30-40Bn structured/enhanced alpha indices; biased to US trading flows

Commodity Flows

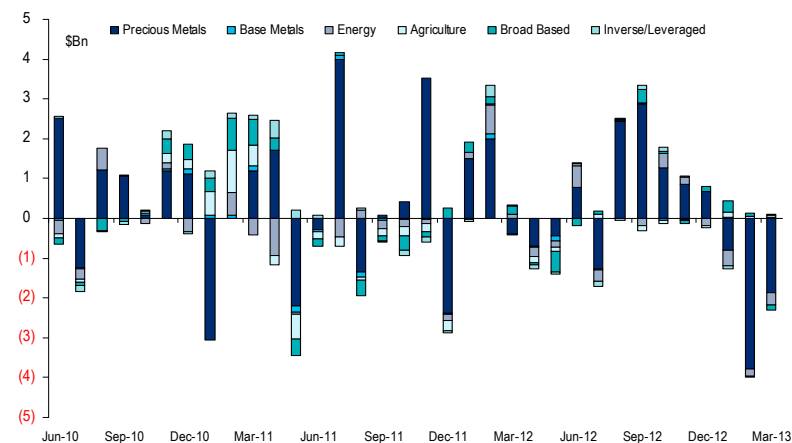
- Passive index market net withdrawals during 1Q'13 are assessed between -\$2Bn to -\$3Bn coupled with nearly -\$7Bn in commodity-linked exchange traded product net redemptions for a combined cumulative net outflow total near -\$10Bn. These sluggish estimates stand in stark contrast to 1Q'12 figures that would suggest aggregate net inflows of \$15.5Bn at this same time last year. Although a general improvement in commodity investor sentiment unfolded during March despite resilient US dollar strength and deceptively sluggish fundamentals in Chinese trade data, markets have been unable to regain the bullish footing that seemed to be taking shape during the January risk rally. Commodities continue to underperform other asset markets—particularly US equities—which have hit new nominal highs in 2Q and are expected to continue outperforming in 2013.
- ETF net withdrawals persisted for the third consecutive month in March suggesting an ongoing dislocation between more diversified commodity index swap markets versus an exchange-traded commodity product group dominated by precious metals (gold tickers IAU and GLD alone constitute 75% of the product universe asset base). March net outflows totaled -\$2.2Bn inclusive of more than -\$1.8Bn leaving physical gold funds and -\$0.3Bn exiting energy. 1Q'13 listed commodity exchange traded product net outflows are estimated near -\$6.9Bn and negate most of the +\$7.2Bn in aggregate ETF net inflows during the entirety of 2H'12.
- Benchmark commodity indices that are more heavily skewed towards energy and agriculture markets—with de minimis exposure to the metals complex—are also expected to see traded levels remain weak given looser oil market fundamentals and the outlook for a sharp easing of staple cereal prices on a global grain supply rebound beginning this quarter and likely lasting through most of 2014 on the assumption of normal weather in the US and larger loading programs in Latin America and the Black Sea producing region (see: [Agriculture Digest: Global grains easing](#)).

Figure 4. 1Q'13 Cumulative Commodity Market Investment by Sector*



Source: Citi Research, *includes passive index benchmarks and US listed exchange traded products

Figure 5. Commodity-Linked Exchange Traded Fund Net Flows by Month

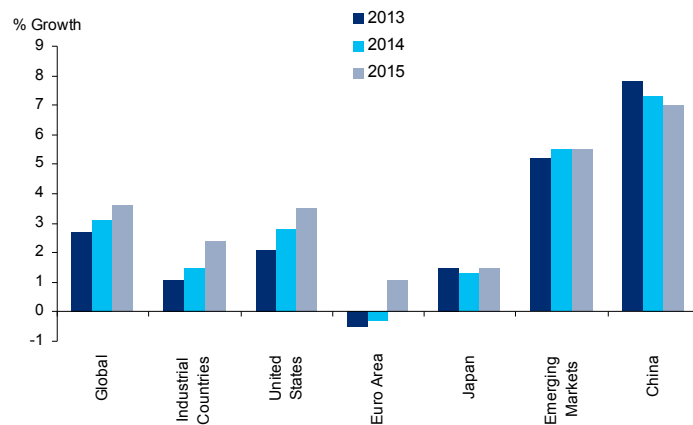


Source: Citi Research

Overall macroeconomic outlook

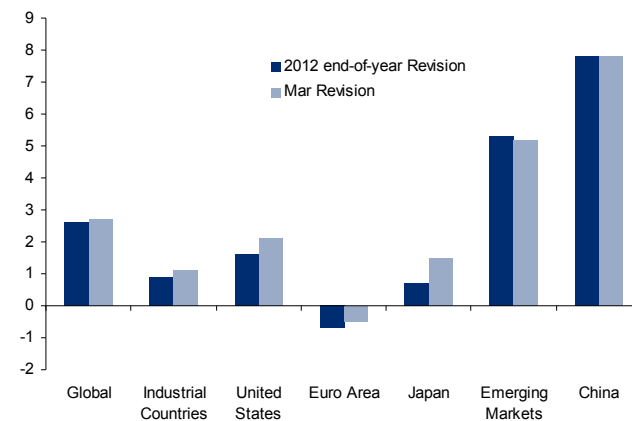
- **Improved 1Q'13 economic data in major industrial economies prompted an upward revision in Citi's economic forecasts, but emerging markets could be experiencing a slight slowdown.** Citi's economists forecast 2.7% global GDP growth in 2013 and 3.1% in 2014, with industrial economies growing at 1.1% in 2013 and 1.2% in 2014, and emerging markets growing by 5.2% in 2013 and 5.5% in 2014. (Regional GDP growth figures are based on market exchange rates unless specified otherwise.)
- **Citi revised GDP growth forecasts for developed countries upward from 0.9% to 1.1%.** Better economic data and continued central bank liquidity support boosted growth expectations in advanced economies. Global QE brought about some genuine improvement in certain economies, such as the US, and prevented some economies from weakening further. Specifically, 2013 US GDP growth was revised higher from 1.6% to 2.1%, reflecting a pickup in private sector spending, improvements in the labor market and a robust housing sector. For Japan, GDP growth forecast for 2013 rose from 0.7% to 1.5% on Prime Minister Abe's economic plan, in conjunction with aggressive monetary easing by the Bank of Japan. But the boost to the economy surrounding this new QE could be tampered by higher import costs of energy and materials. For Europe, the optimism resulting from high repayment of LTRO (Long-Term Refinancing Operation) could be undercut by a rising debt-to-GDP ratio in periphery countries, the electoral uncertainty in Italy and the "bail-in" in Cyprus. The EMU crisis may be far from over. Any substantial escalation in the conflict in the Korean Peninsula could lead to a return to safe haven markets but a price declines in risk assets.
- **GDP growth in emerging markets was revised lower. With the commodity-hungry non-OECD exhibiting slower growth, broader commodity demand growth should remain subdued.** Citi's China growth forecasts of 7.8% in 2013 (~8% in 1H'13 and low-7% in 2H'13) followed by 7.3% in 2014 are lower than consensus. Economic reform, inflation fear, environmental concerns and tighter regulations on financing could limit growth. In addition, Latin American growth has slowed and developing Europe could face more headwinds. Slovenia could be at risk and any worsening could ripple to nearby countries.

Figure 6. Citi Economics Forecasts for Selected Countries and Regions (2013-2015)



Source: Citi Research

Figure 7. Citi Economics Forecast 2013 Revisions in Q1

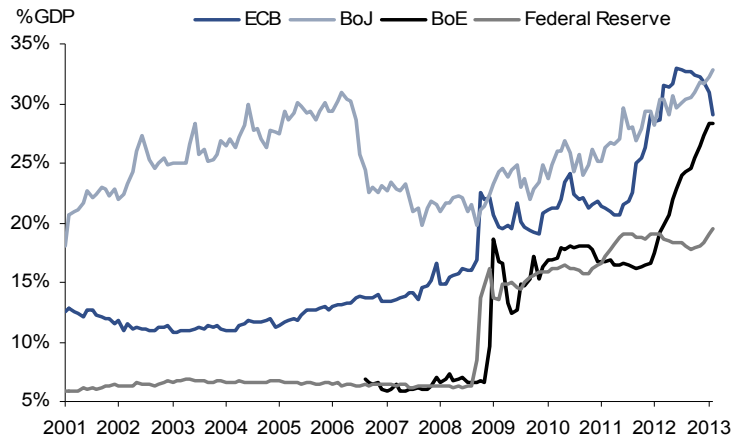


Source: Citi Research

Support from Central Banks

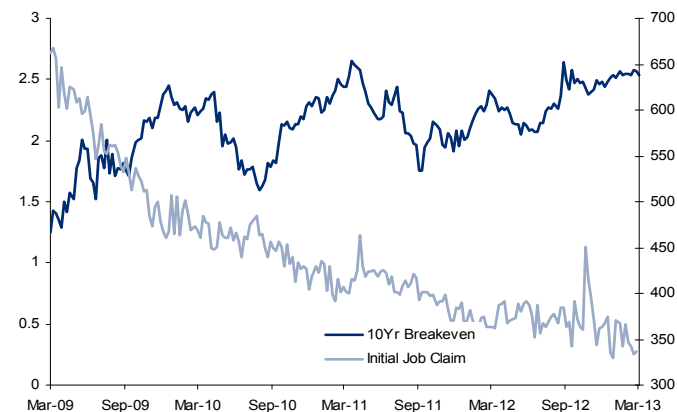
- **Central banks worldwide, through various asset purchase programs and low policy rates, are supporting global economic growth and help to prevent/contain sovereign credit and banking crises.** Asset prices were supported in 1Q'13, including commodities, after rebounding from their lows in 2009. However, these vast expansions of Central Bank balance sheets also raised concerns that these measures could lead to strong inflation later on and questions are being asked how these measures would be eventually wound down without being disruptive to financial markets, and how strong a footing the underlying economies would actually be without this support. These perceptions could shape the markets' risk appetite (the risk-on/risk-off cycle) down the road.
- **For now, the divergence in asset markets can be clearly seen in the US Treasury market, where yields are at historic lows but the US equity market is also at historic highs.** They seem to contradict each other. **Commodity prices in general appear to reflect more moderate economic growth.** Considerable uncertainty lies ahead and it appears that only the US Federal Reserve, of all the Central Banks, may be looking to unwind its accommodative programs on better economic data. Unemployment figures, which the Fed explicitly targets, will remain important.
- **As for other Central Banks, their balance sheet expansions continue.** By the end of Feb'13, the European Central Bank (ECB) increased its balance sheet by 29%. Although it fell from 32% at the end of 2012 on higher LTRO repayment from EU banks, the ECB's balance sheet could expand again in response to ongoing weakness in its economy. Citi's economists also expect the Bank of England to expand its balance sheet in pursuit of looser monetary policy. Some improvement in economic activity has failed to sustain and a downgrade by rating agencies could be forthcoming. Bank of Japan's (BOJ) balance sheet at 33% of the nation's GDP should see a substantial expansion after announcing its aggressive action, including purchases of very long-dated Japanese Government Bonds (JGBs) to jump-start the economy and target a 2% long-term inflation rate. Citi's economists consider reaching the 2% inflation target in two years a challenging goal, however. Additional easing measures by the BOJ, if they come about, could involve purchases of risk assets such as equities.

Figure 8. Balance Sheets as % of GDP for Selected Central Banks since 2001



Source: BoJ, ECB, FOMC, Citi Research

Figure 9. US 10yr Breakeven Rate and Weekly Initial Job Claim since Mar 2009

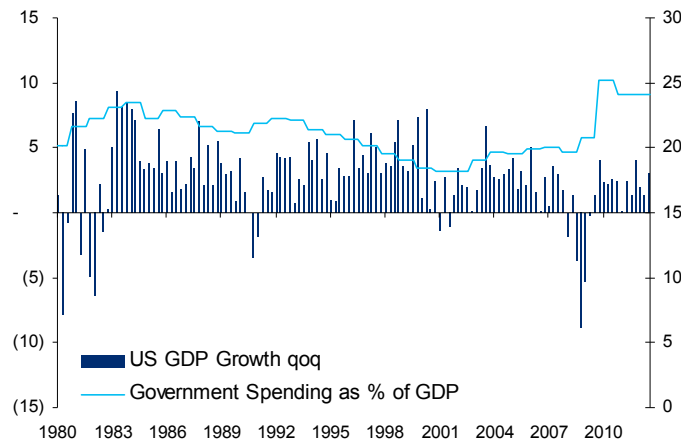


Source: Bloomberg, BLS, Citi Research

US – A Pillar of Strength in a World of Uncertainty

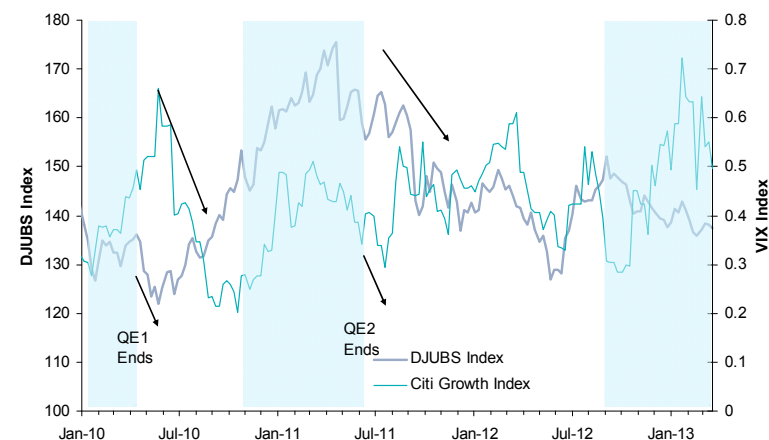
- The “Bernanke put” has kept economic growth relatively robust, but Citi’s view of the US economy falls on the lower end of FOMC projections, as Q2 data remain important barometers of the health of the underlying economy. While the Fed expects the US economy to grow between 2.3 and 2.8% in 2013, and between 2.9 and 3.4% in 2014, as reflected in better macroeconomic data recently, Citi expects the US economy to grow by 2.1% in 2013 (with a dip to 1.2% in Q2) and by 2.8% in 2014 due partly to broader concern on the public sector.
- The Fed also shares such concerns, even though private sector hiring and consumption have been strong. Cutbacks on the fiscal side (i.e. fiscal cliff deal, sequester and other cuts) could have resulted in a 1.5% hit to the economy, so the Fed has stayed aggressive in its policies. FOMC guidance on rates seems to be enough to approximate what is called the “optimal control path of interest rates,” leading to a path of unemployment and inflation that is about as good as the Fed can get. The Fed reiterated that short-term interest rates would stay near 0% as long as the unemployment rate remains above 6.5% and inflation stays benign.
- Whether Q2 could again exhibit a decline in activity seen in recent years is critical. On the one hand, Central Bank policymakers do not foresee a spring-time slump, when weather events and seasonality in previous years might have contributed to strong Q1 growth but weakness in Q2. On the other hand, the effect of sequester and tax increases could still weigh on the economy, as recent lackluster consumer sentiment data potentially foreshadow events to come.
- An eventual change in Fed’s policy, if not managed properly, could be disruptive to the market. Some compare it to the sharp monetary policy change in 1984 and the resulting chaos, but this would probably not repeat. It does serve as a cautionary tale, however. Differences between now and 1984 were that the Fed had far less credibility and it was novel for the Fed to communicate policy changes. Citi expects a likely policy change in the middle of 2H’13, but a smooth implementation of the Fed’s Exit Strategy may not be accomplished easily. As such, increased transparency on policy guidance could prepare the market and ease the transition.

Figure 10. Public Sector Cutbacks is the Major Uncertainty in US Economy



Source: Bloomberg, Citi Research

Figure 11. The Open End QE is More Flexible Therefore Less Disruptive to Market

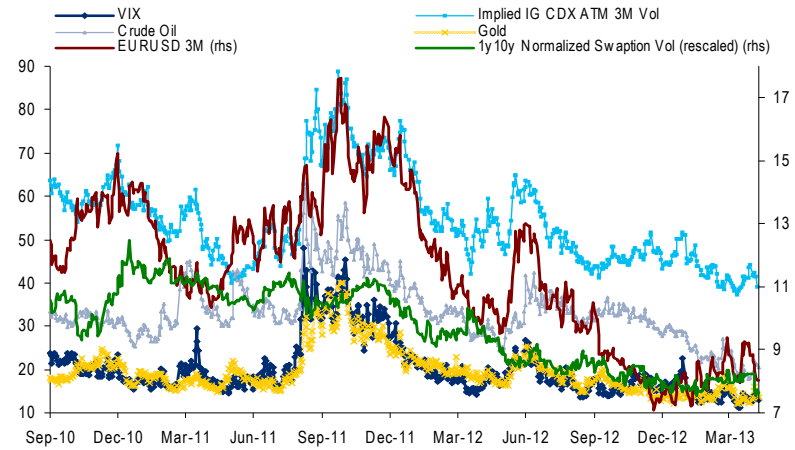


Source: Bloomberg, Citi Research

US Leading the Pack

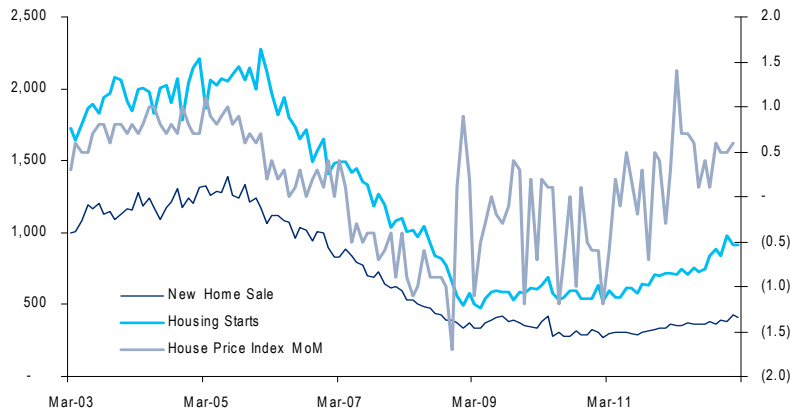
- Monetary accommodation, the general state of volatility compression across asset markets and a sharp turn up in macroeconomic data prints for housing and an improving labor market have given US investors reason to cheer despite ongoing turmoil in Europe and uncertainty surrounding China. The ISM fell in 3-points in March to 51.3 and might signal a sluggish manufacturing sector that is still struggling to break out, albeit compared to most of the OECD the US continues to remain a bright spot. Certainly the March jobs report was disappointing with the change in non-farm payrolls coming in at below 90,000 and about half of consensus implying that sequester concerns may yet bite. Watching the payroll data is likely to remain crucial and is worth reiterating.
- US economic growth is forecast to be tepid this year but is expected to rise in 2014 amid heightened risks including any fiscal drag from statutory budget tightening that could hit harder beginning this quarter. The Citi base case does not anticipate any major grand-bargain or large-scale reforms this year so political gridlock could increase further in 2H'13 when a new round of debates over the debt ceiling and spending policy are likely to re-emerge.

Figure 12. Market Implied Volatility: Equities, Credit, Crude Oil, Gold, FX and Rates



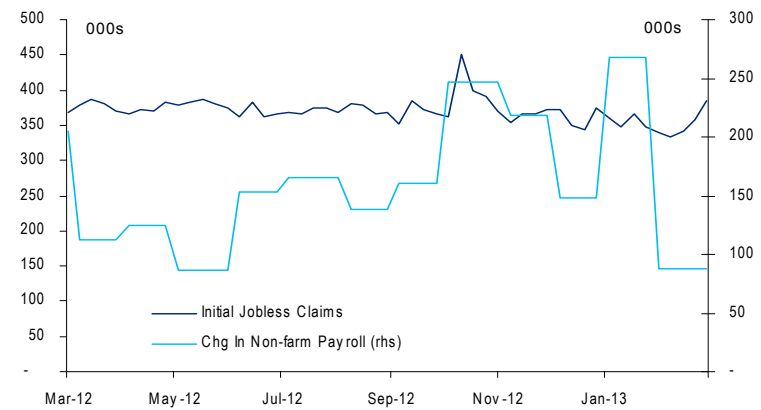
Source: CME, IG Credit Trading, Citi Research

Figure 13. US Housing Market Leading Indicators



Source: Bloomberg, Citi Research

Figure 14. US Employment Statistics

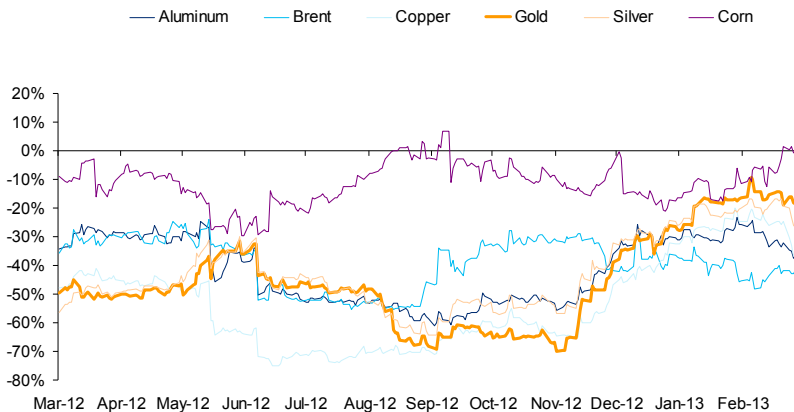


Source: BLS, Citi Research

Foreign Exchange

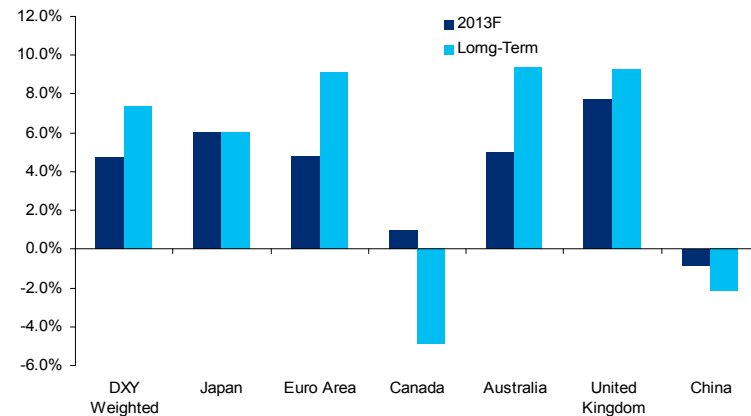
- **The direction of dollar-based commodity prices has been driven by currency denomination, risk-on/off factors and economic outlooks.** The currency-commodity relationship strengthened in the beginning of 2012, particularly for gold, copper and crude oil. At the time, commodity prices fell just as USD strengthened in 2Q'12, but the reverse was true in 3Q'12.
- **Currency correlations with commodity prices have weakened from Q4'12 into 1Q'13 (along with broader asset market correlations), but a brief strengthening may be taking place.** The rolling 3-month correlation of gold and DXY bottomed at 9% in Feb'13 but was at 15% by the end of Mar'13. Similarly, in metals, copper's correlation with DXY went from 21% to 36% in the same period. DXY's correlation with energy has been relatively stable but its correlation with agriculture has been falling.
- **Looking ahead, the USD is expected to remain strong.** Citi expects the dollar index (DXY) to rise from 82.78 in 0-3 months to 86.44 in 6-12 months. Citi is also forecasting EURUSD at 1.32 in 0-3 months and 1.25 in 6-12 months. The dollar strength comes from the relative economic outperformance of the US vis-à-vis the Eurozone, which is beset by uncertainty and potential crises. In addition, the Fed might be looking to scale back its QE just as the ECB contemplates the opposite. Dollar strength is most apparent versus JPY due to BOJ's considerably accommodative monetary policy. USD is also expected to strengthen versus the commodity-focused Australian dollar. Citi expects the AUDUSD to go from 1.04 in 0-3 months to 1.00 in 6-12 months, as the Reserve Bank of Australia may continue to cut rates, though this awaits final Q1 data.
- **Gold, as a fiat currency, often reflects commodity price movements against changes in currency values, and levels have fallen in 2013.** It is possible that a stronger correlation effect could re-emerge when the Fed more explicitly contemplates its QE exit strategy. The recent decline in gold prices may have been a reflection of the anticipated tightening by the Fed, until a partial reversal due to weak March US jobs data reading.

Figure 15. Rolling 63-day Correlation of Selected Commodity and DXY since March 2012



Source: Citi Research

Figure 16. Citi Economics FX Forecast for Selected Currency *

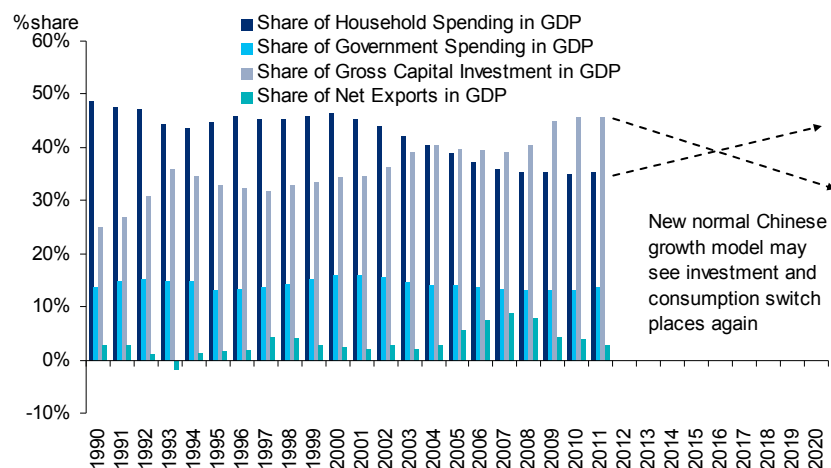


Source: Citi Research * positive means dollar appreciation vs. specific currency compared to early April'13

China at a crossroad

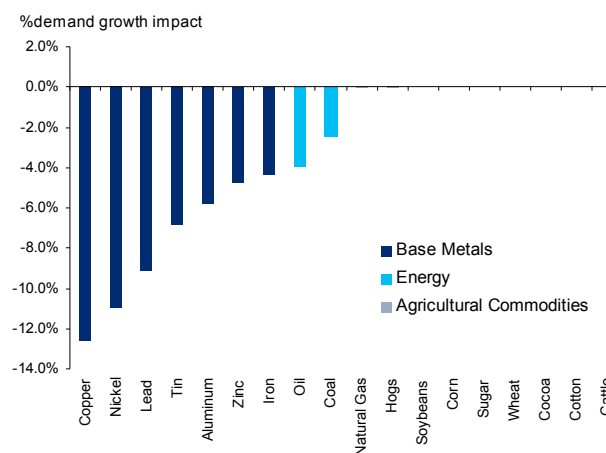
- **The new leadership has yet to lay out a comprehensive plan on balancing growth and reform of the economy. However, Citi's China economists believe that economic growth could slow in the latter half of 2013, as the liquidity boost in the first quarter fades and constraints on the economy begin to emerge.** Real GDP growth could fall from 8.0% and 8.2% in 1Q and 2Q'13, to 7.7% and 7.5% in 3Q and 4Q'13, for an annual growth rate of 7.8% in 2013. Further moderation is expected in 2014, with GDP growth declining to 7.3%. A sharp deterioration related to the H7N9 avian flu situation could slow China's economy.
- **Constraints on economic growth could emerge in four areas later in the year, with much of the impact on commodities likely falling on bulks. A general slowdown should also affect metals and much of energy consumption but natural gas, gasoline and jet fuel are the only exceptions. First, inflation** could be edging higher, perhaps to as much as 3.5% later in the year due to higher food and labor costs. This could prompt the People's Bank of China to start tightening. **Second, overcapacity** remains an issue, as the investment-led boom over the past few years increased plant capacity, as can be seen in the refining and steel sector. **Third, environmental rules** could become more stringent, with a greater conviction on enforcement. The worsening pollution problem, including Beijing, brought both public outcry and strong condemnation from the leadership. **Fourth, a tighter financing environment** awaits local governments due to the need to contain the expansion of local government debt and reorient the economic model. Local government spending has been the primary driver of a number of commodity-intensive infrastructure and construction projects. The credit concern was highlighted in Fitch's downgrade of Chinese local government bond denominated in RMB. Although the impact now is limited as holders are mostly limited to within the country, the unsolved risks inherited in the shadow-banking system may lead to further actions from other rating agencies.
- In particular, **government officials have hinted that several sectors could be affected by tighter environmental regulations, if policies were implemented later in the year. They include steel, cement, petrochemical, non-ferrous metals and thermal coal power.** They are all highly energy-intensive sectors, with broad impacts on the demand for bulk commodities. The government is also looking to accelerate the adoption of cleaner petroleum product standards, as vehicular emissions make up a large part of the overall rise in pollution. But government does face strong pushback from industries.

Figure 17. Share of spending, investment and net exports in Chinese GDP since 1990



Source: China Government, Citi Research

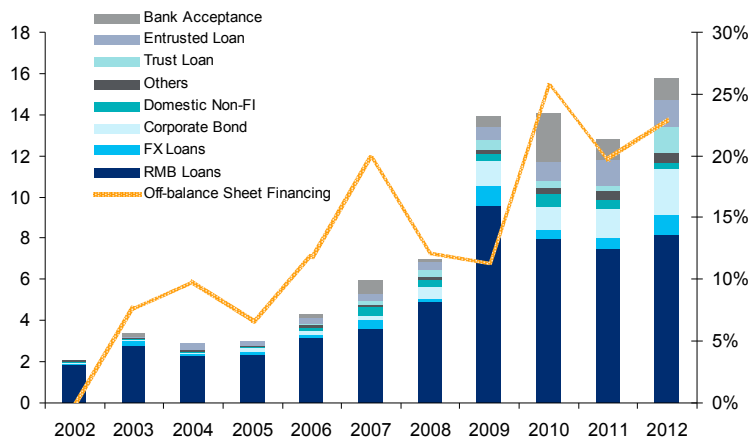
Figure 18. The Impact of Chinese GDP Growth Changes on Commodity Markets



Source: Citi Research

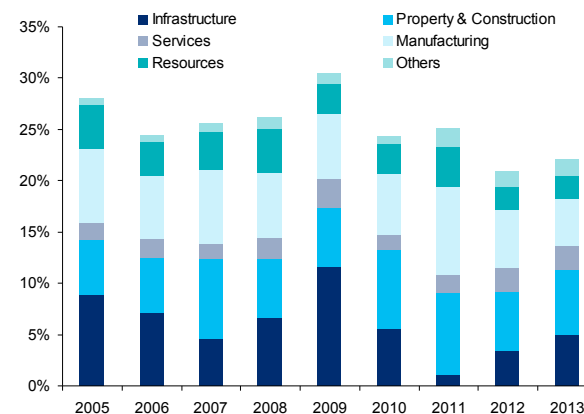
- Although **some believe that economic growth could remain strong on both new sources of spending and a lack of substantial tightening of the property sector**, curbs on financing activities could limit the potential for much stronger growth. Sectors contributing to growth include the following: the railway investment objectives laid out in the 12th Five Year Plan have not been rolled out yet, as the government awaits the corporatization of the Ministry of Railways. Intra-city rail development and the revitalization of "urban villages" could be other drivers of spending growth. In addition, at this point of economic and leadership transition, the fear of a sharp slowdown in the economy as a result of substantial tightening of the property sector may mean much less aggressive actions on financing activities.
- Nonetheless, various measures appear to be in place. **Tightening measures on wealth management products could limit how much local governments can lean on social financing for more project finance funding.** This is especially true in light of the Central Government's intention to limit local government debt and spending. Local governments have been able to borrow through three channels: bank lending, bond issuance and borrowing from wealth management products. Restraints on bank lending can be seen in large reserve ratios of major banks. Bond issuance is expected to be limited but no solid guidance has been put forward.
- This leaves wealth management products but guidelines just released should start to affect their availability as a form of financing. Currently, deposits into these products are pooled and lent out, without necessarily specifying the assets in which the funds are invested. New policies mandate that each product has to be clearly linked to specific assets and that they are audited. Products already in existence will have to comply by the end-2013. Given how local governments have been the driver of infrastructure spending and how infrastructure spending has been the driver of growth, limits placed on financing could slow economic growth.
- Moreover, **a clampdown on wasteful spending and vigilance against corruption could slow near-term growth.** The government appears to be resolute in curbing its own spending on banquets, official building construction and luxury goods, thereby hurting the consuming and investment parts of GDP.
- **Lower FAIs (Fixed Asset Investments), a reduction in energy subsidies (or loosening of retail energy price caps) and rising domestic commodity production could also reduce commodity imports.** The current stock building at intermediate levels along the manufacturing supply chain may not be supported, given lackluster PMI figures and other industrial production figures. **Natural gas, gasoline and jet fuel should be commodities that show strong YoY gains.**

Figure 19. The Easing on Credit Comes from Off-Balance Financing since 2002



Source: Bloomberg, China Government, World Bank, Citi Research

Figure 20. Declining Infrastructure/Total Fixed Asset Investment Growth since 2005

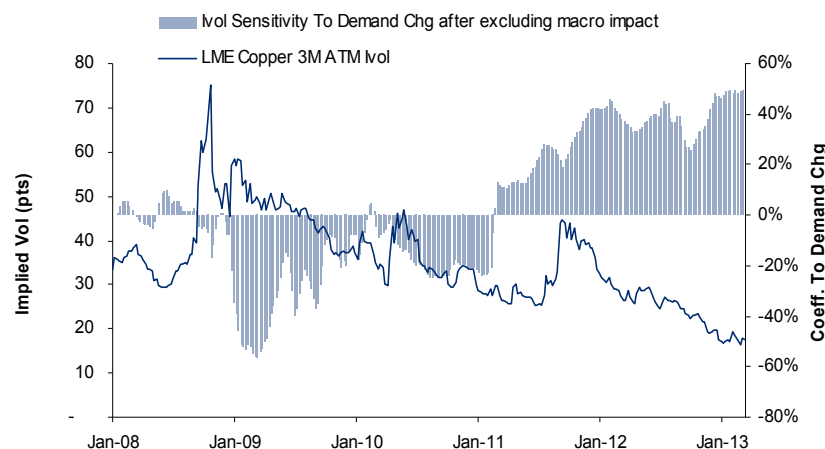


Source: Bloomberg, China Government, Citi Research

Fading macro influence and softening market fundamentals driving volatility down

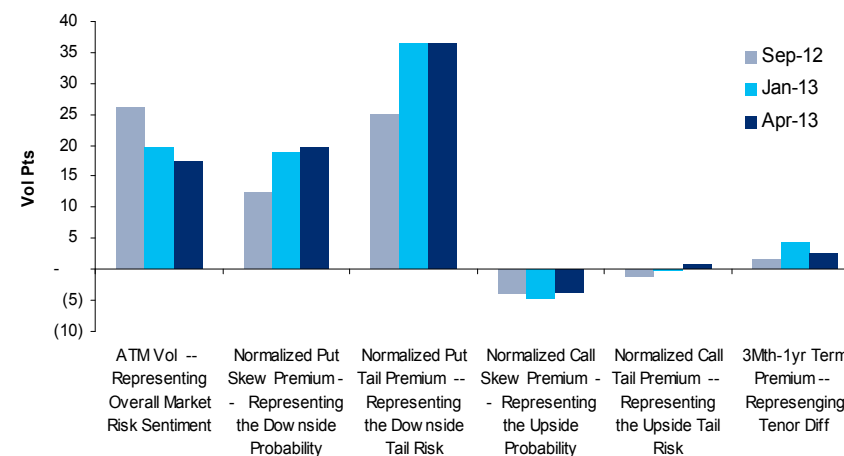
- The implied volatility across different commodities and even different asset classes were subdued in the first quarter of 2013, mostly driven by a decline of systematic risks in financial markets. Given the current trends of decreasing realized volatility and reduced concerns over the risk of major macro events going forward, it is likely that implied volatilities will remain low.
- Within the metals space, we see more interactions between supply-demand fundamentals and implied volatility. This is partially because macro risks in metals markets are fading, and investors are shifting from risk-on/off type of trades to different kinds of alpha strategies. Sensitivity analysis shows that the coefficient of copper's 3mth at-the-money implied volatility to changes of worldwide copper demand has reached a historic high (excluding the impact of major macro risks and events reflected in the implied volatility). In this case, if we expect a significant change in fundamentals, such as slowing demand growth in China, markets could see a higher correlation with fundamentals in the implied volatility space.
- An analysis of historical implied volatility surfaces provides a good reflection of risk sentiment. Comparing implied volatilities in the beginning of 2013 with those at end of 3Q'12, at-the-money implied volatility fell, reflecting a decline in the sentiment of overall market risk. However, an increasing normalized put skew premium in volatility points shows the market remains concerned over further declines in prices, with volatility markets charging higher vol premiums to investors seeking to buy downside protection. Downward tail risks heightened significantly in 4Q'12, and have remained at a high level through 1Q'13.

Figure 21. Copper 3mth ATM Implied Volatility and its Sensitivity To Demand Chg after excluding Macro Impact



Source: Bloomberg, Citi Research

Figure 22. Copper Implied Volatility Surface Snapshot Comparison

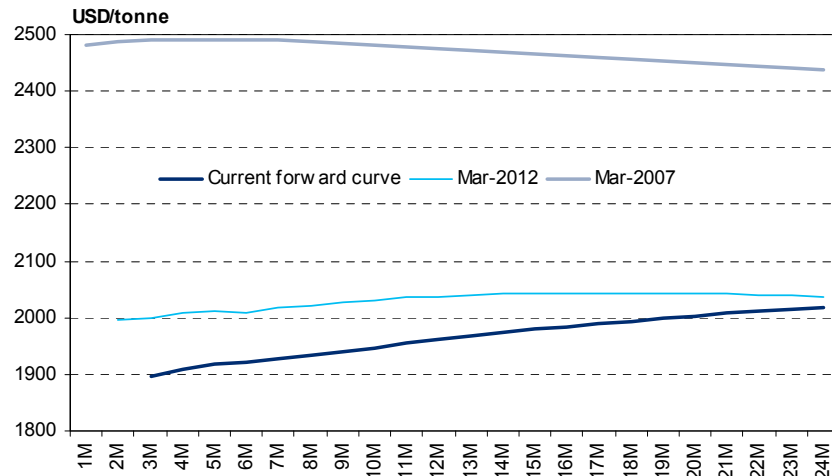


Source: Bloomberg, Citi Research

Softening fundamentals prompt coordinated contangos

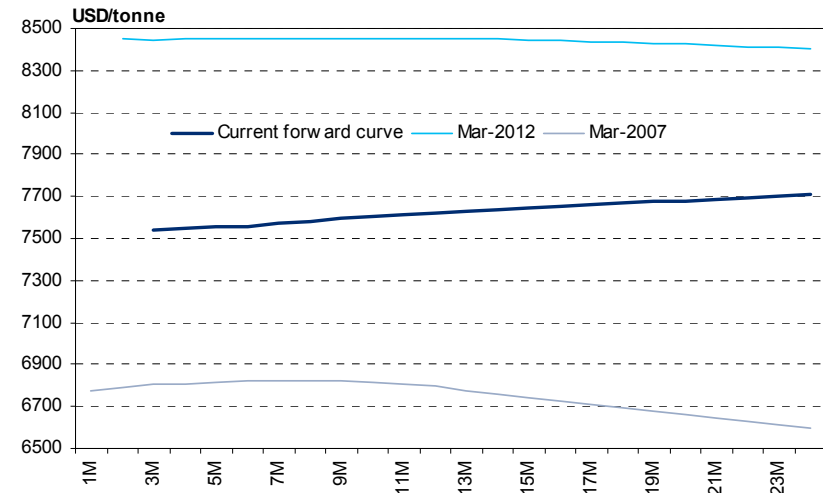
- The combination of slower-than-expected Chinese economic activity and therefore metals consumption growth over the last year, combined with a relative lack of supply adjustment, has prompted a coordinated move in metal price structures to full forward contangos.
- While Aluminum, a metal that China has been more than self-sufficient in, moved into a full contango structure in 2009, the move in other metals has been much more recent.
- Both lead and nickel moved into full contango structures in May 2012, whilst zinc was two months later in July. The last metals to follow suit were copper and tin, both slipping into full contango only during April this year.
- If there is a common factor, it is that metals in which China has traditionally been most significantly net short, in terms of domestic consumption requirements versus domestic production, have been the last metals to move into full contango.

Figure 24. Zinc forward curve development



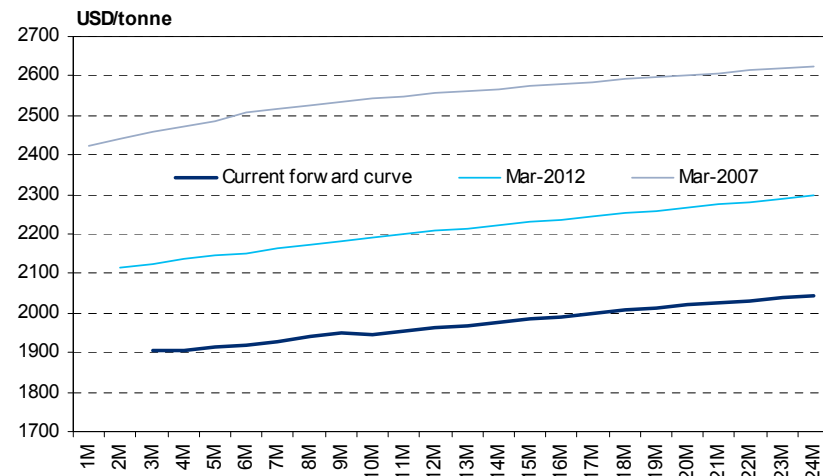
Source: LME, Citi Research

Figure 23. LME copper forward curve development



Source: LME, Citi Research

Figure 25. Aluminum forward curve development

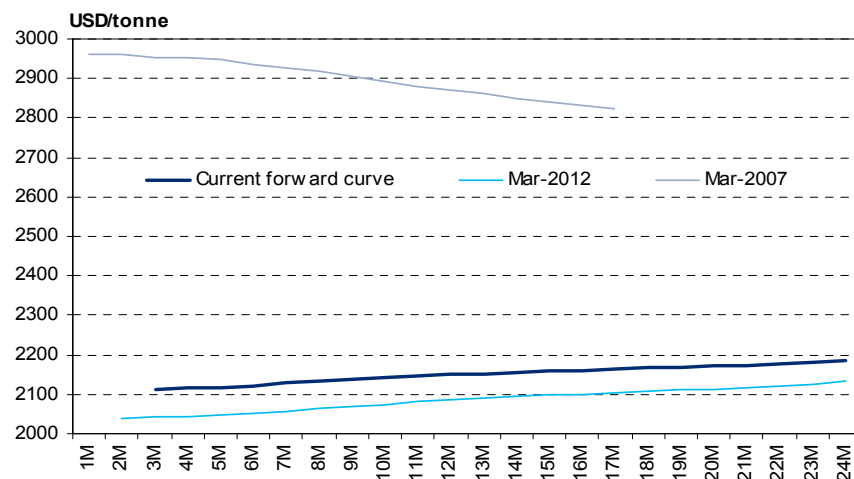


Source: LME, Citi Research

Curve structure implications for price

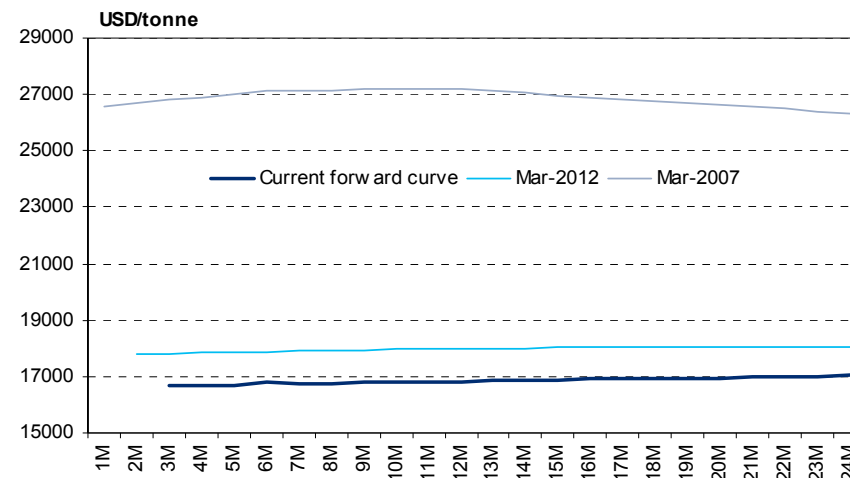
- The curve shape for a balanced market should normally be a contango structure, with the forward curve effectively reflecting the cost of storage, insurance etc of units of metal. The normal implication for a move into steepening contango should be increased downward pressure on nearby prices to the point where marginal production is forced out of the market, effectively reducing any excess overhang of metal.
- In a normally operating market, a period of oversupply should push prices down levels close to marginal costs of production. For Aluminum, current prices are approximately \$100/t below 90th percentile marginal costs (around \$2,000/t), while nickel prices are currently trading marginal production costs levels (\$16,000-\$16,500/t), suggesting both these metals have limited downside from current levels.
- For copper, lead and to a lesser extent zinc, prices continue to trade above marginal production costs, in the case of copper around \$6,500/t, and lead/zinc \$1,700/t, suggesting these metals have further downside potential from current trading ranges (see more color in the Base Metals section).

Figure 27. Lead forward curve development



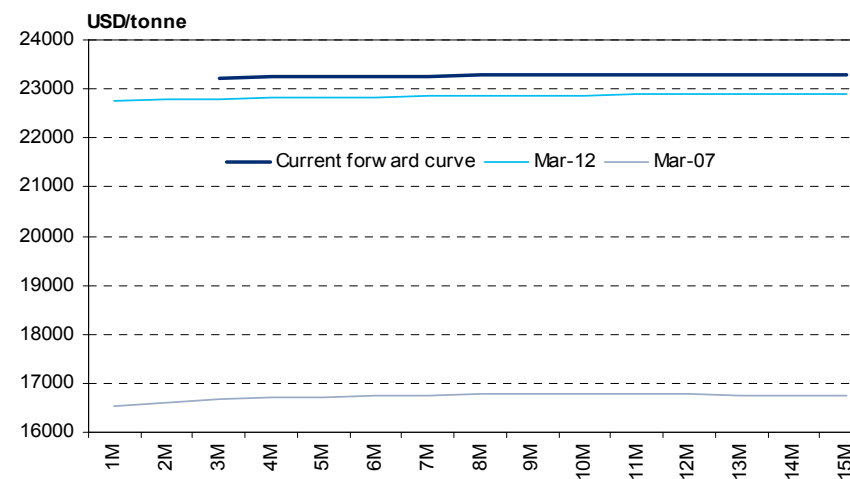
Source: LME, Citi Research

Figure 26. Nickel forward curve development



Source: LME, Citi Research

Figure 28. Tin forward curve development



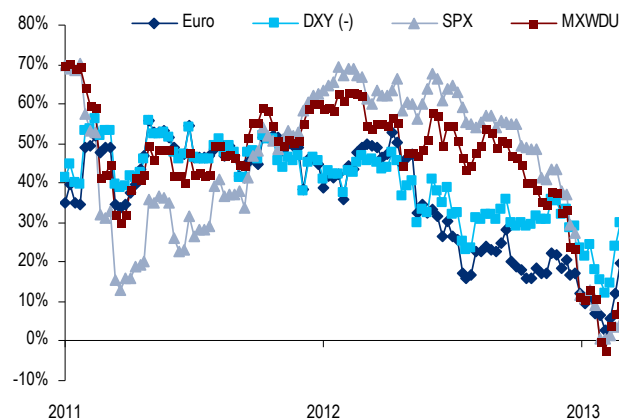
Source: LME, Citi Research

Energy

Crude Oil: Fundamentals remain weak and the risks remain weighted to the downside

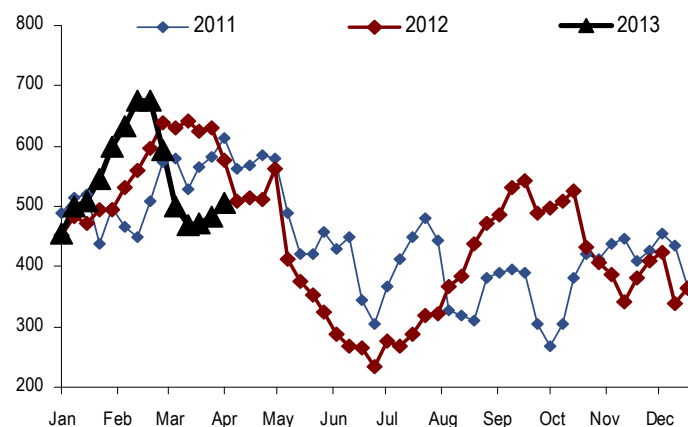
- **Fast money flows amidst a risk-on rally took Brent to \$119 in February but since then prices have fallen sharply. Citi expects this move lower will continue as fundamentals remain weak.** Despite Saudi Arabia pulling back on production by almost 1 mmb/d, Chinese crude imports reaching record highs, the S&P 500 making record highs and ample geopolitical stimuli the global crude market has deteriorated with Dubai flirting with contango in February and now Brent following suite.
- **Bearishness has reasserted itself** with a deep refinery turnaround season in the US and Europe, followed by maintenance in Asia from the end of 1Q'13. 2Q tends to be the weakest quarter of the year. But this is joined by two factors easing Brent: upcoming changes to the pricing methodology that increase liquidity to the Brent contract, as well as the partial closing of a tax loophole that has encouraged South Korean imports of North Sea Forties crude, both slated for this summer.
- **Distillates, the key product for markets, have weakened despite turnarounds. Hardly a bullish sign.** The only really strong spot in the market is Dubai timespreads, which reflects a surge in Chinese crude imports, but which will in turn fuel heavy refinery throughput and further rises in already record high gasoil exports.
- **The collapse in oil's correlation with other assets is one sign of a return to normalcy, as is oil and other commodities underperformance versus equities.** Equities are a forward-looking asset, while commodities typically reflect conditions in the here and now. That was changed with the increasing financial flows into commodities, but normality seems to be reasserting itself in this respect.
- **Updated price outlook.** Citi's original Q1 price outlook was for Brent at \$105 and WTI at \$85; Brent averaged close to \$112.5 instead, with WTI at \$94.5. The WTI-Brent spread averaged \$18, close to Citi's call for \$20. Citi is marking to market the Brent price outlook for the rest of the year up \$5, for an outlook of \$100 in 2Q, \$105 in 3Q, \$100 in 4Q, for a 2013 average of \$104. The outlook for the WTI-Brent arb is for \$15 in 2Q, \$15 in 3Q, \$10 in 4Q, for a 2013 average of \$14, implying WTI at \$85 in 2Q, \$90 in 3Q, \$90 in 4Q, for a 2013 average of \$90.

Figure 29. Weekly Correlations (30 week rolling) Between Brent and Other Assets Have Collapsed



Source: Bloomberg, Citi Research

Figure 30. Managed Money Net Length In All ICE+NYMEX Petroleum Contracts – 1000 contracts

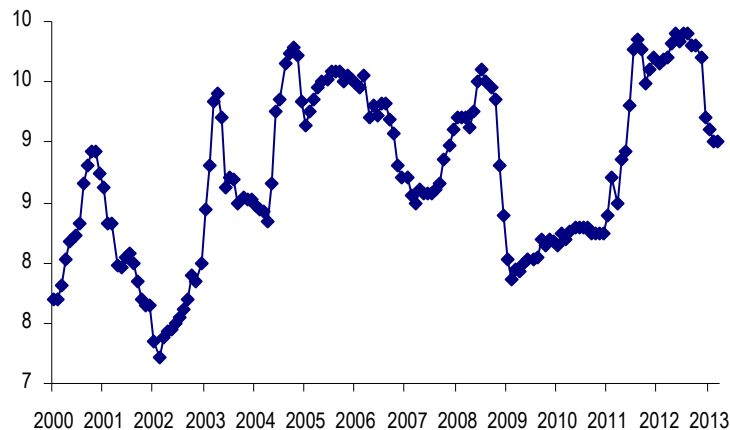


Source: Bloomberg, Citi Research

The Saudi Pullback, Record Chinese Imports, Supportive Geopolitics And New Highs For The S&P – Combined, Were Not Enough To Support Crude

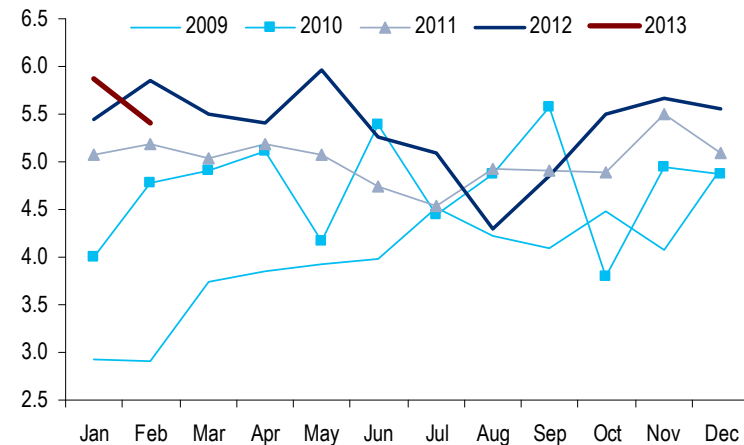
- **Geopolitics came to the fore again in 1Q**, with the hostage crisis in Algeria leading to 38 hostages killed, as an Al Qaeda-affiliated group attacked the BP/Statoil Amenas gas facility in the southeast of the country, near the Libyan border. The US Embassy in Turkey was hit by a terrorist attack. Egypt has seen protests in several cities along the Suez Canal. The Syrian civil conflict threatens to fragment the country, and contagion to the wider region remains a risk. Nigeria has seen force majeure again that have reduced its oil production, including continued issues with Qua Iboe flows, as well as attacks on the Nembe Creek pipeline and a declaration from MEND that broader attacks were to resume. Venezuela saw the passing of Chavez, but oil markets shrugged off the news, and the country has remained stable so far, ahead of elections. Iran nuclear talks have taken yielded no sign of progress.
- **Despite this fairly relentless flow of supportive news and record highs made in many equity indices, Brent prices have fallen back below \$105/bbl for the first time since mid-2012.** The stronger USD has played a role, pulling down most commodities with its denominator effect, but crudes increasingly challenged fundamentals are clearly playing a role.

Figure 31. Saudi crude production fell at end-2012.....



Source: Bloomberg, Citi Research

Figure 32. Chinese Net Crude Imports – mmb/d



Source: China Customs, WIND, Citi Research

Citi 2013 short-term oil outlook

- Citi has revised its demand expectations lower in light of a very weak 1Q in Europe and an expectation that demand will continue to disappoint.
- Citi now sees global oil demand growth at **+0.65-m b/d in 2013**. This balance comes from ongoing growth in the non-OECD but an accelerating contraction in the developed world. Latin America, the FSU and China should all see ≈3% 2013 growth. Conversely OECD demand growth for 2013 continues to look exceptionally weak, mainly in Europe where it is expected to drop 0.4-m b/d.
- **Non-OPEC crude supply is forecast to increase by +0.9-m b/d in 2013**. Recent non-OPEC supply increases have been largely cancelled out by a pullback in OPEC production. Last month OPEC supply fell despite increased production in Iraq and Saudi Arabia. This occurred as Angola and Nigeria saw drops in their production of 100-k b/d and 50-k b/d respectively.

Figure 33. Citi global oil supply-demand balance 2012-13 (m b/d)

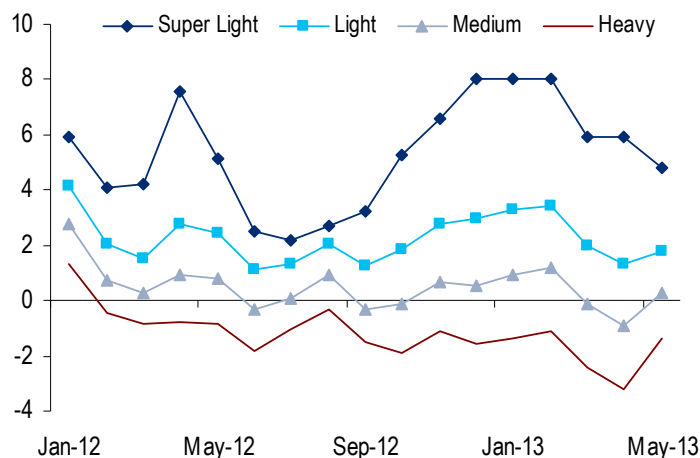
Demand	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	2012	2013	YoY	YoY%
North America	23.5	23.8	23.9	23.8	23.7	23.6	23.9	23.8	23.8	23.8	0.00	0.0%
OECD Europe	13.7	13.8	13.8	13.6	13.1	13.1	13.6	13.6	13.7	13.4	-0.38	-2.7%
OECD Asia	9.1	8.0	8.2	8.7	9.0	7.9	8.0	8.5	8.5	8.4	-0.15	-1.8%
OECD Demand	46.3	45.6	45.9	46.1	45.8	44.6	45.5	45.9	46.0	45.5	-0.52	-1.1%
China	9.3	9.4	9.6	10.1	9.8	9.8	9.9	10.2	9.6	9.9	0.30	3.1%
India	3.7	3.7	3.5	3.8	3.8	3.8	3.6	3.9	3.7	3.8	0.12	3.3%
Other Asia	7.6	7.6	7.5	7.6	7.6	7.8	7.7	7.8	7.6	7.7	0.14	1.9%
Africa	3.5	3.4	3.4	3.4	3.5	3.5	3.4	3.5	3.4	3.5	0.07	2.1%
Non-OECD Europe	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.00	-0.4%
FSU	4.5	4.6	4.6	4.7	4.7	4.6	4.8	4.9	4.6	4.7	0.15	3.2%
Latin America	6.3	6.4	6.7	6.5	6.6	6.7	6.7	6.6	6.5	6.7	0.19	2.9%
Middle East	7.2	7.7	8.2	7.6	7.5	7.9	8.3	7.8	7.7	7.9	0.20	2.6%
Non-OECD	42.7	43.6	44.2	44.5	44.2	44.8	45.1	45.4	43.7	44.9	1.17	2.7%
Total Demand	89.0	89.2	90.1	90.6	90.0	89.4	90.6	91.3	89.7	90.3	0.65	0.7%
Supply	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	2012.0	2013.0	YoY	
North Sea	2.9	2.7	2.3	2.6	2.6	2.5	2.3	2.5	2.6	2.5	-0.15	
FSU	12.5	12.4	12.4	12.5	12.6	12.6	12.6	12.6	12.5	12.6	0.11	
United States	6.2	6.3	6.2	6.6	6.7	6.9	7.0	7.1	6.3	6.9	0.60	
Canada	3.1	3.1	3.3	3.4	3.3	3.4	3.4	3.5	3.2	3.4	0.21	
Mexico	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.7	2.5	2.6	0.09	
Brazil	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	0.01	
Total Non-OPEC crude	42.3	41.8	41.3	42.2	42.7	42.8	42.6	43.1	41.9	42.8	0.92	
Iraq	2.7	2.9	3.1	3.1	3.2	3.3	3.4	3.5	2.9	3.4	0.43	
Iran	3.4	3.1	2.8	2.7	2.8	2.8	2.8	2.8	3.0	2.8	-0.20	
OPEC crude	31.4	31.7	31.3	31.2	31.0	31.0	30.8	30.6	31.4	30.8	-0.56	
NGL production	12.6	12.5	12.7	12.8	12.9	12.8	13.0	13.3	12.7	13.0	0.36	
Other oils	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.01	
Processing gains	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.2	0.04	
Biofuels	1.6	1.8	2.2	1.9	1.9	1.8	1.8	1.8	1.9	1.8	-0.04	
Call on OPEC	29.5	30.1	30.9	30.6	29.5	28.9	30.1	30.0	30.3	29.7	-0.63	
Call on OPEC - (Iraq+Iran)	23.5	24.1	25.1	24.8	23.6	22.8	23.9	23.7	24.4	23.5	-0.86	

Source: Citi Research

Saudi Production Looks Set to Rise Into the summer...Partly To Meet External Demand But Also To Meet the Kingdom's Internal Hydrocarbon Needs

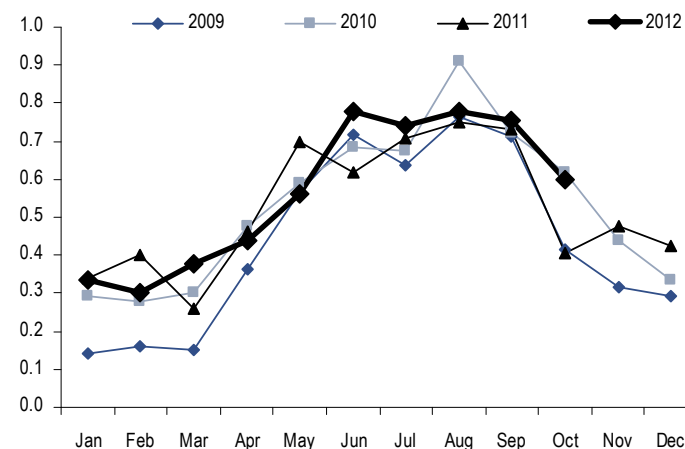
- Saudis will need to ramp up crude production in order to meet their domestic natural gas requirements in the summer, as well as to supply Jubail when it comes online and when they start to supply Motiva on the US Gulf Coast. If and when the 500 kbd Manifa field starts up it will be used to meet some of these needs.
- Coupled with the increased need for revenue given the social spending binge in the aftermath of the Arab Spring, the ability of the Kingdom to pull back on production to defend prices does look very constrained.
- Saudi OSPs so far in 2013 seems more concerned with preserving Asian market share than had been the case in late 2012, when the pricing was aggressive in order to prevent oil inventories building. This reflects the Kingdom's view that demand should be stronger in 2H 2013, pulling down inventory build ups that happen in 1H. The recent rise in May OSPs for Asia may indicate they are reconsidering this sanguine view of the world
- Iraq, OPEC's second largest producer, is ramping up crude production and exports, particularly in Asia and this is causing some concern in the Saudi Kingdom. The OSP pricing drop so far for 2013 has come after Iraq had also dropped its mark down of Basra light by \$1.10 against Arab Medium to win over more of the Asian market and undercut their Saudi rivals. This can be seen as direct competition between the two nations for the expanding Asian market and going forward Saudi Arabia will have to be cautious in increasing their OSP's as Iraq's optimistic target crude output of 3.7 mm b/d for this year will seemed very appealing in the Far East.

Figure 34. Saudi OSPs (\$/bbl)



Source: Bloomberg, Citi Research

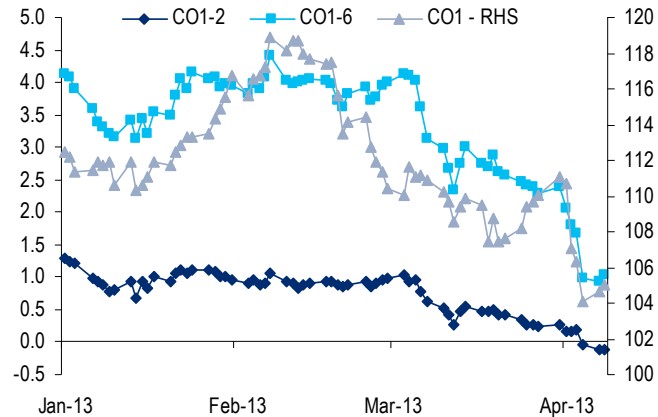
Figure 35. Saudi Crude Burn – mmb/d



Source: JODI, Citi Research

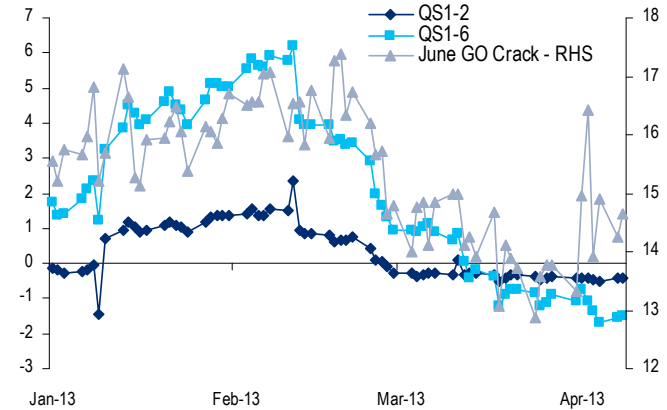
Despite Plenty of Bullish Stimuli, Signs of Strength Are Scarce Outside of Dubai Structure

Figure 36. Brent flat price and time spreads have weakened (\$/bbl)



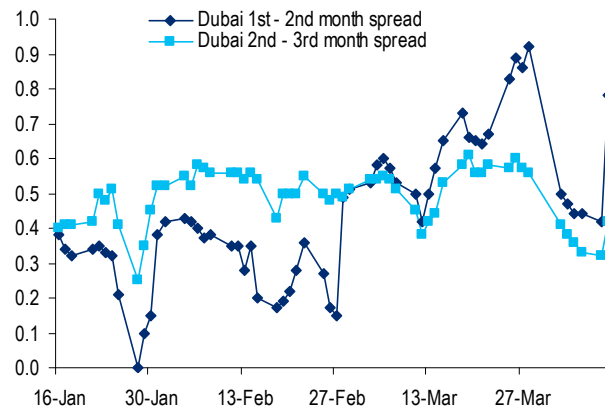
Source: Bloomberg, Citi Research

Figure 37. Gasoil timespreads and cracks have weakened, despite turnarounds and exceptionally cold weather in Europe in March (\$/bbl)



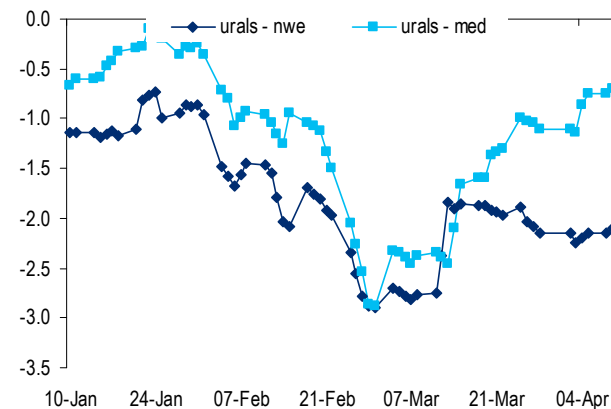
Source: Bloomberg, Citi Research

Figure 38. Dubai time spreads flirted with contango before rebounding (\$/bbl)



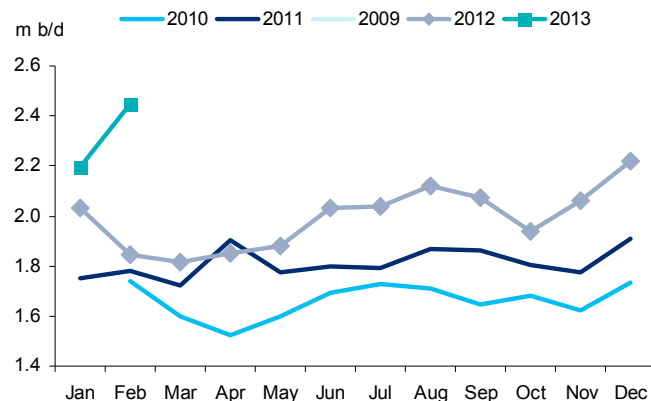
Source: Bloomberg, Citi Research

Figure 39. Urals differentials have been relatively soft (\$/bbl)



Source: JODI, Citi Research

Figure 40. China (m b/d, 2009-13)

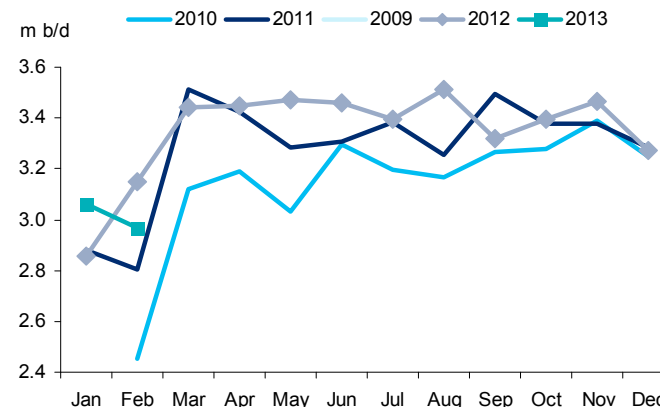


Source: China National Bureau of Statistics, China Customs, Citi Research

Chinese oil demand increasingly skewed to gasoline, while flat in gasoil

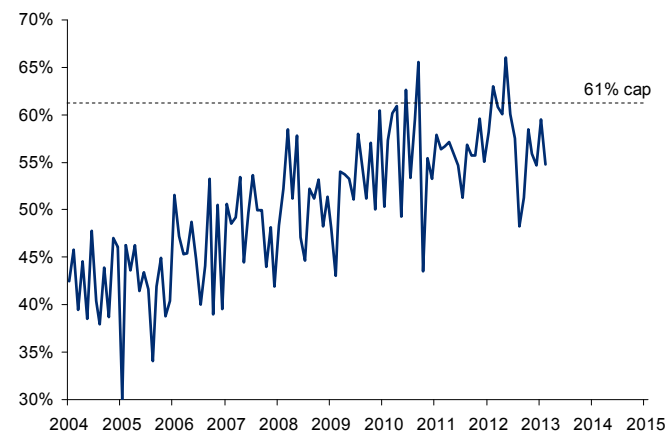
- **Increasingly consumption-led oil demand growth.** Underlying demand growth is concentrated in gasoline, suggesting consumption is becoming a more important driver of oil demand growth. Gasoil demand – linked to demand from industrial and power generations sectors – has languished since late 2010.
- **Citi's outlook for Chinese GDP growth saw 7.8% in 2012 and forecasts 7.8% in 2013 and 7.3% in 2014.** These are no longer the days of double-digit growth up to 2007. Based on historical rule-of-thumb relationships to oil demand, this would imply sub-4% growth, or under 400-k b/d. But given lower commodity intensity of economic growth, given a shift to consumption as a key driver of oil demand growth – showing up as gasoline demand – this may be on the high side. Industrial demand for oil – as shown in gasoil and residual fuel oil – looks rather flat.
- **China's Five-Year Plan calls for reduced energy intensity as % of GDP, with a % cap on foreign crude import dependence.** This includes capping its crude imports at 61% of total crude demand; China's net crude imports already stand at ~55%. By 2015, refinery crude processing capacity was targeted to rise to 620-mt (12.5-m b/d) and refined petroleum product output to rise to 330-mt (7.1-m b/d). This would imply 7.6-m b/d of crude imports as the 2015 cap, up from just under 6-m b/d in peak months over 2012.

Figure 41. China's refinery throughput (m b/d, 2009-13)



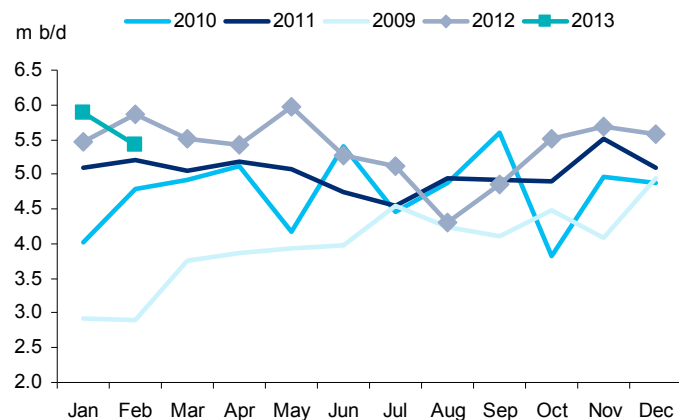
Source: China National Bureau of Statistics, China Customs, Citi Research

Figure 42. China net gasoil exports rising (m b/d, 2009-13)



Source: China National Bureau of Statistics, China Customs, Citi Research

Figure 43. China crude imports (m b/d, 2009-13)



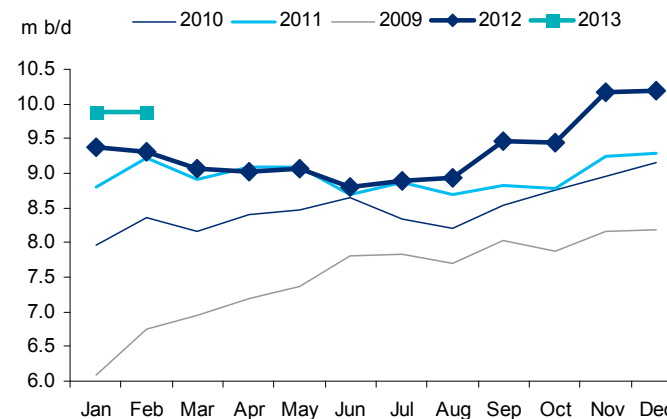
Source: China National Bureau of Statistics, China Customs, Citi Research

Chinese crude imports bolstered by capacity build-outs

■ **Rapid refinery build-out has driven higher refinery throughput, but these have driven higher petroleum product exports.** 2012 saw some 750-k b/d of crude distillation capacity built in China; 2013 looks set to see another 450-k b/d (though some of 2012 capacity came at year-end, meaning its impact on refinery runs may only show up this year). This new refinery capacity from late-2012 showed up in record refinery runs, which hit over 10.2-m b/d in November and December 2012. But this, and inventory building outside commercial stocks data released by Xinhua China OGP, masks weaker underlying demand. Net gasoil exports became positive again in 2H'12 and hit almost 80-k b/d in January, and should continue to rise going forward as refinery capacity grows faster than product demand. Chinese refiners have a strong incentive to export products at world prices, given domestic prices are controlled by the NDRC, keeping refinery margins low and even negative.

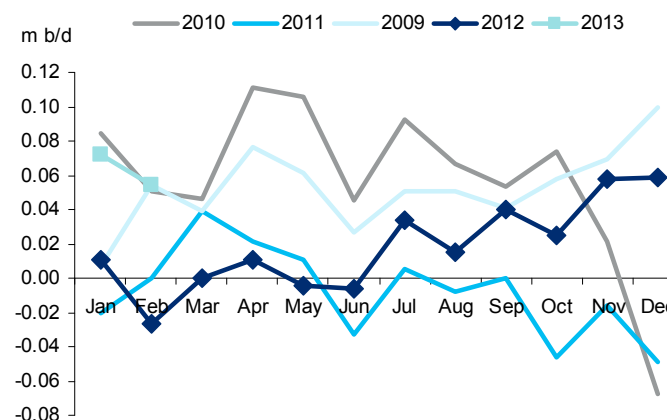
Crude needs over and above petroleum product demand include filling of strategic crude stocks as well as logistical needs ("dead oil requirements") for new refineries and pipelines, and reportedly some direct crude burn for power generation.

Figure 44. China's refinery throughput (m b/d, 2009-13)



Source: China National Bureau of Statistics, China Customs, Citi Research

Figure 45. China net gasoil exports rising (m b/d, 2009-13)



Source: China National Bureau of Statistics, China Customs, Citi Research

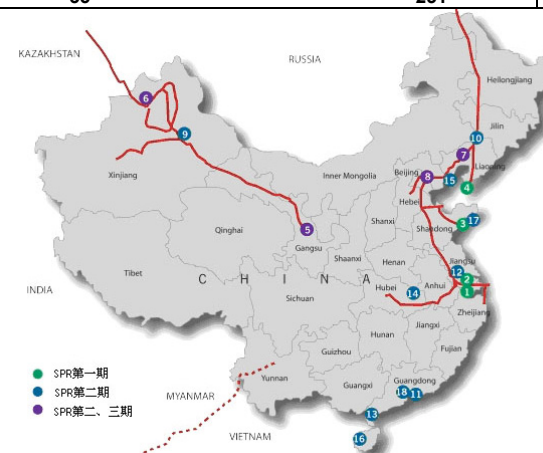
Figure 46. Planned SPR capacity by Phase

m bbls	Capacity	Completion	Company
Phase 1	103.1		
Zhenhai, Zhejiang	32.7	2006	Sinopec
Zhoushan, Zhejiang	31.4	2007	Sinochem
Huangdao, Shandong	20.1	2008	Sinopec
Dalian, Liaoning	18.9	2008	CNPC
Phase 2	206.9		
Lanzhou, Gansu	18.9	2011	CNPC
Dushanzi, Xinjiang	18.9	2011	CNPC
Jinzhou, Liaoning	18.9	2015	CNPC
Shanshan, Xinjiang	39	2015	CNPC
Jintan, Jiangsu	15.7	2015	CNPC
Huizhou, Guangdong	31.4	2013	CNOOC
Tianjin	20.1	2015	Sinopec
Zhanjiang, Guangdong	44	2015	Sinopec
Phase 3	313		
SPR 2020 target	623		

Source: Xinhua, China OGP, FGE, Citi Research

Figure 47. Refinery capacity build-out, estimated logistical needs, 2012-2020

Year	No. of projects	New logistical needs for crude (k b/d)	(m bbls)	CDU capacity (k b/d)
2012	7	89	33	750
2013	5	51	19	450
2014	7	103	38	1,090
2015	4	104	38	1,060
2016	6	124	45	1,170
2017	3	83	30	840
2018	0	0	0	0
2019	1	30	11	200
2020	2	50	18	280
TOTAL	35		231	5,840

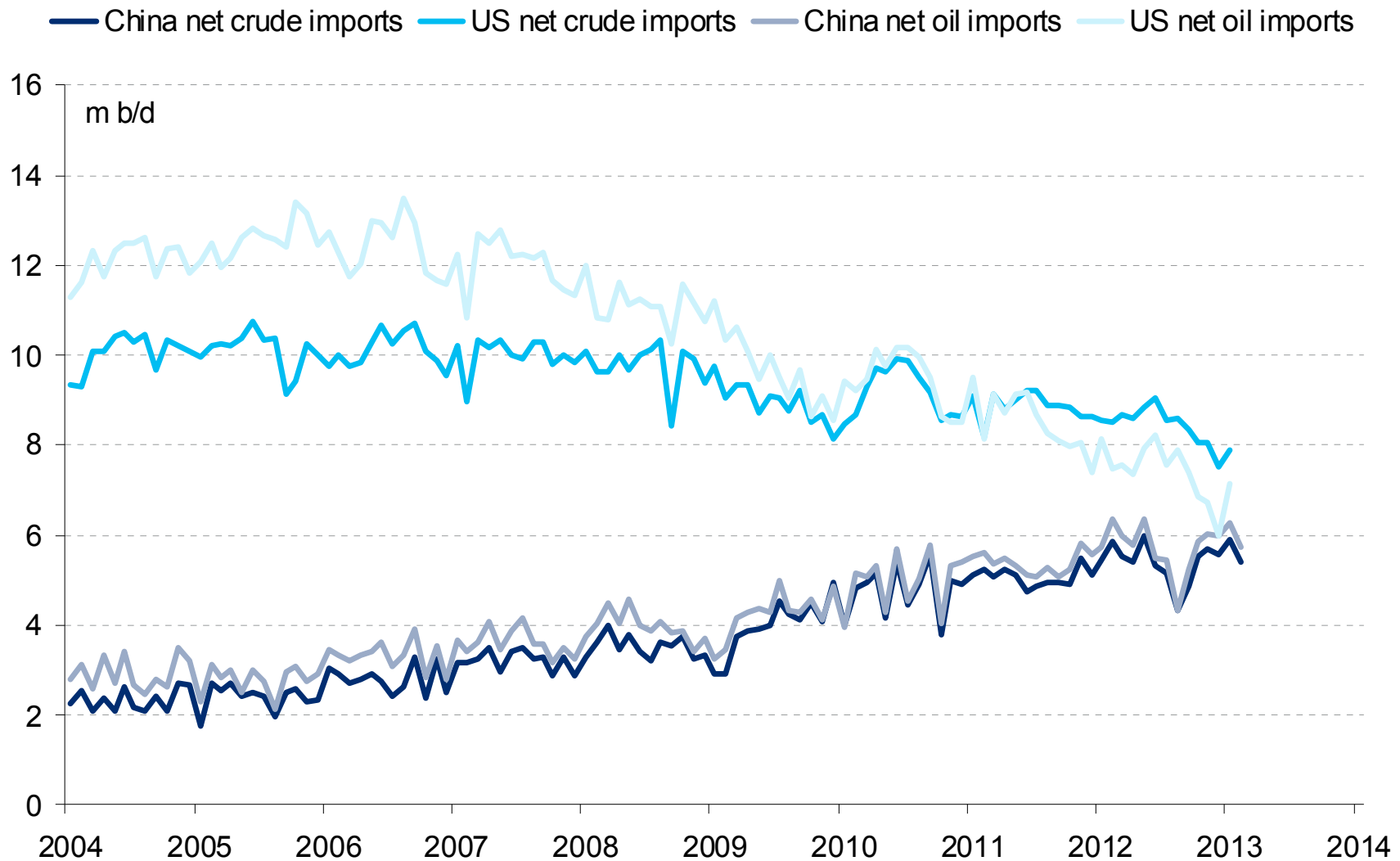


Source: Xinhua, China OGP, FGE, Citi Research

Estimated additional crude demand for strategic stocks, logistical needs

- **China has been building strategic petroleum reserves (SPR), and tries to purchase at opportune times when prices are low. This adds to China's pull on crude, over and above its product demand.** China aims for 90 days of forward import cover, targeting 623-m bbls of SPR by 2020, though this would imply 6.9-m b/d of imports by that time, which seems unrealistic. However, given the close relationship between NOCs and the government, commercial inventories are additional capacity that can be drawn upon for strategic needs. Commercial storage capacity is at 245.4-m bbls, and planned to rise to 279.4-m bbls by 2015.
- **Current SPR fill.** CNPC has said that 141-m bbls of the SPR is filled, implying Phase I full and 38-m bbls of Phase II filled, likely by 1H'12. The remaining Phase II capacity is targeted for 2015, though the Huizhou, Guangdong facility could be 2013. Phase III is yet to be started, targeted for 2020. Given plans to fill remaining Phase II capacity of ~169-m bbls by 2015, this implies ~150-k b/d of SPR fill on average going forward, higher if "strategic" commercial stocks also need filling.
- **New refineries are being built almost every year this decade. New refinery capacity requires associated crude stocks ("dead oil" requirements).** 2013 sees 450-k b/d of new CDU capacity from 6 projects (though the 2012 Pengzhou refinery starts only in early 2013). Assuming each refinery requires 30 days' inventories, while new associated pipelines to connect the refinery need ~5-m bbls or so, **this adds another 50- to 100-k b/d of growing logistical needs** as refinery capacity continues to climb to 2017 (averaged over the year of project completion, but could be higher or lower on a month-to-month basis).

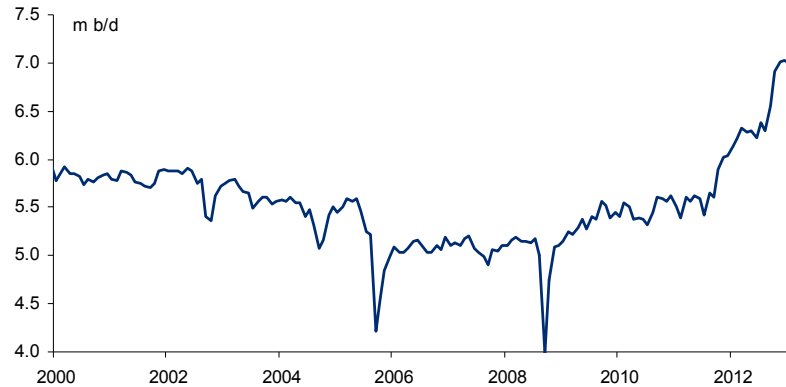
Figure 48. Star-crossed? China net oil imports rising as the US's fall; US net oil imports fell to under 6-m b/d in December as crude production reached 7-m b/d, up 1.1-m b/d y/y, and net product exports rose to a record 1.5-m b/d; meanwhile, China's net oil imports was 6.3-m b/d in Jan 2013



Source: EIA, China Customs, Citi Research

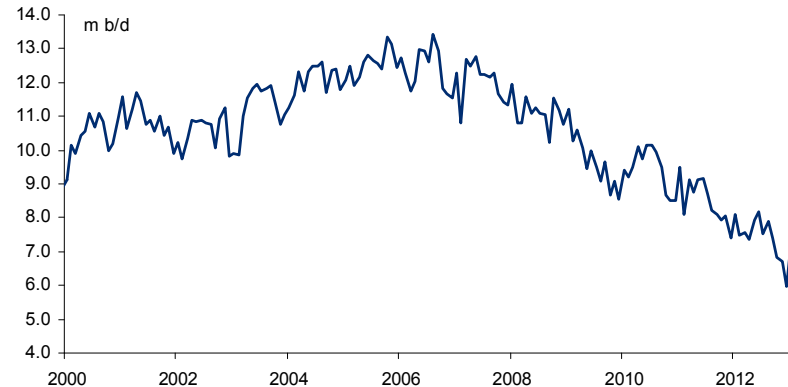
The US takes big strides towards energy independence

Figure 49. Crude production growing at ~1-m b/d y/y



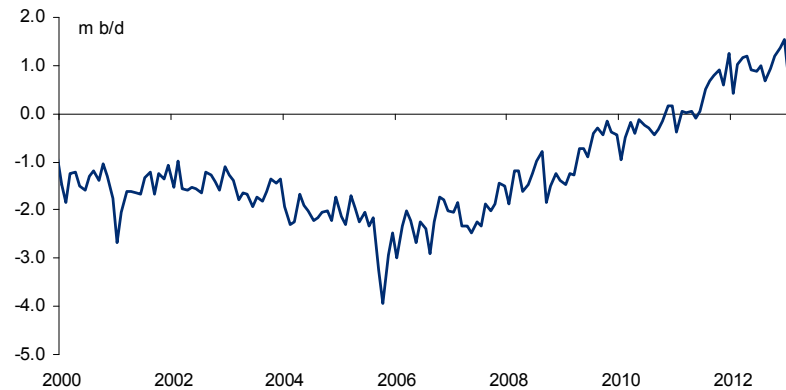
Source: EIA, Citi Research

Figure 50. Net oil imports fell to below 6-m b/d in Dec'12



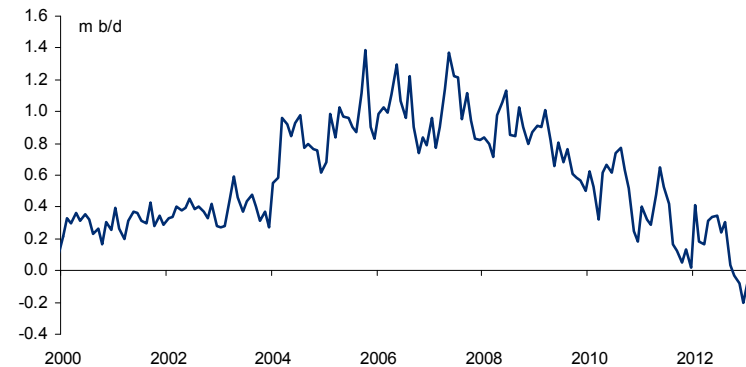
Source: EIA, Citi Research

Figure 51. Net product exports as high as 1.5-m b/d in Dec'12



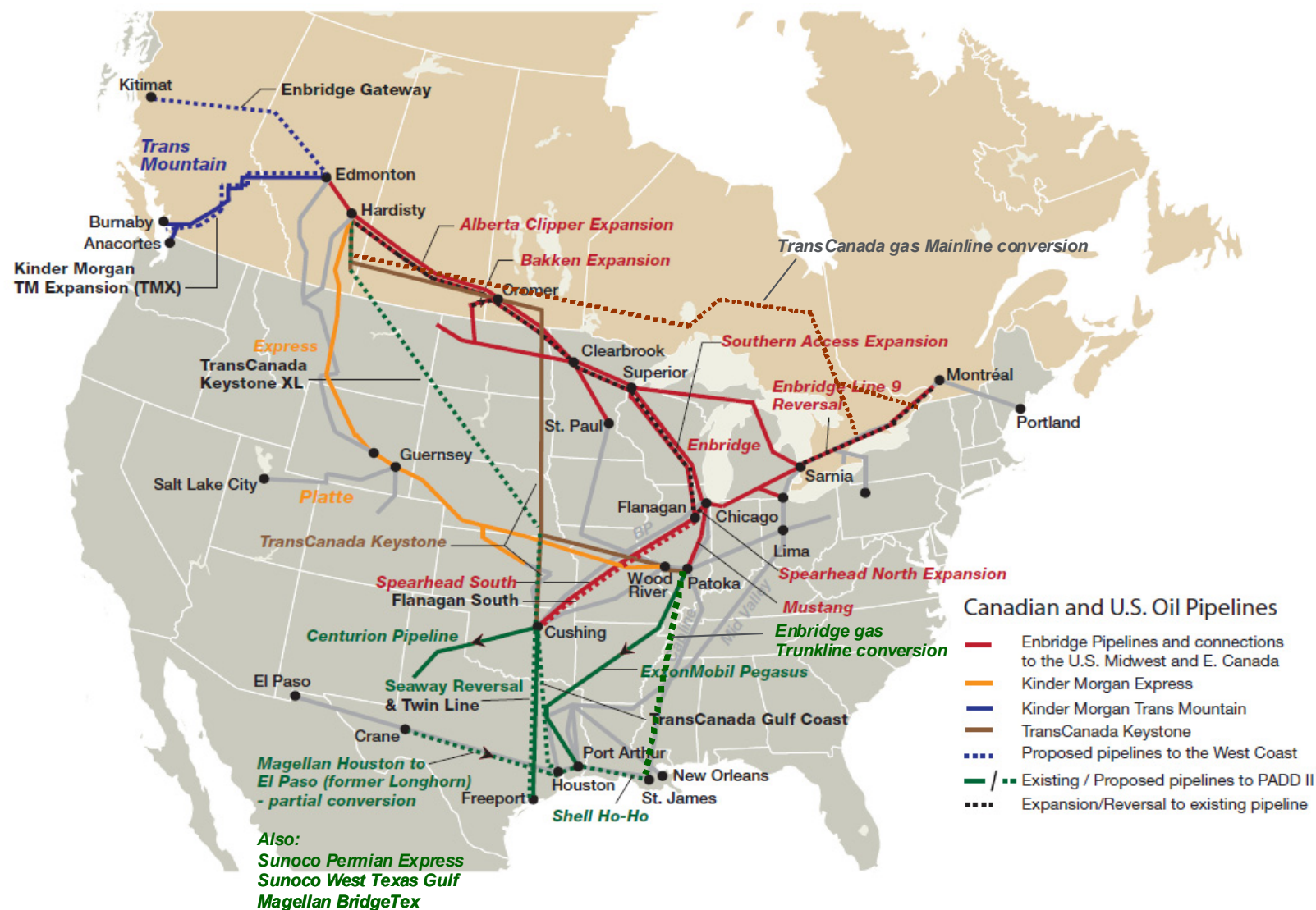
Source: EIA, Citi Research

Figure 52. The US has become a net gasoline exporter for the first time (including blending components)



Source: EIA, Citi Research

Figure 53. The North American supply revolution is reshaping legacy infrastructure



Source: CAPP, company reports, Citi Research

But pipelines are being built, reversed and expanded to accommodate the growth of local, abundant crude supply

Figure 54. Pipeline capacity debottlenecking Cushing and bringing the glut down to the Gulf Coast 4Q' 12-4Q' 15 (k b/d)

	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15
Enbridge/Enterprise Seaway	150	400	400	400	400	850	850	850	850	850	850	850	850
TransCanada Gulf Coast Project	-	-	-	-	700	700	700	700	700	700	700	700	700
Magellan Longhorn	-	135	225	225	225	225	225	225	225	225	225	225	225
Sunoco Permian Express	-	90	90	150	150	150	150	150	350	350	350	350	350
Sunoco West Texas Gulf	-	-	110	110	110	110	110	110	110	110	110	110	110
Magellan BridgeTex	-	-	-	-	-	-	-	-	300	300	300	300	300
Total pipeline capacity	150	625	825	885	1,585	2,035	2,035	2,035	2,535	2,535	2,535	2,535	2,535

Source: Company reports, Citi Research

Figure 55. Canadian Debottlenecking pipeline projects

	2012	2013	2014	2015	2016	2017
KM Trans Mountain	300	300	300	300	300	890?
Enbridge Northern Gateway	-	-	-	-	-	525?
TransCanada Mainline conversion	-	-	-	-	-	625?
Enbridge Mainline light	1,069	1,069	1,069	1,069	1,069	1,069
Enbridge Mainline heavy	1,246	1,246	1,466	1,466	1,466	1,466
KM Express/Platte to Wood River	280	280	280	280	280	280
TransCanada Keystone to Cushing/Patoka	591	591	591	591	591	591
TransCanada Keystone XL (northern leg)	-	-	-	700?	700?	700?
Enbridge Eastern Access (Lines 9, 6B)	-	-	200	200	200	200
Total	3,486	3,486	3,906	4,606	4,606	6,346

Source: company reports, Citi Research

Figure 56. Rail transportation of crude is growing remarkably quickly too. Crude-by-Rail receiving capacity as refineries and terminals, by region – only reported volumes contribute to totals (kb/d end 2012)

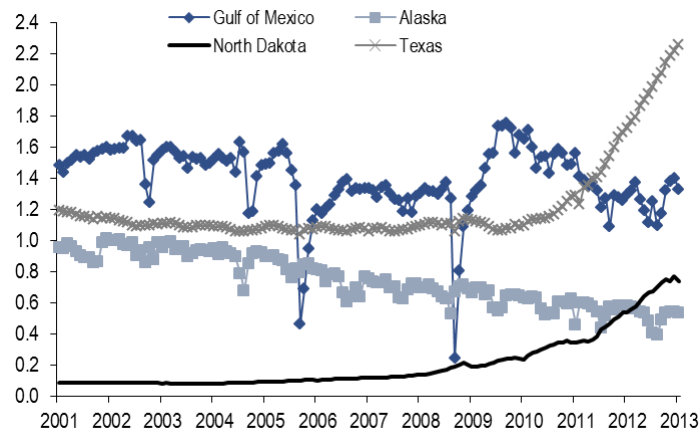
		2011	2012	2013	2014	2015	2016
Plains All American (formerly USDG)	St. James, LA	65	130	130	130	130	130
EOG, Nustar	St. James, LA	20	130	130	130	130	130
Savage/KCS	Port Arthur, TX	-	70	70	70	70	70
Nustar	Texas City, TX	-	3	3	3	3	3
GT Logistics	Port Arthur, TX	-	80	80	80	80	80
EOG	San Angelo, TX	-	5	5	5	5	5
Flint Hill	Odessa, TX	-	5	5	5	5	5
CrossTex Energy	Geismar, LA	-	15	15	15	14.5	14.5
Delek	El Dorado, AK	-	10	10	10	10	10
Rangeland/Flint Hill Pine Bend	Pine Bend, MN	-	-	-	-	-	-
TOTAL GULF COAST, MIDCONTINENT		85	448	448	448	448	448
Rangeland/Tesoro	Anacortes, WA	-	40	50	50	50	50
Phillips 66 refinery	Ferndale, WA	-	20	20	20	20	20
US Oil and Refining Tacoma refinery	Tacoma, WA	-	-	-	-	-	-
BP Blaine refinery	Blaine, WA	-	-	60	60	60	60
BNSF to Alon Bakersfield refinery	Bakersfield, CA	-	-	-	-	-	-
TOTAL WEST COAST		-	60	130	130	130	130
Sunoco/Carlyle (120 in 2Q'13, 180 late'13)	Philadelphia, PA	-	20	120	180	180	180
Delta (Apr 13)	Trainer, PA	-	-	-	-	-	-
PBF (expand to 110-k b/d in early 2013)	Delaware City, DE	-	40	110	110	110	110
Global Partners rail-to-barge	Albany, NY	-	160	160	160	160	160
Buckeye Partners, rail-to-barge	Albany, NY	-	-	135	135	135	135
Buckeye Partners*	Perth Amboy, NJ	-	-	-	-	-	-
Plains All American (3Q'13)	Yorktown, VA	-	-	130	130	130	130
Enbridge (3Q'13, expandable mid-2014)	Philadelphia, PA	-	-	80	160	160	160
Hess (from Tioga, ND, supply others)*	Port Reading, NJ	-	-	-	-	-	-
Irving (35-k b/d shipped from Albany)	St. John, NB	-	70	70	70	70	70
TOTAL EAST COAST (INC. CANADA)		-	290	805	945	945	945
TOTAL RECEIVING CAPACITY		85	798	1,383	1,523	1,523	1,523

Source: Reuters, Company Reports, Citi Research

US Shale Revolution, Full Steam Ahead?

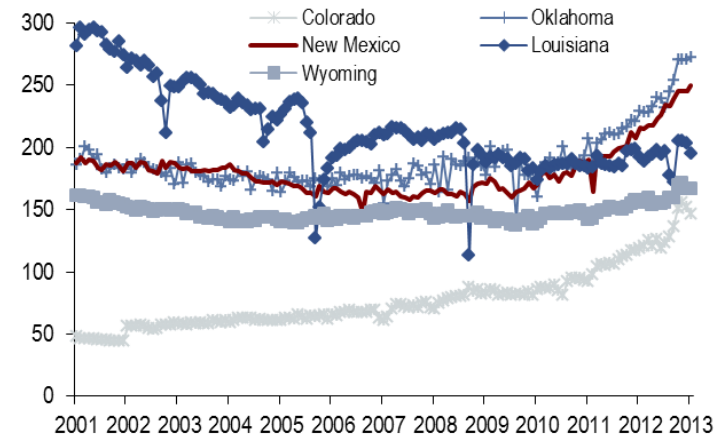
- The breakdown of US production by state shows compelling evidence that the US is not resting on its laurels and relying solely on mainstream Bakken and Eagleford formations to generate the increased shale oil production. Alternative plays such as shale oil from the Permian Basin have helped to double Texan output over the past two years, now over 2.2 mb/d. Several other lesser known oil producing states such as Colorado, where Oil production has risen from 92 k b/d to 146 k b/d over 2 years and Oklahoma which has seen increases of 70 k b/d over the same period are helping diversify production. Whilst these increases taken individually might not seem too effective, they signify the breadth and pace of the US shale revolution and it's potential to continue to develop more unconventional shale plays.
- Overall we are seeing a rapidly-changing environment in which US shale oil production is flourishing, whether it be from improved infrastructure, technology, investment or any number of possible catalysts. The key here is that the benefits of the US shale revolution are broadening out and with rapid growth being generated from unexpected areas, going forward the knock-on effect from other areas could look to drive the pace of this revolution even faster rather than see it subside.

Figure 57. Crude Oil Production of Selected US states (m b/d, 2001-13)



Source: EIA, Citi Research

Figure 58. Crude Oil Production of Selected US States (m b/d, 2001-13)

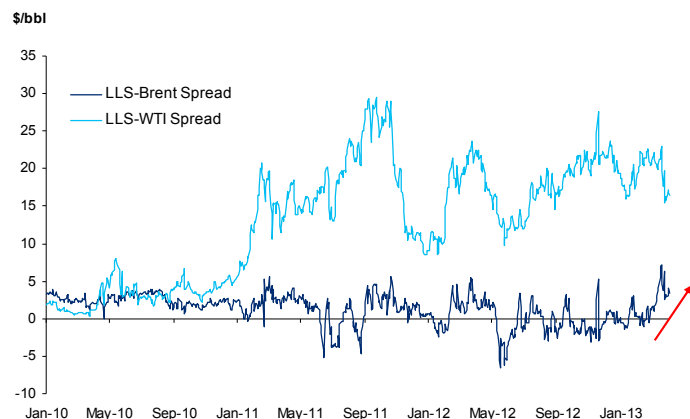


Source: EIA, Citi Research

WTI, LLS, Brent outlook

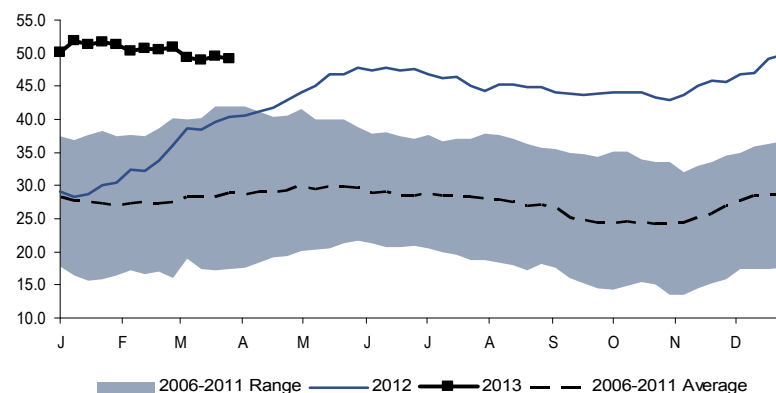
- WTI-Brent is expected to average \$14 in 2013, flirting with \$10 by 4Q'13. 2013 should see the WTI-Brent spread come in with Seaway capacity ramping-up to 300-k b/d in January; Longhorn, Permian Express and West Texas Gulf diverting Permian Basin flows away from Cushing in mid-2013, starting at lower volumes before ramping-up to full capacity by year-end, and the southern leg of the Keystone XL pipeline starting-up in 4Q'13, with initial pipe fill perhaps as early as the summer. BP Whiting is converting its CDU from sweet to sour use, and should be complete summer 2013, but the associated coker may not be commissioned until 1Q'14. With 1.4-m b/d of pipeline capacity and 600-k b/d of rail receiving capacity, WTI-LLS should be able to close to pipeline costs while LLS should move to a discount to Brent. The first signs should come from falling pipeline volumes from the Permian Basin to Cushing (along the Basin and Centurion pipelines), as well as weakening US Gulf Coast naphtha prices, which as yet remain relatively strong, and eventually, significant LLS discounts to Brent, already priced into forward curves. March/April local refinery maintenance could mean flat-to-moderate builds at Cushing before the draw down begins in earnest.
- West-to-east Gulf Coast bottlenecks may keep WTI-LLS wider, LLS at premium to Brent. WTI-LLS may see some blowouts, potentially leaving LLS at a premium to Brent at times, if west-to-east Gulf Coast logistics are not resolved by end-2013, though the Ho-Ho pipeline (expected mid-2013), lateral pipelines to the ECHO terminal and other debottlenecking currently taking place come to fruition. But as US Gulf Coast light sweet imports move to zero and pressures grow to export, the Atlantic Basin should become better supplied, weakening Brent.
- Cushing stocks can draw down to operating levels by 4Q'13. Cushing stocks have stayed relatively flat even with new Seaway flows in 1Q'13, as local production looks to have grown, and volumes may have been diverted away from Patoka to Cushing. But an additional 250-k b/d of net outflows from Cushing (due to a drop-off in Basin/Centurion inflows from the Permian Basin) could draw down stocks at the Oklahoma hub from current 50-m bbl levels to 27-m bbl levels (which are 5-yr average levels) in ~90 days. The Basin pipeline has a capacity of ~400-k b/d, and in theory could all be diverted to the Gulf Coast until price differentials narrow to balance flows from the Permian Basin to either Cushing or the Gulf Coast.

Figure 59. LLS premium to Brent should fall back to discount as pipelines and west-to-east Gulf Coast bottlenecks are eased



Source: Bloomberg, Citi Research

Figure 60. Cushing crude stocks – when Permian Basin pipelines ramp-up, net outflows at 250-k b/d levels could draw stocks down to historical operating (27-m bbls) levels within 90 days (m bbls)

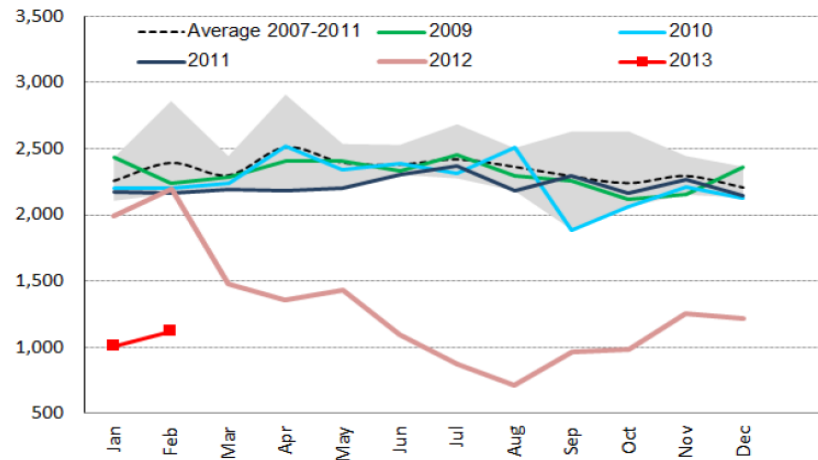


Source: EIA, Citi Research

Iran sanctions: 2013 could see Iran under pressure with declining Production, Exports and Revenues

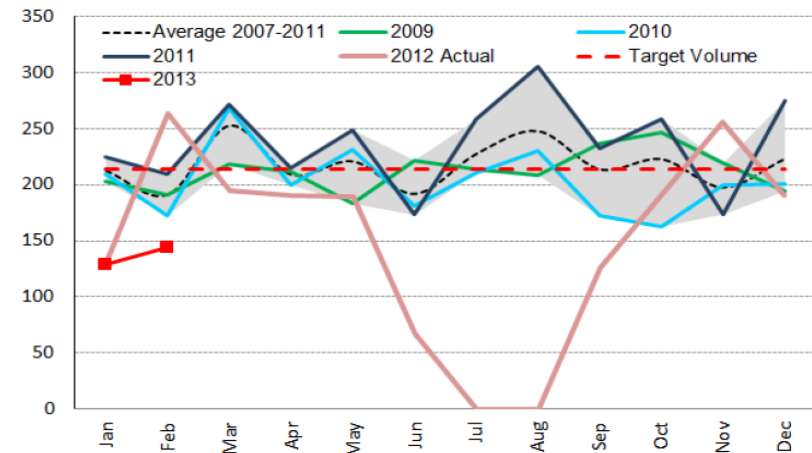
- 2013 has seen a sizeable slowdown in Iranian Crude production as February 2013 Implied production stood at 2.9 mbpd whilst the February 2012 level was 3.8mbpd. Crude imports have fallen 1mbpd YoY so far in January and February as the US is looking to punish importers of Iranian Crude who they deemed to have violated sanctions.
- In early April, Iran had its latest round of talks with the P5+1 regarding its nuclear programme. The talks didn't yield much progress yet the US still believes a potential resolution is viable but the timeframe for this to occur is shortening. The Israeli government seems to be getting impatient whilst a decision that occurs before the Iranian Election in June seems unlikely with no new talks having been scheduled. The situation may look to garner some more attention as the Israeli Strategic Affairs minister asked the P5+1 group to set a deadline of military action if no resolution is settled.
- This comes as Asia-Pac refiners have been cutting Iranian Crude imports compared to last year but it is unlikely these will stop altogether. India and South Korea have been cutting their imports from Iran as India has been paying for the Crude in rupees after US sanctions forbid USD payments whilst South Korea is looking to avoid banking sector sanctions as its Iranian Crude imports are down 60 kbpd YoY for Jan-Feb. China has increased imports by 20 kbpd to 410 kbpd of Iranian Crude this year compared to Jan-Feb 2012 with the US state department keeping a close eye on when it spikes over 500 kbpd as it did in November. The slack is likely to be picked up by the Middle East and potentially Latam but with Iran's much more favorable trade terms the Asian refiners will not be looking to cut imports from Iran down to zero, just enough to achieve US sanction exemptions.

Figure 61. Iranian crude exports (k b/d)



Source: Citi Research

Figure 62. South Korean crude imports from Iran (k b/d)

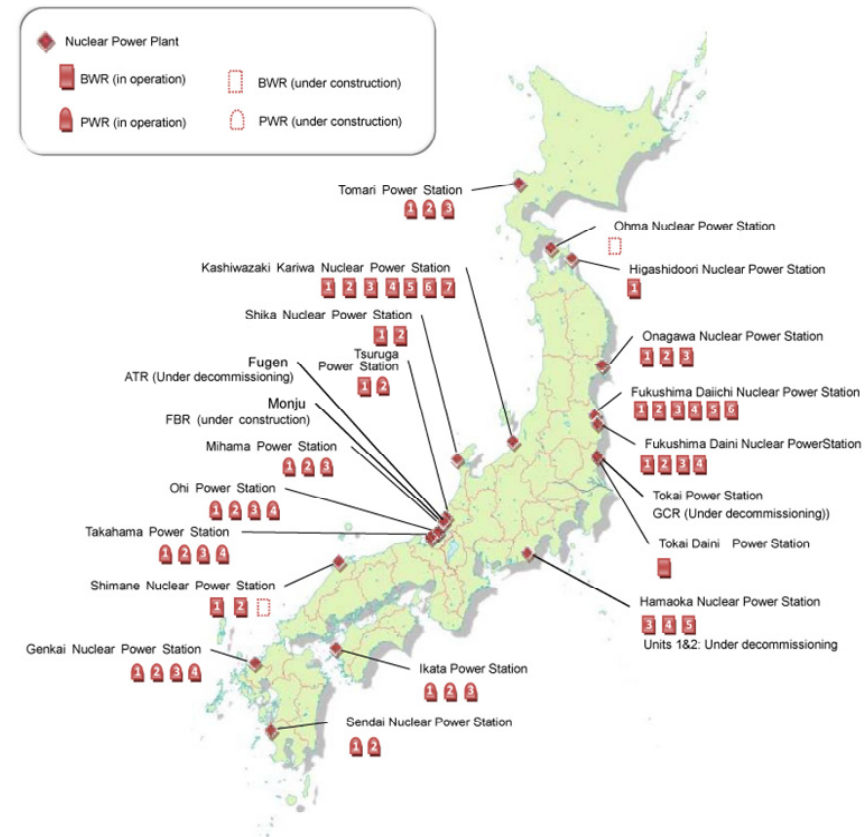


Source: Citi Research

Japan's "nuclear option": nuclear restarts likely to impact LNG more than oil

- Prime Minister Abe announced his pledge to restart nuclear reactors, but restarts may not happen until the coming winter, with potentially two to three reactors coming online after safety reviews. If three reactors were to restart, then between 96- and 120-k b/d of oil demand could be displaced if all of the oil were to be substituted, or 0.6- to 0.75-Bcf/d (4.5- to 5.6-mtpa) of gas if only LNG were to be displaced. Regions with a greater reliance on nuclear are under more pressure to restart nuclear units.
- Final rules on nuclear safety may not be released until after the Upper House election in July, so as to depoliticize the matter. Draft regulations call for, among others, the construction of protective structures, more stringent thresholds on active faults, installation of filtered air vents for boiling water reactors (BWRs). Restarts of any BWRs could be delayed by two to three years. Some utilities have begun making improvements and will likely revise their previously announced restart targets.
- Upon any nuclear restarts, reducing expensive oil imports first seems most logical, but technical and strategic reasons may point to lower spot LNG imports initially as well. If reactors in Hokkaido, Hokuriku and Shikoku were to restart, their heavy reliance on oil as a substitute for nuclear generation should immediately displace oil imports, as they have little to no reliance on LNG. But areas that import both gas and oil could see gas imports fall earlier. Key government officials as well as utilities and possibly trading houses are strategically positioning themselves for negotiations with LNG exporters and other LNG portfolio players for supply contracts.

Figure 63. Map of Nuclear reactors in Japan

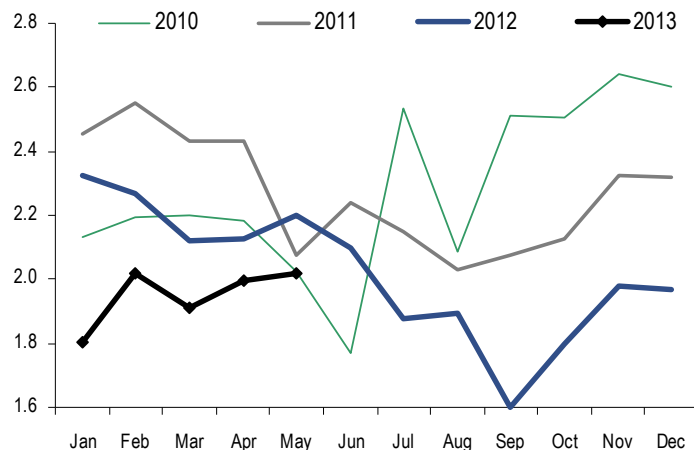


Source: OECD-Nuclear Energy Agency

Brent Balances

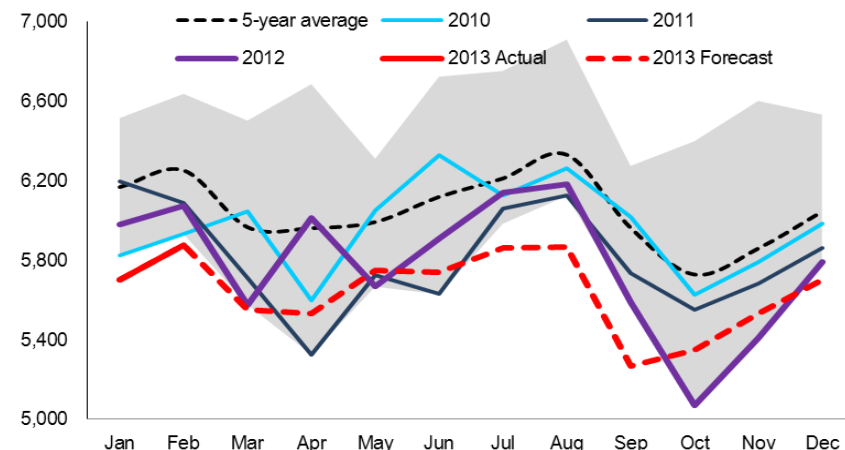
- **Citi has been expecting a correction in Brent Spreads, which has now materialized.** Looking forward the view on Brent structure is fairly opaque, with countervailing bullish and bearish factors in play.
- **The changes to the Brent pricing mechanism and the changes to the South Korean tax regime governing North Sea crude imports and product exports are both moderately bearish.** The move lower in Brent spreads partly reflects this new structural reality for Brent.
- **On the bullish side of the ledger however are the seasonal fundamentals.** N Sea loadings have recovered from a very weak start to the year but are set to decline over the summer as seasonal field maintenance kicks in. Meanwhile, refining throughput will increase seasonally, though Citi expects this to happen at a more gradual pace than in previous years due to weak expectations for European refining margins.
- **On the bearish side in the short term** we are seeing strong increases in May BFOE programs, up 90 k b/d m/m, whilst the May Forties program seems to be in good supply with 22 cargoes. However, currently BP is in possession of 7 May cargoes whilst Shell has 6 cargoes, meaning that about 60% of the month's cargoes are held by two big players which is leaving the market uncertain about how they will choose to play it.
- **Also of note is Urals vs. Forties cracking margins,** which are finely balanced at the moment but could be favoring Urals going forward. Urals is currently weak in the North but strong in the Med, with the North-South arb being constrained by high freight rates.

Figure 64. N Sea Loadings Schedules



Source: Citi Research

Figure 65. Europe (OECD + Non-OECD) Refinery Throughput

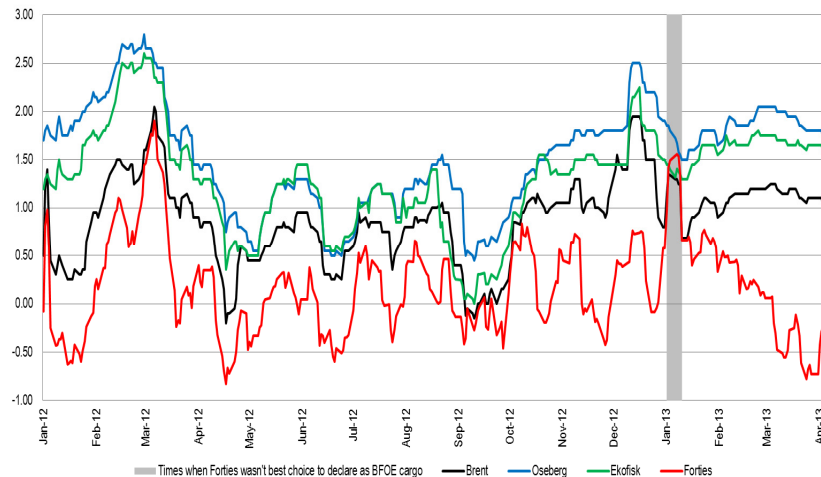


Source: Citi Research

Changing North Sea Pricing of BFOE, How Effective Will it actually be?

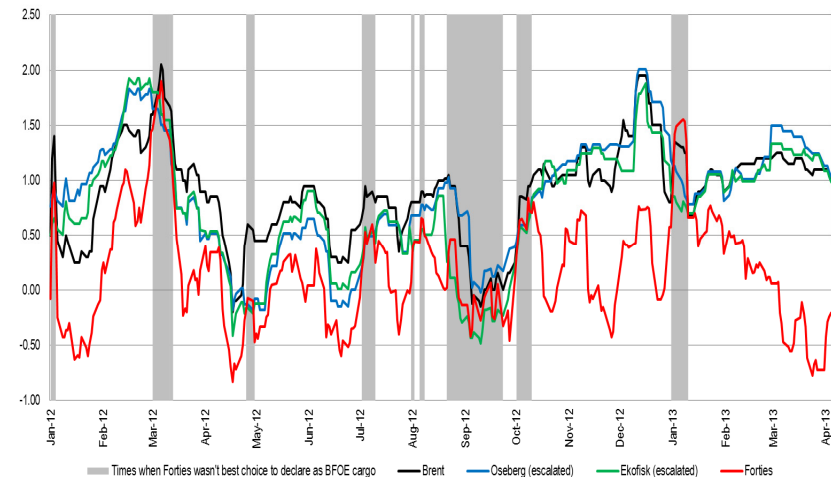
- Shell and Platt's have now settled on a new pricing mechanism for North Sea Crude that will introduce the use of price escalators on Oseberg and Ekofisk Crude grades. This will come into effect in June and is somewhat bearish for the Brent structure. However, using our data to historically replicate the change in pricing as shown in below shows that the Forties problem is far from fixed. The times when Forties was not the Cheapest to Deliver as a BFOE cargo have improved from the current pricing situation displayed but has the price change gone far enough?
- By increasing the amount of time that non-forties crudes set the price for BFOE it does remove the spike potential, but as can be seen by the subsequent chart on a historical basis, Forties is still the price setter for most of the time. This brings into question whether this pricing mechanism change will actually deliver significant improvements.
- The combined effect of the South Korean Tax rebate changes and the Platt's/SUKO-90 price setting change are bearish for Brent but not catastrophically so and the collapse in spreads seen of late obviously indicates some of this new normal being priced in. Bearing this in mind then combined with the upcoming ramp-up in crude demand expected from refiners and the Brent structure may have reached its weakest point.

Figure 66. Old BFOE Pricing Mechanism Cheapest to Deliver



Source: Citi Research

Figure 67. New BFOE Platt's/SUKO-90 Pricing Mechanism applied Historically

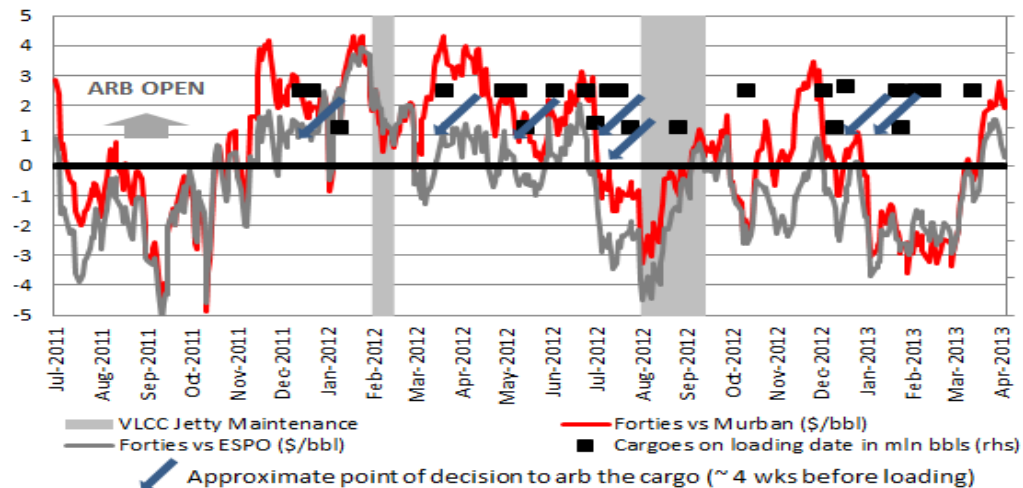


Source: Citi Research

South Korean Tax Rebate Changes; A reduction in the price advantage rather than a closing of the Arb

- Prompt spreads in Brent have now slipped into contango and part of this reason is attributed to changes in the Korean export tax loophole that previously allowed a rebate to be collected on product exports even if they were manufactured with North Sea Crude which itself had no import rebate when entering the country. This adjustment that had been in place since July 2011 has kept the South Korea bid for North Sea barrels artificially high.
- The South Korean government is eliminating the tax rebate on product exports sourced from North Sea Crude barrels starting in July. This will drop the benefit down from a 3% benefit to around a 1.8% benefit based on the calculations that North Sea Crude makes up around 40% of refined product exports from South Korea, this level however could still be subject to change.
- Overall this will be marginally bearish for the North Sea. It will have a more muted effect as this change will not completely eliminate the price advantage afforded to North Sea barrels, rather it will reduce the price advantage. In order for the Arb to close, we would need to see a further narrowing of the Forties vs. ESPO spread.

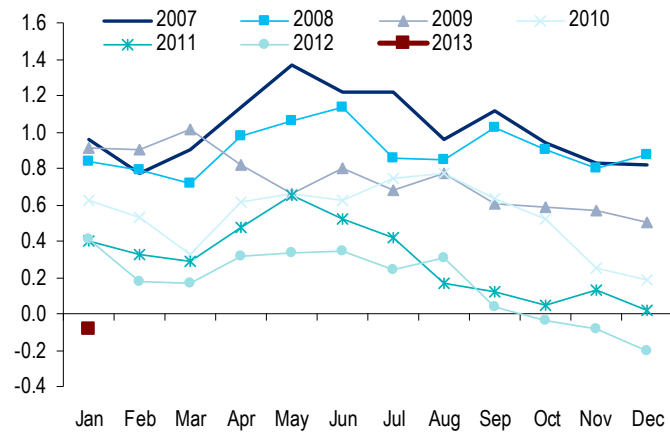
Figure 68. Forties Arbitrage to South Korea



Source: Citi Research

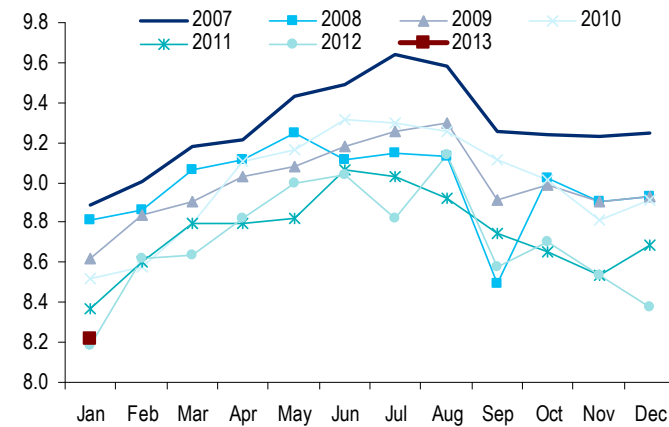
Light ends now bearing the brunt of the US shale revolution

Figure 70. US total gasoline imports (m b/d)



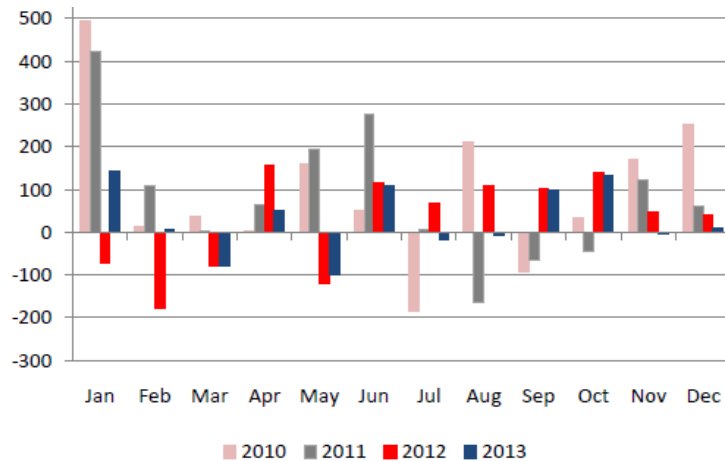
Source: Bloomberg, EIA, Citi Research

Figure 71. US gasoline demand (m b/d)



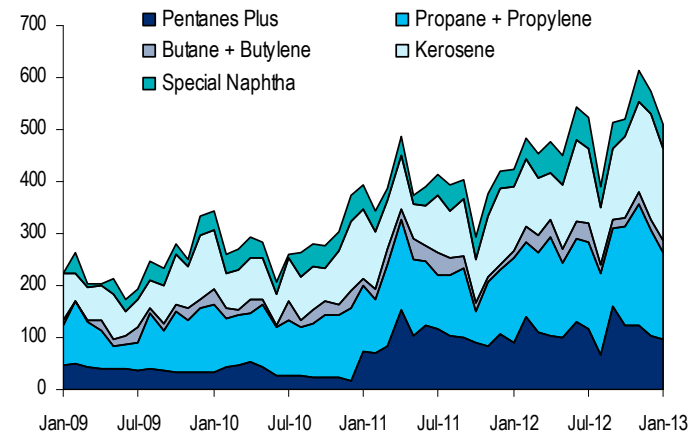
Source: Bloomberg, EIA, Citi Research

Figure 72. Asian gasoline surplus (k b/d)



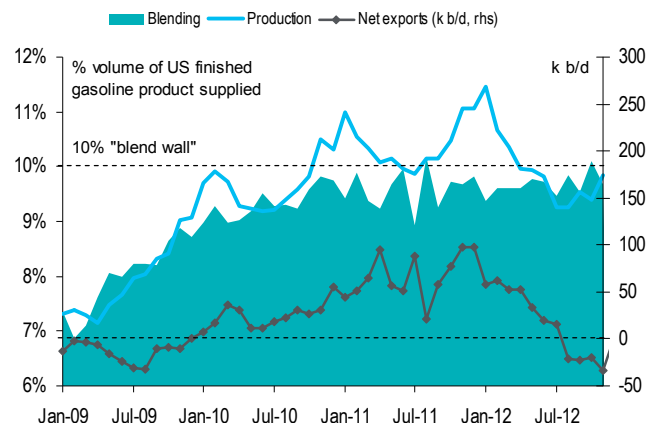
Source: Citi Research

Figure 73. US exports of selected products (k b/d)



Source: EIA, Citi Research

Figure 74. Ethanol blending is close to the blend wall



Source: EPA, EIA, Citi Research

RINsanity, when it really hits, could spike retail gasoline, depress RBOB prices

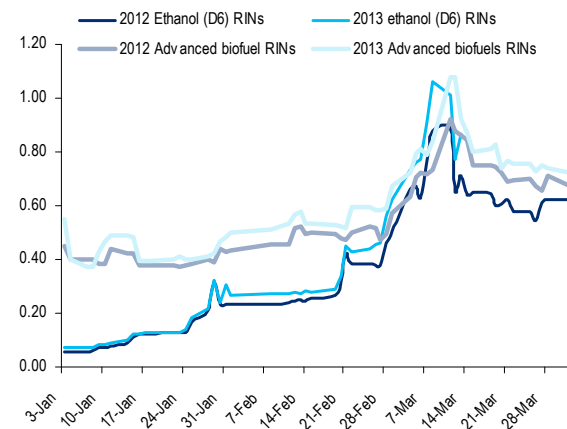
- RINs are credits to make up for a shortfall of ethanol blending below the RFS mandated level. But blenders (that are refiners/importers) face obligated volumes which are higher than 10% of gasoline consumption. Given the E10 standard (10% ethanol, 90% gasoline) and falling gasoline demand in the US, this "blend wall" is falling, and is now falling below the aggregate RFS mandated level in 2013, and further in 2014. Individual obligated parties may yet be able to fulfill the quota in 2013 due to a 9.63% requirement – though the aggregate would remain out of compliance – but the calculation could be above 10% in 2014 for individual obligations too, clearly creating a policy contradiction.
- There is a 2.6-bn gal stockpile of RINs from previous years when the RFS mandate was below the blend wall; thus surplus ethanol was blended and a backlog of RINs was accumulated. But now this can only really be run down going forward. As RINs availability tightens with no safety valve, prices need to rise to ration use. RINs could become prohibitively expensive for refiners to produce/import gasoline for the US market.
- At that point, refiners would look to pass on the cost of RINs to the price at the pump, while also exporting gasoline and cutting imports, which would drive a wedge between the price of retail gasoline and RBOB. This could be bearish RBOB as refiners need import prices to be low enough to offset high RINs costs.

Figure 75. The RFS mandates higher ethanol blending than the blend wall in 2013

bn gal	Corn-based ethanol	Advanced biofuels	Sum
2011	12.6	1.4	14.0
2012	13.2	2.0	15.2
2013	13.8	2.8	16.6
2014	14.4	3.8	18.2
2015	15.0	5.5	20.5
2016	15.0	7.3	22.3
2017	15.0	9.0	24.0
2018	15.0	11.0	26.0
2019	15.0	13.0	28.0
2020	15.0	15.0	30.0
2021	15.0	18.0	33.0
2022	15.0	21.0	36.0

Source: EPA, EIA, Citi Research

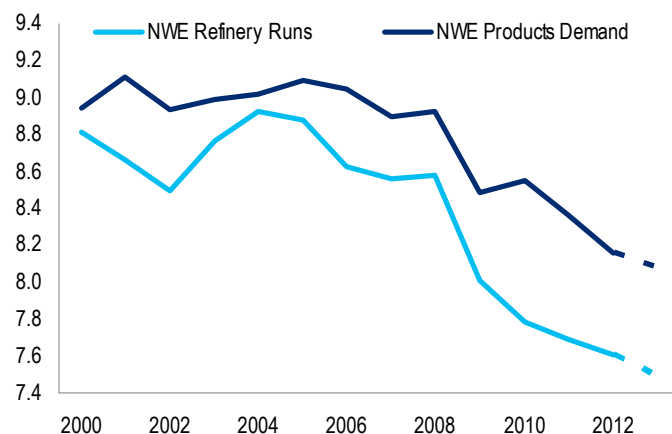
Figure 76. RINs prices spiked and eased, settling at 60-80 c/gal



Source: Bloomberg, Citi Research

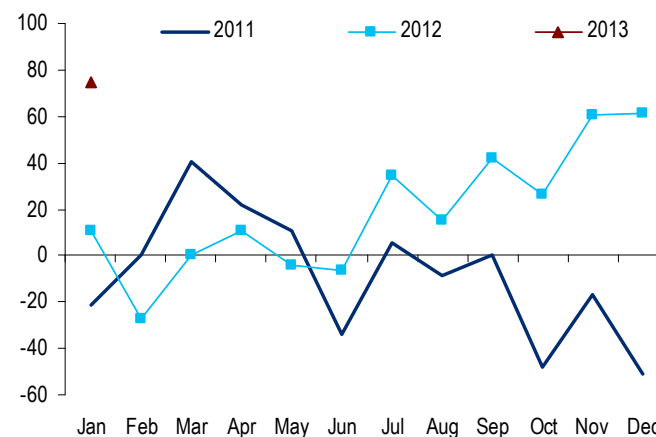
Distillate cracks face pressure from many angles

Figure 77. NWE – Refinery runs falling in line with demand (k b/d)



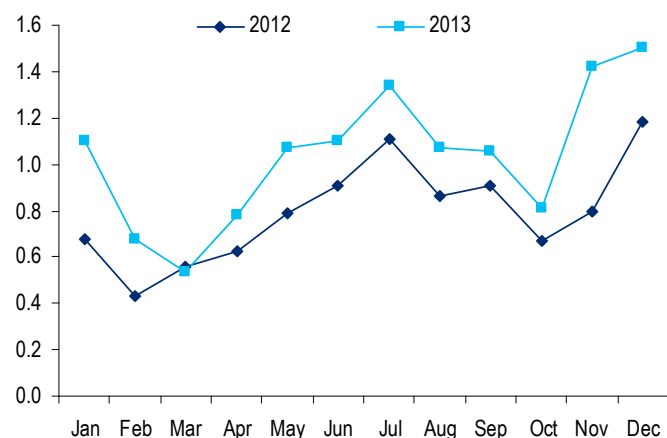
Source: Bloomberg, ESI, Citi Research

Figure 78. Chinese net diesel exports (k b/d)



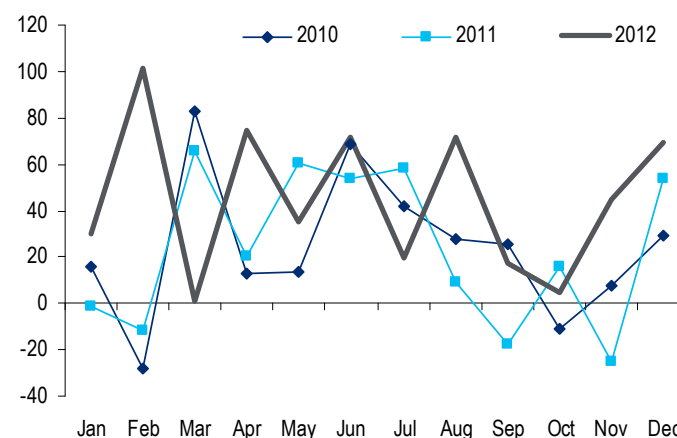
Source: Bloomberg, ESI, Citi Research

Figure 79. US distillate exports (m b/d)



Source: Bloomberg, ESI, Citi Research

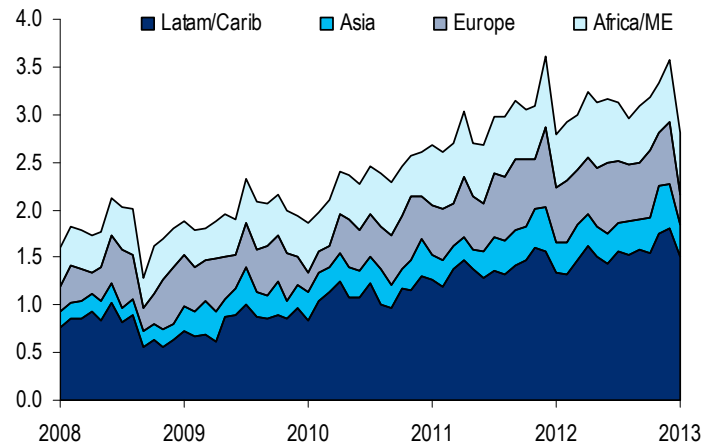
Figure 80. Chinese net jet kero exports (k b/d)



Source: Bloomberg, ESI, Citi Research

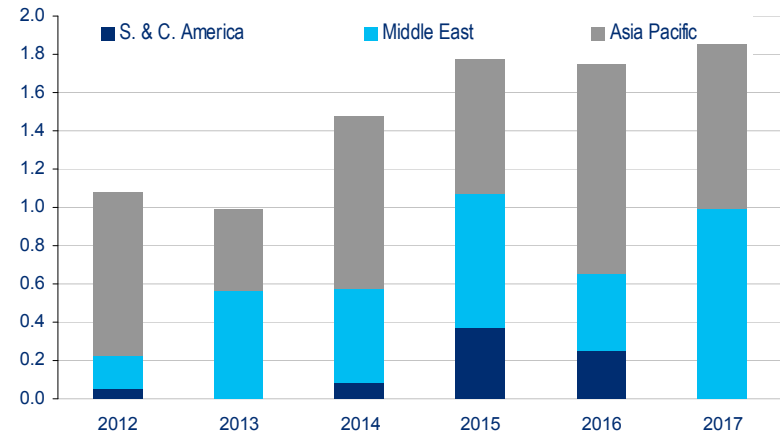
Latin American has been absorbing the US surplus. A Recovery of the Venezuelan Refining Sector is Negative For European Refiners

Figure 81. US product exports by destination (m b/d)



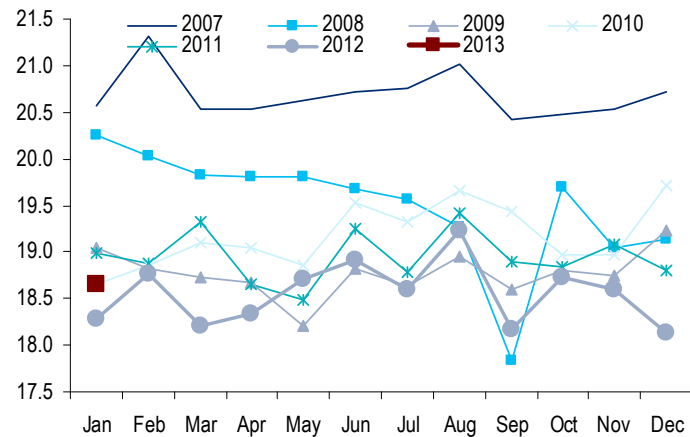
Source: EIA, Citi Research

Figure 82. Regional refining capacity additions (m b/d)



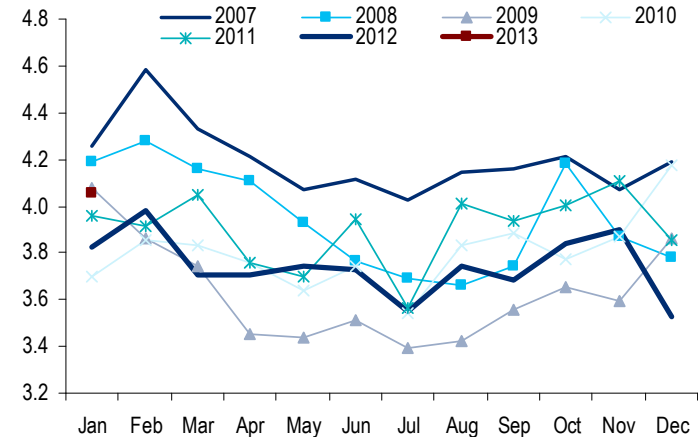
Source: Citi Research

Figure 83. US total oil demand (m b/d)



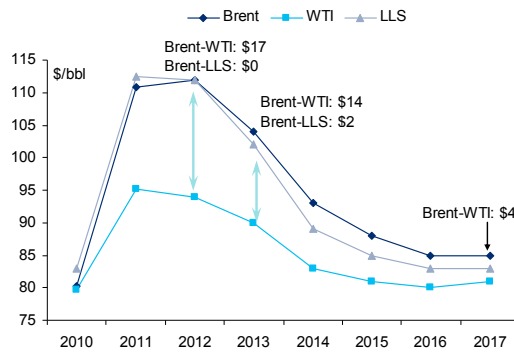
Source: EIA, Citi Research

Figure 84. US distillate demand (m b/d)



Source: EIA, Citi Research

Figure 85. Brent, WTI and LLS Price Forecast (\$/bbl) 2011-2017



Source: Citi Research

Citi medium-term outlook for Brent, WTI, LLS

- **WTI can reconnect with Brent in the medium-term as before 2010, but with WTI now at a discount to Brent.** 2014 sees the Seaway and Spearhead twinning keep the Brent-WTI spread at \$10 as LLS-Brent moves wider as the crude glut migrates down to PADD III and all light, sweet crude imports are pushed out late-2013, with exports to Canada as an initial outlet after Gulf Coast refiners maximize absorption of light sweet crude, without other US crude exports assumed in the short-term. In the longer-term, LLS-Brent could narrow significantly as outlets are found for US light sweet crude.
- **2015 could see the northern leg of Keystone XL bring further Canadian oil sands-derived crudes to Cushing and southwards to the Gulf Coast, relieving WCS further, and allowing Gulf Coast refiners to process heavier Canadian crudes, pushing out further heavier sourer crude imports.** The Enbridge trunkline from Patoka to St James could also be complete, allowing further supplies to reach the eastern Gulf Coast. WTI-LLS could come in further as greater midstream competition causes pipeline tariffs to fall – Gulf Coast to Cushing pipeline costs used to be as low as 75 cents per barrel. Rail transportation costs may also contract to stay competitive in reaching the East and West Coasts. LLS-Brent should contract as export rules potentially loosen, leaving WTI-Brent again at -\$2-3/bbl in the long-term.

Figure 86. Brent, WTI and LLS Price Forecast (\$/bbl) 2011-2017

\$/bbl	2010	2011	2012	2013	2014	2015	2016	2017
Brent	80.3	110.9	112	104	93	88	85	85
WTI	79.6	95.1	94	90	83	81	80	81
LLS	82.9	112.4	112	102	89	85	83	83
WTI-Brent	-1	-12	-17	-14	-10	-7	-5	-4
Brent-LLS	-2.5	-1.4	0	2	4	3	2	2
WTI-LLS	-3	-13	-17	-12	-6	-4	-3	-2

Source: Bloomberg, Citi Research

US Natural Gas – revising prices upward

- **Citi is revising 2013 US Henry Hub natural gas price higher from \$3.55 to \$4.30.** As various factors lowered the projected end-of-October gas storage level to around 3.7-Tcf using current prices, for the market to reach the 4-Tcf storage target by Oct'13, coal-to-gas switching demand has to fall, implying that gas prices would have to rise. **Citi is also marking to market 1Q'13 prices at \$3.48 vs. our pre-1Q forecast of \$3.50.** Factors that have driven gas inventories lower include:
 - A much colder-than-expected March boosted demand and drove gas storage back down to the 1.68-Tcf range, similar to the levels seen in March of 2009, 2010 and 2011. Note that prices averaged \$4.38 in 2010 and \$4.00 in 2011.
 - Due to the structure of the electricity supply-stack, prices are now skewed to the upside. If summer weather becomes hotter than normal and prices rise, the remaining gas-fired units running are highly competitive, so that prices would have to rise more to drive those units out of the merit-dispatch order.
 - There appears to be stronger switching to gas in the power sector than the historical demand-price relationship would indicate. This could be due to some coal-fired plant retirements, which will continue to take place. The weekly gas storage balance is now indicating a tightness of around 0.7-Bcf/d. There are indications stronger gas demand from natural gas vehicles (NGVs) is taking place, but the lack of data transparency prevents us from seeing this.
 - Pacific Northwest hydroelectric generation will likely fall by about 4-GW YoY from Q2 into Q3, contributing to an equivalent of 80-Bcf of extra gas demand.
- **Citi is also revising 2014 gas prices higher from \$4.10 to \$4.50 because of stronger underlying demand making 2014's balance tighter** and the need to factor in borrowing/storage costs. The latter should result in a \$0.20/MMBtu price spread between 2014 and 2013 prices. The continued strength of gas demand for power generation, the increase in natural gas vehicles use and other demand factors should raise consumption further. **However, the forward market may show a tighter spread, as producer hedging may continue to push down the still liquid part of forward curve out two to five years.**

Figure 1. US natural gas supply-demand balance

Quarter	Oct-12	Jan-13	Apr-13	Jul-13	Oct-13	Jan-14	Apr-14	Jul-14	Oct-14	2012	2013	2014	'13v'12	'14v'13
Total Supply	70.2	69.6	69.0	69.6	69.0	71.4	70.8	71.5	70.9	70.0	69.3	71.2	(0.7)	1.9
Prod	66.0	65.4	65.5	65.7	66.0	67.3	67.4	67.7	68.0	65.7	65.6	67.6	(0.0)	2.0
LNG	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	(0.1)	-
Exports to Mexico	(1.1)	(1.7)	(1.9)	(2.1)	(1.9)	(1.8)	(2.0)	(2.2)	(2.1)	(1.5)	(1.9)	(2.0)	(0.4)	(0.1)
Imports from Canada	5.0	5.6	5.1	5.7	4.6	5.6	5.1	5.7	4.6	5.5	5.3	5.3	(0.3)	-
LNG Exports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Demand	72.4	87.8	58.2	59.9	73.2	87.1	60.4	62.2	75.4	70.2	69.8	71.3	(0.4)	1.5
IND	19.9	21.4	18.8	18.6	20.6	22.1	19.6	19.5	21.6	19.1	19.8	20.7	0.7	0.9
ResComm	23.8	41.1	14.5	8.5	25.0	40.4	14.7	8.9	25.4	20.2	22.3	22.3	2.1	0.1
EG	20.1	19.8	20.6	27.7	19.0	18.8	21.3	28.3	19.3	25.1	21.8	21.9	(3.4)	0.1
Pipe Use	1.9	2.5	1.6	1.7	2.0	2.5	1.7	1.7	2.0	1.9	1.9	2.0	(0.0)	0.0
Lease and Plant Fuel	3.8	3.8	3.7	3.8	3.7	3.9	3.9	3.9	3.9	3.8	3.8	3.9	(0.0)	0.1
Transport	0.1	0.3	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.1	0.3	0.6	0.2	0.3
Gas price (\$/MMBtu)	3.40	3.48	4.30	4.60	4.70	4.60	4.40	4.40	4.60	2.75	4.30	4.50	1.54	0.20
Prior Forecast	3.40	3.50	3.50	3.60	3.70	4.20	4.00	4.00	4.20	2.75	3.55	4.10		

Source: Bloomberg, Citi Research

Figure 2 Monthly Supply-Demand Balance

	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	2012	2013	Change
Total Supply	69.3	69.4	69.7	69.6	68.9	68.9	69.2	70.1	69.3	69.5	69.6	69.2	68.2	70.0	69.3	(0.7)
Prod	65.2	64.9	65.5	65.7	65.4	65.6	65.4	65.7	65.4	66.1	66.4	66.5	65.2	65.7	65.6	(0.0)
LNG	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	(0.1)
Exports to Mexico	(1.1)	(1.7)	(1.7)	(1.8)	(1.7)	(1.8)	(2.1)	(2.0)	(2.1)	(2.1)	(2.1)	(1.8)	(1.9)	(1.5)	(1.9)	(0.4)
Imports from Canada	4.9	5.9	5.7	5.4	4.8	4.8	5.7	6.1	5.8	5.3	5.1	4.3	4.5	5.5	5.3	(0.3)
LNG Exports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Normal summer (10-yr avg)																
Total Demand	82.2	93.0	91.1	79.3	62.3	55.6	56.7	60.8	62.2	56.8	61.1	70.9	87.7	70.2	69.8	(0.4)
IND	20.8	21.6	21.6	20.9	19.4	18.6	18.4	18.5	18.6	18.5	19.4	20.5	21.9	19.1	19.8	0.7
ResComm	33.7	44.5	43.1	35.8	21.0	12.8	9.6	8.4	8.1	9.0	13.8	23.0	38.4	20.2	22.3	2.1
EG	19.4	19.7	20.6	19.0	18.5	19.6	23.6	29.3	29.7	24.2	20.1	18.1	18.8	25.1	21.8	(3.4)
Pipe Use	2.2	2.6	2.6	2.3	1.8	1.5	1.6	1.7	1.7	1.6	1.6	1.9	2.4	1.9	1.9	(0.0)
Lease and Plant Fuel	3.8	3.8	3.8	3.8	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.7	3.7	3.8	3.8	(0.0)
Transport	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.3	0.2
Other	2.1	0.5	(0.9)	(2.9)	(2.4)	(1.0)	(0.6)	(1.3)	0.1	(0.6)	2.2	3.4	2.1	(0.1)	(0.1)	-
Storage	(12.9)	(23.6)	(21.3)	(9.7)	6.6	13.2	12.5	9.3	7.1	12.8	8.5	(1.7)	(19.5)	(0)	(0)	(0)
Inventory (Bcf)	3,402	2,670	2,073	1,773	1,970	2,381	2,757	3,045	3,266	3,649	3,912	3,862	3,258			
w/o Mar'13 balancing item	3,402	2,670	2,073	1,682	1,880	2,291	2,667	2,954	3,175	3,558	3,822	3,772	3,167			
HDD (avg per day)	21.8	26.8	26.4	21.8	10.7	4.6	1.0	0.2	0.3	1.8	8.4	16.0	25.7			
CDD (avg per day)	0.5	0.6	0.4	0.4	1.3	3.7	8.0	11.0	10.6	6.0	2.0	0.6	0.3			
2012 Summer																
Total Demand	82.2	93.0	91.1	79.3	62.3	55.6	57.2	65.4	62.7	56.8	61.1	70.9	87.7	70.2	70.2	0.0
IND	20.8	21.6	21.6	20.9	19.4	18.6	18.5	18.7	18.6	18.5	19.4	20.5	21.9	19.1	19.8	0.7
ResComm	33.7	44.5	43.1	35.8	21.0	12.8	9.7	8.5	8.1	9.0	13.8	23.0	38.4	20.2	22.3	2.1
EG	19.4	19.7	20.6	19.0	18.5	19.6	24.0	33.6	30.1	24.2	20.1	18.1	18.8	25.1	22.2	(2.9)
Inventory (Bcf)	3,402	2,670	2,073	1,773	1,970	2,381	2,742	2,886	3,092	3,475	3,739	3,689	3,085			
HDD (avg per day)	21.8	26.8	26.4	21.8	10.7	4.6	1.1	0.1	0.3	1.8	8.4	16.0	25.7			
CDD (avg per day)	0.5	0.6	0.4	0.4	1.3	3.7	8.3	13.3	10.9	6.0	2.0	0.6	0.3			
Summer CDD vs. 10-year avg							104%	121%	102%							
2009 Summer																
Total Demand	82.2	93.0	91.1	79.3	62.3	55.6	56.2	58.0	61.2	56.8	61.1	70.9	87.7	70.2	69.4	(0.8)
IND	20.8	21.6	21.6	20.9	19.4	18.6	18.4	18.5	18.6	18.5	19.4	20.5	21.9	19.1	19.8	0.7
ResComm	33.7	44.5	43.1	35.8	21.0	12.8	9.8	8.5	8.1	9.0	13.8	23.0	38.4	20.2	22.3	2.1
EG	19.4	19.7	20.6	19.0	18.5	19.6	23.0	26.6	28.7	24.2	20.1	18.1	18.8	25.1	21.4	(3.7)
Inventory (Bcf)	3,402	2,670	2,073	1,773	1,970	2,381	2,770	3,146	3,398	3,781	4,044	3,995	3,390			
HDD (avg per day)	21.8	26.8	26.4	21.8	10.7	4.6	1.3	0.5	0.4	1.8	8.4	16.0	25.7			
CDD (avg per day)	0.5	0.6	0.4	0.4	1.3	3.7	7.6	9.4	10.1	6.0	2.0	0.6	0.3			
Summer CDD vs. 10-year avg							96%	86%	95%							

Source: EIA, Citi Research

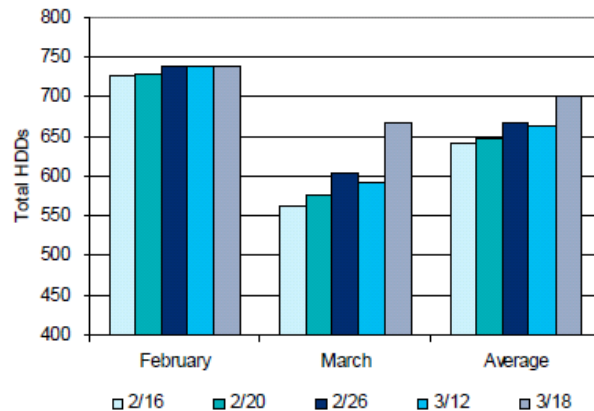
Assuming a normal summer, our price forecast should put Oct'13 storage at around 3.9-Tcf

- If summer weather were as hot as 2012's summer, then Oct'13 gas storage could fall to 3.7-Tcf due to stronger demand for cooling. But this means that the gas demand due solely to its substitution over coal (ie, coal-to-gas switching) should fall because gas-fired power plants becomes less competitive vs. coal.
 - Note the fine distinction between a demand-driven price increase, which a hot summer and the resulting high demand could generate, and a price-driven demand increase, which the market observed last year when gas prices had to fall to induce gas demand for electricity generation (the most price-sensitive sector) to absorb the gas inventory overhang. Cal 13 average gas prices may have to climb above \$4.5 to reduce coal-to-gas switching further, but this could also lead to producers increasing production again, containing price increases
- If summer weather were as mild as 2009's summer, then Oct'13 gas storage could rise to 4.1-Tcf. Gas prices should fall to induce more coal-gas switching to reduce the amount of gas injection into storage. Cal 13 average gas prices may have to fall to \$3.9 to increase coal-to-gas switching, so that the end-of-Oct'13 storage could fall under 4.0-Tcf

Much colder weather at the end of winter sharply reduced gas inventories

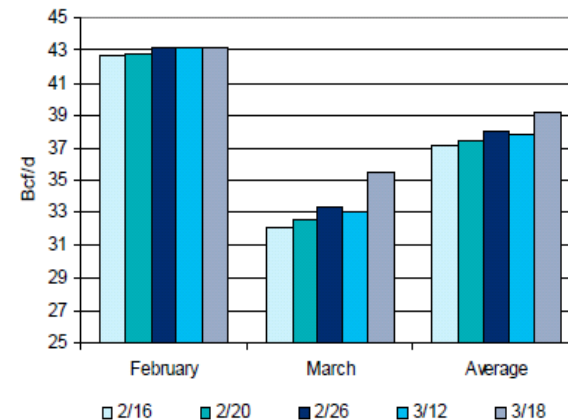
- **Weather change:** The weather forecast for March went from having 3% fewer HDDs than the 10-year normal, as predicted in mid-February, to having 16% more HDDs than 10-year weather. The **remarkable 19% increase in HDDs for March drove a 3.5-Bcf/d rise in heating demand** from the Residential/Commercial sector. Combined with a colder-than-expected end to February, total end-of-March expected storage fell from the 1.9-Tcf range to 1.6-Tcf range.
- **This is in sharp contrast to what had happened over the last few years. The market had been conditioned to think that March could be mild**, if not staying at around normal weather, given how March weather in the past few years typically turned more moderate, despite a cold December-to-February period (e.g. the 2010-2011 winter). The YoY comparison was stark. HDDs in March 2012 were about 36% below the 10-year norm.
- **Low end-of-October inventories:** In mid-February, the Oct'13 inventory level was projected to be 3.88-Tcf based on prices and weather forecasts then. **This storage level was below the 4-Tcf bull/bear threshold that the market seems to target.** Hence, supportive factors to a price rise were in place. As March weather turned colder, a lower end-of-winter gas storage level pulled down further the end-of-injection season storage level in October.
- **Citi's supply-demand and price forecasts incorporate the gas storage requirement ahead of winter, targeting the 4-Tcf level just ahead of winter, instead of leaving Oct'13 gas storage at a much lower level.** Therefore, the resulting price adjustments lead to both a reduction in coal-to-gas switching and a possible return of more gas production. The importance of the 4-Tcf target is illustrated this past winter:
 - With an all-time high in gas storage at over 3.9-Tcf by Nov'12, the end-of-March inventory fell to just over 1.6-Tcf, despite a relatively warm Dec'12 and parts of Jan'13. Thus, if the heart of winter in Dec and Jan were colder-than-normal, the end-of-March storage could fall to much below 1.5-Tcf, perhaps closer to 1.0-Tcf. Although a supply response from higher production should be faster than before, it still takes time for additional production to come online.

Figure 87. Rolling forecasts and actuals of total HDDs in February, March and the two-month average



Source: Bloomberg, Citi Research; *Dates denote when the gas demand model was run

Figure 88. Rolling forecasts and actuals of gas demand in the Residential / Commercial sector in February, March and the two-month average

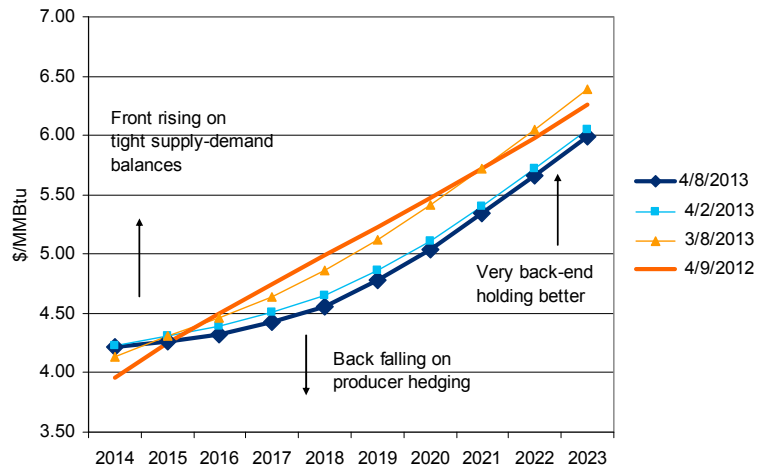


Source: Bloomberg, Citi Research

Narrow time spreads reflect tight front balance, producer hedging at the back

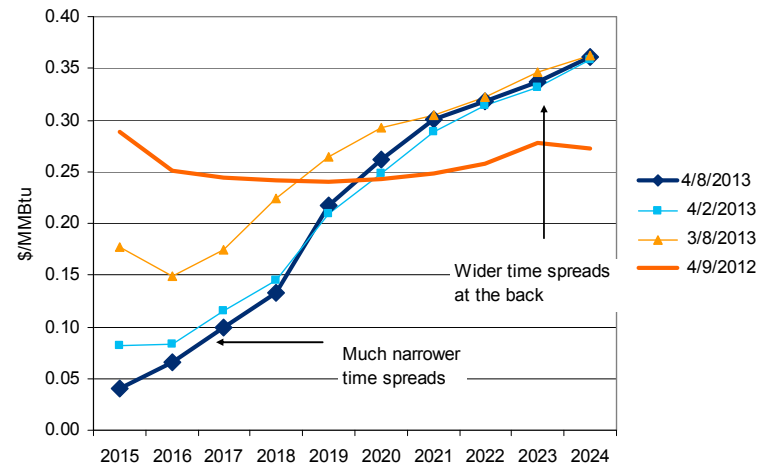
- The surge in front month prices, which induced gas hedging by producers, helped to compress time spreads. The typical 2 to 3c/MMBtu per month of storage spread should have been a key factor keeping the seasonal price spread wide, putting fall prices higher than spring prices. Prices just before winter are typically higher than spring because of the desire to have enough gas available for the high-demand winter season, where the premium paid in fall over spring can be factored into a concept called “convenience yield.” Although this premium is being eroded, as gas supply becomes more abundant and the supply response to high demand and prices is much faster than years past, the fall/spring time spread has narrowed to below storage costs. The response time on the supply side could be down to a matter of weeks, depending on whether producers need to drill for new shale gas in an already-explored area, or producers may have to dial production higher at wells where production has been curtailed mainly due to low prices.
- In fact, the October-May price spread narrowed from a \$0.12 to \$0.15 range (other than a blowout to \$0.20 in the middle of this past winter on the fear that there could be too much gas left in storage by the end of winter) to under \$0.9. This does not appear to price in enough for a storage cost of around 2c/month over the six-month period.
- At the moment, it is unlikely that the multi-year calendar strip could flip from contango, where long-dated prices are higher than front month prices, into backwardation. Weather-normalized gas demand should continue to rise, thereby tightening the supply-demand balance in the future.

Figure 89. Changes in four calendar strips of NYMEX natural gas



Source: Bloomberg, Citi Research

Figure 90. Changes in spreads of calendar strips over the past year

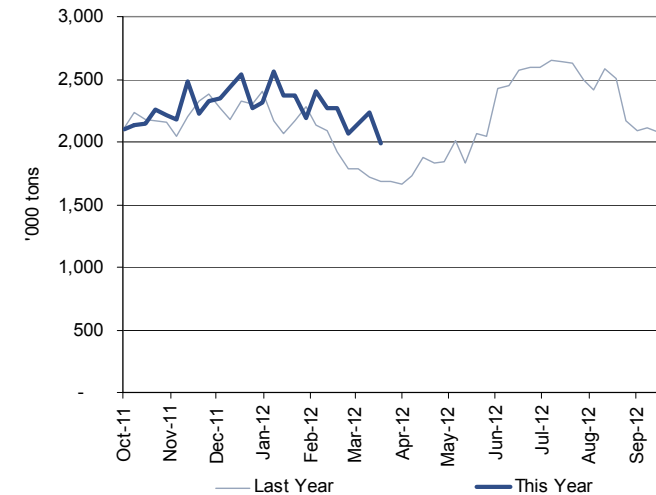


Source: Bloomberg, Citi Research

Higher gas prices should mean more coal burn and less gas demand in the power sector...

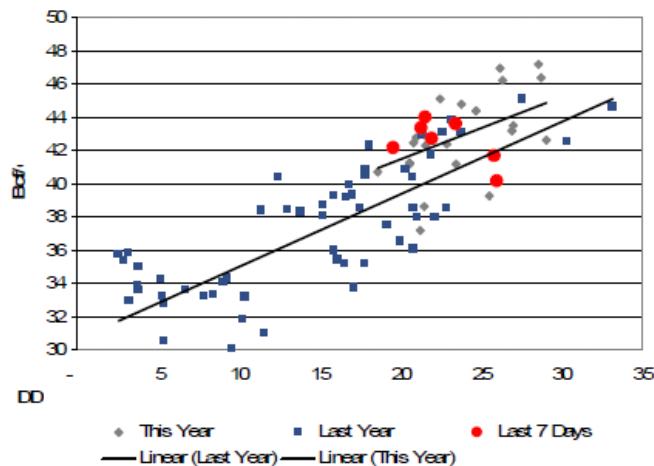
- Higher gas prices should reduce gas demand in favor of more coal demand, as coal-fired power plants become more competitive vs. gas units.
- There are two ways of looking at the amount of coal-gas switching in the power sector: one that is based on daily coal demand and one based on gas demand. Weather-normalized coal demand nationally and in the Mid-Atlantic region (see scatter plots below on coal demand intensities vs. temperature), both show YoY increases. Gas demand intensities vs. temperatures using gas pipeline data show decreases as well, which seem to confirm the shift.
- Yet, despite a shift up in coal demand and a shift down in gas demand, the magnitude does not appear to align with the price change YoY.

Figure 91. Estimated national coal demand



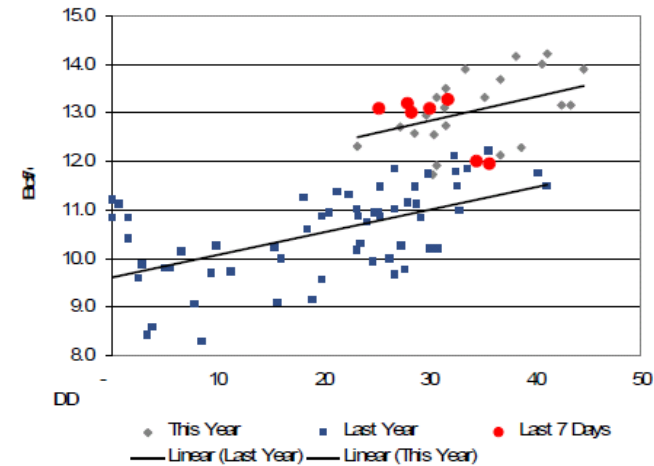
Source: EIA, Genscape, Citi Research

Figure 92. Coal demand intensity (converted to gas-equiv) vs. HDD nationally – showing higher weather-normalized demand



Source: EIA, Genscape, Citi Research

Figure 93. Coal demand intensity (converted to gas-equiv) vs. HDD in the Mid-Atlantic – showing higher weather-normalized demand

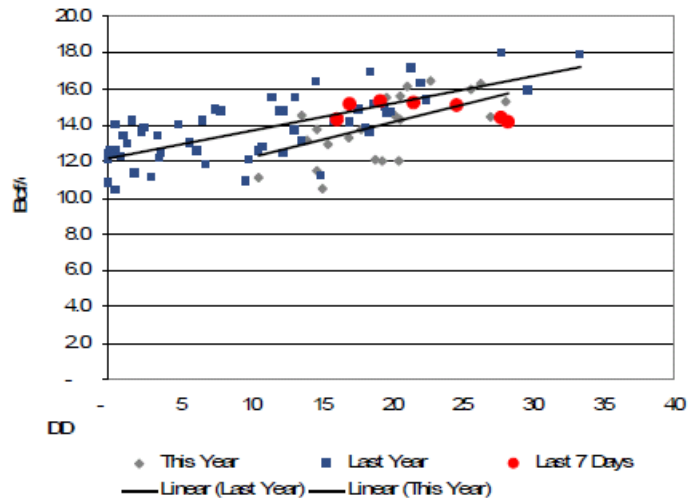


Source: EIA, Genscape, Citi Research

...But coal-gas switching in some regions appears stronger and stickier than prices would indicate

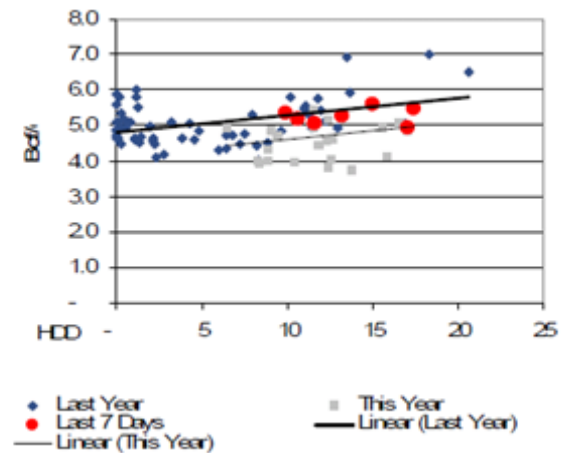
- The Southeast, for example, appears to exhibit a different phenomenon vs. some other regions in the country. **Coal demand intensity vs. temperatures (also known as weather-normalized coal demand) in the power sector is lower YoY.** Weather-normalized gas demand also appears to be about the same as last year, based on measuring gas demand intensities.
- Based on these observations and tightness as implied in weekly storage numbers released by the EIA, **it is possible that gas demand for power generation may be about 0.7-Bcf/d stronger on a weather- and price-normalized basis.** In other words, coal-to-gas switching could be stronger than historical price-to-gas-demand relationship would suggest
- This change could be further corroborated by announcements by a few utilities that they plan to keep gas-fired generation at a relatively high level over coal-fired generation.
- Further, **retirements of coal-fired generation also turn temporary coal-gas switching** due to changes in the prices of gas and coal **into permanent switching**, thereby raising the baseload gas demand.
- Other regions that are seeing a smaller-than-expected coal demand increase include the Midwest and parts of SPP (a power region to the north and east of Texas.)

Figure 94. Coal demand intensity (converted to gas-equiv) vs. HDD in the Southeast



Source: EIA, Genscape, Citi Research

Figure 95. Gas demand intensity (based on gas pipeline data) vs. HDD in the Southeast showing the opposite of coal demand

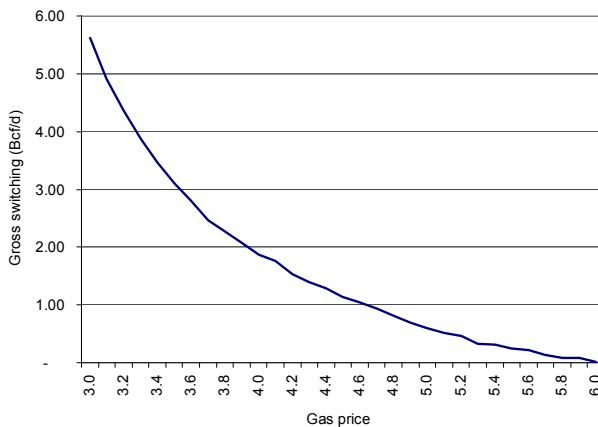


Source: EIA, Bentek, Citi Research

The structure of the electricity supply-stack now requires a bigger price rise to reduce switching

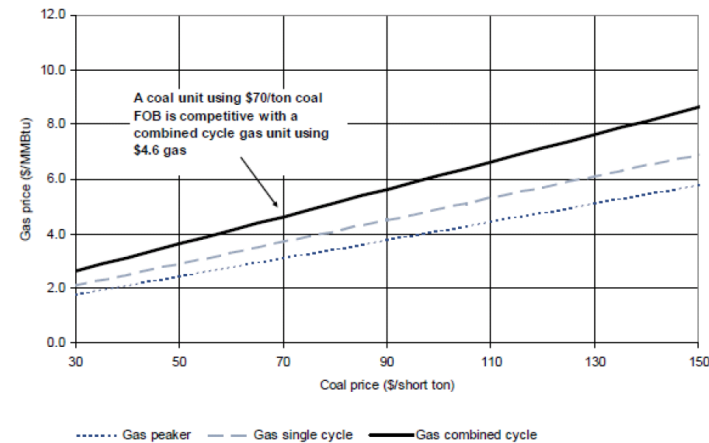
- **Due to the structure of the electricity supply-stack, prices could be skewed to the upside.** If summer weather turns mild and prices fall, there are more gas-fired power plants that can come on and consume gas, so a smaller price change can induce more demand. In 2012, the rule-of-thumb was that for every \$0.50 price change, coal-gas switching could change by 2-Bcf/d, but this happened when most combined cycle and other gas-fired power plants were much more economic than coal-fired power plants. But if summer weather becomes hotter than normal and prices rise, **the remaining gas-fired units running are highly competitive, so that prices would have to rise more to drive those units out of the merit-dispatch order.** This is how the situation would work when gas prices rise from \$3 to \$4:
 - At \$3 gas, the marginal generation cost of a typical combined cycle gas unit at 8- heat rate would be \$24/MWh. At a coal price of \$60/ton for Central Appalachian coal, the typical addition of \$20/ton transport at heat content of 25MMBtu/ton and a heat rate (fuel to electricity conversion) of 10MMBtu/MWh would have meant \$32/MWh in marginal generation cost.
 - However, at \$4 gas, the marginal generation cost becomes \$32, the same as a coal plant. However, some gas plants are highly efficient, such as those that can operate at around 7-heat rate. This means that their marginal generation cost at \$4 gas is around \$28/MWh, still cheaper than and substituting coal. As there are fewer of these plants, prices would have to rise more to make them less economic vs. coal. **For 7-heat rate gas plant to have a marginal generation cost of \$32/MWh, gas prices would have to rise to \$4.57/MMBtu.**
- **There are other factors at work. The drought in the middle of the country could also produce a heat dome effect, raising summer temperature and gas demand,** as the lack of soil moisture deprives the ground's ability to evaporate the heat away. Low water levels could also affect coal and nuclear plant operation because water is needed for cooling boilers inside power plants. Gas power plants are typically called upon to substitute. An improvement in the drought could be helpful, but consecutive years of dry weather may require more precipitation to return the ground to more normal conditions.

Figure 96. Gross coal-to-gas switching (before gas new-builds and coal retirements)



Source: Ventyx, Citi Research

Figure 97. Breakeven costs of gas vs. coal-fired generation

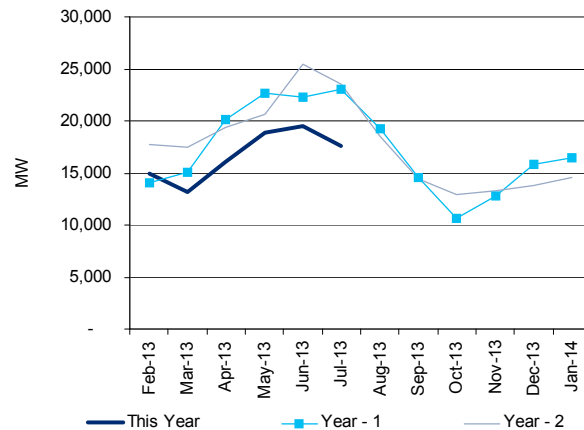


Source: Ventyx, Citi Research

Lower Pacific Northwest hydro generation to tighten the spring/summer market

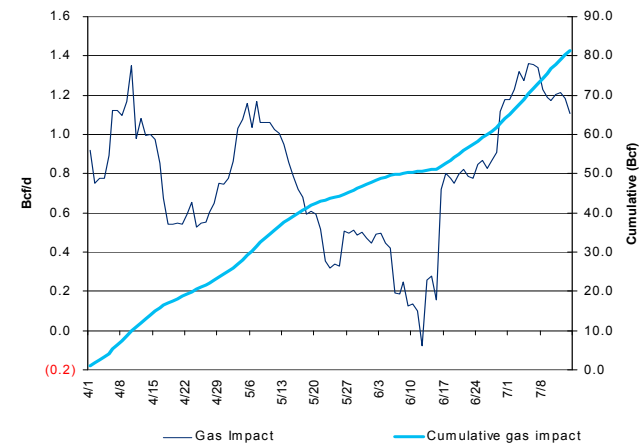
- It looks likely that west hydro generation, which includes the Pacific Northwest and California, could remain lower than last year's level. To substitute the decline in hydropower generation, gas demand will likely increase, as most units in the West are gas-fired.
- Lower YoY hydro generation is due to a winter season ending with a snowpack deficit to last year. Snowfall YTD has been lower, particularly as the region saw a significant decline in precipitation in parts of winter. This is in sharp contrast to the strong precipitation late last winter. Snowpack in Canada is also smaller YoY, thereby reducing the amount of water that could be sent down the Columbia River from British Columbia to Washington state.
- Based on these observations, the average Pacific Northwest hydro generation from April to June could be about 3 to 4-GW lower YoY, based on water inflow forecasts from the government.
- The cumulative impact from now to the end of July could be equivalent to about 80-Bcf in additional gas demand

Figure 98. Monthly hydro generation (actual and forecast)



Source: EIA, NWRFC, Citi Research

Figure 99. Gas impact (assuming 8 heat rate gas as substitute)

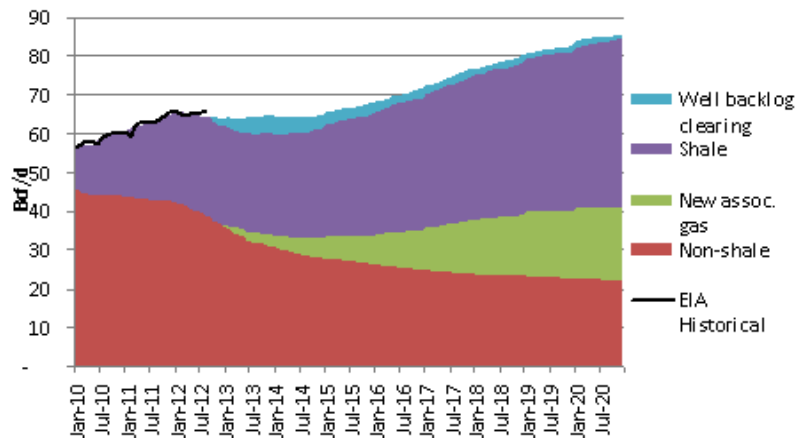


Source: EIA, NWRFC, Citi Research

Production to be supported by tech-improvement, associated gas, well backlogs

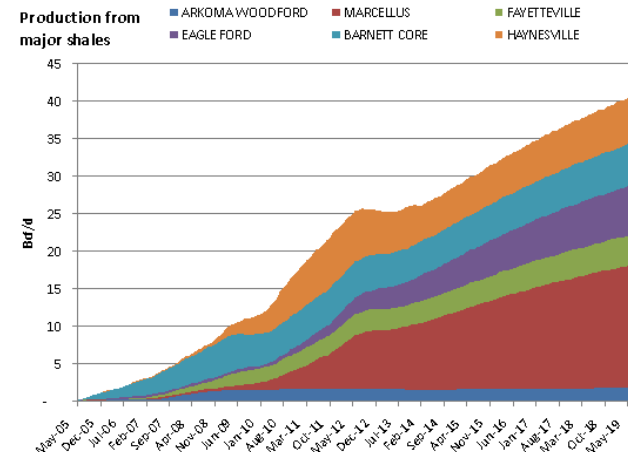
- **With stronger demand this year tightening the supply-demand balance, the expected YoY reduction in production could be reversed. Citi expects production to at least stay flat to 2012.** With projected demand strong and Oct'13 storage falling much below 4-Tcf, **higher prices would be needed to motivate producers bringing additional supply online, either through additional drilling later in the year and/or easing production curtailment.** Higher prices should also reduce coal-gas switching, which is sensitive to coal and gas prices. In particular, the supply decline could be mitigated in three ways:
 - **First, efficiency and productivity improvements could also continue to drive growth**, even with an absence of rig count increase. The improvement is ongoing. Well costs, including pressure pumping and land drilling are also falling in North America, contrary to a possible increase overseas.
 - **Second, clearing the drilled-but-not producing wells could help fill the production gap** from late 2012 to early 2014 left by a natural decline of existing production. **The number of processing plants coming online in Texas and elsewhere could help unlock production that is either being flared, shut-in or curtailed.** Lower rig counts would not have reflected production increase from this segment, as this is deferred production from before. Clearing the backlog of liquids wells can also bring additional associated gas production.
 - **Third, associated gas production should remain strong as the U.S. ramps up oil production.** Oil production could climb by 0.5-mb/d and NGLs higher by 0.2- to 0.3-mb/d YoY in 2013, of which ethane production could rise by 0.1-mb/d. Associated gas production could rise by around 2-Bcf/d YoY. Ethane rejection theoretically could increase gas production by 0.3-Bcf/d, but pipeline specifications could be exceeded due to the mixing of ethane, which has a higher heat content, but also the leakage of propane into the gas stream due to the incomplete separation of propane and ethane.

Figure 100. Production projection



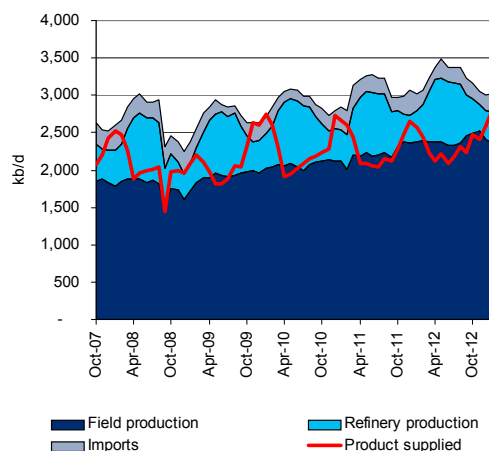
Source: Baker Hughes, Smith International, EIA, Citi Research

Figure 101. Shale production share to surge



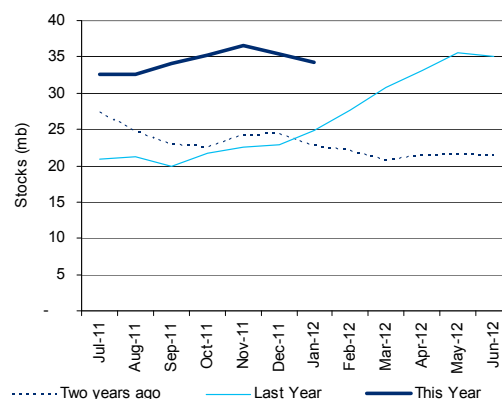
Source: Baker Hughes, Smith International, EIA, Citi Research

Figure 102. NGL supply-demand: rising production



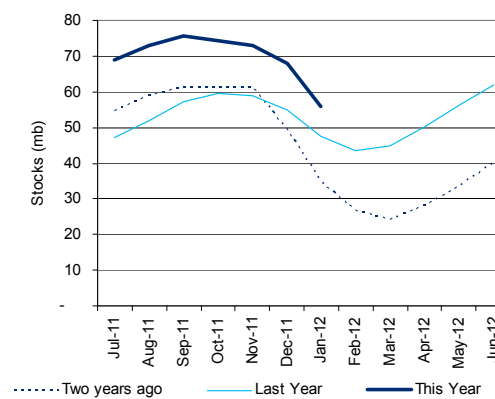
Source: EIA, Citi Research

Figure 103. Ethane stocks remain elevated



Source: EIA, Citi Research

Figure 104. Mild winter to keep propane stocks high



Source: EIA, Citi Research

NGL production should stay strong supporting associated gas production

- Strong production of liquids and oil should boost associated gas production – one of the two drivers keeping gas production in 2013 from falling sharply.
- Natural gas liquids and oil production should continue to be the focus of producers due to the premium over natural gas that they can fetch, and the need to secure liquids-rich and oil acreages. Both could support drilling activities despite the sharp price drop earlier this year and the subsequent range-bound pricing in 2012.
- But prices of lower-value natural gas liquids should remain under pressure. The NGL basket price fell from \$1.40/gallon at the same time last year to \$0.91/gallon in Mont Belvieu, TX – a key price hub in the US. Historically traded at a ratio of 50% to Brent, the ratio fell to as low as 33% earlier in 2012 and remained around the mid-30% now.
- Prices are being dragged down by lower ethane and propane prices due in part to high inventories. Pipes that bring liquids from the Midcontinent to the Gulf Coast relieved the glut up north but exacerbated the glut down in the Gulf Coast. Pipelines that transport ethane to Ontario draw on new ethane production, so they do not necessarily relieve the ethane glut in the continental US.
- With strong liquids production growth expected but not so for ethane/propane demand until the middle of the decade, the glut should remain, as should depressed prices.
- Demand cannot increase enough to absorb the increase in supply. Demand growth awaits major brownfield and greenfield development in the petrochemical, fertilizer and other industrial sectors, which will not be coming until 2016 or later. While export facilities are being added incrementally, they cannot alleviate the NGL glut, especially ethane and propane.

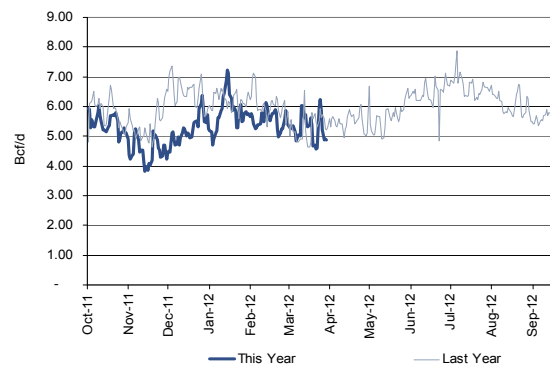
Canadian gas imports to the US could fall slightly as New York no longer imports, but exports gas

Figure 105. Canadian gas production has steadied as more shale plays are drilled, despite a sharp drop in gas rig count



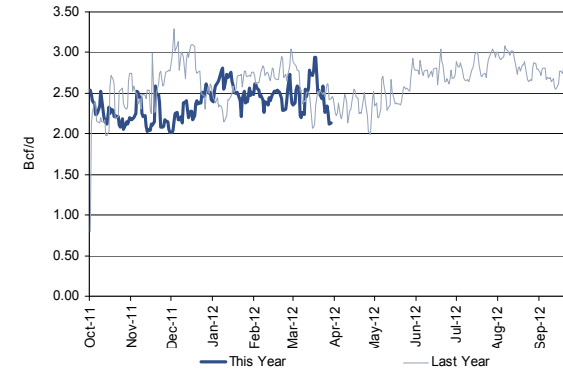
Source: Bentek, Citi Research

Figure 106. Total US imports from Canada. Gas exports from New York account for much of the YoY decline in imports



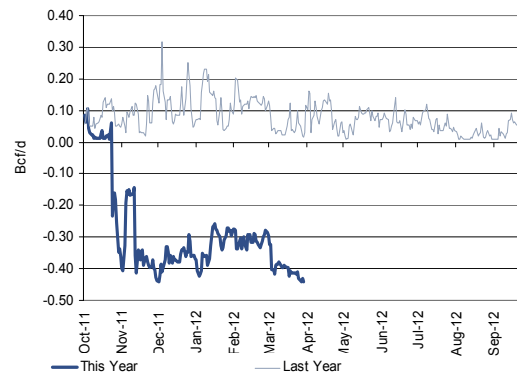
Source: : Bentek, Citi Research

Figure 107. West Coast imports from Canada could stay higher YoY due to lower hydro generation in the Pacific NW



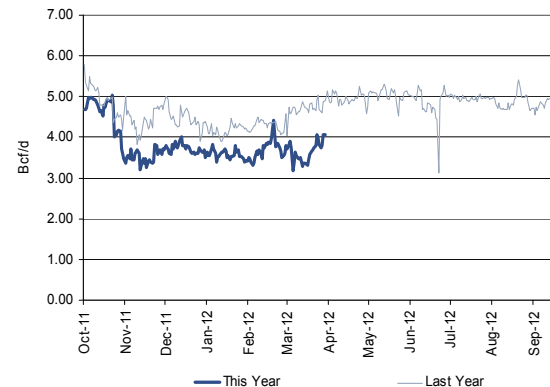
Source : Bentek, Citi Research

Figure 108. New York no longer imports gas but exports Marcellus gas produced in Pennsylvania.



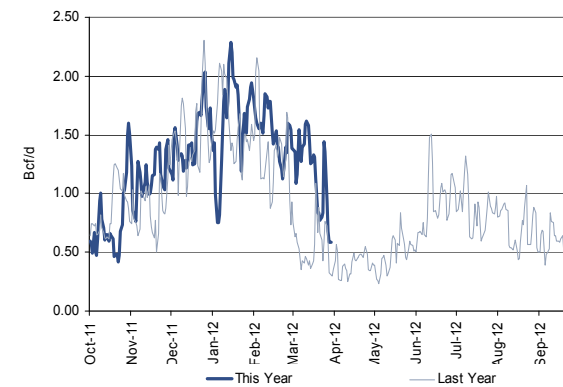
Source: : Bentek, Citi Research

Figure 109. Midwest gas imports from Canada are lower YoY partly due to stronger US domestic production, esp Marcellus



Source: : Bentek, Citi Research

Figure 110. New England imports from Canada could remain high on higher regional demand and limited supply options

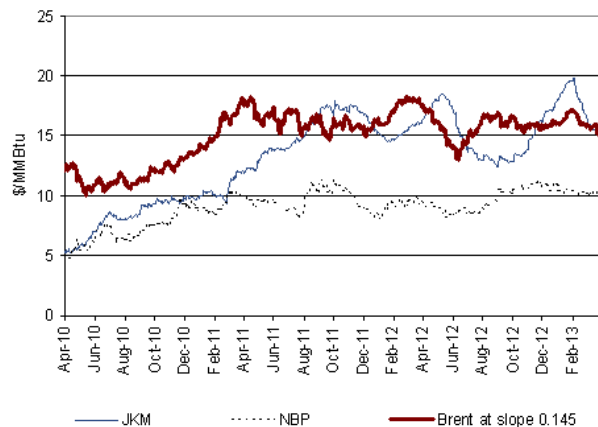


Source: : Bentek, Citi Research

Global Natural Gas

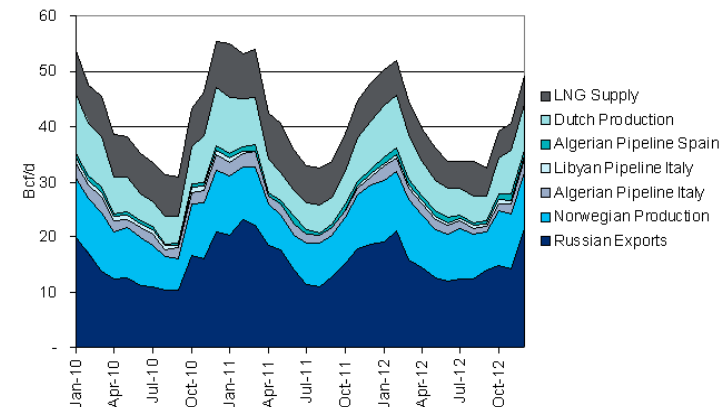
- **Citi is revising Asian LNG prices higher to \$16.3/MMBtu for 2013** from \$15, as a very cold winter in the Northern Hemisphere and higher gas demand in South America due to low hydropower generation caused demand to surge, driving up 1Q'13 prices to \$17.9/MMBtu. 2014 prices are adjusted higher to \$15.8 from \$15.3, as no new supply will be coming online as demand continues to rise. Supply disruptions could linger in Egypt, Nigeria and Yemen. Prices are expected to average \$15 in 2Q'13, \$16 in 3Q'13 on summer demand, and \$16.5 in 4Q'13 as winter demand begins to rise.
- **Citi is revising UK's NBP prices higher to \$10.3/MMBtu (67.5-p/th) for 2013** from \$9.8 (63.4-p/th) due to cold weather while gas supply to Europe fell. Although Qatari LNG production was strong, few cargoes were delivered to the UK, thereby pushing up prices. As long as a supply oligopoly exists, prices could stay elevated. 2014 prices are adjusted higher to \$10.4/MMBtu (68.2-p/th) from \$10.1 (65-p/th), as supply issues could keep the global LNG market tight. Prices are expected to average \$10.4 (67.9-p/th) in 2Q'13, \$10 (65.3-p/th) in 3Q'13 on lighter demand in summer, and \$10.6 (69.2-p/th) in 4Q'13 as winter supply-demand tightens.
- **Demand in Europe, South America and parts of Asia could keep prices above \$15 for the moment.**
 - After a winter when Asian LNG prices (Japan-Korea Marker) surge to around \$20/MMBtu, much milder shoulder season weather in Q2 is driving both domestic gas demand and LNG imports lower. To the extent that Asian buyers have secured LNG cargoes, the lack of substantial storage capacity prevents importers from buying a greater amount of gas during this low demand, lower price period.
 - Cold weather in Europe boosted gas demand for heating and drew down gas storage. Gas demand for storage injection in the next few months should bring European buyers into the LNG market. Very weak hydro generation in Brazil due to low reservoir levels has kept demand up since late last year, with the effect rippling across the global LNG supply chain. Further price support could come from Argentina, which just issued a tender for 10 LNG cargoes for deliveries starting at the end of May to December. The newly-opened terminals in Southeast Asia, including Singapore, could pick up some cargoes as well.

Figure 111. UK (NBP) and Asian (JKM) gas prices since Apr 2010



Source: Platts, Citi Research

Figure 112. Gas supply into Europe on a decline since 2010

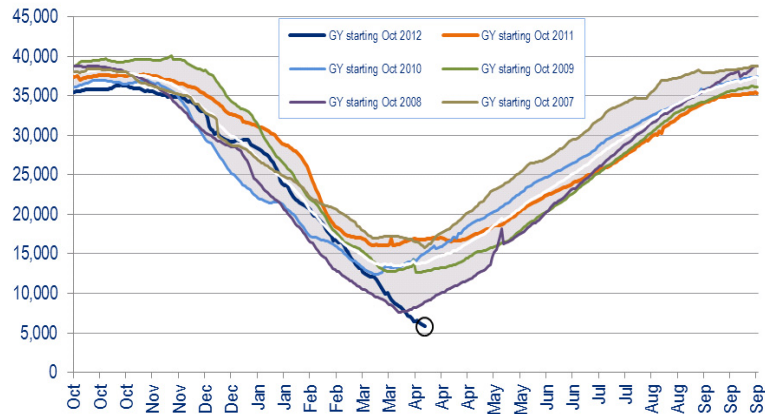


Source: IEA, Bloomberg, Citi Research

UK and Continental European Gas Storage at all-time lows...

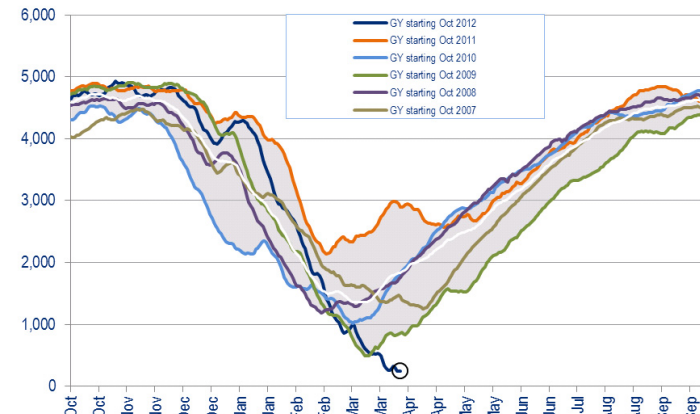
- **After heavy depletion of European Gas Storage during the winter, expect to see strong demand for gas injection over the summer in order to replenish current record low stock levels**
- **Overall the short-term outlook for European Nat Gas is mildly bullish** as strong injection demand from the UK and NWE to refill storage will help provide a lift to European Gas markets. This is the first time in history that the UK starts mid-April with empty long range storage. UK medium range storage is also depleted and in Germany there is less than 3 Bcm of storage, a near record low.
- **On the supply side**, expect to see reduced Nat Gas flows from Norway as it undergoes heavy maintenance during the summer months, namely August/September, this following strong production already during the winter. Increased Russian production capacity from the Bovanenkov field as well as increased capacity to send to NWE means Russian flows should be higher YoY. Also expect continuing diversions of LNG to Asia away from the U.K.
- **Demand-wise** as well as increased storage replacement demand, expect to see small increases in Power demand in the U.K due to the Large Combustion Plant Directive (LCPD). There may be some slight demand erosion as a result of higher gas prices but this effect will be dominated by the European storage demand effect.

Figure 113. NWE Natural Gas Storage Levels (Mcm) – year-on-year comparisons since 2007



Source: Citi Research

Figure 114. UK Natural Gas Storage Levels (Mcm) – year-on-year comparisons since 2007

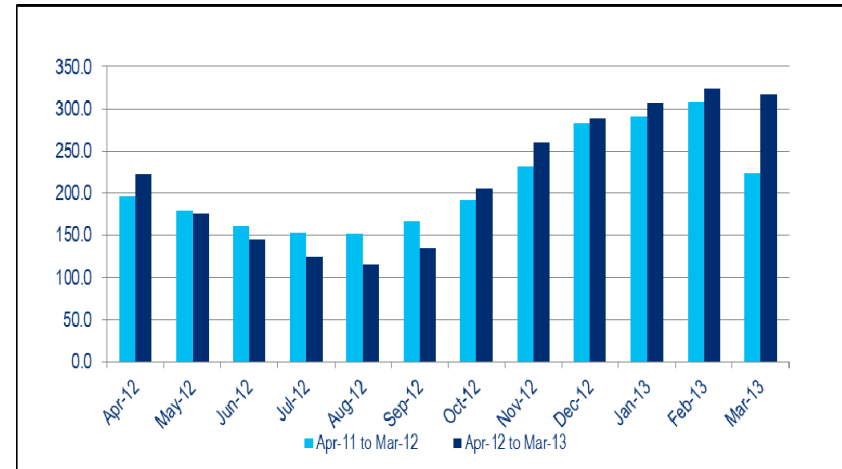


Source: Citi Research

A Structural Shift as UK becomes a net importer

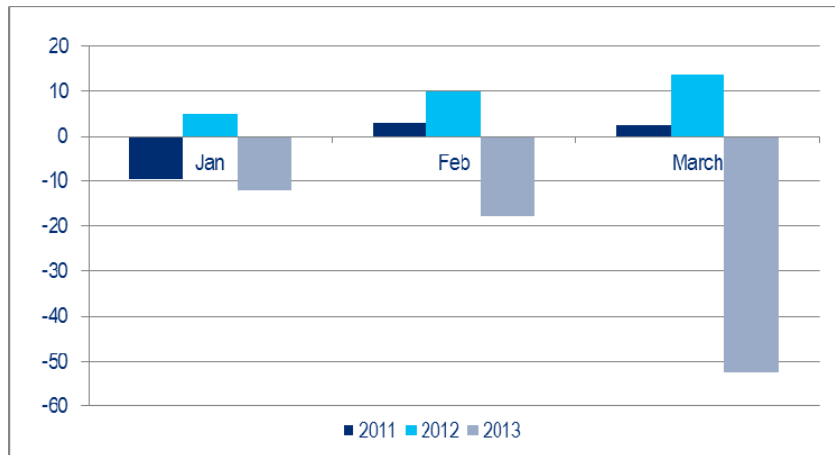
- **The UK Natural Gas market has undergone a structural shift** regarding its net exports. The UK has been historically a net exporter of Natural Gas but this has changed as of late as is shown below displaying negative UK monthly flows. This highlights that the UK should be a net importer of Natural Gas throughout 2013.
- **There has been a strong start to the year for UK Natural Gas consumption** as unseasonably cold weather in March saw increases in average monthly consumption of around 100 Mcm/d YoY
- **LNG flows to the UK continue to diminish as they are diverted to Asia.**

Figure 115. UK Monthly Average Gas Consumption (Mcm/d) – last year and this year



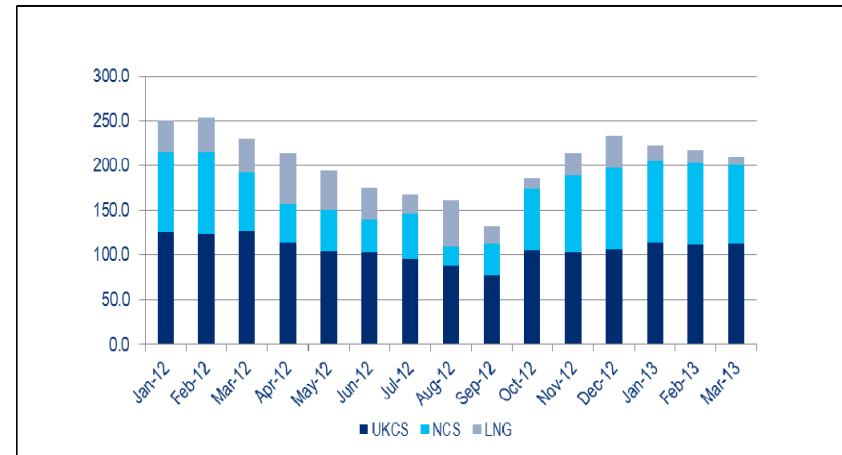
Source: Platts, Citi Research

Figure 116. UK Monthly Average Natural Gas Flows (Mcm/d) – imports/exports



Source: Platts, Citi Research

Figure 117. UK supply sources – LNG availability sharply lower



Source: Citi Research

Asian spot LNG demand could fall in Q2, as importers may have enough cargoes under contract to meet demand

■ Unless the summer is hotter than normal, many Asian utilities might have contracted enough LNG cargoes, reducing their appetite for spot LNG.

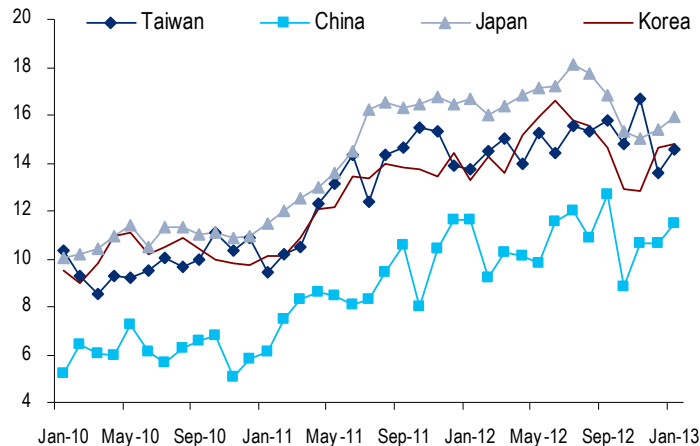
Japanese utilities appear to have factored in no return of additional nuclear units this summer. The earliest that any nuclear units could return could be just before winter. If three reactors were to restart, then between 96- and 120-kb/d of oil demand could be displaced if all of the oil were to be substituted, or 0.6- to 0.75-bcf/d (4.5- to 5.6-mtpa) of gas if only LNG were to be displaced. Regions with a greater reliance on nuclear are under more pressure to restart nuclear units. We outline some restart possibilities by individual reactors.

■ Final rules on nuclear safety may not be released until after the Upper House election in July, so as to depoliticize the matter in Japan. Draft regulations call for, among others, the construction of protective structures, more stringent thresholds on active faults, installation of filtered air vents for boiling water reactors (BWRs). Restarts of any BWRs could be delayed by two to three years. Some utilities have begun making improvements and will likely revise their previously announced restart targets.

■ Upon any nuclear restarts, reducing expensive oil imports first seems most logical, but technical and strategic reasons may point to lower spot LNG imports initially as well. Some regions that must rely on oil as a substitute fuel should see a decline in oil imports, but areas that import both gas and oil could see gas imports fall earlier. Key government officials as well as utilities and possibly trading houses are strategically positioning themselves for negotiations with LNG exporters and other LNG portfolio players for supply contracts

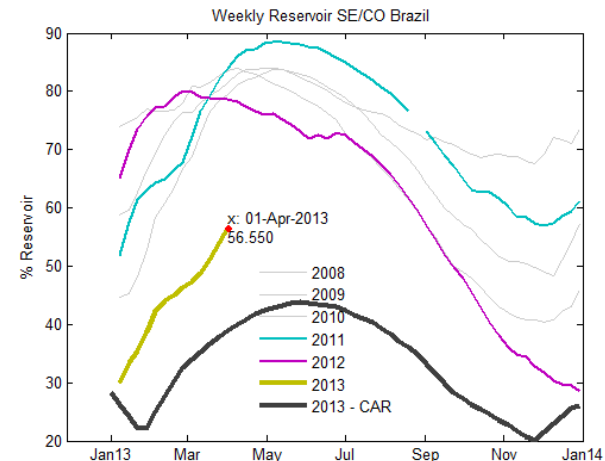
■ LNG demand from South Korea has also fallen, similar to what is happening in Japan. Chinese LNG demand should slacken as well, as demand typically peaks in Q1 and Q4.

Figure 118. Average Asian Countries LNG Import Prices \$/mmbtu



Source: EIG, Citi Research

Figure 119. Regas Capacity Utilization By Region

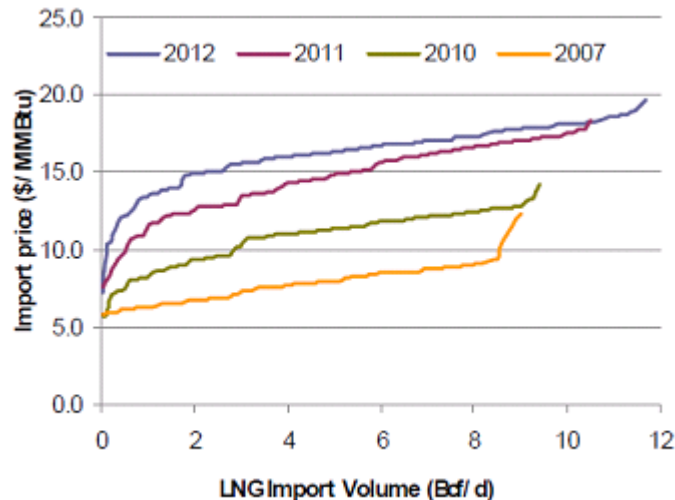


Source: CERA, Citi Research

Longer term, imports of US LNG could lower Japan's long-term gas prices and costs...

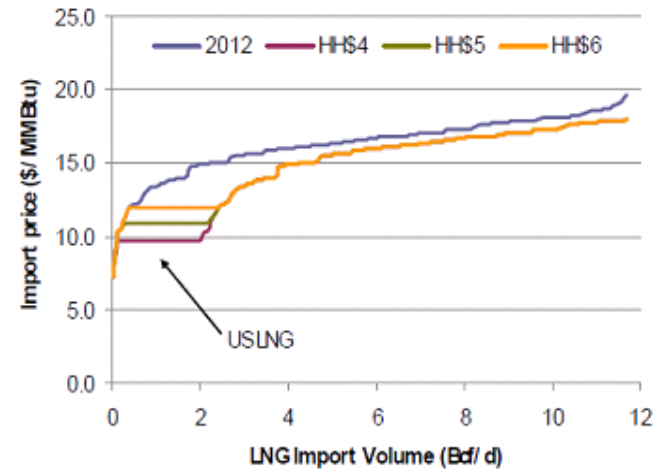
- **Over the past few years, Japan's LNG import cost curve has shifted up significantly.** Compared with 2010 when the average import price was \$10.8/MMBtu, the average 2012 import price has risen to about \$16.3/MMBtu. Higher oil prices have certainly driven oil-indexed prices higher, but larger gas imports to substitute for nuclear generation and the resulting tighter global LNG market pushed prices even higher. **Two major developments could help reverse the situation: US gas imports and nuclear restarts.**
- **Even without nuclear restarts, future imports of LNG from the U.S. should lower the average price and total national annual expenditure on gas imports.** Based on contracting positions of Japanese companies at three proposed LNG terminals (Freeport, Cameron and Cove Point), if all of these terminals were approved, 14.7- mtpa (2.0-Bcf/d) of the most expensive gas could be replaced by gas imports from the U.S. If Japan's gas import cost curve in 2016/17 has the same structure as the 2012 curve, then U.S. gas should occupy near the very left-hand side of the cost curve. If Japan's gas import requirement remains at 11.6-Bcf/d, same as 2012, then the average gas import price could fall by \$1.1 to \$1.5/MMBtu, depending on whether Henry Hub gas prices average \$4 or \$6/MMBtu by 2016/17. The total national annual expenditure on gas imports could fall from around US\$74 billion to between \$67 and \$69 billion, assuming the same exchange rate as 2012.
- Note that US gas imports may not be able to entirely push out some long-term contracted gas, partly due to destination clauses. These clauses restrict where LNG cargoes could be headed or which party can import the cargoes.

Figure 120. Japan's LNG import cost curve



Source: MOF Japan, Citi Research

Figure 121. Japan's LNG import cost curve if 2-Bcf/d (14.7-mtpa) of US LNG were added (based on 2012's cost curve)

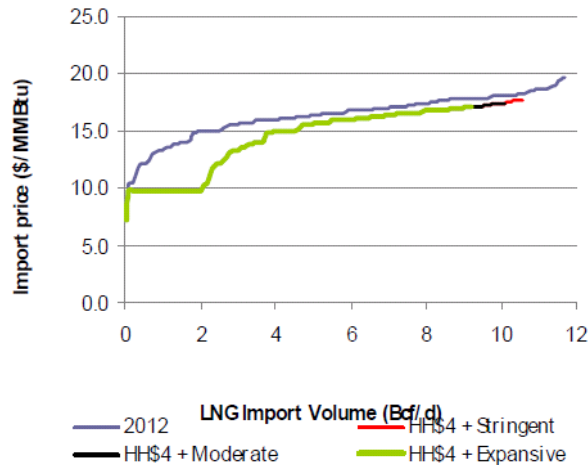


Source: MOF Japan, Citi Research

...With nuclear restarts, annual gas import cost could fall by one-third from 2012's level

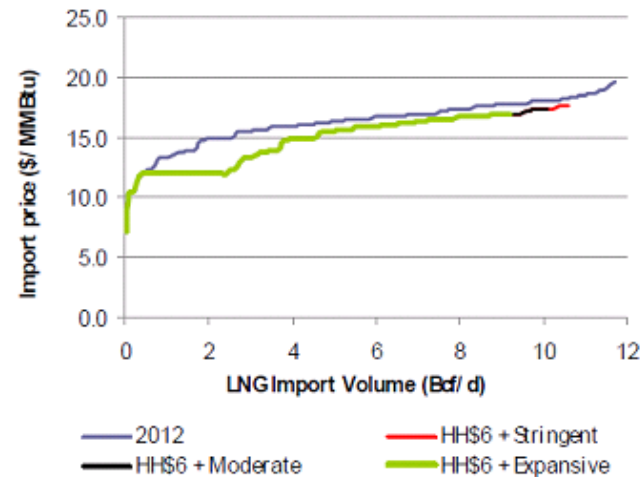
- **In addition to importing US gas, if nuclear reactors were to come back online**, the decline in average prices and annual expenditures could be sizeable. In this thought experiment, we assume that nuclear restarts will only displace LNG imports. Assuming that the market in 2016/17 will be as tight as 2012, **the average import price should fall by between \$1.8 and \$2.3/MMBtu to the \$14/MMBtu range, even if Henry Hub gas were to average \$6/MMBtu. More significantly, the annual expenditure on gas imports could fall by as much as US\$24 billion, from US\$74 billion to between \$50 and \$62 billion**, helping to cut the country's current account deficit.
- **If Japan imports even more gas from North America and East Africa, where delivered prices into Asia are expected to be in a similar or lower price range as LNG from the U.S.** Gulf Coast, then Japan's average gas import price and annual expenditure should fall more. For example, in addition to imports of U.S. gas, if Japan imports 2-Bcf/d of gas from East Africa at a delivered cost of \$10/MMBtu, then in the more optimistic nuclear restart scenario, the average gas import price could fall by \$3.7/MMBtu from 2012's average of \$16.3/MMBtu, with annual expenditure lower by US\$30 billion to US\$45 billion, close to the US\$40 billion spent on gas imports in 2010.
- **More important, with additional LNG supply coming in the middle of the decade and the reduction in Japanese LNG imports, the tightness in the global LNG market is expected to loosen, lowering global prices and annual spending on gas imports.** Finally, oil-indexed prices should drop, as Citi also expects global oil prices to fall due to: (1) rising production in the U.S., Canada, Mexico, Iraq and elsewhere; and (2) a slowing or even a reversal of global oil demand growth. The key factor that could slow this price decline is if gas-for-oil substitution were much stronger than expected

Figure 122. Japan's gas import cost curve assuming \$4 US gas and different nuclear restart scenarios (based on 2012's curve)



Source: MOF Japan, Citi Research

Figure 123. Same as left graph but assuming \$6 Henry Hub US gas



Source: MOF Japan, Citi Research

South American LNG imports to remain high on low hydro, but improvements could lead to more moderate LNG demand

Figure 124. Total monthly thermal generation (mostly gas) in Brazil remains elevated...

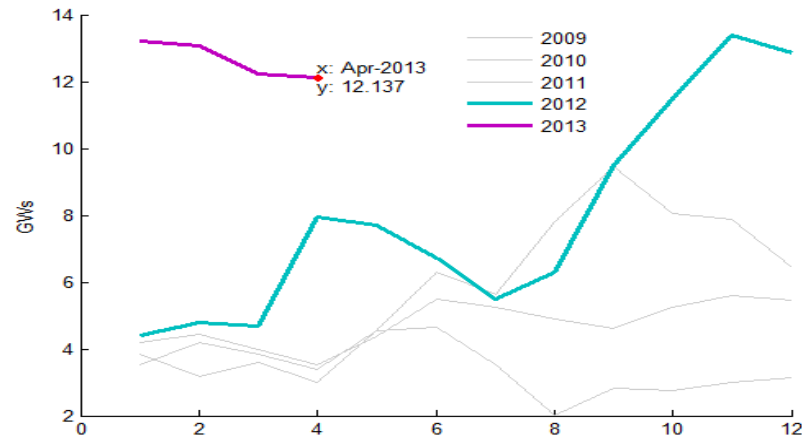


Figure 125. ...As hydro generation has been low in Brazil...

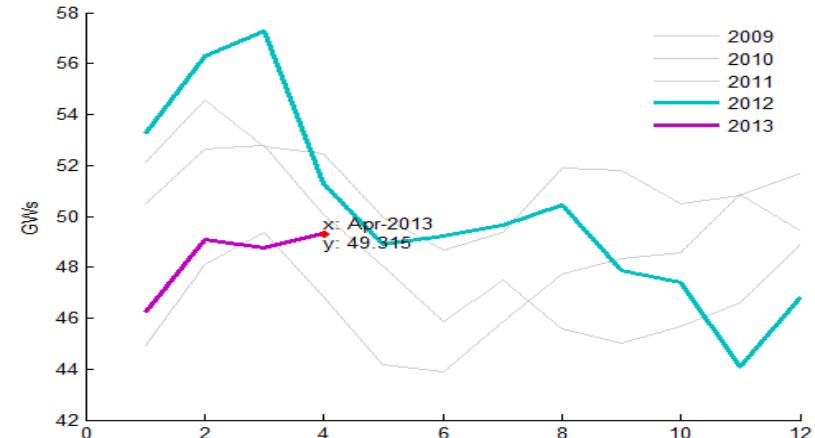


Figure 126. ...And power demand is unseasonably high...

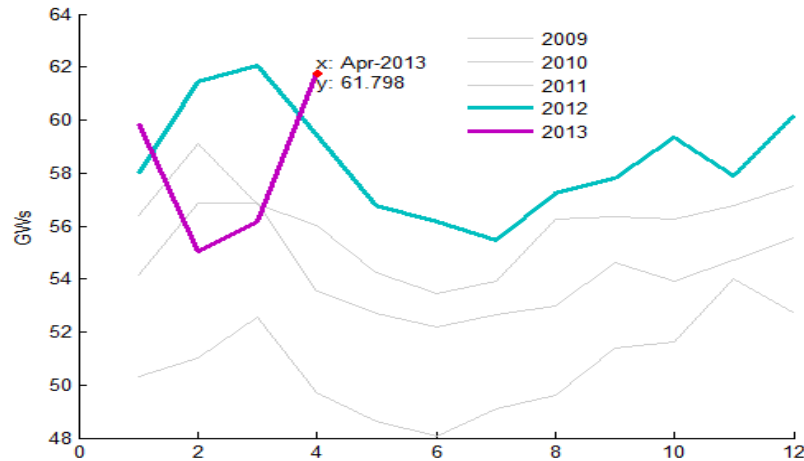
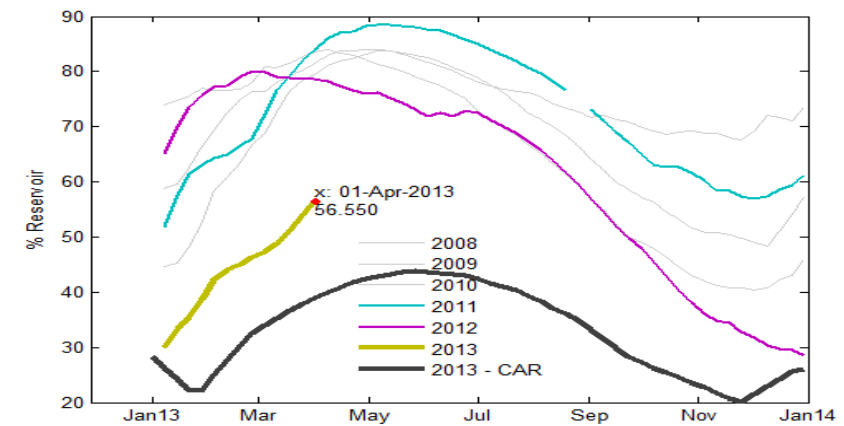


Figure 127. But Brazilian reservoir levels are improving, possibly leading to more moderate LNG demand later



Industrials

Figure 128. Citi Commodity Price Forecasts

		Recent Spot*	0-3M	6-12M	5Y Cyclical	Q1_2013	Q2_2013E	Q3_2013E	Q4_2013E	2013E	Q1_2014E	Q2_2014E	Q3_2014E	Q4_2014E	2014E	2015E
Base Metals																
LME Aluminum	USD/MT	1,889	1,900	2,100	2,200	2,042	1,935	1,940	1,985	1,975	2,000	1,920	1,875	1,925	1,930	1,950
LME Copper	USD/MT	7,445	7,200	6,800	6,200	7,964	7,600	7,400	7,100	7,515	7,000	6,900	6,700	6,500	6,775	6,800
LME Lead	USD/MT	2,055	2,100	2,300	2,200	2,314	2,150	2,100	2,200	2,190	2,250	2,200	2,100	2,250	2,200	2,225
LME Nickel	USD/MT	16,034	18,200	21,000	20,000	17,387	17,000	18,500	19,250	18,035	20,400	21,000	20,200	22,000	20,900	23,000
LME Tin	USD/MT	22,917	23,500	24,500	18,600	24,128	23,500	23,000	23,500	23,530	24,000	23,500	23,000	24,000	23,625	24,000
LME Zinc	USD/MT	1,887	1,950	2,100	2,100	2,057	1,950	1,975	2,000	1,995	2,100	2,050	2,000	2,050	2,050	2,100
Precious Metals																
Gold	USD/T. oz	1,572	1,600	1,450	1,050	1632	1580	1555	1455	1555	1460	1450	1425	1400	1435	1340
Silver	USD/T. oz	27.1	29	26	17	30.1	28.0	27.8	26.5	28.1	26.3	26.0	26.0	25.5	25.9	23.3
Platinum	USD/T. oz	1,536	1,515	1,555	1,531	1634	1515	1523	1530	1550	1575	1625	1650	1650	1625	1750
Palladium	USD/T. oz	730	790	900	680	741	790	825	875	810	925	950	975	950	950	925.0
Bulk Commodities																
Hard Coking Coal (benchmark Asia)	USD/MT	285	172	185	200	165	172	165	180	171	190	190	190	190	190	203
Thermal Coal Asia (NEWC)	USD/MT	89	88	91	105	91	88	88	90	89	92	92	94	96	94	98
Iron Ore Spot (TSI)	USD/MT	138	130	123	81	148	130	115	120	128	125	122	122	120	122	122

Source: Bloomberg, Citi Research, *early April 2013

Industrial Commodities – broad cuts across the curve

Citi has collectively made broad cuts to its Industrial commodity forecasts for the base metals, precious and bulks commodities across the curve. The key base metals of aluminum, copper and nickel have been cut between 5-10% for 2013 and between 8-13% for 2014. The Gold price has seen the biggest change with a cut of around c13% for the next three years. On the bulk commodities, thermal and coking coal price are testing support levels and market fundamentals suggest structural changes. The iron ore market is the only bulk commodity where near-term prices have seen a positive revision. Citi has also increased its long-term tin price by 7.5% to \$20,000/t.

Figure 129. Citi Industrial Commodity Forecast Changes

		LT	2013	2014	2015	2016
Aluminum	Old	2,200	2,100	2,175	2,250	2,100
\$/tonne	New	2,200	1,975	1,930	1,950	2,000
% Change		0.0%	-6.0%	-11.3%	-13.3%	-4.8%
Copper	Old	6,200	7,965	7,775	7,500	7,300
\$/tonne	New	6,200	7,515	6,775	6,800	6,900
% Change		0.0%	-5.6%	-12.9%	-9.3%	-5.5%
Nickel	Old	20,000	19,890	22,725	24,000	22,000
\$/tonne	New	20,000	18,035	20,900	23,000	24,000
% Change		0.0%	-9.3%	-8.0%	-4.2%	9.1%
Zinc	Old	2,100	2,060	2,125	2,220	2,200
\$/tonne	New	2,100	1,995	2,050	2,100	2,150
% Change		0.0%	-3.2%	-3.5%	-5.4%	-2.3%
Lead	Old	2,200	2,115	2,200	2,250	2,200
\$/tonne	New	2,200	2,190	2,200	2,225	2,250
% Change		0.0%	3.5%	0.0%	-1.1%	2.3%
Tin	Old	18,600	22,750	22,875	25,000	24,500
\$/tonne	New	20,000	23,530	23,625	24,000	24,500
% Change		7.5%	3.4%	3.3%	-4.0%	0.0%
Gold	Old	1,050	1,675	1,655	1,540	1,350
\$/oz	New	1,050	1,555	1,435	1,340	1,300
% Change		0.0%	-7.2%	-13.3%	-13.0%	-3.7%
Silver	Old	16.50	31.00	26.50	23.25	20.50
\$/oz	New	16.50	28.10	25.90	23.25	20.50
% Change		0.0%	-9.4%	-2.3%	0.0%	0.0%
Platinum	Old	1,531	1,700	1,775	1,825	1800
\$/oz	New	1,531	1,550	1,625	1,750	1800
% Change		0.0%	-8.8%	-8.5%	-4.1%	0.0%
Palladium	Old	680	775	925	925	900
\$/oz	New	680	810	950	925	900
% Change		0.0%	4.5%	2.7%	0.0%	0.0%
Rhodium	Old	2,859	1,175	1,250	1,500	2,000
\$/oz	New	2,859	1,200	1,250	1,500	2,000
% Change		0.0%	2.1%	0.0%	0.0%	0.0%
Hard Coking Coal	Old	200	174	213	213	218
\$/tonne	New	200	171	190	203	210
% Change		0.0%	-1.8%	-10.6%	-4.6%	-3.3%
Thermal Coal	Old	105	99	111	115	120
\$/tonne	New	105	89	94	98	100
% Change		0.0%	-9.5%	-16.1%	-14.8%	-16.5%
IRON ORE	Old	81	120	122	122	115
\$/tonne	New	81	128	122	122	115
% Change		0.0%	6.9%	0.0%	0.0%	0.0%

Source: Citi Research

More bearish than bullish

- It has been a case of negatives rather than positives for the major industrial commodities in 2013. Palladium is the only commodity which has delivered a positive return.
- Against the forward curve, Citi retains its bullish calls in Palladium and Nickel and bearish calls in Silver, Copper and Gold, against the current strip.

Figure 130. Year to Date Returns (%) as of early April 2013

Year to date return	%
Aluminum	-8%
Copper	-5%
Lead	-10%
Nickel	-6%
Tin	-2%
Zinc	-8%
Gold	-7%
Silver	-8%
Platinum	-1%
Palladium	2%
Thermal Coal Asia (NEWC)	-5%
Iron Ore Spot (TSI)	-3%

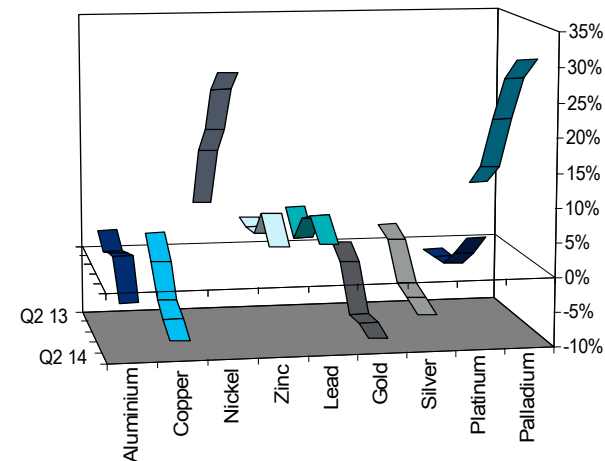
Source: Bloomberg, Citi Research

Figure 131. Bullish & Bearish in Comparison to Forward Prices

Bullish	In Line	Bearish
Palladium	Platinum	Silver
Lead	Zinc	Gold
Nickel		Copper
		Aluminum

Source: Citi Research

Figure 132. Citi Forecasts versus Forward Prices

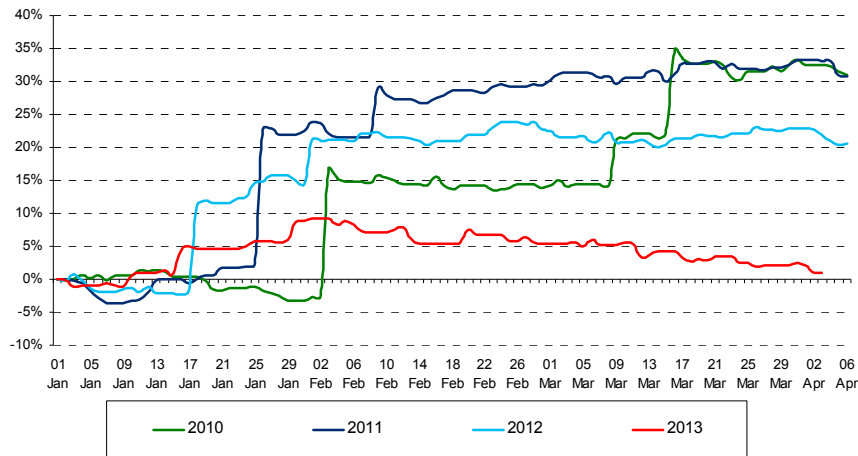


Source: Bloomberg, Citi Research

Steel – 2013 still looks uninspiring

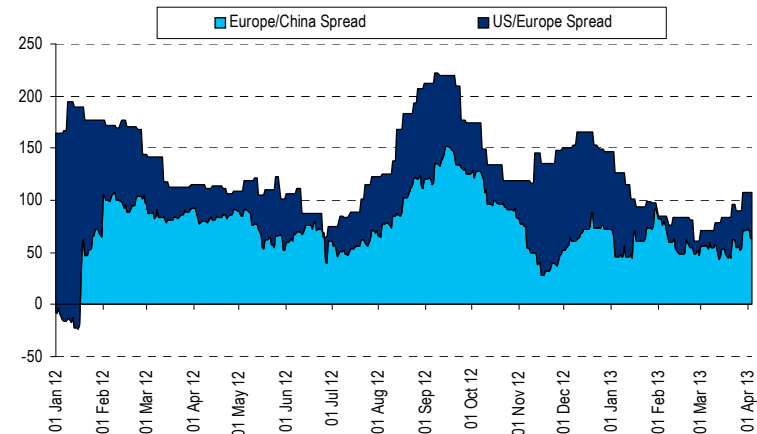
- Europe** – We maintain our demand forecasts for key regions: 2% decline YoY in Europe, 2% growth in US consumption and 3.9% growth in Chinese output. In Europe, we were cautious over the prospect for a seasonal restock in Q1/Q2 and indeed this has not materialized. In fact, European steel price momentum YTD has been the poorest since the financial crisis (see Figure 133), despite high iron ore pricing in Q1. We see little prospect of a significant improvement in pricing; end users and stockholders continue to operate on a hand to mouth basis and mill lead times – a key indicator of supply/demand tension and ultimately price momentum – are at low levels of 4-5 weeks in Europe. Margins will likely remain thin to even negative for some producers. We maintain our €500/t HRC forecast for 2013. One small consolation is that inventory to shipment ratios remain at a reasonable 2.5x.
- US** – The US has seen a muted Q1, with pricing range-bound; HRC currently stands at ~\$680/t. Producers have made a few attempts to implement \$50/t price increases since late January, though these have generally failed to gain traction. However, this has meant that domestic prices remain relatively unattractive for imports; March US steel imports were 2.5m tons according to preliminary import licence data. Weakening Chinese steel pricing has opened up the US-China price spreads slightly in recent weeks which could indicate some further pressure on prices, as could the \$33-43/t decline in April scrap prices. We maintain our forecast for ~2% YoY demand improvement, aided by a potential non-residential construction improvement in 2H13.

Figure 133. European HRC price momentum YTD



Source: Bloomberg, Citi Research

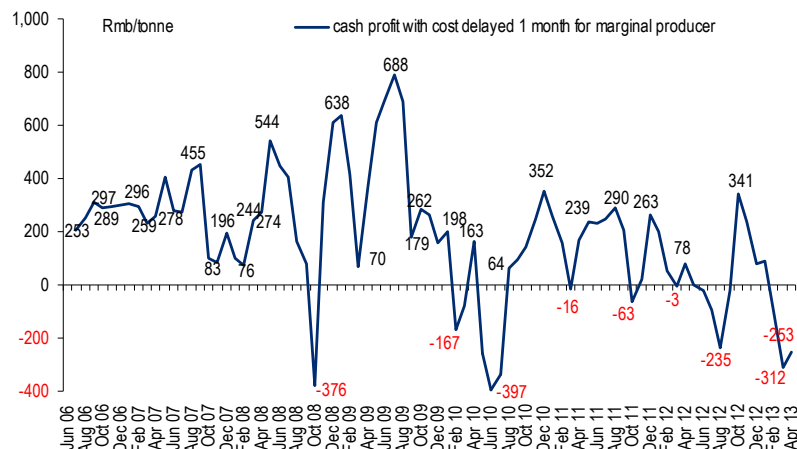
Figure 134. Global Steel Price Spreads



Source: Bloomberg, Citi Research

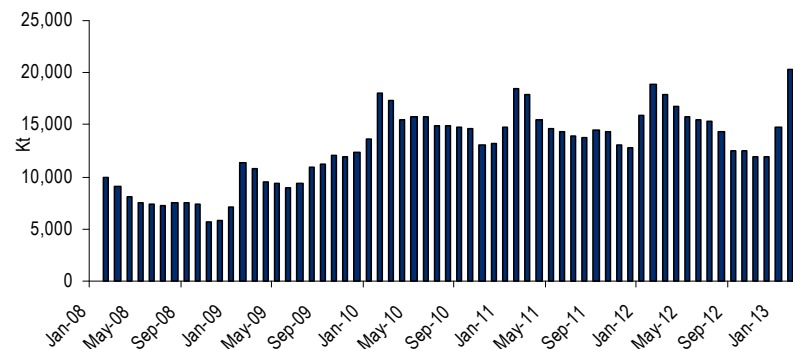
- China** – Chinese steel production has been running comfortably above 2mt per day since the beginning of the year, with the annualized cumulative run rate currently at ~730mt. We forecast 2013 output at 742mt, up 3.9% YoY. However, the underlying demand picture does not appear to be as healthy as output would suggest; Trader inventories have almost doubled to ~22mt since the beginning of the year, while pricing has been rolling off from its late February peak of \$615/t HRC. Interestingly, iron ore inventories at ports have reduced by ~15mt (which would equal 9-10mt of steel) since December, suggesting these tonnages have been pushed further down the supply chain into steel inventories.
- Chinese steel margins** – Based on our calculations, marginal producers have been operating at cash losses since January and gross profit losses (including depreciation) since December 2012. Negative cash margins peaked at Rmb(312)/t in March, with April margins easing somewhat on the back of lower raw materials costs, to Rmb(253)/t. This scenario is likely to continue well into Q2 barring any significant improvement in Steel prices, which judging by production and inventory levels, seem optimistic.
- Supply** – We see little progress taking place in 2013 regarding the key overhang for the industry – excess capacity. Chinese capacity will continue to grow. We expect an additional 50mt this year to come online, with several projects under construction in Hebei province. In Europe, the difficulty faced by the likes of ArcelorMittal in closing parts of its Florange (France) and Liege (Belgium) sites suggests that governments in Europe are still struggling to come to grips with the true extent of the structural issues in the region and thus we see little potential for further rationalization in 2013. The US remains the most disciplined and balanced major market, though the resolution of ownership at the 5mt Alabama rolling mill currently up for sale could be important – a new entrant into the market could see it losing some supply discipline somewhat, if the new entrant were to ramp up the asset too quickly. Ownership by an existing US operator would likely see a more gradual ramp-up.

Figure 135. Cash margins at marginal producers have been negative since January



Source: Citi Research

Figure 136. Chinese Trader Inventories have almost doubled so far this year



Source: Broker reports, Citi Research

Figure 137. Steel Prices – Historical and Forecast

	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15
EU Hot Rolled Coil US\$/t	638	756	672	700	844	856	765	662	693	694	650	611	645	650	650	650	676	676	676	676	676	676	676	676
EU CR Coil Price US\$/t	722	894	760	825	940	989	860	797	802	812	761	723	748	761	761	761	787	787	787	787	787	787	787	787
EU CR Coil Price €/t	504	663	616	601	692	693	610	590	617	631	585	556	575	585	585	585	605	605	605	605	605	605	605	605
EU HR Coil Price €/t	445	560	545	510	602	592	543	490	533	539	500	470	496	500	500	500	520	520	520	520	520	520	520	520
EU CR-HR €/t	59	103	71	91	90	101	68	100	84	92	85	86	79	85	85	85	85	85	85	85	85	85	85	85
EU Shredded Scrap €/t	220	281	249	275	353	338	300	290	320	310	292	284	290	292	292	292	304	304	304	304	304	304	304	304
Heavy Plate (€/t)	713	685	690	651	736	713	714	649	622	616	571	530	530	534	534	534	556	556	556	556	556	556	556	556
EU Rebar \$/t	572	742	619	653	763	791	785	750	735	699	673	671	647	653	653	653	679	679	679	679	679	679	679	679
EU Rebar €/t	399	550	502	476	573	547	557	532	565	543	518	516	498	502	502	502	522	522	522	522	522	522	522	522
US Rebar US\$/t	600	688	653	719	800	802	806	801	844	800	760	730	747	753	753	753	783	783	783	783	783	783	783	783
US HRC US\$/t	640	752	655	670	877	896	755	729	789	714	705	683	689	690	690	690	716	716	716	716	716	716	716	716
US Plate	741	970	845	827	1000	1146	1120	1054	1054	997	925	875	875	877	877	877	910	910	910	910	910	910	910	910
US Shredded scrap US\$/t	347	363	335	412	463	445	460	432	422	405	368	370	378	381	381	381	396	396	396	396	396	396	396	396
US-EU Premium/(Discount)	2	-4	-17	-30	33	40	-10	68	96	20	55	72	44	40	40	40	40	40	40	40	40	40	40	40

Source: Bloomberg, Citi Research

Figure 138. Regional Crude Steel Production

Regional Production - Crude Steel	2009	2010	2011	2012	2013e	2014e	2015e
EU (15)	116	144	150	146	143	147	147
Other Europe	48	54	60	64	64	66	66
CIS	96	107	112	116	121	121	121
NAFTA	81	111	118	123	125	131	131
Central/South America	38	44	50	47	48	50	51
China	566	637	694	714	742	766	785
Japan	88	110	108	111	111	114	111
India	56	66	72	74	76	82	90
Other Asia/Pacific	80	95	104	116	116	118	120
Africa/Middle East	32	36	34	48	55	57	57
Global Production	1,203	1,405	1,502	1,559	1,599	1,652	1,678
Estimate Production Excess/(Deficit)	4	46	63	81	78	85	67
Finished Steel Production	1143	1335	1427	1481	1519	1569	1594

Source: Citi Research estimates

Figure 139. Regional Finished Steel Demand

Regional Demand - Finished Steel	2009	2010	2011	2012	2013e	2014e	2015e
EU (15)	102	122	125	124	122	123	125
Other Europe	34	43	44	44	45	45	46
CIS	38	48	51	52	54	56	58
NAFTA	77	103	111	114	116	120	124
Central/South America	31	38	39	41	42	44	45
China	558	596	645	664	690	712	730
Japan	66	84	81	82	83	85	86
India	55	59	63	69	72	75	81
Other Asia/Pacific	112	129	132	137	142	148	154
Africa/Middle East	67	68	70	73	75	77	79
Global Demand	1,139	1,289	1,363	1,400	1,441	1,484	1,528
Global Finished Steel Production	1,143	1,335	1,427	1,481	1,519	1,569	1,594
Estimate Production Excess/(Deficit)	4	46	63	81	78	85	67

Source: Citi Research estimates

Iron Ore – bearish view retained

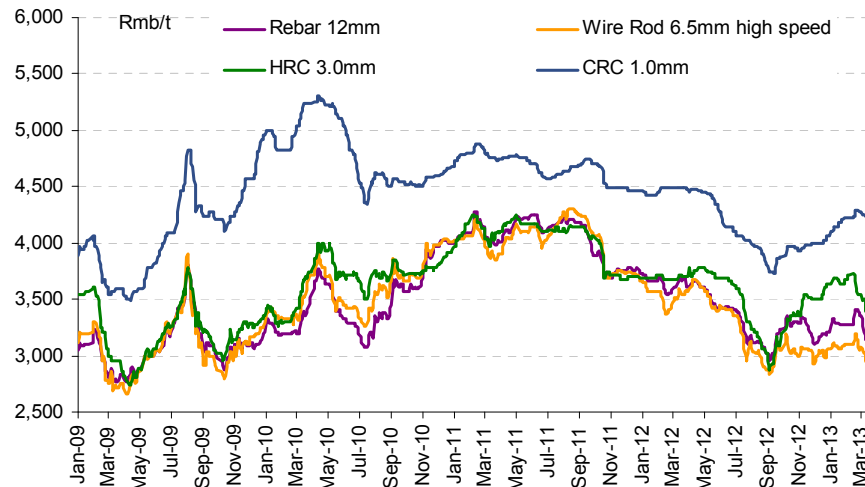
- We have increased our 2013 price forecast to \$128/t from \$120/t, which is principally a mark to market of the first half prices. The iron ore price has traded higher than Citi forecasted in the first half principally from higher than expected Chinese steel production and lower exports from India.
- Citi retains its bearish second half price forecasts, and expects that the iron ore price will average \$118/t. It is anticipated that the current high steel production in China will roll in the second half and this coupled with around 30mt of low-cost production coming into the seaborne market, from the major miners, will result in downward price pressure.
- The forward curve has moved into steep backwardation during the course of this year and has been coupled with rebar prices downwards. With Chinese steel prices at three-year lows, and negative margins, we expect Chinese steel producers to cut production to stabilize prices.

Figure 140. Iron ore price forecasts (US\$/t)



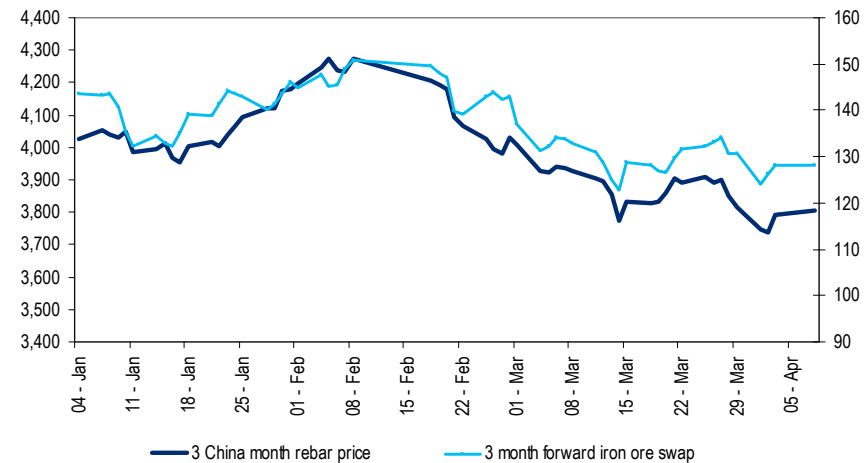
Source: Bloomberg, Steel Business Briefing, Citi Research

Figure 141. Various Shanghai Steel prices VAT Exclusive – Yuan/tonne



Source: Bloomberg, Steel Business Briefing, Metal Bulletin, Citi Research

Figure 142. China 3-month rebar prices versus 3-month forward

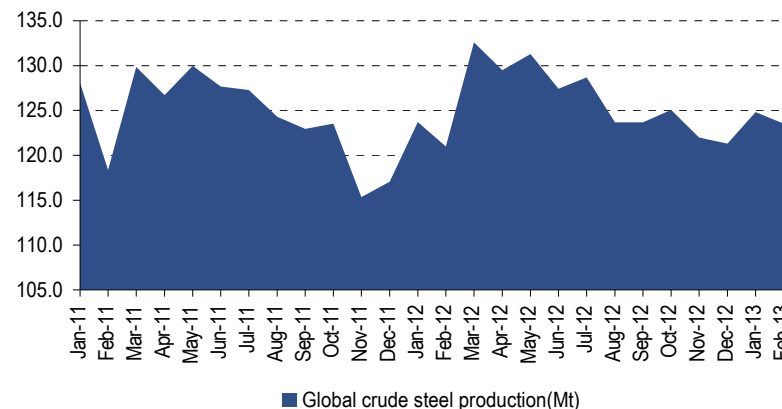


Source: Bloomberg, Steel Business Briefing, Metal Bulletin, Citi Research

Demand limps higher

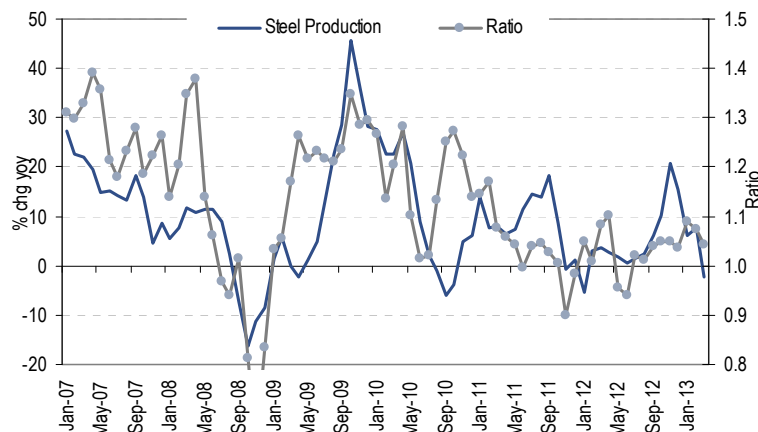
- Citi are forecasting global steel production (ex China) to increase by around 1.5% in 2013, this growth is expected to occur in Latam, the CIS and the US markets. Against this positive growth, Citi are forecasting a moribund outlook for Europe and steady production in Japan. There is some early optimism around a recovery in Japan, given the country's intention to reflate the economy and devalue the yen to jump is only trickling into demand. The Indian market remains subdued weighed down on inflation and bureaucratic concerns.
- Outside of captive iron ore markets (CIS, North America, Brazil), this will likely translate into negative demand growth for the seaborne iron ore market. The new orders to inventory ratio would suggest that steel production in China, at least in the short term, may have peaked and we expect it to roll in the second half. We are forecasting steel production in China to average 742mt for the full year.

Figure 143. World crude steel production (Mt month)



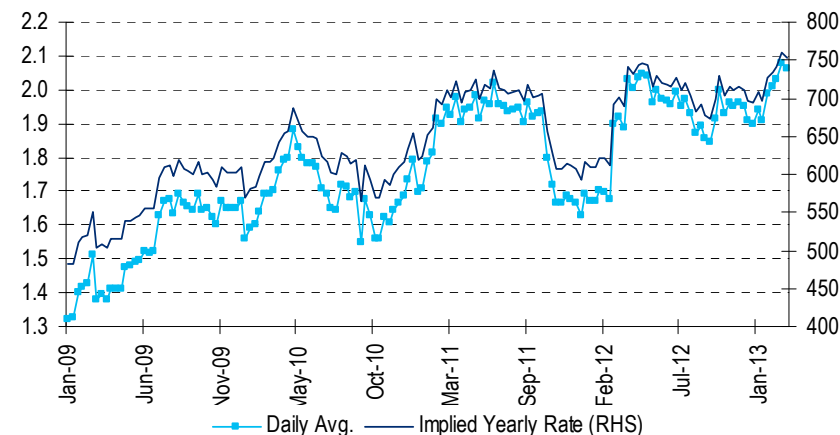
Source: World Steel Authority, Citi Research

Figure 144. China New Orders / Inventory Ratio versus Steel Production



Source: Bloomberg, Citi Research

Figure 145. China daily steel production

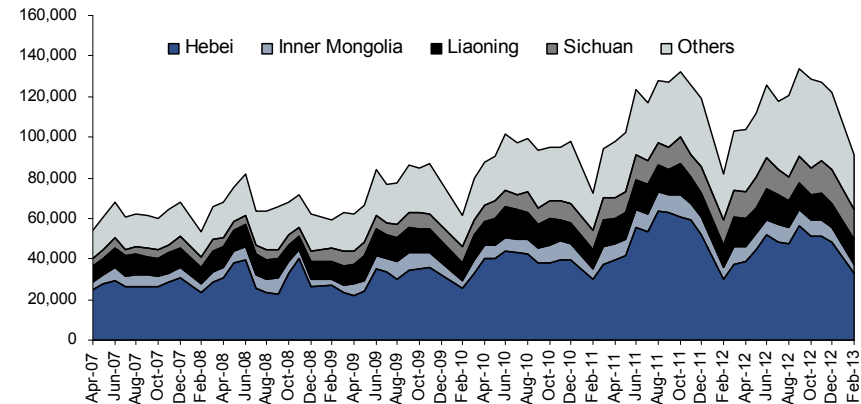


Source: CISA, Citi Research

Supply – second half rebound

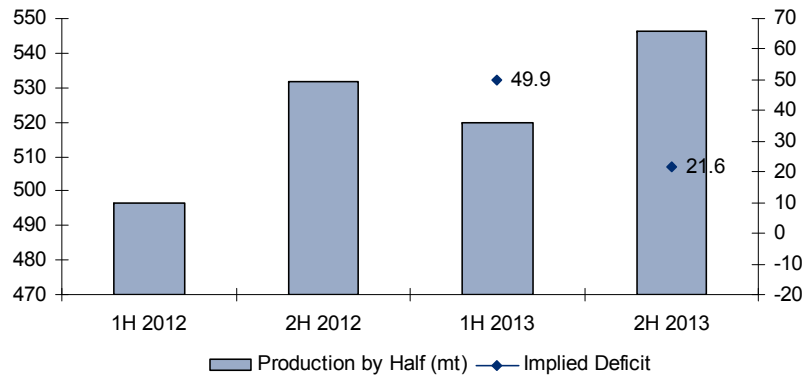
- The major mining companies are expected to deliver an additional 30 Mt of low cost supply into the seaborne market in the second half of 2013. The first half production is expected to be lower than the second half of 2012, due to weather disruption and loss of production from India.
- The probability of the second half supply is growing in certainty; the 30Mt is coming principally from Australia and the major miners of FMG, BHP Billiton and Rio Tinto. Citi are also forecasting a seasonal ramp-up in Chinese domestic production, after utilization rates fell by around 27% from peak levels in October due to the winter period.
- On the positive side, Chinese steel mills, on our calculations, have destocked over the past two months, however, this could be a reflection on demand expectations for steel and falling conversion margins between the iron ore and steel prices, reducing hedging opportunities.

Figure 146. China domestic iron ore production (kt) by region



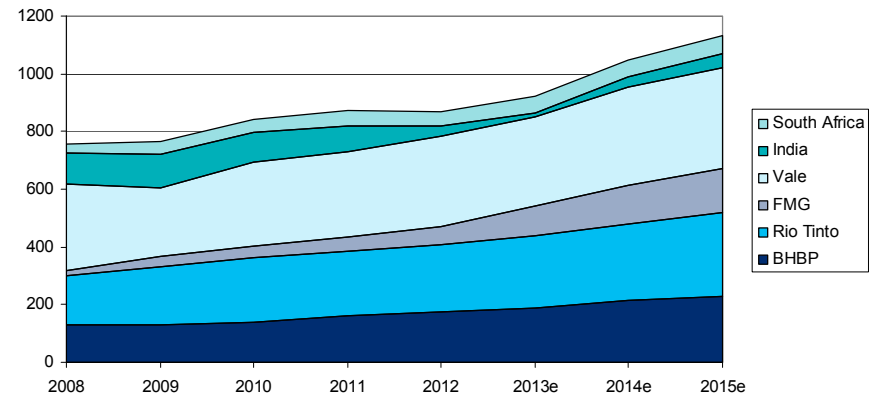
Source: WIND, Citi Research

Figure 147. Global Seaborne market production by half



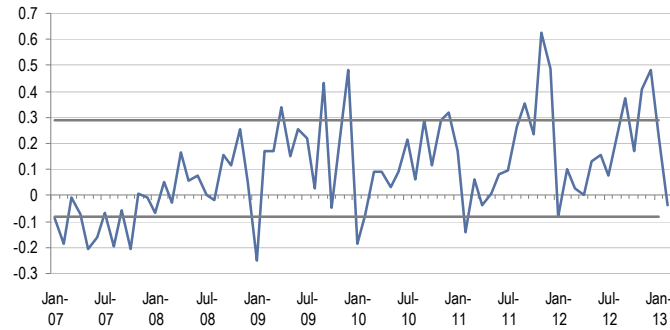
Source: Citi Research estimates

Figure 148. Major producers by region Mt



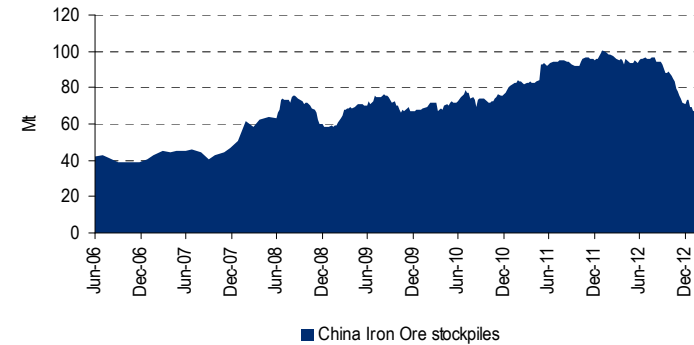
Source: Company reports, Citi Research

Figure 149. Inventory build- steel production less domestic iron ore production and imports



Source: Bloomberg, Citi Research

Figure 150. China Iron Ore stockpiles at port



Source: Bloomberg, Citi Research

Figure 151. Citi – Iron ore Supply and Demand Balance

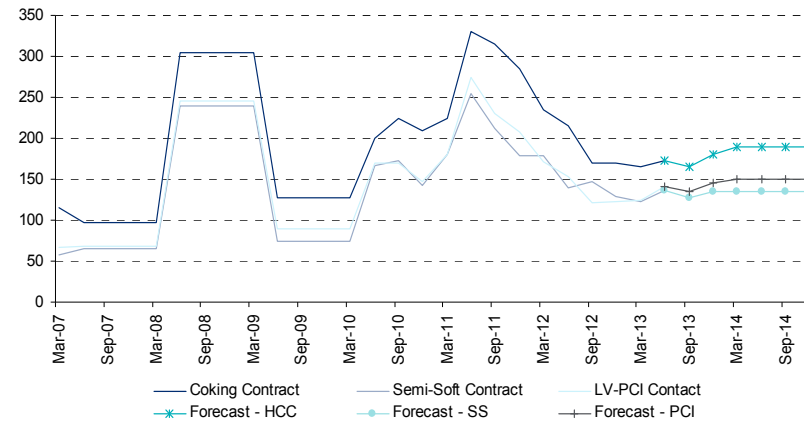
Mt	2008	2009	2010	2011	2012	2013e	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Supply: Seaborne Exports													
Australia	308	362	401	437	494	583	641	690	744	809	849	852	855
Brazil	282	266	311	331	322	324	358	385	415	415	461	493	548
India	106	115	102	90	35	15	35	50	50	50	50	50	50
Canada	22	28	28	25	31	34	37	39	39	39	39	39	39
Africa	44	55	59	61	67	79	97	105	106	121	137	145	146
Other	43	55	86	86	97	51	48	50	45	45	45	45	45
Total Seaborne Exports	800	871	966	1,030	1,046	1,085	1,215	1,319	1,399	1,478	1,580	1,623	1,682
Demand: Seaborne Imports													
Japan	140	115	134	128	128	133	137	133	133	133	133	133	133
Korea	50	42	58	66	66	73	74	75	81	86	92	98	105
Taiwan	16	12	19	21	19	19	20	20	21	23	24	26	27
EEC	125	81	98	94	92	97	97	97	97	97	97	97	97
USA	9	4	6	5	9	11	11	12	12	11	11	11	11
Other (inc 3G)		20	40	40	40	40	49	65	113	147	156	161	168
Total Seaborne Imports	340	274	356	354	355	373	388	402	456	496	512	525	541
Market balance ex-china	460	597	611	676	691	712	827	917	943	982	1068	1098	1141
China Adjustment													
Available exports for China	460	597	611	676	691	712	827	917	943	982	1,068	1,098	1,141
Chinese requirements (@63% Fe)	745	872	996	1,087	1,063	1,131	1,167	1,197	1,218	1,233	1,249	1,256	1,264
Surplus/(Deficit) Pre China Domestic Production	-285	-275	-386	-410	-372	-419	-340	-279	-275	-251	-181	-158	-123
Domestic production	314	251	386	424	368	366	349	349	328	314	307	299	299
Implied Surplus/(Deficit) (incl China Domestic)	29	-24	1	14	-4	-53	9	69	53	63	126	141	177
% of seaborne+Chinese supply	3%	-2%	0%	1%	0%	-4%	1%	4%	3%	3%	7%	7%	9%
Iron Ore Price Forecast	167.8	125.0	120.0	122.0	129.0	128.3	122.3	122.3	115.0	110.0	107.5	105.0	105.0

Source: Tex Report; Citi Research

Metallurgical Coal – modest price cut

- The Q2 Hard Coking Coal price were settled at US\$172/t (up on Q1 prices of \$165/t) between BMA and Nippon Steel / Sumitomo Metal Corporation. Nevertheless, since then, the spot price has languishing at around \$150/t.
- In contrast, the Low Vol PCI fared better, with a settlement at US\$121/t which translated to an 18% discount to the HCC price, mainly due to weather conditions in Queensland. Citi expects this to be a one-off and for PCI prices to move to more historical discounts of around 25%.
- Citi has cut its 2013 forecasts mildly by 1.8% for 2013 to \$171/t, to reflect the recent settlement and the near-term outlook. The major change has occurred in future periods; the 2014 forecast has been cut from \$213/t to \$190/t and 2015 from \$213/t to \$203/t. The fundamentals of the Met coal market have swung in favour of the steel mills and it will take a period to digest new supply, placing the market in a persistent surplus in the medium term. Citi's long-term price of US\$200/t at 95c AUD remains unchanged.

Figure 152. Metallurgical Coal Prices (US\$/t)



Source: Bloomberg, Citi Research

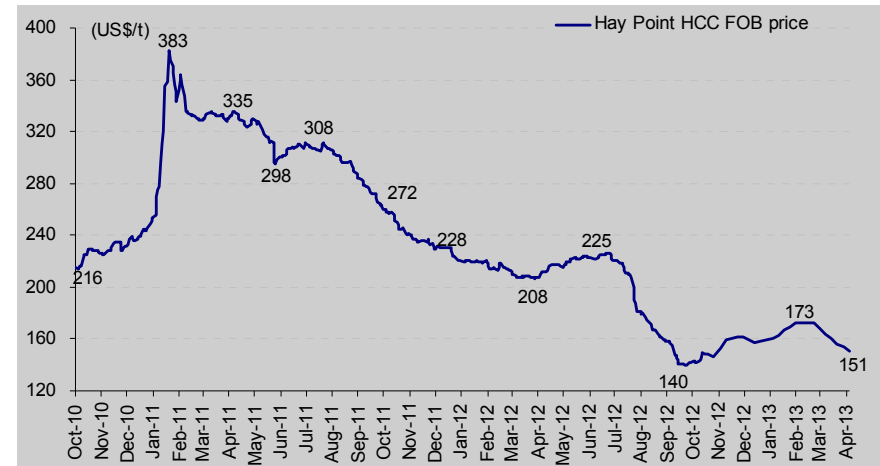
Figure 153. Metallurgical Coal Supply-Demand Balance

Mt	2010	2011	2012e	2013e	2014e	2015e	2016e
Imports							
Japan	58.2	54.6	55.0	56.7	58.2	56.7	57.8
South Korea	23.5	27.5	28.3	26.6	27.0	27.5	29.4
Taiwan	7.6	9.5	9.8	10.1	10.3	10.5	9.0
India	32.7	32.5	32.4	30.9	31.1	31.3	26.4
EC	54.7	54.3	51.7	44.5	44.5	44.5	44.4
China	33.8	27.0	43.5	47.8	48.9	56.4	54.6
Brazil	12.9	15.0	14.3	14.0	14.6	15.3	16.5
Other	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Total	238.5	235.3	250.2	245.5	249.6	257.1	253.0
Exports							
Australia	158.9	134.2	135.0	149.7	160.6	166.5	180.8
US	47.8	53.0	44.2	44.0	44.0	44.0	44.0
Canada	26.1	26.3	27.3	30.1	32.5	34.0	34.0
China	1.1	0.6	0.6	1.5	1.5	1.5	1.5
Russia	12.4	10.4	12.0	9.9	10.4	13.0	13.0
Mozambique	0.0	0.0	2.1	3.8	5.0	12.2	17.2
Other	12.2	3.0	24.8	19.0	10.0	9.8	0.7
Total	258.6	227.5	246.0	258.0	264.0	281.0	291.2
Balance	20.1	-7.8	-4.2	12.5	14.4	23.9	38.2

Source: Tex Report; Citi Research

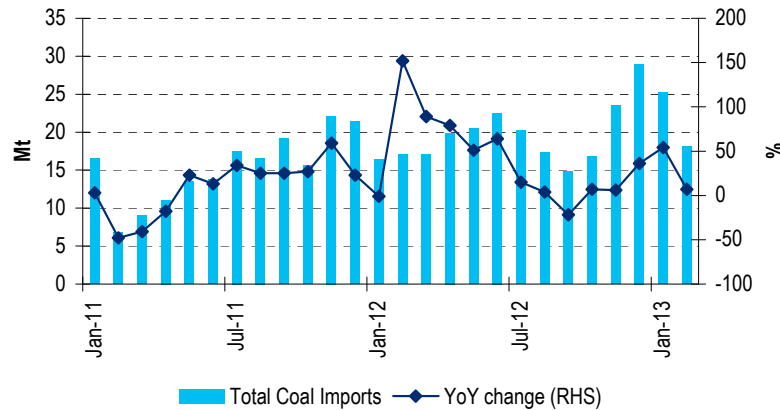
- The long-term demand picture appears to be softening for Met coal, Chinese steel consumption growth rates are expected to fall to around 2% p.a. over the coming decade, versus the previous decade at around 12% CAGR.
- The shift in available supply has resulted in a sharp pull-back in prices to the marginal cost of production. It is our base case view that demand growth will now undershoot the additional supply in the market for the foreseeable future, resulting in prices being set off the marginal cost of production.

Figure 154. Spot Met Coal Prices FOB



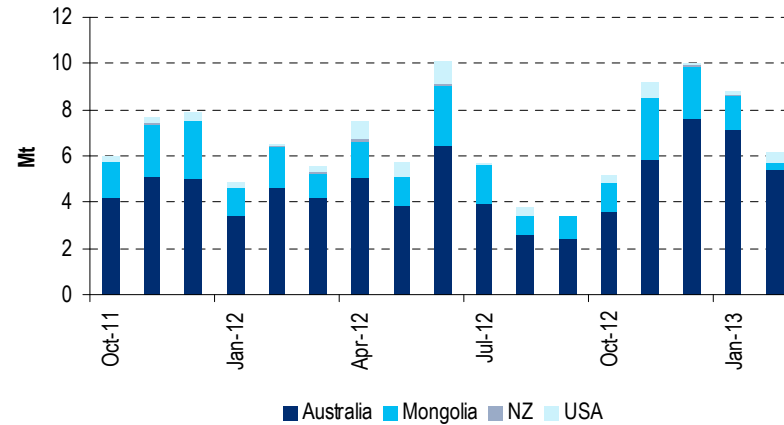
Source: Platts, Citi Research

Figure 155. Total Chinese Coal Imports From Mongolia



Source: China Customs, Wind, Citi Research

Figure 156. Chinese Coking Coal Imports

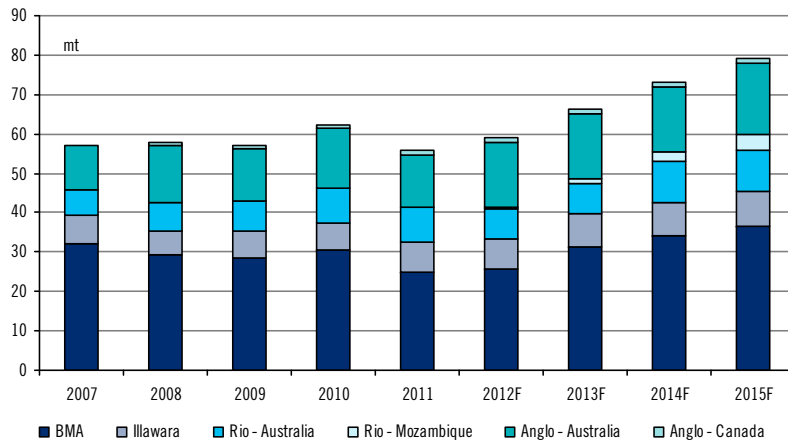


Source: China Customs, Wind, Citi Research

Supply remains adequate

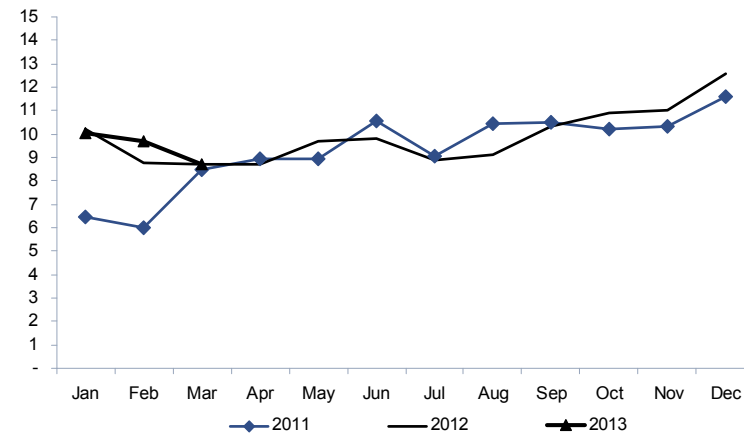
- The high prices of recent years were largely driven by poor supply performance from Australia, that in turn encouraged high cost capacity. Given the supply picture has changed and barring poor weather conditions, it is unlikely that this picture will return. The Australian producers are fighting a high Australian dollar and cost increases and it appears that to fight inflation miners will focus on increased volume, in an attempt to improve profitability. Under this environment and a lack of supplier discipline, it is likely to be adequately supplied in the medium term.
- In the first quarter of 2013, Queensland flooding in the first half caused a fall in met coal exports from Australia at around 28.5Mt, which was down QoQ but up year on year. The railway lines operated by Aurizon resumed operation in mid-March and Citi is forecasting Australian coking coal exports of around 150Mt.
- Mongolian exports have been volatile with South Gobi having operational issues, though it recently announced it had resumed operations at its Ovoot Tolgoi mine. Vale also declared force majeure in mid-February at its Mozambique operations due to weather conditions, though resumed shipments in late March.
- On the positive side, long-term supply may tighten with Rio Tinto questioning the long-term viability of its written down Mozambican assets, and the company is now questioning whether the assets represent tier one status. In the US, Walter Energy announced that it will close its Willow Creek operation in Canada.

Figure 157. Met Coal production – large miners



Source: Company reports, Citi Research

Figure 158. Queensland Coal exports

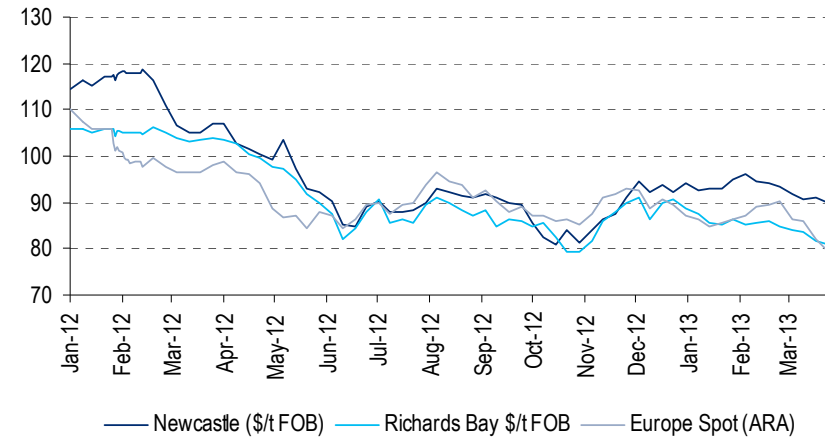


Source: Wood Mac, Citi Research

Thermal Coal – at a crossroad

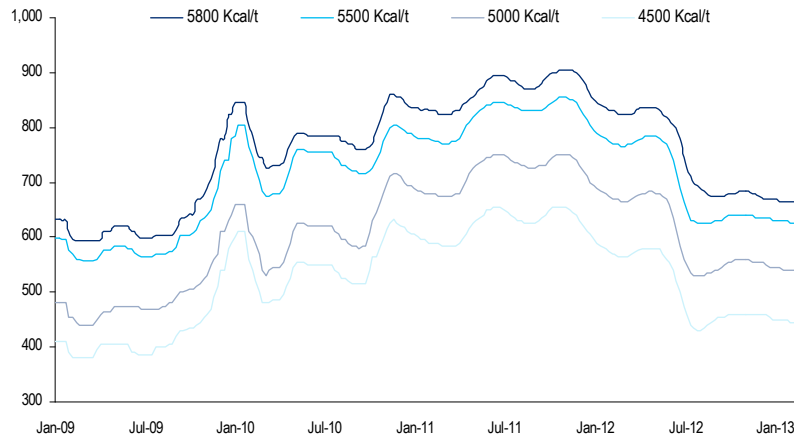
- The thermal coal market is being tested to the downside; the market appears to be in chronic oversupply and supplier discipline is required to restore the market balance which is not forthcoming. The Japan annual price negotiations appear to be in stalemate with the Australia producers with a wide bid-offer spread.
- Arguably less tonnage is being sold at reference prices such as the Newcastle FOB (6,300kcal) at \$92/t, as the QHD price trading at a discount to Newcastle, China is therefore absorbing the lower quality coals.
- Prices in the first quarter continued to fall despite disruptions in South Africa and Colombia on labor strikes as the market was aptly supplied and power demand globally remains tepid.
- Citi has reduced its 2013 thermal coal price forecast to \$89/t from \$95/t for FOB Newcastle. Citi has also reduced its 2014 forecast to \$94/t from \$111/t FOB Newcastle; however, the marginal price is likely to be set off the QHD price which we see at around RMB 650 for the foreseeable future.

Figure 159. Weekly coal prices (US\$/tonne)



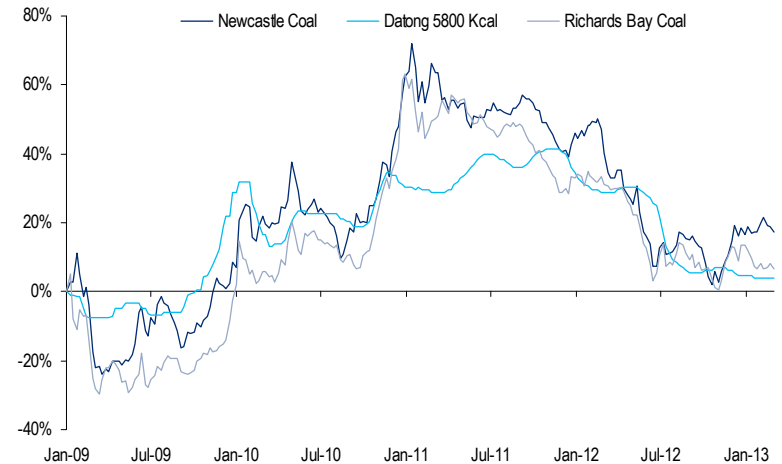
Source: Global Coal, Citi Research

Figure 160. QHD Coal Price (Rmb/tonne, with VAT)



Source: Bloomberg, Citi Research

Figure 161. Newcastle Coal vs QHD Coal since 2009 % change

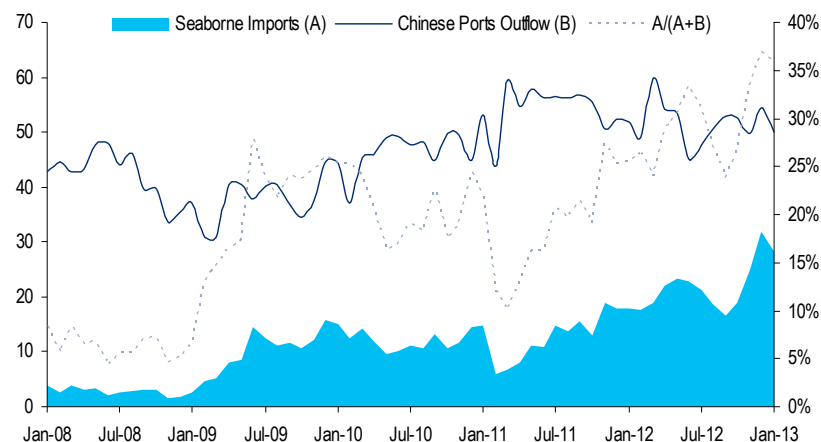


Source: Bloomberg, Citi Research

Demand remains subdued

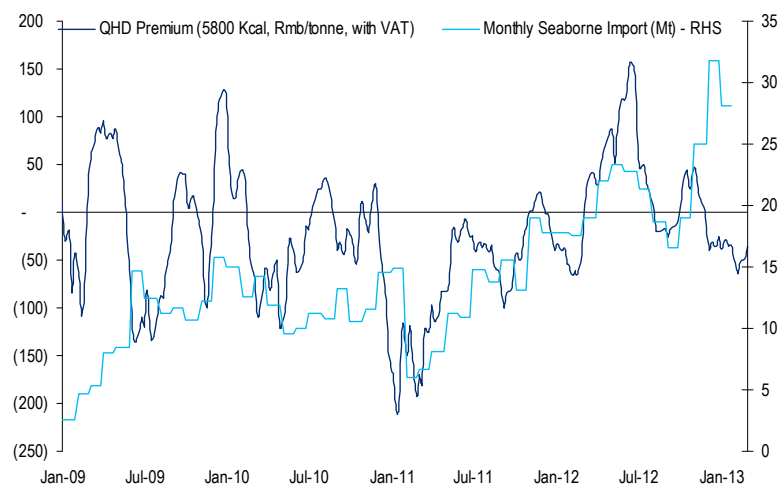
- Spot prices have tested three-year lows. At present, thermal coal prices delivered into Southern China are pricing below domestic prices, placing pressure on the seaborne market. Local prices have softened in major ports and Chinese plant stocks are more than adequate.
- Imports were up in Europe, China and India last year as coal remains the cheapest energy source. However, in Europe, this year is likely to be weaker than expected as a number of countries reduce coal-fired capacity.
- China economic activity has resumed after the Lunar New Year but burn rates remain low. Price arbitrage favours Indonesian over Australian coal. As stated in the macro section, constraints on economic growth could emerge, thereby slowing power/industrial demand. If environmental rules tighten later, coal could be hit hard, as officials hinted that several sectors could face stringent rules.
- Elsewhere, Japanese power demand continues to fall and India, which was one of the largest seaborne importers in 2012 as Coal India struggled to produce, is currently well stocked.

Figure 162. Total Chinese Ports Outflow and Imports



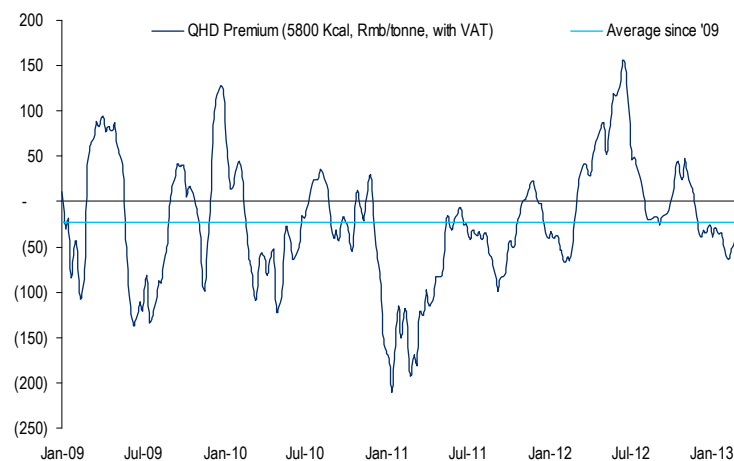
Source: SXcoal, Citi Research

Figure 163. QHD (5800 Kcal) Premium vs Monthly Seaborne Import Volume



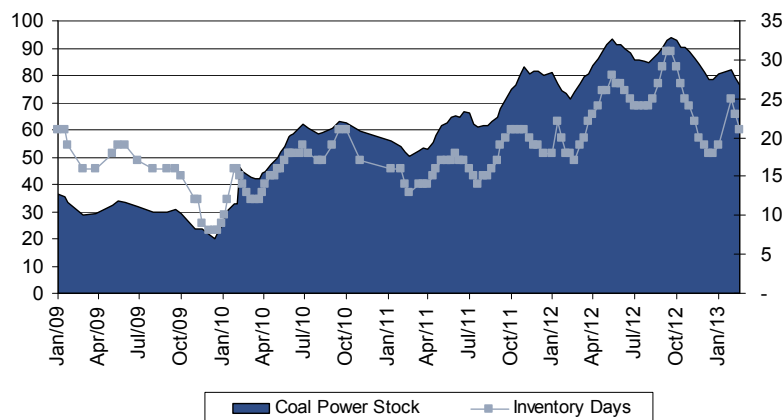
Source: SXcoal, Bloomberg, Citi Research

Figure 164. Total Chinese Ports Outflow and Imports



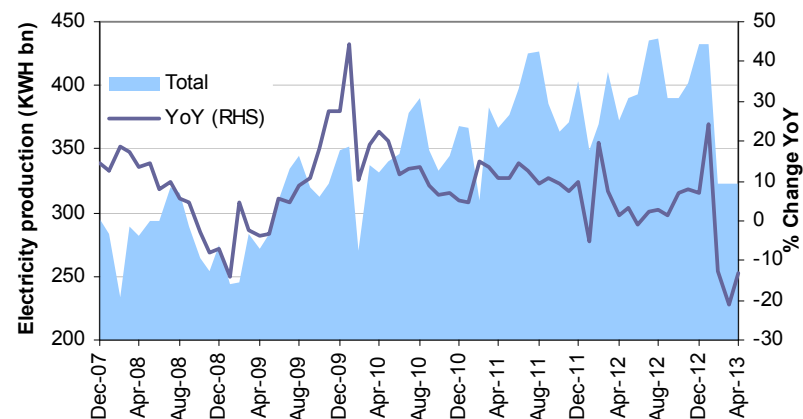
Source: SXcoal, Bloomberg, Citi Research

Figure 165. Power companies' coal inventory data – Mt / days



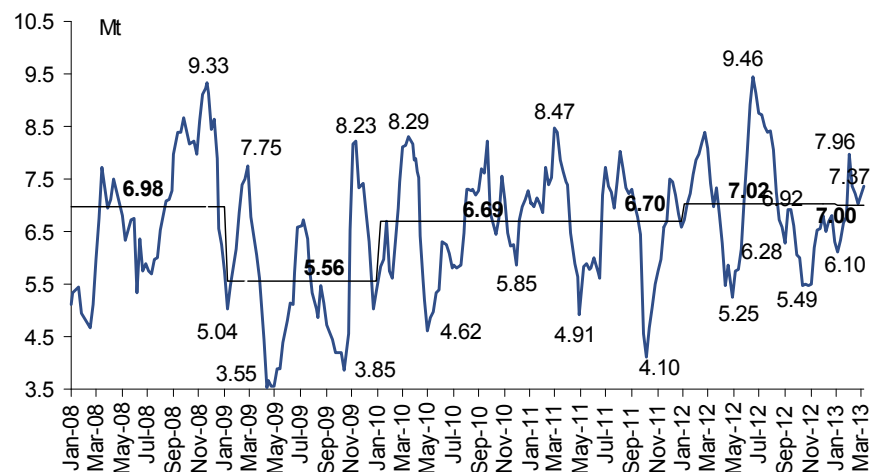
Source: SX Coal, Citi Research

Figure 166. China Electricity Production



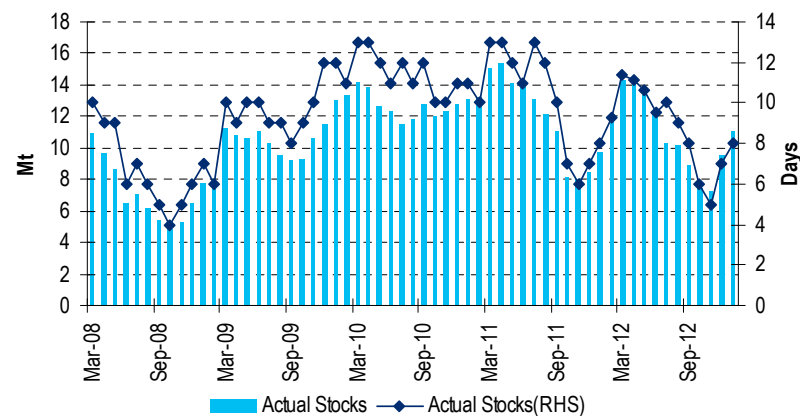
Source: Bloomberg, Citi Research

Figure 167. China Coal inventory at Qinhuangdao Port



Source: India CEA, Citi Research

Figure 168. India's Thermal Coal Stocks

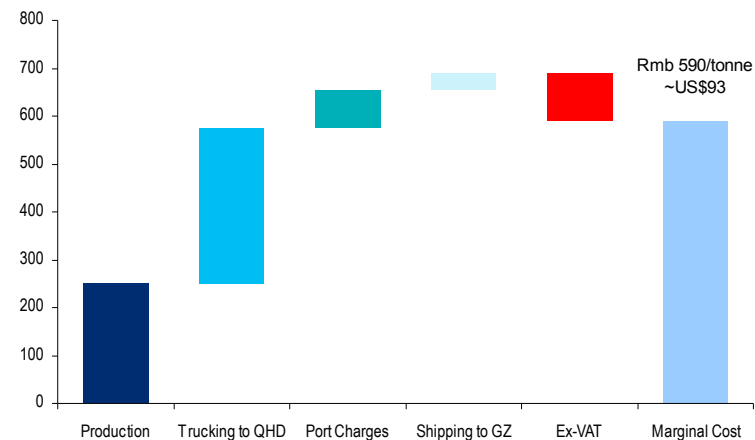


Source: India CEA, Citi Research

Supply – a mixed picture globally

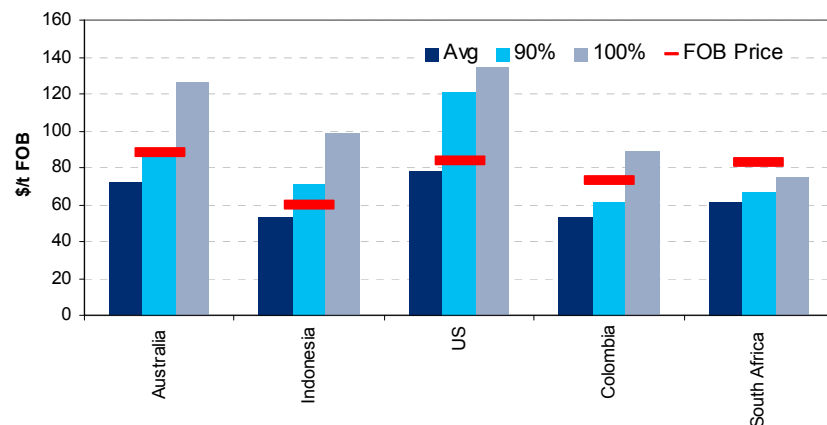
- Atlantic is characterized by an abundance of material from Russia, South African and Columbia
- At current prices, virtually all US producers have cash costs higher than prevailing prices. Exports are still happening on previously contracted cargoes. Higher US gas prices are also lowering gas demand for power generation and raising coal demand, giving suppliers the opportunity to produce and utilities to burn the coal. But the rebound in coal demand is not as strong as it should, as some coal-fired power plants have retired and utilities decide to burn more gas.
- Pacific – China resumed economic activity after Chinese New Year, yet domestic prices have continue to decline in major hubs. Stronger hydropower generation and decreasing domestic prices are slowing down imports. Indonesian coals have remained competitive into China but prices will remain under pressure.

Figure 169. Chinese production costs (RMB/t)



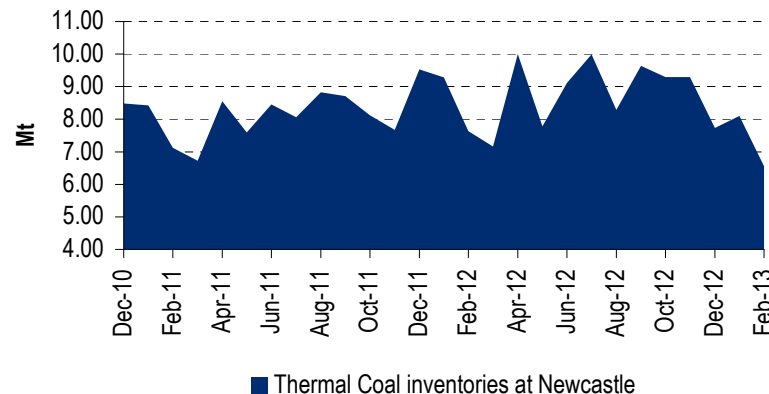
Source: Citi Research

Figure 170. Seaborne Market cash operating costs



Source: Bloomberg, Citi Research

Figure 171. Thermal coal inventories at Newcastle (Mt)



Source: Bloomberg, Citi Research

Figure 172. Thermal Coal Supply and Demand

	2012a	2013e	2014e	2015e	2016e	2017e	2018e	2019e	2020e
Demand									
Europe	163	162	158	161	152	145	137	130	132
Americas	21	20	19	21	26	27	26	28	29
Middle East/ other	20	20	20	20	20	20	20	20	20
<i>sub total Atlantic</i>	<i>204</i>	<i>202</i>	<i>198</i>	<i>203</i>	<i>198</i>	<i>192</i>	<i>183</i>	<i>178</i>	<i>182</i>
India	92	110	125	130	140	147	154	155	161
China	224	240	265	282	300	365	410	429	476
Japan	124	120	114	113	114	116	120	123	124
South Korea	107	101	100	104	107	108	108	109	110
Taiwan	61	60	60	64	63	63	67	72	73
Other Pacific	21	19	20	21	22	23	23	24	25
<i>sub total Pacific</i>	<i>628</i>	<i>650</i>	<i>684</i>	<i>713</i>	<i>745</i>	<i>822</i>	<i>881</i>	<i>913</i>	<i>968</i>
Total	832	852	883	916	943	1014	1064	1090	1150
Supply									
North America	44	32	32	36	40	40	40	40	40
Colombia	84	89	95	112	116	127	132	134	139
Russia	51	51	51	51	51	51	52	53	53
South Africa	74	82	82	82	89	91	94	95	96
Australia	180	194	212	236	246	251	263	273	311
Indonesia	354	362	378	378	377	417	446	446	445
China	8	7	7	7	8	8	8	8	8
Russia	24	24	24	25	25	26	26	27	28
Other	35	41	42	42	43	43	44	44	44
Total	855	883	923	969	995	1055	1105	1120	1164
Implied Balance	23	31	41	53	52	40	41	29	14

Source: Bloomberg, Citi Research

Base Metals

Copper – will it become the new aluminum?

- The global copper market moved decisively into surplus during the second half of last year, accompanied by steadily rising exchange inventories, and an LME forward contango curve price structure pushing further and further forward. Indeed, the copper forward curve moved into full contango in late March of this year, highlighting the growing attractiveness of contango financing copper, an issue few would have thought believable a year ago.
- The combination of strengthening copper mine supply, slower Chinese copper consumption and rising Chinese copper exports, has seen copper inventories at LME, Shanghai Futures Exchange and COMEX warehouses surge to 890,000 tonnes, the highest levels since October 2003 . The bulk of the increase has, perhaps unsurprisingly, occurred in LME warehouses in New Orleans, Johor, and Antwerp, locations that are synonymous with the building of long load out queues in other metals. Warehouse operators in these locations are offering cash premiums in the region of \$100/t for traders/producers to deliver copper to the warehouses.
- The rate of build in LME inventory in this year has averaged over 3,700 tonnes per day. Should this rate continue, and we see little reason why it should not particularly given growing surpluses plus the financial incentives warehouses are paying, then LME inventory levels should end this year at over 1 million tonnes. At the same time, the percentage of cancelled LME warrants has also been rising, with levels currently at 25% of total LME inventory compared to 5.5% at the beginning of March. However, metal is patently not flowing out of warehouses after being cancelled, it is a clear indication that warehouse operators are attempting to build long load out queues for copper at key locations, as has been the case for both zinc and aluminum.
- Rising inventories, lengthening load out queues, and rising physical financing demand for copper, point to a pattern of increasingly limited prompt availability of copper from LME warehouses. This in turn points to a probable uplift in physical copper premiums, despite growing oversupply, and an increasing disconnect between consumer prices and benchmark LME copper prices. Such pricing distortions are likely to add to downward pressure on LME prices going forward.

Figure 173. Copper supply / demand balance

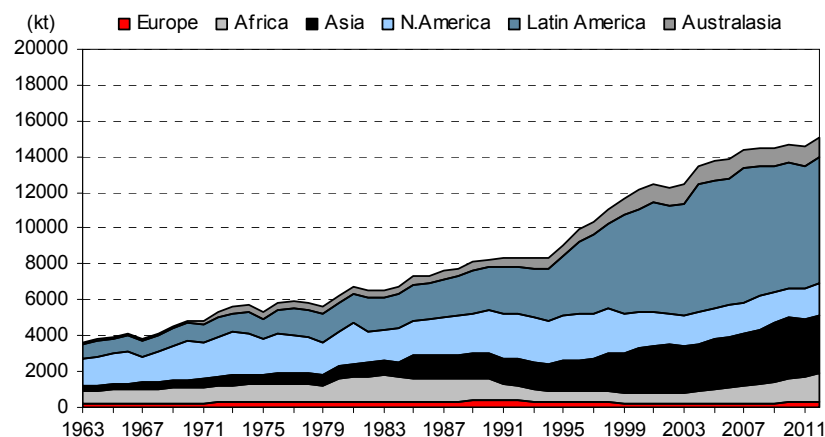
kt	2011	2012	2013E	2014E	2015E	2016E	2017E
Mine Production (Concentrates)	12,723	13,015	13,899	14,974	15,687	16,401	17,051
Scrap/Resmelted blister etc. (incl losses)	2,688	2,874	2,598	2,322	2,286	2,165	2,262
Smelter Capacity	17,986	18,861	19,775	20,971	21,796	22,103	22,090
Smelter Production	15,421	15,890	16,414	17,196	17,872	18,567	19,273
Mine Production (Electrowon)	3,458	3,637	3,792	3,896	3,948	3,875	3,924
High Grade Scrap	780	655	689	680	681	696	711
Mine Production (Total)	16,181	16,652	17,691	18,869	19,635	20,227	20,957
% Change	-0.1%	3.0%	6.2%	6.7%	4.1%	3.2%	3.3%
Refined Production (Total)	19,659	20,182	20,894	21,772	22,501	23,138	23,897
% Change	3.3%	2.7%	3.5%	4.2%	3.4%	2.8%	3.3%
Consumption/Demand	19,783	19,944	20,554	21,269	22,105	22,952	23,762
% Change	3.0%	0.8%	3.1%	3.5%	3.9%	3.8%	3.5%
Surplus/Deficit	-124	238	341	502	396	186	136
Stock Change	-75	116	341	502	396	186	136
Stocks	1,156	1,272	1,612	2,114	2,510	2,696	2,832
Stock:Consumption Ratio (wks)	3.0	3.3	4.1	5.2	5.9	6.1	6.2
Price (US\$/lb)	4.00	3.60	3.41	3.07	3.08	3.13	3.18
(US\$/t)	8,829	7,945	7,515	6,775	6,800	6,900	7,000

Source: Wood Mackenzie, WBMS, ICSG, Citi Research

Copper supply – our growth theme is playing out

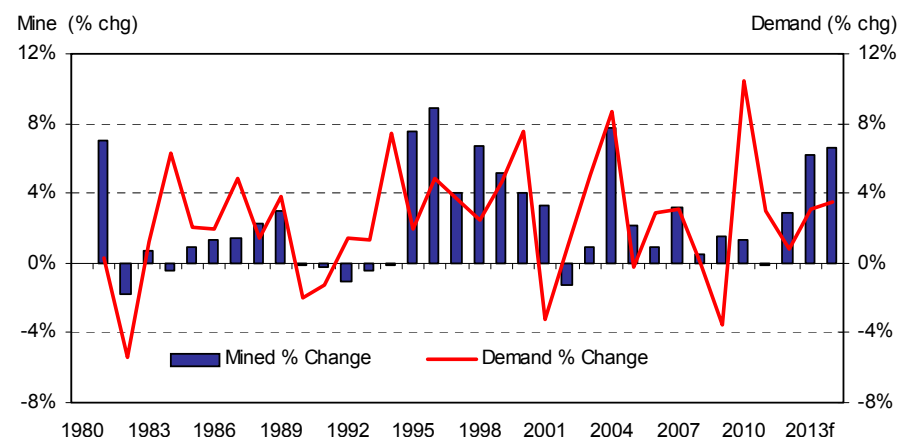
- We first alluded to the probability of surging copper supply and surpluses in [Super Cycle Sunset....](#) published in March last year, a theme that now appears to be playing out. During 2012, positive growth was seen on a quarter-on-quarter basis from 10 major listed miners in both Q2 and Q4, with Q4 2012 production levels up 8.2% on Q3. If data is assessed on a year-on-year basis, the numbers are even more positive, with Q2 growth at 2.7%, Q3 8.2%, and Q4 9.7%. For the year as a whole, mine supply (including SxEw) grew by 3%, with Codelco pulling the average down.
- Growth has largely been coming from Anglo's Collahuasi and Los Bronces mines, BHP/Rio Tinto's ore upgrade program, recovering production at Freeport's Grasberg mine, and Antofagasta's Esperanza mine. The argument that copper supply will fail to deliver in 2013, due to strike-related losses, ore depletion and project slippage, appears to be stuck in the past. Obviously these have been the reasons for poor performance in recent years. However, we believe that these factors will be less of an issue in 2013, leading to an expectation of total mine supply growth of over 1 million tonnes, or 6.2%, for the year.
- The ongoing Chilean port strike has garnered significant press coverage but has little meaning in terms of supply. The strike began at the Angamos terminal on March 16 and spread to other ports. Chilean monthly exports average 235,000 tonnes of cathode, 34,000 tonnes of blister, and 174,000 tonnes of copper in concentrate, with metal and concentrate continuing to be produced but being stockpiled at ports. The endgame of the strike appears to be nearing with 3 of the 5 ports now agreeing to return to work. We do not believe the port strikes are a precedent for mine disruptions, given that non-wage related mine strikes are illegal.
- The acceleration in 2013 mine supply is expected to be driven by continued growth from Escondida, an H2 start from Rio's Major Mongolian mine project, Oyu Tolgoi, an expected 30% growth at Freeport's Grasberg mine, full ramp-up of ENRC's DRC-based Frontier mine, ramp-ups of the Peru-based Antapaccay mine, KOV in the DRC, and Vale's Salobo mine in Brazil, plus continued production improvements from Anglo operations to name but a few. Codelco is also expected to become part of the growth story with the start-up of Mina Ministro Hales in H2. We believe the mining industry is essentially facing the third wave of mine supply growth since the early 1990s, with growth surges occurring every 8-9 years.

Figure 174. Mine supply – clear recovery started in 2012



Source: Company reports, Citi Research

Figure 175. 2013/2014 mine supply growth – above recent trends

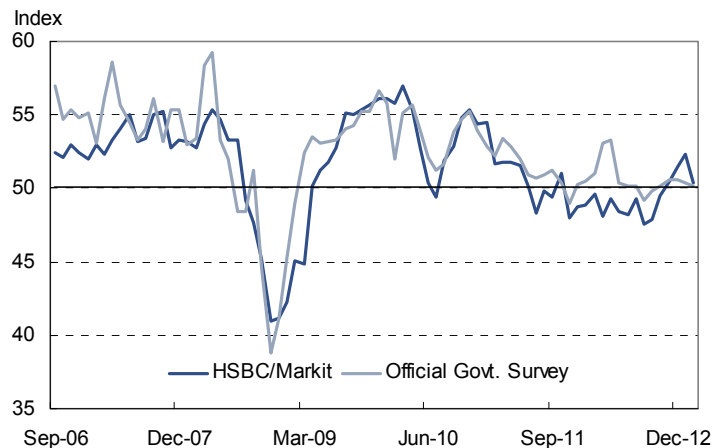


Source: Company reports, Citi Research

Copper demand – China not in the driving seat

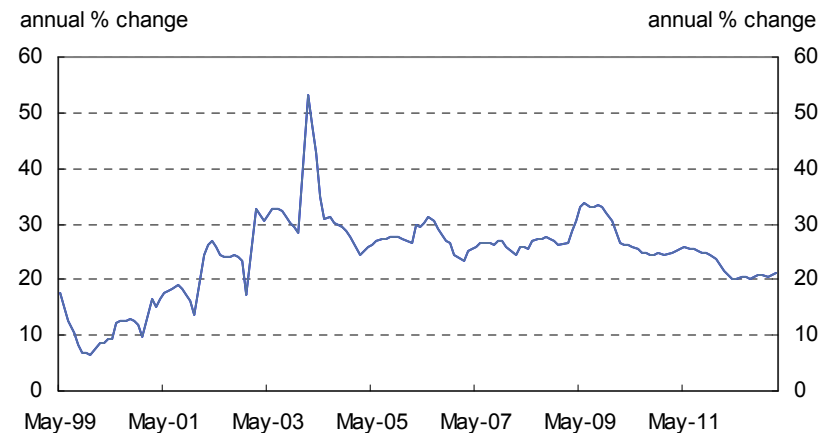
- Recent data from the Chinese National Bureau of Statistics (NBS) points to strong copper semis growth of 15.8% y/y for January and February, which on the face of it appears positive. However, with the March official China manufacturing PMI coming in at 50.9, comparing positively to 50.1 in February but well below consensus expectations of 52, a continuation of more muted levels of manufacturing growth suggests there is little downstream demand support this uptick in semi's production.
- The Chinese property sector accounted for around 20% of Chinese refined copper consumption in 2012, roughly 1.7 million tonnes, and has been a key source of copper consumption growth in recent years. However, recent Chinese Government pronouncements urging further clamp downs on property speculation suggest that property construction growth will be significantly slower than expected this year, adding to the sense that manufacturing growth will be muted in 2013.
- It appears that urban population growth rates may have peaked in 2010, with subsequent levels being lower than average levels seen between 1997 and 2003 according to NBS data. Conversely, the rate of population decline in rural areas also appears to have peaked in 2010. This suggests that there the rate of growth in urban construction and infrastructure investment demand will continue to slow, again not a positive for metals consumption growth. Indeed, the rate of growth of residential floor space under construction has been on a general downward trend since mid-2011.
- Energy sector investment does not support an acceleration of Chinese copper consumption in 2013. The China State Grid Corp, one of China's two major power grid operators, plans to invest around Rmb300bn in power grid in 2013. However, this represents a flat investment profile when compared to 2012, when investment in grid infrastructure amounted to Rmb305.4 bn.
- We have downgraded our 2013 Chinese copper consumption growth expectations from 7.5% to 5.9%, which essentially would push the global copper market further into surplus this year after H2 surpluses last year. Indeed, given our expectation of a continuation of the upward copper mine supply growth trend seen during the latter three quarters of 2012, we now believe the copper market will be heading towards a surplus of around 340,000 tonnes in 2013.

Figure 176. Chinese manufacturing PMI – stuttering



Source: HSBC/Markit, NBS, Bloomberg, Citi Research

Figure 177. Urban fixed asset investment growth

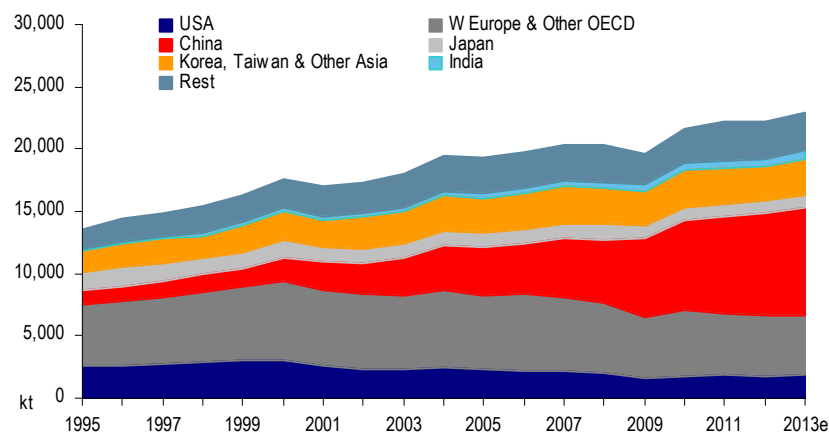


Source: NBS, Bloomberg, Citi Research

Copper outlook – normalizing demand, accelerating supply prompts significant price outlook downgrades

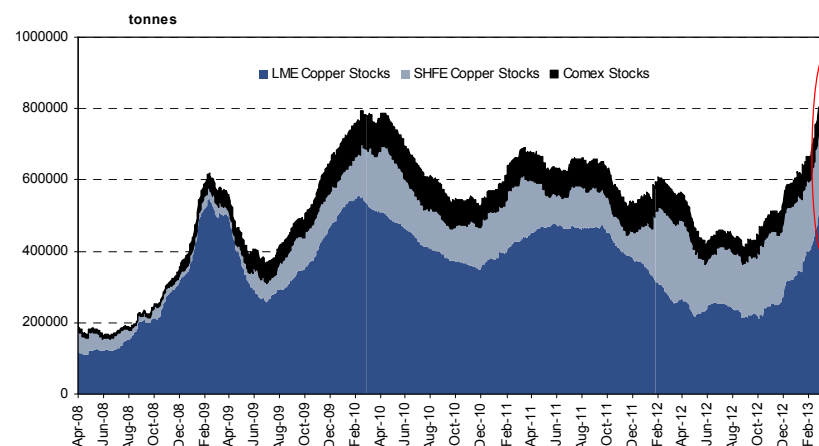
- Whilst Chinese 2013 copper consumption growth is projected to show no acceleration over 2012 growth rates, there is more optimism about the US, with particular focus on a continued rebound in US housing construction activity. However, the positive impact of this rebound is being overplayed. Residential construction activity accounted for only one third of total US construction related consumption of copper in 2012, with total construction activity accounting for 50% of US copper consumption. If new housing starts rise by 30-40% in 2013, this would add in the region of 80-100,000 tonnes to US primary copper consumption levels. Indeed, we forecast US copper consumption to grow by close to 4% on 2012 levels, but this is not sufficient to balance the impact of reduced Chinese demand growth.
- For copper consumption globally, we expect 2013 growth rates of 3.1%, taking consumption levels to 20.5 million tonnes for the year as a whole, a 230,000 tonne reduction versus our previous 2013 projections. Looking forward, we expect more moderate rates of annual consumption growth from China in particular to ensure that global copper consumption growth lags mined and refined copper supply growth until 2016, but with the market to stay in annual surplus until 2018.
- The prospect for copper prices is not positive. In the short term, the combination of US dollar strength, notably weaker-than-expected Chinese manufacturing levels, strong levels of Chinese primary copper exports prompted by the removal of export tariffs on tolled copper, rising LME and Shanghai Exchange (SHFE) copper inventory, and positive quarterly mine production results will likely continue to weigh on market sentiment. Indeed, we have significantly downgraded our 2013 price outlook, with prices projected to average \$7,515/t for the year as a whole, and \$7,100/t in Q4.
- Larger surpluses are projected for 2014 and 2015 as the current wave of green and brownfield projects move towards full production, while Chinese demand remains moderate at best as the government continues to shift the economy away from infrastructure investment driven growth towards a less metals intensive consumption centric source of growth. This should place further downward pressure on prices, with levels expected to fall below \$6,500/t in late 2014/early 2015.

Figure 178. Chinese is a key source of copper consumption growth



Source: WBMS, Citi Research

Figure 179. Upward trend in exchange inventories continues in 2013



Source: LME, Citi Research

Aluminum– squeezed, for now

- Bouts of backwardation have increasingly become a feature of the LME Aluminum market forward curve with individual spread squeezes seen initially between Sept/Oct 2012 and Dec 2012/Jan 2013. Rather than being irregular events, backwardated monthly spreads have appeared between Jun/Jul 2013, Sept/Oct 2013, and Dec 2013/Jan 2014 dates. This effective flattening of parts of the forward curve potentially presents a challenge to rolling forward contango financing deals.
- It does seem somewhat strange that tightness can occur along the forward curve in such a dramatically oversupplied market. The points of tightness in a still largely contango forward structure are merely a reflection of the size of contango financing deal related position that need to be rolled forward, and a relative lack of sufficient liquidity in the market. Does this mean that metal will fall out of financing deals? The answer we think is no at an aggregate level. While LME open interest was relatively low at the beginning of the year enabling the opening up of points of backwardation, levels have surged over the past month, and are now at the highest level since last October, suggesting there is growing market liquidity. Recent falling prices have prompted a pick-up in consumer buying and hedging activity, helping provide more market liquidity, and it is not coincidental that the Sept/Cot 2012 backwardation has now rolled out.
- A frequently asked question with reference to contango financing deals is whether the prospect of rising interest rates in the future will prompt a reduction in investor appetite to maintain or increase volumes held in financing deals, as rising rates would increase the cost of borrowing and thus margins on such deals. However, we think this view is misplaced. An increase in interest rates would simply act to steepen the contango, assuming the market remains in significant oversupply, which is our core view. Initially, a rate hike would reduce the volume of metal being bought by investors, as borrowing cost rose, prompting the front end contango to deepen. As a consequence of this, investors would also initially be selling less volume further forward, prompting the back end curve prices to rise. The contango would essentially adjust to the point where financing would remain attractive.
- We expect contango financing to remain an integral feature of the LME Aluminum market. This is particularly due to the fact that neither regulators nor the LME show any interest in tackling the issue of long load out queues for Aluminum at key locations such as Detroit and Vlissingen, currently holding 1.7 and 1.4 million tonnes of metal respectively. The queues have resulted in record high physical premiums which in turn have perpetuated Aluminum oversupply.

Figure 180. Aluminum supply / demand balance

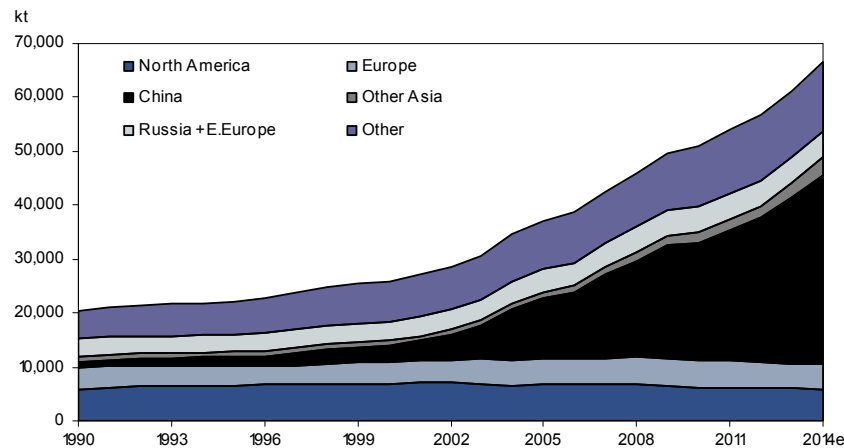
kt	2011	2012	2013E	2014E	2015E	2016E	2017E
Smelter Capacity ktpy	53,885	56,698	61,167	66,627	71,526	74,724	76,169
Refined Production	45,802	47,583	49,492	52,516	55,826	59,005	61,471
Capacity Utilization (%)	85%	84%	81%	79%	78%	81%	84%
Supply Incr (%)	8.6%	3.9%	5.5%	5.4%	5.9%	5.3%	4.6%
Consumption/Demand	44,574	46,489	48,920	52,029	55,285	58,488	61,267
Consumption Incr. (%)	9.1%	4.3%	5.2%	6.4%	6.3%	5.8%	4.8%
MARKET BALANCE	1,228	1,094	1,272	887	741	517	445
Stocks	6,999	7,359	8,631	9,518	10,259	10,776	11,221
Stock Change	496	360	1,272	887	741	517	445
Stocks (weeks)	8.2	8.2	9.2	9.5	9.6	9.5	9.4
Price: US\$/lb	1.10	0.93	0.90	0.99	1.02	0.95	0.95
US\$/t	2,423	2,049	1,975	1,930	1,950	2,000	2,050

Source: Woo Mackenzie, IAI, Citi Research

Aluminum – Supply growth continues despite cuts

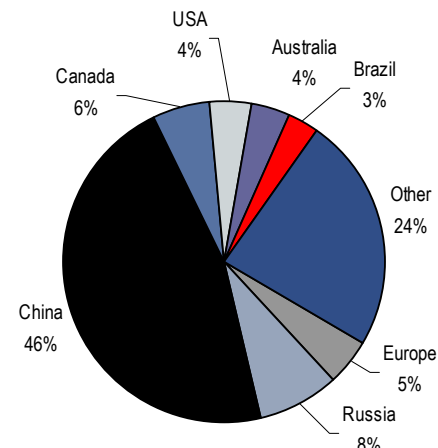
- The last month has seen new announcements of production curtailments by smelters. Rusal announced plans to cut 2013 production by 300,000 tpy on March 3, though we remain somewhat sceptical that the announcement will be fully implemented, as the company has not fully implemented previously announced cuts. Chinese producers Xinwang and Baise Yin Hai closed 155,000 tpy of capacity also in March. April has seen three more Chinese smelters, Shenhua, Datun Power and Yunnan Dongyuan, announce combined curtailments of 255,000 tpy. Analysts Wood Mackenzie suggests that over 1 million tpy of Chinese capacity has been permanently or temporarily shut since January 2012. The problem is that such capacity cutbacks have had little impact on restricting the size of surpluses due to continued brown and greenfield projects capacity and production growth.
- Despite announced Chinese cuts, Chinese primary Aluminum production grew by about 13% to close 22 million tonnes, and given the extent of capacity building particularly in western states of China, we expect a further 13% increase in 2013, meaning Chinese production will significantly outpace Chinese domestic primary Aluminum demand this year. Indeed, February production data from the National Bureau of Statistics showed Chinese production grew by 1.8 mtpy versus January levels. Whilst we do not expect there to be a flood of primary Aluminum exports from China, we expect Aluminum semis exports to pick up strongly, which will have a knock-on negative impact on primary consumption in the other regions, particularly other Asia and Europe, regions we expect to be the most significant recipients of Chinese semis exports this year.
- It not only in China where primary production is growing. A number of new greenfield projects are starting up this year including Alcoa's JV 700 ktpy Ma'aden smelter in Saudi Arabia, Hindalco's 360 ktpy Mahan smelter in India. This year alone will see 3 million tonnes of new capacity begin production. We are currently projecting primary Aluminum production to grow 5.5% this year, a level somewhat below consensus, as we expect to see further production cuts in Europe. Currently more than 25% of EU operating smelter capacity is failing to break even on a cash costs versus LME cash plus physical premium basis.

Figure 181. No slowdown in supply growth going forward



Source: Wood Mackenzie, IAI, Citi Research

Figure 182. Aluminum production by region, 2012

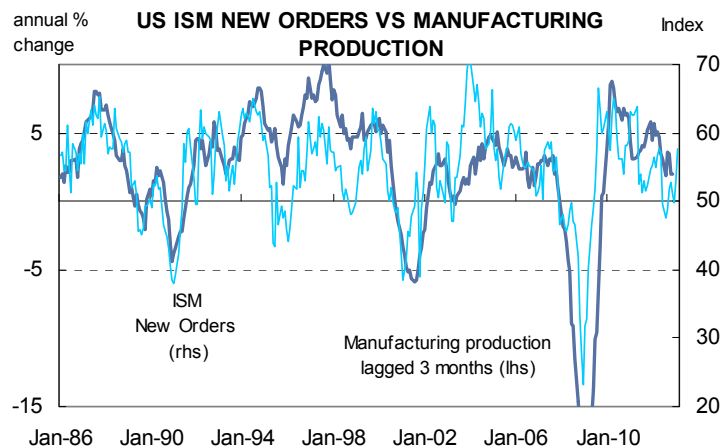


Source: Wood Mackenzie, IAI, Citi Research

Aluminum – no 2013 demand surge projected

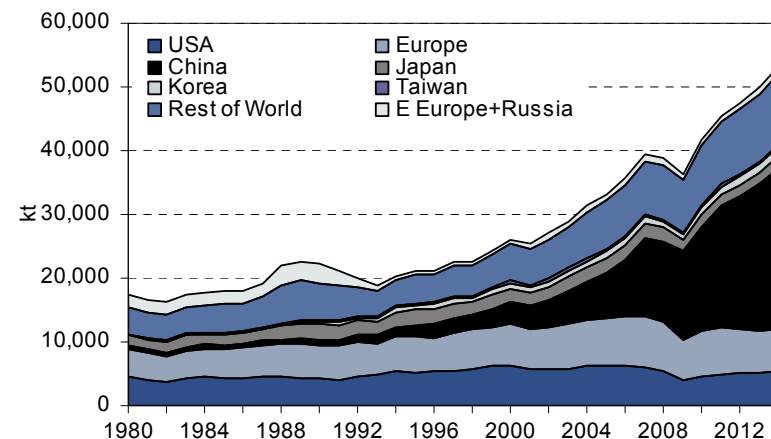
- Chinese Aluminum consumption growth slowed appreciably in 2012 to 9.4% from 16.4% in 2011. Slow housing construction activity and slow rates of growth in fixed asset investment dragged growth levels down as the influence of the 2009 stimulus policy faded. Recent macro data suggests that last year's more moderate rate of consumption growth will continue. Indeed, official March 2013 PMI came in at 50.9, up on January but below both March 2012 levels and consensus estimates of 52.
- A rise in Chinese housing starts over January-February, up 15% yoy, has led some commentators to expect a continuation of such growth rates over the year as a whole. We believe the surge in starts was in response to rising property prices seen during Q4 last year. However, the March introduction of measures to significantly restrict credit availability for property purchases, in order to reverse property price inflation, suggests this growth trend won't continue. As mentioned in the above copper section, budgeted investment plans for energy networks also do support a view of strongly accelerating Chinese Aluminum demand.
- US manufacturing activity in March also disappointed, with the ISM survey at 51.3, down on February levels of 54.2. Perhaps more worrying was the fact that New Order growth declined sharply, measured at 51.4 versus 57.8 in February. The auto/transport sector in particular has decelerated in recent months, with high levels of auto inventories built through 2012 pointing to more moderate rates of production going forward.
- The outlook for Europe remains gloomy with stabilisation looking like an overused term. The March Markit Eurozone PMI survey pointed to the 23rd straight month in a row of year-on-year declines in manufacturing activity. End use sectors remain moribund, with Eurozone auto sales over the first two months of the year having declined by 22% yoy, with light and heavy commercial vehicles both down by 23% yoy. We expect European Aluminum consumption to contract by 2.2% this year following from a 6.8% contraction in 2012.
- Globally, demand growth is projected to pick up from 2012, growing by 5.2%, a modest increase versus 2012 growth levels of 4.3%, largely as a result of Chinese demand rising by 9.6%.

Figure 183. US ISM new orders fell sharply in March



Source: Bloomberg, Citi Research

Figure 184. Modest pick-up in consumption growth expected in 2013

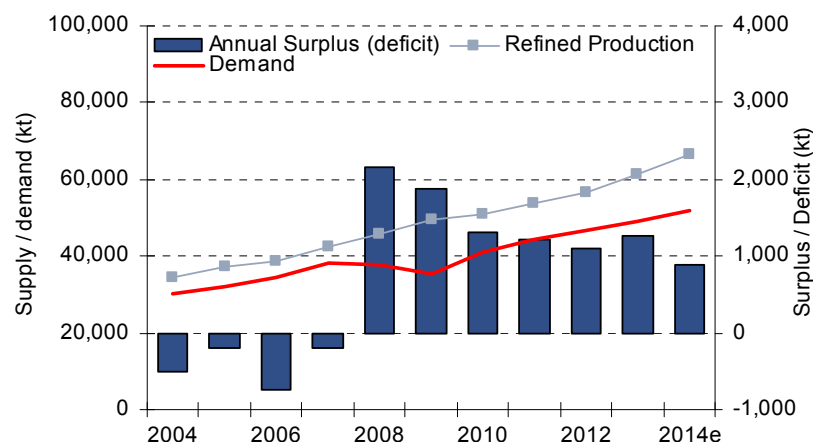


Source: Wood Mackenzie, WBMS, Citi Research

Aluminum – prices struggle under growing weight of metal

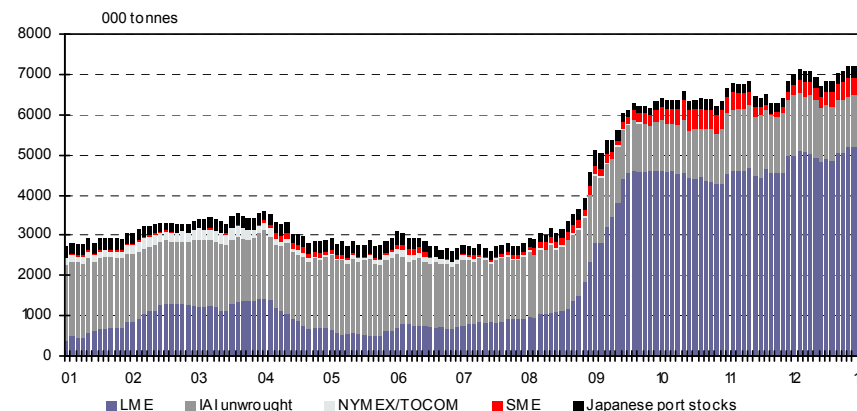
- The Aluminum market is heading for its sixth consecutive year of sizeable surplus in 2013 given our expectation for supply to outstrip demand by almost 1.3 million tonnes this year. We estimate that the volume of metal now accumulated since the last year of deficit in 2007 is over 9 million tonnes. It is worth emphasising that in 2007 reported inventories (LME, SHFE, producer and consumer holdings) stood at 3 million tonnes, and unreported stocks estimates at a similar level, suggesting that total Aluminum stockpiles are currently around 13-14 million tonnes and probably significantly above. In a normally functioning market, such high levels of inventory, one third of total global consumption would prompt significantly lower prices.
- The first week of April has seen LME 3-month Aluminum prices trade down to \$1,860/t, the lowest levels since August 2012 driven down by softening macro cues from the US and China, and re-emergence of Eurozone worries driven by the up to 60% depositor haircut in Cyprus prompting fears of capital flight from other highly indebted European countries. However, even at these prices, high physical premiums ranging from \$259/t in North America to \$285/t in Europe and \$242/t in Japan continue to sustain production at what are effectively uneconomic smelters, particularly in Australia and Europe. As we mentioned in our 2013 Outlook – [The New Abnormal](#), published in November last year, we would need to see a sustained price move below \$1,800/t for a matter of months to prompt meaningful capacity closures. This is not a scenario we see as likely.
- As was the case in 2012, dips towards the important \$1,800/t have seen both consumer and fund buying. Hedge funds in particular have been playing copper versus Aluminum relative value trades over the last 2 quarters, selling copper and buying Aluminum when the copper – Aluminum price ratio gets to over 4, and switching this trade around when the ratio gets to 3.5. The first week of April saw this ratio push to over 4 again, suggesting aluminum's moves towards \$1,800/t will be limited. However, growing inventory levels will continue to limit any significant upside. Our expectation of growing oversupply this year has prompted a downgrade in our 2013 price expectations, with price now projected to average \$1,975/t compared to our previous projections of \$2,100/t, with prices in Q2 and Q3 average \$1,935 and \$1,940/t respectively. We expect little upside in 2014 with prices forecasts to average \$1,930/t.

Figure 185. Aluminum surplus expected to equal 1.3 million tonnes in 2013



Source: LME, Citi Research

Figure 186. Reported stocks expected to climb above record levels in 2013



Source: Various exchanges, Citi Research

Nickel – about to drown in NPI again?

- At the time of writing, nickel has been the second equal best (or second least bad) price performer this year, even allowing for the early April price pull-back towards the \$16,000/t level. Indeed, current price levels are at 91% of those at the start of the year, beaten only by tin where current prices levels are 93% down. What makes nickel's relative performance surprising is that again it is due to be facing a wave of supply from Chinese Rotary Kiln (RKEF) based nickel pig iron (NPI) producers, High Pressure Acid Leach (HPAL) projects and Ferronickel projects. Indeed, a number of analysts continue to recount the suggestion that between 500-700 ktpy of RKEF capacity is currently in build in China this year, without stopping to question what volume of NPI the Chinese Stainless steel sector actually needs.
- It is important to try and dissect the actual type of nickel usage in Chinese Stainless mills to ascertain whether the projections of NPI capacity growth are viable. Looking at the major producers, it is clear that Chinese stainless mills continue to consume very large quantities of ferronickel and LME grade material, rather than completely substituting out these grades of nickel for NPI. For example, TISCO, China's largest stainless producer, produced over 3 million tonnes in 2012, and consuming between 170-180 kt of nickel, of which 25-30 kt of nickel scrap, 55-60 kt of NPI, and 80-90 kt of higher grade primary nickel. TISCO's scrap ratio is now 15% compared to between 25-30% prior to the emergence of large-scale NPI production in 2007. The data for Bao Steel No.1 is somewhat similar, consuming roughly 45kt in 2012, of which 20 kt was NPI, 20kt higher grade primary nickel, and 5 kt scrap. At LISCO, NPI consumption was around 12 kt of approximately 40 kt of primary nickel consumption, with scrap being an additional source 6-7 kt of nickel units. So high grade primary (non-NPI) nickel accounts for 50-60% of primary nickel use for these mills. It is the same story for all of China's top 12 stainless producers accounting for 79% of Chinese stainless production. Overall, China's scrap ratios have declined from 39.7% to 16.7% since 2007, according to Wood Mackenzie, indicating that it is scrap has been substituted out, rather than higher grade primary nickel.
- Looking at NPI from the point of view of current Chinese stainless mills primary nickel consumption needs suggests that any NPI production capacity over approximately 340-350 kt in 2013 will be excess requirements. We are currently projecting NPI production to be 362 kt in 2013, suggesting an excess availability of NPI or 10-20 kt. Does excess NPI availability have negative connotations for the wider nickel market? The simple answer is no, as NPI is not exportable outside China, thus it is essentially stranded material. Indeed, we expect to see independent NPI producers with no direct stainless mill linkage to be forced out of the market through 2013/2014, as stainless mill linked/owned RKEF capacity does expand. Any talk of 500-700 kt of new RKEF capacity will not be net capacity additions.

Figure 187. Nickel demand / supply balance

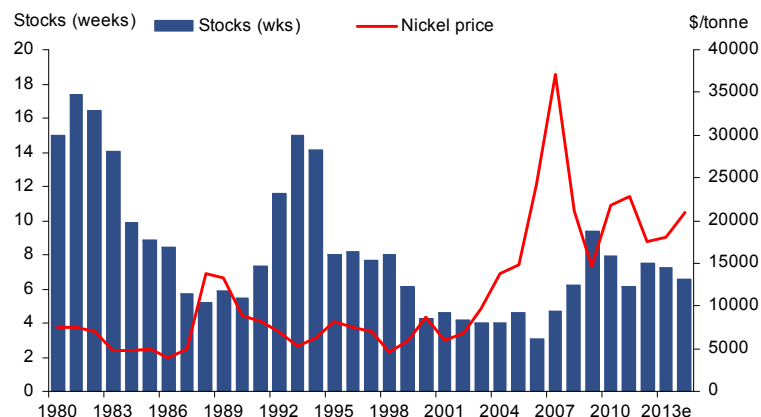
Kt	2011	2012	2013E	2014E	2015E	2016E	2017E
Mine production	1,982	2,132	2,195	2,260	2,265	2,416	2,387
Refined capacity	2,420	2,577	2,602	2,673	2,684	2,630	2,630
Refinery utilization	67%	68%	70%	72%	74%	77%	78%
Nickel in Pig iron	260	317	362	354	367	365	375
Metal production	1,627	1,752	1,826	1,919	1,980	2,017	2,047
Supply	1,627	1,752	1,826	1,919	1,980	2,017	2,047
Supply (%)	12.5%	7.6%	4.3%	5.1%	3.2%	1.9%	1.5%
Consumption/Demand	1,633	1,722	1,820	1,928	2,003	2,031	2,080
Consumption (%)	7.0%	5.5%	5.7%	5.9%	3.9%	1.4%	2.5%
Surplus/Deficit	-5.4	29.1	5.8	-9.5	-23.0	-13.9	-33.7
Reported stocks	192.3	248.2	254.0	244.5	221.5	207.6	173.9
Stock change	-40.9	55.9	5.8	-9.5	-23.0	-13.9	-33.7
Stocks (wks)	6.1	7.5	7.3	6.6	5.8	5.3	4.3
Price - US\$/lb	10.38	7.98	8.18	9.48	10.43	10.89	10.89
- US\$/t	22,888	17,592	18,035	20,900	23,000	24,000	24,000

Source: Citi Research

Nickel – no restocking demand in Q1, but melt rates are picking up

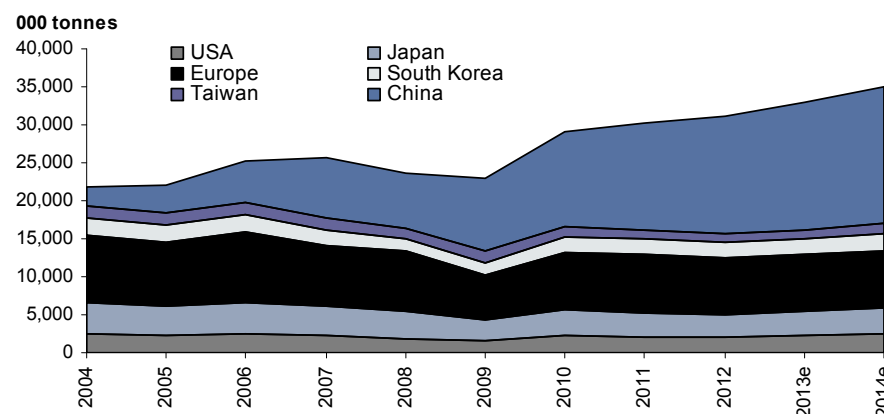
- Q1 did see a pick-up in global stainless steel melt rates, at 2.3% y/y to 9.2 million tonnes, but the market saw little in the way of sustained restocking, either by stainless steel consumers, or stainless steel mills themselves rebuilding nickel inventories. Data from analysts suggests strong growth in China (up an estimated 12.9% y/y) was to some extent countered by soft melt rates in Europe and North America. However, European mills have reported that Q1 melt rates were actually better than they had expected and significantly better than Q4 2012 levels. In the US, service centre destocking has weighed melt rates in Q1, though real end user stainless demand is reported to be positive, with demand boosted by construction activity.
- 2012 generally saw significant destocking drive, not only by stainless steel consumers but also stainless steel mills destocking nickel as prices remained under pressure between Q2 and Q4. Mills in Europe and North America are still said to be ordering nickel deliveries on very much a hand to mouth basis. This trend partly explains the rise in exchange inventory that has occurred though 2012. Indeed, the pricing of stainless in Europe and the US using a base price and an alloy surcharge based on 1-2 month preceding alloy (nickel) prices creates an incentive for stainless consumers to cancel orders and run down inventory in the face of a falling nickel price, so not to be left with overpriced stainless. The modest Q1 2013 nickel price rally was not sufficient to prompt any form of restock.
- For 2013 as a whole, stainless production global is expected to pick up on 2012 growth rates, rising from 3.1% to 6.1%, on continued melt capacity growth in China, plus a pick-up in US melt rates going forward as service centres continue to work off inventory. Perhaps the most interesting recent trend has been the pick-up in Austenitic (300 & 200 series stainless) ratios in China, which have moved from 71% in 2008 to 78% in 2012, with higher grade nickel bearing stainless accounting for close to 50% of the total, and 200 series around 28-29%. We expect nickel to be one of the key metal beneficiaries from China's policy moves to re-gear the economy to a more domestic consumer driven focus, being a consumer product focused metal.
- While nickel bearing grades are increasing their share of Chinese stainless production, another key trend has been the effective substitution of nickel scrap, and in particular imported scrap from the nickel unit supply mix, with scrap ratios at 16.7% in 2012, while non-NPI primary nickel has continued to account for around 50% of nickel units used in stainless production, a fact that goes against prevailing sentiment that higher grades of nickel or not needed in the face of rising NPI capacity.

Figure 188. Nickel inventory expected to return to draw trend in 2013



Source: Wood Mackenzie, INSG, Citi Research

Figure 189. Stainless production expected to pick up on 2012 levels

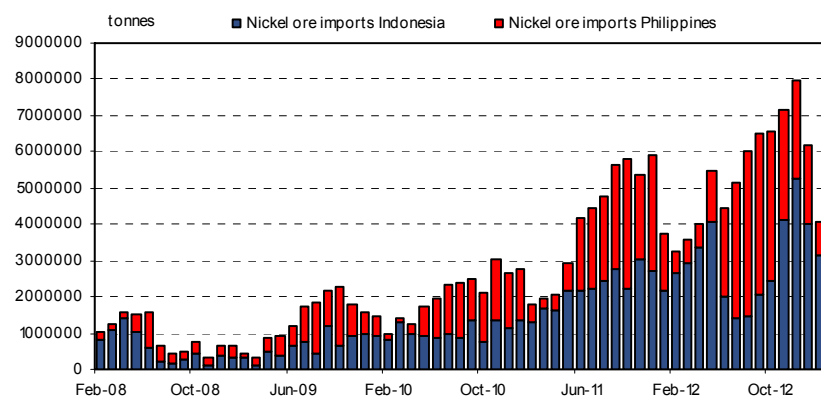


Source: Wood Mackenzie, INSG, Citi Research

Nickel – Mainstream supply failure a continuing theme

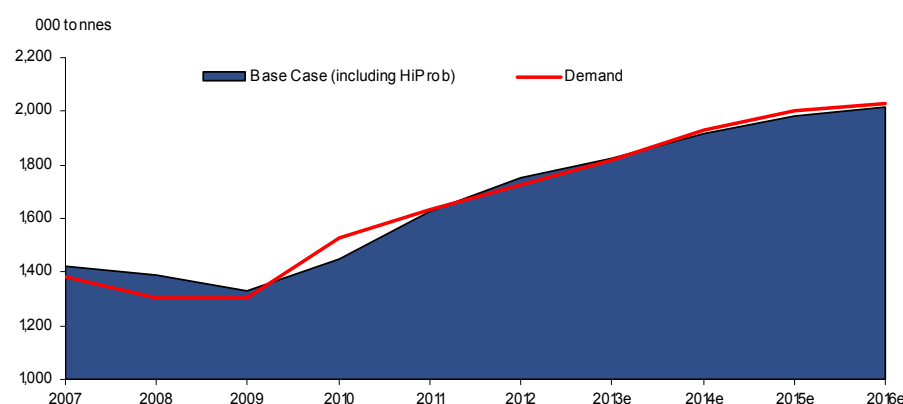
- While much of the mainstream debate over nickel supply focuses on Chinese NPI production, there is clear evidence that mainstream (non-NPI) production continues to face problems. At existing producers, Norilsk has reduced its 2013 production guidance down by between 15-25 kt from 2012 levels, while capacity has been closed by Mechel (Pobuzhsky -25 ktpy capacity FeNi plant) in Russia, and Nicaro (16 ktpy hydromet capacity plant) in Cuba. For new projects, the 60 ktpy Koniambo FeNi plant in New Caledonia, which was due to start production in Q1, has been delayed, and we have reduced our 2013 production expectations by 4-5 ktpy to 11kt. Vale's 58 ktpy Onca Puma FeNi plant is out of action for a full year due to extensive furnace damage, while Anglo's similarly designed 40 ktpy Barro Alto FeNi plant is operating at less than half capacity also due to furnace damage. These issues alone effectively remove around 130,000 tonnes from 2013 production.
- Double counting also appears to be an issue with much analysis of the impact of some of the new projects. For example, First Quantum's 39 ktpy Ravensthorpe HPAL plant and MCC's 22 ktpy Ramu HPAL plant only produce nickel intermediates which largely flow to Chinese refiners Jinchuan, Jilin and other small Chinese producers, and not final production in addition to Jinchuan and Jilin expansions.
- For non-NPI nickel production, we forecast very minimal growth of 2% in 2013, rising from 1.43 million tonnes to 1.46 million tonnes largely provided by TISCO's Tanguang JV 22 ktpy FeNi project in Myanmar, the start-up of Koniambo in New Caledonia, the ramp-up at Sherritt's Ambatovy operation in Madagascar and continued expansion of Jinchuan's refining operations in China.
- Going forward, Indonesia remains the biggest threat to supply-side growth. While interim nickel ore export ban measures introduced in May 2012 were ruled illegal by the Indonesian Supreme Court in September on a technicality (that only the Ministry of Trade can ban exports, not the Ministry of Finance), the actual full ban under the 2009 Mining Code remains in place and is due to be implemented from January 2014 in order to promote more ore processing within Indonesia. Ahead of this we expect Chinese ore imports to surge as large Stainless Steel producer backed NPI plants build inventory ahead of the possible ban. Indeed stocks of nickel ore at Chinese ports are now reported to be over 21 million tonnes, of which 12 million tonnes are Indonesian material suitable for RKEF based NPI production. It should be emphasised that RKEF NPI plants need to use ore of 1.8% nickel content or above to stay cost competitive, which means Filipino material is not interchangeable for Indonesian. Even a limited ban of Indonesian sourced ore is likely to have a production cost impact once ore inventories have been run down.

Figure 190. Chinese nickel ore imports: Filipino material no substitute for Indonesian ore



Source: NBS, Citi Research

Figure 191. Nickel supply is beginning to underperform

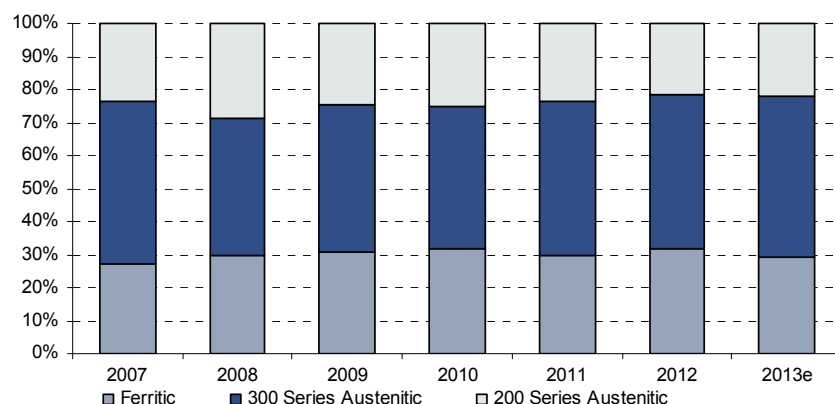


Source: Wood Mackenzie, Citi Research

Nickel – Significant surplus still not expected

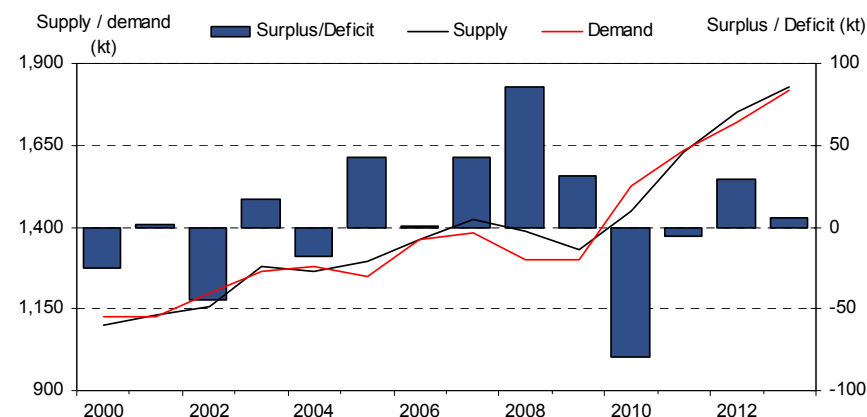
- Many analysts continue to confuse the use of NPI with the use of primary nickel in Chinese stainless steel production. The splits in the consumption mix of nickel units at major Chinese stainless steel plants continue to show that where 300 series grade of stainless are produced, NPI is not the dominant source of nickel units, but is largely used to replace scrap units. The low scrap discounts to LME prices in the US and Europe, reported as low as 76%, partially illustrates the impact of China's dwindling needs for scrap imports. Where NPI is the more important source of nickel units is for lower nickel content 200 series stainless. Looking at China's stainless grade mix over time, it appears that while 300 series share has been stable at around 50%, while 200 series has taken share from non-nickel ferritic grades.
- Higher cost forms of NPI production, such as the Blast Furnace route where costs range between \$17,350/t to \$23,700/t, are expected to disappear going forward. The continued viability of EAF NPI production in inland states such as Inner Mongolia and Ningxia is also questionable given February's 13% increase in rail freight tariffs from RMB 0.1151 to 0.1301 tonne per km. For a 2% Ni ore grade, this represents an increase from RMB 58 to RMB 65 per tonne Ni per km. Once distance is taken into account, this means around a RMB 3,200/t Ni increase in shipping 2% ore to Inner Mongolia by rail, and more than double that to Ningxia. In January, NPI production costs in these 2 regions ranged between \$15,500/t and 16,300/t respectively, the freight hike would add between \$500-\$1000/t Ni to production costs.
- Mainstream nickel continues to face distinct lack of capex going forward. With major HPAL/Ferronickel projects costing in the region of US\$5-7 bn, major miners are looking elsewhere to focus exploration and development budgets and nickel mine supply is expected to begin to contract by 2017. Indeed, Koniombo represents the last major fully funded mine-to-metal project due to begin production this decade. Next year's start-up Vale's Long Harbour Refinery at Voisey's Bay, Canada, marks the final stage of the development of Vale's Newfoundland operations, where mining began in 2005. It should be noted the Long Harbour will effectively replace the Thompson Refinery in Manitoba, which will close in the same year, and thus does not represent a net addition to supply.
- In terms of our outlook, we expect a relatively balanced market in 2013, with surplus NPI nickel production countered by a relative lack of growth in other forms of nickel output. In terms of price activity, nickel appears to have found a reasonable floor at around \$16,200/t, and we expect prices to trade between this level and \$18,000/t over the middle two quarters, supported by struggling mainstream production, and continued positive growth in US and Chinese stainless demand.

Figure 192. China: austenitic vs ferritic



Source: Wood Mackenzie, INSG, Citi Research

Figure 193. Nickel Balanced in 2013



Source: Wood Mackenzie, INSG, Citi Research

Zinc – growing distortion as contango financing take hold

- After being the LME's joint best performing metal for the first 3 quarters of 2012, zinc has more recently been vying with Aluminum to be the market's worst performer. Indeed, LME 3-month zinc prices have fallen 17% since reaching \$2,230/t in mid-February, while over the same period Aluminum has fallen by over 14%. The link between the two metals is the issue of oversupply, load out queues, and contango-related inventory financing. Zinc has, in terms of contango spreads, overtaken Aluminum in terms of attractiveness to contango finance largely as a result of the development of spread tightness along the Aluminum forward curve.
- Zinc inventory has become concentrated in LME warehousing locations that are synonymous with load out queues, namely New Orleans, Detroit, Antwerp, Vlissingen and Johor. New Orleans alone accounts for 64% of total LME zinc inventory, currently standing at a total of 1.15 million tonnes, slightly off the 1.21 million tonnes record high level in mid-March. Currently 63% (462,375 tonnes) of the zinc inventory in New Orleans is on-cancelled warrant. This essentially means that it would now take 154 working days (31 weeks) to obtain metal from the New Orleans warehouses if you cancelled a warrant today. In Antwerp, cancelled warrants now stand at 95.5% of zinc inventory, while in Vlissingen the level of cancelled warrants is 75% of the total.
- If Aluminum represents a guide to what can happen to LME prices while LME warehousing continues to operate in its current dysfunctional state, then there is every prospect that spot physical premiums will continue the upward trend seen over the last 12 months, at the expense of upside moves in LME prices. Indeed, since 2011, US physical zinc premiums have risen from around 4% (\$114/t) of end consumer prices (LME + physical premium) to close to 9% (\$176/t), as long load out queues at LME warehouses have been built, limiting prompt availability of metal.
- It is tempting to suggest that the recent draw trend in LME inventory is a sign of a significantly tightening market due to either rapidly improving demand, or weaker supply. Indeed, total LME inventory levels have fallen by 63,000 tonnes since their mid-March 2013 peak of 1.21 million tonnes. The draws have occurred in warehouses in New Orleans and Antwerp. However, refined production, particularly in China, has seen a pick-up this year, while demand does not appear robust if the lower rates of galvanised steel sheet production in China in January and February are representative. Given the location of the draws, we believe that the trend represents attempts by two major metals traders to exert greater upward pressure on physical premiums, rather than an indication of strong underlying demand.

Figure 194. Zinc supply / demand outlook

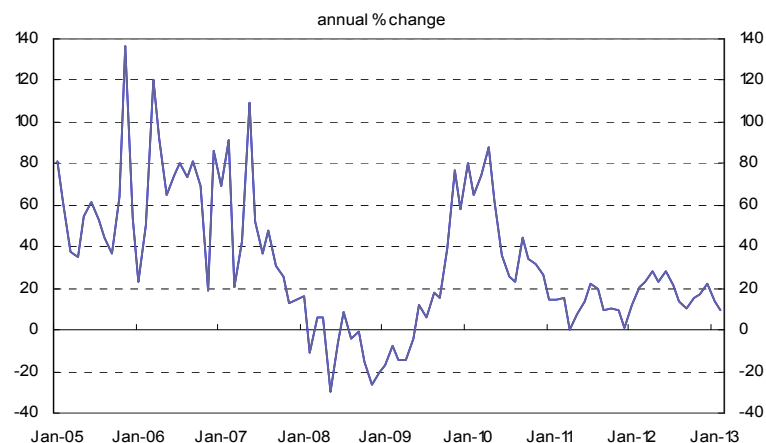
kt	2011	2012	2013E	2014E	2015E	2016E	2017E
Mine production	12,625	13,340	13,539	14,020	14,246	14,556	14,903
Concentrate required	13,077	12,689	12,938	13,450	14,000	14,398	14,812
Smelter Capacity	15,378	15,719	16,071	17,048	18,127	18,059	18,099
Primary prodn	12,473	12,103	12,340	12,829	13,353	13,732	14,127
Secondary prodn	956	991	1,063	1,066	1,076	1,076	1,076
Supply	13,429	13,094	13,403	13,893	14,429	14,808	15,203
Supply (%)	3.5%	-2.5%	2.4%	3.7%	3.8%	2.6%	2.7%
Consumption	12,593	12,808	13,138	13,584	14,169	14,680	15,168
Consumption (%)	7.6%	1.7%	2.6%	3.1%	4.6%	3.6%	3.3%
MARKET BALANCE	836	286	265	346	259	128	35
Reported stock change	253	340	265	346	259	128	35
Total reported stocks	1,617	1,957	2,222	2,568	2,827	2,955	2,990
Stocks (wks)	6.7	7.9	8.8	9.9	10.4	10.5	10.3
Price (US\$/lb)	1.00	0.89	0.90	0.93	0.95	0.98	0.99
(US\$/t)	2,212	1,963	1,995	2,050	2,100	2,150	2,175

Source: Wood Mackenzie, ILZSG, Citi Research

Zinc – demand better in 2013, but not by much

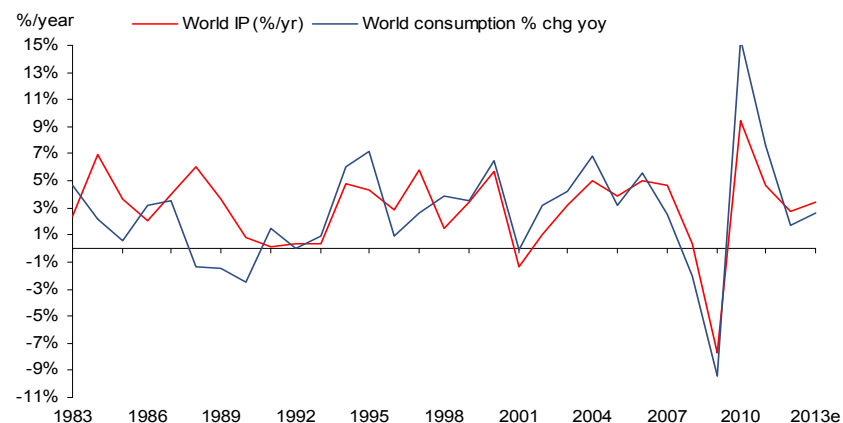
- Zinc demand growth slowed to 1.7% in 2012, largely as a result of significantly slower Chinese consumption growth, which slowed to 6.6% compared to 12% in 2011. Sluggish construction activity was a key factor in slowing Chinese demand last year, as measures introduced by the government to control or reverse property price inflation in major urban areas acted as a disincentive for property developers. In addition, the hoped-for boost to construction activity through the setting of regional targets for economic house building failed to have the desired impact. Last year, the Government targeted 7 million units, where actual numbers came in at 6 million. We also understand that even these outcome numbers were over inflated by regional Governments reclassifying unsold property as economic units in order to try and meet targets. The current targets for 2013 economic housing building are for 6.3 million new starts, however we suspect these targets are similarly ambitious. We estimate that construction and infrastructure building accounts for over 55% of zinc demand in China, thus reduced residential construction activity has a major impact.
- Will 2013 be any different for Chinese demand? Housing starts for January and February suggested a more positive outlook for zinc demand, with 19% increase in numbers of property units starting construction in January and February this year compared to last year. However, we believe this surge was largely in response to a pick up house price inflation during Q4 last year. A raft of new Government measures introduced in February to further combat property price inflation suggests that this early year pick up in construction activity will be short lived. While we expect positive growth from the Chinese auto sector this year, we have reduced our Chinese zinc growth expectations to 4% for 2013 on slower construction activity in light of recent policy announcements on property markets, and a generally more neutral policy approach to infrastructure building this year.
- While demand in Europe is expected to continue to struggle, with passenger and commercial vehicle sales down collectively by around 22% yoy in the first 2 months of the year, and we expect a continued decline over the next 2 quarters. Over all Eurozone manufacturing activity has now been in decline since May 2011, with no clear evidence of a turnaround insight. The outlook for the US market is more positive given the recent trends in housing starts. However, we are cautious over the auto sector outlook, given the extent of finished auto inventory that built through last year, levels stood at 3.19 million units at the end of February this year, the highest level since December 2008. Indeed, we expect light vehicle production growth to slow to 2% this year, compared to 15% in 2012, as some inventory is worked off.

Figure 195. Chinese galvanized sheet production continues to slow



Source: Bloomberg, Citi Research

Figure 196. Zinc demand stalled in 2012, only modest improvement expected 2013

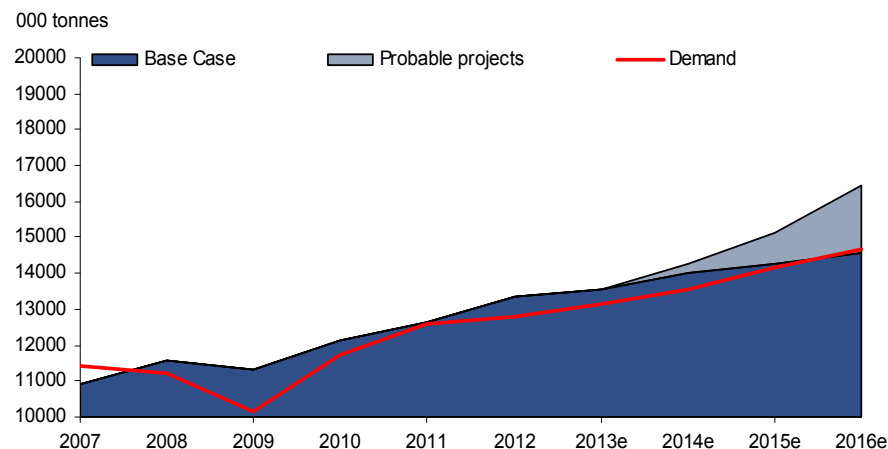


Source: Bloomberg, Wood Mackenzie, Citi Research

Zinc – Still no supply shortages

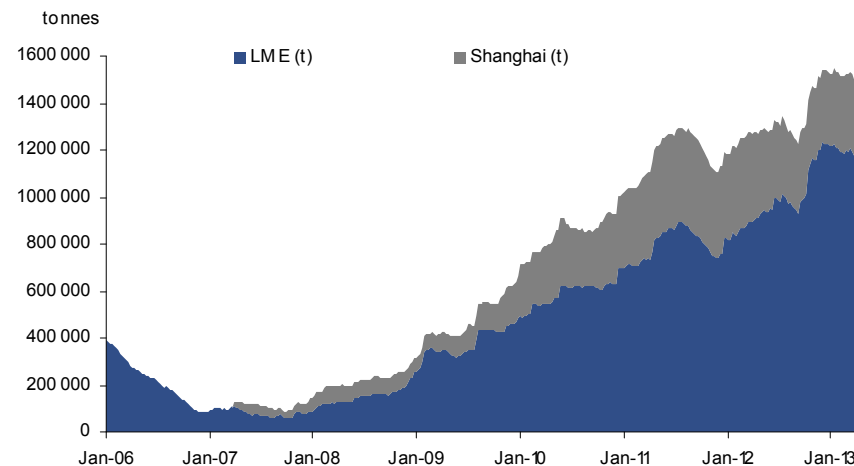
- The contraction in Chinese refined zinc supply during Q2 and Q3 2012 pitched the Chinese zinc market into a deficit for the year, prompting a 69% jump in net refined imports. However, China's domestic shortage of refined material did not push the global market into deficit, emphasising the extent of oversupply is the rest of the world. For the year as a whole, Chinese refined production pulled back by 7.5 y/y, but Q4 did see a rebound (up 18% q/q) in Chinese refined production, as improving prices and treatment and refining charges (TC/RCs) prompted smaller smelters to restart operations. Indeed, the Yunnan provincial government attempted to support local smelters towards the end of last year through the collateralising of 50,000 tonnes of zinc, as did the SRB (State Reserves Bureau) buying 100,000 tonnes of zinc in November, in order to support prices. The slow recovery in Chinese refined production has continued into Q1 this year, with Jan-Feb refined production levels up 1.5% yoy, with the SRB again helping by buying 45,000 tonnes of zinc in March.
- The Chinese refined cutbacks last year were prompted by zinc miners holding back concentrate from the market in order to drive down TC/RCs paid to smelters. Indeed, unlike refined production, Chinese National Bureau of Statistics data shows Chinese mine production grew by 15% yoy to 5.13 million tonnes last year, with the growth trend continuing into 2013, with Jan-Feb levels up 7% yoy. The concentrate market in China remains well supplied despite last year's 34% fall off in concentrate imports. We expect TC/RCs paid to Chinese smelters will continue improve through 2013, helping return Chinese refined production to growth next year.
- On the mine supply side, the bullish narrative for zinc in the form of ore depletion at larger older mining complexes continues to be pushed forward into the future. The settlement of annual TC/RC negotiations in (non-Chinese) Asia saw levels rise to \$210.5/t from \$191/t last year suggesting there is little expectation of a tightening concentrate market. Indeed, last year's announcements over the Century mine in Australia, with Minmetals further extending mine life into 2016 and perhaps beyond, plus the probable development of other Minmetals projects, Dugald River and Izok Corridor, life of mine extensions at Skorpion in Namibia, and continued Chinese mine supply growth, suggests there little prospect of a significant tightening of the zinc market in the short to medium term.

Figure 197. No apparent shortage in Zinc mine supply



Source: Wood Mackenzie, ILZSG, Citi Research

Figure 198. Zinc inventories in LME and Shanghai Exchange continue to rise

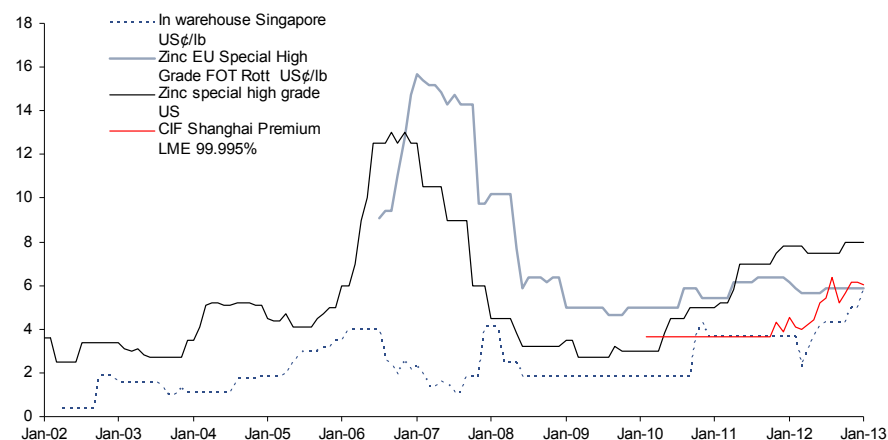


Source: LME, Citi Research

Zinc – upside moves remain challenging

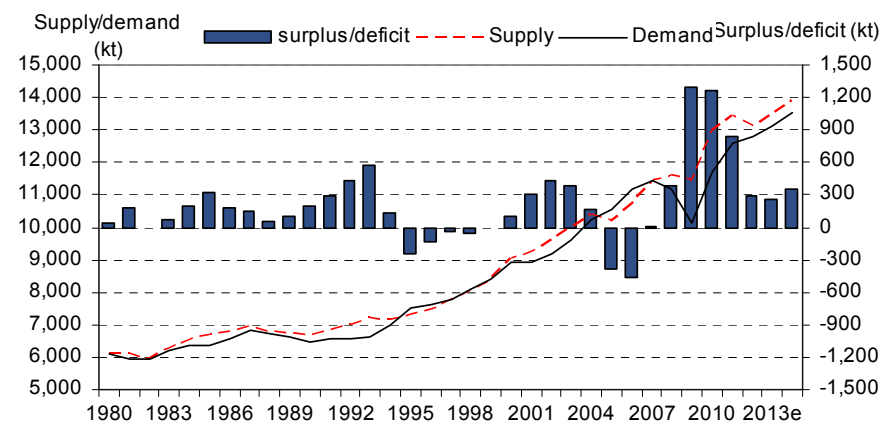
- After last year's contraction refined supply contraction, driven by pull-back in Chinese refinery output, we expect a return to growth this year, with global refined production expected to grow by close to 2.5%, driven by 10% pick-up in Chinese refined production. As a result of China's domestic production recovery, we expect that net zinc imports from the rest of the world will decline significantly from 2012 levels of 509,000 tonnes. Levels in 2013 have already declined by close to 20% yoy, and this import downtrend is expected to continue through the rest of the year, with net import levels forecasts to be similar to levels in 2011 of around 300,000 tonnes. Indeed, it is China's reduced call on outside primary zinc resources that will keep the zinc market in surplus in 2013. Looking further forward, we remain somewhat sceptical of the expectation of tightening zinc markets due to mine depletion in the Western world, and no further mine production growth in China. This has been the argument supporting a bullish view for zinc for the last 5 years, and each year China has surprised on the upside, and depletion of major mines has been postponed.
- 2013 will represent the seventh consecutive year of surpluses faced by the zinc market, with accumulated surpluses since 2007 pointing to implied stocks of close to 3 million tonnes. Data from the International Lead Zinc Study Group (ILZSG) suggests that combined exchange, producer, consumer and SRB stocks amounted to over 2.2 million tonnes at the end of January. This therefore suggests that a significant volume of zinc is now being held 'off warrant', which would fit the pattern of contango finance activities we have seen in the Aluminum market.
- If zinc really is beginning to mimic aluminum, then rising physical premiums should be expected to prompt greater supply growth, a possibility given the continued growth in mine supply combined with a smelting sector operating well within capacity utilization constraints. This in turn suggests that zinc is unlikely to continue to be one of the base metals sector's better price performers through 2013, with oversupply hampering pricing upside. Oversupply is like to continue to deepen the forward contango price structure, as has been seen through H2 2012, allowing increasingly attractive contango stock financing programmes to mop up any excess metal. In such a scenario, zinc prices are projected trade sideways, averaging \$1,995t for the year.

Figure 199. Zinc premiums, edging upwards



Source: Bloomberg, Citi Research

Figure 200. Market projected to remain in surplus in 2013



Source: Wood Mackenzie, ILZSG, Citi Research

Lead – still in surplus

- Lead was very much the H2 2012 price performer of the LME base metals complex, driven in part by surging warrant cancellations in US located LME warehouses. Indeed, lead cancelled warrants surged from 15% at the end of June to over 57% by the end of the year, with cancellations in US warehouses jumping from 0% end June to 88.5% (47,200 t) of total US located inventory by the year-end. Surprisingly, or perhaps unsurprisingly, actually outflow of metal from US warehouses occurred at a significantly slower rate, with the inventory falling by 15,000 tonnes over H2. The spark for US tightness was the September start-up of Johnson Controls 132 ktpy secondary lead plant in Florence, South Carolina, which effectively tightened an already tight secondary lead market, prompting other secondary users to try and source primary lead instead, presenting a number of large metals traders a perfect opportunity for a classic market squeeze. Given the extent of cancellations, US physical premiums rallied from \$165/t to \$331/t during October.
- The US market tightness was not representative of the wider global lead market. Indeed, tightness was not a factor in other major lead-consuming regions, such as China and Europe. Through H2 lead inventory in Shanghai Futures Exchange (SHFE) warehouses rallied from 22,645 tonnes to 68,045 tonnes by year-end, with Chinese lead prices falling from mid-September onwards despite the market supposedly entering the key restocking period for lead acid battery manufacturers to meet higher winter replacement battery demand. Rising primary lead mine production and secondary lead availability in China also acted to soften the Chinese market, with secondary metal's share of refined output rising from 21% to over 35% in the last decade, particularly driven by growing returns from the e-bike market.
- We estimate that the Chinese market was in surplus by around 100,000 tonnes last year, much of the excess appearing in SHFE warehouses, while on a global basis the surplus was closer to 38,000 t. The build in SHFE stocks, and generally weak winter replacement demand for batteries, suggested that the LME price rally was essentially unsustainable, as borne out by lead's price performance since the beginning of February. The switching of China back to being a net refined lead exporter in December 2012, the first time since March 2011, remaining a net exporter in subsequent months, as Chinese produce/traders take advantage of stringer LME prices versus SHFE, added to the sense that lead was over valued.
- With the winter and thus peak annual lead demand past, we expect the rate of draws in LME inventory to slow and probably reverse, pointing to a continued softening in prices through Q2 and for much of Q3 before winter driven restocking kicks in towards the end of Q3.

Figure 201. Lead Supply / Demand Balance

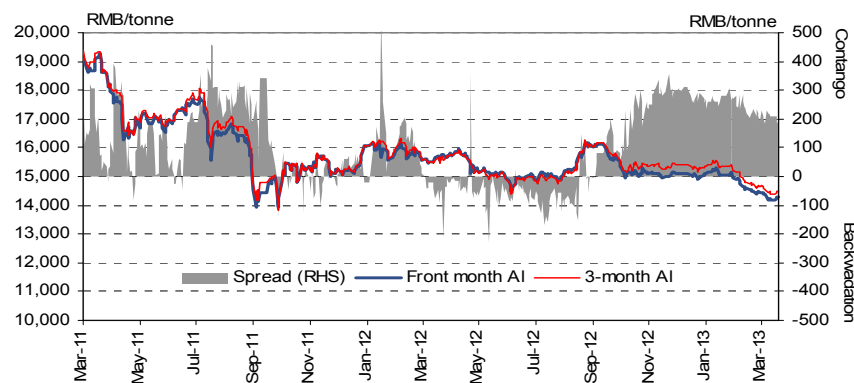
kt	2011	2012	2013E	2014E	2015E	2016E	2017E
Mine Production	4,540	5,096	5,522	5,750	5,748	5,715	5,608
Primary Production	5,190	5,244	5,440	5,543	5,729	5,771	5,763
Secondary Production	5,106	5,303	5,415	5,529	5,655	5,910	6,210
Refined Metal Production	10,296	10,547	10,855	11,072	11,384	11,681	11,973
% Change	6.7%	2.4%	2.9%	2.0%	2.8%	2.6%	2.5%
Consumption	10,126	10,509	10,759	10,957	11,262	11,569	11,882
% Change	4.4%	3.8%	2.4%	2.1%	2.5%	2.7%	2.7%
Surplus/Deficit	170	38	96	85	122	112	90
Reported Stocks	612	625	720	805	928	1,039	1,130
Stock Change	178	13	96	115	122	111	90.4
Stocks (wks)	3.1	3.1	3.5	3.8	4.3	4.7	4.9
Price (US\$/lb)	108.5	94.0	99.4	99.8	100.9	102.1	99.8
Price (US\$/t)	2,391	2,072	2,190	2,200	2,225	2,250	2,200

Source: Wood Mackenzie, WBMS, ICSG, Citi Research

Lead – supply growth expected in both China and the West

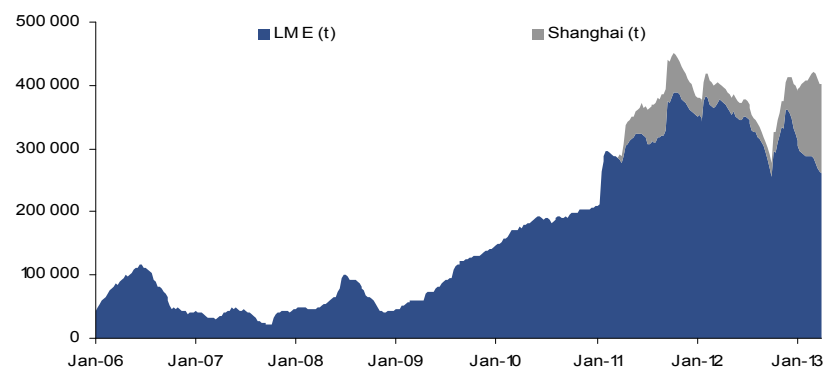
- Looking forward, despite plans to close smaller secondary plants in China on pollution control grounds, we expect continued growth in secondary availability within China, particular as batteries sold with surge new auto production in 2009 and 2010 begin to re-enter the supply chain. Indeed, secondary availability in China is expected to jump by over 12% this year, pushing total Chinese refined production to over 5 million tonnes. As result of production growth, we expect China to remain a net refined lead exporter this year.
- Supply is also set to rise in the rest of the world, with the restart of the 100 ktpy Porto Vesme Smelter in Italy, and last November's restart of the La Oroya smelter in Bolivia countering the closure of SFPZ's 40 ktpy Oued el Heimer lead smelter in Morocco and the upcoming closure of Doe Run's Herculaneum smelter, the last remaining US-based primary lead smelter. On the mining side, we expect the upcoming closures of Lisheen in Ireland and Brunswick in Canada to be countered by up to 200,000 tonnes of production from new mine projects over the next 2 years. However, we remain a little more cautious over the proposed Q2 2013 restart of Invernia's Parro Station (formerly Magellan) mine in Australia, given past false starts over environmental issues.
- On the demand side, relatively mild winters in the North Hemisphere meant that replacement battery market failed to spark in January and February of this year. We also expect demand growth for the OEM (Original Equipment Manufacturer) batteries for new autos to be softer this year, as the European auto sector continues to contract, while the 2012 rebound in US autos slows partially under the weigh of excess auto inventory. In China, lead acid battery production grew at 18% yoy according to the Chinese National Bureau of Statistics (NBS) in January and February, far ahead of demand of both domestic and export, with Chinese Analysts Antaika reporting size builds in lead acid battery inventory. Indeed, NBS report that exports of all forms of lead acid batteries from China fell by 13% yoy in Jan/Feb.
- In terms of price outlook, we expect lead prices to continue to soften into Q2, particularly as the grip of the US focused squeeze begins to ease, while China continues to export excess primary lead. Indeed, we project last year's 40 kt surplus to rise to 96 kt this year, due to stronger primary and secondary production combine with a softer demand profile.

Figure 202. Lead market moves further into contango of trader squeeze dissipates



Source: Bloomberg, Citi Research

Figure 203. Inventory levels remain close to record highs despite LME draws

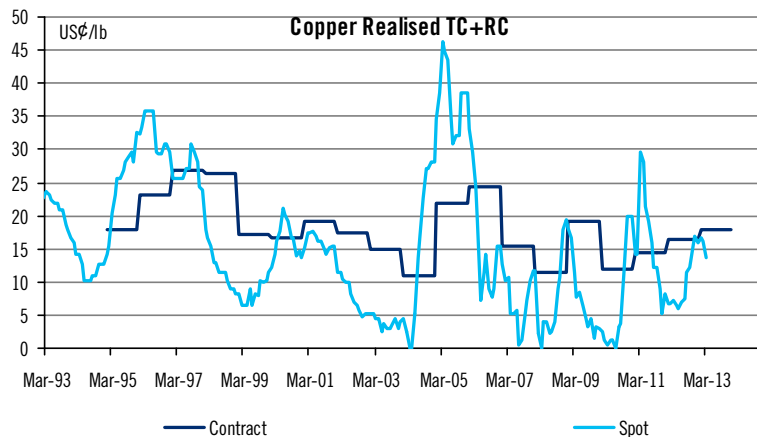


Source: LME, SHFE, Citi Research

Copper Treatment and Refining Charges (TC/RC)

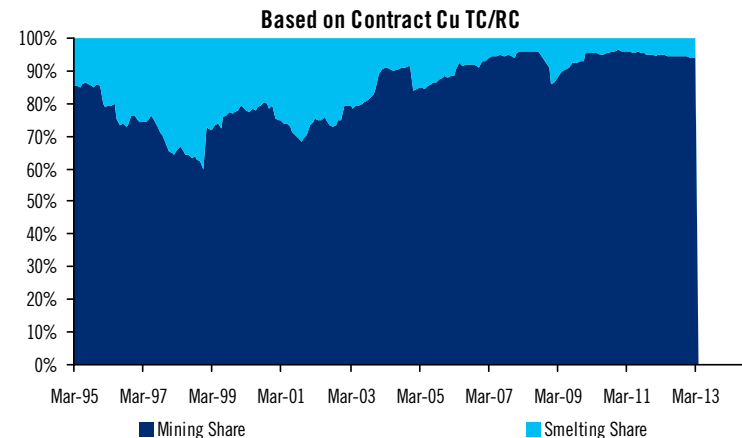
- 2013 benchmark TC/RC has been established at \$70/t and 7¢/lb, up ~10% from \$63.5/t and 6.35¢/lb in 2012.
- With the expectation of copper concentrate market turning into surplus and staying there for the next few years, we expect copper TC/RC to remain on upward trajectory
- The Supreme Court's verdict to reverse Madras high court's decision to shut down Sterlite's copper smelter (largest in India) takes away the bigger overhang on smelter's future. However, the smelter is currently shut under an order from pollution control board (PCB). An extended shutdown could benefit spot TC/RC given the dependence on imported concentrates and significant exposure to spot markets,
- Furthermore, the extended suspension of the Sterlite smelter could also spike up the physical premiums in the region.
- Copper smelting gives lower share of the metal price compared to zinc primarily because the copper price has been much higher resulting in a higher denominator. On the numerator side, there is no price participation and negligible free metal. We don't foresee any significant change in the trend, however sustained increase in TC/RC and lower expectations of copper price would result in an improved price share for smelters compared to current levels.

Figure 204. Spot vs. Contract Realised Copper TC/RC



Source: Wood Mackenzie, Datastream, Citi Research

Figure 205. Miners vs. Smelters share of metal price - Contract

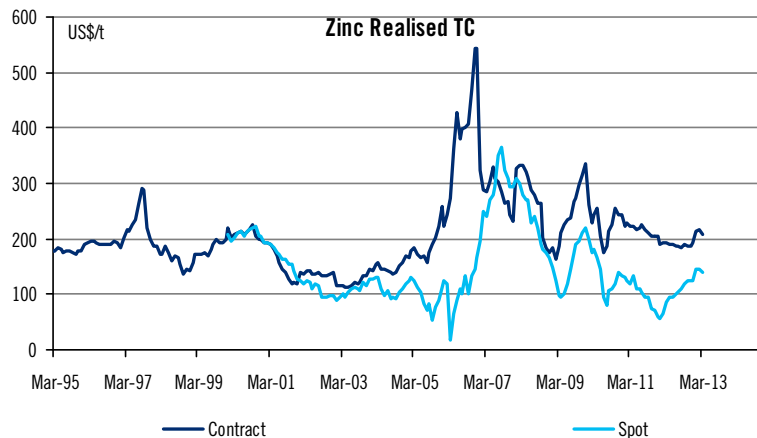


Source: Wood Mackenzie, Datastream, Citi Research

Zinc Treatment Charges (TC)

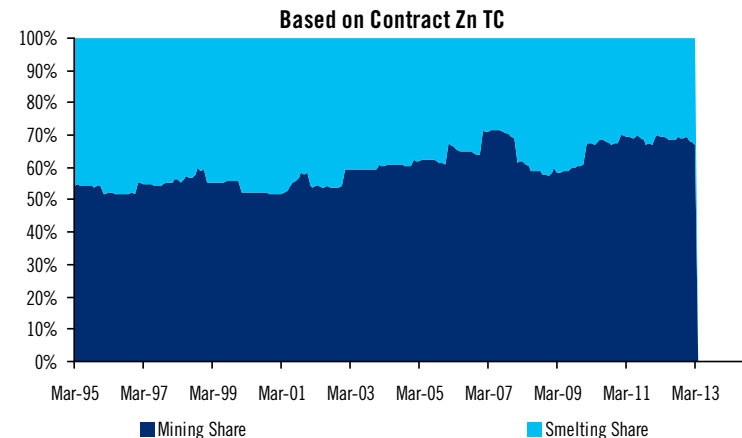
- While we haven't seen European TC settlements for 2013, Asian indicative settlements came out at \$210.5/t on a \$2,000/t zinc price, ~10% higher than 2012 settlements at \$191/t. Upscales are 6% between \$2,000/t to \$2,500/t, 5% between \$2,500/t-\$3,000/t, 2% between \$3,000/t - \$3,500/t, and none beyond \$3,500/t. Downscapes came out at 3% between \$2,000/t-\$1,500/t and none below \$1,500/t.
- 2012 witnessed the first shrinkage of Chinese zinc metal output since the early 1980s. With higher concentrate inventory both in China and globally, RoW smelters which have already been operating at near optimum levels have gained better bargaining power compared to what they have in the recent years.
- Spot TCs (primarily Chinese market) have continued to rise since January 2012, highlighting the pressure on Chinese smelters which are struggling to remain profitable as free metal is making a smaller contribution due to lower zinc prices.
- 2013 settlements will depend on how Chinese smelters act during 2012 but we expect another ~10% increase in 2013. However, higher Zinc TCs should come under pressure thereafter as the long expected concentrate deficit becomes more visible and closer. We expect sustained TC decline thereafter to settle at \$175/t longer term in today's prices.
- Old smelters in RoW have got higher sustaining capex and some capacity might eventually be shut down once Zinc TC starts its downhill journey. In the event of RoW capacity closure, longer-term Zinc TCs might stay higher than what we currently forecast.

Figure 206. Spot vs. Contract Realised Zinc TC



Source: Wood Mackenzie, Datastream, Citi Research

Figure 207. Miners vs. Smelters share of metal price - Contract



Source: Wood Mackenzie, Datastream, Citi Research

Precious Metals

Gold – US outlook is key

- Given ongoing concerns over the outlook for Europe, again brought into the spotlight by negotiations over the details of a Cypriot bailout, the fraying of Portugal's austerity plans by the recent Constitutional Court ruling, and an Italian state with still no functioning government, one might have thought European investors would have been rushing for gold as a safe haven, but that has not been the case. Similarly, the announcement on Thursday 5th April of the Bank of Japan's \$1.4 trn asset buying plan to try and end Japan's long period of deflation by doubling money supply and targeting 2% inflation over the next 2 years should notionally have sent gold price soaring, but by the end of the day prices were \$3.16/oz lower than at the open.
- While the gold market appears to be largely unmoved by Europe and Japan, the reality is that it is events in the US and their related dollar/inflation impact which remain pivotal for gold. This was clearly evidenced by gold's \$27/oz rally on Friday April 5th, the largest upward gold price move since November 6th. This move was on the back of weaker than expect US jobs data, with non-farm payrolls up by only 88k and private payrolls by 95k. This was interpreted by investors as an effective postponement of any moves by the Federal Reserve to pull back the \$85bn per month buying spree of mortgaged-backed securities, with negative implications for the dollar and longer-term inflation expectations, hence the brief gold bounce.
- Over the short term, ongoing concerns about the US sequester are likely to keep gold prices better supported through much of Q2. Indeed, a failure to have a deal on a set of agreements on deficit reduction by April 19th could well spark a renewed flight to gold on rising sovereign risk issues. However, just as in January, when US legislators simply agreed to kick any resolution to the budget deficit issue down the road, so we expect a fudge deal to be agreed by April 19th, to be put before the end of May to prevent a government shutdown.
- We are of the view that gold prices will struggle to maintain current levels in the second half of the year, as there appears to be little in the way of short or medium term risk, with inflation concerns being pushed further and further forward into the future, while low interest rates and growing liquidity have tended to favour other asset classes such as equities over gold. Additionally, the prospect of US rates backing up—the 10Y Treasury perhaps 60-70 basis points from current levels to around 2.50% during the latter part of this year according to our rates team—also serves as a potential headwind for the yellow metal.

Figure 208. Gold Supply / Demand balance

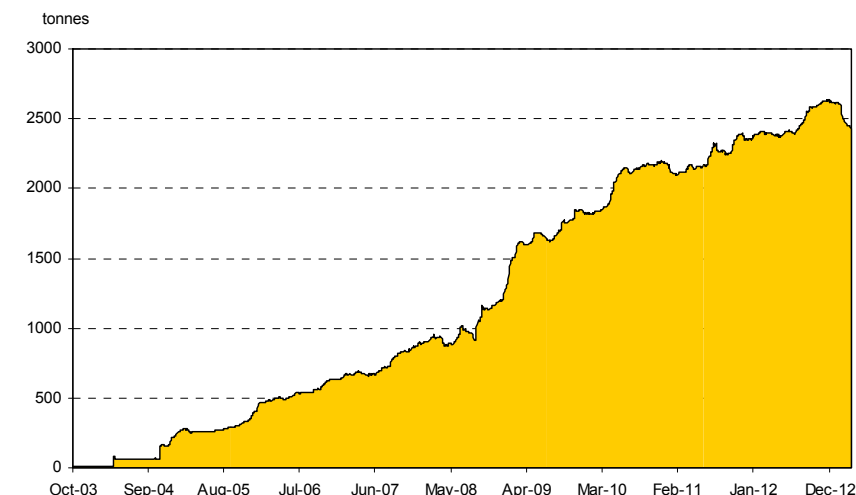
tonnes	2011	2012	2013E	2014E	2015E	2016E	2017E
Mine Supply	2,819	2,843	2,894	2,941	2,810	2,850	2,800
Scrap Supply	1,661	1,626	1,655	1,454	1,199	1,100	1,075
Net Producer Hedging	6	0	0	1	180	200	210
Total Supply	4,486	4,469	4,549	4,396	4,189	4,150	4,085
Jewellery	1,973	1,908	1,898	1,915	2,202	2,300	2,350
Other Fabrication and Industrial use	786	743	760	729	664	664	664
Total Fabrication Demand	2,759	2,651	2,638	2,644	2,866	2,964	3,014
Official Sector Purchases	456	535	550	400	280	261	230
Physical Bar Investment	1,202	973	1,096	1,005	986	855	740
Net Producer De-hedging	0	20	4	0	0	0	0
Implied Other Investment	69	290	241	347	57	70	101
- of which: ETFs	171	275	-300	-100	-70	-50	-50
Coins, Medals, Other	-102	15	541	447	127	120	151
Total Demand	4,486	4,469	4,549	4,396	4,189	4,150	4,085
(US\$/oz)	1,570	1,669	1,555	1,435	1,340	1,300	1,200

Source: Thomson Reuters GFMS, Citi Research

Investors accelerate bail out from gold

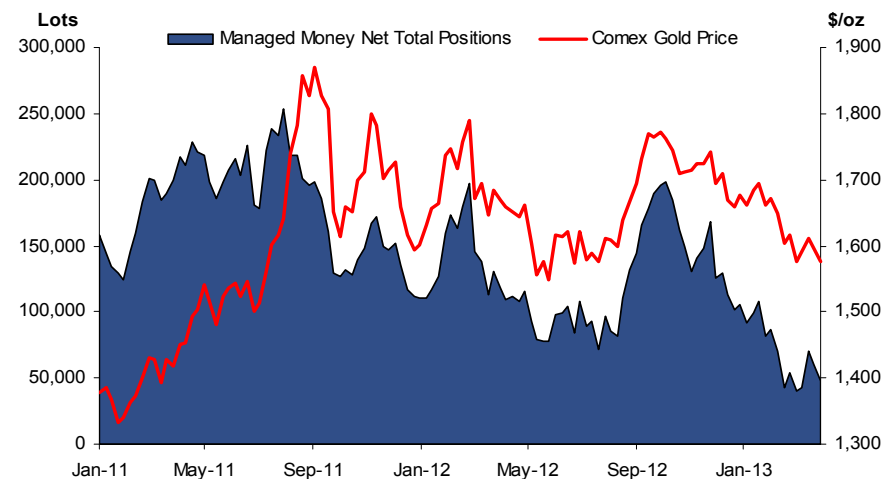
- Investors have continued to leave the gold space this year, as other assets classes grow in attraction, while inflation fears are further and further postponed. Indeed, net long managed money positions on Comex have fallen by 53% since the beginning of this year, a clear vote of no confidence in gold.
- Gold has not been helped by the mixed messages emanating from various members of the FOMC with regards to timing of an ending of QE operations. Indeed, hints of an earlier-than-expected end of asset purchases have removed focus from the potential longer-term inflationary impact of easing.
- ETF uptake provides a key to wider investor sentiment towards the gold space, with physical gold holdings in exchange traded funds down by close to 200 tonnes in the year to date, with levels falling by 110 tonnes in February alone. The daily outflow rate appears to have slowed in April, possibly due to renewed Eurozone concerns and US debt negotiations. However, to some extent, the reduction in ETF gold holdings are self-reinforcing, in that visible outflows remove confidence in investing in an ETF in the first place.

Figure 209. Outflow from ETFs at 200 tonnes and rising



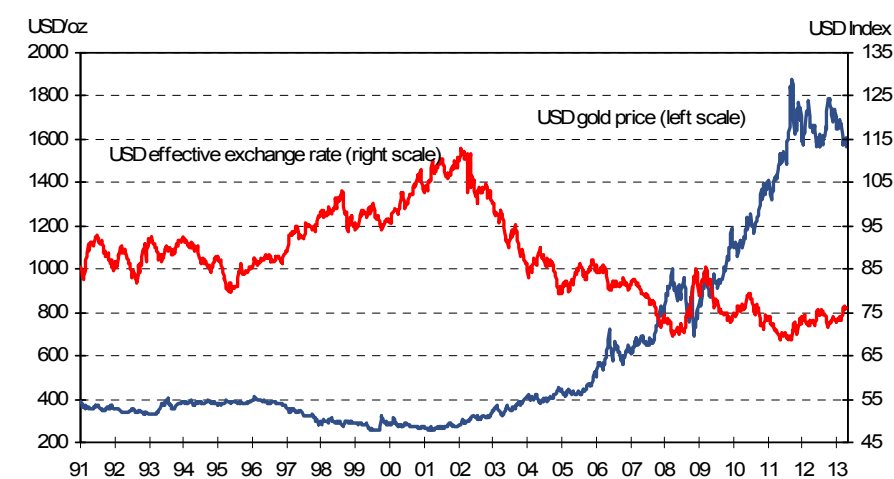
Source: Bloomberg, Citi Research

Figure 210. Manager net long positions half over the first 3 months of the year



Source: CFTC, Citi Research

Figure 211. Dollar recovery weighs on gold

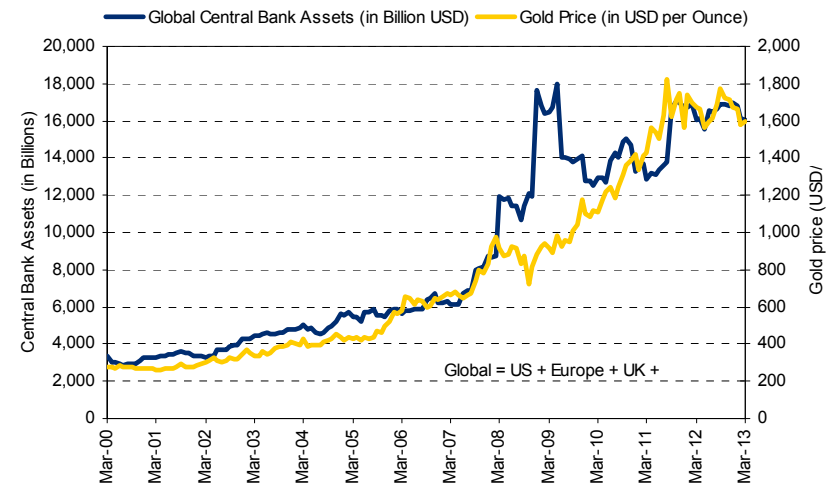


Source: Bloomberg, Citi Research

Inflation fears = the principal gold driver

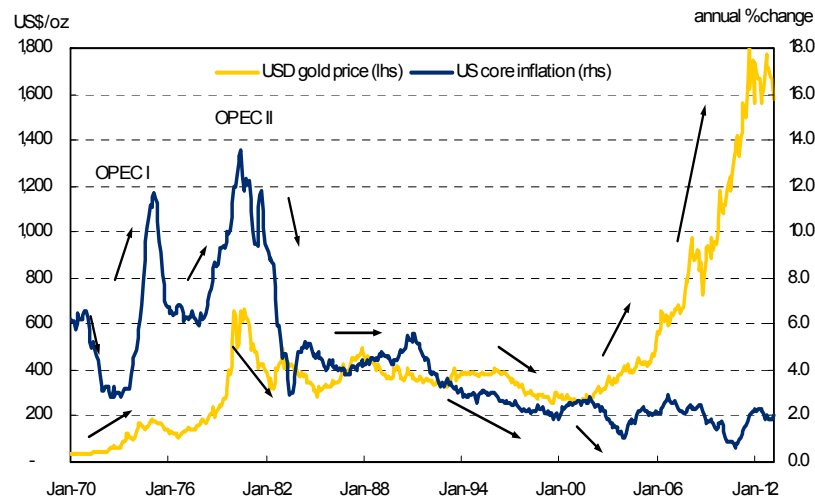
- We see a number of analysts allotting the rise in gold prices over the last decade, and principally since 2008, to the expansion of central bank balance sheets, i.e. QE. There is clearly some degree of linkage, but the question is: what is the transmission mechanism between expanding Central Bank balance sheets on the one hand, and rising gold prices on the other?
- The answer of course is the fear of inflation. During the first 5 years of the last decade, inflation concerns were stoked by the level of global economic growth and running into global capacity constraints. In the last five years, inflation concerns have been driven by the extent of the expansion of Central Banks' balance sheet through QE.
- However, inflation has not occurred. Indeed, in the US, core CPI has generally been on a downward trend over the last decade. The very fact that inflationary pressure is almost non-existent appears to be informing professional investors' decision-making processes with regards to gold investment. Indeed, as fears of inflation driven by global QE recede, for the time being, so should the gold price.

Figure 212. Central Bank Balance Sheet expansion appears to correlate well with gold



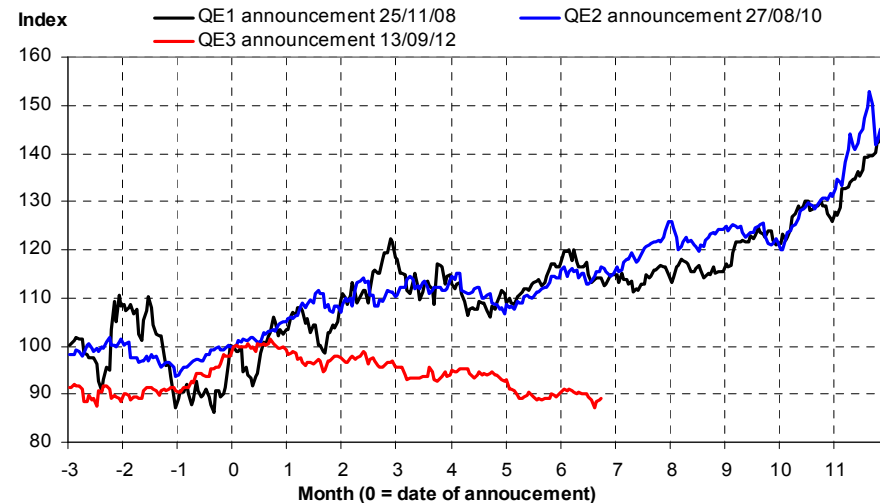
Source: Bloomberg, Citi Research

Figure 213. No-apparent connection between US core inflation and gold



Source: Bloomberg, Citi Research

Figure 214. Inflationary concerns of each round of QE have clearly diminished

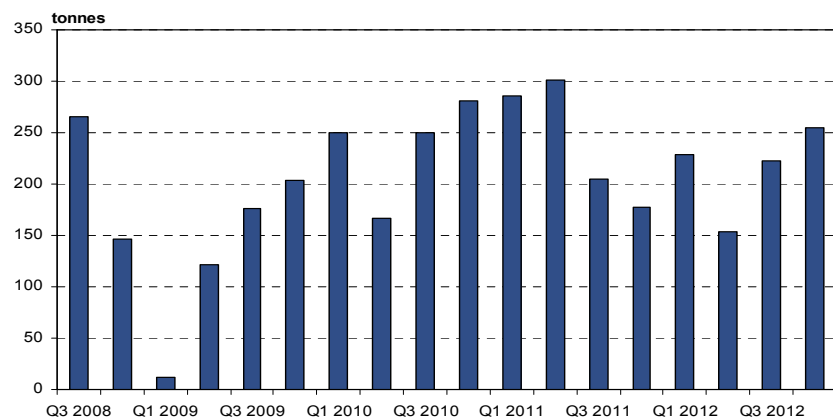


Source: Bloomberg, Citi Research

Gold physical demand – mixed patterns

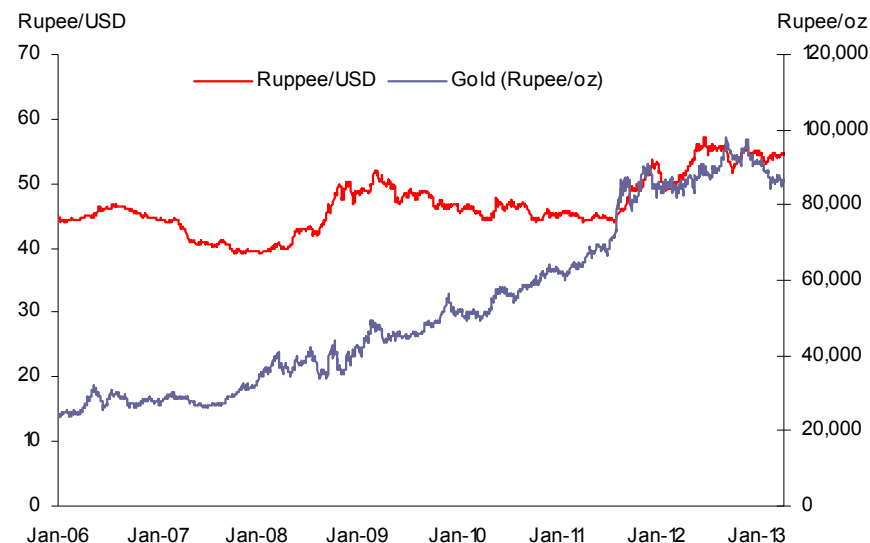
- Indian gold demand was in the doldrums through 2012, struggling under the impact of weak rupee and a temporary import duty rate hike in H1. However, towards the end of the year, import demand began to rally ahead of an expected hike in import duties, which in fact took effect on January 21st. The key driver for the Indian market remains the USD/Rupee exchange, which though off recent lows, has not rallied sufficiently to prompt significant uptick in end user jewellery demand.
- In contrast, Chinese demand remains robust, and we expect positive growth through 2013. Indeed, we have moderately revised up our total jewellery sector fabrication for gold from 1,775 tonnes to 1,898 tonnes on the back of strong Chinese and other Asian (ex. India) demand.
- The official sector remains a net purchaser of gold, with most recent data for January-February showing 20 tonnes of holding addition by Korea, 12.2 tonnes by Russia, and 10.2 tonnes by Turkey. What is notable about central bank gold purchases is that buying is more price sensitive and opportunistic in nature than in the past. Indeed, central banks have provided a floor during dips in gold prices, and are still not a price driving factor

Figure 216. India Gold imports pick up ahead of import duty hike – expect levels to slow in 2013



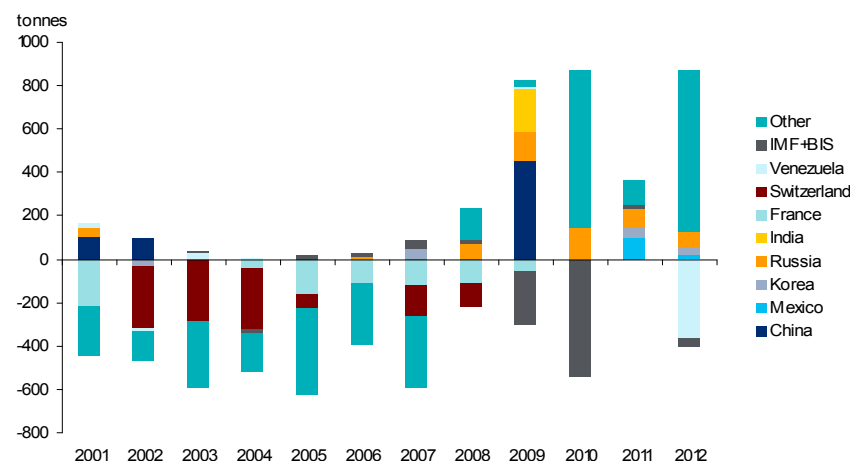
Source: World Gold Council, Citi Research

Figure 215. Rupee prices off recent highs, but Government import duties impacting



Source: Bloomberg, Citi Research

Figure 217. Central Banks continuing to buy physical gold in 2013



Source: World Gold Council, Citi Research

Silver: Gold By-Product Mine Production to Drive Mine Supply Growth

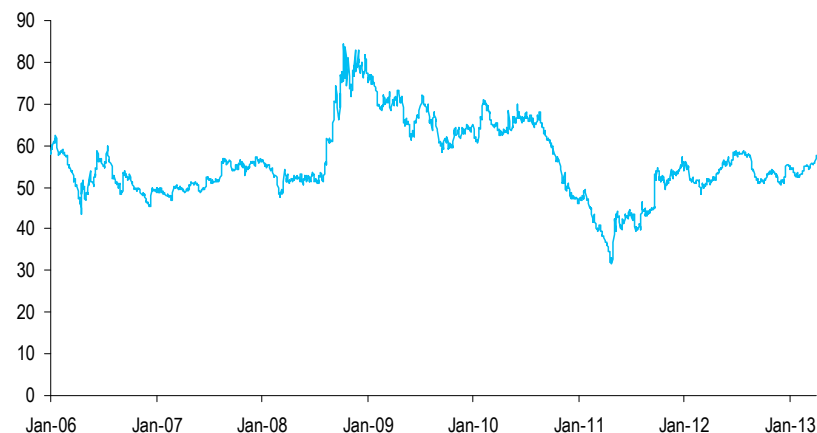
- Silver has been on an almost unbroken downward trend since the beginning of the year, with prices falling by 10% from \$ 30.3 /oz to \$27.3/oz on 8th April, outperforming gold on the downside. Fundamentally, silver looks vulnerable to further downside moves on continued incremental and largely price inelastic mine side growth, and a decidedly mixed fabrication demand outlook. In addition, given that many retail investors in particular still bear the scars of the severe losses inflicted in late April/early May 2011, we maintain our bearish view on silver for 2013.
- On the supply side, rising production of silver as a by-product of gold is likely to be the main driver of growth in mine supply over the forecast period. According to analysts GFMS, gold mining's share of global silver mine supply is expected to increase from 13% in 2012 to 20% in 2015. This increase is being led by Barrick Gold's Pascua-Lama mine project on the border of Chile and Argentina. Despite the start-up date for this project being delayed until the second half of 2014, it is anticipated to contribute 20 million oz of production in 2014. In addition, the mine will have the capacity to produce over 30 million oz of silver per annum once full capacity is reached in 2015/2016.
- In addition to by-product output growth from gold mining, some by-product production from copper mining grow is expected, while the mine life depletion issue in the lead-zinc industry continue to be pushed further forward into the future, which should result in this industry continuing to make significant contributions to total silver mine production. In contrast, primary silver production is expected to decline. Although the start-up of the Tahoe Resources' Escobal project is currently on-schedule and the Hecla Mining's Lucky Friday mine has resumed production, declining ore grades at older mining complexes such as the Fresnillo mine in Mexico, are likely to be drag on primary production. Despite this, total mine supply is expected to grow by 8 million oz in 2013, and picking up strongly 2014 and 2015, as increasingly volumes of by product production come to market.

Figure 218. The Silver Price Has Stayed Below \$30/oz since the Middle of February



Source: Bloomberg, Citi Research

Figure 219. Gold/Silver Ratio Remains in Neutral Territory

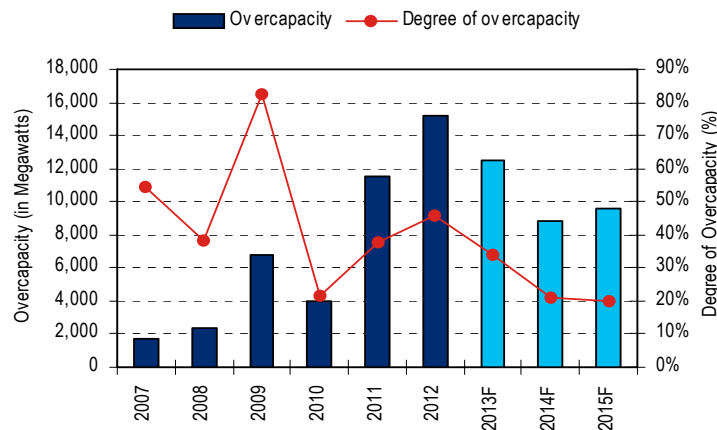


Source: Bloomberg, Citi Research

Silver: Weaknesses in the Photovoltaic Industry to Weigh on Industrial Demand Growth

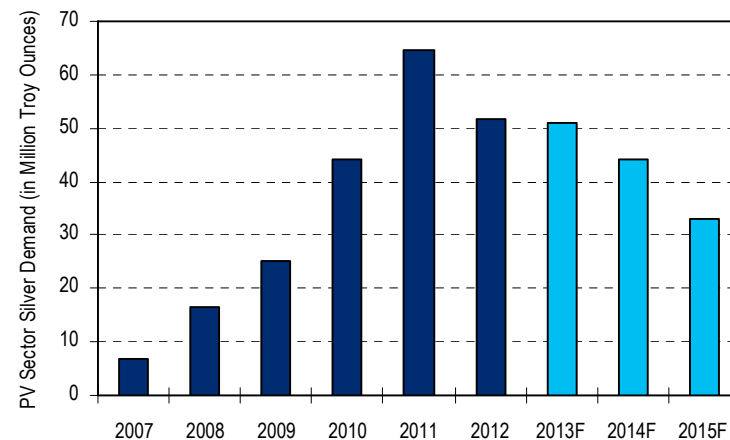
- Over the last decade, silver industrial demand has enjoyed a robust performance. Indeed, silver industrial demand has increased from 383.3 million ounces in the year 2000 to 451.7 million ounces in 2012, according to data from GFMS. One of the main catalysts behind this has been the rapid growth of silver demand from the expanding Photovoltaic (PV) solar energy industry. However, we expect that silver demand from this industry will decline in the future.
- The expansion of the PV industry is largely due to the deployment of Feed-in-Tariffs (FiTs), which are designed to accelerate investment in renewable energy technologies, such as solar PV, by offering renewable energy producers long-term contracts based on the cost of energy generation. FiTs are being reduced across various nations, due to FiT degression (or reduction) and decreased government spending. The PV industry is also now suffering from significant overcapacity. Data from Citi Research shows that overcapacity in the PV industry was roughly 46.01% of PV demand in 2012. This overcapacity is mainly due to the development of the industry in China. Although we expect overcapacity to decrease over the forecast period, this is likely to be achieved principally through consolidation and closure of uneconomic capacity. Hence, PV cell production growth is expected to slow, which will put downward pressure on PV silver demand.
- This issue is also being exacerbated by increasing and volatile silver prices forcing PV cell producers to reduce or eliminate the silver content of their cells, in order to limit costs. Indeed, Aluminum is being increasingly used as a substitute to silver in the manufacturing process. Analysts GTM Research expect that silver paste content in a typical PV solar cell will decrease from 0.21 grams per cell in 2012 to 0.18 grams per cell in 2013, 0.15 grams per cell in 2014 and 0.11 grams per cell in 2015.
- Consequently, we expect silver demand from the PV industry to decrease by 1.5% in 2013, before decreasing at a sharper rate of 13.16% in 2014 and 25.10% in 2015. However, this decline is expected to be mitigated by strong growth in demand for silver containing consumer products (such as televisions, computers and white goods) from China, as the country's economic growth model becomes more reliant on domestic consumption. As a result, we forecast silver industrial demand to increase by modest rates of 3.5% in 2013, 3.9% in 2014 and 3.7% in 2015, much lower than the growth rates seen earlier in the decade.

Figure 220. Intense Investment Has Resulted in the PV Suffering From Significant Overcapacity



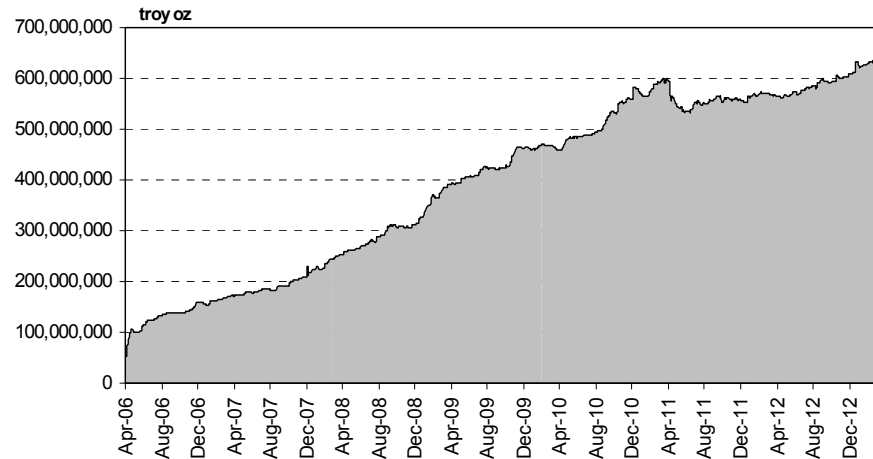
Source: Bloomberg New Energy Finance, GTM Research, Citi Research

Figure 221. Photovoltaic Industry Silver Demand is Forecast to Decline in the Future



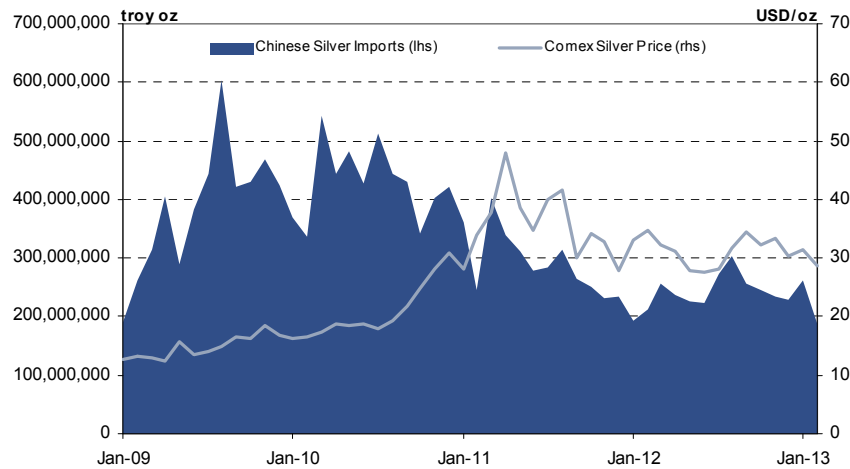
Source: Bloomberg New Energy Finance, GTM Research, Citi Research

Figure 222. Upward Momentum in Silver ETF Holdings Continues



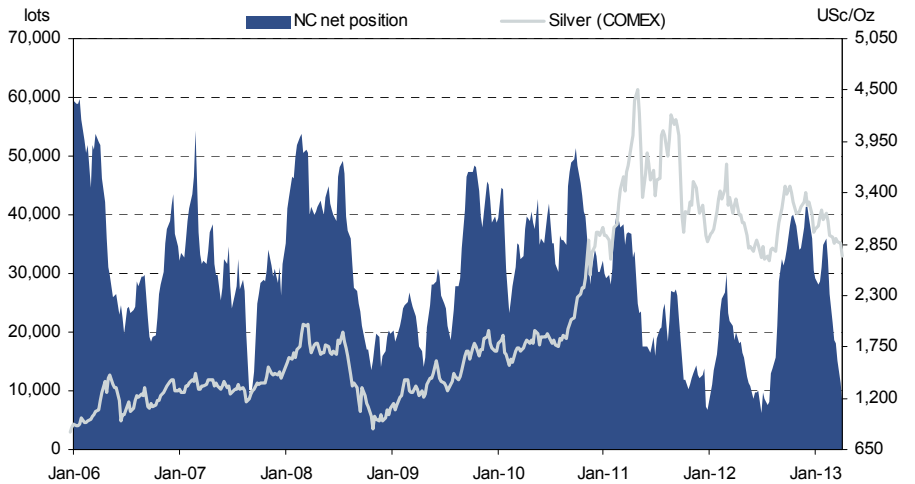
Source: Bloomberg, Citi Research

Figure 224. Chinese Silver Imports Continue to Slip, Despite The Falling Silver Price



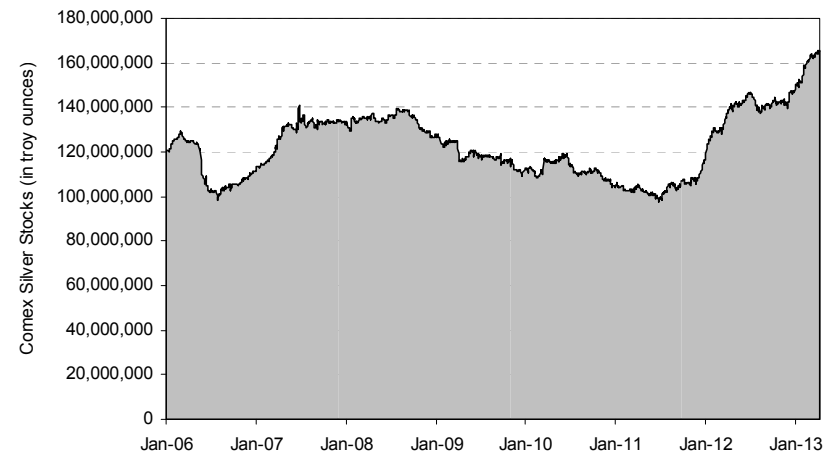
Source: Bloomberg, Citi Research

Figure 223. Non-Commercial Net Longs Have Been Falling Since the Beginning of December 2012



Source: Bloomberg, Citi Research

Figure 225. Comex Silver Stocks Have Surged To Record Levels



Source: Bloomberg, Citi Research

Silver: Will Investment Demand Pick Up The Slack?

- With silver mine supply growing and industrial demand growing at a reduced rate, the key question is: will another form of demand be able to absorb the excess metal? Jewelry fabrication demand experienced modest growth of 2.1% in 2012. This growth is expected to slow to 1% in 2013, as a result of further increases in jewelry demand growth from China being negated by significant decreases in demand from the industrialized world in the face of continued economic headwinds. Looking ahead to 2014 and 2015, we believe that jewelry fabrication will increase sharply by 9.5% in 2014 and 11.0% in 2015, as prices ease more quickly.
- Silver demand from photographic applications has continued to decline, as a result of the rise of digital technology. Indeed, photographic silver demand plummeted by 18% in 2012 and is expected to decline by 13.3% in 2013, 4.3% in 2014 and 5.8% in 2015. Consumption from photographic applications is only being supported by demand from the motion picture and radiography sectors, which have been slower to adopt the new digital technology.
- Consequently, this places the onus on investors to bridge the gap. Net Implied Investment would need to increase from 292.5 million oz in 2012 to 305.7 million oz in 2013 in order for the market to be in balance. ETF holdings have continued to build so far this year, with the inflow for the first quarter of this year equal to 24.43 million ounces compared with 14.75 million ounces during the same period last year. However, easing global inflationary pressures have seen Comex non-commercial net long silver positions fall to 11,404 lots in the first week of April, which is their lowest level since January last year. In addition, hedge funds and money managers have turned net short on silver for the first time since 2006. These points suggest that investors' desire to absorb surplus metal may abate. Hence, we forecast that the average silver price will drop from \$31.20/oz in 2012 to \$28.10/oz in 2013.

Figure 226. Silver Supply and Demand Balance

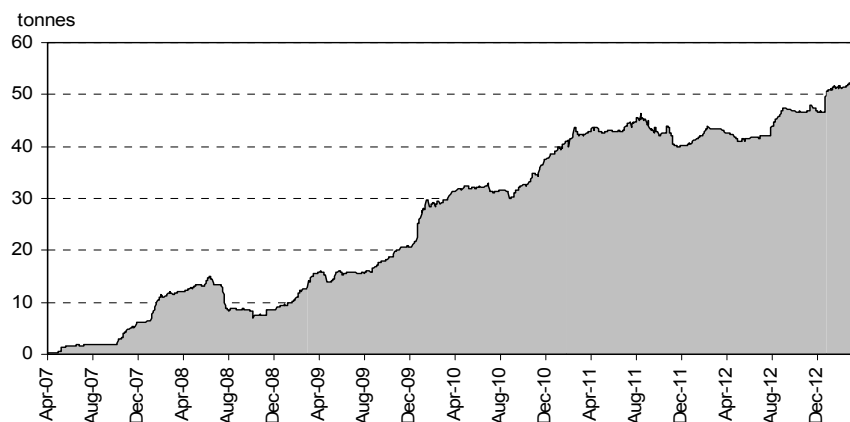
(million ounces)	2010	2011	2012	2013E	2014E	2015E
Supply						
Mine Production	751.4	761.6	802.6	810.6	828.5	849.2
Net Government Sales	44.2	11.5	8.4	8.1	7.0	0.0
Net Producer Hedging	50.4	10.7	25.0	45.0	55.0	74.5
Scrap	228.7	256.7	260.2	255.0	240.0	225.0
Total Supply	1074.7	1040.5	1096.2	1118.7	1130.5	1148.7
Demand						
Industrial	500.0	486.5	451.7	467.5	485.9	503.9
Photographic	72.1	66.1	54.2	47.0	45.0	42.4
Jewelry	167.4	159.8	163.2	164.8	180.4	200.3
Silverware	51.2	46.0	44.9	43.8	46.9	55.5
Coins & Medals	99.4	118.2	89.7	90.0	89.0	65.0
Total Fabrication	890.1	876.6	803.7	813.1	847.2	867.0
Net Producer de-hedging	0.0	0.0	0.0	0.0	0.0	0.0
Net Implied Investment	184.6	163.9	292.5	305.7	283.3	281.7
Total Demand	1074.7	1040.5	1096.2	1118.7	1130.5	1148.7
Price (US\$/oz)	20.24	35.26	31.20	28.10	25.90	23.25

Source: Thomson Reuters GFMS, Citi Research

Platinum Group Metals – continued outperformance

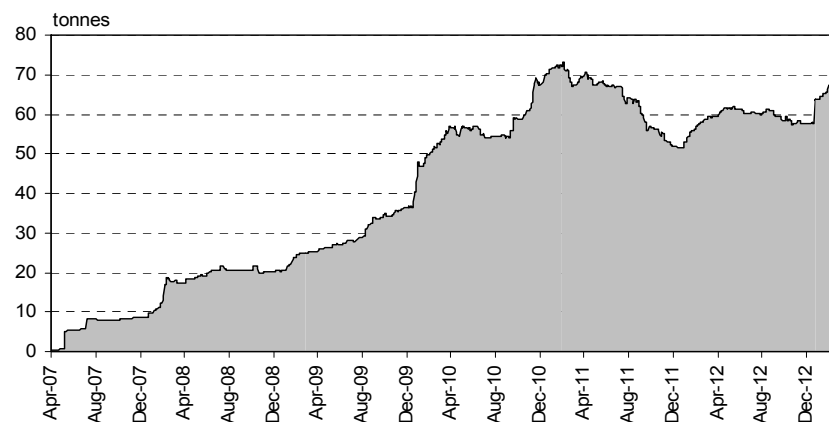
- The PGMs have been the most positive price performers in the metals space so far in 2013, driven by both price positive supply and demand issues. Indeed, average palladium prices in Q1 were around 9% up yoy, and 14% up on Q4 2012 average levels, leaving platinum in its shadow, with levels up 2% qoq and yoy.
- Despite our relatively positive fundamental platinum view, as outlined below, we downgraded our 2013-15 dollar platinum prices by 4.1%-8.8% to reflect a weaker rand outlook. Given that ~90% of platinum is mined in South Africa, a weaker rand vs. dollar presents some degree of margin relief for South African platinum miners, removing some pressure for production cuts. However, we expect the dollar platinum price to weaken when the rand depreciates relative to the dollar, and vice versa. Looking further forward, the introduction of Euro VI commercial vehicle emissions regulations (to be phased in by January 2014) will support platinum demand growth in Europe. The Euro VI measures require significant additional cuts in diesel particulate and NOx emissions, which require and additional platinum based catalyst.
- For palladium, we have upgraded our 2013-14 dollar palladium price expectations 4.5% and 2.7% respectively on a growing deficit outlook. Indeed, we forecast a 336k ounce deficit in 2013, rising to 639k ounces and 946k ounces in 2014 and 2015 respectively. This is mainly due to our view of a continued medium-term growth in auto production in gasoline based markets like the US and China. The sheer size of these markets (40% of global vehicle production) implies significant uplift in demand for palladium. The positive effect positive US/Chinese/emerging market auto growth may be somewhat offset by lower jewellery demand and a pick-up in auto catalyst recycling. We estimate that auto catalyst recycling will increase 13% to 2.1m ounces in 2013.
- Palladium is also expected to continue to get a lift from expectations of a dwindling of Russian government stockpile sales. Analysts GFMS suggest that 2013 will be the last year of Russia stockpile sales, while Johnson Matthey suggests that Russian government sales were as little as 250,000 oz in 2012, with levels expected to fall further in 2013. We remain somewhat cautious on predictions of the end of these stockpile sales, as such predictions have been made annually since 2010, only for material to continue to appear in the market.

Figure 227. Platinum ETF holdings – Lift from South African strike beginning to ebb



Source: Bloomberg, Citi Research

Figure 228. Palladium ETF holdings – On the decline since May



Source: Bloomberg, Citi Research

Figure 229. Platinum Supply / Demand

000 ounces	2011	2012	2013E	2014E	2015E	2016E	2017E
Mine production:							
South Africa	5,195	4,485	4,569	4,827	4,992	5,094	5,210
Russia	835	790	798	767	752	737	737
North America	350	340	381	376	371	366	366
Rest of World	100	120	120	120	120	120	120
Total Mine Supply	6,480	5,735	5,868	6,090	6,235	6,317	6,432
Autocatalyst recycling	1,225	1,179	1,335	1,426	1,513	1,602	1,684
Total Supply	7,705	6,914	7,203	7,516	7,748	7,919	8,116
% chg.	7.8%	-10.3%	4.2%	4.3%	3.1%	-0.1%	4.9%
Gross Autocatalyst demand	3,105	3,227	3,160	3,263	3,305	3,337	3,442
Net Jewellery demand	1,660	1,717	1,818	1,887	1,969	2,029	2,086
Industrial demand	2,050	1,948	2,045	2,118	2,191	2,265	2,342
Investment	460	210	274	202	202	202	202
Total Demand	7,275	7,101	7,297	7,471	7,666	7,873	8,072
% chg.	2.6%	-2.4%	2.8%	2.4%	2.6%	2.7%	2.5%
Surplus / (Deficit)	430	-187	-94	46	82	46	45
- US\$/oz	1,722	1,552	1,550	1,625	1,750	1,800	1,705

Source: Johnson Matthey, Citi Research

Figure 230. Palladium Supply / Demand

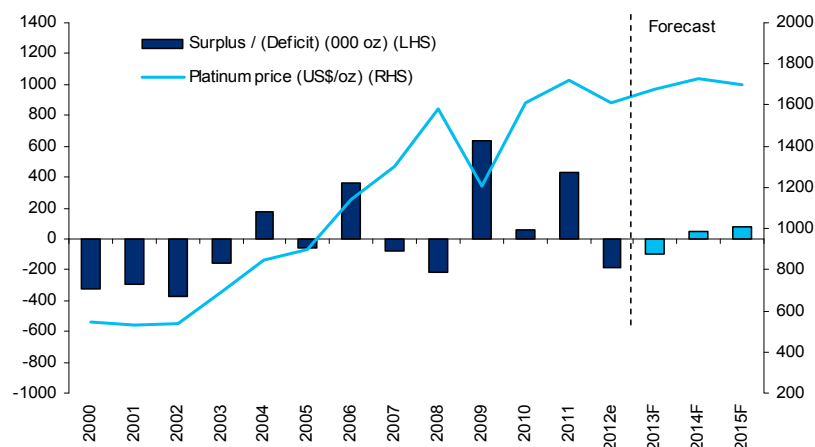
000 ounces	2011	2012	2013E	2014E	2015E	2016E	2017E
Mine production:							
South Africa	2,825	2,523	2,625	2,733	2,822	2,870	2,920
Russia	2,705	3,350	3,400	3,400	3,400	3,400	3,400
North America	900	890	870	980	1,050	1,050	1,050
Rest of World	155	180	180	180	180	180	180
Total Mine Supply	6,585	6,943	7,075	7,293	7,452	7,500	7,550
Russian stock sales	775	750	750	750	750	750	750
Autocatalyst recycling	1,655	1,844	2,086	2,225	2,357	2,492	2,616
Total Supply	9,015	8,787	9,162	9,519	9,809	9,992	10,166
% chg.	4.0%	-2.5%	4.3%	3.9%	3.0%	1.9%	1.7%
Gross Autocatalyst demand	6,030	6,783	7,070	7,671	8,187	8,686	9,123
Net Jewellery demand	295	211	214	237	265	337	346
Industrial demand	2,000	1,900	1,995	2,067	2,137	2,210	2,285
Investment	-565	185	219	183	165	165	165
Total Demand	7,760	9,080	9,497	10,158	10,754	11,397	11,918
% chg.	-15.4	17.01%	4.6%	7.0%	5.9%	6.0%	4.6%
Surplus / (Deficit)	1,255	-292	-336	-639	-946	-1,405	-1,753
- US\$/oz	734	645	810	950	925	900	760

Source: Johnson Matthey, Citi Research

Platinum – Market still well supplied despite supply disruptions

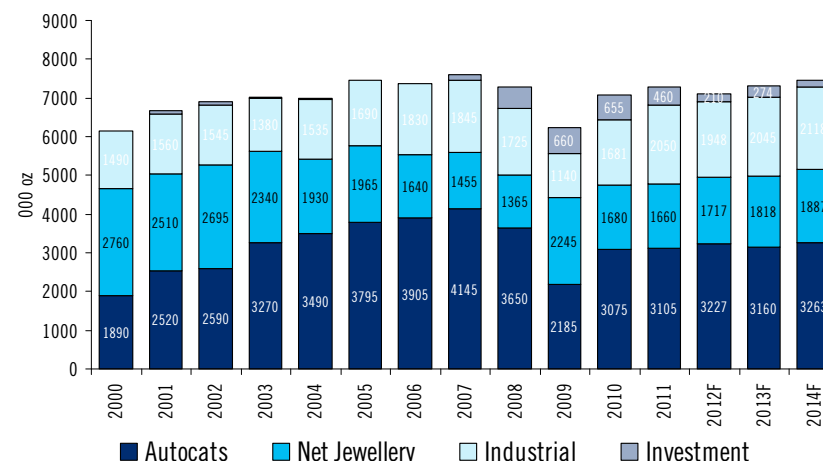
- Despite the mine supply losses and production cuts, the platinum market remains well supplied. Total above-ground stock for platinum have increased by 4.8m ounces since 2007 to 9.6m ounces in 2012, which represents 1.6 years of mine supply, compared with 0.75 years in 2007. The increased availability of above-ground stock holdings may weigh on platinum's upside, as these will likely be drawn down when platinum rises.
- The rise in above-ground stock has been fuelled by: 1) the introduction of ETFs in 2007, 2) fabricator stock holdings accumulated in a surplus and low price environment, and 3) a continued increase in other investment holdings. Citi estimates that holdings by fabricators, traders and physical investors now amount to well over 1.5m oz, largely accumulated during the past four years' surpluses. In addition to primary metal, secondary supply, which accounts for roughly 18% of total supply, is likely to pick up in 2013 after being held back in 2012 due to soft platinum prices particularly through the middle of the year. This is likely to be released now prices have settled in a higher trading range. Indeed, we forecast a 13% increase in scrap supply in 2013.
- Another factor that will likely cap the upside for platinum is price elastic demand for platinum from the Chinese jewellery market. Chinese platinum jewellery demand now accounts for 25-30% of total platinum, compared with 13% of total demand in 2007. Chinese jewellery demand is highly elastic and we calculate that a 10% increase in platinum prices could lead to an 18% decrease in Chinese platinum jewellery demand. Although growth in Chinese GDP/capita should make this market more inelastic over time, we believe that this is unlikely to occur in the next five years.
- The severe contraction that European light vehicle production has undergone since Q1 2012 has clearly hampered platinum demand. This has to some extent counteracted the 2012 South African strike-related production losses. For 2013, signs of recovery in European auto production are not expected to be seen until Q4 at the earliest, with continued contractions likely to limit the impact of the outcome of negotiations over Angloplats announced mine capacity closures. As a result, we forecast a balanced market from 2014-17; even without assuming a return of recently mothballed production. Hence, we remain cautiously positive on platinum.

Figure 231. Citi Platinum Surplus (deficit) forecasts



Source: Johnson Matthey, Citi Research

Figure 232. Citi Platinum demand by application forecasts

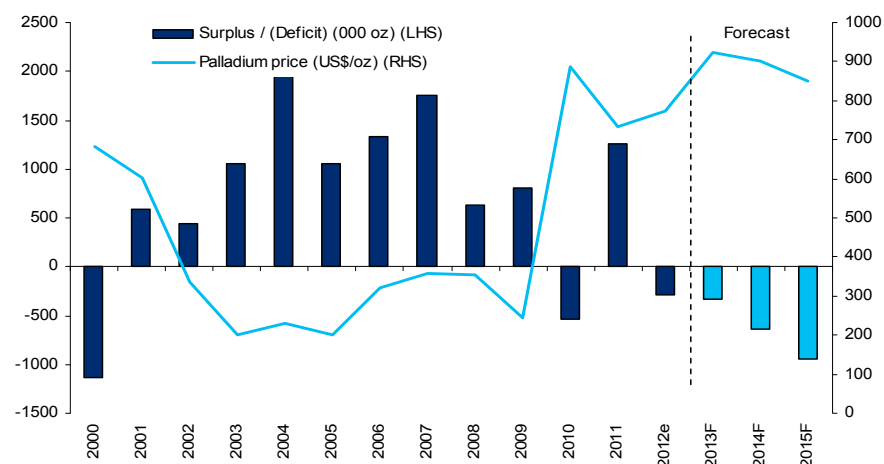


Source: Johnson Matthey, Citi Research

Palladium – stricter Chinese emissions measures a further source of support

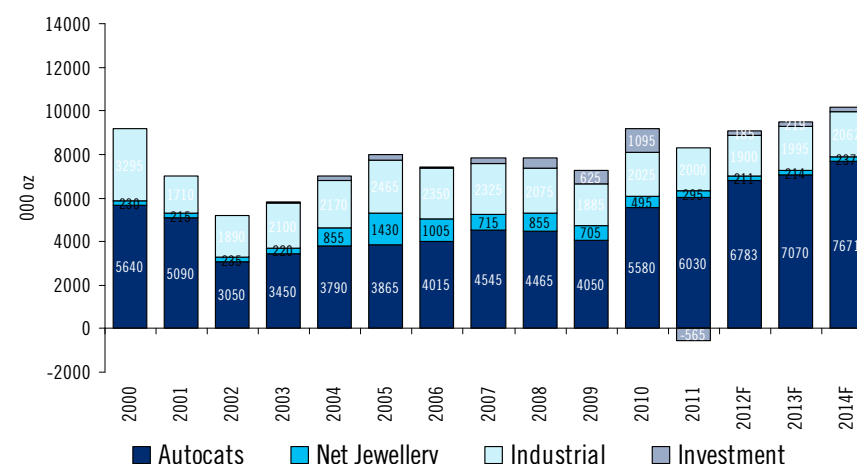
- In contrast to platinum, palladium outperformed consensus expectations during the last quarter of 2012 and has largely continued to do so in 2013. It has benefitted not only from South African strike-related production losses, estimated at 300,000 oz, but more importantly a far more positive demand environment, with a minimal exposure to price-sensitive jewellery markets (approximately 2% of demand net of scrap), and highly positive gasoline auto sector exposure.
- The auto market picture is significantly more positive for palladium than platinum, driving our bullish price outlook for the former. Indeed, more gasoline focused North American, Chinese, and other emerging market auto markets have continued to see good growth, driving palladium demand. Globally, gasoline vehicles account for around 80% of total vehicle production, giving palladium a significant market share in the global autocatalyst market. Chinese auto production growth was somewhat sluggish during 2011 and the first half of 2012 as slower economic growth and in particular sluggish property markets impacted negatively on passenger vehicle demand. However, Q4 2012 showed a strong pick-up in LV production, and this strong growth trend is expected by Citi auto sector analysts to continue into 2013, helped by the introduction of Euro 5 equivalent emissions standard in Beijing and other cities, effectively increasing palladium catalyst loadings.
- We expect Auto production in other emerging markets including India, Thailand, South Korea, Malaysia, Brazil, and Mexico will also be key to the positive palladium demand story. Collectively, emerging market auto sector demand for palladium accounted for 1.5 million oz of palladium consumption in 2012, and we expect that this will rise to 1.6 million oz in 2013, on back of Citi auto sector analyst projections of a combined 6% increase in total vehicle production. In these regions, autocatalyst recycling accounts for roughly 8-9% of palladium consumption, hence the positive demand story is very much primary metal focused. Indeed, we expect improving auto production to help drive palladium use in autocatalyst production to 1.49 m oz, compared to 1.35 m oz in 2013, an 11% increase.
- The inventory story for palladium also looks more positive than for platinum. Above-ground stock holdings for palladium have decreased by 7.5m oz between 2007 and 12.2m ounces in 2011, with a further 860,000 oz fall in 2012, which suggests that volumes net of ETF holdings stood at 8.5 million oz at the end of last year.

Figure 233. Citi Palladium Surplus (deficit) forecasts



Source: Johnson Matthey, Citi Research

Figure 234. Citi Palladium demand by application forecasts

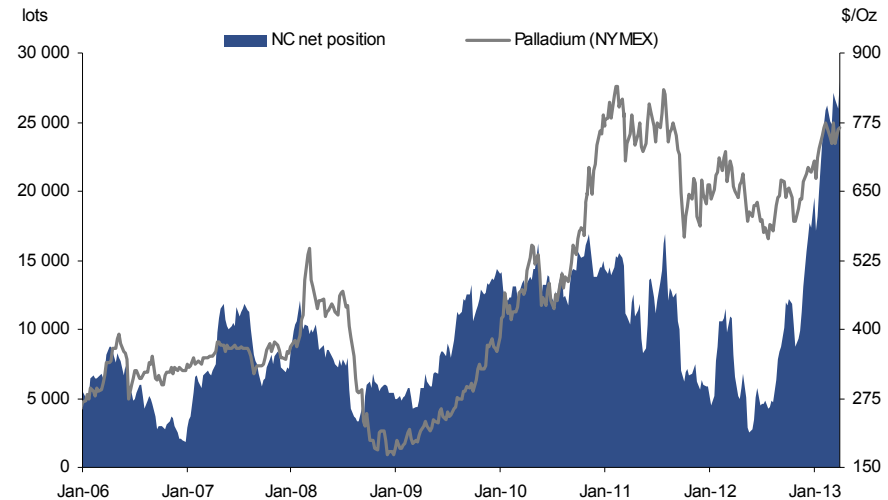


Source: Johnson Matthey, Citi Research

PGM positioning – pull-backs before more upside moves?

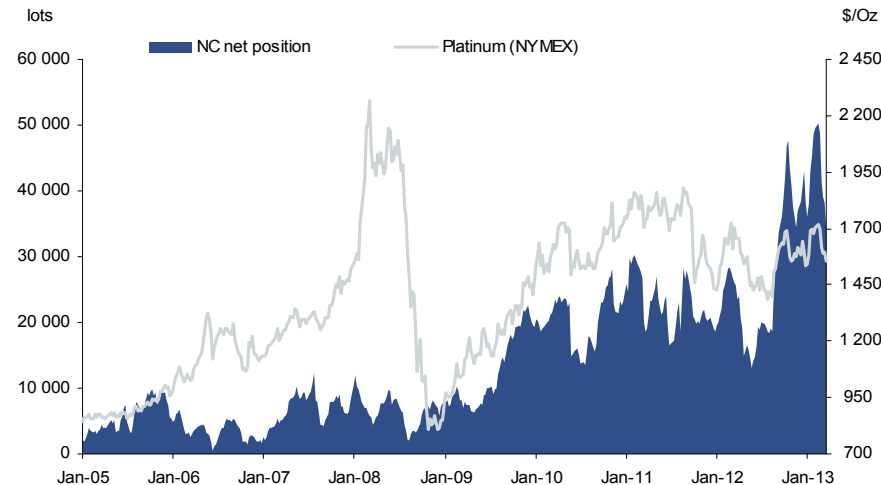
- The biggest potential threat to our bullish thesis for PGMs, at least in the short term, is the potential for reversal in investor sentiment. Since the middle of 2012, net non-commercial length in palladium on NYMEX surge 510%. Over the same period, net platinum length has jumped by 71%, though levels are significantly off the highs seen in February, prompted by Anglo's mine review.
- For palladium, we may have already seen the wash out of less firm hands with the pull-back in prices from 2013 ytd highs of \$784/oz on April 2nd down to \$707/oz on April 10th. Indeed, around 35% of net long palladium positions reported by the CFTC on April 4th were put in place at prices about \$700/oz. However, we expect any short-term dips below \$700/oz to represent positive buying opportunities given the underlying bullish palladium S/D story.
- For platinum, the 32% shake out of net length since mid-February suggests that the risk of a significant sell in the event of a new macro trigger/crisis is much less acute than at the beginning of the year.

Figure 235. Net non-commercial NYMEX palladium positions vs. price



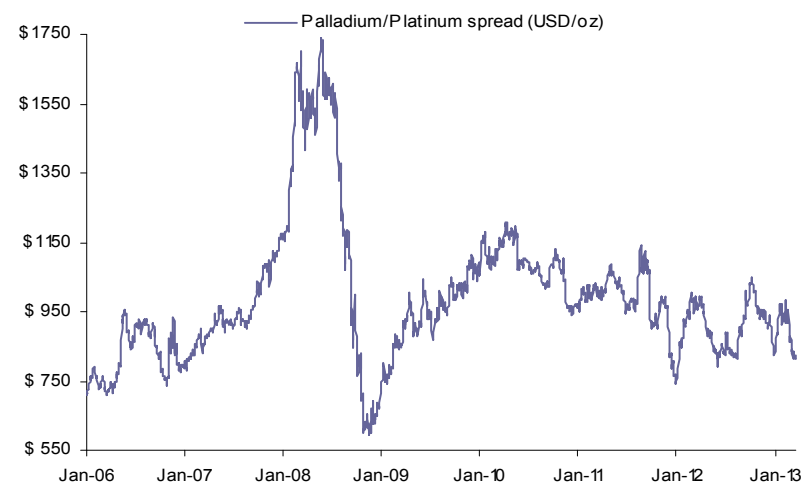
Source: NYMEX, Citi Research

Figure 236. Net non-commercial NYMEX platinum positions vs. price



Source: NYMEX, Citi Research

Figure 237. Expect platinum/palladium spread squeezed further 2013



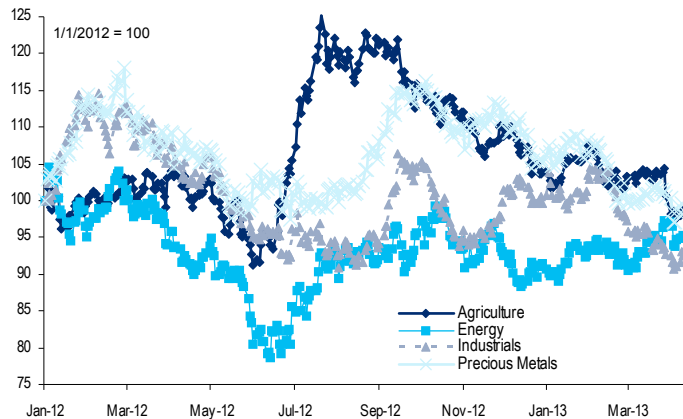
Source: Bloomberg, Citi Research

Agriculture

Global 'Ag' Market Easing Starts to Unfold in Earnest...

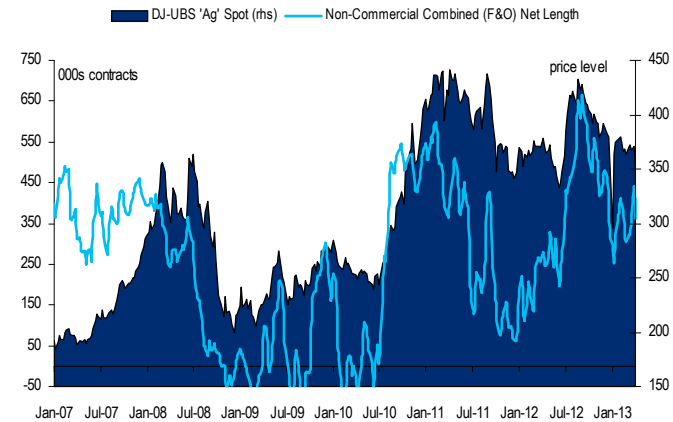
- Significantly lower staple grain and oilseed prices seem to be unfolding even sooner than we had anticipated during our 1Q'13 agriculture market updates. What we had previously forecast as a sharp reduction of coarse grain and soybean contract levels beginning in 2H'13 following a gradual easing during 2Q'13 has started earlier after a surprisingly bearish USDA quarterly stocks report at the end of March. To be sure, unprecedented flat-price spikes and spread blowouts for the row crops as a consequence of the disastrous 2012 US drought appear to have done their part to ration use amid the prospects of another record year of US planted acres for corn and beans and our early assessment calling for back-to-trend yields on more favorable weather. Meanwhile benchmark foodstuff crops including wheat and rice—grown more globally and consumed particularly in Asia and MENA—also appear biased towards looser supply/demand fundamentals (ex-US) this year. Elevated wheat prices fueled by stronger feed demand substitution vis-à-vis coarse grains will perhaps normalize as the shortfalls in Black Sea and European availabilities from 2012 return online. Bumper rice harvests in SE Asia should keep CBOT contract prices capped this year. The easing of old-crop and new-crop prices should benefit both foreign and domestic consumers that have been forced to curb grain demand as a consequence of trade bans, low inventories and weather-related supply shocks since 2010. Overall, rising cereal prices in 2011 and 2012 should give way to lower prices in 2013 and even lower levels in 2014.
- Soft commodities including coffee, sugar and cocoa also appear poised to remain relatively subdued this year versus last. Although prices for ICE coffee and cocoa are forecast to end the year higher than their currently depressed levels, generally loose balances and the absence of geopolitical tail-risks that dominated recent campaigns are unlikely to propel prices anywhere near the highs of 2011 and 2012. Sugar also looks likely to stay weak and below 20-cents in 2013 on a robust Brazilian harvest. Cotton markets are the one exception where an elevated trading range between 85-95 cents seems likely to persist for the old-crop and new-crop. Official Chinese policy towards cotton remains critical as the world's pre-eminent producer, consumer and holder of sovereign stockpiles of the labor-intensive crop.

Figure 238. Commodity Sector Performance – 2012 to present



Source: USDA, Citi Research

Figure 239. Non-Commercial Net Length: CBOT and ICE Grains/Oilseeds/Softs*

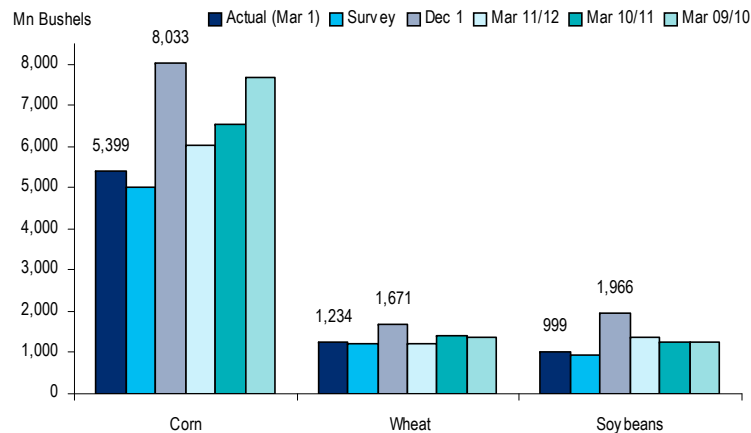


Source: CFTC, Citi Research, *week ending 2 April 2013; corn, wheat, soybeans, rice, cocoa, cotton, coffee, sugar

Looser Supply/Demand Balances across the Grains Complex

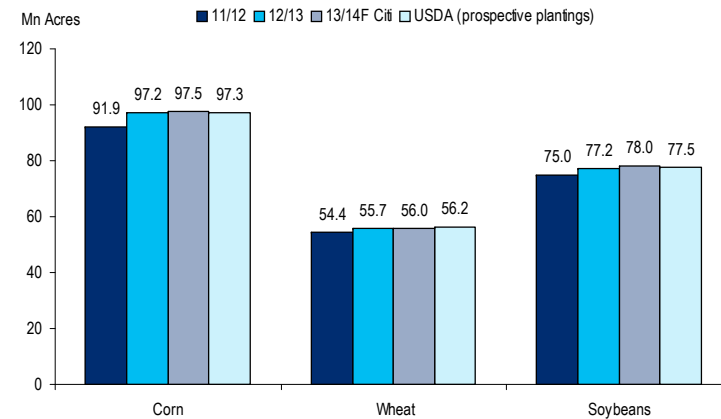
- March 1 US stocks came in surprisingly bearish for row crops in particular. The USDA print was somewhat more in line for wheat. Corn structure has consequently collapsed with end-February inventories of 5.4-bn bu just about 0.4-bn bu north of consensus. Amid weak export sales and a still nascent uptick in recent weekly EIA ethanol output prints, the cut in feed/resid use should lift projections of 12/13 corn carryout from our intolerably tight 640-mn bu old projection back near the 0.85-bn bu historical minimum threshold, boosting old-crop ending stocks-to-use to just below 8% and about 5-6 points shy their trailing 10-year average of 12.6%; a still tight but much more manageable market that might loosen further in subsequent WASDEs. Higher than expected soybean inventories of 1-bn bu also buttresses old-crop ending stocks although smaller than expected prospective plantings and LatAm loading delays have put a floor on the bean sell-off.
- Planting intentions in the US—which remains the global ‘breadbasket’ at ~1/3 of global corn and soybean output and 20-25% of world wheat exports—are robust even if coming in short of early season assessments. The initial planting outlook is also subject to revisions by the June quarterly USDA report when more clarity is achieved on the still nascent planting season and the fruition of double-row-cropped acres and additional physical surveys. We project record aggregate acres for corn, wheat and beans at 231.5-mn or 1% growth versus 2012 and expect modest upward revisions for row crop acres to materialize prior to the harvest season.
- The corn and soybean supply rebound is buttressed by record output in Latin America and looming export programs from Brazil and Argentina beginning later this quarter. On aggregate, these two countries should harvest 98.5-mt of corn and export 35-mt and reap 136-mt of beans with exports just under 50-mt.
- The US balance sheet is poised to tighten for foodstuff grains—wheat and rice in particular—but globally the balances look much less onerous and the marginally better outlook for old-crop wheat carryout should also help ease some of the tightness on new-crop total supply as a consequence of HRW abandonment. Rice prices that have caught a bid this quarter on reduced US acres should stabilize given what is still a promising global supply outlook for the staple grain.

Figure 240. March 1 (12/13 and historical) US Grains and Oilseed Quarterly Stocks



Source: DJ, USDA, Citi Research

Figure 241. US Planted Acreage for Major Grains (prior two cycles, and current forecast)



Source: USDA, Citi Research

April WASDE does not change the outlook of global grains easing...rather it affirms it...

- The April WASDE did show a tighter domestic balance sheet (versus consensus) for the row crops but world ending stocks came in on the bearish side with the initial pop in spreads for corn and beans unwinding rather quickly during the NY session. Furthermore, we project a bit of a looser situation for US corn to perhaps start emerging.
- Overall the April outlook from the USDA did little to change our conviction of lower prices and looser supply/demand balances ahead for the major cereals; if anything, there could be further downside for US corn exports to below 0.8-bn bushels in our view. And while US fuel ethanol output is likely to tick-up in the coming months, it might be a challenge to hit 4.55-bn bushels mark of use for old-crop where we have had it pegged at 4.535-bn bushels expecting since 1Q'13 for output to stabilize between 800-k b/d to 830-k b/d in the near term. DOE data pointing to a weekly production north of 850-k b/d in April—to its highest levels since June 2012—is encouraging but such elevated prints need to persist for some time to impact aggregate seasonal corn use which has been on pace at only 4.45-bn bushels ethanol grind for several months now.
- Domestic wheat carryout was loosened by the USDA to 30.3% stocks-to-use by the agency although we are not adjusting our US carryout for the time being.
- Soybean markets still look relatively tight in the short-term with the USDA upgrading the outlook for US crush and export sales. We are in line with this view albeit we expect further bearish pressure on beans to unfold as Latin American supply begins hitting the market in earnest, with Chinese purchases remaining a key metric to follow.

Figure 242. April WASDE Release

	Apr WASDE	Mar WASDE	Citi	Survey	Diff vs. Survey	M/M
Ending Stocks (m bu)						
US Corn	757	632	864	850	-10.9%	20%
US Wheat	731	716	716	729	0.3%	2%
US Soybeans	125	125	139	135	-7.4%	0%
Exports (m bu)						
US Corn	800	825	775			-3%
US Wheat	1,025	1,025	1,025			0%
US Soybeans	1,350	1,345	1,340			0%
Production (m bu)						
US Corn	10,780	10,780	10,780			0.0%
US Wheat	2,269	2,269	2,269			0.0%
US Soybeans	3,015	3,015	3,015			0.0%
Total Supply (m bu)						
US Corn	11,894	11,894	11,889			0%
US Wheat	3,142	3,142	3,142			0%
US Soybeans	3,204	3,204	3,204			0%
Total Use (m bu)						
US Corn	11,137	11,262	11,025			-1%
US Wheat	2,411	2,425	2,425			-1%
US Soybeans	3,080	3,080	3,065			0%
Stocks to Use (%)						
US Corn	6.8%	5.6%	7.8%			
US Wheat	30.3%	29.5%	29.5%			
US Soybeans	4.1%	4.1%	4.5%			

Source: Bloomberg, USDA, Citi Research

Price Forecast – Baseline 2013 conviction calls intact across the board for the agriculture complex

- **Grains/oilseeds:** Our 1Q'13 convictions for cereal price moves—published well in advance of the USDA/NASS quarter-end reports—remain intact with only modest downward revisions for 2Q'13 and 3Q'13 coarse grain levels given the 'early' bearish follow-on impact from the March 1 stocks figure (i.e. our previous 3Q'13 corn price outlook now pushed up to 2Q'13 with slight revision, etc). For corn we have reduced our 2013F price 30-cents to USd615/bu and leave unchanged our 6-12m point-price target of 500. Wheat prices are expected to stabilize around USd720/bu with the wheat parity to corn continuing to widen to its historical premium during 2H'13; a view we have held since January. Our soybean price forecast remains unchanged with 0-3m point-price of USd1350/bu and 6-12m target of 1175 the same as before. Rough-rice prices could remain a bit elevated on US acreage tightness but the global supply situation looks more promising and prices are forecast at \$15.30/cwt this year. 2014F prices for all of these crops remain the same in this report as updated in our 1Q'13 publications (and in the case of 2014F wheat, left unchanged from our 4Q'12 outlook).
- **Softs:** Coffee and cocoa price forecasts are unchanged and still show some modest upside for the new-crop. 2013 cotton price forecasts are revised upwards 1-cent from our January 2013 update to USd86/lb. Sugar price estimates for this year are cut 2.5 cents to USd18.1/lb from our 4Q'12 update.
- **Spec flows and fund net length** looks less supportive this year than during 2011 and 2012 given the large rise of combined open interest for the grains (and cotton) during 1Q'13 and amid sharp unwinding of bull-spreading positions this quarter as investors prepare for lower trading bands for the new-crop cereal complex. Aggregate non-commercial net length (CBOT/ICE corn, wheat, soybeans, rice, cocoa, coffee, cotton, sugar) in early April stood at over 360,000 contracts and up 30% y/y with some room for retrenchment on reduced price outlooks and looser balances. The largest global agriculture ETF—DBA—has seen measurable declines in its assets under management from more than \$2.1Bn last summer during the drought to below \$1.7Bn today as open interest distribution for out-of-the-money call strikes has fallen sharply from levels seen earlier this year. Sentiment also appears unlikely to improve without a weather-related upside catalyst.

Trades and Positioning

- **Prior conviction calls published in January** included going long corn spreads (old-crop versus new-crop), bearish back-end beans (thereby implicitly neutral/long structure) and for consumers to hedge (buy) the cal'14 ICE cotton forward strip. **Updated conviction calls include** consumers hedging the cal'14 ICE cotton curve on dips, selling back-end beans (unchanged from January 2013 update), being bullish new-crop wheat versus new-crop corn on the CBOT screen (an idea first discussed in our 16 January 2013 grains report and re-established in our 27 March 2013 grains report) and for producers to hedge cal'14 rice on price spikes.

Figure 243. Agriculture Commodities Price Outlook*

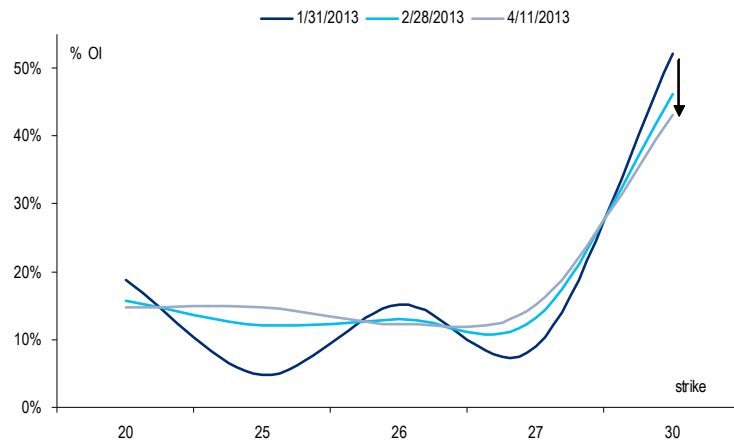
Apr-13	2010	2011	1Q12	2Q12	3Q12	4Q12	2012	0-3m	6-12m	1Q13	2Q13f	3Q13f	4Q13f	2013f	2014f	11 vs. 10	12 vs. 11	13 vs. 12	14 vs. 13
Corn (USd/bu)	428	680	641	618	783	737	695	630	500	715	630	600	515	615	500	252	15	(80)	(115)
Wheat (USd/bu)	582	709	643	641	870	846	750	700	720	738	700	720	720	720	775	127	41	(31)	56
Soybeans (USd/bu)	1049	1317	1272	1426	1675	1485	1465	1350	1175	1448	1350	1300	1175	1320	1150	268	148	(145)	(170)
Rice (USD/cwt)	12.5	15.1	14.3	14.8	15.3	15.1	14.9	15.4	15.3	15.3	15.4	15.4	15.2	15.3	15.0	2.6	(0.2)	0.4	(0.3)
Cocoa (USD/mt)	2942	2921	2308	2221	2440	2420	2350	2200	2400	2176	2200	2425	2475	2320		(21)	(571)	(30)	
Coffee (USd/lb)	164	253	205	170	172	152	175	145	155	144	150	150	155	150		89	(78)	(25)	
Cotton (USd/lb)	94	137	93	81	73	73	80	85	90	82	85	85	90	86		43	(57)	6	
Sugar (USd/lb)	22	27	24.5	21.2	21.0	19.6	21.6	18	18	18.4	18.0	18.0	18.0	18.1		5	(5)	(3)	

Source: Citi Research, *subject to revision

Weather Normalizing?

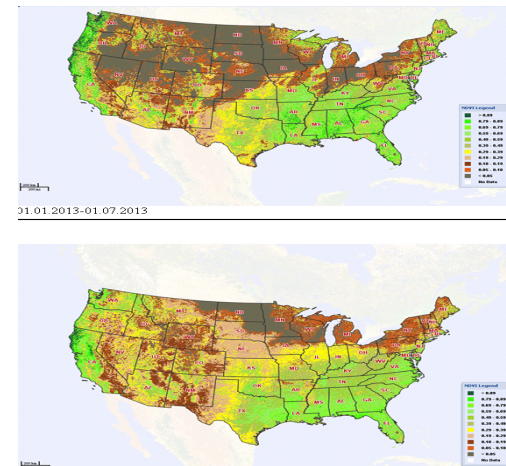
- The biggest uncertainty that could derail the outlook of easing grain prices this year and next is the weather outlook and knock-on impacts of persistent drought-like conditions across the US farm-belt albeit the situation does appear to be on the mend. The USDA Vegetation Condition Explorer has shown significant improvement from January to March, especially in bellwether corn-belt states such as Illinois, Indiana and Nebraska. However, this snapshot has not been comparable to the same period last year when conditions were in fact much healthier and generally consistent with 'average' seasonal conditions. Current conditions impacted by the short soil moisture levels from the 2012 drought and the unusually long-lasting cold winter weather (compared to the warmest US winter in over a generation in 2012) across the corn-belt are less promising when compared y/y although a far improvement from what could have been a much worse scenario. We would expect a better recovery of vegetation conditions in late April and a later planting schedule for the row crops this year versus 12/13.
- The National Weather Service's Climate Prediction Center (CPC) has issued its extended weather forecasts in March. The outlook for April calls for above-normal temperatures and precipitations across the Eastern Corn Belt. The US Drought Monitor has also indicated replenishment of the parched soils by decent snow cover and rainfall and drought retreatment from the Eastern regions including bellwether states such as Illinois and Indiana (both are top five row crop growing states).
- While the general weather outlook does appear more optimistic, to be clear, there are also various risks associated with it. Some meteorologists have warned a high chance of La Nina condition and the intensification of the drought with the highest risk in the Plains states including Texas, Dakotas, Iowa, Minnesota and Missouri. Even if rainfall is adequate, that might push the scale to the other extreme as NOAA has alerted river flooding risk for the northern and eastern areas of the US. But the probability of normalization and yield rebounds are much more likely in our view and has occurred in multiple instances throughout recent history subsequent a year of significantly adverse weather conditions including drought.

Figure 244. DBA Call Option Open Interest Distribution* suggest less of a bullish pull on 'ags'



Source: Bloomberg, Citi Research, *DBA per share price: \$26, AUM: ~\$1.7bn

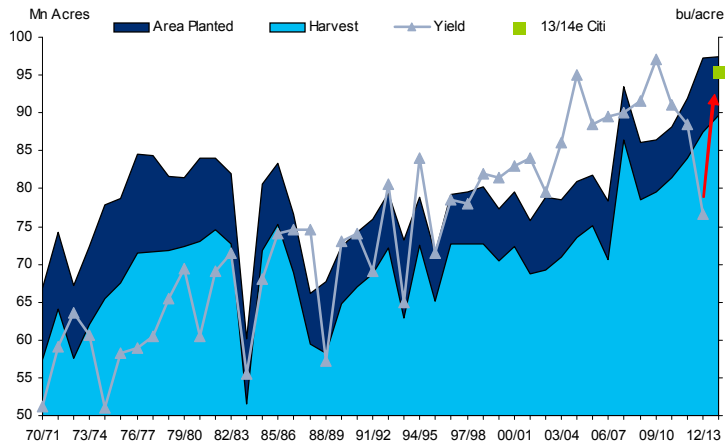
Figure 245. Recent Vegscape Conditions improving (bottom) versus Beginning of 2013 (top)



Source: NASS

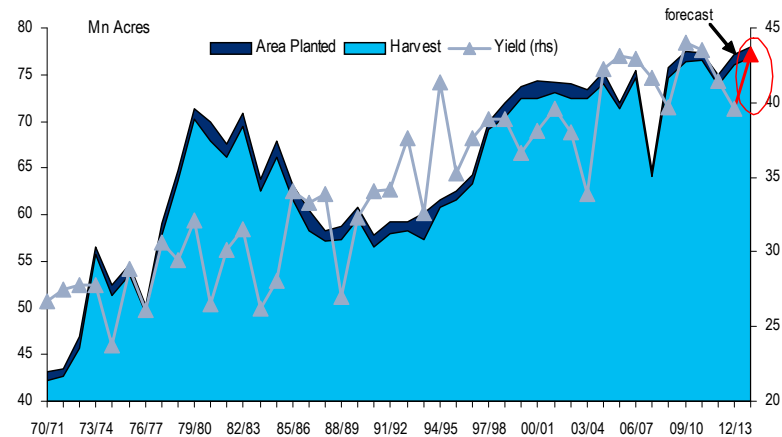
- The negative feedback loop and persistence of drought remains an embedded premium for new-crop contracts particularly for corn and beans (wheat being generally more weather resilient) whereby Citi's 13/14 forecasts still appear bearish the curve. In general we note: y/y changes in precipitation levels are uncorrelated; summer pollination weather matters more than spring sowing weather and dry soil moisture conditions are marginally improving in major Midwestern producing states such as Illinois and Indiana. In short, while weather risks are unpredictable and tangible, for now we assess that 2013 will not be a repeat of 2012.
- Examining over a century of summer precipitation data for the bellwether producing state of Iowa shows annual precipitation levels are generally uncorrelated and the amount appears to mean-revert (to slightly above 4.5 inches). Data are very similar for neighboring farm-belt states. Corn crop prospects and final yield sensitivity is much more pronounced during the critical summer pollination months when taking a look at CDDs and precipitation. Sowing weather during the earlier part of the season appears to have a much weaker relationship in impacting yield (and ultimately output) which is, of course, linked to price (the similar holds for beans as well).
- To be certain, after severe US droughts in 1983 and 1988, yields bounced back sharply in 1984 and 1989. For corn, bushels/harvested-acre jumped about 30% or more than 25-points in the subsequent years; fertilizer use also increased. Soybean yields also gained ~10-20% y/y during this period. Beans benefit from a later-stage pollination cycle vis-à-vis coarse grains. And in affinity to 2012 (39.6-bu/acre versus 42-bu/acre 5Y avg.), the 1980s drought-inflicted years did not see soybean yields deviate from trend as much as they did for corn. Harvested acres and abandonment levels are also important in determining final output, but less meaningful versus yields. Over the past thirty years, seed technology and efficiency gains for farming have led to an upward trend in harvested bushels per acre although more recently corn has lagged this trajectory and might be due for a break-out closer to 160. Season-by-season the change in yields can be severe and negative, particularly in drought years including 1983, 1988, 1995 and 2012. But they also have bounced back in 1984, 1989 and 1996 – and we anticipate as much in 2013.
- For further discussion on all grains/soft commodities discussed in this section please refer to www.citivelocity.com and search for *Agriculture Digest* tagged reports.

Figure 246. US Corn Fundamental Underliers



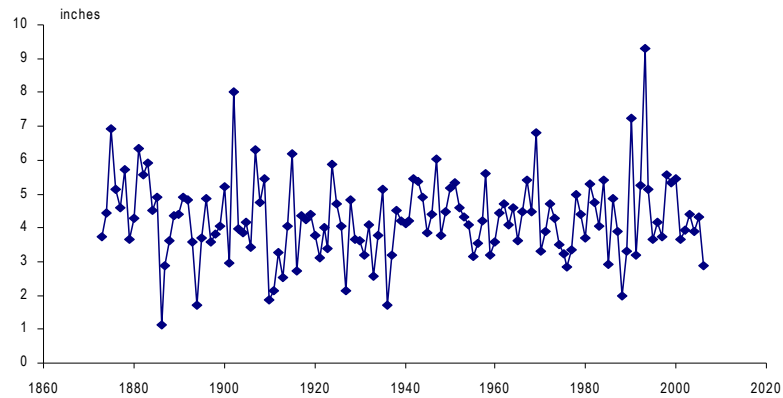
Source: USDA, Citi Research

Figure 247. US Soybean Fundamental Underliers



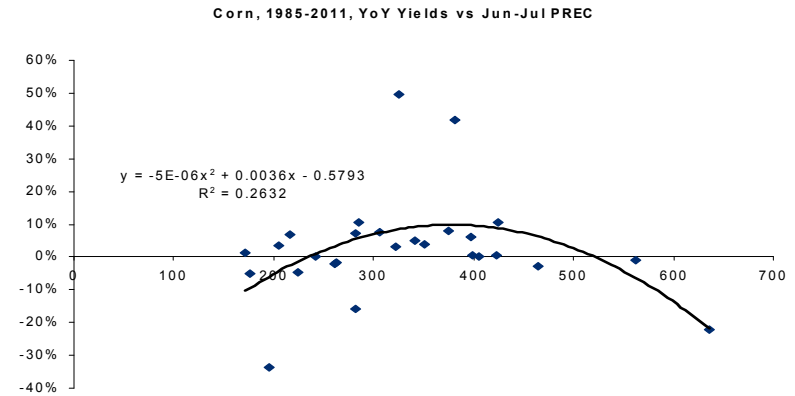
Source: USDA, Citi Research

Figure 248. Iowa June-July Precipitation (1873 – 2006) – generally uncorrelated year/year



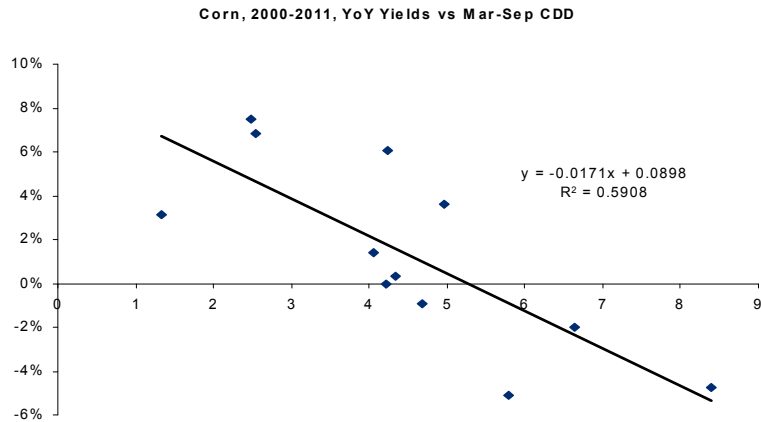
Source: Iowa Department of Agriculture and Land, Citi Research

Figure 249. Extreme precipitation conditions (i.e. flooding, drought) matter more than just moderately drier or moderately wetter growing conditions



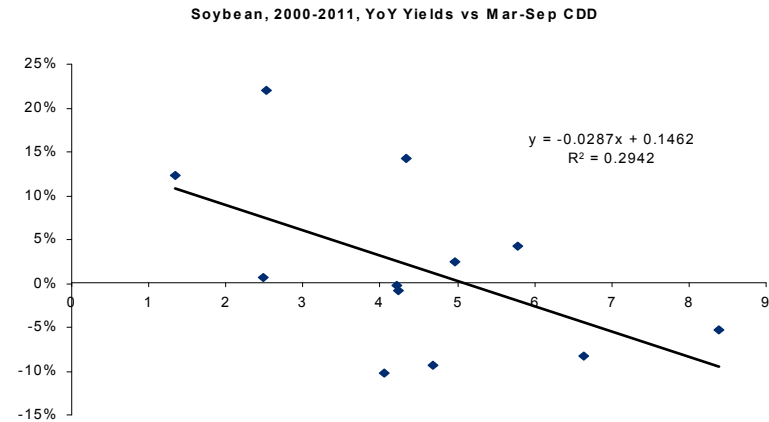
Source: Citi Research

Figure 250. ...there is a meaningful link between high temperatures and yields...



Source: Citi Research

Figure 251. ...but the relationship is stronger during the later-stage growing cycles...

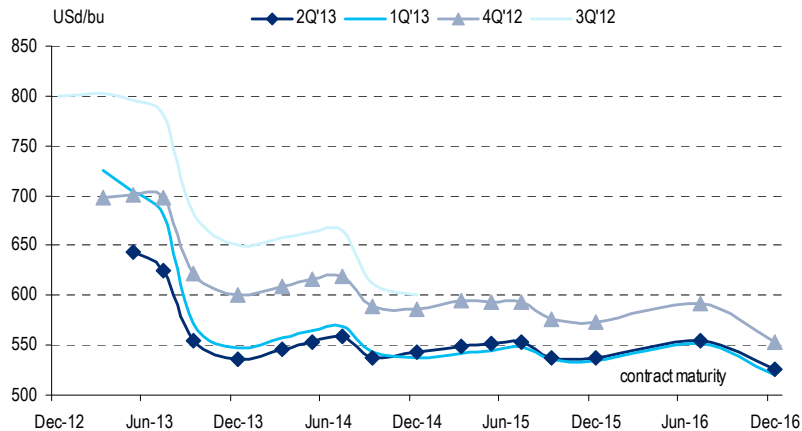


Source: Citi Research

Forward Curves Diverge

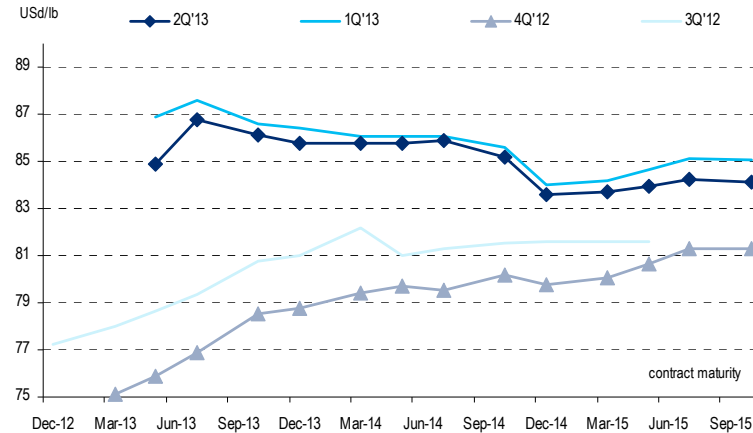
- Row crop structure has weakened substantially from their blow-out peaks during the 2012 drought and more recently in 1Q'13 in advance of the March NASS/USDA reports. Old-crop prices remain elevated but have eased substantially for coarse grains in particular, given a loosening market. Corn and bean new-crop contracts might still be trading rich on the screen on US weather outlook uncertainty. Given prospective acres planted in the US, back-to-trend yields and the output rebound from Latin America this year, global supply is primed to surge with domestic stocks-to-use more than doubling y/y for these primary feed/fuel sources. Although elevator-prices continue to trade at a strong premium to exchange levels the impetus for sharp inverses upon delivery roll-down has reduced and could persist on normal pollination weather in 3Q'13.
- The most notable soft commodity curve shift has been cotton which has flipped from carry to full backwardation earlier this year, beginning with the July contract. Markets expecting strong US upland export sales and ongoing Chinese buying pushed cotton prices +20% during 1Q'13 although spreads have recently come in. Spec length remains very long even though s/d fundamentals do not imply such a tight market for the old-crop albeit the 13/14 campaign should be tighter.

Figure 253. CBOT Corn Forward Curve, 2Q'13, 1Q'13, 4Q'12 and 3Q'12 – row crop market weakening with further downside for deferred prices should US weather cooperate



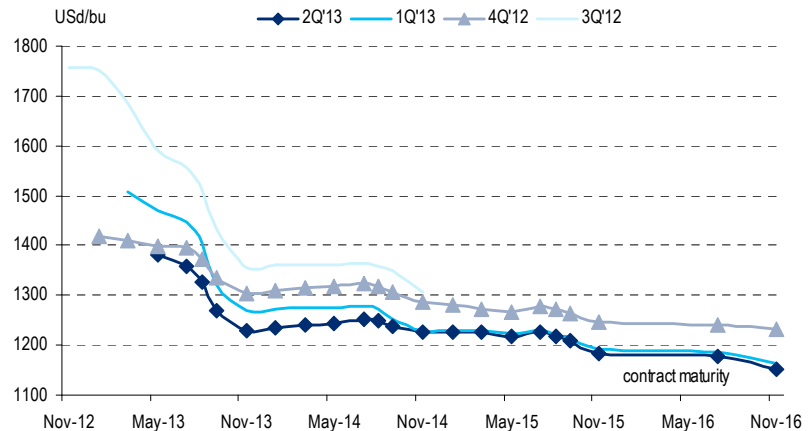
Source: Bloomberg, Citi Research

Figure 252. ICE Cotton Forward Curve, 2Q'13, 1Q'13, 4Q'12 and 3Q'12 – stronger market through 1Q'13 but spreads and structure have weakened this month



Source: Bloomberg, Citi Research

Figure 254. CBOT Soybean Forward Curve, 2Q'13, 1Q'13, 4Q'12 and 3Q'12 – market still supported short-term on LatAm loading issues but prices poised to decline for new-crop



Source: Bloomberg, Citi Research

Corn – easing comes sooner than expected

- US prices are expected to trade in an elevated but much lower trading band for the balance of 12/13 given the outright bearish surprise the USDA offered in its March quarterly stocks report suggesting lower feed/resid demand. Money manager net-length has collapsed at the beginning of April as flat-price declined ~USD100/bu since end-1Q'13. Domestic old-crop carryout might have improved over 200-mn bushels to a still tight but manageable 864-mn bushels lifting stocks-to-use 2-points to 7.8%. 2013 sowed acres in the US are expected to come in at 97.5-mn acres and yields are lifted 1-point from our prior trend forecast to 161-bu/harvested acre lifting output to just about 14.5-bn bushels with peak Dec. 1 post-harvest stocks at the end of 2013 likely to grow 35% y/y to over 11-bn bushels. Cash markets continue to trade at a 30-50 cent premium to futures but higher inventories are likely to mute the extent to which spreads rally on old-crop delivery rolls. New-crop prices are expected to fall to around USD500/bu and could decline further still if summer weather were to be favorable on the assumption of back-to-trend yields.
- Sharp inverse structures persisting since the 2012 drought have done their part to ration domestic use and amid generally stabilizing US fuel ethanol output that we project near 830-k b/d for the next two quarters amid sluggish US export sales that continue to lag on a sequential and seasonal basis. Ethanol profit margins and output have surged this month on the decline in corn prices although production remains on pace for ~12.7-bn gallons this year and assuming an intact RFS2, will require refiners/importers of mogas to draw down 900-mn-1.2-bn gal of D6 RINs and import 600-800-mn gallons of Brazilian sugarcane ethanol for the advanced carve-out (see: [RINs](#)). The current pace of US export sales could mark a cycle as weak as 725-775-mn bushels amid LatAm competition and drawdown of Brazilian crops and Argentina's maize harvest albeit Chinese buying could help to support markets in 3Q when US corn is more difficult to obtain in advance of its reaping.
- While the US b/s looks tight there appears to be a global easing for the old-crop and particularly for new-crop where world supply is poised to rebound markedly for 13/14 with our preliminary expectations that total production will grow 120-mn tons y/y and the stock-balance change will sharply increase from a tepid decline in 12/13. Overall production rises are driven by a rebound in the Americas (North and South) and should more than offset the 8% rise in consumption to 930-mn tons.

Figure 255. US Corn Balances

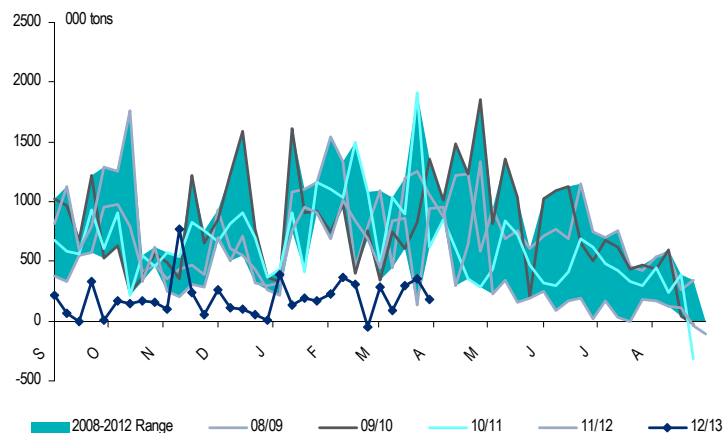
Mn bushels/Mn acres	09/10	10/11	11/12	12/13 USDA (Apr)	12/13E Citi	13/14E Citi
Planted Area	86.4	88.2	91.9	97.2	97.2	97.5
Harvest	79.5	81.4	84	87.4	87.4	89.7
% Harvested	92%	92%	91%	90%	90%	92%
Yield (bu/acre)	165	153	147	123.4	123.4	161
Beginning Stocks	1,673	1,707	1,127	989	989	864
Output	13,092	12,447	12,358	10,780	10,780	14,442
Imports	8	28	29	125	120	10
Total Supply	14,773	14,182	13,514	11,894	11,889	15,316
Feed/Resid	5,125	4,793	4,550	4,450	4,350	5,200
Food/Industrial	1,370	1,406	1,410	1,337	1,365	1,450
Fuel Ethanol	4,591	5,021	5,020	4,550	4,535	4,800
Exports	1,980	1,835	1,545	800	775	1,550
Total Demand	13,066	13,055	12,525	11,137	11,025	13,000
Ending Stocks	1,707	1,127	989	757	864	2,316
% use	13.1%	8.6%	7.9%	6.8%	7.8%	17.8%

Source: USDA, Citi Research

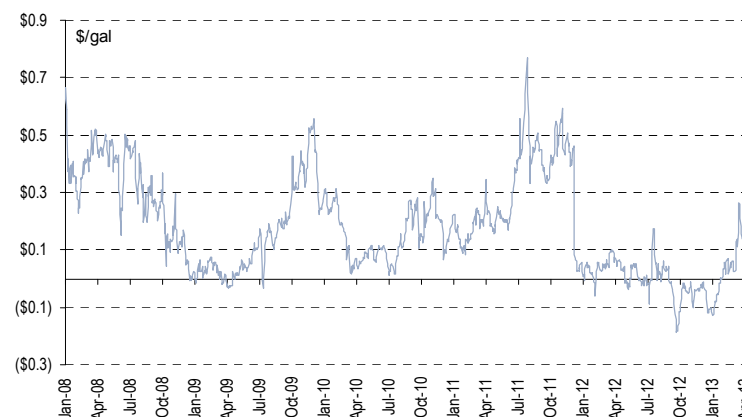
Figure 256. Global Corn Balances

(000 MT)	08/09	09/10	10/11	11/12	12/13E	13/14E
Beginning Stocks	131,320	144,893	128,720	114,607	126,107	123,107
Total Production	799,300	813,400	828,000	880,000	855,000	975,000
y-o-y change	0.60%	1.76%	1.79%	6.28%	-2.84%	14.04%
US Production	307,100	332,500	315,000	313,893	273,818	366,819
% of world	38.4%	40.9%	38.0%	35.7%	32.0%	37.6%
Imports	82,450	89,750	91,338	125,000	94,000	100,000
Total Supply	1,013,070	1,048,043	1,048,058	1,119,607	1,075,107	1,198,107
Exports	84,477	96,823	90,451	115,000	89,000	102,000
Consumption	783,700	822,500	843,000	878,500	863,000	930,000
Total Demand	868,177	919,323	933,451	993,500	952,000	1,032,000
Stock Bal Change	13,573	-16,173	-14,113	11,500	-3,000	43,000
Ending Stocks	144,893	128,720	114,607	126,107	123,107	166,107
% Use	17%	14%	12%	13%	13%	16%

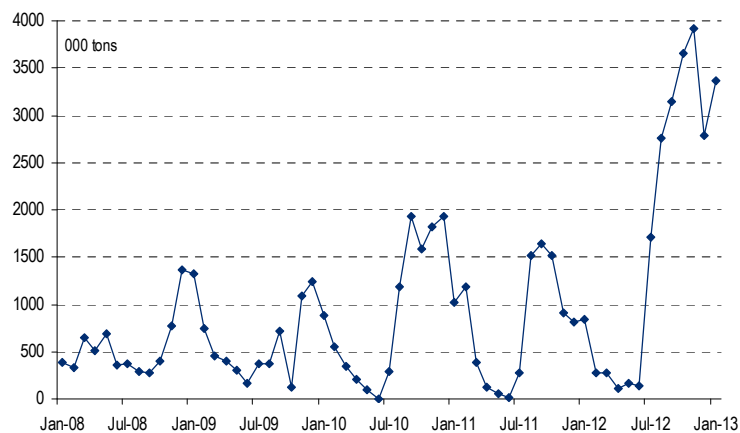
Source: USDA, Citi Research

Figure 257. US Corn Export Sales (12/13 current marketing year) remain weak...


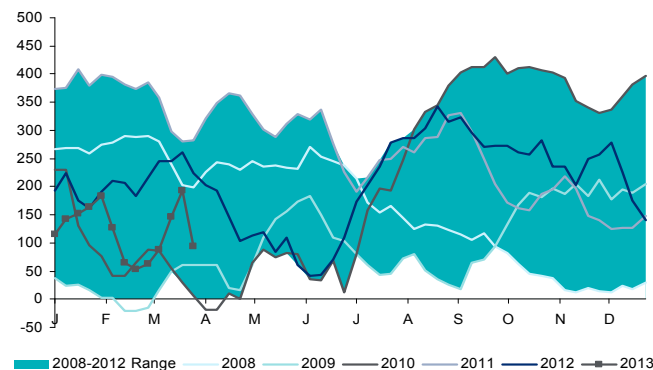
Source: USDA, Citi Research

Figure 258. Simple Ethanol Plant Profit Margin


Source: CME, Citi Research

Figure 259. Brazilian Maize Exports


Source: Brazil Ministry of Commerce, Citi Research

Figure 260. Money Manager Net Length (F&O, 000s lots): CBOT Corn – non-commercial selling heavy after the ‘surprise’ bearish reading of the March 1 stocks report prior to which markets were bidding up old-crop contracts expecting a sub-700-mn bushel 12/13 carryout to hold...


Source: CFTC, Citi Research

Wheat – historical premium to corn re-emerging for the new-crop

- Global supply/demand assessments suggest loosening balances in 13/14 with a world new-crop harvest near 695-mn tons or y/y growth of 7%. Producing regions including Europe, Russia and Canada should see higher output with robust Indian output intact and the US down slightly to 2,176-mn bushels on all-wheat planted acres of 56-mn. Flat worldwide seasonal demand at 680-mn tons could imply global stocks-to-use growing 4% in 13/14 to 26%. Meanwhile, US carryout looks unchanged ~30% on lower yields and smaller takedown of sowed acres at 86% versus a trailing three-year average of 87%. Given the outlook for significantly lower corn prices in late 2H'13 and 2014, we suspect coarse grains consumption for feed will alleviate wheat use in that category. But adverse domestic winter wheat conditions and low 12/13 carryout may still see 13/14 US wheat supplies decline 3.8% y/y to 3,022-mn bushels.
- Domestic wheat output for 2013 is projected to decline 4.3% y/y to 2,176-mn bushels for the new-crop despite the fact that planted acres appear set to modestly rise to 56-mn. The drop in US output is a result of a one-point seasonal reduction in forecast yields to 45.2-bu/acre and lower takedown of sowed acres (~86%) as a consequence of larger-than-normal Hard Red Winter wheat crop abandonment. Assuming decent precipitation in 2Q, at least some of these HRW acres are expected to rotate towards soybeans. The benchmark oilseed is expected to see its US planted acres jump 0.8-mn acres y/y to 78-mn.
- Assuming normal 13/14 weather, we assess that the historical CBOT wheat premium to corn is likely to re-establish itself at ~USd225/bu or higher. Current marketing year US export sales which now total above 757-mn bu and have picked up some traction in recent weeks with purchases spread broadly across traditional importers such as Egypt and buyers in Asia and Southern Europe. This has coupled with a spike in weekly inspections that need to stay elevated above 24-mn bushels in order for old crop wheat exports to scale 1-bn bu for the season. For now, we are assuming 13/14 wheat exports to remain unchanged y/y at 1,025-mn bushels although this figure is biased to push lower assuming a global supply rebound and better availabilities from major producing blocs including the Black Sea and Europe. Domestic new-crop carryout is expected to fall below 700-mn bu—and would represent the tightest market since 07/08—albeit this baseline outlook is preliminary and shall adjust as more clarity is achieved on yields and demand trends.

Figure 261. US Wheat Balances

Millions of Acres Millions of Bushels	12/13 USDA Estimates			Citi Estimates	
	09/10	10/11	11/12	March	April
Area Planted	59.2	53.6	54.4	55.7	55.7
Area Harvested	49.9	47.6	45.7	49.0	49.0
Percent Harvested	84%	89%	84%	88%	88%
Yield per Harvested Acre	44.5	46.24	43.72	46.2	46.2
Beginning Stocks	657	975	862	742	742
Production	2,218	2,207	1,999	2,269	2,269
Imports	119	97	112	130	130
Total Supply	2,993	3,279	2,974	3,142	3,142
Food	919	926	941	950	950
Seed	69	71	76	75	76
Feed and Residual	150	132	164	375	360
Total Domestic Usage	1,138	1,128	1,182	1,400	1,386
Exports	879	1,289	1,049	1,025	1,025
Total Demand	2,018	2,417	2,231	2,425	2,411
Ending Stocks	976	862	743	716	731
Stocks to Usage	48.36%	35.66%	33.30%	29.53%	30.32%
% Soft Wheat (Red & White)	48.77%	41.30%	34.45%		

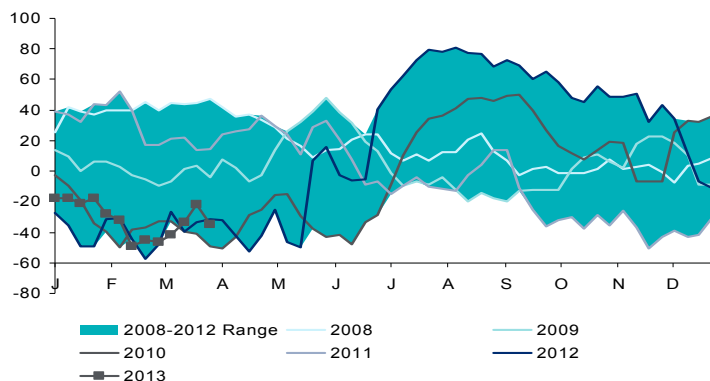
Source: IE, USDA, Citi Research

Figure 262. Global Wheat Balances

Millions of Hectares Millions of tons	12/13 USDA Estimates						Citi Estimates	
	07/08	08/09	09/10	10/11	11/12	12/13	Previous	Current
Yield	2.82	3.05	3.05	3	3.2	3.0	3.0	3.1
Beginning Stocks	134	128	168	201	199	199	198	199
Production	612	684	687	652	697	655	651	655
Imports	114	138	134	132	148	142	138	142
Total Supply	860	950	989	966	1044	997	987	997
Feed	102	121	121	116	145	129	132	129
Total Domestic Usage	614	637	650	654	687	679	675	679
Exports	117	145	137	133	157	136	133	136
Total Demand	732	782	787	787	845	814	808	814
Ending Stocks	128	168	201	199	199	182	174	182
Stocks to Usage	18%	22%	26%	25%	24%	22%	22%	26%

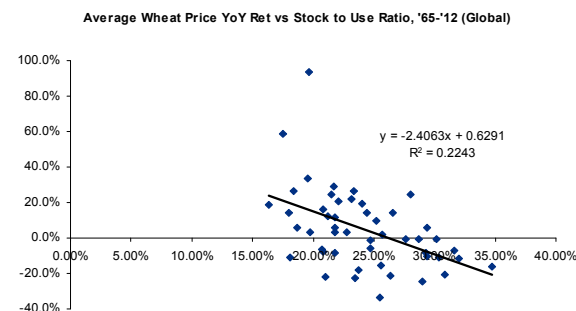
Source: FAO, USDA, Citi Research

Figure 263. CBOT Wheat – Money Manager (F&O, 000s lots) net positioning suggests a tapering of the wheat market sell-off since November 2012. Funds have reduced their net short in CBOT wheat (generic US benchmark) markets to the low-end of their trailing 5-year range



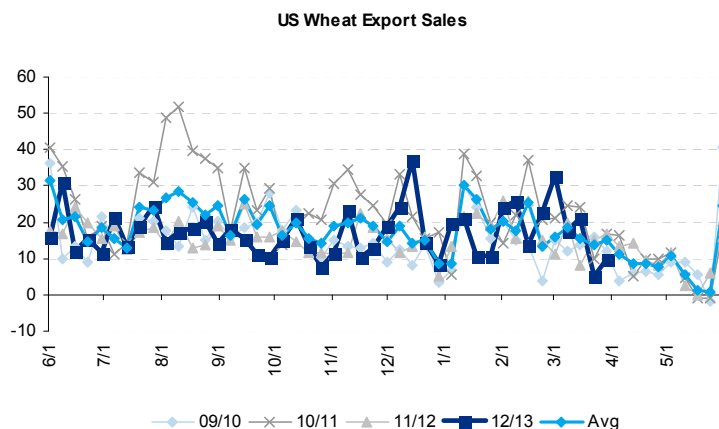
Source: CFTC, Citi Research

Figure 264. 12/13 US wheat prices have averaged nearly USd800/bu and are expected to have a mean value of ~USd785/bu by the end of 2Q in advance of the new-crop. This would imply a 0-3m point-price target of USd700u-USd725/bu for CBOT wheat. This jibes with looking at the historical relationship between y/y changes in US average wheat prices and final seasonal carryout—a linear correlation which appears to have strengthened in recent years.



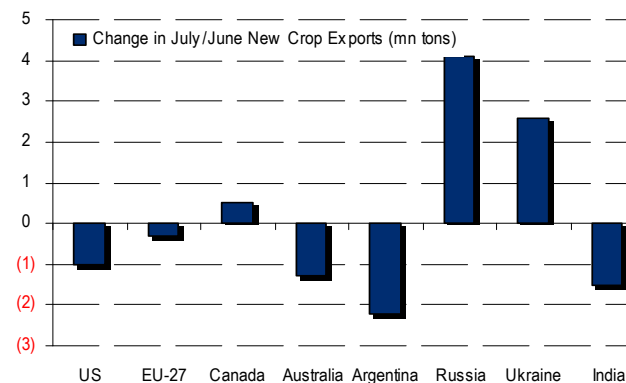
Source: Citi Research

Figure 265. US Wheat Weekly Export Sales (mn bushels)



Source: USDA, Citi Research

Figure 266. Year-on-Year Change in Wheat Exports favor Black Sea on upgraded output growth



Source: IE, Citi Research, *13/14 cycle, mn-tons

Soybeans – the same view for lower levels in 2H'13 and 2014

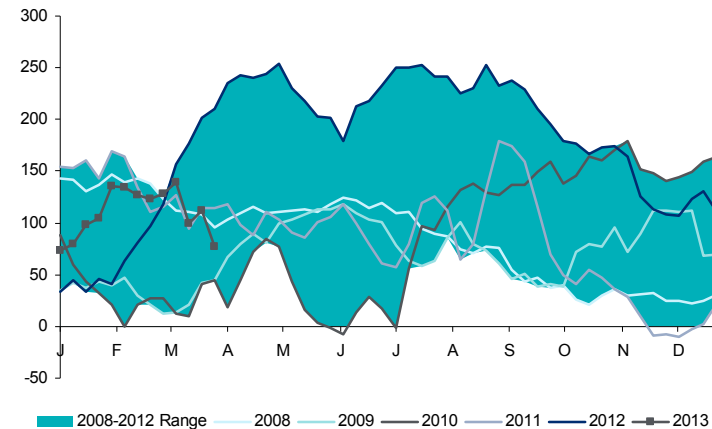
- The price outlook for beans remains unchanged with 2H'13 and 2014 contract levels continuing to look bearish in advance of a delayed but sizable Brazilian loading program north of 38-mn tons. The measurable row crop surplus out of Brazil in 2013 should continue to weigh on markets—able to absorb any bid out of China (expected to import 62-mt beans this year)—with total supply further buttressed in 2013 by expectations of a 300-mn bushel increase in US output for the new-crop. Argentina is expected to export more corn in 2Q with Brazil starting to push-out beans in place of corn. In combination, Brazil and Argentina are expected to harvest 136-mt of beans with gross exports just shy of 49-mt or up 11% versus the prior campaign.
- US soybean balances look tight but less drastic with our carryout figure for Sept. 1 at 139-mn bushels implying seasonal stocks-to-use of 4.5%. Greater domestic crush and strong exports out of the US are aided by higher inventories and lower resid use. New-crop acres of 78-mn across the farm-belt are north of the USDA estimate although we expect an upward revision by the end of this quarter. 13/14 stocks-to-use is expected to grow about 3% to 7.4% and above the trailing three-year average as total demand is expected to rise for industrial and export use is expected to return-to-trend. US yields we project at 43.2-bu/acre are currently below consensus and conservatively forecast just a bit shy of the 10-15% y/y rise for the final yield on years following drastic droughts during campaigns in the mid-1980s and mid-1990s. Spec net length for beans has held up despite a somewhat bearish USDA quarterly stocks report and more neutral WASDE as short-term port congestion issues in Brazil have caused delays and kept the market tight.
- Global oilseed output in the April WASDE was lifted 2-mn tons m/m to 469-mn tons with continued improvement from the South American minors including Paraguay and Uruguay. The USDA season-average price outlook for soybeans remains strong at 13.80-14.80 and we think the outlook later in 2Q and for 3Q would push towards the downside of this range with 13/14 looking more bearish as soybeans in the high-teens in 2012 that are trading in the mid-teens today stop trading in the teens altogether later this year and into 2014.

Figure 267. US Soybean Balances

Mn bushels/Mn acres	09/10	10/11	11/12	12/13 USDA (Apr)	12/13E Citi	13/14 E Citi
Planted Area	77.5	77.4	75	77.2	77.2	78
Harvest	76.4	76.6	73.8	76.1	76.1	76.8
% Harvested	98.6%	99.0%	98.4%	98.6%	98.6%	98.5%
Yield (bu/acre)	44	43.5	41.9	39.6	39.6	43.2
Beginning Stocks	138	150	215	169	169	139
Output	3,359	3,329	3,092	3,015	3,015	3,319
Imports	15	14	16	20	20	15
Total Supply	3,512	3,493	3,323	3,204	3,204	3,473
Crush	1,752	1,648	1,702	1,635	1,625	1,650
Exports	1,500	1,500	1,360	1,350	1,340	1,475
Seed	90	87	90	89	90	90
Residual	20	43	2	5	10	20
Total Demand	3,362	3,278	3,154	3,079	3,065	3,235
Ending Stocks	150	215	169	125	139	238
% use	4.5%	6.6%	5.4%	4.1%	4.5%	7.4%

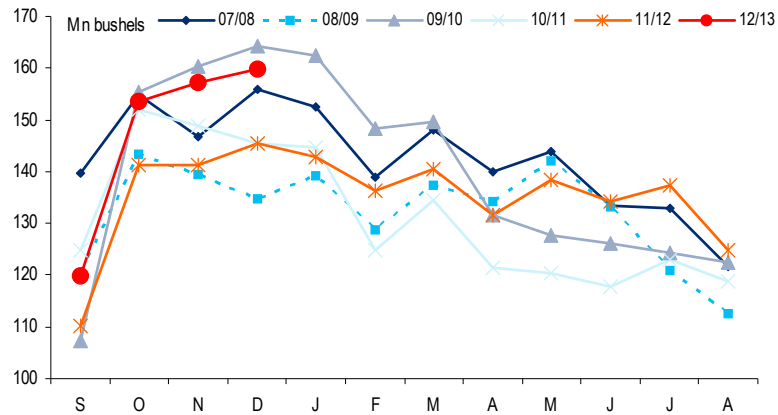
Source: USDA, Citi Research

Figure 268. Money Manager Net Length (F&O, 000s lots): CBOT Soybeans



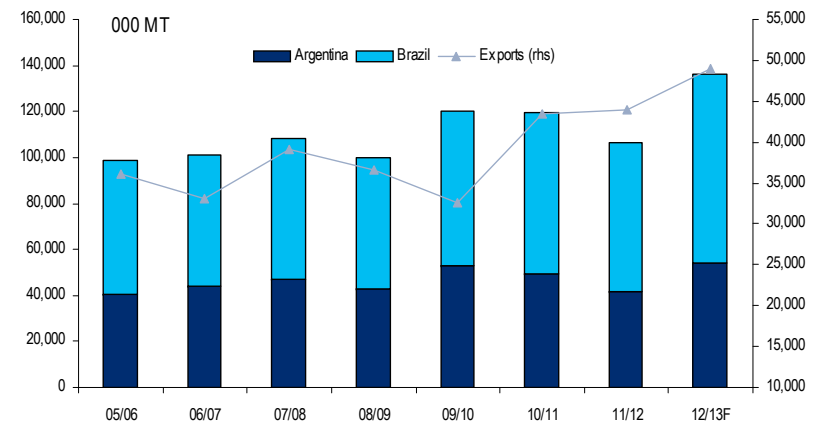
Source: CFTC, Citi Research

Figure 269. US Soybean Crush



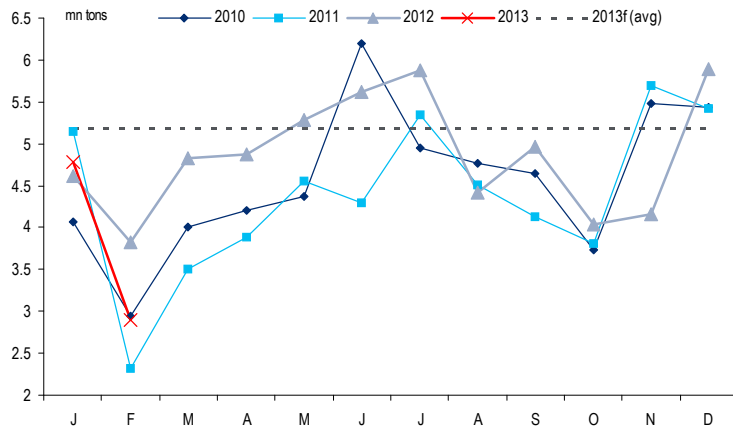
Source: NOPA, Citi Research

Figure 270. Latin American Soybean Profile



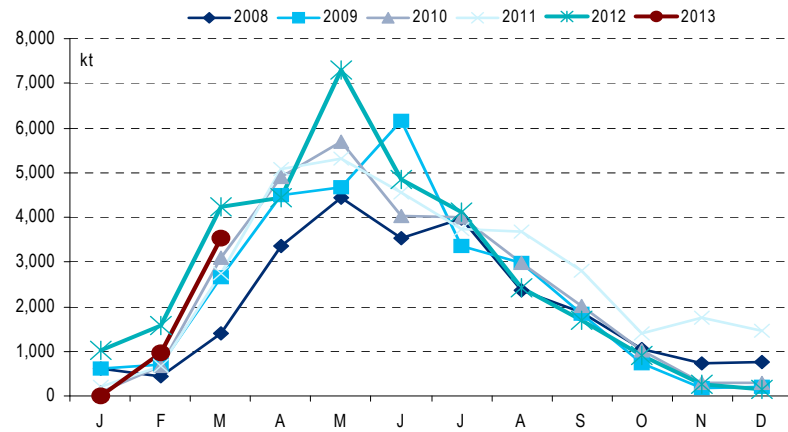
Source: CONAB, Oil World, USDA, Citi Research

Figure 271. China Soybean Net Imports



Source: China Customs, WIND, Citi Research

Figure 272. Brazilian Soybean Export Volumes are Set to Surge this summer...



Source: Brazil Ministry of Development, Citi Research

Rice – poised to stabilize with global output remaining strong

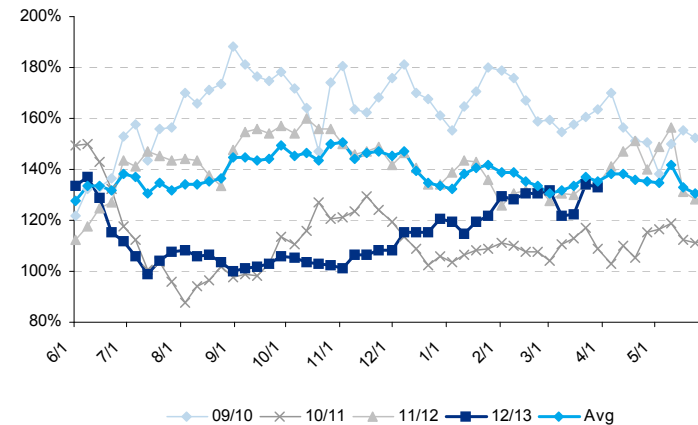
- Even though the USDA is reporting reduced allocation to domestic rice acres in 2013 and 2Q/3Q prices should trade a tad higher from our old forecast, the global supply/demand picture looks rather rosy for rice this year amid robust inventories in Vietnam and Thailand. World output, led by Asia, is expected to climb 1% y/y to a record 472-mn tons. This boosts total supply to about 612-mn tons or 35-mn tons above the trailing five-year average. While the US balance sheet appears less bearish, akin to wheat, the rice rebound is RoW driven. Total use is expected to remain relatively stable at about 500-mn tons with export markets with domestic consumption shrinking in 13/14 versus 12/13. On the whole, ending stocks might rise to a record 112-mn tons lifting the world carryout ratio 3-points to 23%.
- Rice prices are poised to stabilize in conjunction with the staple row crops and small grains. Worth noting, rough rice contracts are very thinly traded on CME and they are not part of any benchmark commodity indices; furthermore, the US position in global market supply for rice is much smaller than it is for corn, soybeans and wheat. Over the past few marketing cycles, rice has traded about 1x to 1.4x its equivalent CBOT wheat counterpart (in ton terms). Given the relative stability of rice flat price over the past several months and the general softening of wheat prices since their summer 2012 peaks, the ratio has rebounded back to average 1.2-1.3x levels. We suspect rice will not deviate from this normalized pattern in the near term. Additionally, the historical linear relationship between global rice carryout and average seasonal price change is weak; unlike that for wheat or other major grains.
- On the whole, rice contracts are likely to stay capped given looser fundamentals and price direction will likely follow the lead of the other benchmark grains. But if adverse US growing conditions derail the resurgence for global row crop output, that could tighten the rice balance sheet as inventories draw down and boost US levels. To be sure, relatively ample rice supplies in recent years have helped grain consumers adjust to tighter and more volatile corn and wheat markets plagued by drought, trade bans and reduced stocks. Rough rice prices are forecast to remain range-bound between \$15-\$16 with a 2013 average price of \$15.3/cwt.

Figure 273. World Rice Balances

Millions of Hectares							12/13 USDA Estimates		Citi Estimates
Millions of tons	07/08	08/09	09/10	10/11	11/12	12/13	Previous	Current	13/14
Yield	2.79	2.84	2.83	2.85	2.9	3.0	2.9	3.0	3.1
Beginning Stocks	75.46	80.9	92.4	95.2	98.7	105.5	105.8	105.5	103.3
Production	432.59	448.7	441.1	449.1	465.8	467.6	464.3	467.5	472
Imports	29.99	27.3	28.2	32.9	36.0	34.5	34.3	34.5	36.5
Total Supply	538.04	556.9	561.7	577.1	600.4	607.6	604.4	607.6	611.8
Total Domestic Usage	425.68	435.5	435.4	443.5	455.9	466.1	467.9	466.1	464.8
Exports	31.48	29.0	31.1	34.9	39.1	37.8	36.5	37.8	34.4
Total Demand	457.16	464.5	466.5	478.4	494.9	503.8	504.4	503.8	499.2
Ending Stocks	80.88	92.4	95.2	98.7	105.5	103.8	102.3	103.8	112.6
Stocks to Usage	18%	20%	20%	21%	21%	21%	20%	21%	23%

Source: IGC, USDA, Citi Research

Figure 274. Rice-to-Wheat Ratio* expected to remain in-line with the historical average

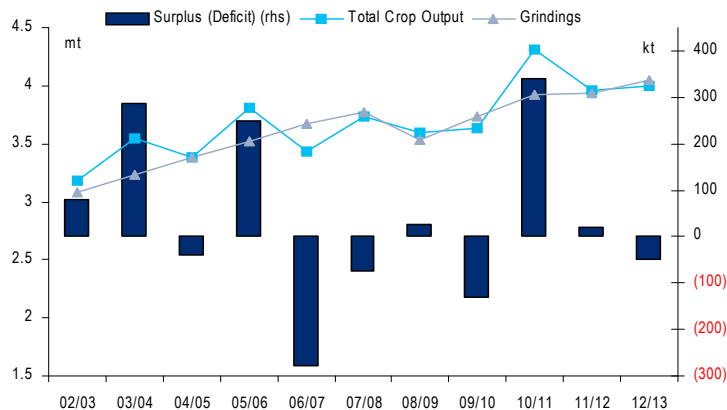


Source: Bloomberg, Citi Research, *in ton equivalent terms, rice multiple over wheat on CBOT

Cocoa – stability short term

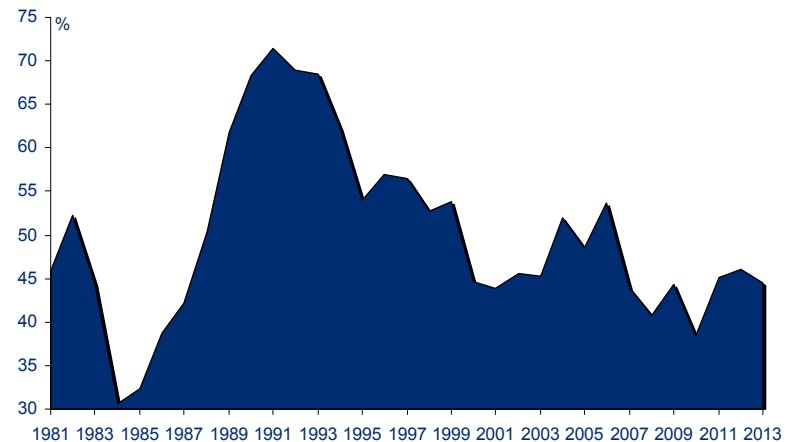
- Weak speculative flows and looming producer forward selling are likely to keep ICE cocoa traded levels subdued and largely compressed in the near term. CFTC positioning data indicate money manager net length for NYB-ICE cocoa has declined 60% year-to-date to stabilize around 12,000 contracts and broker markets suggest short-covering sentiment as still lackluster for the non-commercial space amid a spike in ICE warehouse stocks to above 4.6-mn bags and their highest levels in over six months. Cocoa availabilities and export sales have been robust with producer hedging out of West Africa likely to further weigh on short-term prices. But the 12/13 marketing cycle appears to be in a modest deficit and 4Q'13 could see contracts lift back towards US\$2400/MT as natural and technical selling pressure alleviates; which also happens to be in line with our original 2013 forecast that was published in November 2012.
- Combined output from the producing region of Ivory Coast and Ghana is assessed at 2.37-mt and should underpin global production of 4-mt versus world grindings of 4.05-mt. The 12/13 deficit of 50-mt is about half of our November 2012 view but not nearly as tight as recent cycles in 09/10 and 06/07. Processing in the largest consuming region—Europe—has been sluggish with 4Q'12 usage of 328-kt down about 6% y/y with 1Q'13 also likely to print weak. After tightening a bit late last year, cocoa butter ratios have fallen below 2x in Europe through much of 1Q'13 and are also lower in Asia, implying decent supply hitting the market. Nevertheless, a 2.8% rise in grindings y/y would compare to total crop production growth of 1% and may eventually buttress higher prices as stockpiles are curtailed in advance of what remains an unclear picture for the 2014 campaign. Global bean stocks-to-grinding ratios are projected to decline in 2013 to about 45% from over 46% in 2012.
- Higher prices later this year are likely to be limited to fundamentals and future crop prospects; aided by the potential of renewed buying interest from the non-commercial community. Given the absence of geopolitical heat and government hedging policy uncertainty that dominated markets in 2011 and 2012, 2013 prices should remain clipped in a tighter and less volatile range with some greater upside in 2H'13 after what seems to be a large mid-crop program (around 440,000 tons according to ICCO) is sold forward. Our annual price target (unchanged) of \$2,320 jibes with the historical relationship (accounting for modest inflation) between prices and carryout—which we project at approximately 1.8-mt and slightly lower y/y from the 11/12 program.

Figure 275. World Cocoa Balances Suggest a Modest deficit



Source: ICCO, Citi Research

Figure 276. World Cocoa Bean Stocks-to-Grinding Ratio falling slightly in 2013 versus 2012



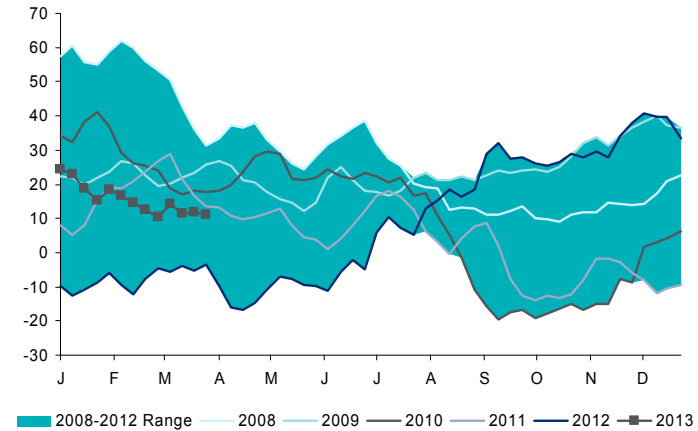
Source: ICCO, Citi Research

Figure 277. Cocoa Butter Ratio



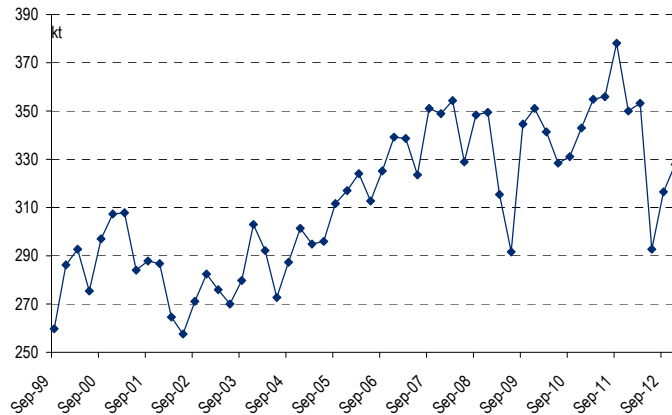
Source: Cocoa Merchants Association, Citi Research

Figure 278. Money Manager Net Length (F&O, 000s lots): NYB-ICE Cocoa remains range-bound



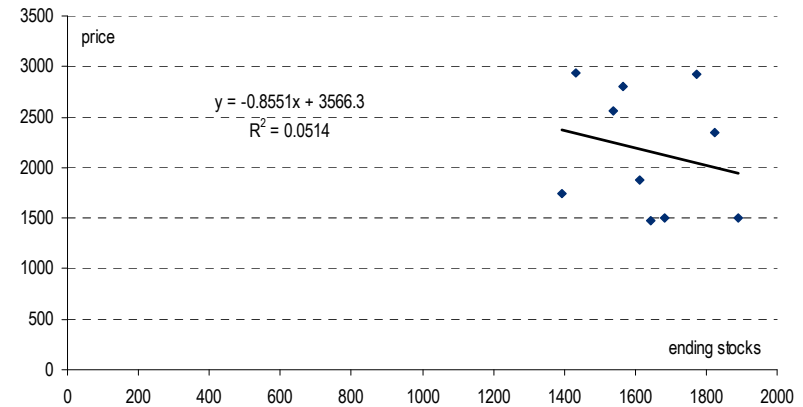
Source: CFTC, Citi Research

Figure 279. European Cocoa Bean Usage Generally Sluggish



Source: ECA, Citi Research

Figure 280. Cocoa Crop Carryout (Fit-to-Price)

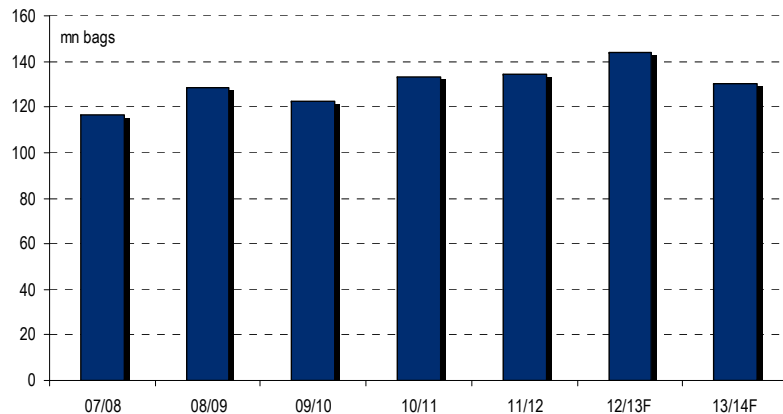


Source: Citi Research

Coffee – weak market but rust issues provide modest upside

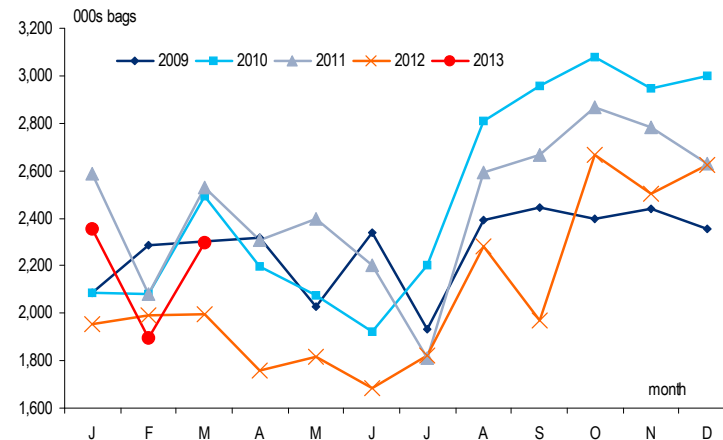
- Generally bearish speculative trading flows, elevated warehouse inventories and healthy physical supply should keep a lid on Arabica coffee prices in the short term. We forecast an average price of USD150/lb this year (unchanged from our 1Q'13 update). ICE coffee spreads are dull with K3 – N3 and N3 – Z3 stagnant despite a sharp decline in prices since 3Q'12; the calendar strip essentially shifting down in parallel. CFTC data for ICE coffee show the money manager net short averaging 23,000 lots since early November and well south of historical and seasonal ranges. Short-covering rallies have been few and far between and category positioning remains a headwind. ICE certified stocks have meanwhile soared to two-year highs north of 2.7-mn bags suggesting strong availabilities in contrast to a precipitous decline in Robusta stocks on Liffe with the NY (Arabica) and London (Liffe) 'arb' hitting four-year lows at USD40/lb in recent weeks.
- The record 52-mn bag 12/13 Brazilian crop with a looming 13/14 off-cycle harvest beginning in July that could be as large as 48-mn bags is pressuring the Arabica market amid lackluster OECD consumption. Roaster switching from Arabica to Robusta of about 2-3-mn bags last year after the 2011 price spike also needs to return. ICO trade data show annual Robusta coffee exports through February 2013 were 47-mn bags gaining 18% y/y, contrasting with no export volume growth for Arabica in the same TTM. So far the five months of the 12/13 season have seen 47-mn bags of total exports primarily Robusta led. While Brazilian (Arabica) export volumes did pick up 21% m/m and 15% y/y in March to just shy of 2.3-mn bags, this local producer selling—given substantial inventories unsold—could further weigh on NY trading levels. The extent to which Arabica demand returns in a potentially tighter fundamental market is what might support prices down the line with the market still ignoring the coffee rust issues in Central America despite government officials pointing to a loss of at least 2.3-mn bags in the current cycle.
- Aggregate coffee supply-demand balances do still indicate healthy 12/13 availabilities; but with tightening down the line on Latin American output declines. Exporting countries could fall 10% y/y to 130-mn bags if historical off-cycle production declines are any guide with retrenchment mainly out of Central America. Recent global demand growth only has a CAGR of 1.2-1.3% and at ~145-mn bags is not expected to deviate from trend, but the drop in Arabica crop may serve to buoy deferred ICE prices. The linear relationship between seasonal ending stocks and price (accounting for modest inflation) does suggest USD145/lb as fair value for prices today.

Figure 281. Global Coffee Major Exporting Nations Total Production



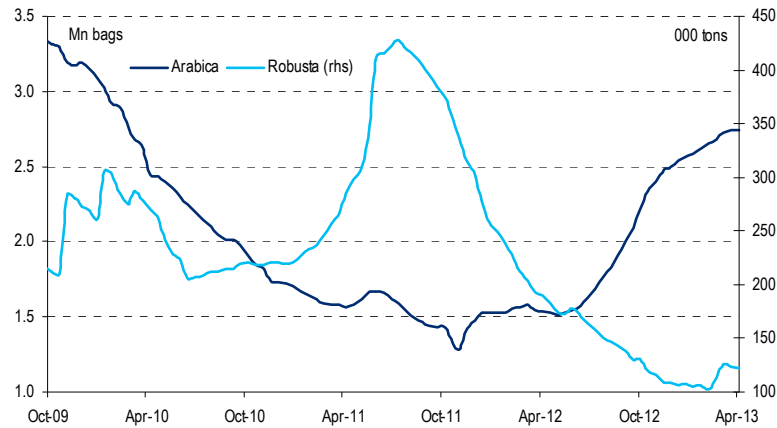
Source: ICO, Citi Research

Figure 282. Volume of Brazilian Coffee Exports



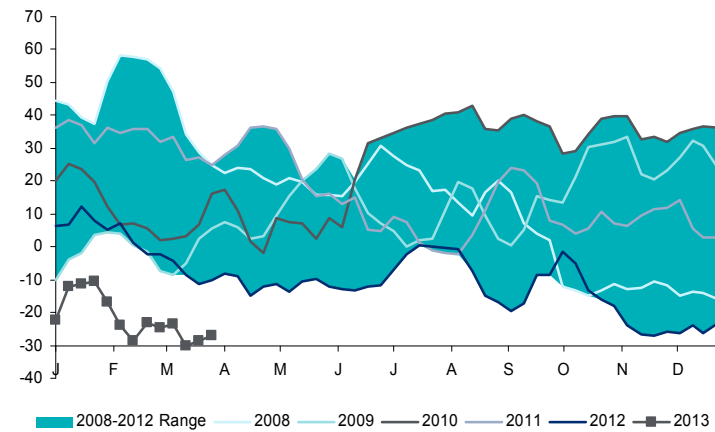
Source: Brazil Ministry of Development, Citi Research

Figure 283. Exchange Certified Coffee Stocks Remain Robust for Arabica on ICE



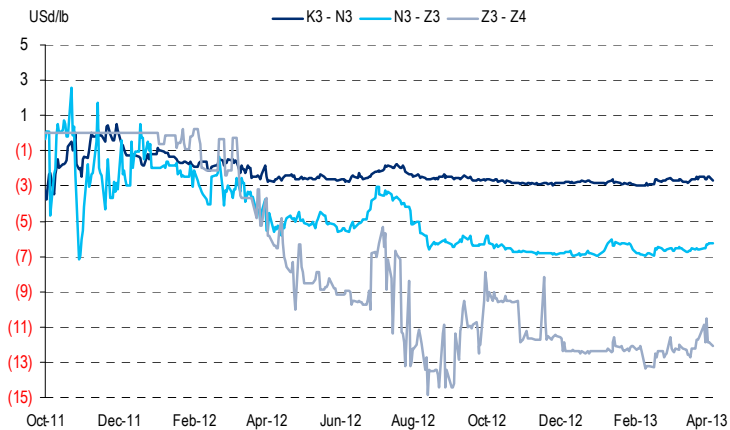
Source: ICE, Liffe, Citi Research

Figure 284. Money Manager Net Length (F&O, 000 lots): ICE Coffee – weak sequentially and seasonally



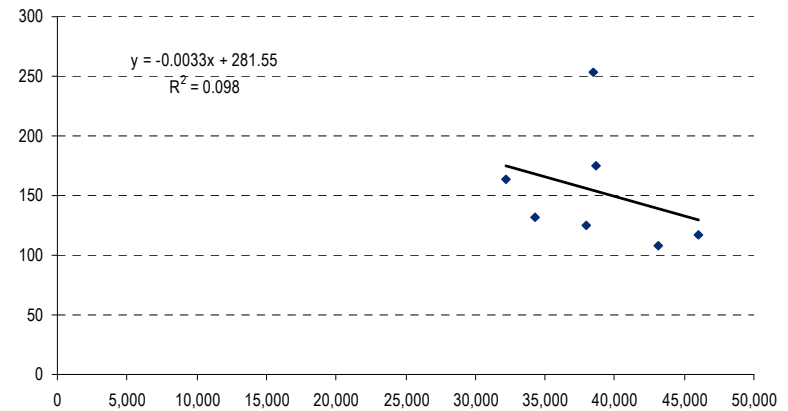
Source: CFTC, Citi Research

Figure 285. ICE Coffee Spreads Remain Stable with the Forward Curve Shifting in Parallel



Source: Bloomberg, Citi Research

Figure 286. Coffee Crop Carryout (Fit-to-Price)



Source: Citi Research

Cotton – higher range-bound market between 85-95 cents

- Cotton prices have rallied hard this year outpacing all other 'ags.' 1Q'13 returns near +17% were a complete fillip from 2012—a period when prices declined -18% and Cotton No.2 on ICE was one of the worst performing softs. The confluence of tighter projections for 13/14 supply-demand balances ex-China, robust US export sales and a surge in non-commercial net length did point to higher trading levels this year despite ongoing policy uncertainty from the Middle Kingdom (see: [Cotton Direction is Driven by China](#)). The moves in flat-price and spillover across the back-end have also been sharp and quick; catching many investors off guard. Spread volatility both at the front of the calendar strip and for deferred new-crop cotton contracts this year has been strange. One explanation might be the roll down of spec money heading into H3 delivery period with non-commercials now concentrated in K3 and N3 impacting Z3 – Z4. CFTC data show money manager net length in ICE cotton has jumped 140% this year. For the reporting period ending 2nd April, category net length of 68,184 contracts was at heights not observed since 4Q'11. Funds were net short recently as November but today managed money gross longs as a percentage of total combined open interest are at record levels north of 25%. Spec length seems heavy given a 350% surge in ICE warehouse stocks this year to over 425,000 bales albeit coincidentally the last time exchange inventories were this high markets were trading around the same level. The concern is that specs unwind hard if Chinese buying tapered or if US export sales slowed.
- China policy remains critical. For now it seems the government will continue its current price floor support and state reserve program purchases but significant shifts could send one-leg of a trade scurrying depending on whether the Asian Dragon decided to lift its quota (bullish) or sizably release reserves (bearish). Elevated NY exchange prices have advanced Far East offering rates. The A-index hit new highs in March and non-quota imports in China as a consequence have appeared less viable although local stockpiling should continue. 2Q'13 prices are revised up 3-cents to USd85/lb while 6-12m point-price targets set in January at USd90/lb coupled with our view that consumers hedge (buy) cal'14 on dips are unchanged. Initially proposed when the strip was ranging between USd79-81/lb it has since lifted to USd86/lb. But the curve did not shift in parallel; Z3 – Z4 flipping from carry to inverse. Heightened spread volatility has made positioning in cal'14 challenging. For flat-price, we remain neutral as current levels have come below USd90/lb in what has been a spec driven rally and in what remains a well-supplied market near term.

Figure 287. World Cotton Balances

(000 bales)	08/09	09/10	10/11	11/12	12/13E	13/14E
Beginning Stocks	62,030	62,502	47,823	49,520	68,380	80,580
Total Production	107,313	102,230	116,395	122,710	119,000	114,500
y-o-y change	-10%	-5%	14%	5%	-3%	-4%
US Production	12,820	12,190	18,100	15,570	17,000	13,500
% of world output	12%	12%	16%	13%	14%	12%
Imports	30,475	36,350	35,920	43,550	40,400	36,000
Total Supply	199,818	201,082	200,138	215,780	227,780	231,080
Exports	30,402	35,593	36,661	43,400	40,400	36,000
Consumption	106,914	117,666	113,957	104,000	106,800	109,000
China	41,750	50,000	46,000	41,000	35,800	34,000
% of world consump.	39%	42%	40%	39%	34%	31%
Total Demand	137,316	153,259	150,618	147,400	147,200	145,000
Stock Bal Change	472	-14,679	1,697	18,860	12,200	5,500
Ending Stocks	62,502	47,823	49,520	68,380	80,580	86,080
% Use	46%	31%	33%	46%	55%	59%

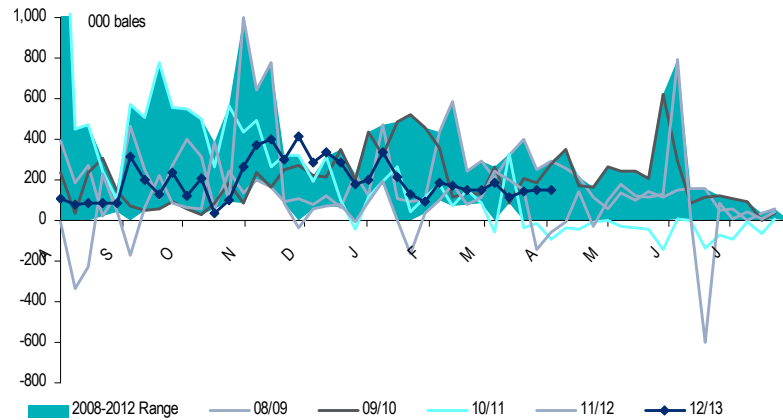
Source: USDA, Citi Research

Figure 288. Viability of Chinese Cotton Imports Beyond Normal Quota



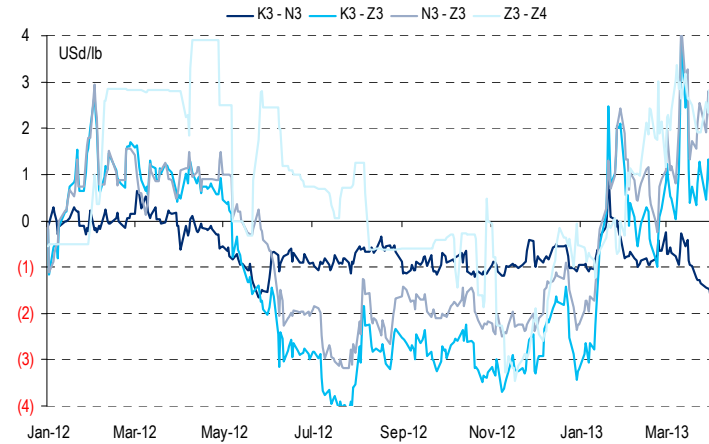
Source: CCI, Cotlook Ltd., Citi Research

Figure 289. US Cotton Export Sales (12/13 current marketing year)



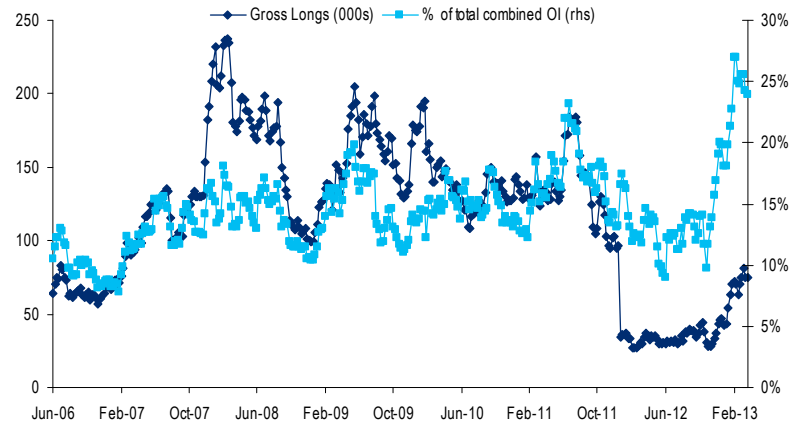
Source: USDA, Citi Research

Figure 290. ICE Cotton Spreads have been volatile this year but have weakened in 2Q'13 with old-crop versus new-crop inverses softening...



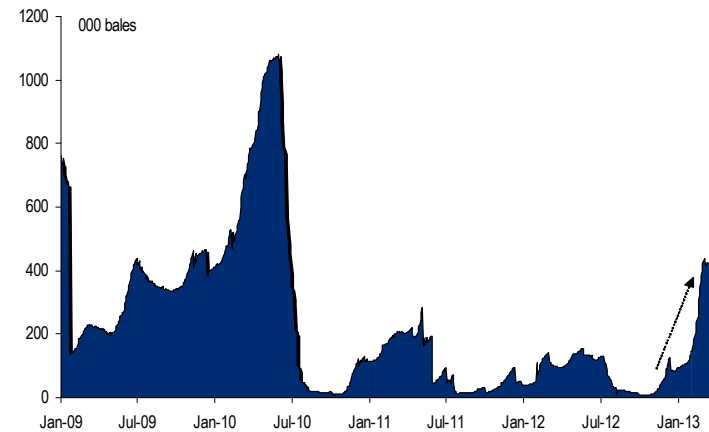
Source: Bloomberg, Citi Research

Figure 291. Money Manager (F&O) Gross Longs + % of Total Combined OI: ICE Cotton



Source: CFTC, Citi Research

Figure 292. Exchange Cotton Stockpiles Suggest Decent Availabilities Certified

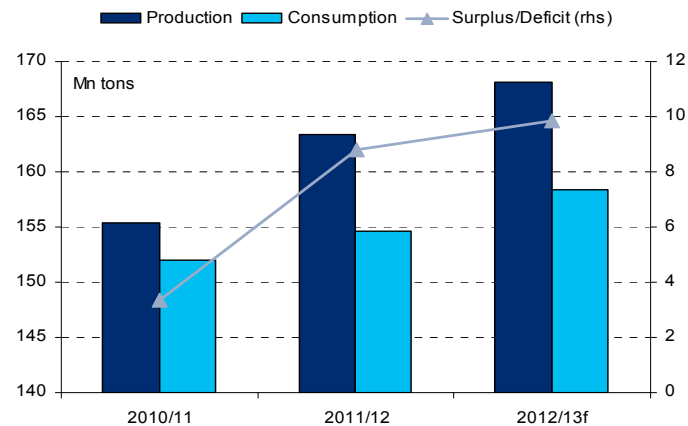


Source: ICE, Citi Research

Sugar – prices should remain below 20-cents

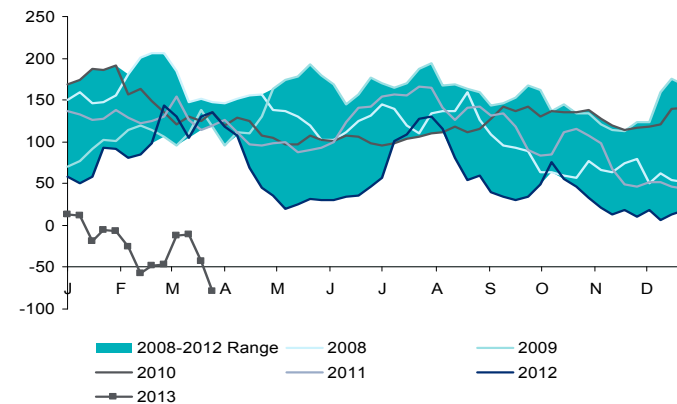
- ICE sugar prices have come crashing down more than 8% this year and in our view face a somewhat hard ‘ceiling’ at 20-cents on ICE. We are cutting our bearish forecast by 2.5 cents to US\$18.1/lb for exchange prices this year. Healthier availabilities from bellwether Northern hemisphere producing blocs including India, Thailand and Mexico are likely to materialize. The USDA also updated cane sugar production for Mexico in particular on stronger yields. As for the key global supplier, Northeast Brazil has been disappointing on drought but its center-south region appears poised for a record cane crop—the real issue being how the cane will be crushed. The 5% bump to 25% change to anhydrous blend with gasoline has been confirmed and US needs to import Brazilian ethanol (600-800mn gallons) for RFS2 compliance align with broker market reports suggesting a bias to stronger ethanol output. Conab expects 25.8-bn liters of ethanol output this year which or almost a 10% y/y rise. But conversations with some local producers have implied that they will still produce all the sugar they can. To be sure, adjustments to local Brazilian ethanol tax could be impactful but thus far no decisions have been formally announced.
- World sugar balances imply a surplus 12/13 market of 9.85-mn tons versus 8.8-mn tons in the prior campaign. Total production of 168.2-mn tons would be growth of 3% versus the prior cycle and sufficient to offset the 2% rise in consumption to 158.3-mn tons. Areas of stronger 12/13 output include Brazil CS, Mexico, Australia and China at +2.79-mt, +1.052-mt, +0.5-mt and +1.9-mt respectively. Even with demand expected to grow in major consuming regions it seems to be the case that production will be more than adequate to match use. Conab is expecting aggregate Brazilian sugar production of 43.6-mn tons or a rise of 13.6% versus 2012.
- CFTC data show that speculative fund flows are at multi-year lows with the non-commercials firmly entrenched in a net short for the first time in history. The money manager net short of about -80,000 contracts at the beginning of April is an all-time low for the category amid gross shorts exceeding 200,000 lots for the first time on record. Although short-covering rallies could support prices the fundamentals appear bearish for right now and we suspect ICE levels will stay in the teens this year.

Figure 293. Global Sugar Balances*



Source: Citi Research, *crop year basis and actual weight

Figure 294. ICE Sugar prices perhaps face a ceiling of 20-cents this year and combined managed money net length remains in the doldrums—below historic and seasonal ranges...



Source: CFTC, Citi Research



Notes

Citi Research



Notes (cont)

Citi Research

Appendix A-1

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