

What China's rebalancing means for commodities

Commodities Research

Commodity prices have rallied over the last two weeks

October has seen both oil and metals prices rally sharply, on the back of weaker US macro data, announced supply cuts (in metals) and stretched positioning. But we do not believe that this signals any significant change in fundamentals. Rather, we continue to look to the long-run commodity supply trends, and the 'hard-data' of EM demand – which paints a more bearish picture, but one that is also starting to signal a rebalancing of demand away from capex and towards opex commodities.

But the longer-term trends are in supply...

We have long argued that strong EM commodity demand bid prices up during the last decade. Ultimately this incentivized capacity buildout and technological innovation – pushing us into today's oversupply, where prices have been searching for a new lower equilibrium. Coupled with inter-related macro trends (the "3D's of macro": deflation in input costs, divergence of US growth and the US\$, and deleveraging of EM debt) this has kept commodity prices locked in a downward trajectory since mid-2014.

...and China demand rebalancing – where we see that a shift from "Capex" towards "Opex" consumption has started

Most financial markets have taken a uniformly bearish view on the situation in China. However, digging into the guts of the commodity demand data we find rising demand for "opex" commodities (energy and consumption-based metals such as aluminum) and declining demand for "capex" commodities (steel, cement, iron ore). This should actually increase confidence in Chinese policymakers' ability to rotate growth away from investment and towards consumption.

History tells us this rebalancing is to be expected at China's level of income and is a permanent, structural change

For years, China-watchers have been emphasizing the need for China to start this rotation. Through the lens of commodity demand, it now appears to have started. Furthermore, our historical analysis of the typical growth path that economies take tells us that this change is both expected around China's current income level, and is permanent. This means that peak metals demand growth is very likely in the past for China – raising a bearish question for long-term capex metals demand: which country will be the "next China", rapidly scaling up capex to building out productive capacity, and driving future metals demand growth.

Michael Hinds

(212) 357-7528 michael.hinds@gs.com
Goldman, Sachs & Co.

Jeffrey Currie

(212) 357-6801 jeffrey.currie@gs.com
Goldman, Sachs & Co.

Damien Courvalin

(212) 902-3307 damien.courvalin@gs.com
Goldman, Sachs & Co.

Max Layton

+44(20)7774-1105 max.layton@gs.com
Goldman Sachs International

Christian Lelong

(212) 934-0799 christian.lelong@gs.com
Goldman, Sachs & Co.

Amber Cai

+852-2978-6602 amber.cai@gs.com
Goldman Sachs (Asia) L.L.C.

Raquel Ohana

+44(20)7774-3470 raquel.ohana@gs.com
Goldman Sachs International

Mikhail Sprogis

+44(20)7774-2535 mikhail.sprogis@gs.com
Goldman Sachs International

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What China's rebalancing means for commodities

Following a disappointing September US employment report (released October 2), oil prices began to rally, and have subsequently climbed over 10%. This has coincided with a cross-asset recovery in EM-exposed assets such as EM commodity producer FX (BRL +4.5%) and equities (MSCI EEM +6.9%), as expectations shifted towards the Fed funds rate remaining lower for longer.

Metals joined this upward trend last Friday (October 9), rallying strongly across the board (zinc in particular saw a very strong +10.5% price increase) following announcements of production cuts by Glencore. Just as for oil, these price rises were exacerbated by both positioning (low or outright short net speculative lengths) and breaking through key technical levels, strongly reminiscent of what happened during the late August surge in oil prices.

Despite the magnitude of the recent rally, we do not believe that any data releases or company announcements over the past two weeks suggest a change in commodity fundamentals. In the oil market, high frequency stocks continue to point to an oversupplied market despite a gradual decline in US production (see: *Oil rally to fade given still weak fundamentals*, October 8, 2015). And in metals markets, announced production cuts still fall far short of the quantity of metals demand at risk from further slowdown in China. Furthermore, delays in the US rate lift-off would suggest a weaker outlook for growth and slower DM commodity demand growth. While offering short-term relief for highly-leveraged EMs, a few months of delay in the US rates cycle would not do much to change the long-term, real demand picture in EMs, especially considering that current imbalances have been decades in the making.

As such, we maintain a broad, bearish view on commodities, and continue to look to: (1) the long-run commodity supply cycle, (2) signs of EM demand rebalancing.

To recap on supply, our long-held view is that strong EM commodity demand (particularly from China) in the face of constrained global supply growth forced EMs to bid away scarce resources from DMs over most of the last decade. Accordingly, while prices increased, trend global demand growth for many commodities slowed. At the same time, this bidding up of prices incentivized a large expansion in productive capacity which (together with technological improvements, such as shale oil and nickel pig iron production) directly led to today's oversupply. Since before the mid-2014 sell-off, we argued for the critical importance of supply and highlighted a shift towards an "Exploitation" phase of the commodity cycle. Across commodities this has meant a substantial move lower in prices, as the market searches for a new equilibrium.

As we have argued in *Commodity Watch: 3D's of Macro push commodity markets lower*, a trifecta of forces has kept the markets locked in the search for lower equilibrium prices: continued productivity gains and falling costs of production (deflation), EM growth weakness vs. the US and US\$ appreciation (divergence), and a necessary rebalancing of EM debt (deleveraging). While we continue to see lower prices in several markets, the pace of declines has slowed recently – as we have approached our near-term price forecasts.

Among the EM demand trends, it has been tempting to attribute most of the 2015 weakness in commodity prices to China's slowdown and the recent CNY devaluation. However, contrary to popular belief, we see nuance in China's commodity demand data which points more towards a rebalancing of growth. Rapidly rising demand for "opex" commodities (energy and consumption-based metals such as aluminum) and declining demand for "capex" commodities (steel, cement, iron ore) should actually increase confidence in Chinese policymakers' ability to rotate growth away from investment and towards consumption.

Combining this evidence of the start of rebalancing in 2015 with a longer-term (going back as far as 1960) and broader (more than 200 economies) historical analysis of how commodity demand typically changes with GDP, consumption and investment per capita, we find that this shift from capex to opex is both expected around China's current income levels and has historical precedents. Capex commodity demand growth tends to peak at lower income levels, while opex demand growth only begins to peak at higher income levels. This is actually quite an intuitive result, as fixed investment is needed to raise the capital stock, boosting the productive capacity of the economy, leading to higher incomes, rising GDP per capita, an improving standard of living, ultimately more consumption demand and hence a greater pull on opex commodities.

Furthermore, once this transition occurs it is very likely to be permanent – resulting in structurally lower demand growth for capex commodities (and structurally higher demand growth for opex commodities). This raises a difficult question for longer-term demand for capex metals: with China consuming almost half of global metals output, which country will be the “next China”, rapidly scaling up capex to building out productive capacity, and driving future metals demand growth. Given robust supply in the current Exploitation phase of the commodity cycle, this question highlights the considerable downside price risks now faced by capex commodities.

Clear signs of internal rebalancing in commodity demand...

We have long argued that the relationship between Chinese demand and commodity markets is not a simple: strong (weak) Chinese growth equals rising (falling) commodity prices. Our China Leverage Score (see Exhibit 1) attempts to provide a simple composite measure of which commodities are most exposed to China demand, by combining share in global demand (squared) plus net imports (as a share of global demand). And while this provides a good “first glance”, going beyond a cursory look paints a much more complex picture for most commodities. Some of the less obvious facets of Chinese commodity demand are:

- Where China is an intensive consumer of a particular commodity, it tends to import that commodity in large amounts, even if it already has substantial domestic production capacity. This is because China plays a key role across value chains: China produces raw commodities (especially metal ores), refines imported and domestic raw commodities (in particular iron ore and coking coal into steel, and to a lesser extent crude oil into oil products), and also turns refined commodities into manufactured goods for export (in particular, petrochemicals, copper and aluminum).
- China has also made substantial strides towards metals independence over recent years thanks to new production technologies such as nickel pig iron (leading to a decline in leverage score for the most “leveraged” commodities). As such, China has become the largest exporter of refined metals such as aluminum and steel over recent years, despite also fulfilling robust domestic demand for these metals (by domestic investment projects and the export-led manufacturing sectors).
- A key drawback of this larger and more integrated role in commodity production is that lower commodity prices are now far less stimulative for China than they would have been several years ago. On net, lower oil prices are still very likely to provide a positive effect on Chinese oil demand and the overall economy. Yet, lower metal prices, other than copper, are likely to reinforce weakness in some of the key Chinese heavy industries centered on commodity production.

Exhibit 1: China Leverage Scores are much higher for ores and metals than oil and oil products

China commodity Leverage Scores (defined as squared % demand share + % net import share)

Period	Commodity	Unit	China			Global Output	China Demand % Global	China Net Import % Global	China Leverage Score
			Consumption	Domestic Production	Deficit/net imports				
2013E	Iron ore	1000 MT	1,115,484	415,171	700,313	1,891,000	59.0%	37.0%	0.72
2015E	Nickel (refined)	1000 MT	996	642	449	1,979	50.3%	22.7%	0.48
2015E	Copper (refined)	1000 MT	9,627	7,400	2,900	21,986	43.8%	13.2%	0.32
2015E	Zinc (ore)	1000 MT	6,200	4,823	1,428	13,450	46.1%	10.6%	0.32
2014/15	Soybeans	1000 MT	86,050	12,350	73,700	319,366	26.9%	23.1%	0.30
2013E	Coking coal	1000 MT	663,394	589,084	74,310	1,417,774	46.8%	5.2%	0.27
2015E	Copper (ore)	1000 MT	5,022	1,600	3,600	18,673	26.9%	19.3%	0.27
2014	Aluminium	1000 MT	29,224	31,551	-60	57,293	51.0%	-0.1%	0.26
2015E	Zinc (refined)	1000 MT	6,408	6,200	300	13,900	46.1%	2.2%	0.23
2013	Steel (crude)	1000 MT	771,729	821,990	-50,261	1,649,303	46.8%	-3.0%	0.19
2012	Thermal coal	Mil. Short Tons	3,887	4,018	-131	8,687	44.7%	-1.5%	0.19
2014	Steel (products)	1000 MT	702,206	781,563	-79,357	1,543,360	45.5%	-5.1%	0.16
2014/15	Cotton	1000 480 lb. bales	34,000	30,000	4,000	118,938	28.6%	3.4%	0.12
2014	Crude oil	1000 b/d	10,592	4,181	6,411	77,574	13.7%	8.3%	0.10
2014/15	Corn	1000 MT	217,000	215,670	1,330	1,007,473	21.5%	0.1%	0.05
2014/15	Sugar	1000 MT	17,400	11,000	6,400	174,308	10.0%	3.7%	0.05
2013	Natural gas (dry)	Bcf/d	16	11	5	332	4.7%	1.5%	0.02
2014	Distillate	1000 b/d	3,447	3,465	-17	26,621	12.9%	-0.1%	0.02
2014/15	Wheat	1000 MT	118,000	126,170	-8,170	725,243	16.3%	-1.1%	0.02
2014/15	Coffee	1000 60 kg. bags	1,660.0	0.0	1,660	146,263	1.1%	1.1%	0.01
2013/14	Cocoa	1000 MT	42	0	42	4,365	1.0%	1.0%	0.01
2012	Motor Gasoline	1000 b/d	1,908	2,098	-190	22,456	8.5%	-0.8%	0.00

Source: Goldman Sachs Global Investment Research, Wood Mackenzie, WSA, EIA, IEA, USDA, ICCO

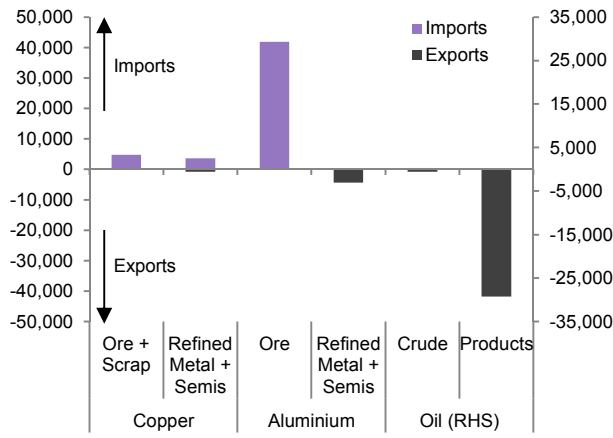
Yet, the most obvious thing that can be seen from our China Leverage Scores is that for commodities such as motor gasoline, food and natural gas, China still exerts an extremely low influence on global markets. While in recent years, for steel and copper, the importance of Chinese demand is hard to overstate. This ultimately reflects the underlying growth imbalances that have been present for at least two decades – namely, a heavy skew in GDP growth towards fixed investment and exports, and away from private consumption.

For years, China-watchers have been emphasizing the need for China to rotate its economy away from investment and towards consumption, with domestic demand eventually becoming the key driver of growth.

Yet China's fixed investment is now almost half of GDP, double the global average. To put this in context, the gap between China's current investment as a share of GDP and the global average equates to almost US\$2.5tr now, or as much as US\$12.5tr by 2050, following our economists' GDP projections which see China as a US\$52tr economy by 2050. Put differently, the current gap is as large as the GDP of France, while an equivalent gap in 2050 is projected to be larger than the total GDP of China today.

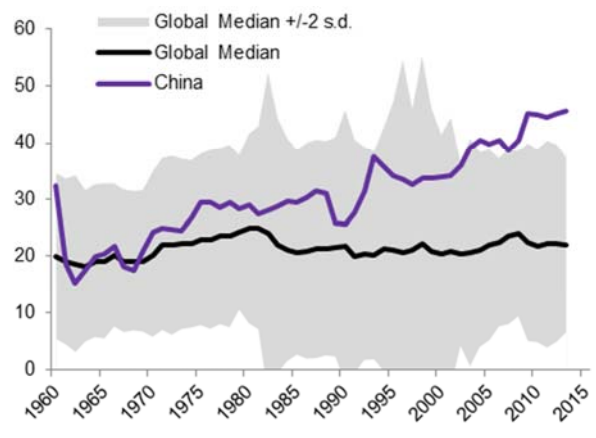
This matters for China's commodity consumption profile as some commodities are used more intensively in fixed investment – iron ore, coking coal, steel, cement and, to a lesser extent, copper – while others are used more intensively by consumers – natural gas, heating oil (for heating / cooling), motor gasoline (transport), aluminum (packaging and increasingly transportation), copper (consumer durables and electronics) and nickel (in stainless steel). The outputs of fixed investment (buildings, bridges, ports, railways, airports, etc.) are all constructed using capex commodities, but the day-to-day inputs required to use this infrastructure (heating, cooling and driving) are opex commodities.

Exhibit 2: As well as being a significant consumer, China is well integrated across the commodity value chain
China imports & exports of raw & refined commodities (thous. Tonnes, 2014)



Source: China Customs

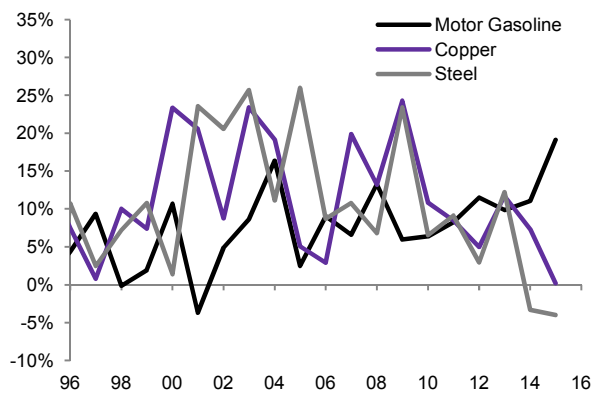
Exhibit 3: China has accumulated significant macro imbalances
Fixed investment as a share of GDP (%), China vs. Global average



Source: World Bank, Goldman Sachs Global Investment Research

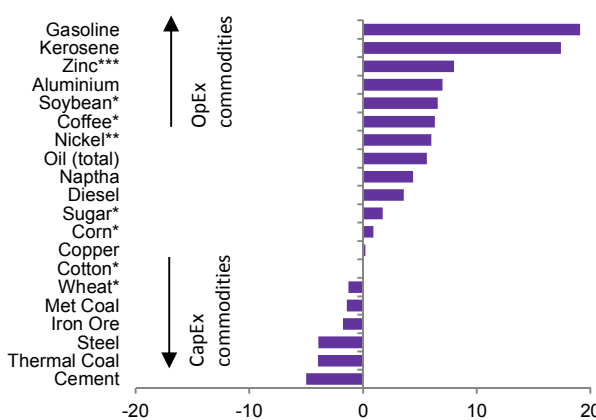
However, we believe there are now signs in commodity demand statistics that show the rebalancing has finally started. By rank-ordering commodities, from more capex-intensive to opex-intensive, and then focusing on the demand growth for each year-to-date, we find that the more capex-intensive the commodity, the weaker the demand growth, while the more opex-intensive the commodity, the stronger the demand growth. Demand has declined by 5.0% for cement, yet demand for gasoline is up 19.1%. This pattern suggests that policymakers are, at least to a degree, successfully creating the conditions for the much-anticipated rotation in economic growth away from investment and towards consumption.

Exhibit 4: Copper and steel demand has slowed considerably, while gasoline demand has been rising...
Historical China commodity consumption growth (%yoy)



Source: EIA, IEA, Wood Mackenzie, CEIC, WSA, Goldman Sachs Global Investment Research

Exhibit 5: ...in line with strong demand for Opex and slowing demand for Capex commodities
China consumption growth 2015 (%yoy, 2015 ytd)

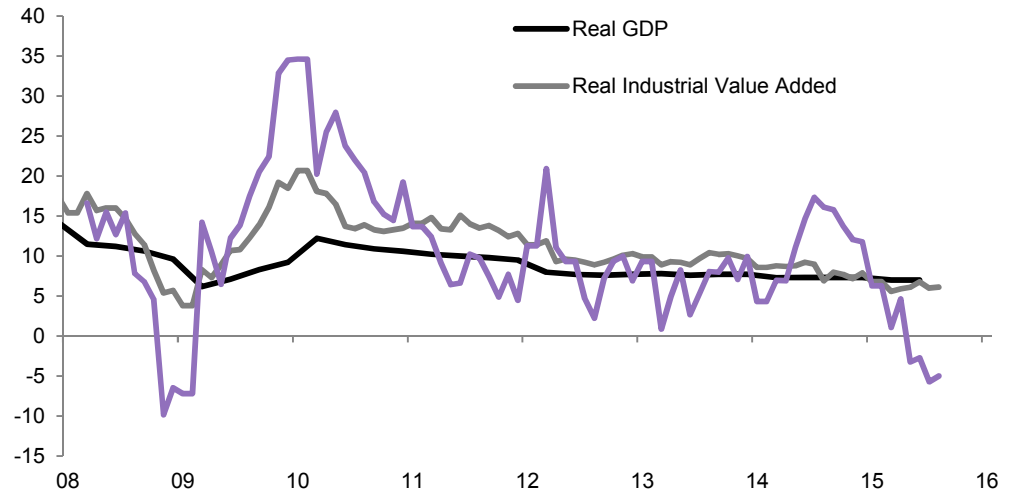


Source: IEA, Wood Mackenzie, CRU, CEIC, USDA, Goldman Sachs Global Investment Research
*Estimated 2015 annual consumption growth (no monthly data)
**calculated from apparent Stainless Steel demand
***calculated from zinc galv. production

Decomposing growth in China by sectors shows the same trend; output from metals-intensive sectors that compose heavy industry (such as steel mills) has experienced an unmistakable hard landing in 2015, equal in severity to that seen during 2008/2009. Yet overall industrial production and GDP growth (notwithstanding methodological issues in measuring output in China) have seen much less slowdown.

Exhibit 6: Metals-intensive industries have slowed much more than the rest of the economy

GDP, IP and GS China Metals Consumption Index (%yoy growth)



Source: CNBS, Goldman Sachs Global Investment Research

...Opex outperforming Capex commodities is typical as a country gets richer

While we already see signs of rebalancing in the current commodity demand data, we can go further with our analysis by using the historical record of a broad range of other countries' development in terms of GDP and commodity demand – in essence providing a “road map” of how commodity consumption tends to evolve as a country gets richer, using the (average) experience of more than 200 countries over a period which spans back as far as 1960.¹

China is firmly in upper middle income territory with a GDP per capita of \$7,600 (or \$3,900 in real 2005 US\$ terms), previous work by our global economists (see *Global Economics Paper 220: What the World Wants*) showed that between \$5,000-\$12,000 per capita, most economies are entering the later stages of commodity demand growth and the early stages of consumer durables demand growth. As such, demand growth for “basic necessity” commodities (such as wheat) have levelled off, while meat, energy and copper demand are already rapidly increasing as incomes grow. But as incomes continue to rise, these commodities start to see demand growth slow, as consumers in turn demand more durable goods and cars. Eventually, peak demand growth shifts to luxury cars, domestic

¹ Technically, we use a panel data regression model relating commodity consumption per capita to GDP (headline, consumption or fixed investment) per capita. While we have both a high number of countries and large number of years, the panel does contain many missing values.

and international travel, and services such as advertising and insurance. This creates an overall “Ladder of Spending”.

In this analysis, we build on this framework but focus solely on commodity demand, and specifically how commodity demand is related to the composition of GDP per capita – whether consumption or fixed investment is the driving force behind the commodity demand.²

Our first key result this that while we find similar results for all measures of GDP per capita: total GDP, private consumption and fixed investment; capex commodity (steel, distillate and zinc) demand tends to be explained more precisely by fixed investment per capita, while opex demand tends to be better explained when using consumption per capita. In every case we use the adjusted R², a measure of “explained variance” as our metric to determine which model gives the best fit.

Exhibit 7: Consumption of capex commodities is generally best explained by fixed investment, and opex commodities by consumption – an intuitive, but important, result
R² for best and second-best fitting regressions (Panel regression model of commodity consumption and GDP components, Gompertz specification and country fixed effects)

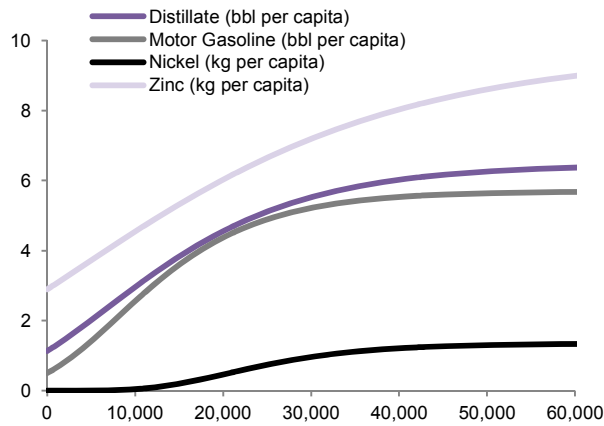
	Commodity	Best-fitting relationship		Second best fitting relationship	
Capex commodities	Distillate	Fixed Investment	92.4%	Consumption	91.6%
	Steel	Fixed Investment	88.4%	Consumption	83.5%
	Zinc	Fixed Investment	86.8%	Total GDP	86.5%
	Jet Fuel	Fixed Investment	80.3%	Total GDP	80.2%
	Total Petroleum	Total GDP	92.2%	Consumption	88.1%
Opex commodities	Natural Gas	Total GDP	88.7%	Consumption	88.6%
	Gasoline	Total GDP	91.1%	Consumption	89.1%
	Copper	Total GDP	91.3%	Consumption	90.6%
	Aluminium	Consumption	86.1%	Total GDP	85.5%
	Meat	Consumption	92.6%	Total GDP	92.1%
	Wheat	Consumption	94.1%	Fixed Investment	93.8%
	Nickel	Total GDP	94.7%	Consumption	94.6%

Source: Goldman Sachs Global Investment Research

² Our regression specification is the standard Gompertz function, $= ae^{-e^{\beta(x-\gamma)}}$, and includes country fixed effects. For more details on regression methodology see Global Economics Paper No. 220: “What the world wants”, September 2013.

Exhibit 8: Commodity consumption grows with GDP across the board...

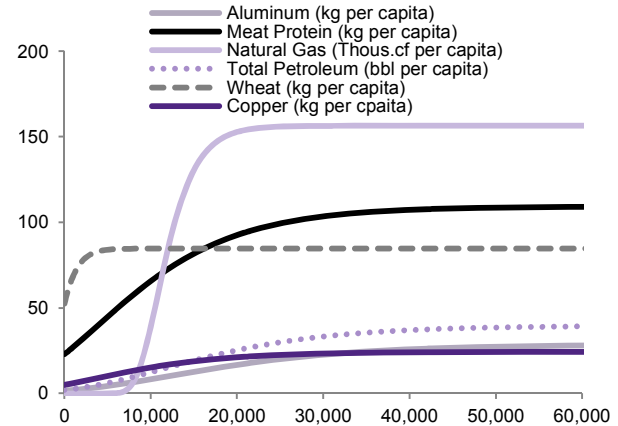
Per capita consumption vs. GDP per capita (2005 US\$)



Source: Goldman Sachs Global Investment Research

Exhibit 9: ...but the maximum level of consumption varies...

Per capita consumption vs. GDP per capita (2005 US\$)

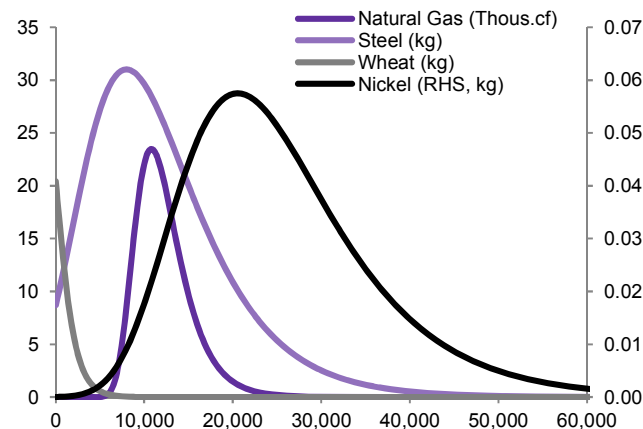


Source: Goldman Sachs Global Investment Research

Our second key result is that capex commodities tend to see their fastest rate of growth at lower income levels, while opex commodities see their maximum demand growth at higher income levels. This is actually quite an intuitive result as fixed investment is needed to raise the capital stock, which in turn raises the productive capacity of the economy (alongside increasing labor and TFP, or “technology”), leading to higher GDP per capita and ultimately an improving standard of living – which sees more consumption demand and hence a greater pull on opex commodities.

Exhibit 10: ...and each commodity sees maximum demand growth at a different income level...

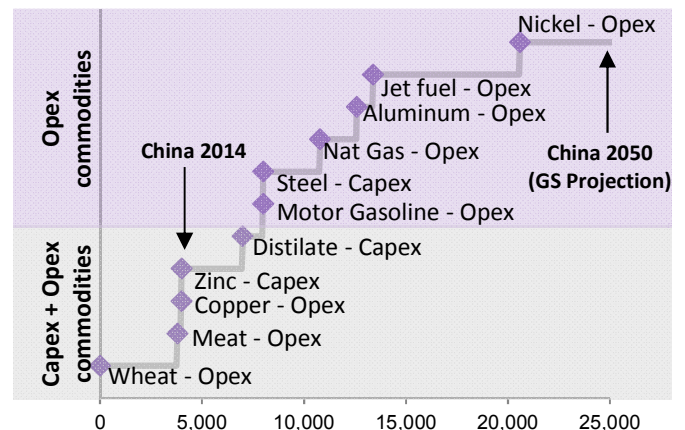
Incremental demand per \$1,000 of GDP per capita (2005 US\$)



Source: Goldman Sachs Global Investment Research

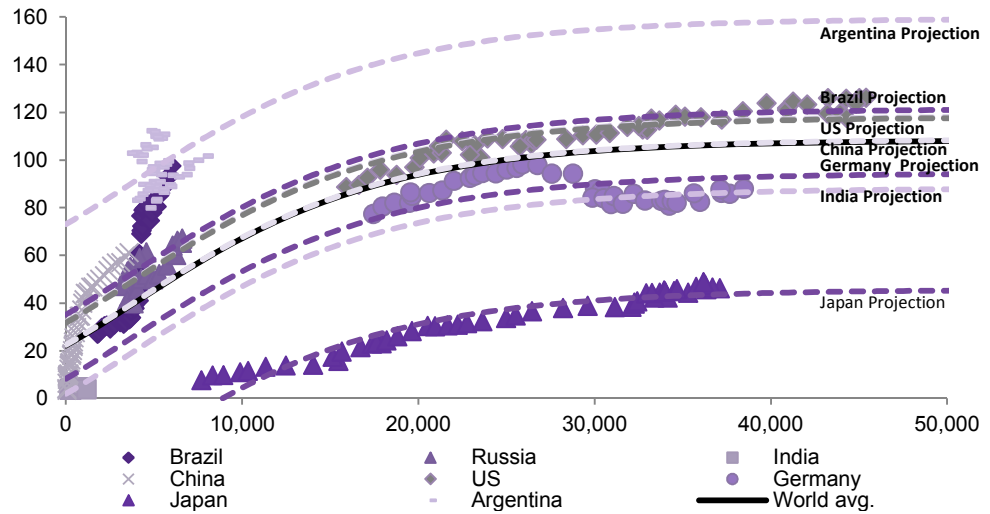
Exhibit 11: ...which leads to a “Ladder of Consumption”, favoring Capex at lower and Opex at higher incomes

Point of fastest growth in demand vs. GDP per capita (2005 US\$)



Source: Goldman Sachs Global Investment Research

Exhibit 12: Preferences also vary across countries, but these can be accounted for, and do not change the overall picture of consumption or peak demand growth
 Meat protein demand (kg per capita per year) with country ‘fixed effects’



Source: FAO, Goldman Sachs Global Investment Research

Our third result is that there are significant cross-country differences in commodity consumption. As Exhibit 12 shows: Japan and India have tended to eat significantly less meat per capita than countries such as the US, Argentina and Brazil at any given level of GDP per capita. However, what is most important, is that this does not change the overall picture of rising consumption with incomes – both on a global average basis, or within any country. Such cross-country differences can be mostly explained by differing preferences, but it is also worth noting that most of the countries that consume a disproportionately high amount of a commodity for their income level tend to be the largest producers of that commodity. A history of production and consumption, low transport costs, and easy integration between upstream and downstream suppliers are the most likely explanations for this trend.

China’s commodity rebalancing is both expected and very likely to be persistent

While this analysis doesn’t begin to capture every factor behind China’s rise (both in GDP or commodity market terms) – for example China undoubtedly benefitted from earlier shifts in domestic policy, improving global logistics, a secular rise in “off-shoring” of manufacturing and greater reliance on global production chains over the 2000’s – it does capture the common themes across economies as they develop.

Our results suggest that the current rebalancing in China’s commodity demand from capex to opex is both expected, around current income levels, and has historical precedents. While it will still take a significant period of time for opex commodity demand to reach the levels seen in most DM economies, we are now very likely observing the start of an extended period of structural demand shift in this direction. On the other hand, while capex commodity demand growth should normalize in line with macro stabilization, the trend rate of growth is likely to slow considerably. In other words, peak demand growth for industrial metals and other capex commodities in China is over, along with China’s ‘old economy’ period of fixed investment and export-led growth.

In the short-run there could be more downward pressure for all metals, as Max Layton has recently highlighted (see *Metal Detector: London Metals Exchange Week 2015 preview*, October 8, 2015). Nickel, aluminium and zinc have also seen large price declines alongside copper and steel. This is partly reflecting the large base use already built out in China, the broad impact of the current slowdown on all sectors of the economy, and also the fact that each metal has different uses within both investment and consumption. Therefore, even for metals which are overall more opex-related (such as aluminium, which is used most intensively in consumer packaging, autos and appliances) they still have capex uses (for aluminium these are construction and power grid infrastructure) which would see overall demand slow, to some extent, as capex slows.

In the long-run, this analysis also adds renewed emphasis to the question of which EM (or EMs) will be the “next China”, i.e. which countries will see faster build out of capital stock, and ultimately become the key driver of demand growth for capex commodities. For now this remains an open question, highlighting the considerable downside risks to capex commodity prices in the face of still robust supply.

Commodities in a nutshell

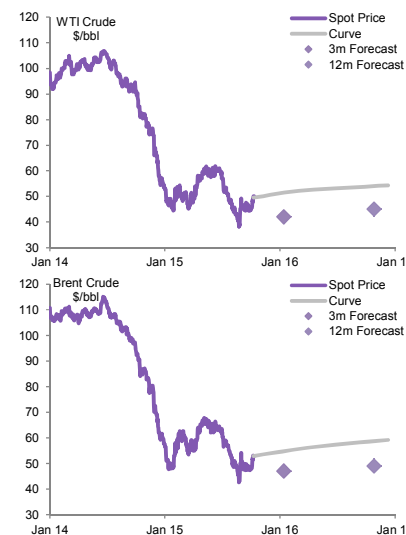
Energy

Crude Oil: Lower for even longer

Fundamentals: Ex SPR US crude stocks built 3.6mb in Sep vs. a seasonal draw of 2 mb. Cushing on the other hand drew 3.9 mb vs. a seasonal draw of 2 mb though we are heading into peak refinery maintenance period. Fundamentals remain weak and we view the market to be strongly oversupplied. Sep crude, gasoline, distillate, jet, fuel oil and unfinished oil inventories have built 8.9 mb vs. a seasonal build of 1.5mb. The market now requires non-OPEC production to shift from growth to large declines in 2016. The uncertainty on how and where that adjustment will take place has increased significantly. The potential access to capital in the US means that elevated financial stress needs to be maintained to eventually attain these adjustments. There is also the potential for prices to collapse to production costs if the oversupply breaches logistical and storage capacity. We estimate 2015 oil demand growth at 1.62 mb/d and we forecast 2016 global demand growth to be 1.28 mb/d which leaves the market 400 kb/d oversupplied.

Price Outlook: Prices have declined sharply over the past month to our previous \$45/bbl forecast. Part of this was precipitated by macroeconomic concerns but in our view, it was also warranted by weak fundamentals. In line with our oversupplied outlook, we have changed our 3, 6 and 12-month WTI forecasts to \$42/bbl, \$40/bbl and \$45/bbl.

Time spread Outlook: Time spreads should remain in contango as the market needs to incentivize storage since there is insufficient demand to absorb supply.



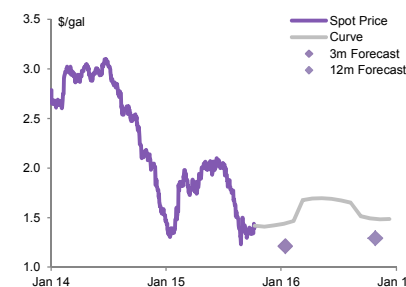
Source: NYMEX, ICE, Goldman Sachs Global Investment Research

RBOB Gasoline: Seasonal decline in demand though yoy strength should persist

Fundamentals: Gasoline stocks built 9mb in Sep vs. a 2 mb seasonal build. Demand remains robust – growing at 3% year-on-year though the US is heading into a seasonal decline as winter sets in. The risk of hurricanes recedes as we are past the peak season. The market is also now trading winter gasoline where butane enters the gasoline blending pool making the cost of production cheaper. While some refineries have scheduled seasonal maintenance in October, the end of the year sees the return from maintenance. A seasonal decline in demand coupled with high margins-related production implies a weak outlook. Demand growth should persist into next year on the back of low pump prices and a healthy macroeconomic environment.

Price Outlook: The gasoline market has been strong and backwardated though it has recently softened on the inventory builds. The curve at the end of the year is already in contango so some element of the seasonal view above is already priced in. Strength should return next year as demand seasonally increases into the summer. While RBOB could remain supported during the maintenance period, we expect the end of the year to be soft and then become strong again seasonally, in line with our view above.

Timespread Outlook: In line with our view, we expect spreads to remain supported in the near term with softness setting in at the end of the year. We roll our 3, 6 and 12-month spreads forecast to -1.1%, 0.8% and -1.5% respectively.



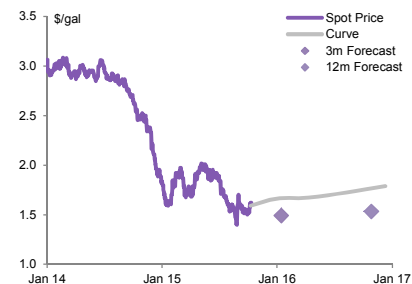
Source: NYMEX, Goldman Sachs Global Investment Research

NYMEX Heating Oil: Weather is key

Fundamentals: Stocks have been flattish in Sep, in line with seasonals. In winter, distillate demand really depends on the outlook for US weather. Initially, turnarounds in the US can restrict production but the main support has to come from demand. A mild winter would see stocks building further meaning further pressure on the market. The other solution would be cold European weather which would incentivize the export of barrels from USGC.

Price Outlook: We expect heating oil to continue to be soft as inventories are at healthy levels. There can be some support as we get into the maintenance period in the fall and then into the heating season – provided the weather is supportive.

Timespread Outlook: The market remains in contango due to the high level of stocks. We roll our 3, 6 and 12-month spreads forecast to 1.0%, 0.9% and 0.6%.



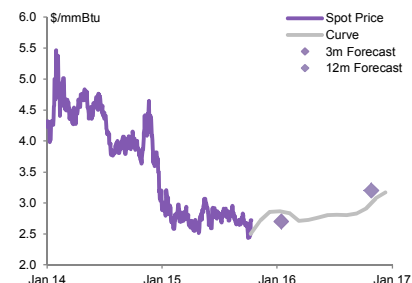
Source: NYMEX, Goldman Sachs Global Investment Research

NYMEX Nat. Gas: Downside risks on Northeast production and mild winter forecasts

Fundamentals: Overall US gas production slowed modestly since early October due to maintenance and despite NE production reaching new highs. With further pipelines coming online in Marcellus and Utica in Nov-Dec, we expect overall production to resume growing. With industrial demand still weak and down relative to last year, we expect the US gas market to remain well oversupplied over the winter and pricing against PRB coal (and despite sequentially lower Canadian imports and higher exports to Mexico).

Price Outlook: In the short-term, the key downside risk to our 4Q15 price forecast of \$2.70/mmBtu is driven by strong Northeast production growth in the midst of a forecasted mild winter. In 2016, we believe that a slowdown in associated gas production along with strong, broad-based demand growth will provide enough catalyst for prices to increase to \$3.00/mmBtu, attributable to coal-plant retirements, new petrochemical plants, LNG exports and continued growth in exports to Mexico. However, upside risks to our Northeast production forecast and a weaker 2015 starting point imply risk to the price recovery as skewed to the downside.

Timespread Outlook: Natural gas stocks have been building by c.13 Bcf faster-than-normal since the start of the injection season, boosting inventories at a surplus to 5-year average levels.



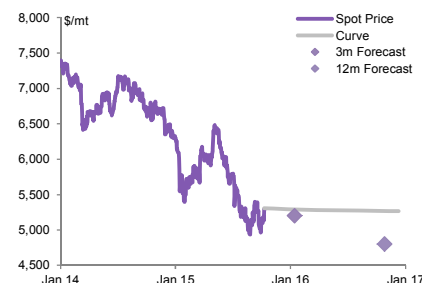
Source: NYMEX, Goldman Sachs Global Investment Research

Industrial Metals

Copper: Outlook remains bearish

Fundamentals: Of particular importance to copper has been weakness in China, as shown by our GS China Metals consumption Index (GS China MCI) – which points to a hard landing for commodities demand during 2015. This general weakness in China’s old economy was coincident with weakness in late-cycle copper-intensive Chinese construction “completion”, which have fallen 15% ytd. The ongoing weakness in demand has recently led to some major supply curtailments. Overall, we view the price-related copper supply cuts primarily as confirmation of weak demand and as being insufficient to change our projections of c.500kt copper market surpluses through at least 2019. Net speculative positioning on the LME and Comex is broadly flat and around its 6-month average.

Price Outlook: We continue to expect that copper prices will fall to \$4,800/t by year-end,



Source: LME, Goldman Sachs Global Investment Research

and to \$4,500/t year-end 2016. Overall, we continue to see the risks surrounding these forecasts as skewed to the downside, and in particular we see a long list of bearish catalysts for copper around the turn of the year and during 1Q15.

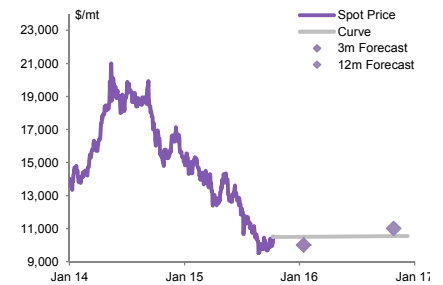
Timespread Outlook: Copper time spreads remained tight over the past two months. This in our view reflects seasonal factors as well as a rise in LME cancellations.

Nickel: Next to see supply cuts?

Fundamentals: There has been further deterioration in China’s demand for nickel as our stainless steel indicator weakened. At the same time, there were fewer cuts in nickel pig iron production than we have previously anticipated despite 10-15% of production losing cash. Net speculative positioning is well above its 6-month average, and call-put skew is above its 5-year average.

Price Outlook: Demand developments and the outlook for further sluggish growth globally mean that this year’s surplus is larger than we previously anticipated and will take more time to balance up. In the very near term production cuts could support a rally in pricing, but over the coming year we take a broadly neutral view on pricing since we believe that these price levels are enough to balance the nickel market over time. However, we see the risks surrounding this forecast as skewed to the downside. The main downside risk is that Chinese demand does not pick up and that there is pressure on the currency to depreciate, improving nickel pig iron competitiveness and pushing out supply curtailments.

Timespread Outlook: Nickel time spreads have softened over the past month.



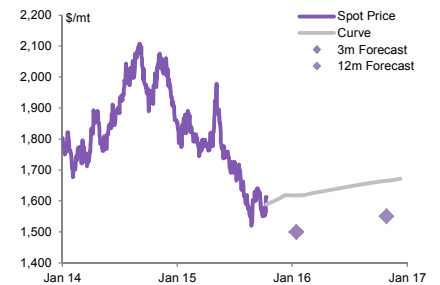
Source: LME, Goldman Sachs Global Investment Research

Aluminium: Ongoing rally presents a selling / hedging opportunity

Fundamentals: Chinese aluminium demand growth has been very disappointing during 2015, reflecting a prolonged government-led slowing in credit growth, a rising trade weighted exchange rate, and slowing property market activity. Net speculative positioning is small net long, and around its 6-month average.

Price Outlook: The aluminium market is, arguably, facing the greatest bearish fundamental shock in a generation, and perhaps, in its history. Historically, global demand recoveries have tended to rescue the aluminium market and result in its turn, something we do not expect to occur over the next 12-24 months. As such, since we cannot rely on sufficient producer discipline (3mt+ of output cuts) in order to balance the market, we remain resolutely bearish on the outlook for the market, even from all-in price levels which are nearing 2003/04 levels.

Time spread Outlook: Aluminium time spreads have tightened significantly over the past two months.



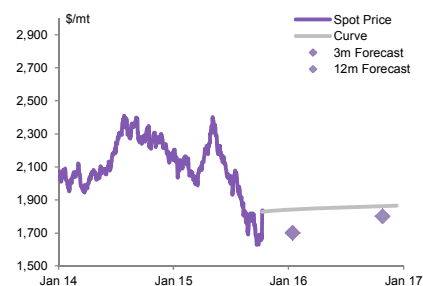
Source: LME, Goldman Sachs Global Investment Research

Zinc: Glencore cuts support zinc pricing

Fundamentals: Recently Glencore announced production cuts of up to 500kt per annum which is roughly 3.5% of global supply. However, Glencore also stressed that these cuts are “temporary”, forecasting an impact of 100kt in 4Q15. A number of these mines are cash flow positive hence there is high probability that these mines will come back online, whether Chinese demand and pricing picks up, or not. Prior to the announcement by Glencore zinc net speculative positioning was flat, though at its lowest levels of the past year and well below its 6-month average.

Price Outlook: We expect the zinc price to rally in the very near term as the market prices the Glencore cuts over the forecast period. Beyond very near term zinc price strength, with the demand risks as they are (in our opinion heavily skewed to the downside), it is likely to be prudent to wait for a major tightening in zinc mine supply (via falling zinc treatment charges) before becoming bullish on the refined zinc market. Further, there are risks, like in aluminium and copper, that if demand surprises to the downside in China, depreciation could take the Chinese cost curve lower or inventories could move from off market to on market.

Time spread Outlook: Zinc time spread has softened considerably over the past month reflecting increases in LME inventories.



Source: LME, Goldman Sachs Global Investment Research

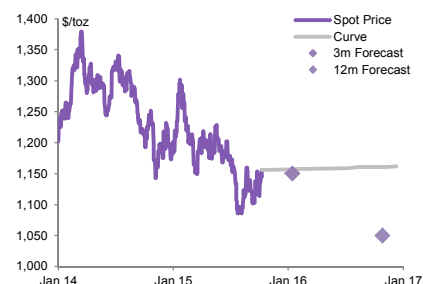
Precious Metals

COMEX Gold: Maintaining our bearish view

Fundamentals: We continue to expect continued strengthening of the dollar and a gradual increase in US real rates (as we expect the FED hike to happen in the end of 2015) to push gold prices further down.

Price Outlook: Since the July sell-off the gold price rose due to an increase in volatility of global equity markets. Gold rallied in mid-August as global equity markets sold off and there was a spike in VIX. There was a second spike in September when the Fed said that it will not hike interest rates. Our gold price forecasts remain \$1,150/oz in 3 months, \$1,100/oz in 6 months and \$1,050/oz in 12 months.

Time spread Outlook: We expect the current 1-2 month and 1-12 month time spreads to remain broadly unchanged until later in the hiking cycle.

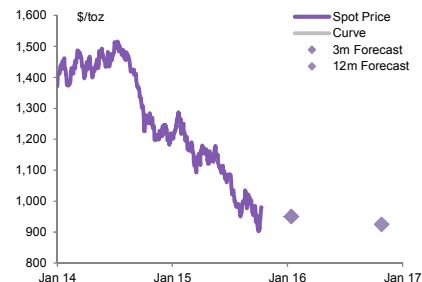


Source: COMEX, Goldman Sachs Global Investment Research

COMEX Platinum: Moving to 75th percentile for 2016 as VW controversy puts a question mark on future of diesel vehicles

Fundamentals: Post the Volkswagen controversy we believe that the demise of diesel has been brought forward. We see an increasing shift from diesel to gasoline vehicles both from the auto makers point of view (as they look to preserve margins) and consumers (as buying diesel right now means increased uncertainty). As such we become increasingly bearish on platinum.

Price Outlook: We expect the metal to trade around spot for the near term – which is the 75th percentile of the cost curve until there is a material supply response. Over the next 12 months we forecast the prices to remain near the spot levels – US\$925/oz with risks skewed to the downside should the move away from diesel be swifter and larger in magnitude than we anticipate.

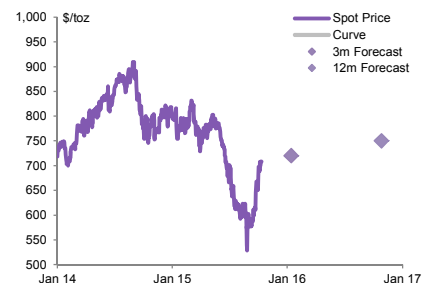


Source: COMEX, Goldman Sachs Global Investment Research

COMEX Palladium: Increasingly attractive, as diesel to gasoline shift to hasten

Fundamentals: We expect increasing demand for gasoline vehicles from both the EM's (which are primarily gasoline) and also from Europe (which has predominantly diesel) after the VW controversy. The metal has underperformed YTD on China auto growth concerns and positioning. However, going into 2016 we expect a pick-up in demand and forecast the metal to remain in a sustained period of deficit.

Price Outlook: Over the next 12 months we forecast the prices to move up to \$750/oz on sustained deficit. We highlight significant risks – especially from supply side as one of the biggest producers, Lonmin, struggles to get funding. Should its mine close the metal could be in an even bigger deficit than we forecast which would be a significant upside risk to our thesis.



Source: COMEX, Goldman Sachs Global Investment Research

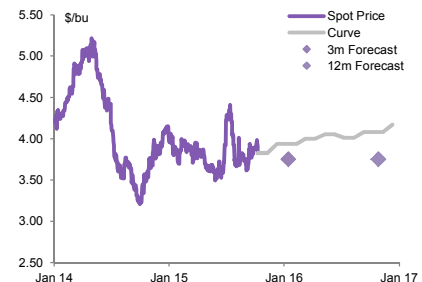
Agriculture

CBOT Corn: Carryout estimates reduced, but bearish outlook remains unchanged

Fundamentals: The USDA reduced the 2015/16 corn carryout estimate in the September Crop Production report, mainly on lower production (the yield estimate was trimmed to 167.5 bu/ac). Crop conditions have continued to be favorable (68% good to excellent nationally) and harvest progress, while behind the 5-year average, is not yet a cause for concern.

Price Outlook: Despite the recent downward adjustments to US and global (particularly European) corn carryout estimates, we continue to see robust 2015/16 supply keeping stock-to-use ratios elevated. In particular, the 44% ytd depreciation in the BRL and more recent shift in corn-to-soybean ratio could see South American safrinha corn acreage increase. This keeps our 2015/16 forecasts firmly anchored below \$4. Recent weather forecasts have been indicating drier conditions in the US corn belt, which should also be supportive of faster harvest progress over the coming weeks.

Time spread Outlook: We continue to expect high global carryout stocks and hence continue to see negative roll yields persisting.



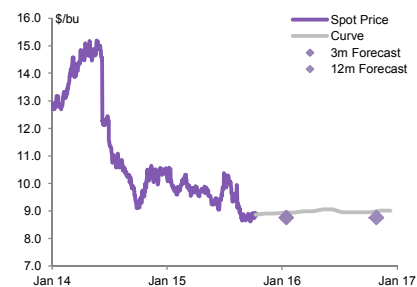
Source: CBOT, Goldman Sachs Global Investment Research

CBOT Soybean: US estimates revised down but South American production outlook remains strong

Fundamentals: Wet weather earlier in the US growing season saw slow planting progress and deteriorating crop conditions over late June / early July. After normalizing towards the middle of the growing season, the weather has now turned slightly drier than seasonal averages. This has helped to advance harvesting, which is now well ahead of the 5Y average, at 42% complete. While planted acreage estimates for the US have been revised down in the September WASDE, we continue to see some downside risks to official production. However, more globally, 2015/16 production is likely to remain strong with increased planting in Brazil in large part due to the large shift in the BRL year-to-date.

Price Outlook: Record 2014/15 production and high planting estimates for 2015/16 from South America, should keep prices from rising materially, despite the recent revisions to US estimates. Accordingly, we see prices close to current levels.

Time spread Outlook: Large global 14/15 carryout stocks and 2015/16 production suggest that inventories will remain elevated for longer. We continue to see weak time spreads for at least the duration of the current marketing year.



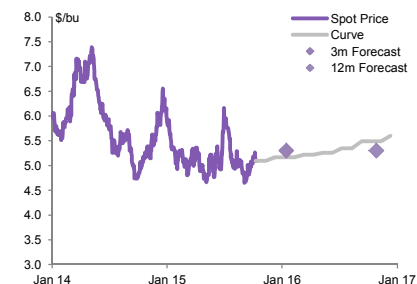
Source: CBOT, Goldman Sachs Global Investment Research

CBOT Wheat: A balancing act between weather risks and a competitive export environment

Fundamentals: Weather risks have increased for wheat over the last few weeks. Dry weather in the US, former Soviet Union and Australia all point to risks of either lower plantings (US and FSU) or lower yields (Australia). Combined with rising corn prices, this was likely the key driving force behind higher wheat prices over the last month. However, while weather remains a key concern for 2015/16 production (including the ongoing risks from El Niño – which is currently forecast with a 95% chance to persist through winter 2015-16), global stocks remain ample thanks to strong 2014/15 global output.

Price Outlook: We forecast prices to remain near current levels. But with ample global 2014/15 carryout stocks and a stronger USD weighing on exports on one hand, and ongoing global weather risks for 2015/16 production on the other, there are risks to both sides of this forecast.

Time spread Outlook: Large 2014/15 carryout stocks point to larger inventories, and weak time spreads for longer. However, adverse weather on the back of El Niño could still see these stocks drawn more rapidly than previously expected.

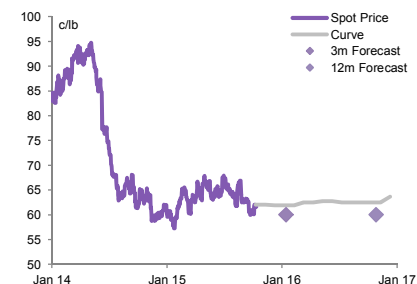


Source: CBOT, Goldman Sachs Global Investment Research

NYBOT Cotton: Weather risks and demand weakness

Fundamentals: US production estimates were revised upwards on the back of improved weather and higher production estimates for Texas. However, the upward revision was well short of the consensus expectation and together with inclement weather in the Carolinas and the ongoing Indian monsoon rainfall deficit, this suggests limited upside for 2015/16 global production. But at the same time, there are clear signs of demand weakness. US exports have been quite slow – likely reflecting both US\$ strength and weakness in China. And to date, Chinese authorities have made very little progress in auctioning off the huge domestic stockpile.

Price Outlook: We maintain our forecasts at 60c/lb over 3, 6 and 12-month horizons, assuming no major weather or global growth shocks.



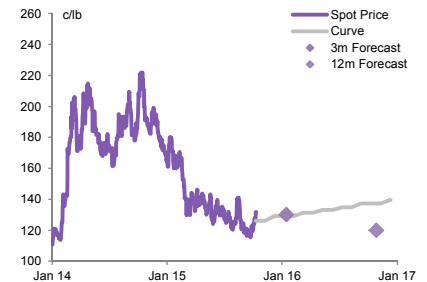
Source: NYBOT, Goldman Sachs Global Investment Research

Time spread Outlook: Time spreads are likely to remain relatively flat in the absence of supply (weather) or demand (particularly from China) shocks, as the theme of persistently large global inventories continues.

NYBOT Coffee: Weather uncertainties (past and future) remain key

Fundamentals: Coffee reached new lows, below 115c in mid-September before rallying on the news that CONAB cut Brazil 2015/16 production estimates to 42.15m bags, down from 44.3m in the previous estimate and 45.3m in 2014/15.

Price Outlook: El Niño (which is forecast to remain in place over the coming northern hemisphere winter) continues to pose a risk for global coffee producers, including Colombia which has seen a lack of rain over recent weeks. But the deflationary effects on export prices of FX depreciation among the key (EM) coffee producers (Brazil 46%ytd, Vietnam 5%ytd, Colombia 22%ytd, Indonesia 11%ytd) should continue to weigh on export pricing (in USD terms) over the coming year. Accordingly, we revise our 3, 6 and 12-month forecasts to 130, 130, 120c/lb (from 150c/lb flat previously).

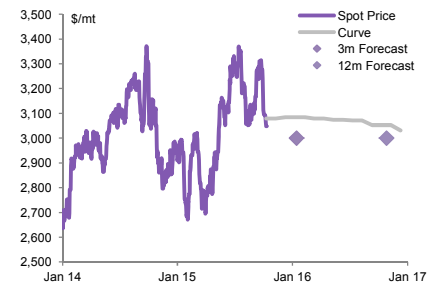


Source: NYBOT, Goldman Sachs Global Investment Research

NYBOT Cocoa: Supply weakness from West Africa, but demand continues to slow

Fundamentals: Cocoa prices rallied by more than 20% over Q2 as West African production estimates (particularly for Ghana) were been revised substantially lower. Strong Harmattan winds earlier in the year and reduced fertilizer and pesticide application (GHS has depreciated by 36%ytd) were the key drivers behind the downgrades. Current El Niño conditions also point to continued downside risks to production outside West Africa.

Price Outlook: While prices are still above our \$3,000/mt forecasts, and supply risks are likely still skewed to the downside owing to El Niño conditions, we remain cautious on prices. Weaker GDP growth saw Q2 grindings slow a lot further (particularly in Asia, -12%yoy). With prices still up 6%ytd, and growth weakness in China, further near-term demand destruction may still be seen over the coming months.

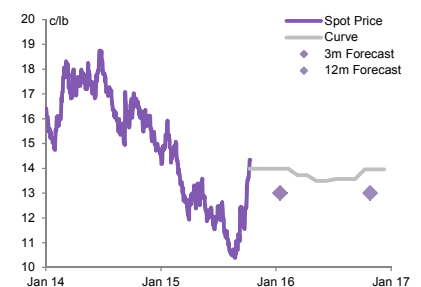


Source: NYBOT, Goldman Sachs Global Investment Research

NYBOT Sugar: El Niño continues to pose upside risks to prices

Fundamentals: Despite a strong harvest in Brazil, a greater share of cane has been converted into ethanol rather than sugar (owing to higher domestic gasoline prices). In India, reintroduction of export subsidies had been pointing towards a better supplied global sugar market, but El Niño has resulted in a significant rainfall deficit to this year's monsoon. Accordingly, there are growing signs that the sugar market could enter deficit this year.

Price outlook: El Niño continues to pose significant downside risks to production. For now we maintain our forecasts at 13.0c/lb flat over a 3, 6 and 12-month horizon, but the risks are becoming more skewed to the upside.



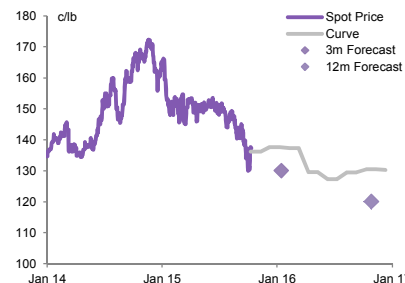
Source: NYBOT, Goldman Sachs Global Investment Research

Livestock

CME Live Cattle: September sell-off driven by heavy cattle backlog. Herd rebuilding still key to long-term outlook

Fundamentals: After trading in a 145-160c/lb range for most of 2015, prices plunged to 122c/lb in early October. The key driver behind this move was falling spot prices, as a glut of heavy animals which had been on feed for 150+ days came to market. This price fall was mostly about timing, as feedlot placements have actually been seasonally weak for almost all of 2015, reflective of a herd re-building cycle (heifer retention and limited feeder cattle supplies) which is likely to see prices moderate over the long-run (see: *Americas Agriculture: Where's the beef?*, October 4, 2015). But in the short-run, cattle on feedlots remained there longer, taking advantage of cheaper grain prices and gaining more weight. This ultimately led to a counter-seasonal glut in beef supply (low slaughter numbers, but much higher dressed weights), in excess of consumer demand, which begins to seasonally decline towards the end of the year.

Price Outlook: Prices have recovered somewhat over the last week, to 137c/lb, but given competition from foreign and alternative domestic meat supplies (particularly chicken), and weaker seasonal demand, we revise down our forecasts to 130c/lb in 3 months. Over 6 and 12 months we see prices at 120c/lb as the herd rebuilding process exerts ongoing downward pressure on prices.

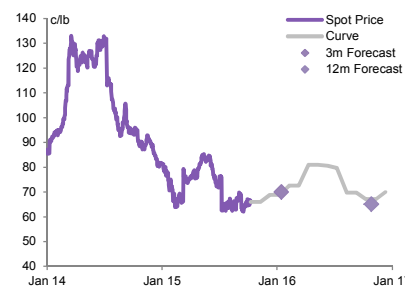


Source: CME, Goldman Sachs Global Investment Research

CME Lean Hog: US\$ strength and herd recovery to keep downward pressure on prices

Fundamentals: While not being much of a surprise to the market, the latest Quarterly Hogs and Pigs Report continued to show signs of post-PEDv herd recovery. Inventories were up +3.7%yoy (to a record 68.4 million head) and pigs per litter has recovered to 10.4, exceeding pre-PEDv levels. We have maintained a moderately bearish outlook on prices for most of the year due to two key factors: (1) post-PEDv recovery in the herd; (2) our FX strategists' strong conviction on US dollar strength, which would weigh on exports. While the first has now very likely played out, the second remains a key risk – particularly given recent EM slowdown (particularly in China) and concurrent EM FX weakness.

Price Outlook: Reflecting USD strength and the risk of export weakness, as well as the passage of time, we roll our forecasts forward to 70, 75, 60c/lb in 3, 6 and 12 months (from 70, 70 and 75c/lb previously).



Source: CME, Goldman Sachs Global Investment Research

Bulks

Iron Ore: Supply ramps up into period of weaker demand

(62% fines CFR China)

Fundamentals: Demand is entering a period of seasonal weakness as cold weather impacts construction activity. Seaborne iron ore demand is likely to peak next year, but mining capacity continues to increase on the back of productivity growth at existing mines, the commissioning of new projects (e.g. Roy Hill's 55 Mtpa mine later this month), and the reopening of previously closed assets.

Recent Market Activity: Spot prices have declined since mid-September from US\$59/t to US\$55/t CFR China as the bearish demand outlook and depressed profit margins among steel producers offset low inventory levels.

Price Outlook: The iron ore market is oversupplied and prices must overshoot relative to marginal production costs in order to trigger closures among seaborne producers on a sufficient scale. We expect prices to decline over our forecast period down to US\$44/t next year and US\$40/t in 2017.

Time spread Outlook: The forward curve should remain in backwardation given ongoing hedging by producers and the combined impact of cost deflation and structural oversupply. Port inventory levels in China have stabilized, and could recover in the short term as demand and supply diverge further.

Metallurgical Coal: Towards a smaller seaborne market and modest LT price upside (Premium HCC, FOB Queensland)

Fundamentals: Cumulative mine closures are equivalent to 13% of seaborne supply and we expect at least another 20Mt of closures in the period to 2019 as a result of falling demand from China and the expected ramp up of new projects in Mozambique and Australia. Cost deflation and weaker currencies may not be sufficient to bring the industry back to break even, and even Tier 1 producers in Australia and Canada are under pressure at current prices.

Recent Market Activity: Prices have declined to US\$80/t FOB Queensland, down US\$7/t since August. The current price level is well below our estimate of marginal cost and a large share of suppliers are experiencing financial distress, as shown by the steady stream of mine closures in the US.

Price Outlook: In the longer term, we see modest price upside as the seaborne market partially decouples from an oversupplied Chinese market, with forecasts for 2016/17/18 at US\$85/90/100/t and LT forecast at US\$110/t.

Time spread Outlook: Future prices must rise in order to return to marginal cost but the recovery will be gradual and its pace will be affected by the timeliness of mine closures and the eventual restructuring of the Chinese coal industry.

Thermal Coal: Trends in India and China undermine price outlook (6,000kcal/kg NAR, FOB Newcastle)

Fundamentals: Low prices have caused a steep decline in Indonesian exports but the market remains well supplied because these production cuts are offset by weaker Chinese imports. Long term, the demand outlook for seaborne thermal coal is challenged by regulatory headwinds, the coming surge in LNG supply, chronic overcapacity in China and rising domestic production in India.

Recent Market Activity: Seaborne thermal coal prices have declined to US\$54/t FOB Newcastle in line with a lower import parity price into China, although the arbitrage window remains closed.

Price Outlook: Our thermal coal forecasts for 2016/17/18 are at US\$54/52/51/t FOB Newcastle and LT forecast is at US\$50/t.

Time spread Outlook: The forward curve is likely to remain backwardated because the market has gone ex-growth and cost deflation will continue to shift the cost curve lower.

Price actions, volatilities and forecasts

	Prices and monthly changes ¹			Volatilities (%) and monthly changes ²				Historical Prices						Price Forecasts ³		
	units	09 Oct	Change	Implied ²	Change	Realized ²	Change	2Q 14	3Q 14	4Q 14	1Q 15	2Q 15	3Q 15	3m	6m	12m
Energy																
WTI Crude Oil	\$/bbl	50.14	↑ 5.34	43.0	0.50	45.7	-22.93	102.99	97.25	73.20	48.57	57.95	55.47	42.00	40.00	45.00
Brent Crude Oil	\$/bbl	52.91	↑ 4.39	41.0	0.26	39.6	-29.00	109.76	103.46	77.07	55.13	63.50	60.24	47.00	45.00	49.00
RBOB Gasoline	\$/gal	1.41	↑ 0.07	40.3	-0.87	39.3	-23.20	3.00	2.75	1.98	1.60	2.00	1.99	1.21	1.43	1.29
NYMEX Heating Oil	\$/gal	1.62	↑ 0.06	39.9	1.39	31.1	-24.56	2.95	2.83	2.32	1.80	1.90	1.80	1.49	1.40	1.53
NYMEX Nat. Gas	\$/mmBtu	2.72	↓ -0.02	39.7	4.11	39.7	6.90	4.58	3.95	3.83	2.81	2.74	2.79	2.70	2.65	3.20
UK NBP Nat. Gas	p/th	42.11	↑ 0.83	19.0	1.47	20.9	1.12	45.03	43.77	54.72	47.58	43.32	42.94	43.00	42.00	38.00
Industrial Metals⁴																
LME Aluminum	\$/mt	1,613	↓ -17	19.6	1.19	17.6	-4.06	1,838	2,009	1,976	1,814	1,788	1,714	1,500	1,500	1,550
LME Copper	\$/mt	5,295	↓ -70	26.3	-1.15	25.7	-4.78	6,764	6,976	6,575	5,805	6,047	5,730	5,200	4,800	4,800
LME Nickel	\$/mt	10,500	↑ 400	38.0	1.92	36.4	-3.44	18,519	18,670	15,926	14,437	13,082	11,981	10,000	10,000	11,000
LME Zinc	\$/mt	1,836	↑ 18	29.9	4.82	42.7	11.75	2,079	2,315	2,242	2,090	2,191	2,025	1,700	1,700	1,800
LME Lead	\$/mt	1,780	↑ 54	26.2	2.05	30.3	4.60	2,121	2,194	2,011	1,820	1,948	1,778	1,800	1,900	2,200
Precious Metals																
COMEX Gold	\$/troy oz	1,156	↑ 54	16.6	0.49	15.7	0.41	1,289	1,281	1,202	1,217	1,193	1,169	1,150	1,100	1,050
COMEX Silver	\$/troy oz	15.8	↑ 124	28.2	-0.30	33.0	3.37	19.6	19.7	16.5	16.7	16.4	15.6	16.0	15.5	15.2
COMEX Platinum	\$/troy oz	980	↓ -2	21.5	1.50	27.2	2.87	1,449	1,434	1,231	1,192	1,128	1,079	950	925	925
COMEX Palladium	\$/troy oz	708	↑ 130	28.86	1.77	32.5	-18.58	816	863	788	786	758	691	720	725	750
Agriculture																
CBOT Wheat	cent/bu	509	↑ 37	25.5	-0.14	25.3	0.85	652	528	556	523	504	587	530	530	530
CBOT Soybean	cent/bu	891	↑ 18	18.6	-1.11	17.5	-11.21	1,471	1,149	1,008	990	965	1,041	875	875	875
CBOT Corn	cent/bu	383	↑ 14	24.2	-2.12	22.2	-4.70	479	360	372	385	366	417	375	375	375
ICE Cotton	cent/lb	62	↓ -1	19.5	-0.13	16.8	-8.28	87	66	62	62	65	67	60	60	60
ICE Coffee	cent/lb	132	↑ 11	33.6	0.24	32.0	-3.88	185	181	190	152	134	125	130	130	120
ICE Cocoa	\$/mt	3,049	↓ -221	23.2	0.92	13.2	-2.20	3,004	3,180	2,962	2,889	3,025	3,287	3,000	3,000	3,000
ICE Sugar	cent/lb	14.3	↑ 2.0	25.6	0.41	31.3	-18.43	17	16	16	14	12	12	13.0	13.0	13.0
CME Live Cattle	cent/lb	137.3	↓ -7.8	16.0	2.42	23.3	5.23	142	154	166	156	154	151	130.0	120.0	120.0
CME Lean Hog	cent/lb	66.1	↑ 2.6	22.7	-2.28	28.7	-11.77	122	113	91	67	77	76	70.0	75.0	65.0

¹ Monthly change is difference of close on last business day and close a month ago.

² Monthly volatility change is difference of average volatility over the past month and that of the prior month (3-mo ATM implied, 1-mo realized).

³ Price forecasts refer to prompt contract price forecasts in 3-, 6-, and 12-months time.

⁴ Based on LME three month prices.

Source: Goldman Sachs Global Investment Research

S&P GSCI® Enhanced Commodity Index and strategies' total return and forecasts¹

	Current Weight	2013			2014	2015 YTD ¹	12-Month Forward
	(%)						12-mo Forecast
S&P GSCI Enhanced Commodity Index	100.0	-0.8	-31.1	-14.7	-10.0		
Energy	60.7	5.6	-42.2	-15.4	-12.0		
Industrial Metals	8.9	-13.0	-7.3	-16.6	-6.0		
Precious Metals	4.1	-29.7	-4.1	-2.5	-9.0		
Agriculture	17.8	-18.0	-9.3	-13.5	-0.5		
Livestock	8.5	-2.8	27.0	-15.6	-20.0		

¹ YTD returns through Oct 09, 2015

Source: Goldman Sachs Global Investment Research

Performance of S&P GSCI Enhanced Commodity Index and Strategies through October 9, 2015

Index and strategies	Dollar Weight	Base Date = 100	9-Oct-15 Level	Total Returns (%)					
				2013	2014	2015 YTD	1-Month Change	3-Month Change	12-Month Change
S&P GSCI Enhanced Index	100.00	Dec-69	416.2	-0.8	-31.1	-14.7	4.1	-9.3	-35.1
Energy	60.72	Dec-82	778.0	5.6	-42.2	-15.4	5.5	-10.7	-43.7
Petroleum	57.48	Dec-82	879.6	5.8	-43.1	-15.2	6.2	-10.8	-44.3
Industrial Metals	8.94	Dec-76	156.2	-13.0	-7.3	-16.6	-0.6	-6.2	-21.9
Precious Metals	4.08	Dec-72	299.9	-29.7	-4.1	-2.5	5.3	-0.1	-6.6
Agricultural	17.80	Dec-69	95.4	-18.0	-9.3	-13.5	4.9	-9.2	-10.8
Livestock	8.47	Dec-69	199.4	-2.8	27.0	-15.6	-2.4	-5.9	-19.8
Commodities									
Energy									
WTI	20.47	Dec-86	857.4	6.3	-42.3	-17.1	8.9	-8.3	-48.1
Brent	20.29	Jan-99	1021.8	8.1	-44.3	-18.7	5.7	-11.6	-46.0
Unlead/RBOB Gas	4.82	Dec-87	1460.3	3.8	-44.2	-0.4	6.6	-16.4	-34.7
Heating Oil	5.28	Dec-82	628.4	0.7	-36.6	-15.3	2.9	-10.5	-36.9
Gasoil	6.61	Jan-99	681.2	3.5	-46.1	-9.2	1.7	-11.2	-39.8
Natural Gas	3.24	Dec-93	81.4	2.0	-23.3	-19.1	-5.0	-10.4	-32.2
Industrial Metals									
Aluminum	2.90	Dec-90	47.2	-21.1	-2.6	-16.5	-1.9	-6.4	-21.1
Copper	3.92	Dec-76	456.0	-7.9	-12.6	-15.5	-1.2	-5.6	-20.1
Lead	0.65	Jan-95	395.0	-7.8	-18.6	-5.4	3.5	-2.4	-15.9
Nickel	0.60	Dec-92	192.1	-20.1	7.4	-31.4	3.9	-9.0	-38.0
Zinc	0.88	Dec-90	104.5	-7.4	3.8	-16.9	0.7	-9.1	-22.9
Precious Metals									
Gold	3.63	Dec-77	297.7	-28.6	-1.7	-2.8	4.9	-0.5	-6.1
Silver	0.45	Dec-72	309.4	-36.6	-20.4	0.3	8.5	2.6	-10.4
Agriculture									
CBOT Wheat	4.02	Dec-69	50.4	-26.5	-12.5	-16.7	7.8	-12.8	-4.2
KBOT Wheat	0.90	Jan-99	46.0	-26.9	-4.7	-25.6	5.9	-17.1	-19.2
Corn	4.99	Dec-69	99.4	-29.0	-7.8	-11.9	3.3	-11.3	-2.9
Soybeans	3.11	Dec-69	409.8	10.2	-3.2	-12.2	1.6	-12.7	-6.1
Cotton	1.35	Dec-76	28.2	5.7	-21.0	1.6	-2.1	-6.4	-2.7
Sugar	1.97	Dec-72	124.2	-20.5	-29.0	-13.2	15.7	10.6	-24.5
Coffee	0.95	Dec-80	29.8	-30.8	38.3	-27.0	8.7	2.5	-46.4
Cocoa	0.52	Dec-83	113.0	18.8	7.0	4.3	-6.8	-7.4	-0.6
Livestock									
Live Cattle	5.05	Dec-69	204.6	-6.1	26.6	-11.2	-3.5	-9.0	-13.4
Feeder Cattle	1.19	Jan-02	159.3	-3.8	33.0	-12.1	-5.5	-9.7	-17.8
Lean Hogs	2.22	Dec-75	177.5	3.0	21.9	-26.2	1.8	3.7	-33.2

All data as of October 09, 2015 close

Source: Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

We, Michael Hinds, Jeffrey Currie, Damien Courvalin, Max Layton, Christian Lelong, Amber Cai, Raquel Ohana and Mikhail Sprogis, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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