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Economic Watch

China

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Economic Analysis

Asia

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What do China's growth outlook and policy outlook mean for commodity demand?

- **Growth is being supported by a simulative policy stance**

  China's growth has been rebounding since the end of the third quarter, due to a pickup in domestic demand spurred by the government's supportive policy stance. Nevertheless, near-term downside risks are still present, and in comparison to recent years, growth is expected to slow over the medium term. All of this has given rise to concerns in international commodity markets about the strength of China's commodity demand. In the meantime, China's incoming new leadership has signalled that it will maintain policy continuity and stability with growth supportive policies.

- **As a major consumer of commodities, China plays an important role in global commodity demand**

  In light of China's significant share in global commodity demand, any policies that influence domestic commodity consumption could have potentially significant effects on global commodity prices. Given their commodity-intensiveness, public investment projects in particular could support global commodity demand. In this regard, announcements earlier this year of large-scale investment projects as part of China's fiscal stimulus measures to support growth could also support global commodity markets.

- **Hard commodities such as metals appear to be used intensively in China's investment projects, implying that investment-oriented stimulus measures should result in a rise in metals consumption**

  Our analysis shows that commodity intensities of metals, measured by consumption of commodity volumes per unit of real GDP, have tended to increase over time (especially for steel and aluminium, and less so for copper), while those for energy inputs have tended to decline steadily (crude oil and coal in particular). Furthermore, investment activities in China are associated with higher commodity intensities relative to consumption activities.

- **China's commodity consumption, despite slowing, is supported by strong growth potential and investment-oriented fiscal stimulus**

  Given our average growth projection of 7.8% in 2012-2013, down from an outturn of 9.6% in 2009-11, we expect China's consumption of steel, crude oil, and coal to decelerate compared to recent years, consumption of aluminium to maintain the same growth pace, and consumption of copper to accelerate.

- **Major commodity exporters should benefit both from China's investment-oriented fiscal stimulus, and over the medium term from its robust growth potential**

  China accounts for a significant share of exports from major metals-producing economies. Among these producers, Australia and Chile would benefit most from an increase in China's demand, followed by Peru and Brazil, and then Indonesia.

What do China's growth outlook and policy outlook mean for commodity demand?

China's growth has been rebounding since the end of the third quarter, due to a pickup in domestic demand spurred by the government's supportive policy stance. Nevertheless, in comparison to previous years, growth is expected to slow over the medium term, to 7-8% in 2011-2020 from over 9% in the previous decade. Near-term risks as well as the projected medium-term slowdown have given rise to concerns in international commodity markets about the strength of China's commodity demand.

Recent government policies and statements suggest that fiscal stimulus measures to support domestic growth in the near-term will continue to be oriented toward investment projects, despite ongoing efforts to rebalance the economy by boosting private consumption. At the end of July, for example, Premier Wen Jiao-bao was widely quoted as stressing the importance of investment to rev up the economy. Since then, the central government has brought forward a number of planned investment projects, and local governments have made bold announcements of large-scale investment projects. Last September, the National Development and Reform Commission (NDRC) approved a batch of subway, highway, municipal, and ports projects. More recently, China's incoming new leadership has stressed the importance of urbanization to sustain growth, which would necessitate additional infrastructure projects in housing and highways, among others.

What will the impact of these investment projects be on commodity demand? How will the impact compare to the massive stimulus of 2009-10 when commodity demand surged?

At present, China's public investment projects concentrate on public housing, transportation (e.g., high speed railway, highways, and airports) and other infrastructure (like utilities), and manufacturing plants (such as steel), all of which involve the intensive use of commodities. Therefore, although much less impressive in scale, the latest round of stimulus projects echo the structure of the investment-oriented stimulus of 2009/10. Therefore, global commodity demand is likely to be boosted again, and this could provide an offset to the impact of the slowdown in China on commodity exporting economies.

As a major consumer of commodities, China plays an important role in global commodity demand

After three decades of rapid growth, China has emerged as the world's second largest economy, and a major commodity consumer for production of both final consumer goods as well as capital goods (Chart 1). For example, construction of the Beijing-Shanghai high-speed railway (1,318 kilometres) is estimated to use steel products of about 10 million ton. Copper is a key material in electrical wires; aluminium is widely used in construction and daily life, like machinery tools and automobiles (about 70 kilogram aluminium used to build a car), airplanes, and so on. As of 2010 China's consumption iron ore accounted for 60% of world consumption, while copper and steel accounted for 40%; in other words, a 10% increase in China's commodity demand would, all else equal, add 6% (iron ore) and 4% (copper and steel) to global demand. With regards to coal and crude oil, China's shares of global consumption are 45% and 10% respectively (Chart 2).

China's economic structure relies heavily on inputs of commodities, with investment relying on metals, more so than consumption

To illustrate the use of commodities in China's economy, we calculate the "commodity intensity" of production, defined as the volume of commodity consumption per unit of real GDP[1]. We apply this measure to analyze major metals (steel, copper, and aluminium) and energy inputs (crude oil and coal) for the period between 2000 and 2011, with the results summarized in Table 1. The first row

[1] Commodity intensity is calculated as (production + Import - export volume)/real GDP. In the longer term, it could be used to reflect the trend of commodity use in China's economy, despite of the weakness that it is disturbed by inventory accumulation in the short term.

shows the average changes in commodity intensity from 2004-08, labelled as "*trend*".[2] The second row measures the impact of the 2009/10 government stimulus, by calculating the difference in percentage terms between commodity intensities in 2009 and the three-year moving averages in 2009 (i.e. the average from 2007 to 2009), which we label as "*jump*".

If the intensity of a particular commodity is more positively correlated with investment than consumption (in other words, that investment involves greater use of that commodity compared to consumption), as is commonly assumed, we should observe a "jump" above the trend of commodity intensity in 2009 due to the government's investment-oriented stimulus (Chart 3). An important caveat is that inventories of commodities could affect short-term movements in commodity intensities as calculated by our method. However, over longer periods the distortion caused by inventories should be less significant

Table 1
Changes of China's commodity intensity over time

Commodity	Steel product	Copper product	Aluminium product	Crude oil	Coal
*Trend (2004-08)	3.8%	0.3%	14.1%	-5.6%	-3.5%
*Jump (2009)	6.6%	1.5%	0.7%	-3.1%	-1.3%

Note: *Trend = average change of commodity intensity from 2004 to 2008;
*Jump = commodity intensity in 2009/its average from 2007-09
Source: CEIC and BBVA Research

Our findings are summarized as follows. Among metals, the intensities of steel and aluminum trend up from 2004 to 2008, rising by 3.8% and 14.1% per year on average respectively, while the intensity of copper remains basically flat. This suggests that the use of steel and aluminum has increased at a faster pace than GDP, while the use of copper has increased at about the same pace as GDP growth.

Meanwhile, the intensities of steel and copper "jumped" in 2009 (against their averages of 2007-09) by 6.6% and 1.5% respectively, which we attribute to the government's investment-oriented stimulus. The results suggest that the two metals are used more intensively in investment compared to consumption. Aluminium (a minimal jump of 0.7%) appears to be equally affected by both investment and consumption. The finding not only provides further support to the widely used assumption that metals are intensively used in production of capital goods[3], but also that metals are associated relatively less with consumption activities.

Among energy inputs, both the intensities of crude oil and coal have trended down across time, consistent with efforts to increase energy efficiency. In 2009 the intensities of crude oil and coal fell by -3.1% and -1.3% respectively against their respective three-year moving averages, implying that the use of energy is less affected by investment compared to consumption.

Therefore, we can conclude that China's use of steel and aluminium is likely to increase at a faster pace than GDP growth, for copper at the same pace, for crude oil and coal at a slower pace. For a fiscal stimulus package oriented toward investment, more steel and copper should be used per GDP. Therefore, the use of metals (steel, copper, and aluminium) should typically rise at a quicker pace than GDP growth if China adopts an investment-oriented stimulus, while the use of energies (crude oil and coal) should rise at a slower pace.

China's slower commodity consumption is to remain robust, thanks to strong growth potential and investment-oriented fiscal stimulus

Notwithstanding an expected positive impact of investment-oriented fiscal stimulus measures on global commodity demand, there is a possibility that the effect could be muted for two reasons. First, the recent economic slowdown may dampen overall import demand (Chart 4). Second, inventories of metals have reached record highs (Chart 5), which could further dampen import

[2] Limited by data availability and time constraint, we could not convincingly estimate the trend of commodity intensity in China; instead, we use the simple three-year moving average and hope it could be a good proxy to the trend of commodity intensity.
[3] Garnaut Ross (2006), "The China Resources Boom", the Australian Agricultural and Resource Economics Conference, Sydney, February 2006.

demand. It has also been reported by various media sources that China's metal stockpiles have accumulated in ports and in factory and commodity exchange warehouses.

In this section, therefore, we seek to quantify the impact of the economic slowdown in the coming years (compared to 2009-11) and the investment-oriented fiscal stimulus policy on China's overall consumption of major commodities. To do so we use the relationship between growth in commodity consumption, as a function of commodity intensity and GDP growth as follows:

$$d\%(com\,\mathrm{mod}\,ity) = d\%(\mathrm{int}\,ensity) + d\%(gdp)$$

The results are shown below in Table 2. In particular, we project China's consumption of steel to increase by 8.6% in 2013, slowing from 12.8% in 2009-2012, attributed to lower growth and commodity intensity. The impact on consumption of other commodities can be seen in the table: we would expect China's consumption of steel, crude oil, and coal to decelerate in 2013 from 2009-2012, consumption of aluminium products would continue at the same growth pace; and counter-intuitively consumption of copper would actually rise because of the pattern of historical consumption, in which there was a spike in consumption of the metal in 2008, followed by a decline. The isolated impact of investment-oriented stimulus is also estimated in the table. The results imply that China's fiscal stimulus package should help to support demand for metals, although it would not fully offset the impact of the slowdown in growth, except for steel products. Important caveats for our projections are: (1) our estimation fails to include the impact from inventories, and (2) incorporates the consumption of steel, copper, and aluminium products rather than raw materials directly, although in general we would expect their trends to be consistent with one another.

Table 2
Projection of China's commodity consumption in 2012-13

Commodity	Steel product		Copper product		Aluminium product		Crude oil		Coal	
Year	2009-2012	2013	2009-2012	2013	2009-2012	2013	2009-2012	2013	2009-2012	2013
I: Growth in China's consumption volume:*	12.8%	8.6% (1.3%)	6.7%	7.8% (1.0%)	12.3%	12.4% (0.9%)	6.9%	5.4% (0.9%)	9.1%	7.7% (0.9%)
II: %d(gdp)	9.1%	7.9%	9.1%	7.9%	9.1%	7.9%	9.1%	7.9%	9.1%	7.9%
III: d%(intensity)	3.3%	0.7%	-2.2%	-0.1%	3.0%	4.5%	-2.1%	-2.5%	-0.1%	-0.2%
IV: Statistical error (IV=I-II-III)	0.4%	n.a.	-0.2%	n.a.	0.2%	n.a.	-0.2%	n.a.	0.1%	n.a.

Note: 2012/13 data are projections of BBVA Research;
*Numbers in the parenthesis are contribution from investment-oriented stimulus.
Source: BBVA Research

Who is likely to benefit?

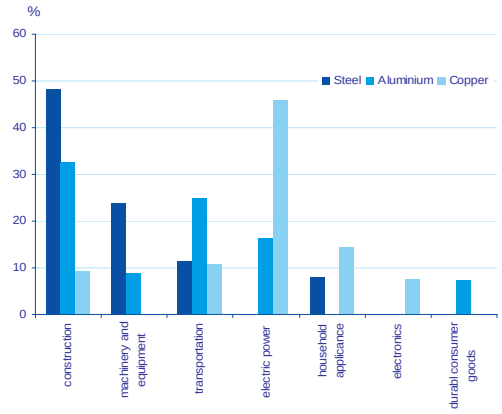
China's imports of metals from other Asian and Latin American countries have grown sharply in the past decade, a trend that accelerated after the 2008/09 financial crisis (Chart 6). In Australia, 42% of iron ore and coking coal exports go to China, up from 22% in the pre-financial crisis period. In Chile, about 34% of copper and non-ferrous ore exports are shipped to China compared to 17% pre-crisis. Other countries like Peru, Brazil, and Indonesia share similar trends.

Thus a rise in China's demand is likely to have a significant impact on commodity exports of these countries. Given the importance of commodity exports as a share of total exports (45% of total exports in Australia, 57% in Chile, 30% in Peru, 25% in Brazil, and 18% in Indonesia), these economies would be impacted significantly via the trade channel from fluctuations in China's commodity demand. Among them, Australia (iron ore, and coal) and Chile (copper) would benefit most from robust demand in China; Peru (copper) and Brazil (iron ore and oil) would be next in place; while Indonesia (coal) would see more limited benefits.[4]

[4] For the longer term implications of commodity exports on economic growth, see Ferchen, Garcia-Herrero, and Nigrinis (2012): "Evaluating Latin America's Commodity Dependence on China", BBVA Research Working Paper No 12/08.

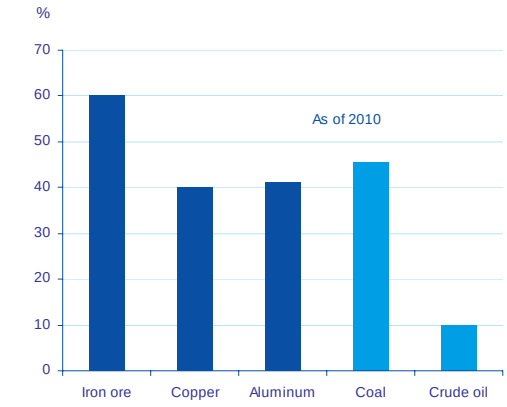
Charts: China and global commodity markets

Chart 1
The uses of metals in China (% of total)



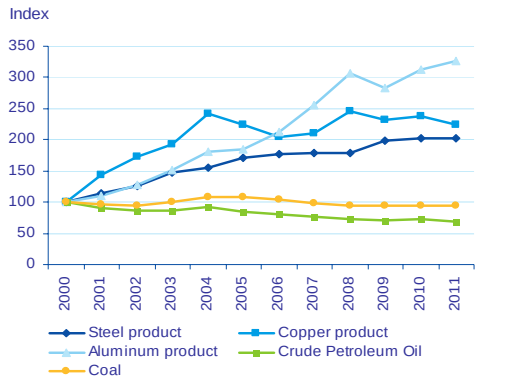
Source: Bloomberg and BBVA Research; For steel, the world's statistics are in place due to the unavailability of China's data.

Chart 2
China's commodity consumption share in the world



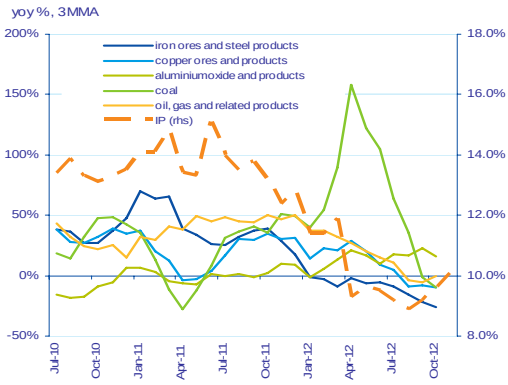
Source: BBVA Research collected from various market reports.

Chart 3
China's commodity intensity across time: divergent trends between metals and energy



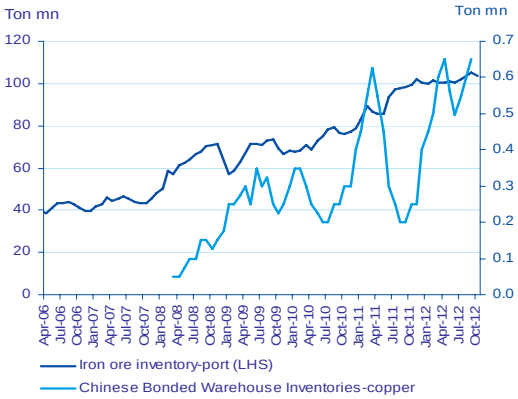
Source: CEIC and BBVA Research

Chart 4
China's slowdown dampens commodity imports



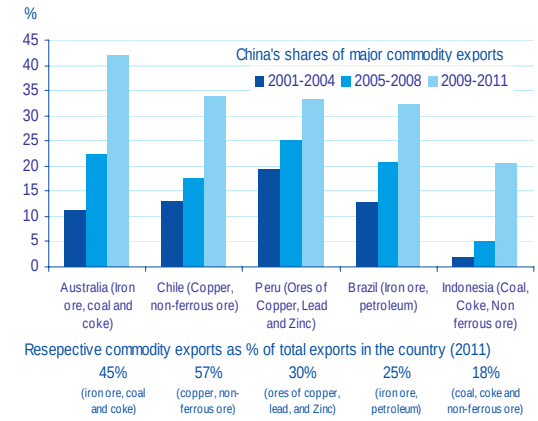
Source: CEIC and BBVA Research

Chart 5
Iron ore and copper inventories stay at highest level



Note: Data of China's inventory of aluminium is not available.
Source: CEIC, Bloomberg, and BBVA Research

Chart 6
China's shares of commodity exports by exporters



Source: UN Comtrade and BBVA Research

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