GLOBAL ECONOMIC PROSPECTS

2014 / July

COMMODITY MARKETS OUTLOOK

WORLD BANK GROUP

Table of contents

About the report

Commodity Markets Outlook is published four times a year in January, April, July and October. The report includes detailed market analysis for most primary commodities, including energy, metals, agriculture, precious metals, and fertilizers. It also includes historical and recent price data as well as price forecasts going up to 2025. Separately, commodity price data are also published at the beginning of each month. The report and data can be accessed at: www.worldbank.org/prospects/commodities.

List of figures

List of tables

List of boxes

Overview

Geopolitical concerns in Iraq and Ukraine/Russia earlier in the year put upward pressure on oil prices during the second quarter. As tensions moderate, oil prices are expected to decline in 2015. Metal prices eased during the 2014Q2 due to supply response from earlier investments and weakening demand, especially by China. Weather concerns (often linked to likely El Niño) induced price increases in some grains earlier in the year but recently prices have weakened as supplies for the upcoming, 2014/15, season are deemed adequate to keep stocks at reasonable levels. Agricultural prices are expected to decline slightly in 2015.

The key commodity price indices have been broadly stable during 2014Q2 (as Box 1 shows that commodity price volatility during 2014Q2 has been low.) Energy and agricultural prices increased 1 percent each, on geopolitical and weather-related concerns, respectively, while metal prices declined 1 percent on signs of Chinese demand weakness (figure 1). The increase in beverage prices was driven by a rally in coffee prices due to dry weather in Brazil—world's largest coffee supplier (figure 2). Precious metal prices changed little while fertilizer prices declined 6.5 percent due to weakness in natural gas prices.

In the baseline scenario, which assumes no macroeconomic shocks or major supply disruptions, oil prices are expected to average $106/bbl in 2014, $2/bbl higher than 2013, reflecting the geopolitical tensions in Iraq (table 1). Oil prices are expected to ease to $104/bbl in 2015 as geopolitical tensions moderate. Natural gas prices in the U.S. are expected to remain elevated during the rest of 2014 and strengthen even more in the longer term in response to stronger demand from energy intensive industries that are moving to the U.S. to capitalize on the "energy dividend". EU natural gas and Japanese LNG prices are expected to moderate due to weakening demand—currently both prices are mostly tied to crude oil.

Agricultural prices are projected to moderate further in 2014 under the assumption that current crop conditions will persist for the 2014/15 crop year. Yet, considerable variation is expected among various crops. Grain prices are expected to decline almost 14 percent in 2014; prices of edible oils & meals and other food items will ease marginally. Beverage prices will gain 18 percent. Metal prices will loose more than 6 percent in 2014 (which comes on top of last year's 5.5 percent drop) as new supplies will be coupled with weaker demand by China. Fertilizer prices are expected to decline 15 percent in 2014 mainly in response to capacity expansion in the U.S. Similarly, precious metal prices are expected to decline more than 12 percent as institutional investors are viewing them less attractive "safe heaven" investment vehicles; reduced demand by China may play a role as well.

There are a number of risks to the baseline forecasts. Downside risks in the oil market include weaker demand concerns by emerging economies (where most demand growth takes place). Oil demand could weaken further in the longer term if substitution between oil and natural gas intensifies.

Figure 1 — **Commodity price indexes**
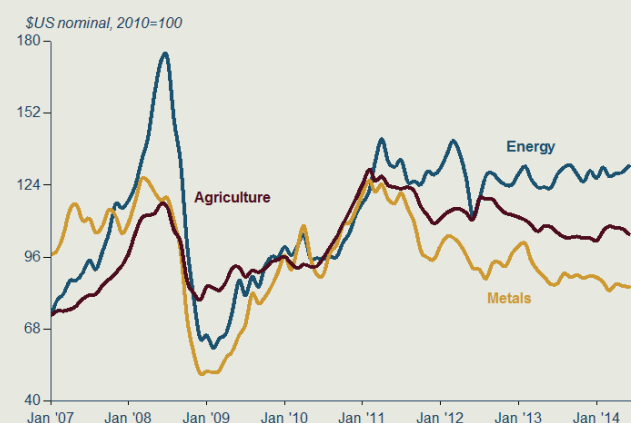
$US nominal, 2010=100

Figure 2 — **Food price indexes**
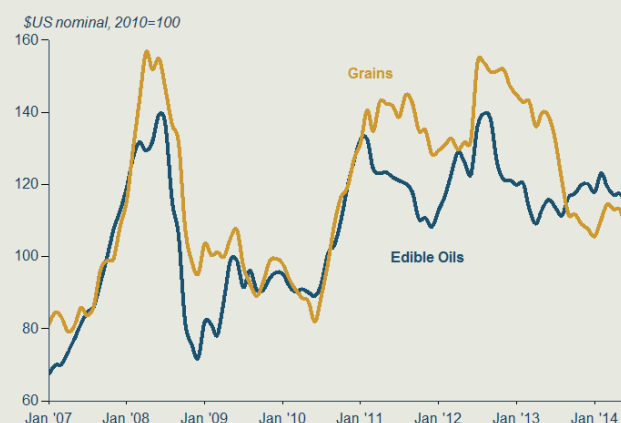
$US nominal, 2010=100

Source: World Bank.

Table 1   Nominal price indices, actual and forecasts (2010 = 100)

	ACTUAL					FORECAST			CHANGE (%)		
	2009	2010	2011	2012	2013	2014	2015		2012/13	2013/14	2014/15
Energy	80	100	129	128	127	130	128		-0.1	1.8	-1.4
Non-Energy	83	100	120	110	102	98	98		-7.2	-3.3	-0.3
Metals	68	100	113	96	91	85	86		-5.5	-6.3	1.4
Agriculture	89	100	122	114	106	105	104		-7.1	-1.4	-0.9
Food	93	100	123	124	116	110	109		-7.1	-4.7	-1.1
Grains	99	100	138	141	128	111	111		-9.3	-13.6	0.4
Fats and oils	90	100	121	126	116	116	114		-8.1	-0.2	-1.8
Other food	90	100	111	107	104	103	101		-3.0	-1.2	-1.4
Beverages	86	100	116	93	83	98	93		-10.1	18.1	-5.2
Raw Materials	83	100	122	101	95	95	97		-5.9	-0.4	1.9
Fertilizers	105	100	143	138	114	97	95		-17.4	-15.0	-1.4
Precious metals	78	100	136	138	115	101	100		-16.9	-12.2	-0.9
Memorandum items											
Crude oil ($/bbl)	62	79	104	105	104	106	104		-0.9	2.0	-1.6
Gold ($/toz)	973	1225	1,569	1,670	1,411	1,250	1,230		-15.5	-11.4	-1.6

Source: World Bank.

On the upside, a key risk is an oil supply disruption in the Gulf and (less so) Central Asia. For example, following the unrest in Iraq, Brent prices gained more than $4/bbl within just a week in early May, although no physical disruption in the flow of crude oil took place. While a disruption in oil supplies could add as much as $50/bbl to the price of oil, numerous factors could change the severity and duration of the outcome, including OPEC's reaction, decisions whether to tap on emergency reserves, and demand curtailment. Currently, the price risks in the oil market are neutral—in contrast to the earlier (April 2014) issue of the *Commodity Market Outlook*, which noted that risks were "weighed on the downside."

Another source of uncertainty in the medium- and long term-outlook is the way in which OPEC (especially Saudi Arabia) would react to changing global supply and demand conditions. Since 2004, when oil prices first exceeded $35/bbl, OPEC has responded to any price weakening by cutting supplies. But it is has also increased output when prices exceed the current $100-110 range. Uncertainty also depends on whether other players such as Iraq, Iran, and Libya could deliver the expected growth. Historical evidence suggests that it may take up to a decade for conflict-induced reduction of oil production capacity to reach pre-conflict levels.

Price risks on metals depend on new supplies coming on stream and China's growth prospects. Although metal prices are down 4 percent since a year ago (Q2/Q2), they are 33 percent lower than their early 2011 peak. The prospects of the metal markets depend crucially on Chinese demand, as the country accounts for 47 percent of the world's metal consumption, up from a mere 5 percent two decades ago.

In its July assessment, the U.S. Department of Agriculture has roughly maintained its comfortable outlook for the upcoming season. The stock-to-use (S/U) ratios, a measure of whether markets are well-supplied, are expected to increase for maize and wheat but decline marginally for rice. A key risk at this stage is El Niño, which according to the U.S. National Oceanic and Atmospheric Administration has a 70 probability of developing in 2014. If 2014 becomes an El Niño year, then a number of commodities, including oilseeds, wheat, and some tropical products may be subjected to upside price risks later in 2014 and 2015—in the past, El Niño has affected crop conditions mainly in the Southern Hemisphere. The last El Niño occurred in 2009-10. Two other risks for agricultural markets, namely trade policies and diversion of food commodities to the production of biofuels, are less of a problem compared to the peak of the price boom a few years ago.

Box 1   **Price volatility for most commodities has returned to historical norms**

The elevated price volatility in the aftermath of the 2005-08 commodity boom has been (and still is) a key concern among policy makers and multilateral institutions (e.g. World Bank 2012, UNCTAD 2012). To examine whether such concerns are consistent with the recent evidence, this box analyzes daily price movements of 18 commodities traded at futures exchanges, based on the 1997-2014 period. It concludes that price volatility for almost all commodities reached historical highs during 2008-09 (which also coincided with the financial crisis), but volatility returned to historical norms after 2010. The box also provides evidence of a causal relationship between S&P 500 returns (a proxy for expectations on overall macroeconomic conditions) and commodity price returns during the financial crisis. However, such a relationship is significantly weaker in periods before 2005 and after 2009. Taken together, the findings suggest that the elevated volatility during 2008-09 was largely temporary and was driven mostly by cyclical macroeconomic factors rather than changes in the fundamentals of global commodity markets as has been often argued (e.g., expansion of biofuels, demand growth by emerging economies, or changing weather patterns).

Price volatility during 2008-09 has been, on average, more than 50 percent higher than other periods (figure B1.1 depicts price volatility for oil Brent copper, and wheat). A simple difference in means test confirms that volatility was significantly higher during the 2008-09 than in other periods for 17 of the 18 commodities analyzed here. For example, daily crude oil price volatility was 2% during 2008-09 and 2.9% in other periods. Likewise, copper and wheat price volatility was higher by 1.11 and 1.03 percentage points.

Of the 18 commodities examined here, 17 commodities exhibited price volatility that was 25 percent higher than its average—coffee being the sole exception, most likely because coffee exhibits high price volatility throughout the entire period. This further confirms that volatility was abnormally high during 2008-09 across the entire commodity spectrum, but also that it has returned to historical levels after 2010 (figure B1.2).

Price volatility in the past quarter was lower than the average volatility during the second quarter of the 1997-05 period across 16 out of 18 commodities—coffee and natural rubber are exceptions (table B1.1). Furthermore, volatility has remained stable over the last two quarters for most commodities. Again, these results are consistent with the view that price volatility for the most recent quarter has been at very low levels across a broad range of commodities. (Maize price volatility was elevated during 2013Q2 and 2013Q3 because of exceptionally adverse weather conditions in the US, which is the major maize exporter).

Several authors (e.g. Bloom 2013) have noted that macroeconomic shocks associated with recessions—such as the 2008/09 financial crisis—are more uncertain than positive shocks because large recessions are rare events with no clear consensus on their likely depth and duration, often amplified by policy uncertainty, they tend to cause greater market volatility than positive shocks. To examine the effect of the macroeconomic conditions on commodity price volatility, Granger-causality tests were run between daily commodity price returns and the returns on the S&P 500 index (figure B1.3 depicts

Figure B1.1   **Volatility of returns (oil, copper, and wheat)**
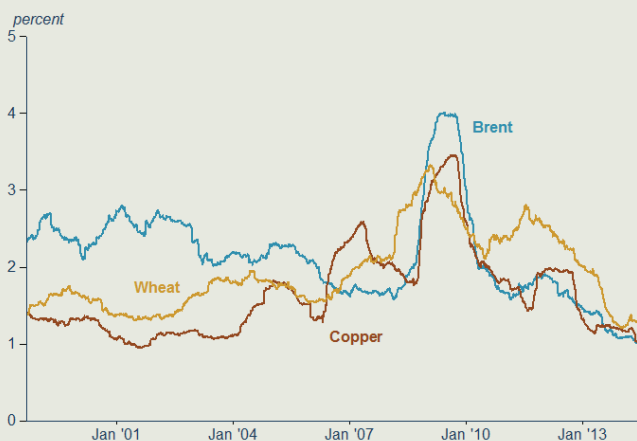
Source: ICE, CME, and World Bank estimates.

Note: Volatility is measured as the standard deviation of daily returns and is based on daily closing futures prices of nearby contracts from 1/1/1998 to 06/31/2014, resulting in a total of 3,673 observations; it is presented as 250-day moving averages, roughly corresponding to a calendar year.

Figure B1.2   **Volatility of returns, 18 commodity prices**
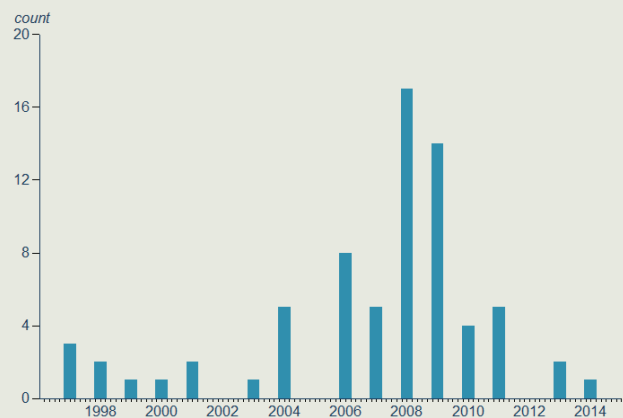
Source: ICE, CME, and World Bank estimates.

Note: The figure reports volatility in excess of 25 percent above annual averages for 18 commodity prices. The averages apply to each commodity during the entire sample and have been calculated separately for each calendar year.

volatility of returns for the S&P 500 index). Summary results, reported in figure B1.4, indicate that a larger fraction of commodities were Granger-caused by *S&P* 500 returns during the financial crisis than any time before or after the crisis. This suggests that common macroeconomic factors were important drivers behind the spike in commodity price volatility during the financial crisis (Baffes and Kshirsagar 2014).

That commodity price volatility has returned to historical levels should not come as a surprise. For example, Jacks et al (2011) find that commodity price volatility has remained stable over three centuries after examining harmonized monthly commodity price returns from 1700 to 2008. Hamilton and Wu (2014) find some influence of indexation on oil returns during 2007-09, but also find that this relationship breaks down post-2009. They also attribute abnormal relationships in commodity markets to factors related to the financial crisis. Yet, it should be noted that these results do not rule out the possibility that commodity prices have become more correlated with each other. Ke and Tang (2012), for example, have documented increased correlation of non-energy prices with oil returns. Further, they argue that the spike in non-energy price volatility during the recession was caused by volatility spillovers from oil. However, their study does not use post-2011 data—a period in which volatility declined and the lagged returns in the S&P 500 had weaker linkages to commodity returns, as shown above.

Table B1.1	Volatility of returns, quarterly averages			
	1997-2005 (Q2)	2013Q2	2014Q1	2014Q2
Coffee, Arabica	2.69	1.63	3.34	3.12
WTI	2.51	1.35	1.09	0.84
Brent	2.20	1.27	0.87	0.79
Cocoa	2.11	1.27	1.12	0.82
Nickel	2.10	1.55	1.30	1.98
Cotton	1.86	1.63	1.25	1.49
Silver	1.68	2.59	1.50	1.17
Wheat	1.68	1.52	1.78	1.42
lead	1.56	1.54	0.96	0.91
Soybeans	1.53	1.43	1.08	1.19
Maize	1.51	2.17	1.28	1.29
Copper	1.45	1.63	1.01	0.80
Soybean oil	1.43	0.89	1.09	1.22
Tin	1.29	1.54	0.93	0.69
Zinc	1.28	1.25	1.03	0.90
Natural rubber	1.19	1.91	1.73	1.45
Aluminum	1.14	1.34	1.08	0.97
Gold	0.87	1.96	0.90	0.78

Source: ICE, CME, London Metal Exchange, and World Bank estimates.

Figure B1.3	Volatility of returns, S&P 500
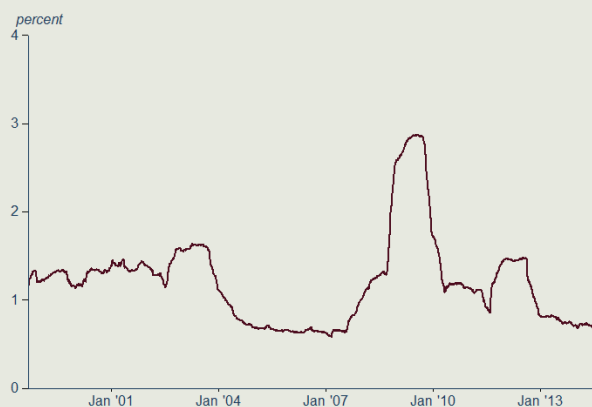
Source: Bloomberg.

Note: Volatility is measured as the standard deviation of daily returns and from 1/1/1998 to 06/31/2014, resulting in a total of 3,673 observations; it is presented as 250-day moving averages, roughly corresponding to a calendar year.

Figure B1.4	Granger causality
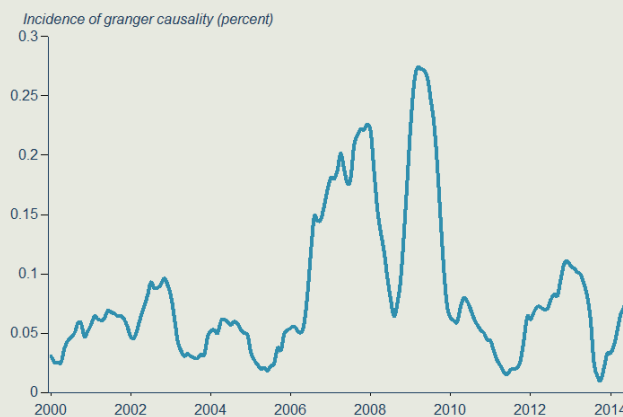
Source: World Bank estimates.

Note: Current commodity returns were regressed on one-day lagged returns of the relevant commodity and the S&P 500 index over a 60-day moving window. A commodity return is labelled as being Granger-caused by the S&P 500 return if the p-value on the lagged S&P 500 coefficient is less than 0.05 and the parameter estimate is positive.

Energy

Energy prices, as measured by the World Bank energy index, were up 1 percent in 2014Q2 an acceleration from 0.5 percent growth in the previous quarter squarely due to increase in crude oil prices (up 2.6 percent for the quarter) given that coal and natural prices declined in 2014Q2 by 5.7 and 9.6 percent respectively. After reaching $100/bbl in early 2011 for the first time since the 2008 financial crisis, crude oil prices have fluctuated within a remarkably tight band around $105/bbl, which is also within OPEC's "desired range" (figure 3). In fact, 2011-13 has been one of the least volatile 3-year periods of the recent history of the oil market. This pattern continued in the 2014Q2, when crude oil price averaged $106.3/bbl, up from $103.7/bbl in the previous quarter.

Fluctuations in oil prices have been driven mainly by geopolitical concerns and output disruptions (Ukraine, Libya and Iraq) on the supply side, and changing developing-country growth prospects on the demand side. Geopolitical risks have reemerged as the main driver of oil prices in 2014Q2 with events in Iraq and Ukraine playing a significant part in the price increases during the quarter. However, after peaking at $111/bbl in late June, prices reversed course to $105/bbl by early July as production was not disrupted in Iraq and Libya announced reopening of export ports that have been shut for nearly a year.

Recent developments

Supply disruptions in the Middle East have been counterbalanced almost barrel for barrel by rapid expansion of unconventional oil production in North America (figure 4). These developments have kept the global oil market broadly in balance and prices in the $100-110/bbl range for the last three years. The Saudi government—the balancing producer with the largest spare capacity—has promised to keep the global market well supplied within that range, which it considers to be a fair price. Increased Canadian oil production from tar sands, combined with rapidly rising U.S. shale liquids production (from horizontal drilling and hydraulic fracturing) have contributed to a build-up of crude oil inventories at a time when U.S. oil consumption is moderating and natural gas supplies are increasing rapidly. The stock build-up caused West Texas Intermediate (WTI, the U.S. mid-continent price) to diverge from Brent (the international marker) since early 2011. Although the spread reached a high of 30 percent late that year, it narrowed to 6 percent in June 2014 as the southern leg of the Keystone pipeline was completed and began transporting crude from Cushing, OK towards the refineries in the Gulf of Mexico (figure 5).

Figure 3   **Oil prices (average of Brent, WTI, and Dubai)**
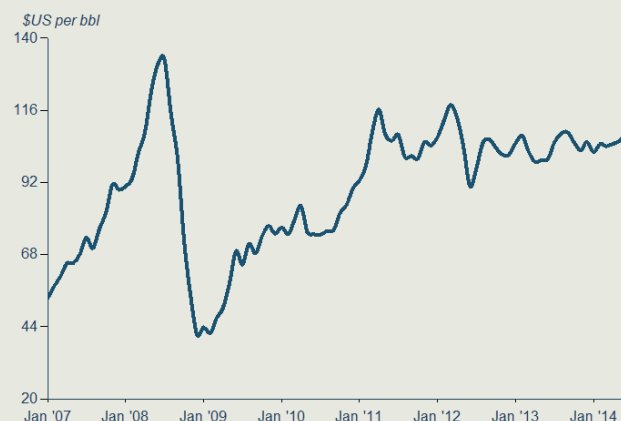
Source: World Bank, International Energy Agency.

Figure 4   **U.S. crude oil supply growth and disruptions elsewhere**
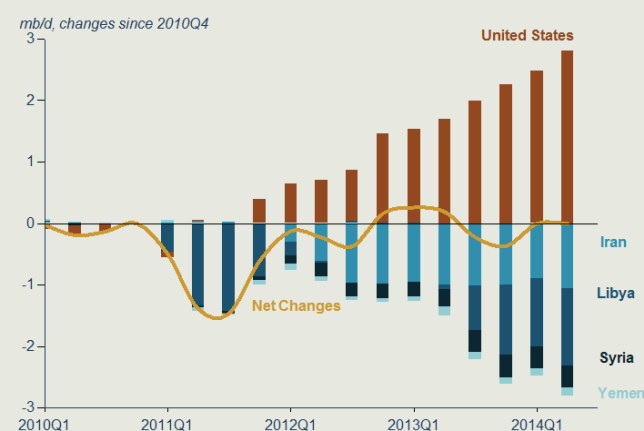
Source: World Bank, International Energy Agency.

Figure 5   **Brent/WTI price differential**
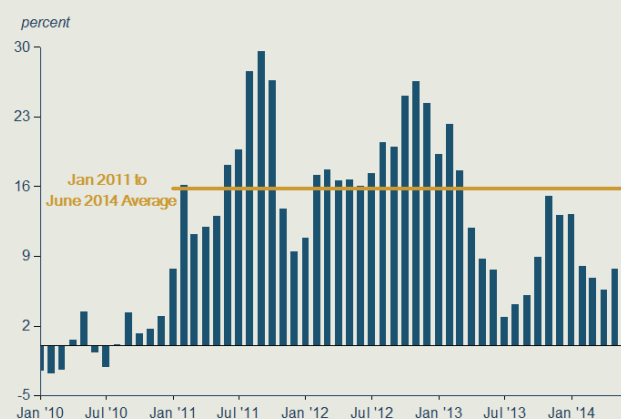
Source: World Bank.

Figure 6   **U.S. crude oil production**

mb/d
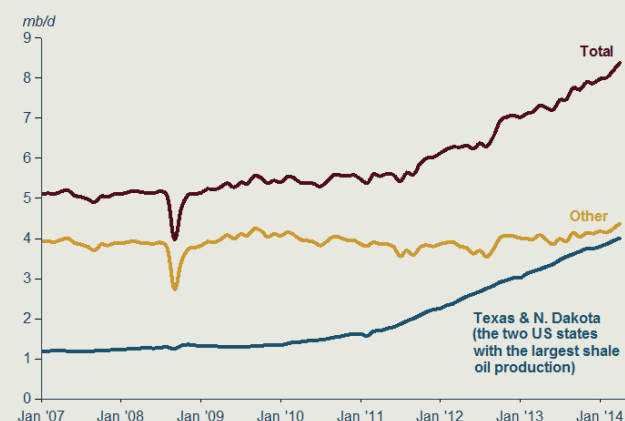
Source: U.S. Energy Information Administration.

Figure 7   **OPEC spare capacity**

mb/d   *million bbl*
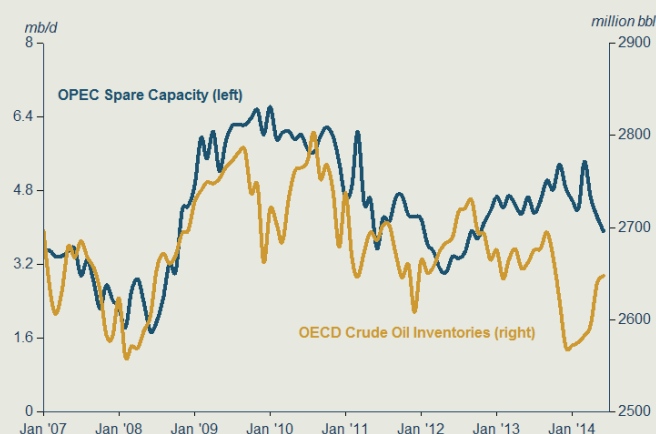
Source: International Energy Agency.

Figure 8   **World oil demand growth**

mb/d, year over year growth

Source: World Bank, International Energy Agency.

In a step that could reduce divergence between the US and world markets, the U.S. Department of Commerce issued export permits to two oil companies for export of wellhead condensate oil (minimally processed crude oil). Although the ruling has been viewed as "technical", it has been interpreted as a first step towards relaxing the four-decade long ban on oil exports. The ban, a response to the 1973 Arab oil embargo, applies to crude oil but not to refined products. Exports of minimally processed crude oil, which may begin as early as August, are expected to be limited initially but may reach 1 mb/d within a year (compared with total US oil production of 8.4 mb/d in April 2014).

Non-OPEC oil output picked up in 2014Q2 to 56.2 mb/d, up 2.1 mb/d from the same quarter in 2013. The U.S. added some 1.5 mb/d to global crude oil supplies since the beginning of 2012. Currently, the U.S. states of North Dakota and Texas, where most of shale oil production takes place, account for almost half of the total U.S. crude oil supplies—up from 25 percent three years ago (figure 6).

OPEC's output averaged 36.4 mb/d in 2014Q2, unchanged from the previous quarter. For 2013 as a whole, OPEC's output declined by 0.7 mb/d. Yet, this production level is still 10 mb/d higher than in 2002Q2, OPEC's lowest producing quarter in recent history.

OPEC's spare production capacity peaked at 5 mb/d in 2013Q4, the highest since 2011Q1, before easing back to 4.3 mb/b in 2014Q2 on increased output (figure 7). OECD industry stocks recovered to 2,639 million of barrels at the end of May from their lowest level since early 2004 at the end of 2013 as the cold winter depleted product stocks in the North America. However, they remain tight and nearly 70 mb below their five-year averages.

World oil demand increased by 1.2 mb/d in 2014Q2 (y/y) with all of the growth coming from non-OECD countries, 1.4 mb/d vs. -0.2 mb/d for OECD countries (figure 8). In contrast to 2013H2, demand in OECD countries during 2014H1 contracted. This is line with the pattern over the past few years where OECD demand has fallen by 5.7 mb/d, or 11 percent, from its 2005Q1 peak of 51 mb/d. Non-OECD demand remains robust. In fact, during 2014Q2, non-OECD economies consumed more oil than the OECD ones, 46.7 versus 45.3 mb/d.

Global natural gas market remains segregated by geography with price differentials between US, European, and Asian prices. Shale gas production in the US has created a glut of supplies that have been walled off from the global markets as the U.S. companies lacked both export infrastructure and

permits. Of the 33 facilities, so far only 7 have received export permits to non-NAFTA countries. In terms of capacity, 36 bcf/d (billion cubic feet per day) of export capacity is seeking permits—roughly half of 70 bcf/d of U.S. daily consumption—while 9.3 bcf/d has been approved for export to countries without a free trade agreement. Only one long-term export contract has been agreed and LNG is scheduled for export at the end of 2016 once retrofitting of the terminal has been completed.

Outlook and risks

Nominal oil prices are expected to average $106/bbl in 2014, $2/bbl higher than 2013 (table 1). This forecast is $3/bbl higher than the April *Global Market Outlook* edition and for the most part reflects the geopolitical tensions in Iraq. Oil prices are expected to ease to $104/bbl in 2015. In the longer term, real prices are expected to fall due to growing supplies of unconventional oil, efficiency gains, and (less so) substitution away from oil. The key assumption underpinning these projections reflects the upper-end cost of developing additional oil capacity from Canadian oil sands, currently estimated at $90/bbl in constant 2014 dollars.

World demand for crude oil is expected to grow at less than 1.5 percent annually over the projection period, with all the growth coming from non-OECD countries, as has been the case in recent years (figure 9). Consumption growth in OECD economies will continue to be subdued by slow economic growth and efficiency improvements in vehicle transport induced by high prices—including a switch to hybrid, natural gas, and electrically powered transport. Pressure to reduce emissions due to environmental concerns is expected to dampen demand growth at the global level as well.

On the supply side, non-OPEC oil production is expected to continue its upward climb, as high prices have prompted increased use of innovative exploration techniques (including deep-water offshore drilling and extraction of shale liquids) and the implementation of new extractive technologies to increase the output from existing wells.

Last, prices of natural gas (in the U.S.) and coal are expected to remain low relative to crude oil and European and Japanese natural gas prices as has been the case during the past few years (figures 10 & 11). Some convergence in prices may take place but its speed (which is expected to be slow) will depend on several factors, including the development of unconventional oil supplies outside the U.S., the construction of LNG export facilities and gas pipelines, relocation of energy intensive industries to the U.S., substitution by coal, and policies.

Figure 9   **Global crude oil consumption**
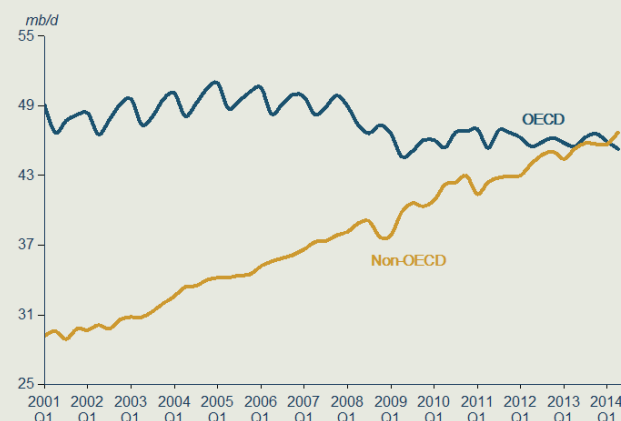
Source: International Energy Agency.

Figure 10   **Energy prices**
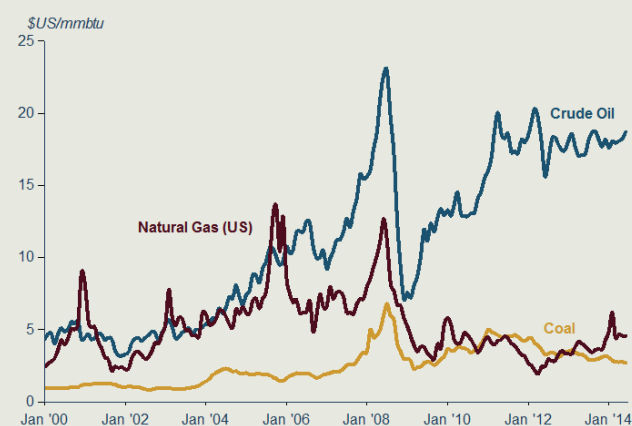
Source: World Bank.

Figure 11   **Natural gas prices**
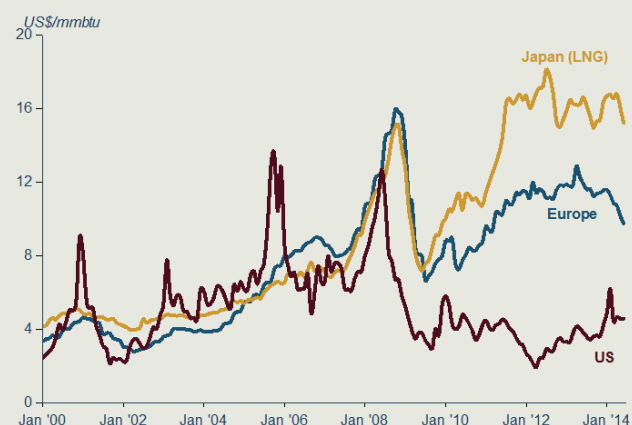
Source: World Bank.

Although the ISIS insurgency did not disrupt Iraqi oil supplies, the country's expected long term capacity growth may not materialize

Iraq, OPEC's second (and the world's seventh) largest producer, holds 140-150 billion barrels of world's proven reserves which are also some of the least costly to extract. Iraq's oil production reached 3.6 mb/d in February 2014, the largest output since 1979 (figure B2.1). A Sunni insurgency in June 2014 threated Iraqi oil supplies, causing a temporary spike in oil prices. Although prices quickly returned to pre-insurgency levels, longer term supply disruptions cannot be ruled out.

A military campaign by the radical Sunni fighters (the so-called Islamic State of Iraq and Sham, ISIS) that began in June has threatened the very foundation of Iraq. ISIS forces took over Mosul, Iraq' second largest city on June 10 and continued their advance towards Baghdad. After controlling large areas in the North and West of the country, it appeared that they could advance on Baghdad. The territory captured contained Iraq's largest refinery, two gas fields and two oil fields. Some of the international oil companies operating in Iraq evacuated non-essential staff. As the insurgency unfolded, the price of oil spiked to $111/bbl. After the ISIS advance stalled, it became clear that the turmoil has not affected Iraq's oil production in the Shia dominated areas of the South and Kurdish areas of the North. The price of oil retreated below $105/bbl, effectively eliminating the "insurgency" risk premium.

Iraq's production in the first half of 2014 averaged 3.3 mb/d, up from the 3.1 mb/d in 2013. Of this, some 2.6 mb/d were exported. June output fell to 3.2 mb/d as production from the Kirkuk oil field was shut—the refinery it feeds was taken over by ISIS. Exports from the Southern oil terminals near Basra were slightly down to 2.4 mb/d in June on logistical difficulties. Barring any technical problems, oil exports are expected to return to 2.6 mb/d by the end of July.

However, the unrest in Iraq has long-term implications as most of OPEC's capacity growth is expected to come from Iraq. The International Energy Agency (IEA) forecasts that Iraq will account for 60 percent of additional capacity during 2013-19. Even though these forecasts have been revised down, in its most recent *Medium-term Oil Market Report*, the IEA still expects Iraq to reach 4.5 mb/d of capacity by 2019, from the current 3.3 mb/d (figure B2.2 shows the additional capacity in 2019 expected by each OPEC member, which for Iraq is 1.2 mb/d). Iraq's government has been even more ambitious—it plans to achieve output of 8.5-9.0 mb/d by 2020. While achievement of the government's targets was questioned even before the insurgency took place, infrastructure bottlenecks along with labor and water shortages, as well as sectarian fighting could make even the IEA target of 4.5 mb/d ambitious.

Although most of the current oil production capacity remained untouched by the insurgency, the risk remains that oil infrastructure might be targeted, causing significant and lengthy crude supply disruption. Such disruptions could have a significant effect on the global oil markets as some 2.5-3.0 mb/d of capacity is already off the market from other countries in the Middle East. So far, these outages have been counterbalanced almost barrel for barrel by rapid expansion of unconventional oil production in North America (Energy section, figure 4). In such tightly balanced market, any additional outages could induce sharp price spikes. Some 60 percent of the Iraqi exports go to Asia with China and India, as the two largest consumers would likely be the ones affected the most. Europe and the US import relatively smaller amounts of Iraqi oil.

Figure B2.1   **Iraq's oil production**
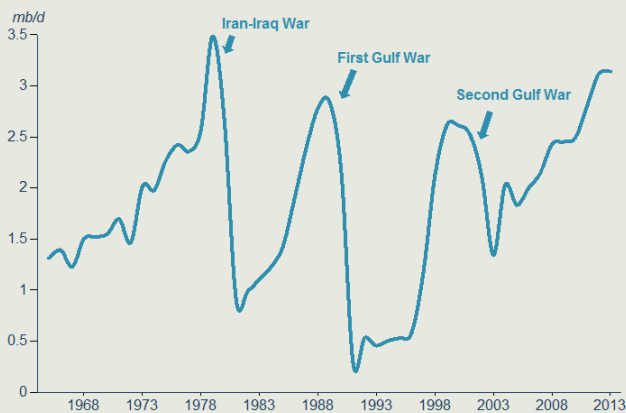
Source: BP, *Statistical Review of World Energy*, 2014.

Figure B2.2   **OPEC's incremental crude production capacity (mb/d)**
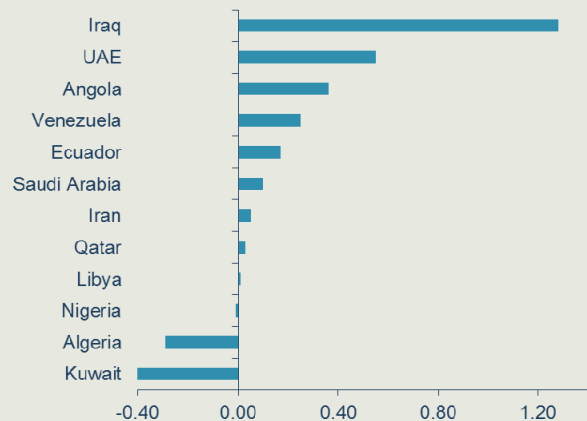
Source: International Energy Agency, *Medium-term Oil Market Report*, 2014.

Metals

The World Bank metals price index reached a high of 126 (2010 = 100) in February 2011, up 164 percent since its December 2008 low (figure 12). This increase, together with the sustained increases prior to the financial crisis generated large new investments and a strong supply response resulting in a cyclical decline since early 2011. Most of the additional metal supply went to meet demand from China, whose consumption share of world refined metals reached 47 percent at the end of 2013, up from 5 percent two decades ago.

The decline in prices continued in 2014Q2 with the World Bank metals price index declining 1 percent (q/q) in 2014Q2 on the continued excess supply for most metals. The bulk of the decline is accounted for by the steep drop in prices of iron ore (down 15 percent q/q) while base metals increased by 2 percent (q/q). The steep drop in iron ore prices for the second quarter in a row reflected expansion of low cost capacity in Australia and Brazil. On the demand side, Chinese imports weakened as growth of imports of aluminum, zinc, copper, nickel and iron ore has slowed to zero or turned negative in three months to May after experiencing growth rates in excess of 50 percent in second half of 2013 (figure 13).

Yet, the recent weakening in metals prices has not been broad-based. Prices of zinc, tin, aluminum, nickel increased by 2.1, 2.2, 5.3, and 26 percent respectively. Exceptions were lead and copper whose prices declined (0.2 and 3.3 percent respectively). Nickel's strength re-

flects Indonesia's export ban on unprocessed ore, in place since January 2014. Nickel, a key ingredient in stainless steel, has been plagued with chronic inventory and over-supply since the financial crisis in 2008. Even with the export ban in place, nickel inventories at the major metals exchanges are at record high and significant tightening of the market is not expected until 2015. Aluminum prices recorded their first quarterly increase after five consecutive quarters of declines as cuts in the production have started to filter to the markets. Copper prices declined, in part, due to a bonded warehouse financing probe over alleged pledging of metal multiple times as collateral for loans.

Global inventories of metals at major exchanges have declined by 9 percent during 2014Q2, but they are considered elevated by historical standards. For example, nickel inventories are up 63 percent at end-2014Q2 (y/y). Aluminum inventories, which have been rising since end-2008, decreased 7 percent during the same period, but they remain near their 10-year peaks. Inventories of lead, tin and zinc are all down (approximately 15-30 percent each) over a year ago, but nonetheless remain near their 10-year averages.

Metal prices are expected to decline by more than 6 percent in 2014 (which comes on top of last year's 5.5 percent drop) as new supplies will be coupled with weaker demand by China. Specifically, iron ore is expected to decline the most in 2014 (-26 percent), followed by copper (-5.6 percent), aluminum (-2.5 percent) and lead (-1 percent). Tin is not expected to change much while zinc and nickel are expected to gain 9 and 26 percent respectively.

Figure 12 **Metals indices**
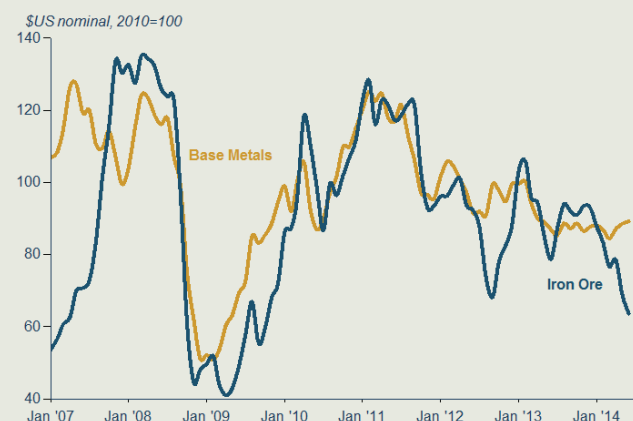
Source: World Bank.

Figure 13 **China's imports of metals**
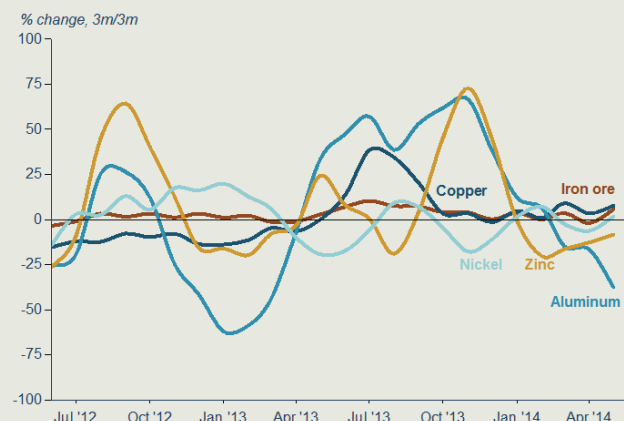
Source: China Customs, World Bank.

Precious metals

Following sharp declines in 2013, precious metal prices stabilized in 2014. The World Bank's precious metals price index declined 1 percent in 2014Q2 from the previous quarter (figure 14). The 4 percent decline in silver prices and 0.4 percent decline in the gold prices were offset by increases in platinum prices of 1.3 percent in 2014Q2.

After slashing their exposure to precious metals through exchange traded funds (ETFs) in 2013, investors found some appeal in gold in 2014 amid increased geopolitical risks. ETF holdings of gold are still down—16 percent lower in June 2014 from a year ago—but monthly outflows have slowed to less than 1 percent. Platinum prices have strengthened although the 5-month labor strikes in South Africa's mines have been resolved.

Despite the recent strength, the overall weakness in precious metals prices is likely to persist and the index is expected to average 12 percent lower in 2014 compared to 2013 as institutional investors will continue to consider them less attractive "safe haven" alternatives. Precious metals prices are expected to decline an additional 1.8 percent in 2015. Most risks are on the downside as economic conditions improve and the U.S. Federal Reserve eventually increases interest rates. Moreover, persistence of India's restrictions on gold imports to curb its current account deficit and China's efforts to regulate its "shadow banking" system may put additional downward pressure on prices given that gold has been used as collateral in financing deals.

Fertilizers

Fertilizer prices continued their slide in 2014Q2 by falling 6.5 percent, after a gain of 4.7 percent in 2014Q1 (figure 15). They have been on a decline for the seven of last eight quarters and they are 20 percent lower than a year ago (and more than 60 lower than its mid-2008 all-time high). Fertilizers are a key input to the production of grains and oilseeds, often exceeding half of purchased input costs. Because natural gas is an important input to some fertilizers, the recent energy revolution and its resulting lower natural gas prices in the U.S. is impacting the global fertilizer industry. Many fertilizer companies are moving their plants to the US in order to utilize lower natural gas prices. From a longer term perspective, this move is expected to put downward pressure on fertilizer prices.

The fertilizer price index is expected to decline almost 15 percent in 2014 and an additional 1.5 percent in 2015—this comes on top of the 17 decline in 2013. Among individual components of the index, phosphate rock is expected to decline 26 percent in 2014, followed by potash (down 21 percent), Urea (down 12 percent), TSP (down 6 percent), and DAP is not expected to change much. This outlook is based on the assumption the U.S natural gas prices will increase at a moderate pace.

Price risks in the fertilizer markets are balanced. Upside risks include higher than expected natural gas prices in the U.S. which may moderate the 'energy dividend' and hence lower the supply response. Also, stronger than expected demand growth by emerging economies where commercialization of agriculture (and hence more fertilizer use) could put upward pressure on fertilizer prices.

Figure 14   **Precious metal prices**
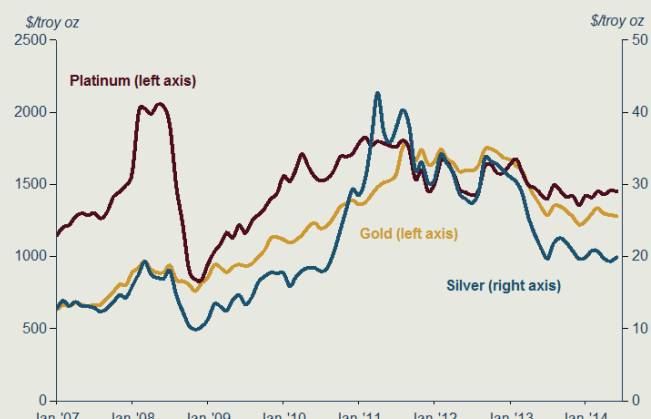
Source: World Bank.

Figure 15   **Fertilizer prices**
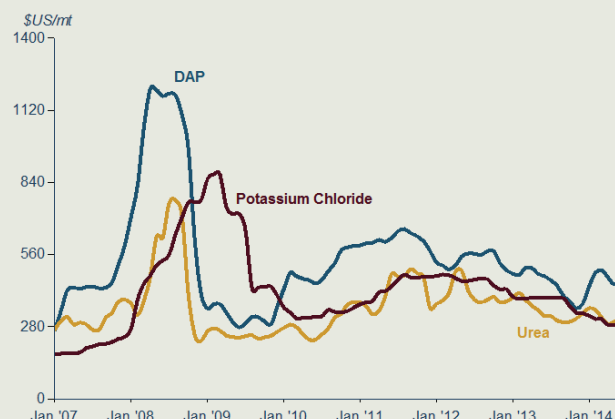
Source: World Bank.

Agriculture

Agricultural prices moved very little and in a mixed manner in 2014Q2. The overall agricultural price index is up 0.9 percent for the quarter but 0.8 percent lower than a year ago. Among key sub-indices, grains are up less than 1 percent for the quarter (20 percent lower than a year ago). Edible oils and meals declined more than 3 percent in 2014Q2 but they are up 3 percent since a year ago. Other food items increased 3 percent in the quarter (figure 16). Beverages prices gained 11 percent in 2014Q2 (up 26 percent from a year ago), due to a weather-induced rally in coffee (Arabica) prices.

In its July assessment (the third for the 2014/15 season), the U.S. Department of Agriculture has maintained its outlook for the upcoming season with global production of wheat, maize, and rice expected to decline (1.3, 0.4, and 0.5) (table 2). The stock-to-use (S/U) ratios, however, are expected to increase in maize and wheat but decline for rice (figure 17). The edible oil and meal outlook appears to be comfortable with global supplies for the 17 most consumed edible oils set to reach a record 202.3 million tons in 2014/15, up from current season's 197 million tons, a 2.7 percent increase. Global production of oilseeds is expected to increase as well, from 496 million tons in 2013/14 to almost 511 million tons in the next season.

Recent developments

Among key grains, the wheat market is still tight, as yields are projected to retreat from last year's record, causing production declines in the world's key suppliers (U.S. Canada, and Australia). Wheat prices strengthened in 2014Q2 (8 percent up for the quarter and 3 percent up for the year). Maize prices, which have been remarkably stable during the past three quarters (fluctuating around $200/ton), are down 27 percent from a year ago (figure 18). An expected 13 percent decline in Ukraine's maize production will be offset by a moderate increase in Argentina and the European Union, thus keeping the market balanced.

Rice prices averaged $393/ton during 2014Q2, the first time below the $400-mark since the spike of 2001Q4. The U.S. Department of Agriculture assessment puts the global rice production for the upcoming season at almost 480 million tons, up from current season's 477.5 tons, implying an S/U ratio of 22.7 percent, slightly lower than current season's 23.1 percent but well above the 2006/07 lows. In addition to well-supplied conditions, the rice

Figure 16 Agriculture price indices

$US nominal, 2010=100
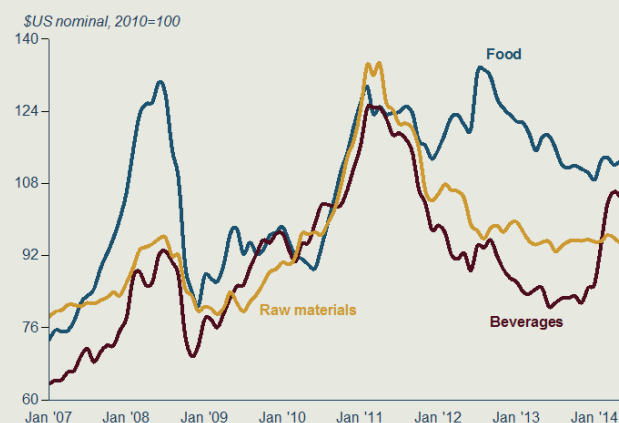
Source: World Bank.

Table 2 Global production (million tons)

	Maize	Rice	Wheat	Soybeans	Palm oil
1960/61	199.6	150.8	233.5	-	-
1970/71	268.1	213.0	306.5	42.1	1.9
1980/81	408.7	269.9	435.9	80.9	4.9
1990/91	482.0	351.4	588.8	104.3	11.0
2000/01	591.8	399.3	583.3	175.8	24.2
2005/06	700.7	417.9	618.9	220.9	35.8
2006/07	716.6	420.5	596.5	236.3	37.4
2007/08	795.5	432.9	612.7	219.0	41.2
2008/09	800.9	449.1	683.5	211.9	44.2
2009/10	825.6	440.9	687.1	260.5	46.1
2010/11	835.9	449.9	650.8	263.9	48.8
2011/12	889.3	466.9	696.0	239.5	52.1
2012/13	868.8	471.7	657.7	268.0	56.0
2013/14	984.4	477.5	714.2	283.9	59.3
2014/15	981.0	479.4	705.2	304.8	62.8

Source: U.S. Department of Agriculture (July 2014 update).

Figure 17 Stocks-to-use ratios for wheat, maize, and rice

percent
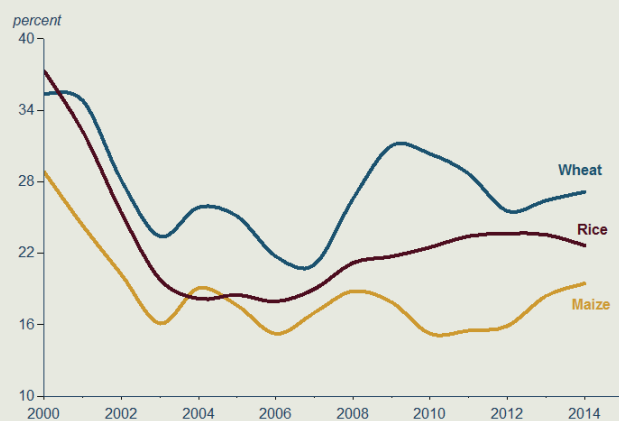
Source: U.S. Department of Agriculture (July 2014 update).

Figure 18   **Grain prices**
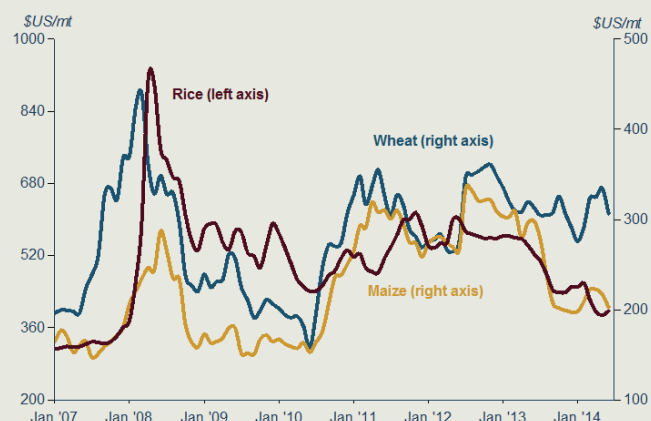
Source: World Bank.

Figure 19   **Edible oil prices**
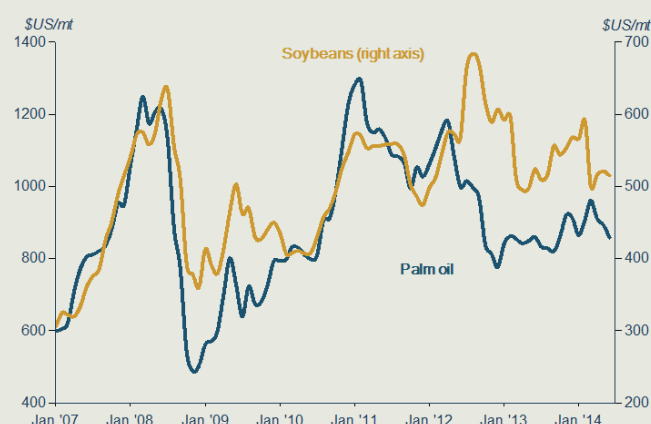
Source: World Bank.

Figure 20   **Beverage prices**
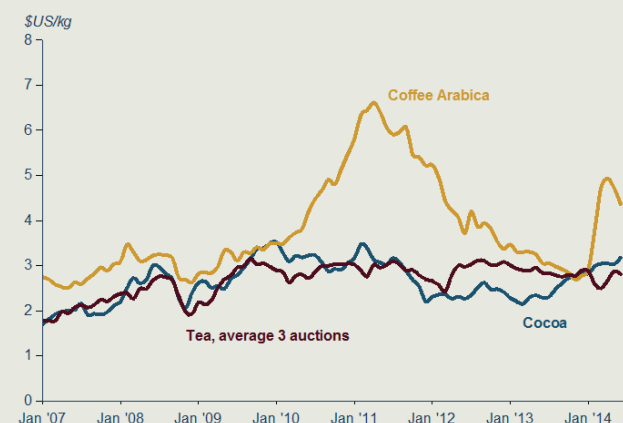
Source: World Bank.

market has been subjected to considerable stockpiling by the Thai government. If stocks are released, rice prices may come under further downward pressure.

The edible oil and meal index declined 3.3 percent in 2014Q2, led by a sharp decline in soybean prices, 6 percent down for the quarter (figure 19). The weakness in soybean prices reflects record area expansion, with global production projected to reach an all-time peak both among producers in the U.S. and South America.

The beverage price index has been the big mover of the quarter, 11 percent up since 2014Q1 and 26 percent higher than a year ago, mostly aided by a rally in coffee (Arabica) prices (figure 20). Because of drought in Brazil, the world's largest coffee supplier, the global coffee market will experience a deficit of almost 2 million bags. Coffee (Robusta) and cocoa prices gained ground as well, up 6 and 5 percent, respectively, also reflecting tighter expected supplies for the upcoming season.

The raw material price index has been remarkably stable during the past two quarters with the various timber prices moving in a mixed manner and natural rubber along with cotton weakening marginally towards the end of 2014Q2 (figure 21). The relative weakness of natural rubber prices (they are down almost 70 percent since their record high in early 2012) reflects slowing tire demand in emerging economies, especially China—most natural rubber goes to tire production. Cotton prices, on the other hand had been aided by massive purchases by China, mostly for stockpiling purposes—currently China accounts for almost 60 percent of global cotton stocks, pushing the S/U ratio to 85 percent, the highest of the sector's history. However, as Chinese purchases slowed, cotton prices began weakening.

Outlook and risks

Agricultural commodity prices are expected to decline 1.4 percent in 2014. Food commodity prices are expected to decline 4.7 percent (grains take the largest hit, -13.6 percent) while prices of edible oils and meals will not change much. The largest decline among food commodities will be in the grain group with maize and rice (both very well supplied markets) down about 18 percent each—wheat will decline marginally. While edible oils and meals will change little at the aggregate, palm oil and coconut oil will increase 3 percent each while soybean oil will decline by more than 9 percent. Likewise raw materials are not expected to change much at the aggregate but a large decline in natural rubber (-21 percent) will be balanced by moderate increases in Logs, Cameroon (2.5 percent) and Sawnwood, Malaysia (6.7 percent).

A number of assumptions (along with associated risks) underpin the agricultural commodity outlook. They include crop conditions, energy prices, biofuels, and trade policies. On crop conditions, it is assumed that the 2014/15 season's outlook will be along normal trends. In its July 2014 assessment, the U.S. Department of Agriculture estimated the 2014/14 crop season's grain supplies (production plus stocks of maize, wheat, and rice) at 2.65 billion tons, similar to current season's crop and 5 percent higher than last season's crop. The level of supplies is deemed adequate to maintain S/U ratios at normal levels, following the historical lows reached a few years ago. Yet, upside price risks exist, especially towards the end of the calendar year, should 2014 become an El Nino year. If so, the markets of rice, wheat, and some edible oils may experience production shortfalls.

Although oil prices will remain elevated at $106/bbl in 2014 (declining to $104/bbl in 2015), fertilizer prices are expected to decline considerably, 15 percent this year followed by another (marginal) decline next year. Given the high energy intensity of agriculture (it is estimated to be 4 to 5 times more energy intensive than manufacture), the easing of fertilizer prices (some of which are closely linked to natural gas prices) will relieve some of the input price pressure that most food commodities have been subjected during the past decade.

The outlook also assumes that biofuels will continue to play a key role in the behavior of agricultural commodity markets but less so than in the recent past. Currently, production of biofuels corresponds to about 1.3 mb/d of crude oil in energy-equivalent terms, up from 0.3 mb/s a decade ago (figure 22). Biofuels are projected to grow moderately over the projection period (much slower than earlier assessments) as policy makers realize that the environmental and energy independence benefits of biofuels do not outweigh their costs. Indeed, global production of biofuels increased little during the past 3 years.

The outlook assumes that policy responses (especially export bans) are unlikely to affect agricultural markets, especially if they are well-supplied, which is currently the case. If the baseline outlook for production materializes, then policy actions are unlikely and, if they take place, they will be isolated events with minimal impact.

Last investment fund activity which was on the rise until 2012, has stabilized (figure 23). According to Barclayhedge, which tracks developments in the hedge fund industry, assets under management in commodities (most of which have been invested in energy and agricultural markets) have been remarkably stable during the past three years. In fact, they ended 2014Q1 at $325 billion, a 6-quarter low.

Figure 21   **Raw material prices**
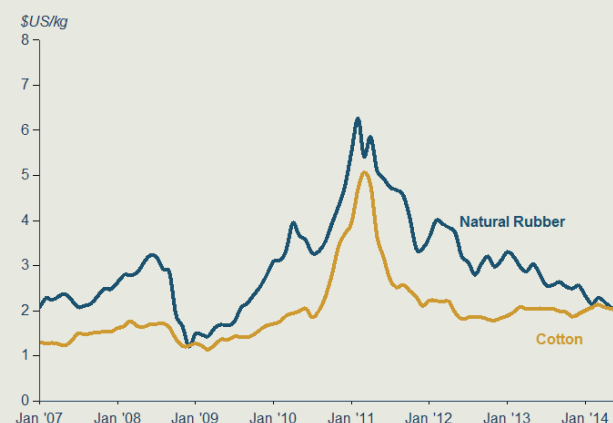
Source: World Bank.

Figure 22   **Biofuels production**
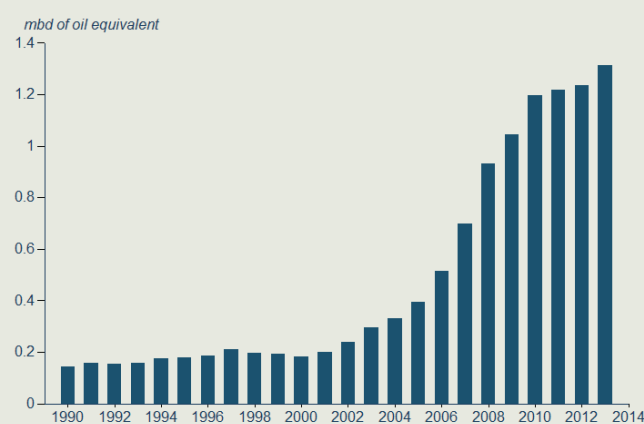
Source: International Energy Agency, BP.

Figure 23   **Assets under management**
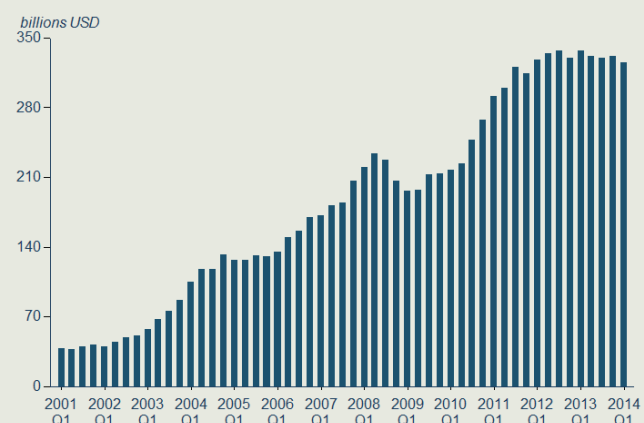
Source: Barclayhedge.

Table 3	Wholesale grain prices		

	2014Q2/ 2014Q1	2014Q2/ 2013Q2	2012Q3-2014Q2/ 2006Q3-2007Q2
Maize (20 countries)			
World (US$)	2.0	-26.5	49.8
Ukraine	61.0	18.7	90.7
Honduras	25.5	-17.5	23.5
Nicaragua	20.2	-5.6	53.4
Uganda	19.3	23.2	151.6
Peru	18.0	5.2	25.6
Guatemala	16.9	-1.5	25.2
El Salvador	15.1	3.0	-5.9
Thailand	12.8	-8.3	23.3
Ethiopia	9.4	-3.4	162.4
Dominican Republic	7.3	3.8	55.5
Kenya	5.2	11.5	121.0
Philippines	5.0	8.5	39.0
Rwanda	3.7	-5.4	66.1
Colombia	2.7	-5.8	-0.6
Panama	0.1	1.8	65.2
Mexico	-0.3	-7.5	62.9
Bolivia	-12.8	-0.6	36.2
Nigeria	-13.9	-22.4	77.5
Mozambique	-18.5	-13.9	94.3
Tanzania	-24.3	0.1	167.4
Median	**6.2**	**-1.0**	**59.2**
Wheat (6 countries)			
World (US$)	8.4	2.6	17.8
Ukraine	18.4	28.4	131.5
Bangladesh	10.2	6.1	250.9
Sudan	5.3	1.3	-16.6
India	4.1	10.8	32.6
Ethiopia	0.0	9.5	63.3
Bolivia	-7.9	-6.3	20.2
Median	**4.7**	**7.8**	**48.0**
Rice (19 countries)			
World (US$)	-11.3	-27.4	22.6
El Salvador	11.3	13.7	13.5
Nicaragua	4.4	12.7	67.6
Philippines	3.8	28.7	38.8
Peru	3.3	34.1	11.2
Mali	2.6	-2.0	21.4
India	1.4	-1.8	75.2
Panama	0.8	2.5	46.0
Guatemala	0.8	2.0	33.8
Rwanda	0.4	-10.9	63.6
Niger	0.0	-10.2	30.8
Uruguay	0.0	16.7	40.2
Uganda	-3.7	2.6	144.7
Djibouti	-3.8	-3.8	9.3
Dominican Republic	-4.0	4.3	19.4
Bangladesh	-4.0	10.2	29.9
Bolivia	-5.7	-1.4	30.6
Burkina Faso	-10.3	-9.5	49.0
Cambodia	-11.1	-11.1	33.7
United Rep. of Tanzania	-16.1	-17.1	105.2
Median	**0.0**	**2.0**	**33.8**

Source: FAO GIEWS Food Price Database
(http://www.fao.org/giews/pricetool/).

Trends in domestic prices

The discussion so far focused on world price movements in U.S. dollar terms. However, the price consumers pay in their home countries (in local currencies) differs considerably from international prices, especially in the short term. Reasons for this include exchange rate movements, trade policies, the distance of domestic trading centers (which add considerably to transaction costs), quality differences, and composition of commodity baskets across countries.

Table 3 reports changes in domestic wholesale prices of three internationally traded commodities (maize, wheat, and rice) for a set of low and middle income countries—the selection of countries was driven by data availability. These changes are compared to the corresponding changes in world prices, reported in the top row of each panel. The periods chosen are 2014Q2 against 2014Q3 (capturing short run responses) and against 2013Q2 (intended to capture medium term effects). The table also reports price changes between 2012Q3-2014Q2 and six years ago, effectively capturing the entire commodity price boom period.

World prices of the three grains changed in a mixed manner between the first and second quarter of 2014: little change in maize, wheat up 8.4 percent, rice down more than 11 percent while the median domestic price changes were 6.2, 4.7, and no change, respectively. However, there was large variation across countries, especially in maize, from a –24.3 in Tanzania to 61 percent in Ukraine. A mixed picture emerges when 2014Q2 is compared to the same quarter of last year. A large decline in in world maize and prices, -26.5 and -27.4 percent, respectively, compared to only marginal changes in the median. The last column of table 3, which reports price changes between 2012Q3-2014Q2 and six years ago, a period long enough not to be affected by the presence of lags in any significant way, shows that domestic and international prices have moved in the same direction.

To analyze the reasons behind the delays in adjustment between domestic and world food commodity prices, Box 3 examines maize price movements in Tanzania for the 8-year period, 2005-13. The box shows that Tanzania maize prices are weakly linked to external markets (proxied by Nairobi) in the long term. It confirms that short term price movements are influenced by a host of factors, including trade policies, weather, poor storage and transportation bottlenecks due to seasonality, fuel prices, and urban inflation (proxy for other costs).

Box 3 **Domestic drivers play a much more important role in Tanzania's maize prices than external factors**

This box examines the key drivers of maize prices in 18 Tanzanian markets. It concludes that, in the long run, domestic prices are weakly influenced by external markets (proxied by Nairobi) but short-run price movements are driven by a number of domestic factors. Discretionary trade policies delay in the adjustment of maize prices towards long-run equilibrium. The short-run influence of weather shocks on local prices is also more pronounced during periods in which an export ban is imposed. Harvest cycles, which have a strong influence on maize prices, signal the importance of improving storage and transportation in order to reduce seasonal price fluctuations which currently vary by 40 percent from trough to peak. Urban inflation (proxy for non-energy input costs) and (less so) fuel prices were also found to be key drivers of maize prices.

External drivers

An econometric model examined the relationship between the 18 Tanzania maize markets and three external ("world") prices, namely, Nairobi, South Africa, and U.S. Gulf. Results show that the relationship between Tanzanian and Nairobi maize prices is the strongest of the three external markets (table B3.1 shows the econometric results and figure B3.1 depicts the 19 Tanzania maize markets). U.S. Gulf maize prices were also found to have significant impacts on Tanzanian prices although not as strong as Nairobi. The price relationship between Tanzanian and South African markets was weaker than for the other markets (only results with Nairobi are reported in this box). An exception to the relationship between Tanzanian and Nairobi maize prices were the southern regions of Tanzania where prices were more influenced by prices in Nampula, the key maize market in northern Mozambique (Tschirley and Jayne 2009, Haggblade 2013). The price adjustments with Nampula were much stronger than for Nairobi for regions in the southern zone and especially for the coastal regions of Mtwara and Lindi. This confirms earlier findings that coastal trade is an important transmission mechanism connecting northern Mozambique with the southern markets (Iliffe 1979).

Table B3.1 **Parameter estimates, error correction model, panel specification**

VARIABLES	Central	Coastal	Lake	Northern	Southern	National
μ	-0.02***	-0.00	-0.02**	-0.02***	-0.05***	-0.02***
	(4.07)	(0.87)	(2.08)	(2.68)	(3.15)	(4.03)
$p_{t-1}^W - p_{t-1}^i$	0.12***	0.13***	0.18***	0.11***	0.12***	0.13***
	(5.36)	(6.81)	(4.78)	(11.58)	(5.61)	(11.74)
Δp_t^W	0.08**	0.04	0.17***	0.25***	0.09**	0.12***
	(2.17)	(0.52)	(2.59)	(28.95)	(2.50)	(4.36)
Δp_t^F	0.33***	0.11	0.31***	0.25***	0.07	0.20***
	(10.58)	(1.11)	(4.08)	(7.90)	(0.79)	(4.52)
Δp_t^I	2.85***	1.45***	2.56***	2.68***	1.40***	2.13***
	(19.61)	(2.85)	(7.21)	(6.72)	(4.60)	(9.34)
$SEASON_t^1$	-0.02**	-0.05***	-0.03***	0.00	-0.05***	-0.03***
	(2.05)	(4.26)	(10.63)	(0.11)	(4.91)	(5.50)
$SEASON_t^2$	0.04***	0.05***	0.01**	0.04***	0.03***	0.03***
	(7.49)	(11.22)	(2.22)	(3.09)	(2.94)	(6.92)
BAN	-2.77***	-3.88***	-3.77***	-4.48***	-2.68***	-3.47***
	(14.68)	(13.59)	(25.18)	(7.81)	(2.66)	(11.02)
$NDVI$	-0.60***	-0.45***	-0.36***	-0.60***	-0.68***	-0.54***
	(10.08)	(4.05)	(4.55)	(9.90)	(4.51)	(9.14)
R-squared	0.31	0.29	0.25	0.31	0.21	0.23

Notes: The dependent variable is the change in the nominal price in market i. All regressions employ a fixed effects methodology with bootstrapped standard errors (100 replications). Z statistics are reported below the coefficients (in parenthesis). All regressions have market dummies. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. p_t^i and p_t^w denote the nominal price in domestic market i and the world at time t; p_t^F and p_t^I denote the price of fuel and urban consumer price index; $SEASON_t^1$ and $SEASON_t^2$ denote seasonality and are set to $SINE[2\pi t/12]$ and $COSINE[2\pi t/12]$. BAN is the export ban taking the value of one when effective and zero otherwise. $NDVI_t$ represents the Normalized Difference Vegetation Index anomaly, a weather proxy. Last, μ and the γ's are parameters to be estimated while ε_t^i denotes the error term. All prices have been expressed in logarithms. Detailed results on individual markets along with robustness tests can be found in Baffes, Kshirsagar and Mitchell (2014). Regions (markets) are as follows: Central (Dodoma, Singida, Tabora); Coastal (Dar es Salaam, Lindi, Morogoro, Mtwara); Lake (Bukoba, Musoma, Mwanza, Shinyanga); Northern (Arusha, Moshi, Tanga); and Southern (Iringa, Mbeya, Songea, Sumbawanga). The analysis, which is based on an error-correction model (Baffes and Gardner 2003), was applied to 18 Tanzanian maize prices and uses monthly data from January 2005 to October 2013.

Figure B3.2, which shows the cumulative price adjustment taking place within the first three months due to an external shock confirms the slow nature of the adjustment process. For example, in only two markets (Bukoba and Musoma) the adjustment exceeds 50 percent while in another four markets (Tanga, Arusha, Dar es Salaam, and Moshi) it exceeds 35 percent. Although the six markets are mixed in terms of whether the respective region is surplus or deficit, they all share the characteristic of being in proximity to Nairobi or having access to a port. There is considerable regional variation as well—the cumulative 3-month adjustment ranges from 65 percent in Bukoba (Lake region) to 14 percent in Morogoro and Dodoma (both in the Southern region).

A number of key conclusions emerge from the price transmission analysis. First, of the three external markets considered, only Nairobi exerts (a moderate) influence on Tanzanian prices in the long term. Second, the southern regions are more closely linked to markets in northern Mozambique than Nairobi. Third, the markets that adjust most quickly to external price changes all are in proximity to Nairobi or have access to a port. From a policy perspective, the results imply that concerns emanating from the impact of short term and temporary spikes in world prices on domestic food markets of developing countries suggest a different interpretation.

Domestic drivers

During 2005-13 the government of Tanzania imposed five export bans. The first and second bans spanned January 2005 to January 2007 with only a 3-month hiatus at the beginning of 2006. A 5-month export ban was in place in 2008, and a ban which lasted almost 2-years was in effect during 2009 and 2010. The duration of the last ban during this period was less clear—it was announced in March 2011, but only became effective in July and its removal was announced in October 2011 but ended in December 2011. The export bans (with the exception of the first one) appear to have been introduced at times of high maize prices, and their removal took place when prices were low (figure B3.3). This is consistent with trade policy responses undertaken by numerous developing countries during the past decade's elevated food prices.

The parameter estimate of the export ban was highly significant in all six regions, with the coefficient of the Northern markets being almost twice as large as the Southern markets (-4.48 versus -2.68). The estimate was not significantly different from zero in six markets (based on market-specific regressions, not reported here). Three of these six markets where the export ban was not found to be effective (Iringa, Mbeya, Mtwara, Singida, Songea, and Tabora) are located in the South, implying that the ban may be not be effective in these markets, most likely due to inadequate monitoring of trade routes. The results of the effect of the export ban are consistent with earlier literature (see, for example, Ihle, von Cramon-Taubadel, and Zorya (2009) for Tanzania; Götz, Glauben, and Brümmer (2013) for Russia).

Figure B3.1 **Distribution of Maize Production in Tanzania**
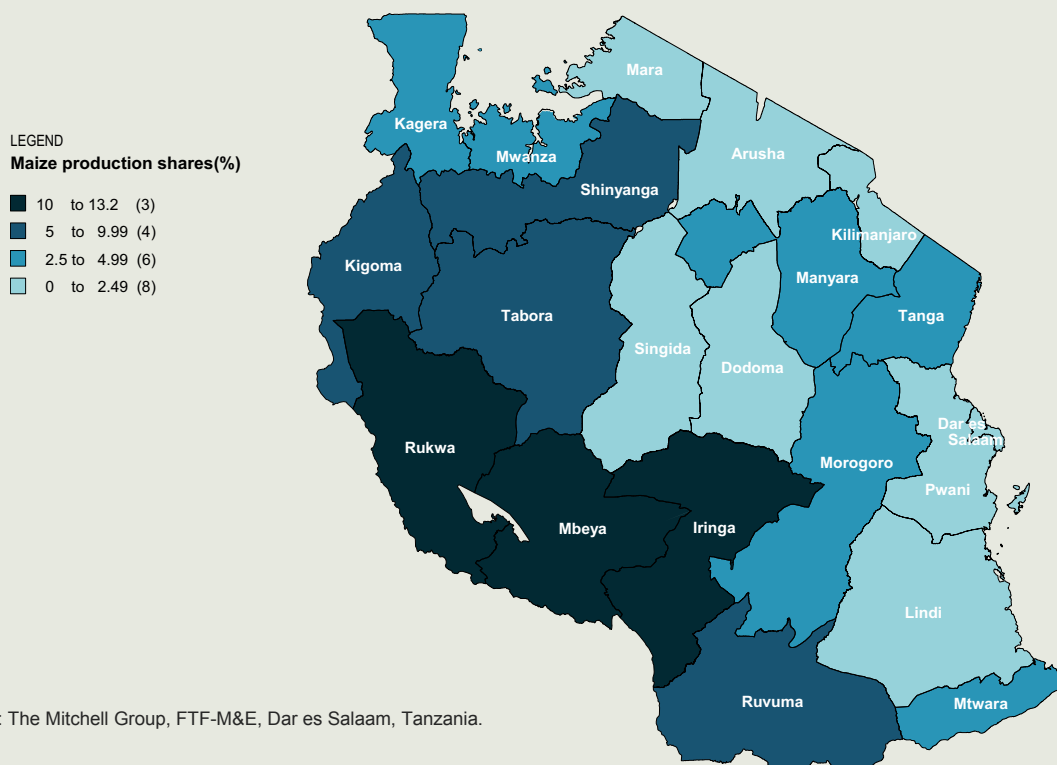
Source: The Mitchell Group, FTF-M&E, Dar es Salaam, Tanzania.

Because Tanzania's rural economy (as is the case with most developing countries) is characterized by limited storage facilities and transport bottlenecks, harvests are likely to have pronounced impacts on local food prices. To account for such factors, the seasonal effect is controlled using trigonometric variables that can capture complex seasonal patterns (Stoffer and Shumway 2010). This specification can capture a wide variety of agroclimatic conditions, including bimodal maize production pattern (e.g. Moshi) or patterns that are characterized by unimodal production with one additional non-maize harvest (e.g. Songea). Although most of the seasonality parameter estimates were significant at the 1 percent level, there was considerable variation across regions. The Southern and Coastal markets are characterized by a strong seasonal price pattern while Northern markets exhibited lower degree of seasonality. But, there was variation even within regions. For example, prices in Arusha and Moshi, exhibited no seasonality while those in Musoma, Mwanza, and Singida exhibited a weak seasonality pattern. At the other end of the spectrum, most southern and lake zone markets exhibited strong seasonality patterns. On a cumulative basis, seasonality could induce prices to be 20 percent lower in May compared to February and 20 percent higher in November compared to September (e.g., Songea). Such cyclicality is consistent with, approximately, a 40 percent gap between lean season's peak and the harvest season bottom (figure B3.4).

Last, weather is expected to have an inverse relationship with domestic maize prices since improved weather conditions depress local prices and vice versa. Weather appears to affect maize prices 13 markets, including several food deficit regions. The exceptions are Bukoba and Musoma (located near Lake Victoria), Lindi and Mtwara (which have access to sea ports), and Iringa. The relatively isolated and surplus markets in the Southern Highlands (Songea and Sumbawanga), exhibited the strongest response to weather anomalies—more than twice the average due to their weak linkages with other markets. In 15 out of the 18 markets, weather shocks induce strong price responses during periods of export bans. In Songea, an isolated food surplus market in the Southern Highlands, a 10 percent positive weather shock is associated with an immediate 11 percent price decline (this is compounded by typical seasonal declines); the same positive shock has no discernable influence on maize prices in periods with no export bans. This is because domestic markets in Tanzania are saturated during export bans and the excess production cannot be absorbed domestically.

The ways in which Tanzanian maize prices respond to external and domestic factors have important policy implications. An export ban—which is more effective in the North—amplifies local price movements. In contrast, it appears to have no effect on trade between Southern markets and Mozambique and therefore does not influence price behavior in these markets. Thus, markets with pronounced seasonality and greater sensitivity to weather are likely to be more seriously affected if climatic changes intensify. For example, Rowhani et al (2011) show maize yields in Tanzania are impacted by both shifts in the growing season as well as increasing intra-seasonal variability. Therefore, international and inter-regional trade may serve to mitigate the impacts of seasonality and weather shocks (Burgess and Donaldson 2010).

Figure B3.2   **Price adjustment achieved within three months**
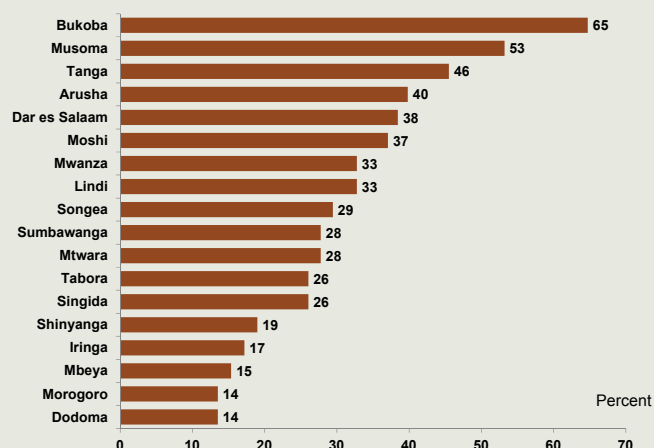
Source: Baffes, Kshirsagar, and Mitchell (2014).

Figure B3.3   **Maize prices in Dar es Salaam and export bans**
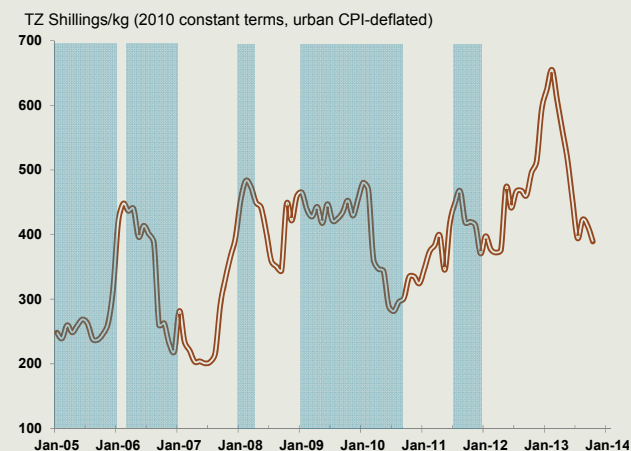
Source: Baffes, Kshirsagar, and Mitchell (2014).

Figure B3.4   **Seasonal influence on maize price changes**
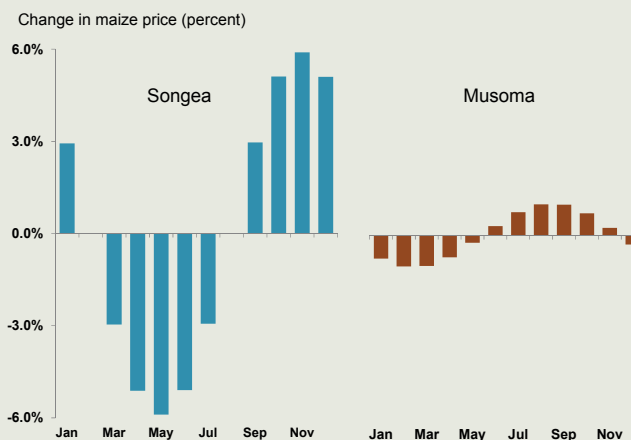
Source: Baffes, Kshirsagar, and Mitchell (2014).

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Historical commodity prices and price forecasts

Table A1.1 — World Bank commodities price data

Commodity	Unit		Annual Averages Jan-Dec 2011	Annual Averages Jan-Dec 2012	Annual Averages Jan-Dec 2013	Quarterly Averages Apr-Jun 2013	Quarterly Averages Jul-Sep 2013	Quarterly Averages Oct-Dec 2013	Quarterly Averages Jan-Mar 2014	Quarterly Averages Apr-Jun 2014	Monthly Averages Apr 2014	Monthly Averages May 2014	Monthly Averages Jun 2014
Energy													
Coal, Australia	$/mt	a/	121.4	96.4	84.6	86.1	77.3	82.0	77.1	72.7	72.8	73.7	71.5
Coal, Colombia	$/mt		111.5	84.0	71.9	71.3	65.8	71.1	68.4	64.8	64.5	66.6	63.3
Coal, South Africa	$/mt		116.3	92.9	80.2	80.4	72.9	83.0	78.4	75.0	75.1	75.8	74.1
Crude oil, average	$/bbl		104.0	105.0	104.1	99.3	107.4	104.5	103.7	106.3	104.9	105.7	108.4
Crude oil, Brent	$/bbl	a/	110.9	112.0	108.9	103.0	110.1	109.4	107.9	109.8	107.8	109.7	111.9
Crude oil, Dubai	$/bbl	a/	106.0	108.9	105.4	100.8	106.2	106.7	104.4	106.1	104.7	105.6	108.0
Crude oil, WTI	$/bbl	a/	95.1	94.2	97.9	94.2	105.8	97.4	98.7	103.1	102.1	101.9	105.2
Natural gas, Index	2010=100		108.5	99.2	112.1	118.6	108.3	111.9	127.8	115.6	119.2	115.1	112.4
Natural gas, Europe	$/mmbtu	a/	10.5	11.5	11.8	12.4	11.5	11.4	11.3	10.2	10.7	10.2	9.8
Natural gas, US	$/mmbtu	a/	4.0	2.8	3.7	4.0	3.6	3.9	5.2	4.6	4.7	4.6	4.6
Natural gas, LNG Japan	$/mmbtu	a/	14.7	16.6	16.0	16.3	15.6	15.7	16.7	16.0	16.8	16.1	15.2
Non Energy Commodities													
Agriculture													
Beverages													
Cocoa	$/kg	b/	2.98	2.39	2.44	2.31	2.47	2.77	2.95	3.08	3.05	3.03	3.17
Coffee, arabica	$/kg	b/	5.98	4.11	3.08	3.20	2.98	2.77	3.82	4.67	4.93	4.72	4.36
Coffee, robusta	$/kg	b/	2.41	2.27	2.08	2.14	2.04	1.85	2.12	2.26	2.33	2.27	2.18
Tea, average	$/kg		2.92	2.90	2.86	2.89	2.79	2.82	2.65	2.79	2.67	2.87	2.81
Tea, Colombo auctions	$/kg	b/	3.26	3.06	3.45	3.29	3.37	3.77	3.72	3.60	3.55	3.67	3.58
Tea, Kolkata auctions	$/kg	b/	2.78	2.75	2.73	3.04	2.76	2.56	1.94	2.77	2.38	2.98	2.96
Tea, Mombasa auctions	$/kg	b/	2.72	2.88	2.40	2.35	2.23	2.14	2.29	1.98	2.09	1.96	1.91
Food													
Oils and Meals													
Coconut oil	$/mt	b/	1,730	1,111	941	839	912	1,175	1,343	1,389	1,356	1,404	1,406
Copra	$/mt		1,157	741	627	560	603	791	896	923	905	930	934
Fishmeal	$/mt		1,537	1,558	1,747	1,821	1,699	1,600	1,583	1,693	1,658	1,656	1,765
Groundnuts	$/mt		2,086	2,175	1,378	1,400	1,380	1,370	1,329	1,224	1,243	1,200	1,228
Groundnut oil	$/mt	b/	1,988	2,436	1,773	1,860	1,694	1,537	1,311	1,228	1,174	1,200	1,310
Palm oil	$/mt	b/	1,125	999	857	850	827	897	911	887	911	893	858
Palmkernel oil	$/mt		1,648	1,110	897	836	871	1,057	1,278	1,263	1,299	1,254	1,235
Soybean meal	$/mt	b/	398	524	545	528	552	570	582	566	566	579	553
Soybean oil	$/mt	b/	1,299	1,226	1,057	1,070	1,006	991	977	967	999	965	936
Soybeans	$/mt	b/	541	591	538	505	527	555	552	517	516	521	515
Grains													
Barley	$/mt	b/	207.2	240.3	202.2	230.4	191.0	150.7	129.5	137.9	135.9	145.0	132.6
Maize	$/mt	b/	291.7	298.4	259.4	291.3	241.9	199.4	209.9	214.0	222.4	217.3	202.4
Rice, Thailand 5%	$/mt	b/	543.0	563.0	505.9	541.6	477.3	442.7	443.7	393.3	395.0	388.0	397.0
Rice, Thailand 25%	$/mt		506.0	543.8	473.0	509.4	435.7	408.9	375.0	351.3	352.0	346.0	356.0
Rice, Thailand A1	$/mt		458.6	525.1	474.0	511.1	440.5	411.8	426.7	397.8	399.3	391.6	402.6
Rice, Vietnam 5%	$/mt		513.6	434.4	392.4	387.8	383.1	397.2	391.2	388.6	370.9	390.5	404.5
Sorghum	$/mt		268.7	271.9	243.3	259.9	219.2	202.1	224.2	219.4	232.4	221.0	204.7
Wheat, US HRW	$/mt	b/	316.3	313.2	312.2	313.8	305.8	308.0	297.1	322.1	324.9	334.7	306.5
Wheat, US SRW	$/mt		285.9	295.4	276.7	275.2	257.7	276.4	264.0	263.7	277.1	277.2	236.6
Other Food													
Bananas, EU	$/kg		1.12	1.10	1.02	1.07	0.98	0.94	1.05	1.14	1.23	1.12	1.07
Bananas, US	$/kg	b/	0.97	0.98	0.92	0.91	0.93	0.93	0.95	0.92	0.93	0.91	0.93
Meat, beef	$/kg	b/	4.04	4.14	4.07	4.11	3.89	4.03	4.23	4.30	4.22	4.28	4.41
Meat, chicken	$/kg	b/	1.93	2.08	2.29	2.29	2.34	2.31	2.31	2.40	2.36	2.40	2.44
Meat, sheep	$/kg		6.63	6.09	5.65	5.45	5.56	6.06	6.32	6.70	6.45	6.82	6.85
Oranges	$/kg	b/	0.89	0.87	0.97	1.07	1.14	0.83	0.80	0.82	0.84	0.86	0.76
Shrimp, Mexico	$/kg		11.93	10.06	13.84	12.24	15.15	16.70	17.09	17.75	17.09	18.08	18.08
Sugar, EU domestic	$/kg	b/	0.45	0.42	0.43	0.43	0.43	0.44	0.45	0.45	0.45	0.45	0.44
Sugar, US domestic	$/kg	b/	0.84	0.64	0.45	0.43	0.45	0.46	0.47	0.55	0.53	0.54	0.56
Sugar, World	$/kg	b/	0.57	0.47	0.39	0.39	0.38	0.39	0.37	0.40	0.39	0.40	0.40

Commodity	Unit		Annual Averages			Quarterly Averages					Monthly Averages		
			Jan-Dec 2011	Jan-Dec 2012	Jan-Dec 2013	Apr-Jun 2013	Jul-Sep 2013	Oct-Dec 2013	Jan-Mar 2014	Apr-Jun 2014	Apr 2014	May 2014	Jun 2014
Raw Materials													
Timber													
Logs, Cameroon	$/cum		484.8	451.4	463.5	457.4	464.1	476.5	479.6	480.0	483.5	480.9	475.7
Logs, Malaysia	$/cum	b/	390.5	360.5	305.4	301.8	301.1	296.3	289.8	291.5	290.3	292.5	291.7
Plywood	¢/sheets		607.5	610.3	560.2	553.5	552.3	543.6	531.5	534.7	532.5	536.5	535.1
Sawnwood, Cameroon	$/cum		825.8	759.3	749.2	736.2	743.8	776.0	792.9	806.5	802.2	807.1	810.0
Sawnwood, Malaysia	$/cum	b/	939.4	876.3	852.8	837.4	846.0	882.7	901.9	917.3	912.5	918.1	921.3
Woodpulp	$/mt		899.6	762.8	823.1	818.7	830.9	858.7	870.2	887.5	875.0	912.5	875.0
Other Raw Materials													
Cotton, A Index	$/kg	b/	3.33	1.97	1.99	2.04	2.02	1.92	2.07	2.04	2.08	2.04	2.00
Rubber, RSS3	$/kg	b/	4.82	3.38	2.79	2.91	2.59	2.53	2.25	2.12	2.20	2.07	2.09
Rubber, TSR20	$/kg		4.52	3.16	2.52	2.45	2.35	2.31	1.98	1.73	1.78	1.70	1.71
Fertilizers													
DAP	$/mt	b/	618.9	539.8	444.9	489.8	432.1	366.1	476.1	458.9	470.6	444.6	461.5
Phosphate rock	$/mt	b/	184.9	185.9	148.1	166.3	143.2	110.0	104.4	110.0	108.0	112.0	110.0
Potassium chloride	$/mt	b/	435.3	459.0	379.2	392.3	391.9	341.6	314.0	287.0	287.0	287.0	287.0
TSP	$/mt	b/	538.3	462.0	382.1	426.0	366.0	301.3	365.9	369.2	371.3	365.0	371.3
Urea, E. Europe	$/mt	b/	421.0	405.4	340.1	342.4	307.5	313.9	337.5	296.0	291.1	299.1	297.9
Metals and Minerals													
Aluminum	$/mt	b/	2,401	2,023	1,847	1,836	1,783	1,767	1,709	1,800	1,811	1,751	1,839
Copper	$/mt	b/	8,828	7,962	7,332	7,161	7,086	7,163	7,030	6,795	6,674	6,891	6,821
Iron ore	$/dmt	b/	168	128	135	125	133	135	120	103	115	101	93
Lead	$/mt	b/	2,401	2,065	2,140	2,053	2,102	2,114	2,101	2,097	2,087	2,097	2,107
Nickel	$/mt	b/	22,910	17,548	15,032	14,967	13,956	13,909	14,661	18,468	17,374	19,401	18,629
Tin	$/mt	b/	26,054	21,126	22,283	20,902	21,314	22,897	22,636	23,146	23,405	23,271	22,762
Zinc	$/mt	b/	2,194	1,950	1,910	1,842	1,861	1,909	2,026	2,071	2,027	2,059	2,128
Precious Metals													
Gold	$/toz	c/	1,569	1,670	1,411	1,415	1,329	1,271	1,293	1,289	1,298	1,289	1,279
Platinum	$/toz	c/	1,719	1,551	1,487	1,466	1,451	1,396	1,427	1,446	1,430	1,456	1,453
Silver	$/toz	c/	35.2	31.1	23.8	23.2	21.4	20.8	20.5	19.7	19.7	19.3	19.9
World Bank commodity price indices for low and middle income countries (2010=100)													
Energy			128.7	127.6	127.4	123.1	130.2	127.7	128.3	129.6	128.5	129.0	131.4
Non Energy Commodities			119.8	109.5	101.7	101.7	99.2	98.6	99.2	99.3	99.9	99.7	98.1
Agriculture			121.6	114.5	106.3	107.3	104.3	103.6	105.5	106.4	107.2	107.1	105.0
Beverages			116.0	92.6	83.3	83.3	82.2	83.1	94.5	104.7	106.1	105.1	102.9
Food			122.5	124.5	115.6	117.4	113.2	111.2	111.9	111.4	112.1	112.6	109.6
Fats and Oils			120.5	126.1	115.9	112.7	113.8	119.2	120.1	116.1	117.1	117.4	113.9
Grains			138.2	141.3	128.2	138.3	121.6	109.5	110.1	110.9	113.1	112.9	106.7
Other Food			111.1	107.1	103.9	104.7	104.7	102.4	102.7	105.6	104.5	106.0	106.4
Raw Materials			122.0	101.3	95.4	94.9	94.1	95.4	95.6	95.2	96.0	94.8	94.9
Timber			117.3	109.1	102.6	100.9	101.6	104.6	105.8	107.4	106.9	107.5	107.8
Other Raw Materials			127.2	92.8	87.6	88.3	85.9	85.4	84.3	81.9	84.1	80.9	80.7
Fertilizers			142.6	137.6	113.7	119.8	108.2	97.9	102.5	95.8	95.0	96.3	96.2
Metals and Minerals			113.5	96.1	90.8	88.2	87.8	88.5	85.7	84.9	85.5	84.8	84.4
Base Metals		d/	113.1	98.0	90.3	88.7	87.1	87.6	86.5	88.3	87.1	88.5	89.2
Precious Metals			136.3	138.5	115.1	114.6	107.4	103.1	104.3	103.3	103.9	103.0	102.9

Notes: a/ Included in the energy index, b/ Included in the non-energy index, c/ Included in the precious metals index, d/ Metals and Minerals exluding iron ore.

Abbreviations: $ = US dollar ; bbl = barrel ; cum = cubic meter ; dmt = dry metric ton ; kg = kilogram ; mmbtu = million British thermal units ; mt = metric ton ; toz = troy oz ; .. = not available.

Source: Bloomberg, Cotton Outlook, Datastream, Fertilizer Week, INFOFISH, INTERFEL Fel Actualités hebdo, International Cocoa Organization, International Coffee Organization, International Rubber Study Group, International Tea Committee, International Tropical Timber Organization, Internatonal Sugar Organization, ISTA Mielke GmbH Oil World, Japan Lumber Journal, MLA Meat & Livestock Weekly, Platts International Coal Report, Singapore Commodity Exchange, Sopisco News, Sri Lanka Tea Board, US Department of Agriculture, US NOAA Fisheries Service, World Gas Intelligence.

World Bank commodities price forecast in nominal U.S. dollars

Commodity	Unit	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy														
Coal, Australia	$/mt	84.6	77.0	79.0	80.9	82.8	84.8	86.8	88.9	91.0	93.2	95.4	97.7	100.0
Crude oil, avg, spot	$/bbl	104.1	106.1	104.4	103.5	103.9	104.3	104.8	105.3	105.9	106.5	107.2	107.8	108.4
Natural gas, Europe	$/mmbtu	11.8	10.5	10.3	10.2	10.0	9.9	9.8	9.6	9.5	9.4	9.2	9.1	9.0
Natural gas, US	$/mmbtu	3.7	4.6	4.7	4.9	5.1	5.3	5.5	5.7	6.0	6.2	6.5	6.7	7.0
Natural gas LNG, Japan	$/mmbtu	16.0	15.8	15.0	14.7	14.5	14.2	13.9	13.7	13.4	13.2	13.0	12.7	12.5
Non Energy Commodities														
Agriculture														
Beverages														
Cocoa	$/kg	2.44	3.00	2.80	2.73	2.67	2.60	2.54	2.48	2.42	2.37	2.31	2.25	2.20
Coffee, Arabica	$/kg	3.08	4.20	3.90	3.86	3.82	3.78	3.73	3.69	3.65	3.62	3.58	3.54	3.50
Coffee, robusta	$/kg	2.08	2.10	2.00	1.98	1.96	1.94	1.92	1.90	1.88	1.86	1.84	1.82	1.80
Tea, auctions (3), average	$/kg	2.86	2.70	2.75	2.79	2.83	2.88	2.92	2.97	3.01	3.06	3.10	3.15	3.20
Food														
Oils and Meals														
Coconut oil	$/mt	941	1,250	1,100	1,078	1,057	1,036	1,015	995	975	956	937	918	900
Groundnut oil	$/mt	1,773	1,350	1,450	1,486	1,522	1,560	1,598	1,638	1,678	1,720	1,762	1,805	1,850
Palm oil	$/mt	857	890	870	863	856	848	841	834	827	820	814	807	800
Soybean meal	$/mt	545	550	525	520	516	511	507	502	498	493	489	484	480
Soybean oil	$/mt	1,057	960	980	982	984	986	988	990	992	994	996	998	1,000
Soybeans	$/mt	538	530	535	532	530	527	525	522	520	517	515	512	510
Grains														
Barley	$/mt	202.2	135.0	145.0	148.2	151.4	154.7	158.1	161.6	165.1	168.7	172.4	176.1	180.0
Maize	$/mt	259.4	215.0	220.0	221.0	222.0	223.0	223.9	224.9	225.9	227.0	228.0	229.0	230.0
Rice, Thailand, 5%	$/mt	505.9	410.0	405.0	402.4	399.9	397.3	394.8	392.3	389.8	387.3	384.9	382.4	380.0
Wheat, US, HRW	$/mt	312.2	310.0	305.0	301.9	298.7	295.7	292.6	289.6	286.6	283.7	280.8	277.9	275.0
Other Food														
Bananas, EU	$/kg	0.92	0.95	0.94	0.94	0.94	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92
Meat, beef	$/kg	4.07	4.20	4.10	4.07	4.04	4.01	3.98	3.95	3.92	3.89	3.86	3.83	3.80
Meat, chicken	$/kg	2.29	2.25	2.20	2.18	2.16	2.14	2.12	2.10	2.08	2.06	2.04	2.02	2.00
Oranges	$/kg	0.97	0.80	0.83	0.84	0.85	0.86	0.88	0.89	0.90	0.91	0.92	0.94	0.95
Shrimp, Mexico	$/kg	13.84	17.00	16.00	15.67	15.35	15.03	14.72	14.42	14.13	13.84	13.55	13.27	13.00
Sugar, World	$/kg	0.39	0.38	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.35	0.35	0.35
Raw Materials														
Timber														
Logs, Cameroon	$/cum	463.5	475.0	480.0	485.2	490.5	495.9	501.3	506.8	512.3	517.9	523.5	529.2	535.0
Logs, Malaysia	$/cum	305.4	300.0	310.0	314.7	319.4	324.2	329.1	334.1	339.1	344.2	349.4	354.7	360.0
Sawnwood, Malaysia	$/cum	852.8	910.0	915.0	930.3	945.8	961.7	977.7	994.1	1,010.7	1,027.6	1,044.8	1,062.2	1,080.0
Other Raw Materials														
Cotton A Index	$/kg	1.99	2.00	2.05	2.07	2.10	2.12	2.15	2.17	2.20	2.22	2.25	2.27	2.30
Rubber, Malaysian	$/kg	2.79	2.20	2.40	2.44	2.48	2.51	2.55	2.59	2.63	2.67	2.71	2.76	2.80
Tobacco	$/mt	4,589	4,800	4,700	4,658	4,617	4,576	4,536	4,496	4,456	4,416	4,377	4,338	4,300
Fertilizers														
DAP	$/mt	444.9	450.0	445.0	444.5	444.0	443.5	443.0	442.5	442.0	441.5	441.0	440.5	440.0
Phosphate rock	$/mt	148.1	110.0	105.0	103.4	101.8	100.3	98.7	97.2	95.7	94.3	92.8	91.4	90.0
Potassium chloride	$/mt	379.2	300.0	305.0	305.5	306.0	306.5	307.0	307.5	308.0	308.5	309.0	309.5	310.0
TSP	$/mt	382.1	360.0	355.0	354.5	354.0	353.5	353.0	352.5	352.0	351.5	351.0	350.5	350.0
Urea, E. Europe, bulk	$/mt	340.1	300.0	295.0	293.5	291.9	290.4	288.9	287.4	285.9	284.4	282.9	281.5	280.0
Metals and Minerals														
Aluminum	$/mt	1,847	1,800	1,840	1,869	1,898	1,928	1,958	1,989	2,020	2,052	2,084	2,117	2,150
Copper	$/mt	7,332	6,900	6,880	6,872	6,864	6,856	6,848	6,840	6,832	6,824	6,816	6,808	6,800
Iron ore	$/dmt	135	100	110	113	116	120	123	126	130	133	137	141	145
Lead	$/mt	2,140	2,120	2,150	2,160	2,170	2,180	2,189	2,199	2,209	2,220	2,230	2,240	2,250
Nickel	$/mt	15,032	18,500	17,000	17,097	17,195	17,294	17,393	17,493	17,593	17,694	17,795	17,897	18,000
Tin	$/mt	22,283	22,500	22,700	22,920	23,142	23,367	23,593	23,822	24,053	24,287	24,522	24,760	25,000
Zinc	$/mt	1,910	2,080	2,100	2,128	2,157	2,186	2,215	2,245	2,275	2,306	2,337	2,368	2,400
Precious Metals														
Gold	$/toz	1,411	1,250	1,230	1,216	1,203	1,189	1,176	1,163	1,150	1,137	1,125	1,112	1,100
Silver	$/toz	23.8	20.0	20.5	20.6	20.8	20.9	21.1	21.2	21.4	21.5	21.7	21.8	22.0
Platinum	$/toz	1,487	1,430	1,400	1,384	1,369	1,353	1,338	1,323	1,308	1,293	1,279	1,264	1,250

Next update: October 2014.

World Bank commodities price forecast in real 2010 U.S. dollars

Commodity	Unit	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy														
Coal, Australia	$/mt	79.7	72.4	74.1	74.8	75.5	76.2	76.8	77.4	78.1	78.7	79.3	79.9	80.4
Crude oil, avg, spot	$/bbl	98.1	99.8	97.9	95.7	94.7	93.7	92.7	91.8	90.9	89.9	89.0	88.1	87.2
Natural gas, Europe	$/mmbtu	11.1	9.9	9.7	9.4	9.1	8.9	8.6	8.4	8.1	7.9	7.7	7.5	7.2
Natural gas, US	$/mmbtu	3.5	4.3	4.4	4.5	4.6	4.8	4.9	5.0	5.1	5.2	5.4	5.5	5.6
Natural gas LNG, Japan	$/mmbtu	15.0	14.9	14.1	13.6	13.2	12.8	12.3	11.9	11.5	11.1	10.8	10.4	10.1
Non Energy Commodities														
Agriculture														
Beverages														
Cocoa	$/kg	2.30	2.82	2.63	2.53	2.43	2.34	2.25	2.16	2.08	2.00	1.92	1.84	1.77
Coffee, Arabica	$/kg	2.90	3.95	3.66	3.57	3.48	3.39	3.30	3.22	3.14	3.05	2.97	2.89	2.82
Coffee, robusta	$/kg	1.96	1.97	1.88	1.83	1.78	1.74	1.70	1.65	1.61	1.57	1.53	1.49	1.45
Tea, auctions (3), average	$/kg	2.70	2.54	2.58	2.58	2.58	2.58	2.59	2.58	2.58	2.58	2.58	2.58	2.57
Food														
Fats and Oils														
Coconut oil	$/mt	887	1,176	1,031	996	963	930	898	867	837	807	778	751	724
Groundnut oil	$/mt	1,672	1,270	1,360	1,373	1,387	1,401	1,414	1,427	1,440	1,452	1,464	1,476	1,488
Palm oil	$/mt	808	837	816	797	780	762	744	727	710	693	676	660	643
Soybean meal	$/mt	514	517	492	481	470	459	448	437	427	416	406	396	386
Soybean oil	$/mt	996	903	919	908	897	886	874	863	851	839	828	816	804
Soybeans	$/mt	508	498	502	492	483	474	464	455	446	437	428	419	410
Grains														
Barley	$/mt	190.6	127.0	136.0	136.9	138.0	139.0	139.9	140.8	141.6	142.4	143.2	144.0	144.8
Maize	$/mt	244.6	202.2	206.3	204.2	202.3	200.3	198.2	196.0	193.8	191.6	189.4	187.2	185.0
Rice, Thailand, 5%	$/mt	477.0	385.6	379.7	371.9	364.4	356.9	349.3	341.8	334.4	327.0	319.8	312.7	305.7
Wheat, US, HRW	$/mt	294.4	291.5	286.0	279.0	272.3	265.6	258.9	252.3	245.9	239.5	233.3	227.2	221.2
Other Food														
Bananas, EU	$/kg	0.87	0.89	0.88	0.87	0.85	0.84	0.82	0.81	0.80	0.78	0.77	0.75	0.74
Meat, beef	$/kg	3.84	3.95	3.84	3.76	3.68	3.60	3.52	3.44	3.36	3.28	3.21	3.13	3.06
Meat, chicken	$/kg	2.16	2.12	2.06	2.01	1.97	1.92	1.87	1.83	1.78	1.74	1.69	1.65	1.61
Oranges	$/kg	0.91	0.75	0.78	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.77	0.77	0.76
Shrimp, Mexico	$/kg	13.05	15.99	15.00	14.48	13.99	13.50	13.03	12.57	12.12	11.68	11.26	10.85	10.46
Sugar, World	$/kg	0.37	0.36	0.35	0.34	0.33	0.33	0.32	0.31	0.31	0.30	0.29	0.29	0.28
Raw Materials														
Timber														
Logs, Cameroon	$/cum	437.1	446.7	450.1	448.5	447.0	445.4	443.5	441.5	439.4	437.2	435.0	432.7	430.3
Logs, Malaysia	$/cum	288.0	282.1	290.7	290.8	291.1	291.2	291.2	291.1	290.9	290.6	290.3	290.0	289.6
Sawnwood, Malaysia	$/cum	804.1	855.8	857.9	859.8	862.0	863.7	865.1	866.2	867.0	867.6	868.1	868.4	868.7
Other Raw Materials														
Cotton A Index	$/kg	1.88	1.88	1.92	1.92	1.91	1.91	1.90	1.89	1.88	1.88	1.87	1.86	1.85
Rubber, Malaysian	$/kg	2.63	2.07	2.25	2.25	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.25	2.25
Tobacco	$/mt	4,327	4,514	4,407	4,305	4,208	4,110	4,013	3,917	3,822	3,729	3,637	3,547	3,459
Fertilizers														
DAP	$/mt	419.5	423.2	417.2	410.8	404.6	398.3	392.0	385.6	379.1	372.8	366.4	360.1	353.9
Phosphate rock	$/mt	139.7	103.4	98.5	95.6	92.8	90.0	87.3	84.7	82.1	79.6	77.1	74.7	72.4
Potassium chloride	$/mt	357.5	282.1	286.0	282.3	278.9	275.3	271.6	267.9	264.2	260.5	256.7	253.0	249.4
TSP	$/mt	360.2	338.5	332.9	327.6	322.6	317.5	312.3	307.1	301.9	296.8	291.6	286.6	281.5
Urea, E. Europe, bulk	$/mt	320.7	282.1	276.6	271.2	266.1	260.8	255.6	250.4	245.3	240.1	235.1	230.1	225.2
Metals and Minerals														
Aluminum	$/mt	1,741	1,693	1,725	1,727	1,730	1,732	1,733	1,733	1,733	1,732	1,732	1,731	1,729
Copper	$/mt	6,913	6,489	6,451	6,351	6,255	6,158	6,059	5,960	5,860	5,761	5,663	5,566	5,470
Iron ore	$/dmt	128	94	103	105	106	107	109	110	111	113	114	115	117
Lead	$/mt	2,018	1,994	2,016	1,996	1,977	1,958	1,937	1,916	1,895	1,874	1,853	1,831	1,810
Nickel	$/mt	14,173	17,398	15,940	15,802	15,671	15,533	15,390	15,242	15,091	14,939	14,786	14,632	14,478
Tin	$/mt	21,010	21,159	21,284	21,183	21,091	20,988	20,876	20,757	20,633	20,505	20,375	20,243	20,109
Zinc	$/mt	1,801	1,956	1,969	1,967	1,966	1,963	1,960	1,956	1,952	1,947	1,942	1,936	1,930
Precious Metals														
Gold	$/toz	1,331	1,176	1,153	1,124	1,096	1,068	1,041	1,014	987	960	935	909	885
Silver	$/toz	22.5	18.8	19.2	19.1	18.9	18.8	18.7	18.5	18.3	18.2	18.0	17.9	17.7
Platinum	$/toz	1,402	1,345	1,313	1,279	1,247	1,215	1,184	1,153	1,122	1,092	1,062	1,034	1,005

Next update: October 2014.

Commodity	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Price indices in nominal US dollars (2010=100)													
Energy	127.4	129.7	127.9	127.3	127.9	128.6	129.4	130.3	131.3	132.2	133.3	134.3	135.4
Non-energy commodities	101.7	98.3	98.0	98.2	98.4	98.6	98.8	99.0	99.3	99.5	99.8	100.1	100.4
Agriculture	106.3	104.8	103.9	103.8	103.7	103.6	103.5	103.4	103.4	103.3	103.3	103.3	103.3
Beverages	83.3	98.4	93.3	92.3	91.3	90.4	89.4	88.6	87.7	86.8	86.0	85.2	84.5
Food	115.6	110.2	109.0	108.6	108.1	107.7	107.3	106.8	106.4	106.0	105.6	105.2	104.8
Fats and oils	115.9	115.6	113.5	112.8	112.2	111.5	110.9	110.2	109.6	109.0	108.4	107.8	107.2
Grains	128.2	110.7	111.2	111.0	110.7	110.5	110.3	110.1	110.0	109.8	109.6	109.4	109.3
Other food	103.9	102.6	101.2	100.8	100.4	100.1	99.7	99.3	98.9	98.6	98.2	97.8	97.5
Raw materials	95.4	95.0	96.8	98.0	99.1	100.3	101.5	102.8	104.0	105.3	106.6	107.9	109.3
Timber	102.6	107.4	108.7	110.4	112.2	114.1	115.9	117.8	119.8	121.7	123.7	125.7	127.8
Other Raw Materials	87.6	81.5	83.9	84.3	84.8	85.3	85.8	86.3	86.8	87.4	87.9	88.5	89.1
Fertilizers	113.7	96.7	95.3	94.9	94.4	94.0	93.6	93.1	92.7	92.3	91.9	91.5	91.1
Metals and minerals a/	90.8	85.1	86.3	87.1	88.0	88.8	89.7	90.6	91.5	92.5	93.5	94.4	95.5
Base Metals b/	90.3	88.9	88.8	89.3	89.9	90.4	91.0	91.6	92.1	92.7	93.3	93.9	94.5
Precious Metals	115.1	101.1	100.2	99.5	98.7	98.0	97.2	96.5	95.8	95.1	94.4	93.8	93.1
Price indices in real 2010 US dollars (2010=100) c/													
Energy	120.1	122.0	120.0	117.6	116.6	115.5	114.5	113.5	112.6	111.7	110.7	109.8	108.9
Non-energy commodities	95.9	92.4	91.9	90.8	89.7	88.5	87.4	86.3	85.1	84.0	82.9	81.8	80.7
Agriculture	100.2	98.6	97.4	95.9	94.5	93.0	91.6	90.1	88.7	87.2	85.8	84.4	83.1
Beverages	78.5	92.5	87.5	85.3	83.2	81.2	79.1	77.2	75.2	73.3	71.5	69.7	67.9
Food	109.0	103.6	102.2	100.3	98.5	96.7	94.9	93.1	91.3	89.5	87.7	86.0	84.3
Fats and oils	109.3	108.7	106.4	104.3	102.2	100.2	98.1	96.1	94.0	92.0	90.1	88.1	86.2
Grains	120.9	104.1	104.3	102.6	100.9	99.3	97.6	96.0	94.3	92.7	91.1	89.5	87.9
Other food	98.0	96.5	94.9	93.2	91.5	89.9	88.2	86.5	84.9	83.2	81.6	80.0	78.4
Raw materials	90.0	89.3	90.8	90.5	90.4	90.1	89.8	89.5	89.2	88.9	88.6	88.2	87.9
Timber	96.7	101.0	101.9	102.1	102.3	102.5	102.6	102.7	102.7	102.8	102.8	102.8	102.8
Other Raw Materials	82.6	76.6	78.7	78.0	77.3	76.6	75.9	75.2	74.5	73.8	73.0	72.3	71.6
Fertilizers	107.2	90.9	89.4	87.7	86.1	84.4	82.8	81.2	79.5	77.9	76.4	74.8	73.3
Metals and minerals a/	85.6	80.0	80.9	80.5	80.2	79.8	79.4	79.0	78.5	78.1	77.7	77.2	76.8
Base Metals b/	85.2	83.6	83.3	82.6	81.9	81.2	80.5	79.8	79.0	78.3	77.5	76.8	76.0
Precious Metals	108.5	95.1	94.0	91.9	90.0	88.0	86.0	84.1	82.2	80.3	78.5	76.6	74.9
Inflation indices, 2010=100 d/													
MUV index e/	106.1	106.3	106.7	108.2	109.7	111.3	113.0	114.8	116.6	118.4	120.4	122.3	124.3
% change per annum	(1.4)	0.3	0.3	1.5	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6
US GDP deflator	105.2	106.9	108.9	111.1	113.3	115.6	117.9	120.3	122.7	125.2	127.7	130.3	133.0
% change per annum	1.4	1.6	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Next update: October 2014.

Notes:
a/ Base metals plus iron ore.
b/ Includes aluminum, copper, lead, nickel, tin and zinc.
c/ Real price indices are computed from unrounded data and deflated by the MUV index.
d/ Inflation indices for 2013-2025 are projections.
e/ Unit value index of manufacture exports (MUV) in US dollar terms for fifteen countries (Brazil, Canada, China, Germany, France, India, Italy, Japan, Mexico, Republic of Korea, South Africa, Spain, Thailand, United Kingdom, and United States).

DESCRIPTION OF PRICE SERIES

ENERGY

Coal (Australia), thermal, f.o.b. piers, Newcastle/Port Kembla, 6,700 kcal/kg, 90 days forward delivery beginning year 2011; for period 2002-2010, 6,300 kc/kg (11,340 btu/lb); prior to year 2002, 6,667 kcal/kg (12,000 btu/lb).
Coal (Colombia), thermal, f.o.b. Bolivar, 6,450 kcal/kg, (11,200 btu/lb); during years 2002-July 2005 11,600 btu/lb, less than .8% sulfur, 9% ash, 90 days forward delivery.
Coal (South Africa), thermal, f.o.b. Richards Bay, 90 days forward delivery; 6,000 kcal/kg, during 2002-2005, 6,200 kcal/kg (11,200 btu/lb); during 1990-2001 6390 kcal/kg (11,500 btu/lb).
Crude oil, average price of Brent, Dubai and West Texas Intermediate, equally weighed.
Crude oil, U.K. Brent 38° API. Crude oil, Dubai Fateh 32° API. Crude oil, West Texas Intermediate (WTI) 40° API.
Natural Gas Index (Laspeyres), weights based on 5-year consumption volumes for Europe, US and Japan (LNG), updated every 5 years, except the 11-year period 1960-70.
Natural Gas (Europe), average import border price, including UK. As of April 2010 includes a spot price component. Between June 2000 - March 2010 excludes UK.
Natural Gas (U.S.), spot price at Henry Hub, Louisiana.
Natural gas LNG (Japan), import price, cif, recent two months' averages are estimates.

NON ENERGY COMMODITIES

BEVERAGES

Cocoa (ICCO), International Cocoa Organization daily price, average of the first three positions on the terminal markets of New York and London, nearest three future trading months.
Coffee (ICO), International Coffee Organization indicator price, other mild Arabicas, average New York and Bremen/Hamburg markets, ex-dock.
Coffee (ICO), International Coffee Organization indicator price, Robustas, average New York and Le Havre/Marseilles markets, ex-dock.
Tea, average three auctions, arithmetic average of quotations at Kolkata, Colombo and Mombasa/Nairobi.
Tea (Colombo auctions), Sri Lankan origin, all tea, arithmetic average of weekly quotes.
Tea (Kolkata auctions), leaf, include excise duty, arithmetic average of weekly quotes.
Tea (Mombasa/Nairobi auctions), African origin, all tea, arithmetic average of weekly quotes.

OILS AND MEALS

Coconut oil (Philippines/Indonesia), bulk, c.i.f. Rotterdam.
Copra (Philippines/Indonesia), bulk, c.i.f. N.W. Europe.
Groundnuts (US), Runners 40/50, shelled basis, c.i.f. Rotterdam.
Groundnut oil (any origin), c.i.f. Rotterdam.
Fishmeal (any origin), 64-65%, c&f Bremen, estimates based on wholesale price, beginning 2004; previously c&f Hamburg.
Palm oil (Malaysia), 5% bulk, c.i.f. N. W. Europe.
Palmkernel Oil (Malaysia), c.i.f. Rotterdam.
Soybean meal (any origin), Argentine 45/46% extraction, c.i.f. Rotterdam beginning 1990; previously US 44%.
Soybean oil (Any origin), crude, f.o.b. ex-mill Netherlands.
Soybeans (US), c.i.f. Rotterdam.

GRAINS

Barley (US) feed, No. 2, spot, 20 days To-Arrive, delivered Minneapolis from May 2012 onwards; during 1980 - 2012 April Canadian, feed, Western No. 1, Winnipeg Commodity Exchange, spot, wholesale farmers' price.
Maize (US), no. 2, yellow, f.o.b. US Gulf ports.
Rice (Thailand), 5% broken, white rice (WR), milled, indicative price based on weekly surveys of export transactions, government standard, f.o.b. Bangkok.
Rice (Thailand), 25% broken, WR, milled indicative survey price, government standard, f.o.b. Bangkok.
Rice (Thailand), 100% broken, A.1 Super from 2006 onwards, government standard, f.o.b. Bangkok; prior to 2006, A1 Special, a slightly lower grade than A1 Super.

Rice (Vietnam), 5% broken, WR, milled, weekly indicative survey price, Minimum Export Price, f.o.b. Hanoi.
Sorghum (US), no. 2 milo yellow, f.o.b. Gulf ports.
Wheat (US), no. 1, hard red winter, ordinary protein, export price delivered at the US Gulf port for prompt or 30 days shipment.
Wheat (US), no. 2, soft red winter, export price delivered at the US Gulf port for prompt or 30 days shipment.

OTHER FOOD

Bananas (Central & South America), major brands, free on truck (f.o.t.) Southern Europe, including duties; prior to October 2006, f.o.t. Hamburg.
Bananas (Central & South America), major brands, US import price, f.o.t. US Gulf ports.
Meat, beef (Australia/New Zealand), chucks and cow forequarters, frozen boneless, 85% chemical lean, c.i.f. U.S. port (East Coast), ex-dock, beginning November 2002; previously cow forequarters.
Meat, chicken (US), broiler/fryer, whole birds, 2-1/2 to 3 pounds, USDA grade "A", ice-packed, Georgia Dock preliminary weighted average, wholesale.
Meat, sheep (New Zealand), frozen whole carcasses Prime Medium (PM) wholesale, Smithfield, London beginning January 2006; previously Prime Light (PL).
Oranges (Mediterranean exporters) navel, EEC indicative import price, c.i.f. Paris.
Shrimp (Mexico), west coast, frozen, white, No. 1, shell-on, headless, 26 to 30 count per pound, wholesale price at New York.
Sugar (EU), European Union negotiated import price for raw unpackaged sugar from African, Caribbean and Pacific (ACP) under Lome Conventions, c.i.f. European ports.
Sugar (US), nearby futures contract, c.i.f.
Sugar (world), International Sugar Agreement (ISA) daily price, raw, f.o.b. and stowed at greater Caribbean ports.

TIMBER

Logs (West Africa), sapele, high quality (loyal and marchand), 80 centimeter or more, f.o.b. Douala, Cameroon beginning January 1996; previously of unspecified dimension.
Logs (Malaysia), meranti, Sarawak, sale price charged by importers, Tokyo beginning February 1993; previously average of Sabah and Sarawak weighted by Japanese import volumes.
Plywood (Africa and Southeast Asia), Lauan, 3-ply, extra, 91 cm x 182 cm x 4 mm, wholesale price, spot Tokyo.
Sawnwood (Cameroon), sapele, width 6 inches or more, length 6 feet or more, f.a.s. Cameroonian ports.
Sawnwood (Malaysia), dark red seraya/meranti, select and better quality, average 7 to 8 inches; length average 12 to 14 inches; thickness 1 to 2 inch(es); kiln dry, c. & f. UK ports, with 5% agents commission including premium for products of certified sustainable forest beginning January 2005; previously excluding the premium.
Woodpulp (Sweden), softwood, sulphate, bleached, air-dry weight, c.i.f. North Sea ports.

OTHER RAW MATERIALS

Cotton (Cotton Outlook "CotlookA index"), middling 1-3/32 inch, traded in Far East, C/F beginning 2006; previously Northern Europe, c.i.f.
Rubber (Asia), RSS3 grade, Singapore Commodity Exchange Ltd (SICOM) nearby contract beginning 2004; during 2000 to 2003, Singapore RSS1; previously Malaysia RSS1.
Rubber (Asia), TSR 20, Technically Specified Rubber, SICOM nearby contract.

FERTILIZERS

DAP (diammonium phosphate), standard size, bulk, spot, f.o.b. US Gulf.
Phosphate rock (Morocco), 70% BPL, contract, f.a.s. Casablanca.
Potassium chloride (muriate of potash), standard grade, spot, f.o.b. Vancouver.
TSP (triple superphosphate), bulk, spot, beginning October 2006, Tunisian origin, granular, fob; previously US origin, f.o.b. US Gulf.
Urea (Black Sea), bulk, spot, f.o.b. Black Sea (primarily Yuzhnyy) beginning July 1991; for 1985-91 (June) f.o.b. Eastern Europe.

METALS AND MINERALS

Aluminum (LME) London Metal Exchange, unalloyed primary ingots, high grade, minimum 99.7% purity, settlement price beginning 2005; previously cash price.
Copper (LME), grade A, minimum 99.9935% purity, cathodes and wire bar shapes, settlement price.
Iron ore (any origin) fines, spot price, c.f.r. China, 62% Fe beginning December 2008; previously 63.5%.
Lead (LME), refined, 99.97% purity, settlement price.
Nickel (LME), cathodes, minimum 99.8% purity, settlement price beginning 2005; previously cash price.
Tin (LME), refined, 99.85% purity, settlement price.
Zinc (LME), high grade, minimum 99.95% purity, settlement price beginning April 1990; previously special high grade, minimum 99.995%, cash prices.

PRECIOUS METALS

Gold (UK), 99.5% fine, London afternoon fixing, average of daily rates.
Platinum (UK), 99.9% refined, London afternoon fixing.
Silver (UK), 99.9% refined, London afternoon fixing; prior to July 1976 Handy & Harman. Grade prior to 1962 unrefined silver.