GLOBAL ECONOMIC PROSPECTS

2014 / January

COMMODITY MARKETS OUTLOOK

THE WORLD BANK

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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.

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Overview

With the exception of energy, all the key commodity price indices declined significantly in 2013 (figure 1). Fertilizer prices led the decline, down 17.4 percent from 2012, followed by precious metals (down almost 17 percent), agriculture (-7.2 percent), and metals (-5.5 percent). Crude oil prices (World Bank average), which have been remarkably stable during the past three years, averaged $104/barrel (bbl) during 2013, marginally lower than the $105/bbl average of 2012. Most non-energy commodity prices, notably grains, followed a downward path during 2013 (figure 2).

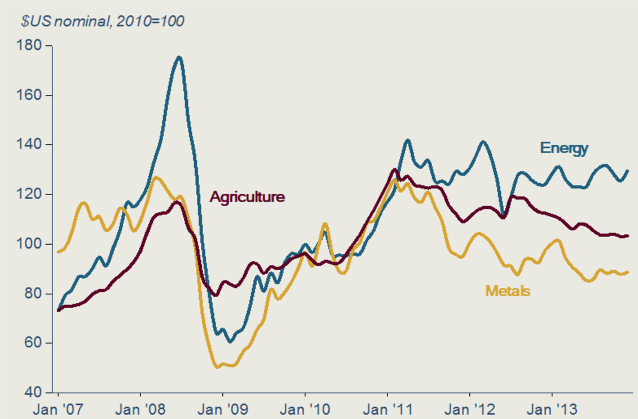
In the baseline scenario, which assumes no macroeconomic shocks or supply disruptions, oil prices are expected to average $103/bbl in 2014, just 1 percent lower than the 2013 average (table 1). Natural gas prices in the US are expected to increase due to stronger demand from energy intensive industries that are moving to the U.S. to take advantage of the "energy dividend". On the other hand, EU natural gas and Japanese LNG prices will moderate due to weaker demand (both prices are tied to the price of oil). Coal prices are expected to increase as well as—more coal is being used for electricity generation due to substitution away from nuclear power.

Agricultural prices are projected to decline a further 2.5 percent in 2014 under the assumption that the existing improved crop conditions will continue for the rest of the year. Specifically, prices of food and beverages are expected to drop by 3.7 and 2.0 percent—raw material prices will not change much. Metal prices will decline an additional 1.7 percent in 2014 as new supplies are expected to come on board while there are no expectations of a surge in demand. Fertilizer prices are expected to decline almost 12 percent in 2014, on top of the 17.4 percent decline in 2013, mostly due to new fertilizer plants coming on stream in the U.S., in turn a response to low natural gas prices. Similarly, precious metals are expected to decline more than 13 percent in 2014 as institutional investors increasingly consider them less attractive "safe haven" alternatives.

There are a number of risks to the baseline forecasts. Downside risks include weak oil demand if growth prospects in emerging economies (where most of the demand growth is taking place) deteriorate sharply. Over the long term, demand for oil could be dampened further if substitution between oil and natural gas intensifies. On the upside, a key risk remains a major oil supply disruption in the Gulf, which could add as much as $50 to the price of oil. However, the severity and duration of the outcome depends on a number of factors, including policy actions regarding emergency reserves, demand curtailment and OPEC's response. Yet, the price risks in the oil market are weighed mostly on the downside as the probability of an oil supply disruption is much lower now for 2014 than it was a year ago for 2013.

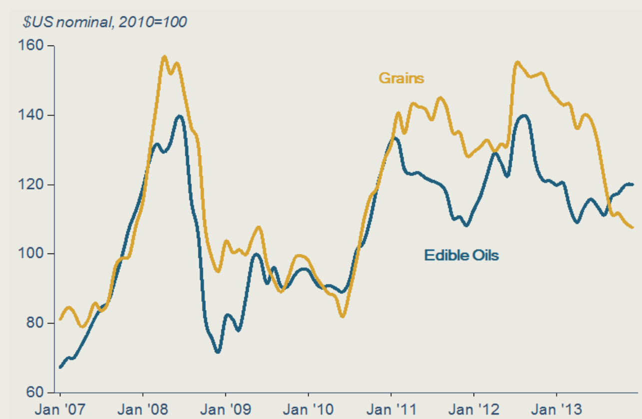
Another source of uncertainty in the medium- and long-term outlook is how OPEC, notably Saudi Arabia, reacts to changing global demand and supply conditions as well as how fast other key players (mainly Iraq, Iran, and Libya) will reach earlier output levels. Since 2004, when oil prices exceeded $35/bbl (the upper limit of the range deemed "appropriate" by OPEC at the time), the Organization has

Figure 1 **Commodity price indexes**



Source: World Bank.

Figure 2 **Food price indexes**



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	127	124	-0.1	-0.1	-2.6
Non-Energy	83	100	120	110	102	99	99	-7.2	-2.6	-0.2
Metals	68	100	113	96	91	89	90	-5.5	-1.7	1.1
Agriculture	89	100	122	114	106	104	103	-7.2	-2.5	-0.6
Food	93	100	123	124	116	111	110	-7.1	-3.7	-1.4
Grains	99	100	138	141	128	116	117	-9.3	-9.8	0.8
Fats and oils	90	100	121	126	116	116	113	-8.1	0.5	-3.2
Other food	90	100	111	107	104	101	100	-3.0	-3.1	-0.8
Beverages	86	100	116	93	83	82	82	-10.1	-2.0	0.4
Raw Materials	83	100	122	101	95	96	97	-5.9	0.9	1.1
Fertilizers	105	100	143	138	114	100	99	-17.4	-11.7	-1.4
Precious metals	78	100	136	138	115	100	98	-16.9	-13.1	-1.8
Memorandum items										
Crude oil ($/bbl)	62	79	104	105	104	103	100	-0.9	-0.6	-3.5
Gold ($/toz)	973	1225	1,569	1,670	1,412	1,220	1,200	-15.4	-13.6	-1.6

Source: World Bank.

responded to subsequent price weaknesses by reducing supplies. But it has also increased supplies when prices exceed the $100-110 range for an extended period of time—as it did last year following output reductions by Iraq and Libya. Indeed, with few exceptions, the $100-110 range has been maintained during the past three years. However, as non-OPEC supplies (notably unconventional oil) come on stream and substitution by other types of energy intensifies, such an approach may not be sustainable.

Price risks on metals depend on new supplies coming on stream and growth of China's economy. Metal prices have declined 30 percent since their early 2011 highs, but have been relatively stable during the past three quarters. Last year's declines reflected moderate demand growth and strong supply response, the latter a result of increased investment of the past few years which was induced by high prices. The prospects of the metal market depend crucially on Chinese demand, as the country accounts for almost 45 percent of global metal consumption. However, if robust supply trends continue and weaker-than-expected demand growth materializes, metal prices may decline more than the baseline presented in this outlook, with significant negative consequences for metal exporters (and benefits for metals importers).

In agricultural commodity markets the key risk is weather. According to the global crop outlook assessment released by the U.S. Department of Agriculture on January 11, 2014, the global maize market will be better supplied in the current 2013/14 season—production and stocks are expected to increase by 12 and 20.5 percent, respectively. Wheat will improve as well (production and stocks up 8.6 and 5.3 percent), but still below historical standards. Price risks for rice are on the downside, especially in view of a well-supplied market and the large public stocks held by Thailand. Indeed, when the Thai government announced the release of stocks last September, rice prices came under pressure. Edible oil and oilseed markets have limited upside risks as well. The marginal price increase of the edible oil price index during 2013Q4 (up 4.7 percent from 2013Q2) reflected idiosyncratic factors of some markets rather than a broad-based trend. The global output of 17 major edible oils is expected to reach 196.3 million tons during 2013/14, up from last season's 187.6 million tons.

Other risks for agricultural markets are mostly on the downside as well. For example, the risk of trade policies impacting agricultural prices is low as evidenced by the absence of any export restrictions during 2011-13, despite several spikes in prices (notably maize and wheat). Finally, production of biofuels experienced a third year of little (or no) growth, as policy makers increasingly realize that the environmental and energy independence benefits from biofuels may not outweigh the costs.

Energy

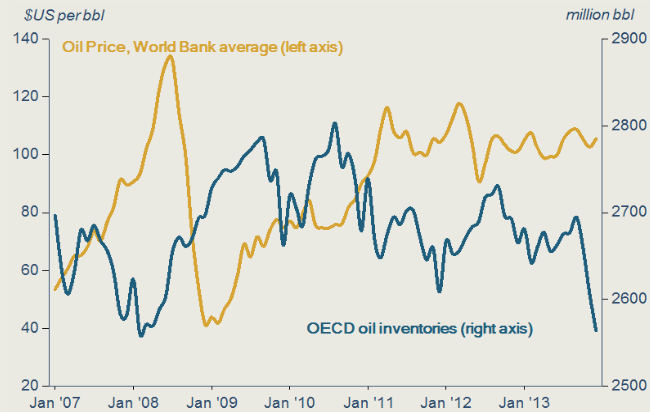
After reaching $100/bbl in early 2011 for the first time since the 2008 financial crisis, crude oil prices (World Bank average) have fluctuated within a remarkably tight band around $105/bbl, which is also OPEC's "desired range" (figure 3). In fact, 2011-13 has been one of the least volatile 3-year periods of the recent history of the oil market (Box 1 elaborates further on the nature and causes of crude oil price volatility).

Fluctuations in oil prices have been driven mainly by geopolitical concerns (Egypt and Syria) and output disruptions (Iraq and Libya) on the supply side, and macroeconomic concerns, initially due to the European debt issues and more recently changing developing-country growth prospects on the demand side. Last year's fears that the Syrian conflict might spread to the Gulf and cause a major disruption in oil supplies have been replaced by cautious optimism. While the interim deal between Western powers and Iran will relieve some sanctions, including lifting the ban on insuring oil shippers, the bad on crude exports remains in place. The relaxation in insurance provisions within the current sanctions regime may lead to some increases in Iranian crude exports to existing customers in the short-term. However, Iran's oil exports could be further facilitated by through an oil-for-goods deal with Russia worth $1.5 billion a month, the equivalent of 0.5 mb/d—that however may not be consistent with the interim deal. On the positive news on the supply side, a pipeline in northern Iraq for crude oil exports to the port of Ceyhan, Turkey has been completed. However, agreement between the Kurdish Regional Government and the central government in Baghdad over the control of the resources, exports and revenue are still to be agreed, hampering exports in the interim. Last commercial oil inventories in OECD countries deline sharply during November and December 2013 bringing them down to the lowest levels since early 2008.

Recent Developments

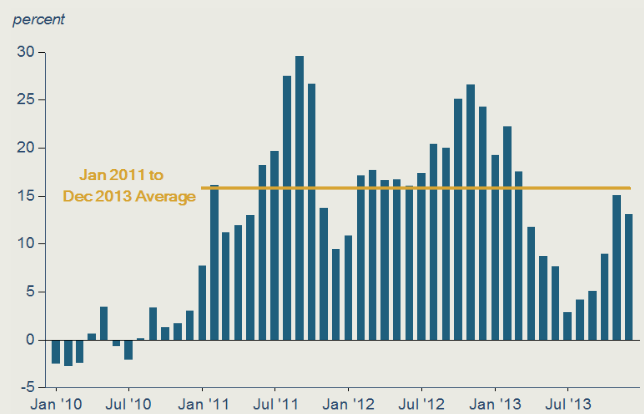
Developments in the oil market have been dominated by the rapid expansion of unconventional oil production. Increased Canadian oil (from tar sands) to the United States combined with rapidly rising U.S. shale liquids production (from fracturing and horizontal drilling) have contributed to a build-up of stocks 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

Figure 3 Oil prices and OECD oil stocks



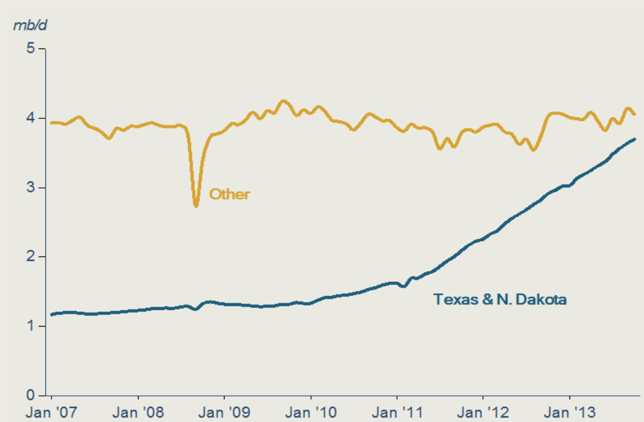
Source: World Bank, International Energy Agency.

Figure 4 Brent/WTI price differential



Source: World Bank.

Figure 5 U.S. crude oil production



Source: U.S. Energy Information Administration.

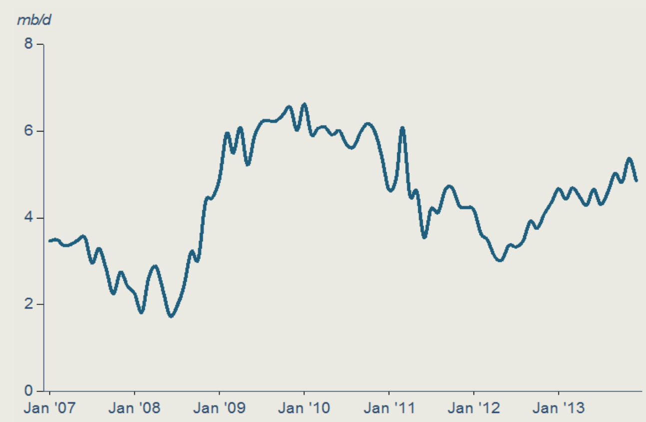
2011—the spread reached a high of 30 percent late that year. While the Brent-WTI spread narrowed in July 2013 to less than 5 percent, it widened again to reach almost 15 percent by the end of 2013 (figure 4). The spread is expected to narrow upon completion of the Keystone pipeline (perhaps late 2014).

The decline in non-OPEC oil output growth that began in 2011 has been reversed. Non-OPEC producers added some 0.7 mb/d to global supplies in 2012 and an additional 1.3 mb/d during 2013, mainly reflecting earlier large-scale investments. In the United States, horizontal drilling and hydraulic fracturing have added 1.4 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 5). Indeed, the IEA projects that the surging North America crude oil output could add close to almost 5 mb/d to the global oil supplies by 2018 2.3 mb/d from the U.S. "light tight oil" and 1.3 mb/d from Canada's oil sands.) To keep this additional oil into perspective, consider that biofuels added in 2012 the 1.5 mb/d of crude oil equivalent to the global market, as much as North Dakota and Texas added between December 2011 and October 2013.

A significant reduction in oil supplies by Iraq and Libya during the summer of 2013 (estimated at more than 1 mb/d each) was balanced by increases in Saudi output, thus causing only a marginal reduction in OPEC output—it averaged 36.1 mb/d in 2013Q4, down from 36.9 mb/d in the previous quarter. For the entire year, OPEC's output declined by 0.7 mn/d. Yet, this production level is still 10 mb/d higher than in 2002Q2, OPEC's lowest producing quarter in recent history, and well above the Organization's 30 mb/d quota.

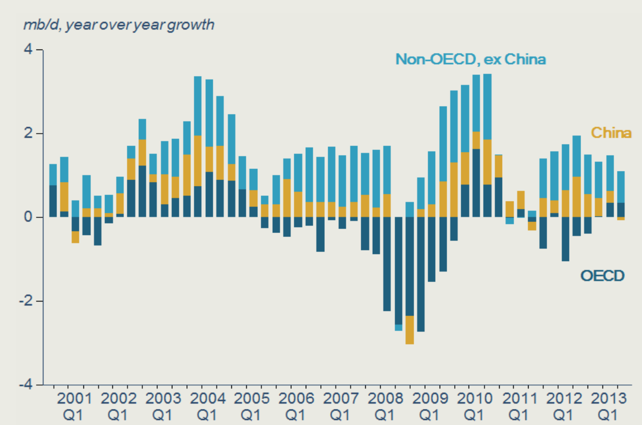
The downward trend of OPEC's spare production capacity that began in early 2010 has been reversed since 2012Q1 with spare capacity reaching almost 5.2 mb/d in November 2013, the highest since March 2011, before easing back slightly in December (figure 6). The Saudi government has promised to keep the global market well supplied. But, the Kingdom also deems the $100-110/bbl range to be a fair price. Such range has been maintained during the past three years despite various geopolitical issues and supply disruptions as well as output growth in North America. According to the IEA, spare capacity in the global oil market may exceed 7 mb/d by the end 2014, almost three times higher than the 1.5-3.0 mb/d range during 2004-08. Spare capacity will begin declining by 2016 as production in the U.S. slows.

Figure 6 **OPEC spare capacity**



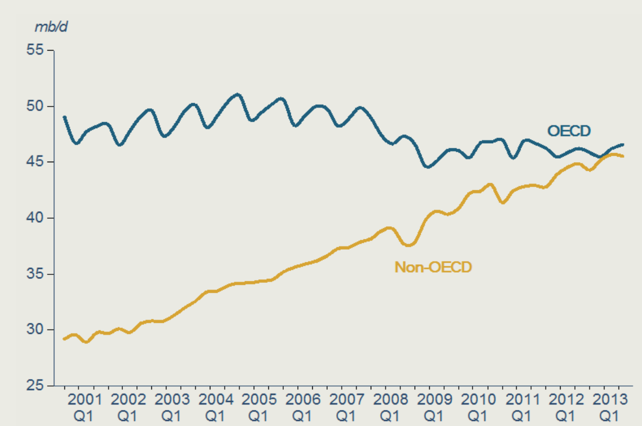
Source: International Energy Agency.

Figure 7 **World oil demand growth**



Source: World Bank, International Energy Agency.

Figure 8 **Global crude oil consumption**



Source: International Energy Agency.

World demand increased by 1.02 mb/d in 2013Q4 (y/y) with nearly 2/3 of the growth coming from non-OECD countries, 0.67 mb/d vs. 0.35 mb/d (figure 7). Chinese demand was a drag on growth for the first time since the end-2011. Demand has increased in the 2013H2 in OECD countries, in contrast with the patterns of the past few years where demand has fallen by 4.5 mb/d, or 9.6 percent, from its 2005Q1 peak of 51 mb/d. Non-OECD demand remains robust. In fact, during 2013Q4, non-OECD economies consumed almost as much oil as OECD ones, 45.5 versus 46.7 mb/d (figure 8).

Outlook and Risks

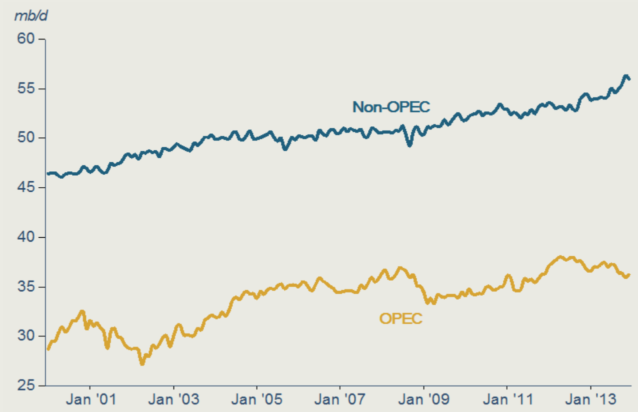
Nominal oil prices are expected to average $103/bbl during 2014 (down from $104/bbl in 2013) and decline to $100/bbl in 2015. In the longer term, prices in real terms are expected to fall, due to growing supplies of unconventional oil, efficiency gains, and (less so) substitution away from oil. The key assumption underpinning these projections reflects the upper-end cost of developing additional oil capacity from Canadian oil sands, currently estimated at $80/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 8). 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.

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 (figure 9).

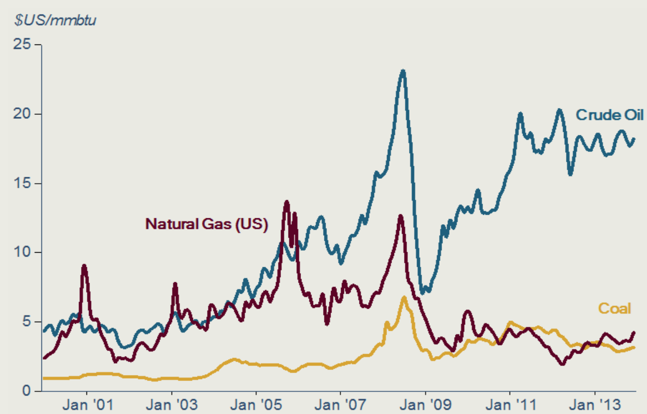
Last, prices of natural gas (in the U.S.) and coal are expected to remain low relative to crude oil (figure 10) as well as European and Japanese natural gas prices (figure 11). Some convergence in prices is expected to take place but its speed will depend on several factors, including the development of unconventional oil supplies outside the U.S., the construction of LNG facilities and gas pipelines, relocation of energy intensive industries to the U.S., substitution by coal, and policies.

Figure 9 **Global crude oil production**



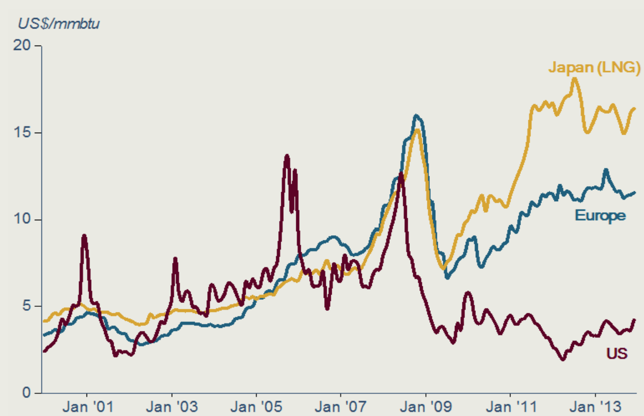
Source: International Energy Agency.

Figure 10 **Energy prices**



Source: World Bank.

Figure 11 **Natural gas prices**



Source: World Bank.

Box 1 The nature and causes of oil price volatility

The nominal price of Brent (the international marker of oil) averaged 111/bbl during 2011-13. This was the highest of any 3-year period since 1860 in real terms. During 2011-13 oil price volatility dropped to historical lows, shortly after experiencing a record high during the great recession of 2008/09. This box (which draws heavily from Baffes and Kshirsagar 2014) examines the nature and causes of oil price volatility. It concludes that the recent spike in volatility—the second highest of the past 25 years—reflected uncertainty regarding the health of the global economy induced by the 2008 financial crisis while a similar spike in 1990 was related to supply disruption concerns associated with the first Gulf war. The analysis also shows that high prices are neither a necessary nor a sufficient condition for elevated price volatility since both high and low volatility can take place under high and low prices. Last, concerns that oil prices have become more volatile after 2008 are inconsistent with the empirical evidence.

During 2008, the price of oil changed by more than 5 percent in a single day in 27 out of 260 trading sessions. It exceeded the 5 percent threshold only once in 2011 and once in 2012, while in no day oil prices changed more than 5 percent during 2013 (Figure box 1.1). Thus, on the basis of this simple metric, 2008 has been the most volatile year in the recent history of the oil market while 2013 was one of the least volatile years.

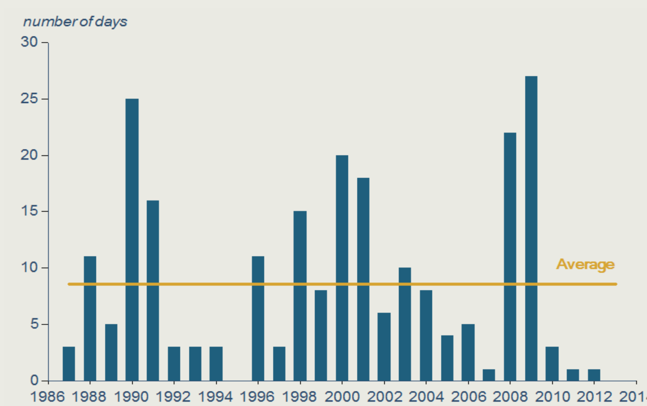
Next, the volatility of returns was calculated based on daily Brent prices from January 20, 1987 to December 31, 2013 (6,643 observations.) Volatility of returns, a measure used frequently by the financial literature, is defined as vol(r_t) = 100*Std[log(p_t) – log(p_{t-1})], where Std[.] denotes the standard deviation while p_t and p_{t-1} represents the current and lagged price of oil. Figure box 1.2 depicts vol(r_t) and p_t since 1988. In order to smooth out outliers and also take into account seasonality, both indices are presented as 250-day moving averages, roughly corresponding to a full year. Indeed, it becomes apparent that the last three years have been characterized by the highest oil price level and the lowest oil price volatility.

Last, the kurtosis of r_t for the five years 2008 to 2012 was calculated as well—kurtosis "measures" the proportion of extreme observations of a distribution; a normal distribution has a kurtosis of 3. As shown in Figure box 1.3, every successive year after 2009 has experienced a reduction in the dispersion of the empirical oil price change distribution—the kurtosis of r_t declined from 7.1 in 2008 and 2009 to just 3.7 in 2013. Therefore, returns have become much less dispersed after the 2008/09 financial crisis.

Three messages emerge from this analysis. First, during the past 25 years the global oil market has been subjected to two distinct spikes in volatility: 1990 (first Gulf war) and 2008/09 (great recession); this finding has been confirmed econometrically by numerous authors, including Salisu and Fasanya (2013) and Charles and Darné (2013). Second, while the 1990 spike was associated with a modest increase in oil prices, the 2008/09 spike emerged alongside the largest post-second World War commodity price boom. Third, despite oil prices remaining at historically high levels during 2011-13, price volatility dropped to record lows.

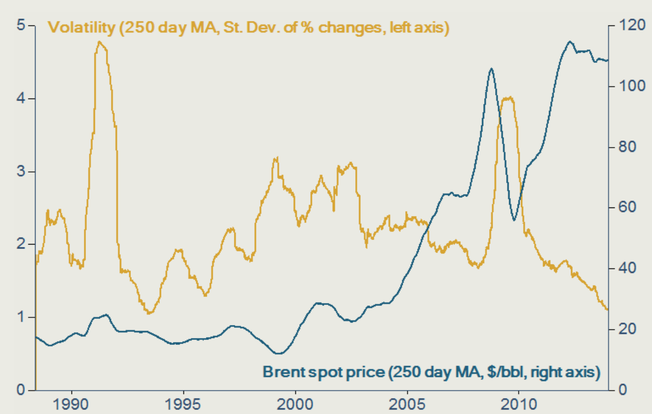
What causes spikes in oil price volatility? In addition to supply disruptions, concerns about the health of the global economy, and hence demand, is the most frequently mentioned factor. The relationship between macroeconomic

Figure B1.1 Price change greater than 5 percent



Source: World Bank.

Figure B1.2 Volatility of oil prices and price levels



Source: World Bank.

conditions and oil shocks has been studied extensively. Hamilton (2013) identified four major oil price shocks during the past 25 years and noted that two of them—1990 and 2002/03—were related to supply disruption concerns associated with the Gulf wars while two—1999/2000 and 2007/08—were caused by demand changes. Bloom (2013) noted that macroeconomic shocks associated with recessions—a case in point being the 2008 financial crisis—are more uncertain than positive shocks. Moreover, because recessions are rare events with no clear consensus on their likely depth and duration, which are often amplified by policy uncertainty, they tend to cause greater market volatility than positive shocks. This is consistent with the fact that one of the two largest volatility spikes of the past 25 years coincided with the great recession.

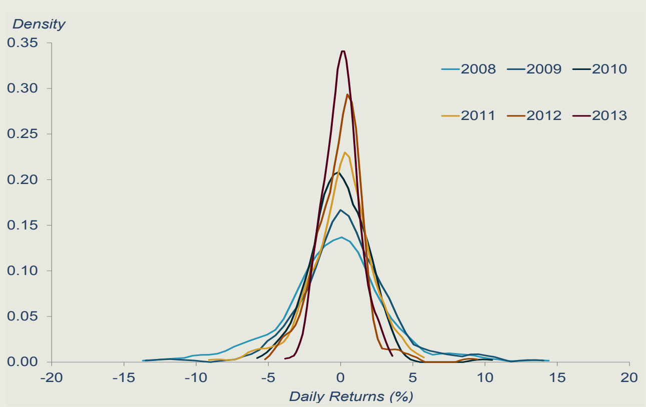
The next step is to examine the relationship between vol(r_t) and the volatility of the S&P 500 index, vol(SP_t). The S&P 500 index, which consists of the largest 500 companies traded in U.S. equity markets, is often viewed as an indicator of expectations about overall macroeconomic conditions. Figure box 1.4 confirms a strong correlation between vol(r_t) and vol(SP_t) during the 2008/09 financial crisis but no correlation in 1990. Thus, visual inspection alone strongly suggests that the 2008/09 volatility episode was associated with the 2008 financial crisis (and therefore demand-driven) while the 1990 episode reflected supply concerns induced by the first Gulf war (and, by induction, supply-driven).

To validate this conjecture, a Granger causality test was applied to vol(r_t) and vol(SP_t). Specifically, vol(r_t) was regressed on vol(r_{t-1}) and vol(SP_{t-1}) for each 250-day moving window during 1988-2013. Subsequently, White's robust standard errors were calculated. A p-value of less than 0.01 associated with the parameter estimate of vol(SP_{t-1}) would be consistent with a Granger-causal relation from vol(SP_t) to vol(r_t).

Causality analysis results (not reported in this box) confirm that vol(SP_t) began "Granger-causing" vol(r_t) in 2007, albeit in a limited way. The strongest causation was detected in 2009 (i.e., as the regressions included more observations from 2009, the parameter estimate of vol(SP_{t-1}) was becoming progressively more significant). The causation began dissipating in 2010 and more so in 2011, effectively disappearing by 2012. These Granger-causality results suggest that the 2008/09 spike in oil price volatility emanated from macroeconomic concerns and thus should be viewed as demand-driven. On the other hand, the absence of Granger-causality in 1990 leaves supply disruptions due to the Gulf war the likely explanation of the spike in volatility. The results are consistent with Hamilton's (2013) finding that the 1990 and 2007/08 volatility episodes are supply- and demand-driven, respectively.

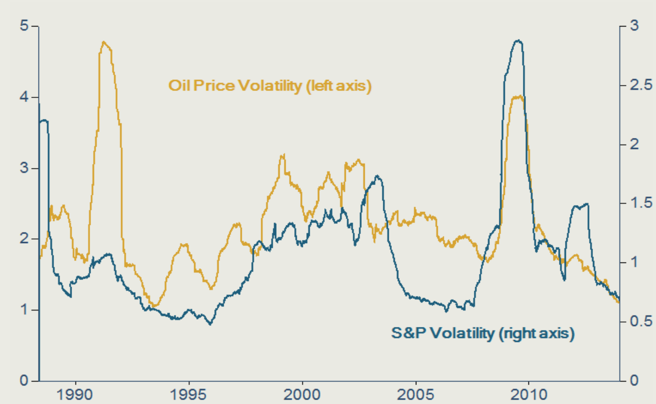
The three measures of volatility presented here (price changes in excess of 5 percent, standard deviation of returns, and within-year dispersion of returns) suggest that the view that oil price volatility will be permanently higher after 2008 is not supported by the empirical evidence. Furthermore, the evidence suggests that high oil prices are neither a necessary nor a sufficient condition for elevated price volatility since both high and low price volatility can take place under high and low prices. Indeed, the 1990 spike in volatility was associated with only a moderate increase in oil prices. while elevated volatility during the late 1990s, coincided with the lowest price level in recent history (when oil prices dropped temporarily below $10/bbl). Last, volatility during 2008/09 spiked well after the collapse of oil prices in late 2008.

Figure B1.3 **Dispersion of oil price changes**



Source: World Bank.

Figure B1.4 **Volatility of oil price and S&P 500**



Source: World Bank.

Metals

Following the collapse in metal prices in the wake of the 2008-09 global financial crisis, prices regained strength and increased almost continuously, reaching a peak in early 2011 (figures 12 and 13). The World Bank metals price index reached a new high of 126 (2010 = 100) in February 2011, up 164 percent from its December 2008 low. This increase, together with the sustained increases prior to the financial crisis, generated large investments which in turn induced a strong supply response.

Most of the additional metal supplies went to meet demand from China, whose consumption share of world refined metals reached almost 45 percent at the end of 2012, up from 42 percent in the previous year (figure 14). China's share of metal consumption in the early 1990s was less than 5 percent.

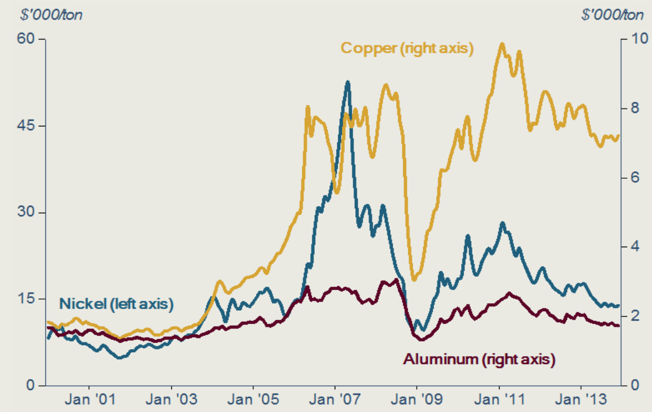
Real metal prices have fallen more than any other commodity group since their peaks in early 2011. For example, real prices of internationally traded energy, food and metals prices, denominated in U.S. dollars, have declined by 9, 13 and 30 percent respectively, between their peaks in early 2011 and November 2013. The declines in industrial metals along with an equally precipitous declines in precious metal prices, has prompted economists and analysts to argue that that the so-called commodity super cycle may be coming to an end. Yet, even though metal prices have eased recently, they are still twice as high compared to a decade ago.

Recent Developments

Although the decline in prices was halted during 2013Q4—up 0.8 percent from preceding quarter—the overall index averaged in 2013 almost 6 percent lower than 2012. The price strengthening in some metals (albeit marginal) during 2014Q4 reflects improving global manufacturing activity and the rebound of imports by China. For example, Chinese imports of aluminum and zinc—and to lesser extent of copper and iron ore—have grown over 100 percent in there months to November. Copper imports peaked at 47 percent in August, and have since moderated (figure 16).

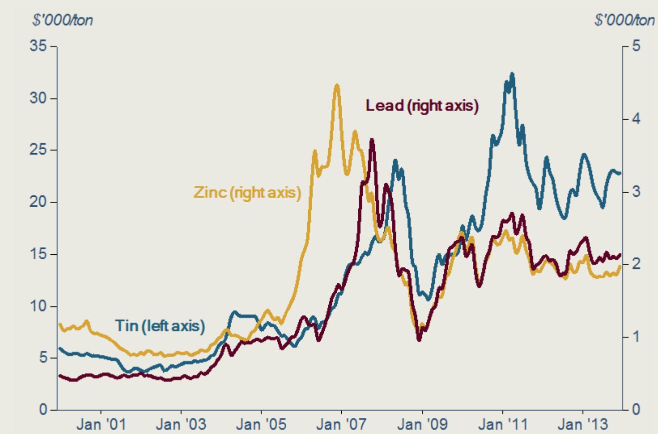
The weakening in metals prices during 2013 has been broad-based. Prices for zinc, copper, aluminum and nickel declined 2, 8, 9, and 14 percent respectively. Exceptions to this trend were lead and tin whose prices increased (up 3.6 percent and 5.5 percent, respectively).

Figure 12 **Metal prices (Aluminum, Copper and Nickel)**



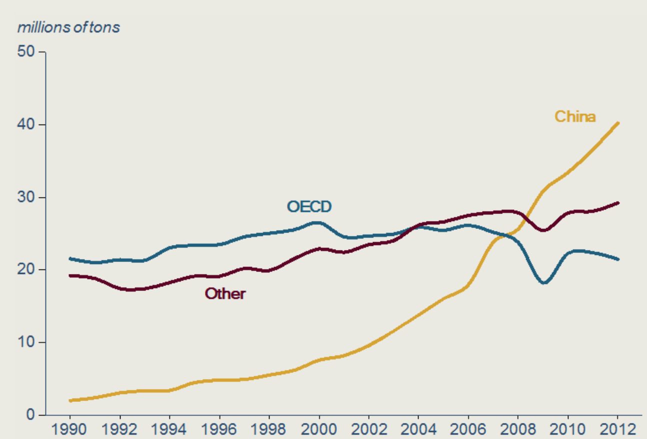
Source: World Bank.

Figure 13 **Metal prices (Lead, Tin, and Zinc)**



Source: World Bank.

Figure 14 **World consumption of metals**



Source: World Bureau of Metals Statistics.

The strengthening in tin prices is policy related. Indonesia, the world's second largest supplier, introduced new purity regulations and also requires that all trading destined for exports should be done through a local exchange. These regulations led to a near-collapse in exports in September/October (though exports have reverted recently to earlier levels). Separately, Indonesia policies could affected the other metals market as well as the government announced a ban on unprocessed ore exports (effective January 2014). The ban could have an impact on a number of metals, notably nickel, but also bauxite, copper and tin. It remains unclear, however, to what extent the ban will be enforced or will miners be able to export ore after paying fines or obtaining exemptions.

Although global stocks of metals at major exchanges have declined somewhat (down 5 percent during 2013), they are still elevated by historical standards. For example, copper, stocks at the major metals exchanges have been declining since the middle of the year and are down 14 percent. Zinc, lead and tin stocks have been on the decline since end-2013Q1 and have dropped by 23-24 percent each since end-2012. Aluminum stocks, which have been rising since end-2008, were flat in 2013, while nickel stocks were up 87 percent for the year. Both aluminum and nickel stocks remain near their 10-year peaks.

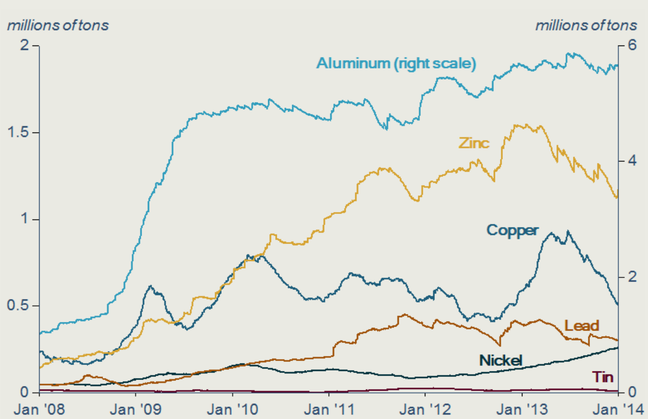
The sharp increase in stocks after 2008 at the London Metal Exchange (especially those for aluminum, zinc, and copper), reflects the fact that they have been tied to financing arrangements, a reflection of the 2008 credit crunch (figure 15). In turn, these arrangements broke the traditional negative relationship between stocks and prices whereby low (high) stocks would reflect tight (surplus) market conditions.

Outlook and Risks

The overall metal price index is expected to decline 2 percent in 2014 and 1 percent in 2015 as more supplies come on board. However, this average masks variations among individual metals. For example, the prices of aluminum, copper and nickel are expected to decline the most in 2014, very little change is expected in iron ore and led, while tin and zinc prices are expected to increase (1 and 5 percent, respectively).

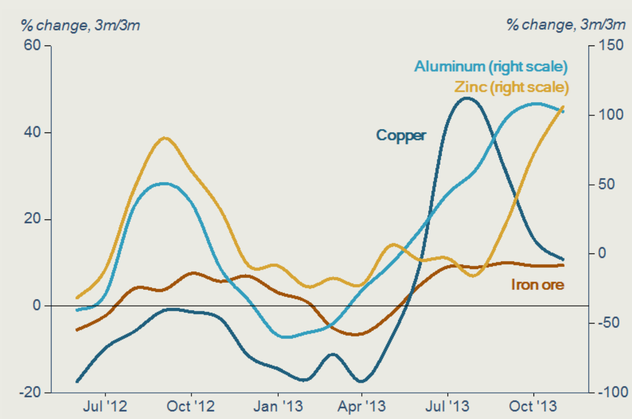
Most price risks are on the downside and depend mostly on the path of the Chinese economy. Last year's price declines reflected moderate demand growth and strong supply response, the latter a result of increased investment of the past few years which was induced by high prices. The prospects of the metal market depend crucially on Chinese demand, as the country accounts for more than 45 percent of global metal consumption. However, if robust supply trends continue and weaker-than-expected demand growth materializes, metal prices could decline more than the baseline presented in this outlook, with significant negative consequences for metal exporters (and benefits for metals importers). Monetary risks, including the impending normalization of monetary policy, should be less of a concern for metals. As elaborated in Box 2, the effect of short term interest rates on metal prices has been mixed and modest. Likewise, the effect of stocks has been small. The most important impact is likely to come from weakening of industrial production.

Figure 15 Stocks of metals at exchanges



Source: Bloomberg.

Figure 16 China's imports of metals



Source: China Customs, and Bloomberg.

Box 2 **Monetary conditions and metal prices**

The monetary easing of the past few years coincided with the longest and broadest commodity price boom since WWII and, not surprisingly, led to the expectation that the impeding monetary tightening may reverse the price trend. This box (which draws from Baffes and Savescu 2014a and 2014b) finds that the effect of short term interest rates on metal prices is mixed and modest. But, changes in longer term rates have a positive and highly significant impact. It also concludes that metal prices respond to industrial production, input prices, US dollar movements, and physical stocks of metals.

Between 1997-2004 and 2005-12 nominal metal increased more than 150 percent. Abundant global liquidity associated with low interest rates and quantitative easing in major developed economies over the past few years figure prominently as the commodity boom's key causes. And not surprisingly, the impending normalization of monetary conditions has created expectations that commodity prices will decline.

The relationship between interest rates and commodity prices goes back to Hotelling (1931) who argued that the price of an exhaustible resource must grow at the rate of interest (see Devarajan and Fisher (1981) for a literature review). Since then, this relationship has been examined extensively, especially during boom and bust cycles. See, for example, Cooper and Lawrence (1975), Barsky and Kilian (2001) for the 1970s boom; Lamm (1980), Gardner (1981), Frankel (1984) for the subsequent price declines; and Calvo (2008), Caballero, Farhi, and Gourinchas (2008), Medlock and Jaffe (2009), McKinnon and Liu (2012) for the recent boom.

Low interest rates could exert upward pressure on commodity prices through several channels. First, they increase current (and expectations about future) demand. Second, they alter stockholding behavior by reducing the cost of carrying stocks, thus reducing availability of current supplies—for extractive commodities stocks could include recoverable reserves as well. Third, they are associated with a depreciation of the US dollar—the currency of choice of most international commodity transactions. Fourth, they induce demand for futures contracts by portfolio managers of investment funds—the so-called financialization of commodities. However, low interest rates reduce the cost of capital which is associated with increasing investment and current (as well as expectations about future) supply, therefore lowering commodity prices. And, they could signal lower expected inflation. Therefore, low interest rates could be consistent with higher or lower prices depending on the dominant effect of the first four channels compared to the investment and inflation expectations channels.

To examine the relationship between interest rates and metal prices, a model that expresses the equilibrium price as a function of fundamentals by equating aggregate demand and supply of a commodity is utilized. The theoretical underpinnings of the model are explained in Turnovsky (1983), Stein (1986), Holtham (1988), and Deaton and Laroque (1992). Empirical applications include Gilbert (1989) who looked at the effect of developing country debt on commodity prices; Pindyck and Rotemberg (1990), who examined comovement among various commodity prices; Reinhart (1991) and Borensztein and Reinhart (1994) who analyzed the factors behind the weakness of commodity prices during the late 1980s and early 1990s; Baffes (1997) who examined the long term determinants of metal prices; Ai, Chatrath, and Song (2006) who re-examined comovement among commodity prices; Baffes and Dennis (2013) who analyzed the key drivers of the post-2004 food price increases.

The model takes the following form:

$$\log(P_t^i) = \beta_0 + \beta_1 \log(IR_t^j) + \beta_2 \log(IP_t) + \beta_3 \log(S_t^i) + \beta_4 \log(MUV_t) + \beta_5 \log(XR_t) + \varepsilon_t.$$

P denotes the nominal price of metal i, i = aluminum, copper, lead, nickel, tin, and zinc. IR denotes interest rate of maturity j, j = 3 month, 1 year, 5 year, and 10 year US Treasury Bills. IP_t, a demand proxy, denotes global industrial production, S represents stock level of metal i, MUV_t is the price index of manufacturing goods (a proxy for input prices), and XR_t is the U.S. exchange rate against a broad index of currencies. The β_is is are parameters to be estimated and ε_t is the error term.

To set the stage, each metal price was regressed on each interest rate by excluding the remaining fundamentals, i.e., $\log(P) = \beta_0 + \beta_1 \log(IR) + \varepsilon_t$. Results for the 24 bivariate regressions (reported in table B 2.1) reveal a strong negative correlation between interest rates and metal prices, consistent with the prevailing view that the low interest rate environment of the past few years has been an instrumental force behind the commodity price boom.

The impact of interest rates on metal prices is assessed by accounting for the full set of fundamentals discussed in equation (1). Results based on the 3m T-Bill are reported in table B 2.2. The impact of the 3-month T-Bill on metal prices is mixed. The average elasticity for aluminum, nickel, and zinc is slightly below 0.1 (significant at the 5% level in all three cases); it is positive and marginally significant for copper, negative and highly significant for tin, but not significantly different from zero for led. The mixed nature of the results echoes estimates from the literature. Gilbert (1989) based on an error-correction model (1965:Q1-1986:Q2) concluded that high interest rates have a negative impact on the metal price index, though with considerable lags. Baffes (1997), who used a reduced form price model for five metals (1971:Q1-1988:Q4) estimated mostly negative but not significantly different from zero elasticities. Akram (2009), based on a VAR model (1990:Q1-2007:Q4), concluded that commodity prices (including metals) increase significantly in response to a reduction in real interest rates. Anzuini, Lombardi, and Pagano (2010), who applied a VAR on monthly data for 1970-2009, did establish that easy monetary policy is associated with higher commodity prices (including a metals) but also noted that the impact is modest. Frankel and Rose (2010), based on annual data for a number of commodities including copper, platinum, and silver, found little support that easy monetary policy and low real interest rates are an important source of upward pressure on real commodity prices.

Table B 2.3 reports results based on all 4 interest rates (only the interest rate parameter estimate is reported). Estimates from the 1y T-Bill (second row) are similar to those of the 3m T-Bill—the size of the estimates increased marginally in 5 out of 6 metals. The longer term rates, however, give a different picture. For aluminum, copper, nickel, and zinc the parameter estimate for the 10y T-Bill averaged 0.57 and is significantly different from zero at the 1% level in all four cases.

Table B 2.1 **Parameter estimates from ordinary least squares regressions of metal prices on T-bills**

	Aluminium	Copper	Lead	Nickel	Tin	Zinc
3- month	-0.06 *** (3.02)	-0.24 *** (6.57)	-0.26 *** (7.68)	-0.18 *** (4.65)	-0.23 *** (9.84)	-0.09 *** (2.68)
1-year	-0.08 *** (3.01)	-0.31 *** (6.28)	-0.33 *** (7.20)	-0.24 *** (4.81)	-0.35 *** (9.30)	-0.11 ** (2.53)
5-year	-0.19 *** (3.90)	-0.64 *** (7.08)	-0.69 *** (6.77)	-0.52 *** (5.27)	-0.70 *** (7.80)	-0.25 *** (3.90)
10-year	-0.31 *** (4.11)	-1.00 *** (6.57)	-1.09 *** (6.48)	-0.86 *** (5.66)	-1.08 *** (7.25)	-0.42 *** (4.12)

Notes: The independent variable is the logarithm of the metal price and the dependent variable is the logarithm of the interest rate; the regressions include a constant term. Heteroskedasticity-consistent absolute t-statistics are reported in parentheses; they are based on Newey-West's method. Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

Table B 2.2 **Parameter estimates from ordinary least squares regressions**

	Aluminium	Copper	Lead	Nickel	Tin	Zinc
Constant (βo)	-37.19 *** (8.37)	-76.95 *** (8.99)	-65.19 *** (8.82)	-83.66 *** (10.58)	-50.97 *** (8.98)	-59.81 *** (4.53)
Interest rate (IR_t)	0.08 *** (4.14)	0.05 * (1.62)	-0.01 (0.35)	0.08 ** (2.54)	-0.05 *** (2.68)	0.10 ** (2.31)
Industrial production (IP_t)	1.45 *** (6.51)	3.08 *** (8.51)	2.28 *** (6.96)	3.47 *** (9.54)	1.95 *** (7.85)	2.48 *** (4.15)
Stocks (S_t)	0.01 (0.14)	-0.02 (0.53)	-0.16 *** (3.14)	-0.14 *** (2.97)	-0.07 * (1.88)	-0.09 (1.33)
Manufacture prices (MUV_t)	1.21* *** (3.98)	1.93 *** (4.85)	2.75 *** (7.59)	1.31 ** (2.44)	2.03 *** (7.63)	0.84 (1.20)
Exchange rate (XR_t)	-0.20 (1.01)	-1.80 *** (7.56)	-0.83 *** (3.71)	-1.56 *** (4.58)	-1.03 *** (6.02)	-1.36 *** (2.87)
Adjusted-R^2	0.88	0.95	0.95	0.89	0.96	0.81
ADF	-3.99 ***	-4.50 ***	-3.81 ***	-4.82 ***	-4.11 ***	-5.66 ***
PP	-4.31 ***	-3.85 ***	-4.20 ***	-3.51 ***	-3.90 ***	-3.69 ***

Notes: The independent variable is the logarithm of the respective price. Heteroskedasticity-consistent absolute t-statistics are reported in parentheses; they are based on Newey-West's method. MAPE = Mean Absolute Percent Error; ADF = Augmented Dickey-Fuller (statistic for unit roots); PP = Phillips-Perron (statistic for unit roots). Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

It is marginally significant for lead (0.23, t-ratio = 1.89), and zero for tin. Thus, longer term interest rates appear to exert a positive and highly significant impact on metal prices. These results are consistent with Scrimgeour (2010) who found that a one percentage point increase in long term interest rates would raise metal prices by almost 10%. Similarly, the 2013 Spillover Report (IMF 2013, p. 14) noted that under a smooth growth-driven normalization of monetary policy (i.e., raising interest rates the "right time") energy and non-energy commodity prices will increase by 7% and 5%, respectively. To check robustness, the model was re-estimated as a panel (fixed effects). Results for all four rates are reported in Box table 2.4. The small and not statistically different from zero parameter estimates for the short term rates (first two columns) mirror the results reported earlier. And, as expected, the longer term rates confirm the positive impact on metal prices established by the OLS regressions, with estimates 0.13 and 0.29.

The effect of the remaining fundamentals is consistent with microeconomic theory. The elasticity of industrial production was significantly different from zero in all cases with estimates ranging from 1.45 (aluminum) to 3.47 (zinc); the average from the panel estimates was 2.35, and highly significant. A similar strong impact has been confirmed by numerous authors, including Baffes (1997), Labys, Achouch, and Terraza (1999), and Issler, Rodrigues, and Burjack, (2013). In three metals (lead, nickel, and tin) stocks have a negative effect on prices, though the magnitude is relatively small (the panel regressions average was 0.17, significant at the 1% level). Manufacturing prices have exerted the largest impact after industrial production (except zinc) as evidenced by both the OLS and panel regressions—confirming the view that high input prices have played a key role during the post-2004 run up in metal prices (e.g. Radetzki et al 2008, World Bank 2009). Last, US dollar movements against a broad index of currencies have a strong and highly significant impact as well, which is in line with earlier literature (Gardner 1981, Gilbert 1989, Baffes 1997, Akram 2009).

Table B 2.3 **Parameter estimates from ordinary least squares regressions, (only the T-bill is reported)**

	Aluminium	Copper	Lead	Nickel	Tin	Zinc
3- month	0.08 *** (4.14)	0.05 * (1.62)	-0.01 (0.35)	0.08 ** (2.54)	-0.05 *** (2.68)	0.10 ** (2.31)
1-year	0.14 *** (4.86)	0.08 * (1.76)	-0.01 (0.28)	0.11 ** (2.35)	-0.07 ** (2.42)	0.16 ** (2.55)
5-year	0.31 *** (6.55)	0.23 *** (3.32)	0.10 (1.40)	0.37 *** (4.43)	-0.06 (0.99)	0.40 *** (3.60)
10-year	0.53 *** (6.72)	0.41 *** (3.58)	0.23 * (1.89)	0.70 *** (5.36)	-0.05 (0.51)	0.65 *** (3.65)

Notes: The independent variable is the logarithm of the respective price. Heteroskedasticity-consistent absolute t-statistics are reported in parentheses; they are based on Newey-West's method. Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

Table B 2.4 **Panel estimates based short- and long-term interest rates**

	3-month	1-year	5-year	10-year
Constant (βo)	-54.03 *** (18.94)	-54.43 *** (18.23)	-63.25 *** (20.28)	-67.39 *** (20.27)
Interest rate (IR_t)	0.01 (0.69)	0.01 (0.82)	0.13 *** (4.57)	0.29 *** (5.66)
Industrial production (IP_t)	2.15 *** (15.41)	2.17 *** (14.97)	2.48 *** (17.11)	2.60 *** (17.68)
Stocks (S_t)	-0.18 *** (11.82)	-0.18 *** (11.50)	-0.15 *** (10.80)	-0.15 *** (11.32)
Manufacture prices (MUV_t)	1.79 *** (9.09)	1.78 *** (9.03)	1.81 *** (9.33)	1.86 *** (9.69)
Exchange rate (XR_t)	-0.97 *** (7.12)	-0.98 *** (7.11)	-1.05 *** (7.88)	-0.97 *** (7.48)
Adjusted-R^2	0.99	0.99	0.99	0.99

Notes: The independent variable is the logarithm of the respective price. Heteroskedasticity-consistent absolute t-statistics are reported in parentheses; they are based on Newey-West's method. Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

Precious Metals

Prices of precious metals declined sharply during 2013. The World Bank's precious metals price index averaged 17 percent lower for the entire 2013 (figure 17). The decline marked a reversal of 11 straight years of increasing precious metal prices and reflects changing perceptions of global risk and inflation, given gold's status as a "safe-haven" asset. Silver prices averaged 23 percent lower, while gold and platinum prices declined 15 and 4 percent , respectively, on average for the year.

Against a background of low and falling inflation, improvements in the global economic outlook, strong equity market performance, and expectations of the start of normalization in U.S. monetary policy gold has lost its appeal to investors who rushed out of the gold exchange-traded funds (ETFs). The holdings of gold by ETFs are down 33 percent for the year according to data from Bloomberg. In contrast, holdings of silver and platinum (where physical demand is more important) were up by 2 and 71 percent, respectively (figure 18). Gold withdrawals were sharpest 2013H1 when outflows were on order of 5-6 percent per month. The rate of outflows slowed down to about 2 percent per month in the remainder of the year and picked up again in December as the U.S. Federal Reserve announced its decision to pare back its asset purchases starting in 2014.

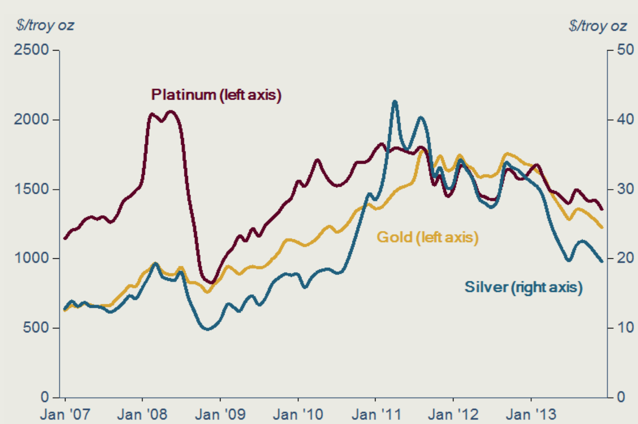
Key support for gold prices this year has been physical demand for gold from India and China in particular. As investor interest dissipated for gold in 2013H1, strong physical demand from these two countries largely absorbed physical outflows from global ETFs and gold moved eastward in response to lower prices. However, by 2013Q3, India introduced measures to restrict gold imports given its growing trade deficit and depreciating currency woes. As India's imports of gold have abated, premiums for physical gold have reportedly climbed to over $100 per oz over the global prices indicating still strong consumer demand for gold.

China's strong physical demand for gold been exceptionally strong in 2013 and it has overtaken India as the world's largest gold consumer, according to Thomson Reuters GFMS survey. Chinese demand grew by 32 percent year-over-year in 2013 and it has increased five-fold since 2003.

The weakness in precious metals prices is expected to persist and the index is expected to average additional 13 percent in 2014 (with gold, silver, and platinum down by 14, 12, and 6 percent, respectively) as institutional investors will continue to consider them less attractive "safe haven" alternatives. Prices are expected to stabilize in 2015 and decline 1.8 percent for the year.

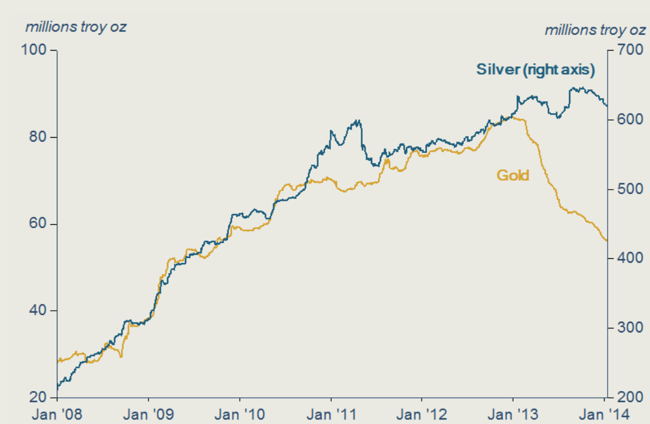
Most risks are on the downside due to the tapering of bond purchases by the U.S. Federal Reserve and likely increases in interest rates. Moreover, India's restrictions on gold imports to curb its current account deficit may put additional downward pressure on prices. In addition, continually robust demand from China might not be enough to counterbalance weak physical demand from India and investors.

Figure 17 Precious metal prices



Source: World Bank.

Figure 18 Precious metals holdings by ETFs



Source: Bloomberg.

Fertilizers

Fertilizer prices, a key input to the production of most agricultural commodities experienced a five-fold increase between 2003 and 2008. In addition to strong demand, the price hikes reflect increases in energy prices, especially natural gas—some fertilizers are made directly out of natural gas. Indeed, fertilizer prices are now more than three times higher than a decade ago, remarkably similar to the three-fold increase in energy prices. However, the upswing in fertilizer prices has been easing. The fertilizer price index, which reached a high of 202 in 2008 (2010 = 100) declined to 138 in 2012 and 114 in 2013. The declines were more pronounced in urea and phosphate, down 20 and 30 percent, respectively (figure 19).

The recent price declines have induced changes in the global fertilizer market. Traditionally, fertilizer companies have exported their products via three marketing organizations that negotiated annual contracts with buyers. However, in July 2013 the potash cartel between Russian and Belarusian companies broke up, followed shortly thereafter by the breakup of the 40-year-old North American Phosphate Chemicals Export Association.

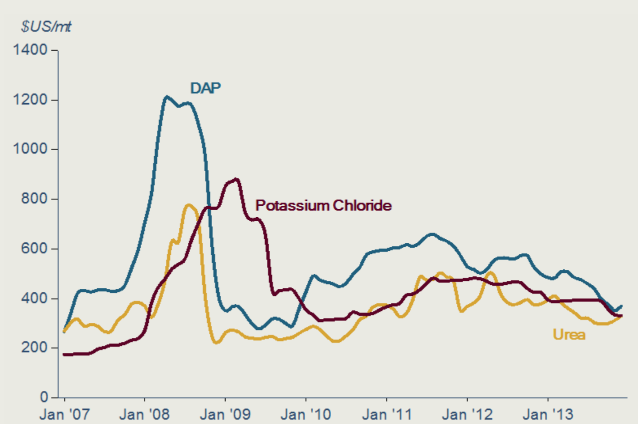
The global fertilizer market is in the process of a large transformation, for the most part induced by changes in energy markets. Because the key input of some fertilizers is natural gas, historically fertilizers and energy prices have moved in synch with each other. For example, the two spikes in fertilizer prices (early 1970s and late 2000s) were synchronized with peaks in energy prices (figure 20).

The recent 'energy revolution', however, is changing all that. As noted in the Energy section of this report, natural gas prices in the U.S. have been delinked from crude oil prices. U.S. natural gas is now traded 80 percent below crude oil, in energy equivalent terms. A decade ago, they were traded near parity. Not surprisingly, the decline of natural gas prices is inducing energy intensive industries move to the U.S. to take advantage of the 'energy dividend'. Such industries include petrochemicals, paper, aluminum, and fertilizer. From a longer term perspective, the move of fertilizer plants to the U.S. will lower fertilizer prices.

It is expected that fertilizer prices will ease further in the medium term. The World Bank's fertilizer index is expected to decline 11.7 percent in 2014 and additional 1.4 percent in the two years thereafter, which comes on top of last year's 17 percent decline. Among the individual components of the index, phosphate rock is expected to decline about 25 percent in 2014, followed by TSP (down 16 percent), DAP (down 12 percent), potash (down 10 percent), and Urea (down 4 percent). This outlook is based on the assumption that U.S. natural gas prices will increase at a moderate pace (due to stronger demand).

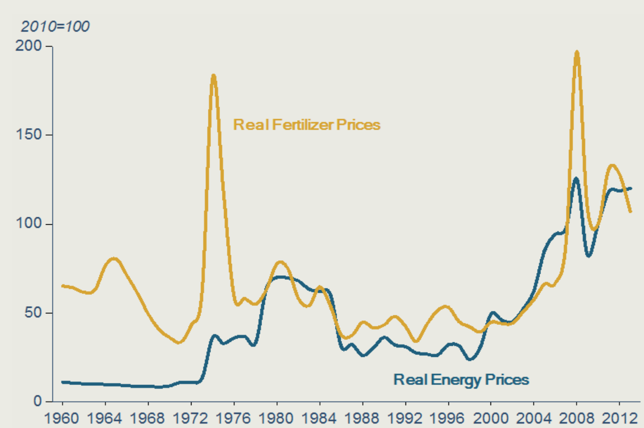
Price risks in the fertilizer markets are balanced. Upside risks include higher than expected natural gas prices in the U.S. which will moderate the 'energy dividend' and hence lower supply response. Also stronger than expected fertilizer demand growth by emerging economies, especially China, where commercialization of agriculture (and hence more use of fertilizer) is still taking place, could put upward pressure on fertilizer prices. However, if more fertilizers plants are built in the US, or demand moderates, prices of fertilizer could decline more than projects.

Figure 19 Fertilizer prices



Source: World Bank.

Figure 20 Historical fertilizer and energy prices



Source: World Bank.

Agriculture

Most agricultural commodity prices (especially grains) continued their weakness with the overall index down 1 percent from 2013Q3 and almost 9 percent lower than a year ago (Figure 21). Grains have led the decline, more than 27 percent down from 2013Q1 to 2013Q4, followed by beverages (-6.9 percent), raw materials (-3.3 percent), and edible oils and meals (-3.0 percent). The large decline of the grain index reflects the free-fall of maize and rice prices, 36 and 25 percent decline in just 9 months (from March to December 2013).

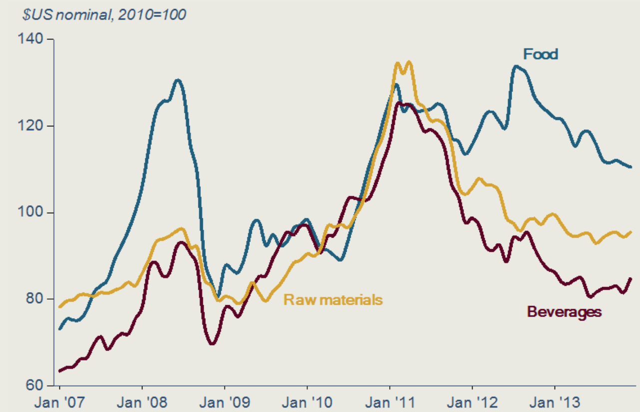
In its January 11, 2014 assessment, the U.S. Department of Agriculture largely maintained the marked improvement for the 2013/14 outlook with production of maize, wheat, and rice expected to increase by 12.0, 8.6, and 0.4 percent, respectively from last season. Increases are expected in the stock-to-use (S/U) ratios for maize and wheat but not rice. The oilseed and edible oil outlook is comfortable as well with global supplies of the 17 most consumed edible oils is expected to reach a record 196.3 million tons in 2013/14, up from last season's 187.6 million tons (a 4.6 percent increase).

Recent Developments

Grain prices have been declining steadily since their summer 2012 spike (figure 22). Between July 2012 and December 2013 maize, rice, and wheat prices declined 41, 28, and 16 percent, respectively—maize and rice prices reached record 3.5-year lows in December 2013. The decline has been aided by a continually improving supply prospects for the 2013/14 crop season. In its January 2014 update, the U.S. Department of Agriculture placed the global maize production estimate at 967 million tons, up from 863 million tons in 2012/13, in turn increasing the S/U ratio from 15.4 percent to 17.1 percent. Similarly, the global wheat production estimate for 2013/14 stands at 713 million tons, up from last season's 656 million tons, increasing marginally the S/U ratio, from 25.9 to 26.4 percent (figure 23 shows USDA's monthly outlook for the current crop since May 2013 when it was first introduced).

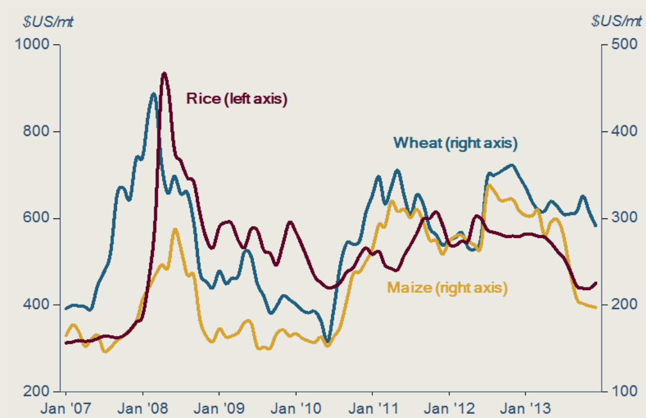
Rice prices averaged $451/ton in December, 3 percent higher than November but 20 percent lower than a year ago and less than half compared to their all time high of early 2008. The U.S. Department of Agriculture's recent assessment puts global rice production at 471 million tons, 2 million tons above last season's record. The S/U ratio is expected to reach 22.2 percent, marginally lower than last season's 22.9 percent but well within historical norms.

Figure 21 Agriculture price indices



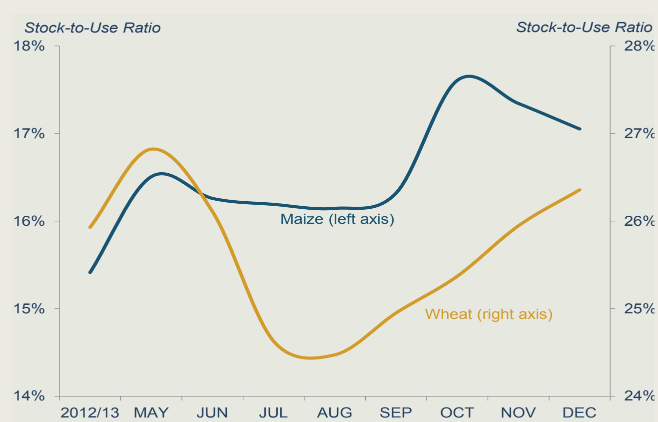
Source: World Bank.

Figure 22 Wheat, maize and rice prices



Source: World Bank.

Figure 23 Improvements in 2013/14 harvest



Source: World Bank.

Trade in rice has improved as well, expected to exceed 40 million tons in 2013/14, a new record.

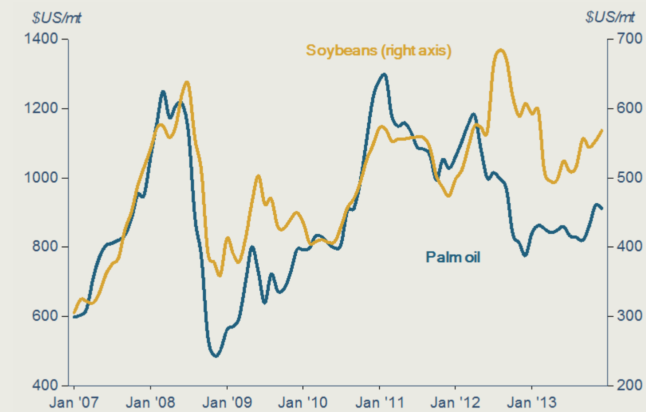
Edible oil and meal prices, which declined sharply in late 2012 and early 2013, gained strength towards the end of 2013 (figure 24). The World Bank's edible oil and meal index increased 4.7 percent in 2013Q4, though it is still 3 percent than a year ago. The strengthening in the edible oil prices was led by palm oil whose prices gained 8.5 percent from 2013Q3 to 2013Q4 when it became apparent later last year that world supplies will fall short of expectations. Furthermore, the governments of Malaysia and Indonesia (world's top palm oil suppliers) are promoting the diversion of palm oil to biodiesel. In fact, palm oil exports are expected to decline to 43.7 million tons in 2013/14, down from last season's 44.2 million tons. Soybean prices increased as well, 5 percent from 2013Q3 to 2013Q4, in part due to a tight soybean balance in the U.S. and in part due to concerns of the South American crop, including logistical bottlenecks that reduced exports.

The beverage price index did not change much in 2013Q4 (1.1 percent up from the previous quarter), but still 7 percent than a year ago. Yet, individual prices moved in opposite directions in response to different market fundamentals. Cocoa prices rallied 12 percent, coffee prices declined 8 percent while tea prices remained virtually unchanged (figure 25). The rally in cocoa prices (they reached a 27-month high in December 2013) reflects fears of a lower West Africa production and increased demand (especially in Europe). Preliminary estimates indicate that 2013/14 will be a deficit year. The coffee market, which had had a surplus of 2.4 million bags in 2012/13, is likely to experience another surplus year with the Brazilian and Vietnamese crops expected reach new record crops, 56 and 27 million bags respectively, adding another 4.5 million bags to the existing surplus—global coffee production reached 147 million bags in 2013.

Sugar prices (not part of the World Bank's beverage price index), which had been remarkably stable until 2013Q3, have come under pressure lately from a combination of factors, including weakening of the Brazilian currency, the real, increased net short position by investment funds, and more importantly, surplus production. Production in South and Central Brazil exceeded expectations while other key producers of the Northern Hemisphere, including India, Mexico, and Thailand are expected to have good crops as well.

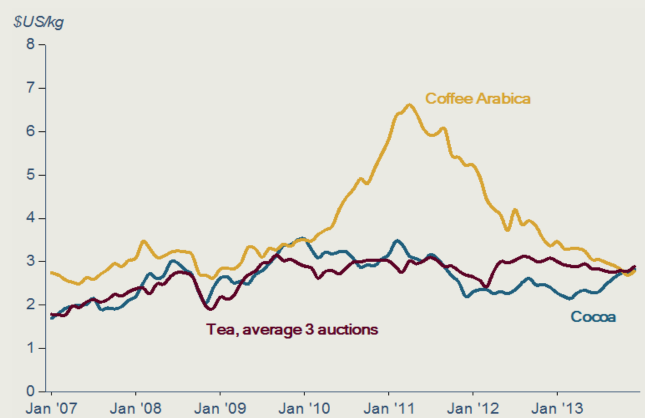
Raw material prices have been relatively stable recently; they increased marginally in 2013Q4 (up 1 percent from 2013Q3) but still 3.3 percent lower than a year ago (figure 26). While both natural rubber and cotton prices (two key

Figure 24 Edible oil prices



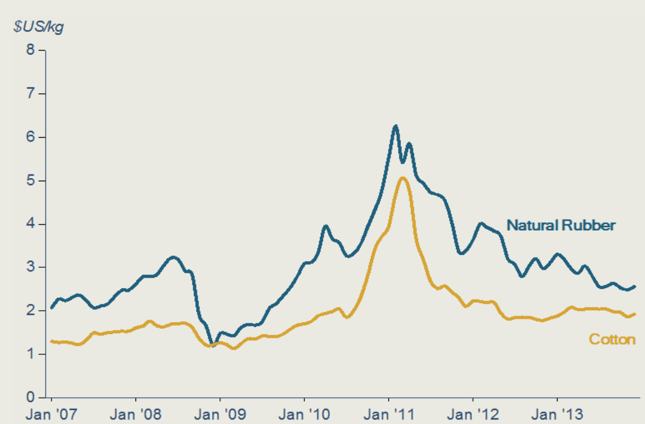
Source: World Bank.

Figure 25 Beverage prices



Source: World Bank.

Figure 26 Raw material prices



Source: US Department of Agriculture, Jan 2014 Update.

components of the World Bank raw material index) have been relatively stable during 2013Q4, each is 60 percent down since its early 2011 historical highs (figure 26). Both markets appear to be over-supplied. Global production of natural rubber increased 5 percent in 2013 (from 3.77 to 3.96 million tons) mostly due to strong production growth by Thailand and Indonesia. Moreover, the rubber market may come under more pressure in the medium term as new planting in several countries are entering the production stage (including Thailand, Laos, India, and Cambodia). On cotton, while global production is expected to decline (25.6 million tons in 2013/14, down from last season's 26.9 million tons), weak demand will generate an additional 2 million tons of stocks, most of which (1.8 million tons) will be absorbed by the Chinese government—at the end of the current season, China is expected to hold more than half of world's stocks.

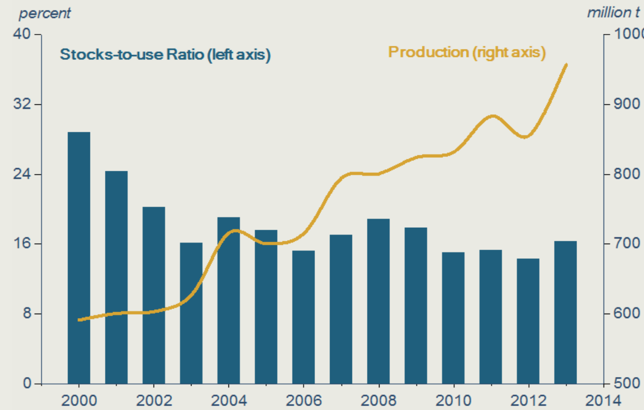
Outlook and Risks

Agricultural commodity prices are projected to decline 2.5 percent in 2014. Food commodities are expected to decline by 3.7 percent, followed by (-2 percent). Raw materials will increase marginally (+0.9 percent). The largest declines among food commodities will be in the grain group with maize, rice, and wheat down by 13, 9, and 4 percent. While edible oils and meals will change little at the aggregate, palm oil and soybeans are expected to increase by 4 and 2 percent while soybean oil and soybean meal will decline by 3 percent each. Raw material prices will increase marginally.

A number of assumptions (along with associated risks) underpin the outlook for agricultural commodities. These risks include crop conditions, energy prices, biofuels, macroeconomic environment, and trade policies. On crop conditions, it is assumed that that the 2013/14 season's outlook will be along normal trends. In its January 2013 assessment, the U.S. Department of Agriculture estimated the 2013/14 crop season's grain supplies (production plus stocks of maize, wheat, and rice) at 2.57 billion tons, up 5 percent from 2012/13. The level of supplies is deemed adequate to replenish stocks (see figures 27, 28, and 29). Since the crop year is well advanced, the probability of adverse weather conditions altering the current outlook in any significant way is very small.

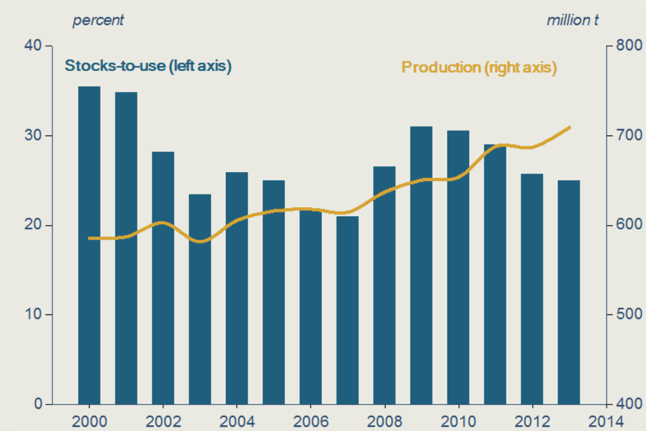
The baseline forecast also assumes that oil prices will remain elevated at $103/bbl in 2014, declining to $100/bbl in 2015. More importantly, fertilizer prices are assumed to decline considerably, almost 12 in 2014 in addition to a 17 percent decline they experienced in 2013. Given the high energy intensity of agriculture (it is estimated to be 4 or 5 times more energy intensive than

Figure 27 **Global maize supplies**



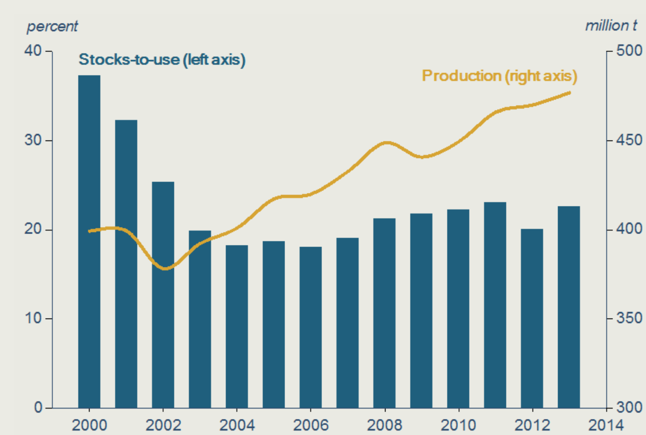
Source: US Department of Agriculture, Jan 2014 update.

Figure 28 **Global wheat supplies**



Source: US Department of Agriculture, Jan 2014 update.

Figure 29 **Global rice supplies**



Source: US Department of Agriculture, Jan 2014 update.

manufacture), the easing of fertilizer prices will relieve some of the input price pressure that the sector has been subjected during the past decade. Furthermore, given that the oil price risks are weighed more on the downside, the risks emanating from energy prices are lower compared to last quarter's assessment.

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, global biofuels production corresponds to about 1.3 mb/d of crude oil production in energy-equivalent terms, up from 0.3 mb/d a decade ago (Figure 30). Biofuels are projected to grow only moderately over the projection period as policy makers increasingly realize that the environmental and energy independence benefits of biofuels may not outweigh their costs. Indeed, with the exception of 2013 where global biofuel production posted a moderate increase (based on preliminary data), production during the past three years changed only modestly.

Given the experience of recent years, the outlook assumes that policy responses are unlikely to affect agricultural markets, an assumption that relies on markets remaining well-supplied. If the baseline outlook materializes, policy actions are unlikely and, if they take place, will be isolated with only limited impact.

Last, investment fund activity which was on the rise until 2013Q1 appears to have stabilized. 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 commodity markets) ended 2013Q3 at $325 billion, down from $332 in 2013Q2. Despite their size relative to commodity markets, the views regarding the effect of such funds on commodity prices has been mixed. Yet, while it is unlikely that these investments affect long-term price trends, they may have affected price variability.

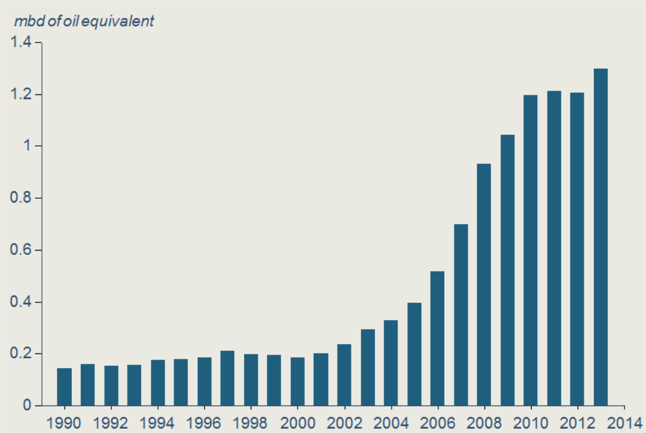
Two other risks often mentioned on agricultural commodities are income growth by emerging economies and macroeconomic fundamentals. Yet, as elaborated in Box 3, income growth by emerging economies does not affect agricultural prices in any significant way. On the contrary, income has a negative impact on agricultural prices when the later are deflated by the prices of manufacturing goods. Last, the effect of exchange rates and interest rates on agricultural prices is limited.

Recent trends in domestic food prices

The discussion so far has focused on price movements in U.S. dollar terms. However, the price consumers pay in their home countries is in local currencies which often differ considerably from international prices, at least in the short run. Reasons for this include exchange rate movements, trade policies intended to insulate domestic markets from world price movements (evident during the 2008/09 spike in food prices), the distance of domestic trading centers from domestic markets (which can add considerably to transportations and other costs), quality differences, and differences in the composition of food baskets across countries.

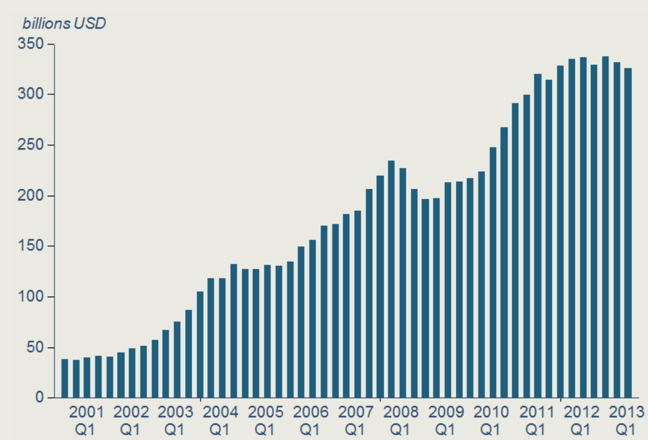
Table 2 reports changes in domestic wholesale prices of three internationally traded commodities (maize, wheat, and rice) for a set of low- and middle-income coun-

Figure 30 Biofuels production



Source: BP Statistical Review of World Energy; OECD.

Figure 31 Assets under management



Source: World Bank.

tries—the selection of countries was driven, in part, by data availability. These changes are compared to the corresponding world price changes (reported in the top row of each panel). The periods chosen are 2013Q4 against 2013Q3 (capturing short run responses) and 2012Q4 against 2013Q4 (intended to capture longer term effects). The table also reports price changes between 2006-07 and 2012-13, effectively capturing the entire food price boom period.

World prices of all three grains changed in a mixed manner between 2013Q3 and 2013Q4: maize and rice down 17.6 and 7.2 percent, respectively, and wheat virtually unchanged. The median domestic price changes were –3.5, 6.6, and 0.3 percent, for maize, wheat, rice, respectively. Domestic wheat and rice prices moved in a relatively calm manner. However, maize prices exhibited very large variation; three countries experienced double-digit increases and another three countries experienced declines which were more than twice the magnitude of world price change. A mixed picture for all three commodities emerges when 2013Q4 is compared to 2012Q4. For example, world maize prices declined by 37 percent but domestic prices in Ethiopia and Bolivia increased about 50 percent each. Similarly, large prices increases took place in Sudan and Ethiopia for wheat, despite a 13.4 decline in the world price.

The last column of table 2 reports price changes between 2006-07 and 2012-13, periods long enough to be not affected by the presence of lags in any significant way. During these two 2-year periods, the world price of maize, wheat, and rice increased by 95, 40, and 69 percent, respectively. Not surprisingly, all countries experienced large domestic price increases in all three commodities, with corresponding median increases at 80, 106, and 47 percent. As was the case with the shorter periods, there is considerable variation across countries. For example, rice prices increased by almost 160 percent in East Africa (calculated as the average of prices in Tanzania and Uganda) but only 43 percent in West Africa (calculated as the average of Burkina Faso, Mali, and Niger). The tentative conclusion from this brief analysis is that in the short term, domestic prices move, for the most part, independently of world prices. A stronger link is present in the longer term but large differences across countries are also present, implying that domestic factors (both policy and marketing) play a dominant and persistent role in the food price determination process of local markets.

Table 2 Wholesale grain prices

	13 Q4/ 13 Q3	13 Q4/ 12 Q4	12-13/ 06-07
Maize (20 countries)			
World (US$)	**-17.6**	**-37.1**	**95.4**
Tanzania	24.3	13.0	178.7
Ethiopia	21.2	53.0	237.5
Uganda	18.1	23.2	162.4
Kenya	8.0	-6.7	126.2
Mozambique	7.0	13.8	98.4
Rwanda	6.6	-3.1	82.3
Colombia	4.1	-3.6	6.8
Bolivia	1.9	49.0	45.3
Philippines	1.2	0.3	42.3
Mexico	-3.5	-13.0	87.5
Panama	-3.6	-3.4	90.4
Peru	-10.3	-3.5	28.4
Thailand	-12.7	-22.0	43.7
El Salvador	-12.9	-5.8	11.1
Dominican Republic	-14.8	-7.8	77.4
Guatemala	-18.1	-3.9	35.6
Nigeria	-20.3	-2.9	111.6
Ukraine	-28.4	-37.9	126.4
Nicaragua	-30.6	7.1	68.3
Honduras	-36.7	-10.4	19.8
Median	**-3.5**	**-3.4**	**79.9**
Wheat (6 countries)			
World (US$)	**0.7**	**-13.4**	**39.9**
Bolivia	12.3	14.8	79.0
Sudan	10.6	50.1	200.2
Ethiopia	8.8	25.0	160.3
Ukraine	4.5	-20.7	132.6
India	2.3	-0.9	55.4
Bangladesh	-4.4	-11.2	39.4
Median	**6.6**	**6.9**	**105.8**
Rice (19 countries)			
World (US$)	**-7.2**	**-20.7**	**69.3**
Peru	13.0	12.3	18.1
Uruguay	10.5	48.4	36.7
Philippines	8.0	16.2	46.5
Tanzania	4.1	-12.5	145.8
Nicaragua	2.6	5.4	85.0
El Salvador	1.4	-0.3	34.3
Rwanda	1.3	-17.1	82.4
Dominican Republic	0.7	9.5	20.4
Guatemala	0.5	1.9	51.3
Bolivia	0.3	30.7	42.3
Burkina Faso	0.0	2.6	57.9
Mali	0.0	-6.7	31.7
Panama	-0.2	3.5	59.0
Djibouti	-1.3	-6.7	39.1
Bangladesh	-2.2	27.8	46.6
India	-3.9	6.0	82.0
Niger	-4.1	-1.7	38.3
Uganda	-6.3	-5.7	167.9
Cambodia	-7.4	-7.4	68.7
Median	**0.3**	**2.6**	**46.6**

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

Box 3 Long term drivers of food prices and the Prebisch-Singer hypothesis

As incomes grow, people consume more food, including input-intensive products such as meat, dairy products, and packaged foods. With population growth, the positive impact of income on food prices should not be surprising. Indeed, income growth in emerging economies has been often mentioned as a key driver of past decade's food price increases. Yet, the relationship between income and food prices (along with its consequences) is a complex one. As early as the mid-1800s the statistician Ernst Engel observed that as income grows, the proportion allocated to food expenditures declines (the so-called Engel's Law). A century later, Kindleberger (1942) emphasized a key consequence of Engel's Law: Prices of primary commodities will be declining relative to the prices of manufacturing goods; stated otherwise, terms-of-trade (ToT) decline as income grows. Kindleberger's thesis was empirically verified by Prebisch (1950) and Singer (1950) independently—thus leading to what has been termed the Prebisch-Singer (P-S) hypothesis. By many accounts, these observations formed the intellectual foundation on which the industrialization policies of the 1960s and 1970s were based upon, that is heavy taxation of agricultural commodities in favor of manufacturing goods, especially in low income countries.

This box reconciles the (assumed) positive income-food prices relationship and the P-S hypothesis. Specifically, it summarizes earlier (Baffes and Dennis 2013) and ongoing (Baffes and Etienne 2014) analysis and shows that income has a negative and highly significant effect on ToT for food commodities, a result which is consistent with the P-S hypothesis and, by extension, with Engel's Law and Kindleberger's thesis. While this finding sheds light on the negative relationship between income and ToT, it is not clear whether the effect operates through the agricultural price channel (the numerator of ToT), the manufacturing price channel (the denominator of ToT), or both. Next, a modified version of the model was employed and showed that the impact operates through the manufacturing price channel. That, in turn, weakens the view that income growth by emerging economies has played a major role during the past decade's run up of food prices. Other key findings include the importance of energy costs, followed by physical stocks, and monetary conditions.

Income growth by emerging economies has been often cited as a key driver to the post-2004 food price increases. Krugman (2008) argued that the upward pressure on grain prices is due to the growing number of people in emerging economies, especially China, who are becoming wealthy enough to emulate Western diets. Likewise, Wolf (2008) concluded that strong income growth by China, India, and other emerging economies, which boosted demand for food commodities, was the key factor behind the post-2007 increases in food prices. Similarly, the June 2009 issue of National Geographic noted that demand for grains has increased because people in countries like China and India have prospered and moved up the food ladder. The role of demand by emerging economies has been highlighted by numerous other authors including Hochman and others (2011) and Roberts and Schlenker (2013).

To better understand the food price-income relationship, a reduced-form price-determination model is utilized (similar to the one described in box 2). Specifically, annual prices (1960-2013) for 6 agricultural commodities (maize, soybeans, wheat, rice, palm oil, and cotton) adjusted by manufacturing prices (i.e., commodity-specific ToT) were regressed on two macroeconomic indicators (the US$ exchange rate against a broad index of currencies and the interest rate), the stock-to-use ratio, crude oil prices as a proxy for energy costs, and income (global GDP). These six commodities account for most of world's arable land.

The six equations were estimated as seemingly unrelated regressions (Table B 3.1). The fundamentals explain more than two thirds of the commodity price trends, while 23 out of 30 parameter estimates (excluding the constant terms) were significantly different from zero at the 5 percent level of significance. The effect of income on the ToT is negative and highly significant for all commodities, with the parameter estimates ranging within a very tight band, from -0.56 for soybeans and wheat (t-ratios = 5.56 & 6.23) to -0.75 for cotton (t-ratio = 5.56).

To examine the sensitivity of results with respect to the measure of income used, the model was re-estimated by utilizing income measured in market and Purchasing Power Parity terms for global, Low and Middle Income countries, and just China and India both in aggregate and per capita terms, giving a total of 12 income measures. Table B 3.2 reports parameters estimates of these 12 income measures (only the income parameter estimate is reported). The results confirm the income-ToT negative relationship for all commodities and income measures at the 1 percent level of significance.

Next, to identify the channel through which income affects ToT, the model was modified by expressing the price variables in nominal terms and including manufacturing prices in the set of explanatory variables. This version of the model is similar to the one discussed in box 2 (see also Baffes and Dennis (2011) for more details). The results regarding the effect of income on ToT (reported in Table B 3.3) are quite revealing. With the single exception of soybeans the parameter estimates of income are not significantly different from zero. Replicating the model by utilizing all six income measures evaluated at market prices and PPP terms, shows that, with the exception of soybeans, income exerts an impact on nominal prices on only a few occasions (Table B 3.4).

The results for the remaining fundamentals are as expected. The parameter estimate of the stocks-to-use (S/U) ratio is negative and highly significant in all 6 commodities, implying that a low S/U ratio (consistent with scarcity) is associated with high prices and vice-versa. The S/U ratio elasticities are remarkably similar across the two models (Tables B 3.1 and 3.3).

They are also similar to findings reported elsewhere. For example, Bobenrieth, Wright, and Zeng (2012) estimated correlation coefficients between S/U ratios and real de-trended prices for wheat, maize, and rice of -0.40, -0.50, and -0.17, respectively (compared to -0.61, -0.50, and -0.21, respectively, in the present study.) Similarly, FAO (2008, p. 6, figure 3) reported correlation coefficients between the cereals price index and various measures of S/U ratios ranging from -0.47 and -0.65.

The oil price parameter estimate was significantly different from zero in all cases; its average across all 6 commodities is 0.20, implying that a 10 percent increase in energy costs increases the ToT by 5 percent. This is an important finding because oil prices tripled during the recent boom, implying that energy costs account for half of past decade's price

Table B 3.1 **Parameter estimates from seemingly unrelated regressions, real prices (1960-2013)**

	Maize	Soybeans	Wheat	Rice	Palm Oil	Cotton
Constant	15.40 *** (7.09)	13.40 *** (4.89)	12.50 *** (5.00)	21.20 *** (7.06)	17.10 *** (4.99)	12.00 *** (4.61)
Stocks-to-Use ratio (lag)	-0.43 *** (-6.80)	-0.16 *** (-2.97)	-0.42 *** (-4.46)	-0.31 *** (-3.51)	-0.34 *** (-3.35)	-0.42 *** (-4.47)
Oil price	0.19 *** (4.80)	0.18 *** (3.60)	0.17 *** (3.48)	0.17 *** (3.06)	0.33 *** (4.74)	0.14 *** (2.96)
Exchange rate	-0.46 (-1.52)	-0.32 (-0.86)	-0.059 (-0.17)	-1.40 *** (-3.43)	-0.20 (-0.42)	-0.20 (-0.55)
Interest rate	-0.0061 (-0.45)	-0.047 *** (-3.18)	-0.042 *** (-3.15)	-0.028 (-1.62)	-0.044 ** (-2.36)	-0.030 ** (-2.15)
Income (GDP)	-0.64 *** (-8.25)	-0.56 *** (-5.56)	-0.56 *** (-6.23)	-0.70 *** (-5.68)	-0.74 *** (-5.96)	-0.75 *** (-7.97)
R-sq	0.76	0.62	0.63	0.74	0.62	0.73
DF-GLS	-3.06 ***	-3.39 ***	-3.92 ***	-1.74	-2.37 **	-2.58 **
PP	-3.12 **	-3.43 ***	-3.31 **	-3.98 ***	-4.10 ***	-3.69 ***

Notes: The independent variable is the logarithm of the respective nominal price divided by manufacturing unit value index (MUV). Interest rate is the 3-month T-bill rate adjusted CPI. Income is measured by the world GDP in 2010 constant dollars. Because of data unavailability, the regressions for soybeans and palm oil begin in 1965. DF-GLS=modified Dickey-Fuller (statistic for unit roots) ; PP= Phillips=Perron (statistic for unit roots).
The numbers in parentheses are t-statistics. * = 10 percent, ** = 5 percent, *** = 1 percent..

Table B 3.2 **Income sensitity analysis, real prices (1960-2013)**

	Maize	Soybeans	Wheat	Rice	Palm Oil	Cotton
Market Prices						
World, total	-0.64 ***	-0.56 ***	-0.56 ***	-0.70 ***	-0.74 ***	-0.75 ***
LMC, total	-0.43 ***	-0.36 ***	-0.37 ***	-0.47 ***	-0.50 ***	-0.52 ***
China/India, total	-0.21 ***	-0.17 ***	-0.17 ***	-0.22 ***	-0.24 ***	-0.27 ***
World, per capita	-1.34 ***	-1.12 ***	-1.15 ***	-1.42 ***	-1.54 ***	-1.57 ***
LMC, per capita	-0.68 ***	-0.50 ***	-0.56 ***	-0.73 ***	-0.78 ***	-0.84 ***
China/India, per capita	-0.24 ***	-0.19 ***	-0.19 ***	-0.25 ***	-0.28 ***	-0.31 ***
PPP						
World, total	-0.60 ***	-0.52 ***	-0.52 ***	-0.65 ***	-0.70 ***	-0.71 ***
LMC, total	-0.41 ***	-0.34 ***	-0.35 ***	-0.45 ***	-0.48 ***	-0.51 ***
China/India, total	-0.22 ***	-0.18 ***	-0.18 ***	-0.23 ***	-0.25 ***	-0.28 ***
World, per capita	-1.16 ***	-0.93 ***	-0.98 ***	-1.23 ***	-1.34 ***	-1.39 ***
LMC, per capita	-0.63 ***	-0.46 ***	-0.51 ***	-0.68 ***	-0.73 ***	-0.80 ***
China/India, per capita	-0.25 ***	-0.20 ***	-0.20 ***	-0.26 ***	-0.30 ***	-0.33 ***

Notes: The independent variable is the logarithm of the respective nominal price divided by manufacturing unit value index (MUV). Interest rate is the 3-month T-bill rate adjusted CPI. Because of data unavailability, the regressions for soybeans and palm oil begin in 1965. LMC denotes low and middle income countries. * = 10 percent, ** = 5 percent, *** = 1 percent.

increases. The strong relationship between energy and non-energy prices has been established long before the recent boom. Gilbert (1989), for example, using quarterly data between 1965 and 1986, estimated transmission elasticity from energy to non-energy commodities of 0.12 and from energy to food commodities of 0.25. Hanson, Robinson, and Schluter (1993) based on a General Equilibrium Model found a significant effect of oil price changes to agricultural producer prices in the United States. Borensztein and Reinhart (1994), using quarterly data from 1970 to 1992, estimated transmission elasticity to non-energy commodities of 0.11. Baffes (2007), using annual data from 1960 to 2005 estimated elasticities of 0.16 and 0.18 for non-energy and food commodities, respectively. A strong relationship between energy and non-energy prices was found by Chaudhuri (2001) as well.

Table B 3.3 **Parameter estimates from seemingly unrelated regressions, nominal prices (1960-2013)**

	Maize	Soybeans	Wheat	Rice	Palm Oil	Cotton
Constant	7.20 *** (4.10)	0.32 (0.25)	2.97 * (1.75)	1.72 (0.66)	4.98 * (1.88)	2.76 (1.57)
Stocks-to-Use ratio (lag)	-0.36 *** (-4.48)	-0.14 *** (-4.18)	-0.38 *** (-4.37)	-0.37 ** (-2.04)	-0.25 * (-1.94)	-0.45 *** (-4.64)
Oil price	0.15 *** (3.22)	0.11 *** (2.77)	0.16 *** (3.40)	-0.014 (-0.17)	0.27 *** (3.25)	0.10 * (1.83)
Exchange rate	-0.18 (-1.23)	-0.76 *** (-6.62)	-0.43 *** (-2.95)	-0.84 *** (-3.42)	-0.50 ** (-2.12)	-0.30 * (-1.89)
Interest rate	-0.10 *** (-4.27)	-0.05 ** (-2.25)	-0.04 (-1.55)	-0.04 (-1.11)	-0.05 (-1.16)	-0.08 *** (-2.96)
Income	-0.30 (-1.60)	0.50 *** (3.76)	0.24 (1.39)	0.34 (1.17)	0.14 (0.51)	-0.19 (-1.05)
Manufacture prices	0.98 *** (3.54)	0.045 (0.26)	0.18 (0.83)	0.71 (1.37)	0.18 (0.47)	0.84 *** (3.59)
R-sq	0.90	0.93	0.91	0.76	0.74	0.85
DF-GLS	-4.05 ***	-6.41 ***	-5.07 ***	-4.88 ***	-2.34 **	-2.73 ***
PP	-4.40 ***	-5.30 ***	-4.00 ***	-4.10 ***	-4.30 ***	-4.30 ***

Notes: The independent variable is the logarithm of the respective nominal price. Interest rate is the 3-month T-bill rate. Income is measured by the nominal world GDP. Because of data unavailability, the regressions for soybeans and palm oil begin in 1965. DF-GLS=modified Dickey-Fuller (statistic for unit roots); PP= Phillips=Perron (statistic for unit roots).The numbers in parentheses are t-statistics. * = 10 percent, ** = 5 percent, *** = 1 percent.

Table B 3.4 **Income sensitity analysis, nominal prices (1960-2013)**

	Maize	Soybeans	Wheat	Rice	Palm Oil	Cotton
Market Prices (2010 constant US$)						
World, total	-0.45	0.78 ***	0.27	0.32	0.11	-0.33
LMC, total	-0.10	0.59 ***	0.26	0.31	0.31	-0.16
China/India, total	0.01	0.35 ***	0.21 *	0.33	0.21	-0.13
World, per capita	-0.68	1.27 ***	0.40	0.47	0.17	-0.50
LMC, per capita	-0.01	0.86 ***	0.40	0.48	0.56	-0.18
China/India, per capita	0.06	0.40 ***	0.25 *	0.42 *	0.26	-0.15
PPP						
World, total	-0.36	0.75 ***	0.25	0.29	0.12	-0.32
LMC, total	-0.10	0.58 ***	0.26	0.32	0.29	-0.17
China/India, total	0.10	0.37 ***	0.21 *	0.35	0.21	-0.14
World, per capita	-0.46	1.18 ***	0.36	0.42	0.20	-0.48
LMC, per capita	0.00	0.83 ***	0.38	0.49	0.52	-0.21
China/India, per capita	0.06	0.42 ***	0.25 *	0.45 *	0.26	-0.16

Notes: The independent variable is the logarithm of the respective nominal price. Interest rate is the 3-month T-bill rate. Because of data unavailability, the regressions for soybeans and palm oil begin in 1965. * = 10 percent, ** = 5 percent, *** = 1 percent..

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Annex

Historical commodity prices and price forecasts

Table A1.1 World Bank commodities price data

Commodity	Unit		Annual Averages			Quarterly Averages					Monthly Averages		
			Jan-Dec 2011[c]	Jan-Dec 2012	Jan-Dec 2013	Oct-Dec 2012	Jan-Mar 2013	Apr-Jun 2013	Jul-Sep 2013	Oct-Dec 2013	Oct 2013	Nov 2013	Dec 2013
Energy													
Coal, Australia	$/mt	a/	121.4	96.4	84.6	86.9	92.9	86.1	77.3	82.0	79.4	82.3	84.3
Coal, Colombia	$/mt		111.5	84.0	71.9	79.3	79.3	71.3	65.8	71.1	67.7	72.4	73.2
Coal, South Africa	$/mt		116.3	92.9	80.2	85.8	84.7	80.4	72.9	83.0	80.6	83.8	84.6
Crude oil, average	$/bbl		104.0	105.0	104.1	101.9	105.1	99.3	107.4	104.5	105.4	102.6	105.5
Crude oil, Brent	$/bbl	a/	110.9	112.0	108.9	110.5	112.9	103.0	110.1	109.4	109.5	108.1	110.7
Crude oil, Dubai	$/bbl	a/	106.0	108.9	105.4	107.2	108.0	100.8	106.2	106.7	106.3	105.9	107.9
Crude oil, WTI	$/bbl	a/	95.1	94.2	97.9	88.1	94.3	94.2	105.8	97.4	100.5	93.9	97.9
Natural gas, Index	2010=100		108.5	99.2	112.1	107.4	109.7	118.6	108.3	111.9	109.0	109.3	117.4
Natural gas, Europe	$/mmbtu	a/	10.5	11.5	11.8	11.7	11.8	12.4	11.5	11.4	11.4	11.4	11.6
Natural gas, US	$/mmbtu	a/	4.0	2.8	3.7	3.4	3.5	4.0	3.6	3.8	3.7	3.6	4.2
Natural gas, LNG Japan	$/mmbtu	a/	14.7	16.6	16.0	15.2	16.2	16.3	15.6	15.9	15.3	16.1	16.4
Non Energy Commodities													
Agriculture													
Beverages													
Cocoa	$/kg	b/	2.98	2.39	2.44	2.45	2.21	2.31	2.47	2.77	2.73	2.76	2.82
Coffee, arabica	$/kg	b/	5.98	4.11	3.08	3.57	3.35	3.20	2.98	2.77	2.84	2.69	2.78
Coffee, robusta	$/kg	b/	2.41	2.27	2.08	2.20	2.28	2.14	2.04	1.85	1.85	1.76	1.94
Tea, average	$/kg		2.92	2.90	2.86	3.04	2.94	2.89	2.79	2.82	2.80	2.78	2.89
Tea, Colombo auctions	$/kg	b/	3.26	3.06	3.45	3.20	3.38	3.29	3.37	3.77	3.77	3.72	3.81
Tea, Kolkata auctions	$/kg	b/	2.78	2.75	2.73	2.91	2.57	3.04	2.76	2.56	2.62	2.52	2.55
Tea, Mombasa auctions	$/kg	b/	2.72	2.88	2.40	3.00	2.87	2.35	2.23	2.13	2.00	2.09	2.31
Food													
Oils and Meals													
Coconut oil	$/mt	b/	1,730	1,111	941	844	837	839	912	1,175	985	1,270	1,269
Copra	$/mt		1,157	741	627	565	553	560	603	791	663	865	846
Fishmeal	$/mt		1,537	1,558	1,747	1,776	1,869	1,821	1,699	1,600	1,646	1,600	1,553
Groundnuts	$/mt		2,086	2,175	1,378	1,423	1,360	1,400	1,380	1,370	1,370	1,370	1,370
Groundnut oil	$/mt	b/	1,988	2,436	1,773	2,298	2,002	1,860	1,694	1,537	1,575	1,543	1,493
Palm oil	$/mt	b/	1,125	999	857	809	853	850	827	897	859	921	912
Palmkernel oil	$/mt		1,648	1,110	897	813	824	836	871	1,057	915	1,112	1,143
Soybean meal	$/mt	b/	398	524	545	587	531	528	552	570	580	566	564
Soybean oil	$/mt	b/	1,299	1,226	1,057	1,158	1,160	1,070	1,006	991	987	996	989
Soybeans	$/mt	b/	541	591	538	604	566	505	527	555	544	553	568
Grains													
Barley	$/mt	b/	207.2	240.3	202.2	249.3	236.7	230.4	191.0	150.7	150.8	152.0	149.2
Maize	$/mt	b/	291.7	298.4	259.4	317.2	305.0	291.3	241.9	199.4	201.7	199.1	197.4
Rice, Thailand 5%	$/mt	b/	543.0	563.0	505.9	558.4	562.1	541.6	477.3	442.7	439.0	438.0	451.0
Rice, Thailand 25%	$/mt		506.0	543.8	473.0	530.8	537.9	509.4	435.7	408.9	423.0	405.0	398.7
Rice, Thailand A1	$/mt		458.6	525.1	474.0	521.2	532.5	511.1	440.5	411.8	420.4	414.3	400.8
Rice, Vietnam 5%	$/mt		513.6	434.4	392.4	438.6	401.5	387.8	383.1	397.2	376.3	395.9	419.4
Sorghum	$/mt		268.7	271.9	243.3	285.4	292.0	259.9	219.2	202.1	205.2	195.2	205.9
Wheat, US HRW	$/mt	b/	316.3	313.2	312.2	355.7	321.4	313.8	305.8	308.0	325.7	306.8	291.6
Wheat, US SRW	$/mt		285.9	295.4	276.7	337.3	297.6	275.2	257.7	276.4	287.7	274.4	267.0
Other Food													
Bananas, EU	$/kg		1.12	1.10	1.02	1.10	1.10	1.07	0.98	0.94	0.96	0.88	0.97
Bananas, US	$/kg	b/	0.97	0.98	0.92	0.94	0.93	0.91	0.93	0.93	0.93	0.92	0.92
Meat, beef	$/kg	b/	4.04	4.14	4.07	4.19	4.27	4.11	3.89	4.03	3.93	4.04	4.11
Meat, chicken	$/kg	b/	1.93	2.08	2.29	2.13	2.21	2.29	2.34	2.31	2.32	2.31	2.30
Meat, sheep	$/kg		6.63	6.09	5.65	5.86	5.53	5.45	5.56	6.06	5.99	6.04	6.14
Oranges	$/kg	b/	0.89	0.87	0.97	0.86	0.83	1.07	1.14	0.83	1.00	0.77	0.74
Shrimp, Mexico	$/kg		11.93	10.06	13.84	10.24	11.26	12.24	15.15	16.70	16.07	16.95	17.09
Sugar, EU domestic	$/kg	b/	0.45	0.42	0.43	0.42	0.43	0.43	0.43	0.44	0.45	0.44	0.45
Sugar, US domestic	$/kg	b/	0.84	0.64	0.45	0.50	0.46	0.43	0.45	0.46	0.48	0.46	0.44
Sugar, World	$/kg	b/	0.57	0.47	0.39	0.43	0.41	0.39	0.38	0.39	0.41	0.39	0.36

Commodity	Unit		Annual Averages			Quarterly Averages					Monthly Averages		
			Jan-Dec 2011[c]	Jan-Dec 2012	Jan-Dec 2013	Oct-Dec 2012	Jan-Mar 2013	Apr-Jun 2013	Jul-Sep 2013	Oct-Dec 2013	Oct 2013	Nov 2013	Dec 2013
Raw Materials													
Timber													
Logs, Cameroon	$/cum		484.8	451.4	463.5	453.2	456.2	457.4	464.1	476.5	477.4	472.4	479.6
Logs, Malaysia	$/cum	b/	390.5	360.5	305.4	352.7	322.5	301.8	301.1	296.3	304.3	297.4	287.3
Plywood	¢/sheets		607.5	610.3	560.2	611.5	591.6	553.5	552.3	543.6	558.2	545.4	527.1
Sawnwood, Cameroon	$/cum		825.8	759.3	749.2	765.9	740.7	736.2	743.8	776.0	771.0	772.1	785.0
Sawnwood, Malaysia	$/cum	b/	939.4	876.3	852.8	874.4	845.2	837.4	846.0	882.7	877.0	878.2	892.8
Woodpulp	$/mt		899.6	762.8	823.1	748.2	784.0	818.7	830.9	858.7	845.7	860.5	870.0
Other Raw Materials													
Cotton, A Index	$/kg	b/	3.33	1.97	1.99	1.81	1.98	2.04	2.02	1.92	1.97	1.87	1.93
Rubber, RSS3	$/kg	b/	4.82	3.38	2.79	3.10	3.16	2.91	2.59	2.53	2.53	2.49	2.56
Rubber, TSR20	$/kg		4.52	3.16	2.52	2.88	2.96	2.45	2.35	2.31	2.32	2.30	2.31
Fertilizers													
DAP	$/mt	b/	618.9	539.8	444.9	532.3	491.6	489.8	432.1	366.1	377.3	351.3	369.9
Phosphate rock	$/mt	b/	184.9	185.9	148.1	185.0	173.0	166.3	143.2	110.0	120.6	108.5	101.0
Potassium chloride	$/mt	b/	435.3	459.0	379.2	430.1	390.8	392.3	391.9	341.6	358.7	334.0	332.0
TSP	$/mt	b/	538.3	462.0	382.1	452.2	435.0	426.0	366.0	301.3	310.0	295.0	298.8
Urea, E. Europe	$/mt	b/	421.0	405.4	340.1	383.0	396.6	342.4	307.5	313.9	299.3	312.4	330.1
Metals and Minerals													
Aluminum	$/mt	b/	2,401	2,023	1,847	2,003	2,000	1,836	1,783	1,767	1,815	1,748	1,739
Copper	$/mt	b/	8,828	7,962	7,332	7,913	7,918	7,161	7,086	7,162	7,203	7,071	7,214
Iron ore	$/dmt	b/	168	128	135	121	148	126	133	135	133	136	136
Lead	$/mt	b/	2,401	2,065	2,140	2,201	2,290	2,053	2,102	2,114	2,115	2,090	2,136
Nickel	$/mt	b/	22,910	17,548	15,032	16,984	17,296	14,967	13,956	13,909	14,118	13,684	13,926
Tin	$/mt	b/	26,054	21,126	22,286	21,609	24,018	20,902	21,314	22,910	23,102	22,827	22,803
Zinc	$/mt	b/	2,194	1,950	1,910	1,952	2,029	1,842	1,861	1,908	1,885	1,866	1,973
Precious Metals													
Gold	$/toz	c/	1,569	1,670	1,412	1,718	1,631	1,415	1,329	1,272	1,317	1,276	1,224
Platinum	$/toz	c/	1,719	1,551	1,487	1,598	1,632	1,466	1,451	1,397	1,413	1,420	1,356
Silver	$/toz	c/	35.2	31.1	23.8	32.6	30.1	23.2	21.4	20.8	21.9	20.8	19.6
World Bank commodity price indices for low and middle income countries (2010=100)													
Energy			128.7	127.6	127.4	124.7	128.6	123.1	130.2	127.7	128.3	125.5	129.5
Non Energy Commodities			119.8	109.5	101.7	108.2	107.2	101.7	99.2	98.6	99.1	98.0	98.5
Agriculture			121.6	114.5	106.3	113.5	110.1	107.3	104.3	103.5	104.0	103.1	103.3
Beverages			116.0	92.6	83.3	89.3	84.5	83.3	82.2	83.1	83.1	81.5	84.7
Food			122.5	124.5	115.6	124.9	120.7	117.4	113.2	111.2	112.0	111.2	110.5
Fats and Oils			120.5	126.1	115.9	122.9	117.8	112.7	113.8	119.2	117.5	119.9	120.1
Grains			138.2	141.3	128.2	150.2	143.6	138.3	121.6	109.5	111.7	109.0	107.6
Other Food			111.1	107.1	103.9	104.7	104.0	104.7	104.7	102.4	105.0	101.6	100.4
Raw Materials			122.0	101.3	95.3	98.3	97.3	94.9	94.1	95.0	95.4	94.3	95.4
Timber			117.3	109.1	102.6	108.3	103.2	100.9	101.6	104.6	104.7	104.3	104.8
Other Raw Materials			127.2	92.8	87.4	87.4	90.8	88.3	85.9	84.6	85.2	83.5	85.1
Fertilizers			142.6	137.6	113.7	132.0	128.9	119.8	108.2	97.9	98.8	96.6	98.2
Metals and Minerals			113.5	96.1	90.8	94.6	98.7	88.2	87.8	88.5	89.1	87.8	88.7
Base Metals		d/	113.1	98.0	90.3	97.3	98.0	88.7	87.1	87.6	88.7	86.5	87.7
Precious Metals			136.3	138.5	115.1	143.0	135.2	114.6	107.4	103.2	107.1	103.4	98.9

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.

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.

Table A1.2 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	87.0	90.0	91.0	91.9	92.9	93.9	94.9	95.9	96.9	97.9	99.0	100.0
Crude oil, avg, spot	$/bbl	104.1	103.5	99.8	98.6	98.2	97.9	97.6	97.4	97.3	97.1	97.0	96.8	96.7
Natural gas, Europe	$/mmbtu	11.8	11.4	11.0	10.8	10.6	10.4	10.2	9.9	9.8	9.6	9.4	9.2	9.0
Natural gas, US	$/mmbtu	3.7	4.2	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	2.40	2.30	2.29	2.28	2.27	2.26	2.25	2.24	2.23	2.22	2.21	2.20
Coffee, Arabica	$/kg	3.08	3.00	3.20	3.23	3.26	3.29	3.32	3.35	3.38	3.41	3.44	3.47	3.50
Coffee, robusta	$/kg	2.08	1.95	1.90	1.89	1.88	1.87	1.86	1.85	1.84	1.83	1.82	1.81	1.80
Tea, auctions (3), average	$/kg	2.86	2.88	2.90	2.93	2.96	2.99	3.02	3.05	3.08	3.11	3.14	3.17	3.20
Food														
Oils and Meals														
Coconut oil	$/mt	941	1,100	1,050	1,034	1,018	1,003	987	972	957	943	928	914	900
Groundnut oil	$/mt	1,773	1,700	1,750	1,760	1,770	1,779	1,789	1,799	1,809	1,819	1,830	1,840	1,850
Palm oil	$/mt	857	890	870	863	856	848	841	834	827	820	814	807	800
Soybean meal	$/mt	545	530	500	493	485	478	471	464	457	450	443	437	430
Soybean oil	$/mt	1,057	1,030	1,020	1,018	1,016	1,014	1,012	1,010	1,008	1,006	1,004	1,002	1,000
Soybeans	$/mt	538	550	535	532	530	527	525	522	520	517	515	512	510
Grains														
Barley	$/mt	202.2	170.0	165.0	166.4	167.9	169.4	170.8	172.3	173.8	175.4	176.9	178.4	180.0
Maize	$/mt	259.4	225.0	235.0	234.5	234.0	233.5	233.0	232.5	232.0	231.5	231.0	230.5	230.0
Rice, Thailand, 5%	$/mt	505.9	460.0	450.0	446.9	443.8	440.8	437.8	434.7	431.8	428.8	425.8	422.9	420.0
Wheat, US, HRW	$/mt	312.2	300.0	295.0	292.9	290.9	288.9	286.8	284.8	282.8	280.9	278.9	276.9	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	4.00	3.95	3.93	3.92	3.90	3.89	3.87	3.86	3.84	3.83	3.81	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	0.75	0.80	0.81	0.82	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.90
Shrimp, Mexico	$/kg	13.84	16.00	15.00	14.79	14.58	14.37	14.17	13.96	13.77	13.57	13.38	13.19	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	890.0	905.0	921.1	937.6	954.3	971.3	988.6	1,006.3	1,024.2	1,042.5	1,061.1	1,080.0
Other Raw Materials														
Cotton A Index	$/kg	1.99	1.95	2.00	2.03	2.06	2.09	2.11	2.14	2.17	2.21	2.24	2.27	2.30
Rubber, Malaysian	$/kg	2.79	2.70	2.75	2.75	2.76	2.76	2.77	2.77	2.78	2.78	2.79	2.79	2.80
Tobacco	$/mt	4,560	4,600	4,400	4,374	4,349	4,323	4,298	4,273	4,248	4,223	4,199	4,174	4,150
Fertilizers														
DAP	$/mt	444.9	390.0	400.0	403.8	407.7	411.6	415.5	419.5	423.5	427.6	431.7	435.8	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	340.0	330.0	327.9	325.9	323.9	321.8	319.8	317.9	315.9	313.9	311.9	310.0
TSP	$/mt	382.1	320.0	330.0	331.9	333.9	335.9	337.9	339.9	341.9	343.9	345.9	347.9	350.0
Urea, E. Europe, bulk	$/mt	340.1	325.0	320.0	317.9	315.9	313.9	311.8	309.8	307.8	305.9	303.9	301.9	300.0
Metals and Minerals														
Aluminum	$/mt	1,847	1,800	1,850	1,878	1,906	1,935	1,965	1,994	2,025	2,055	2,086	2,118	2,150
Copper	$/mt	7,332	7,150	7,100	7,069	7,039	7,009	6,978	6,948	6,918	6,889	6,859	6,829	6,800
Iron ore	$/dmt	135	135	137	138	139	139	140	141	142	143	143	144	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	14,500	15,000	15,276	15,557	15,843	16,135	16,432	16,734	17,042	17,355	17,675	18,000
Tin	$/mt	22,286	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	2,000	2,050	2,083	2,116	2,149	2,183	2,218	2,253	2,289	2,326	2,362	2,400
Precious Metals														
Gold	$/toz	1,412	1,220	1,200	1,190	1,179	1,169	1,159	1,149	1,139	1,129	1,119	1,110	1,100
Platinum	$/toz	1,487	1,400	1,350	1,340	1,329	1,319	1,309	1,299	1,289	1,279	1,269	1,260	1,250
Silver	$/toz	23.8	21.0	20.5	20.6	20.8	20.9	21.1	21.2	21.4	21.5	21.7	21.8	22.0

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Table A1.3 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	80.8	82.6	82.3	82.1	81.7	81.4	80.9	80.5	80.0	79.6	79.1	78.6
Crude oil, avg, spot	$/bbl	98.1	96.0	91.6	89.3	87.7	86.1	84.6	83.1	81.7	80.2	78.8	77.4	76.0
Natural gas, Europe	$/mmbtu	11.1	10.6	10.1	9.8	9.4	9.1	8.8	8.5	8.2	7.9	7.6	7.3	7.1
Natural gas, US	$/mmbtu	3.5	3.9	4.3	4.4	4.5	4.7	4.8	4.9	5.0	5.1	5.3	5.4	5.5
Natural gas LNG, Japan	$/mmbtu	15.1	14.7	13.8	13.3	12.9	12.5	12.1	11.7	11.3	10.9	10.5	10.2	9.8
Non Energy Commodities														
Agriculture														
Beverages														
Cocoa	$/kg	2.30	2.23	2.11	2.07	2.04	2.00	1.96	1.92	1.88	1.84	1.80	1.77	1.73
Coffee, Arabica	$/kg	2.90	2.78	2.94	2.92	2.91	2.89	2.87	2.86	2.84	2.81	2.79	2.77	2.75
Coffee, robusta	$/kg	1.96	1.81	1.74	1.71	1.68	1.64	1.61	1.58	1.54	1.51	1.48	1.45	1.42
Tea, auctions (3), average	$/kg	2.70	2.67	2.66	2.65	2.64	2.63	2.61	2.60	2.58	2.57	2.55	2.53	2.52
Food														
Oils and Meals														
Coconut oil	$/mt	887	1,021	964	936	909	882	856	829	804	779	754	731	708
Groundnut oil	$/mt	1,672	1,578	1,606	1,593	1,580	1,566	1,551	1,535	1,519	1,503	1,487	1,471	1,455
Palm oil	$/mt	808	826	798	781	764	746	729	712	695	678	661	645	629
Soybean meal	$/mt	514	492	459	446	433	420	408	396	383	372	360	349	338
Soybean oil	$/mt	996	956	936	922	907	892	877	862	846	831	816	801	786
Soybeans	$/mt	508	511	491	482	473	464	455	446	436	427	418	410	401
Grains														
Barley	$/mt	190.6	157.8	151.4	150.7	149.9	149.0	148.1	147.0	146.0	144.9	143.8	142.7	141.5
Maize	$/mt	244.6	208.9	215.7	212.3	208.9	205.4	201.9	198.4	194.8	191.2	187.7	184.3	180.9
Rice, Thailand, 5%	$/mt	477.0	427.0	413.0	404.6	396.2	387.8	379.4	370.9	362.5	354.2	346.1	338.1	330.3
Wheat, US, HRW	$/mt	294.4	278.5	270.8	265.2	259.7	254.2	248.6	243.0	237.5	232.0	226.6	221.4	216.2
Other Food														
Bananas, EU	$/kg	0.87	0.88	0.86	0.85	0.84	0.82	0.81	0.79	0.78	0.76	0.75	0.74	0.72
Meat, beef	$/kg	3.84	3.71	3.63	3.56	3.50	3.44	3.37	3.31	3.24	3.18	3.11	3.05	2.99
Meat, chicken	$/kg	2.16	2.09	2.02	1.97	1.93	1.88	1.84	1.79	1.74	1.70	1.66	1.61	1.57
Oranges	$/kg	0.91	0.70	0.73	0.73	0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71
Shrimp, Mexico	$/kg	13.05	14.85	13.77	13.39	13.01	12.64	12.28	11.91	11.56	11.21	10.87	10.54	10.22
Sugar, World	$/kg	0.37	0.35	0.34	0.33	0.33	0.32	0.31	0.31	0.30	0.29	0.29	0.28	0.28
Raw Materials														
Timber														
Logs, Cameroon	$/cum	437.1	440.9	440.5	439.3	437.9	436.3	434.4	432.4	430.1	427.8	425.5	423.1	420.7
Logs, Malaysia	$/cum	288.0	278.5	284.5	284.9	285.2	285.3	285.2	285.0	284.7	284.4	283.9	283.5	283.1
Sawnwood, Malaysia	$/cum	804.1	826.1	830.6	833.9	837.0	839.7	841.8	843.5	844.9	846.1	847.2	848.3	849.3
Other Raw Materials														
Cotton A Index	$/kg	1.88	1.81	1.84	1.84	1.84	1.84	1.83	1.83	1.83	1.82	1.82	1.81	1.81
Rubber, Malaysian	$/kg	2.63	2.51	2.52	2.49	2.46	2.43	2.40	2.37	2.33	2.30	2.27	2.23	2.20
Tobacco	$/mt	4,300	4,270	4,038	3,960	3,882	3,804	3,725	3,646	3,567	3,489	3,412	3,337	3,263
Fertilizers														
DAP	$/mt	419.5	362.0	367.1	365.6	364.0	362.2	360.1	357.9	355.6	353.2	350.8	348.4	346.0
Phosphate rock	$/mt	139.7	102.1	96.4	93.6	90.9	88.2	85.6	82.9	80.4	77.9	75.4	73.1	70.8
Potassium chloride	$/mt	357.5	315.6	302.9	296.9	291.0	285.0	278.9	272.9	266.9	260.9	255.1	249.4	243.8
TSP	$/mt	360.2	297.0	302.9	300.5	298.1	295.5	292.8	290.0	287.0	284.1	281.1	278.2	275.2
Urea, E. Europe, bulk	$/mt	320.7	301.7	293.7	287.8	282.0	276.2	270.3	264.4	258.5	252.7	247.0	241.4	235.9
Metals and Minerals														
Aluminum	$/mt	1,741	1,671	1,698	1,700	1,702	1,703	1,703	1,702	1,700	1,698	1,696	1,693	1,691
Copper	$/mt	6,913	6,637	6,516	6,400	6,284	6,167	6,048	5,928	5,809	5,691	5,574	5,460	5,347
Iron ore	$/dmt	128	125	126	125	124	123	121	120	119	118	117	115	114
Lead	$/mt	2,018	1,968	1,973	1,955	1,937	1,918	1,898	1,877	1,855	1,834	1,812	1,791	1,769
Nickel	$/mt	14,173	13,460	13,767	13,829	13,889	13,941	13,983	14,019	14,051	14,078	14,105	14,130	14,154
Tin	$/mt	21,013	20,885	20,834	20,748	20,661	20,561	20,448	20,325	20,196	20,063	19,929	19,794	19,659
Zinc	$/mt	1,801	1,856	1,881	1,885	1,889	1,891	1,892	1,892	1,892	1,891	1,890	1,889	1,887
Precious Metals														
Gold	$/toz	1,331.1	1,132.5	1,101.4	1,076.9	1,052.8	1,028.7	1,004.4	980.2	956.3	932.8	909.7	887.1	865.0
Platinum	$/toz	1,401.7	1,299.5	1,239.0	1,212.7	1,186.8	1,160.8	1,134.5	1,108.3	1,082.4	1,056.8	1,031.6	1,007.0	982.9
Silver	$/toz	22.5	19.5	18.8	18.7	18.6	18.4	18.3	18.1	18.0	17.8	17.6	17.5	17.3

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Table A1.4 World Bank indices of commodity prices and inflation, 2010=100

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	127.3	123.9	122.8	122.5	122.4	122.3	122.3	122.4	122.4	122.6	122.7	122.9
Non-energy commodities	101.7	99.0	98.8	98.9	99.0	99.1	99.2	99.3	99.4	99.6	99.7	99.9	100.0
Agriculture	106.3	103.7	103.0	103.0	102.9	102.8	102.8	102.7	102.7	102.6	102.6	102.6	102.6
Beverages	83.3	81.6	81.9	82.2	82.4	82.6	82.9	83.1	83.4	83.7	83.9	84.2	84.5
Food	115.6	111.4	109.8	109.2	108.6	108.0	107.4	106.8	106.2	105.6	105.0	104.4	103.9
Fats and oils	115.9	116.5	112.8	111.8	110.9	109.9	109.0	108.1	107.2	106.3	105.4	104.6	103.7
Grains	128.2	115.7	116.6	116.1	115.6	115.1	114.6	114.1	113.6	113.2	112.7	112.2	111.7
Other food	103.9	100.7	99.8	99.5	99.2	99.0	98.7	98.4	98.1	97.8	97.5	97.2	96.9
Raw materials	95.3	96.2	97.3	98.3	99.4	100.5	101.6	102.8	103.9	105.1	106.3	107.6	108.8
Timber	102.6	105.6	107.7	109.6	111.5	113.4	115.3	117.3	119.3	121.4	123.5	125.6	127.8
Other Raw Materials	87.4	86.0	85.8	86.0	86.2	86.4	86.7	86.9	87.1	87.3	87.6	87.8	88.1
Fertilizers	113.7	100.4	99.0	98.4	97.9	97.4	96.9	96.4	95.9	95.4	94.9	94.4	94.0
Metals and minerals [a]	90.8	89.2	90.2	90.7	91.2	91.7	92.2	92.7	93.2	93.8	94.3	94.9	95.5
Base Metals [b]	90.3	88.5	89.3	89.8	90.3	90.8	91.3	91.8	92.3	92.8	93.4	94.0	94.5
Precious Metals	115.1	100.1	98.2	97.7	97.1	96.6	96.1	95.6	95.1	94.6	94.1	93.6	93.1
Price indices in real 2010 US dollars (2010=100) [c]													
Energy	120.1	118.1	113.7	111.1	109.4	107.7	106.0	104.3	102.7	101.1	99.6	98.1	96.6
Non-energy commodities	95.9	91.9	90.7	89.5	88.4	87.2	86.0	84.7	83.5	82.3	81.0	79.8	78.7
Agriculture	100.2	96.2	94.6	93.2	91.8	90.5	89.1	87.6	86.2	84.8	83.4	82.0	80.7
Beverages	78.5	75.7	75.2	74.4	73.6	72.7	71.8	70.9	70.0	69.1	68.2	67.3	66.4
Food	109.0	103.4	100.8	98.9	96.9	95.0	93.1	91.1	89.2	87.2	85.3	83.5	81.7
Fats and oils	109.3	108.1	103.5	101.2	99.0	96.7	94.5	92.2	90.0	87.8	85.7	83.6	81.6
Grains	120.9	107.4	107.0	105.1	103.2	101.3	99.3	97.4	95.4	93.5	91.6	89.7	87.9
Other food	98.0	93.5	91.6	90.1	88.6	87.1	85.5	84.0	82.4	80.8	79.2	77.7	76.2
Raw materials	89.9	89.3	89.3	89.0	88.8	88.4	88.1	87.7	87.3	86.8	86.4	86.0	85.6
Timber	96.7	98.0	98.9	99.2	99.5	99.8	100.0	100.1	100.2	100.3	100.4	100.4	100.5
Other Raw Materials	82.4	79.8	78.8	77.9	77.0	76.1	75.1	74.1	73.1	72.1	71.2	70.2	69.2
Fertilizers	107.2	93.2	90.8	89.1	87.4	85.7	84.0	82.2	80.5	78.8	77.1	75.5	73.9
Metals and minerals [a]	85.6	82.8	82.8	82.1	81.4	80.7	79.9	79.1	78.3	77.5	76.7	75.9	75.1
Base Metals [b]	85.2	82.1	82.0	81.3	80.6	79.9	79.1	78.3	77.5	76.7	75.9	75.1	74.3
Precious Metals	108.5	92.9	90.2	88.4	86.7	85.0	83.3	81.5	79.8	78.1	76.4	74.8	73.2
Inflation indices, 2010=100 [d]													
MUV index [e]	106.1	107.7	109.0	110.5	112.0	113.6	115.4	117.2	119.1	121.0	123.0	125.1	127.2
% change per annum	(1.4)	1.6	1.1	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7
US GDP deflator	105.9	108.3	111.0	113.2	115.5	117.8	120.2	122.7	125.1	127.7	130.2	132.9	135.6
% change per annum	2.1	2.2	2.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

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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 kcal/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 0.8% 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 (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.
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 (Canada), no. 1, Western Red Spring (CWRS), in store, St. Lawrence, export price.
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.
Fishmeal (any origin), 64-65%, c&f Bremen, estimates based on wholesale price, beginning 2004; previously c&f Hamburg.
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.