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## COMMODITY DEPENDENCE AND INTERNATIONAL COMMODITY PRICES



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# Commodity Dependence and International Commodity Prices

## Introduction

The types of commodities exported by a country are another important determinant of a country's vulnerability to exogenous economic shocks. The majority of developing countries are dependent on primary commodities<sup>1</sup> for export revenues and, of the 141 developing countries, 95 depend on primary commodities for at least 50 percent of their export earnings (Brown 2008).

However, international commodity prices are notoriously volatile in the short to medium term, sometimes varying by as much as 50 percent in a single year (South Centre 2005). Moreover, price volatility is increasing over time and across a broad range of commodities. "In the past 30 years, there have been as many price shocks across the range of commodities as there were in the preceding 75 years" (Brown 2008).

*Over the longer term, dependence on primary commodities heightens a country's vulnerability because (non-oil) primary commodity prices exhibit a largely declining trend.*

From the perspective of developing countries, especially those whose principal means of foreign exchange earnings come from the exports of primary commodities, unstable commodity prices create macro-economic instabilities and complicate macro-economic management. Erratic price movements generate erratic movements in export revenue, cause instability in foreign exchange reserves and are strongly associated with growth volatility. The more commodity-dependent an economy — that is, the higher the share of primary goods in a country's exports — the more likely it is to be vulnerable to commodity price shocks.

For LICs that depend mostly on just a few commodities for the bulk share of their export earnings, commodity price fluctuations directly affect the incidence of poverty, since the vast majority of the poor are dependent on the production of primary commodities for their livelihoods. It is estimated that, of the roughly 2.5 billion people engaged in agriculture in developing countries, about 1 billion derive a substantial part of their income from the exports of commodities (Common Fund for Commodities 2005). As it stands, most of the countries dependent on commodities already suffer from widespread poverty and have low human development indicators.<sup>2</sup> "Of the 30 countries with the lowest HDI indicators in 2001, 26 were among either the 54 agricultural CDDCs identified by the European Commission or the 25 most mineral-dependent or 25 most oil dependent countries in the world." (Lines 2004).

At the household level, farmers and workers rely on commodity production for the cash incomes they use to pay for food, school fees and health care. Consequently, the poorest producers are hurt most by volatility, since they have fewer resources and social safety nets to fall back on.

In short, unpredictable price fluctuations can significantly reduce national revenue, cost millions of jobs and render farmers' crops nearly worthless in one fell swoop. At the national level, fluctuating revenues make fiscal planning extremely difficult and this in turn makes it extremely difficult<sup>3</sup> to plan sustainable social and economic development programmes.

Importantly, over the longer term, dependence on primary commodities heightens a country's vulnerability. This is because (non-oil) primary commodity prices exhibit a largely declining trend over the long term.<sup>4</sup> When there is a deterioration in the terms of trade for non-oil primary commodity producers over the longer term, increases in volumes must compensate for drops in prices in order for an economy to be able to afford



the same level of imports. Moreover, higher production in world markets leads to a further reduction in price. A continued and sustained decline in commodity prices also jeopardizes the debt sustainability positions of countries, since a drop in commodity prices increases the debt service to export earnings ratio. “Commodity dependent countries are highly vulnerable to debt unsustainability. Thirty seven of the countries classified as a Heavily Indebted Poor Country (HIPC) rely on primary commodities for more than half of their merchandise export earnings” (UNCTAD 2002).

This implies, then, that short- to medium-term upward movements in commodity prices (such as those that occurred during the 2003–2008 commodity price boom) should not be interpreted to mean that the fortunes of primary commodity-producing nations have irrevocably changed for the better. The longer-term deterioration in their terms of trade would caution against such optimism.

To conclude, the excessive instability in export earnings and economic growth rates that primary commodity-producing countries experience is closely associated with highly volatile commodity prices. Price volatility has been increasing sharply — by 175 percent from one decade (1990–2009) to the next (2000–2009) — evidence that commodity-dependent countries are becoming even more susceptible to price shocks. A disaggregated look at the prices of specific commodities reveals even greater volatility. Since most commodity-dependent nations rely on the export(s) of one or a few primary commodities, such volatility explains why these countries are especially vulnerable to price shocks.

*Trends in the share of primary commodities in total exports for the period 1995–2009 show that, despite a contraction between 1995 and 2000, the share of primary commodities in total exports rose rapidly between 2000 and 2009.*

The longer-term trend in (non-oil) commodity prices shows the dual problems of high risk and low returns faced by these countries. Even as prices of their exports decline over the long term, (non-oil) primary commodity producers are producing even larger volumes to maintain current import levels. And as more output floods the market, prices drop further.

Not surprisingly, much policy attention in this area over the years focused on mechanisms to stabilize the prices of primary commodities and provide compensatory finance to commodity producers in the event of extreme price shocks. Although attention has been shifting recently to income stabilization measures (to various instruments that can help commodity producers generate more stable, predictable incomes), measures to diversify away from a dependence on primary commodities will be critical over the longer term.

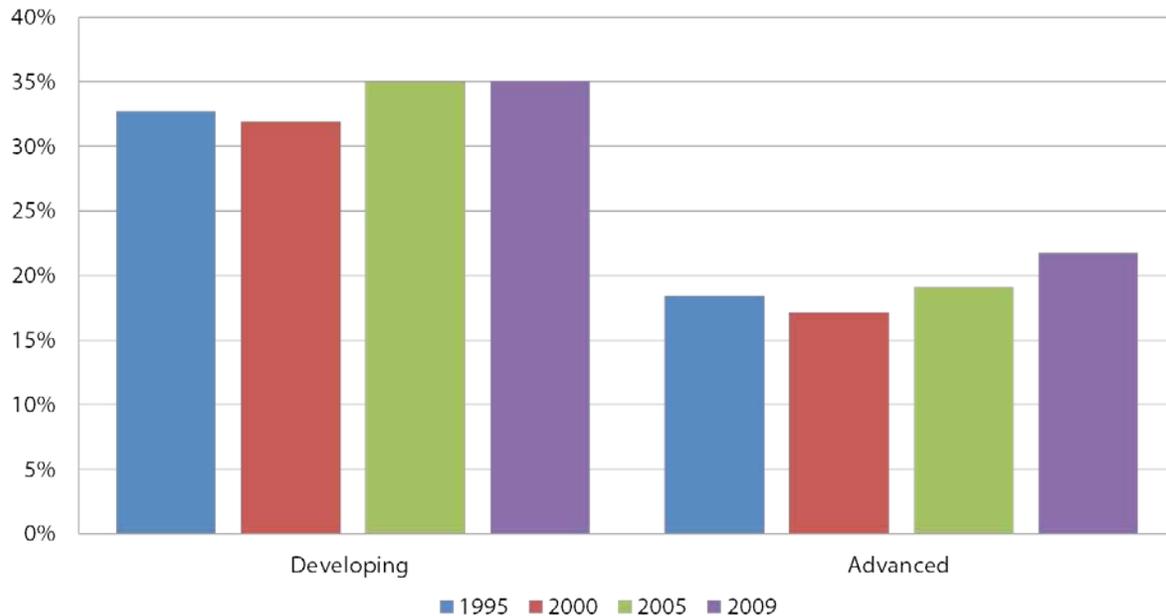
## Trends in Commodity Dependence

Commodity dependence is typically measured by (a) the share of export earnings of the top single commodity (or top three export commodities) in GDP, in total merchandise exports, and in total agriculture exports; (b) the percentage of people engaged in commodity production; or (c) the share in government revenue (South Centre 2005).

Examining trends in the share of primary commodities in total exports<sup>5</sup> for the period 1995–2009 (Chart 2.1) shows that, despite a contraction between 1995 and 2000, the share of primary commodities in total exports rose rapidly between 2000 and 2009. In developing economies, the share of primary commodities in total



**Chart 2.1: Share of primary commodity exports in total exports, 1995–2009**



**Source:** Calculated using data from UNCTAD, *Handbook of Statistics 2009*

exports increased from 32 percent in 2000 to 35 percent in 2009, whereas, in advanced economies, the share of primary commodities rose from 17 percent to 22 percent.

The share of primary commodities in exports increased across all regions of the developing world, albeit at different rates (Chart 2.2). Asian economies, which relied least on primary commodity exports, also witnessed the slowest growth in their share of primary commodities exports (from 25 percent in 1995 to 27 percent in 2009). On the other hand, Africa — the region most dependent on primary commodity exports throughout the period — became even more commodity-dependent (the share of primary commodity exports was 72 percent in 1995 and rose to 81 percent by 2009).

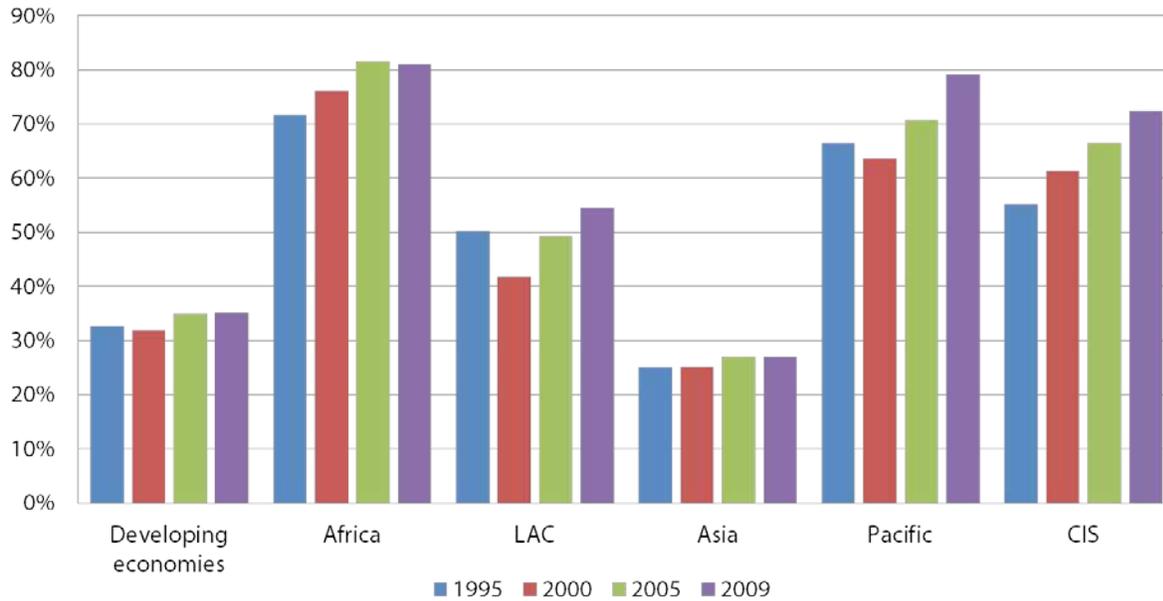
By 2009, the share of primary commodity exports for the Pacific Island states had risen to 79 percent of the region's exports and for the CIS to 72 percent. For Latin America and the Caribbean, the share of primary commodities in total exports rose from 50 percent in 1995 to 55 percent in 2009.

Thus, by 2009, all other developing regions, with the exception of Asia, had become significantly dependent on primary commodity exports (that is, the share of primary commodities in total exports exceeded 50 percent).

By development status (Chart 2.3), high-income developing countries registered a significant increase in their share of primary commodity exports (from 27 percent in 1995 to 37 percent in 2009), although MICs appeared to have the highest share of primary commodity exports: the share of primary exports in total exports increased from 44 percent in 1995 to 51 percent in 2009. Oddly, LICs saw their share of primary commodities in total exports fall from 36 percent in 1995 to 25 percent in 2009. This is mainly accounted for by China, which reduced its dependence on primary commodity exports during this period (from 16 percent in 1995 to 6 percent in 2009).

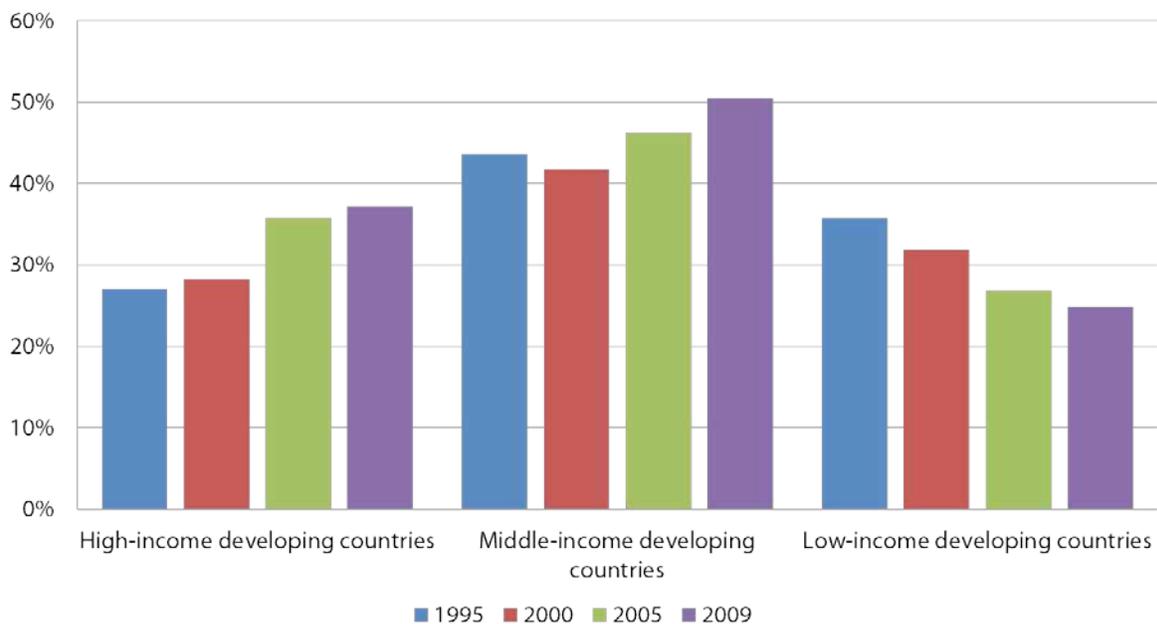


**Chart 2.2: Share of primary commodity exports in total exports by region, 1995–2009<sup>6</sup>**



**Source:** Calculated using data from UNCTAD, Handbook of Statistics 2009

**Chart 2.3: Share of primary commodity exports in total exports by development status, 1995–2009**



**Source:** Calculated using data from UNCTAD, Handbook of Statistics 2009



# Commodity Dependence and International Commodity Prices

It is important to note that, since commodity dependence is defined as the share of primary commodity export revenues to total export revenues, the trends in commodity dependence are a function of both price (value) and quantity (volume) effects. As shown in Chart 2.3, high-income developing economies experienced the largest increase in their share during the period 1995–2009. As expected, this increase was on account of a rise in the price of their exports and an increase in the quantity of exports. Specifically, between 2000–2009, prices rose by 3 percent, whereas total export volumes increased by 42 percent.

Of all country groupings, the group of LDCs has an extremely high dependency on primary commodities. Annex 2.A indicates that the share of primary commodities in total exports of the LDCs rose from 70 percent in 2000 to 78 percent in 2009. The largest increase in primary commodity exports was among the LDCs in the Pacific (increasing from 67 percent in 2000 to 80 percent in 2009). In Africa, the share of primary commodity exports increased from 89 percent in 2000 to 92 percent in 2009, whereas Asian LDCs had the lowest share of primary exports in total exports (41 percent in 2009) when compared to the LDCs from other regions. Overall, the LDCs, especially in Africa, remain extremely commodity-dependent.

## Trends in International Commodity Prices

The aggregate trend in (current) prices for all primary commodities for the period 1995–2010 (Chart 2.4) shows declining prices in the first half of the period (1995–2001). This bottomed out towards the end of 2001 and, from then on, commodity prices started to climb at accelerating speeds until the onset of the global crisis around April 2008. This trend applied to all categories of primary commodities at varying rates (Annex 2.B).

Specifically, by the end of 2001, commodity prices were 33 percent below their January 1995 price level. Commodity prices then went on a 224 percent climb from December 2001 to the peak of the price boom in April 2008. In the crash that followed, commodity prices lost 38 percent of their value from April to December 2008, though they have since rebounded. As of August 2010, commodity prices were 77 percent above their 1995 levels, but there are still high degrees of uncertainty on whether this price rise is sustainable in the long term.

### *Long-term Trends in International Commodity Prices*

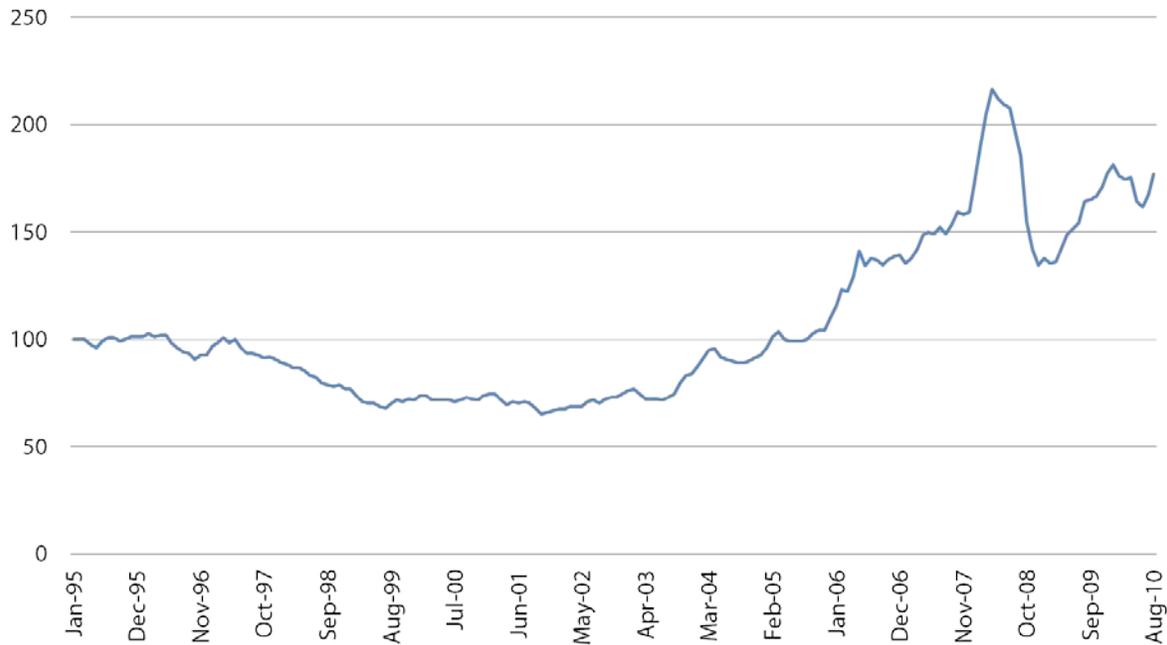
A key feature of international commodity prices is that short- to medium-term price fluctuations take place around declining long-term real price trends for non-oil primary commodities (Brown 2008, South Centre 2005, Page and Hewitt 2001).

Price trends for the last 50 years show that the index of real<sup>7</sup> commodity prices has declined significantly over time (Chart 2.5). Over the 43-year period from 1960 to 2003, the index of real commodity prices declined by 39 percent. This represents a 1.2 percent annual rate of decline.<sup>8</sup> Although commodity prices rose sharply between 2003 and 2008, they began to fall in the second half of 2008 and continued to fall in 2009 by 9 percent. Given continued uncertainties in the global economy and short-term price volatilities, it is difficult to determine if the long-term declining trend in primary commodity prices will reverse course.

Since real prices of commodities exhibit pronounced procyclicality (rising during periods of economic booms and declining during economic recessions and slowdowns), only focusing on medium-term price trends can be misleading and an unreliable indicator of long-term trends. In other words, the five-year commodity price boom (2003–2008) need not necessarily change the long-term trend.

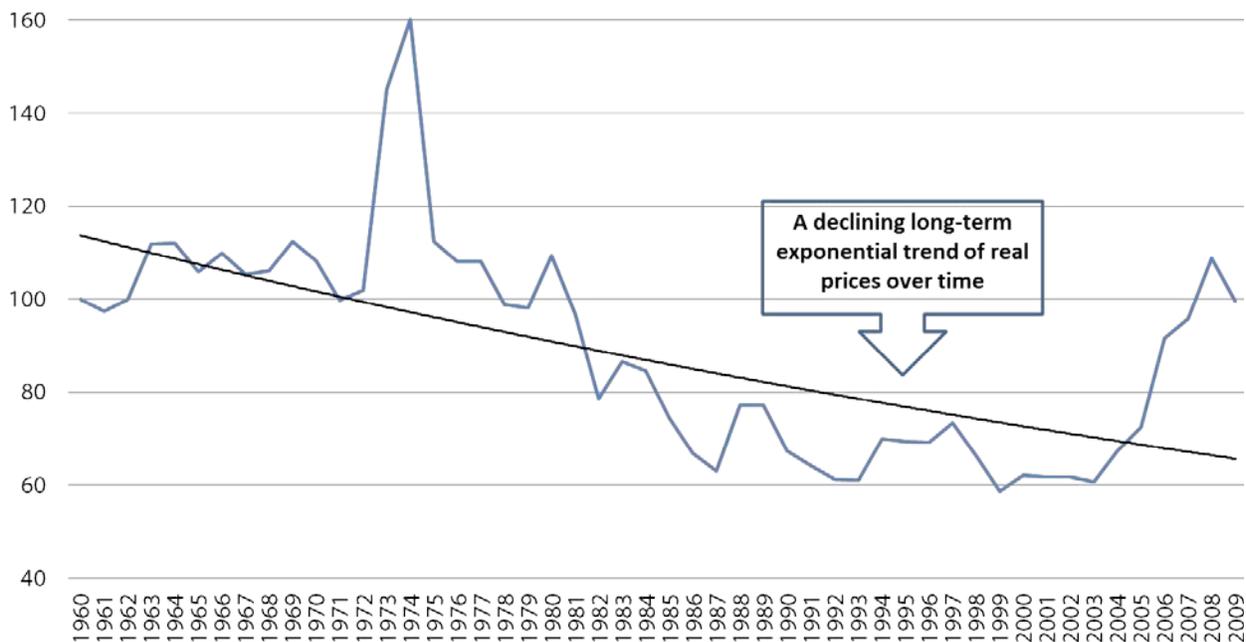


**Chart 2.4: All primary commodities' monthly price index, Jan 1995–Aug 2010 (Jan 1995=100)**



**Source:** Calculated using data from UNCTAD, Commodity Price Statistics 2010

**Chart 2.5: Index of real commodity prices, 1960–2009 (1960=100)**



**Source:** Calculated using data from UNCTAD, Commodity Price Statistics 2010 and International Financial Statistics 2010



# Commodity Dependence and International Commodity Prices

The long-term trends in prices for different types of primary commodities (Annex 2.C) show that, for food and minerals, real price declines have been extremely significant. The decline in real food prices is even more pronounced than that for minerals: between 1960 and 2003, real food prices fell by 42 percent, representing an annual rate of decline of 1.3 percent, as compared to minerals, where prices fell by a total of 27 percent during the period — a 0.7 percent annual rate of decline. Indeed, real food prices were 9 percent lower in 2009 than in 1960. However, the long-term trend in the real price of crude oil differs radically from that of other primary commodities: real prices in 2009 were six times what they were in 1960.

The continuous decline of long-term prices also means that producers' incomes dwindle day by day. To maintain the same level of income, producers need to increase the volume of commodities that they trade. However, as more output is put onto the market, price tends to fall even more. Put differently, a worsening in the terms of

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trade has required non-oil primary commodity-producing countries to compensate for losses in unit values by increasing output (to purchase the same quantity of imports). The terms of trade for developing countries have deteriorated significantly since the mid-1980s. Between 1986 and 1999, the volume of commodity exports from the LDCs increased by 43 percent. However, the purchasing power of their exports increased by only 3 percent. "World Bank estimates suggest that between 1970 and 1997 the terms of trade decline deprived non-oil exporting countries in Africa an equivalent of 119% of their combined annual GDP in lost revenues" (World Bank 2003, FAO 2004).

## *Short- and Medium-term Trends*

One of the distinguishing features of commodities is their highly fluctuating prices over the short to medium term, sometimes varying by as much as 50 percent in a single year (Brown 2008). Worse, price volatility is increasing over time: the commodity price instability index in current US dollars was 2.8 percent from 1999 to 2002, compared with 1.8 percent 10 years earlier (South Centre 2005).

Furthermore, the amplitude of price fluctuations varies considerably among different primary commodities: for instance, over the past 40 years, the prices of vegetable oilseeds and oils have been much more volatile than those of agricultural raw materials, food or beverages. Among non-agricultural commodities, silver, nickel and crude petroleum have the most unstable prices. Commodity price cycles also appear to be asymmetrical in that "periods of rising prices tend to be shorter as compared to periods of falling prices" (South Centre 2005).

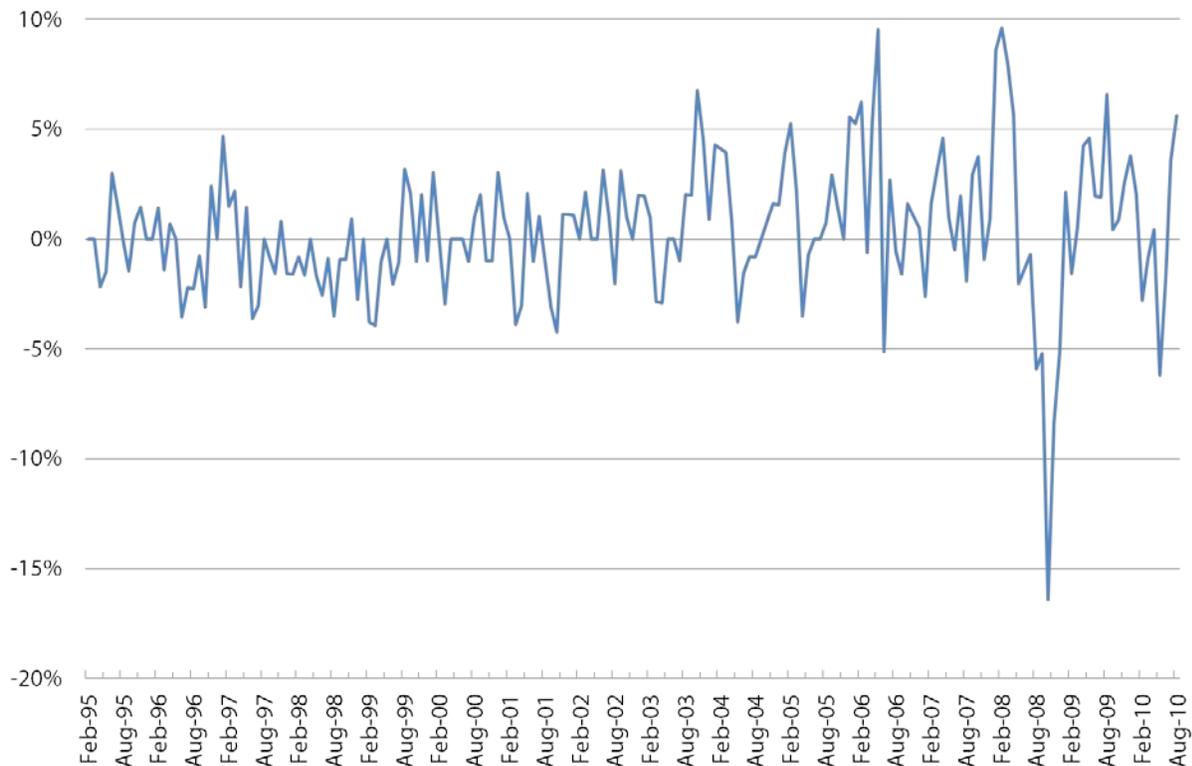
As indicated by Chart 2.6, price fluctuations in the short run are highly volatile even at the most aggregated level of commodity prices.<sup>9</sup> During the period 1995–2010, the maximum monthly decline in the average price level for all primary commodities was 16.4 percent. Not surprisingly, this was in August 2008, at the onset of the global economic crisis.

Monthly data for rates of change in commodity prices show that, in a month of price decline, prices fall by 2.4 percent on average and, in a month of price increases, prices rise by 2.8 percent on average.

Since most commodity-exporting developing countries are generally dependent on a single primary commodity or a few products from the same commodity family (e.g., different types of agricultural products)



**Chart 2.6: Rate of change of commodity prices by month, Feb 1995–Aug 2010**



**Source:** Calculated using data from UNCTAD, *Commodity Price Statistics 2010*

for export income, examining the behaviour of specific commodity prices reflects the magnitude of price variability that different groups of commodity-exporting countries actually experience. For instance, the monthly rate of change of food prices (Annex 2.D) was in decline for 44 percent of the months from February 1995 to August 2010. In a month of decline, the average decline was 2.5 percent and, in the 56 percent of the months when prices increased, the average increase was 3.1 percent. In times of extreme price shocks — for instance, during the global crisis in August 2008 — food prices declined by as much as 14.7 percent in a month.

The minerals price index, which includes all minerals, ores and metals, is even more volatile than the food price index. In the 40 percent of the months when the minerals price index was in decline from February 1995 to August 2010, the average monthly decline was 3.9 percent. During months of price increases, the average monthly increase was 4.1 percent. The maximum monthly decline during the period under examination was 19.7 percent (August 2008) and the maximum monthly increase was 17 percent in a single month (May 2006).

Crude oil prices<sup>10</sup> are even more volatile than either the prices of foods or minerals commodity groups. Between February 1995 and August 2010, in 37 percent of the time when prices declined, the average monthly decline in prices was 7.6 percent. During months of price increases, the price increase was 7.1 percent on average. The maximum decline in a single month was 26.7 percent in a single month. Indeed, more than a quarter of the price of crude oil was slashed in just one month (not surprisingly, August 2008). The maximum price rise in a single month was 23.7 percent.



# Commodity Dependence and International Commodity Prices

Clearly, not only is the volatility of primary commodity prices excessively high, it is also not uniform across different primary commodities. Table 2.1 looks at the average price instability<sup>11</sup> for major primary commodities.

**Table 2.1: Average Monthly Price Instability, 1995–2010**

Commodity Categories	Price Instability
All Primary Commodities	22%
All Food	20%
Minerals, Ores and Metals	34%
Crude Petroleum	31%

**Source:** Calculated using data from UNCTAD, *Commodity Price Statistics, 2010*

For all primary commodities, the average price instability from February 1995 to August 2010 was 22 percent. In other words, short-term price fluctuations on average were 22 percent above or below the long-run trend. The index of all food commodities (which includes foods, beverages, vegetable oils and raw vegetables) was just slightly less volatile than the overall index of primary commodity prices at 20 percent. However, volatility is greater if we examine single food items. For example, the price instability for coffee was 32 percent during the period. For minerals, price instability was 34 percent on average. Thus, minerals as a group are 70 percent more volatile in the short run than food commodities. The prices of specific minerals fluctuated at an even higher rate: for example, the price of phosphate fluctuated by 51 percent and copper by 45 percent between 1995 and 2010. Crude oil price instability was 31 percent during the period.

## Price Instability Over Time

It was noted earlier that not only does the degree of price volatility vary among primary commodities, but volatility has also been increasing over time.

**Table 2.2: Average Monthly Price Instability over Time**

Commodity Categories	1990–1999	2000–2009
All Primary Commodities	9%	26%
All Food	9%	25%
Minerals, Ores and Metals	17%	40%
Crude Petroleum	31%	28%

**Source:** Calculated using data from UNCTAD, *Commodity Prices Statistics, 2010*

As indicated by Table 2.2, the average monthly price instability for all primary commodities was 9 percent in the 1990s. In the first decade of the 21<sup>st</sup> century, this jumped to 26 percent. In other words, price instability of primary commodities increased by 175 percent from one decade to the next. This near tripling of price instability across the board for all primary commodities is further evidence that commodity-dependent countries are becoming even more susceptible to price shocks and volatility. For instance, food price instability rose from 9 percent in the 1990s to 25 percent in the 2000s (190 percent increase). For minerals, price instability rose by 141 percent from the 1990s to the 2000s. When disaggregated further, the instability in prices for specific commodities



shows considerable differentials: for phosphates, price instability rose from 16 percent on average in the 1990s to 67 percent in the 2000s (308 percent increase); and, for copper, price instability was 19 percent in the 1990s and increased to 52 percent in the 2000s (a 171 percent increase). Interestingly, for crude oil, prices became slightly less unstable, dropping from 31 percent in the 1990s to 28 percent in the 2000s.

## Causes of Commodity Price Volatility

It is generally acknowledged that a key reason for excessive price volatility of primary commodities is the inelastic nature of supply and demand of such commodities.<sup>12</sup> In agriculture, for instance, production can be difficult to adjust, since planting and planning decisions must be made far in advance of physical purchases. Thus, situations of oversupply can last for a long time, while it can be difficult to boost production in the case of a shortage.

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Other factors that drive price volatility in commodity markets include:

- a) Business cycles in key markets. Advanced economies are the primary consumers of primary commodities. When these economies experience downturns, prices of primary commodities fall.
- b) Changing weather patterns. Extreme weather events in (agricultural) commodity-producing countries can cause price hikes. Moreover, climate change is expected to increase weather-related volatility in the future as extreme weather events become more common and producers struggle to adapt to changing growing seasons.
- c) Conflict in producing countries. Political instability in supplier countries or important transit countries can disrupt commodity supplies, generating sharp spikes in commodity prices.
- d) Price speculation. Investors and funds that use commodity derivatives (e.g., futures and options) as part of their investment strategy can amplify the price effects of true changes in supply and demand. As of January 2007, Wall Street investment funds accounted for 20 to 50 percent of futures contracts for several agricultural commodities, including wheat, corn, cattle and live hogs. These funds, which are not allowed to trade in physical commodities, must 'roll-over' expiring contracts and re-balance their portfolios each month, creating changes in demand for futures contracts that are unrelated to physical demand for the actual goods (Barrionuevo and Anderson 2007).
- e) Export dumping. Farm subsidies in the United States and the European Union have encouraged excess production that brings down world prices when subsidized commodities are exported overseas and sold below the cost of production. However, developing countries have rarely had the capacity to pursue successful anti-dumping actions against these activities.
- f) Exchange-rate fluctuations. Even if international commodity prices are stable, exchange rate fluctuations affect a commodity's value in local currency, since major markets denominate prices in US dollars or in euros, but producers are paid in their local currency. From a producer's perspective, the cost in euros is irrelevant, since the purchasing power he/she gains by selling a product for local currency is what matters.<sup>13</sup>



# Commodity Dependence and International Commodity Prices

## Commodity Price Volatility and Economic Growth

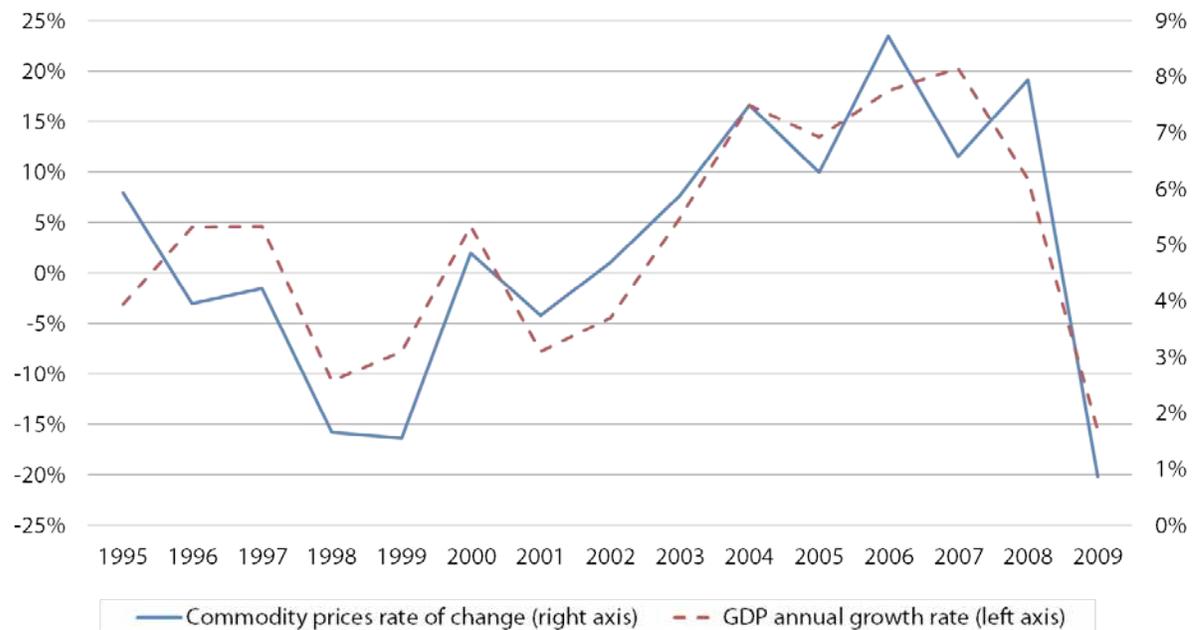
The uncertainty generated from commodity price fluctuations hampers economic growth and is associated with increases in poverty. Indeed, the correlation between changes in commodity prices and economic growth is striking (Chart 2.7). Examining economic growth rates for developing economies against the annual rate of change of commodity prices for the period 1995–2009 finds an 87 percent correlation between the two variables.

In summary, the picture for non-oil primary commodity producers is not rosy. The trends towards increasingly volatile prices, slipping relative prices and shifting power among commodity supply chains have left commodity-dependent countries and producers in a precarious position and grappling with the dual problems of low returns and high risk. Hence, it is important for these countries to reduce their dependence on primary commodities and adopt policies for economic diversification. In this context, policies and measures that focus on both price and revenue (income) stabilization will be critical.

## Building Resilience: Policy Options for Stabilizing Commodity Prices and Incomes of Commodity Producers

Commodity price volatility is not a new problem and different policies have been tried in the past to address it at the global and national levels. At the global level, the international community has tried many different ways to stabilize commodity prices and to smooth revenue fluctuations, including quota systems, commodity

**Chart 2.7: Rate of change in annual commodity prices and GDP growth rate in developing countries, 1995–2009**



**Source:** Calculated using data from UNCTAD, *Commodity Price Statistics 2010*; World Bank, *World Development Indicators 2009*; and World Bank, *Global Economic Prospects 2010*.<sup>14</sup>



agreements, compensatory funds and price hedging on futures markets. Indeed, prior to the 1990s, international attempts to stabilize prices largely focused on International Commodity Agreements (ICAs) and Compensatory Financing Funds (which provide bridging payments to help countries ride out price slumps).

However, starting in the mid-1980s, several international commodity supply agreements (for instance, ones for tin, sugar, and coffee) that previously regulated commodity prices were torn up, reducing international coordination of the production of some key commodities and having immediate impacts on their price.

As noted in Box 2.1, severe limitations have hampered compensatory funds currently in place, such as the European Union's FLEX programme and the IMF's Compensatory Finance Facility. In order to be practically helpful, future compensatory finance instruments need to be more accessible than past programmes, providing support for diversification activities rather than being seen as props for declining or uncompetitive economic sectors. "Less onerous disbursement criteria and fewer conditions would make utilizing CF funds a realistic option for commodity-dependent countries" (Brown et al. 2008).

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## Box 2.1: Compensatory Finance Mechanisms

Compensatory finance (CF) mechanisms attempt to smooth out revenue flows by providing relief payments to countries when unforeseen events cause export revenues to fall. To date, most CF mechanisms have focused on national balance of payments stability. As currently implemented, grants or loans are directed to governments rather than individual producers, although some of the funding may trickle down in the form of diversification programmes or development projects. Some examples of CF mechanisms include the IMF's Compensatory Finance Facility (CFF) and the EU's STABEX and FLEX schemes.

The benefit provided by these measures to countries so far has been minimal. The IMF's CFF suffered from strict eligibility requirements, onerous application procedures and costly financial terms. Countries were often able to secure better terms elsewhere and, as such, the CFF has gone largely unused since 2000.

STABEX (a CFF) was introduced in 1975 by the European Union as part of the first Lomé Agreement and was available to any African, Caribbean and Pacific country. Eligibility for compensation was based on a drop of 6.5 percent—compared to the four-year average—in export revenues from trade with the European Union in any eligible sector. Such a drop would trigger an automatic compensation payment to the affected government to use for diversification efforts and to benefit producers in the affected sector. In 2000, STABEX was replaced by the FLEX programme, which had more stringent eligibility requirements.

The EU programme too has been hampered by serious limitations. Although the CFF exists, it has been redundant in recent years; the EU's FLEX scheme continues to be used, but does not focus solely on commodity shocks.

**Source:** Brown, Oli, 2008, *From Feast to Famine: After Seven Good Years What Now for Commodity Producers in the Developing World*, International Institute for Sustainable Development (IISD), Manitoba, Canada.



# Commodity Dependence and International Commodity Prices

At the national level, although the best long-term solution is economic diversification away from dependence on a narrow and volatile revenue stream, countries and producers first need some semblance of revenue (or income) stability in order to reduce overall dependence on commodities. In other words, the focus is increasingly shifting to commodity income stabilization for developing countries and producers, where income stabilization refers to the various tools and mechanisms that can help countries and producers generate more stable and predictable incomes.

The basic economic tools necessary to help commodity producers get more predictable incomes are well known: supply management; national revenue management; market-based price risk-management; compensatory finance; and alternative trade initiatives. For instance, recent innovations in risk management insurance allow farmers to buy price insurance along with their fertilizer and national revenue management schemes can help smooth out dips in commodity revenue. Fair trade mechanisms can provide a price floor for producers. However, the bad news is that these mechanisms are not widely available to poor producers in the developing world.

## *Supply Management*

The purpose of supply management is to control the supply of a commodity relative to demand in order to influence its price (e.g., OPEC). Supply management can influence domestic or international markets. In addition to production/export quotas, supply management can take other forms when broadly defined, including buffer stock systems in which a central body is created to buy up a specific product when prices are low and release stocks when prices are high; import tariffs or quotas, which can directly limit the supply of imports or ensure that they do not undercut a minimum price; and minimum purchase price systems in which a government sets the minimum purchase price of a commodity and acts as buyer of last resort.

## *National Revenue Management*

National Revenue Management is a general term for fiscal management laws and institutions set up to smooth national spending and insulate a nation's economy from the harm of volatile revenues. Revenue management often takes the form of national revenue funds (NRFs), commonly known as 'stabilization funds'. Typically, the revenue management legislation specifies a baseline revenue level that represents the average commodity revenue stream at a sustainable production level. During commodity booms, profits in excess of the baseline are funneled into the NRF, which should exist outside of the national budget so that windfalls do not tempt short-term, politically motivated spending. Depending on the parameters of the NRF, the country can then draw on the fund when low commodity prices reduce national revenues (e.g., from royalties and taxes) below the pre-determined baseline.

National revenue management systems do not stabilize commodity prices. Instead, they try to sever the link between volatile commodity revenues and government expenditures by stabilizing the amount of money a government is legally allowed to use. This helps government avoid the temptation to treat booming commodity revenues as if they were permanent and subsidizes government spending when prices are low.

NRFs can help commodity-dependent countries avoid various pitfalls. Often, such funds hold investments outside of the country (in US Treasury bills, for instance) to protect against exchange rate appreciation and an increasing reliance on revenues from a single sector of the economy.

NRFs are most associated with oil-producing countries; similar funds have proven useful to some mineral-dependent countries (e.g., Chile, Botswana) and may be a good idea for countries dependent on



## Box 2.2: Chile's Copper Stabilization Fund

In 2006, the Fiscal Responsibility Law, which created two new sovereign wealth funds, was established. The first of these, the Pension Reserve Fund (PRF), is a savings fund created to cover a future expected public pension liability shortfall. Essentially, its purpose is to ensure the transfer of wealth from one generation to another. The PRF is funded using the first 0.5 percent of GDP of budget surpluses.

The second fund, the Economic and Social Stabilization Fund (ESSF), replaced the original Copper Stabilization Fund (CSF), which was established in 1985. The aim of this fund is to help stabilize the macroeconomy in response to volatility in copper prices. When copper prices are high, a portion of the excess copper revenues are accumulated in the fund and invested in low-risk assets. When the price of copper is low, the accumulated resources are then added to the government budget and used to smooth out public expenditure, particularly for social spending (IMF 2010).

The tripling of the price of copper through the middle of the 2000s enabled the Chilean government to accumulate

large amounts of reserves in the ESSF. Prior to the global financial crisis, the ESSF had accumulated revenues totalling about \$20 billion (Revenue Watch). Given the strength of the economy and high copper prices, the Chilean government had little need to tap into these reserves for much of the 2000s. With the onset of the global economic slowdown in 2008 and the fall in the price of copper, however, the Chilean government used a portion of the ESSF to help support social programmes, including pensions, medical and housing programmes. For example, in November 2008, over \$1 billion was used to improve lending opportunities for middle-income families and small and medium-sized businesses. A \$4 billion package was announced in January 2009 to support public works projects and public support for the most vulnerable Chileans (Revenue Watch). Additionally, the government announced the use of resources from ESSF to support reconstruction following the devastating 2010 earthquake, which caused an estimated \$30 billion in damage (Kraul 2010).

**Source:** IMF, 2008, 'Chile: Selected Issues Paper', Country Report No. 08/239, International Monetary Fund, Washington, DC.; Kraul, Chris, 2010, 'Chile will tap copper fund to pay for quake reconstruction', *Los Angeles Times*, March 17; Revenue Watch Institute, 'How Is the Economic Crisis Changing the Management of Resource Wealth?', Background, Revenue Watch Institute, New York.

agricultural commodities as well. Revenue management funds can be used for a variety of purposes, from broad expenditure stabilization to targeted competitiveness or diversification initiatives (such as Chile's Competitiveness and Innovation Fund).

### Market-based Price Risk Management

Market-based price risk management refers to any strategy that uses financial products to help producers reduce the uncertainty surrounding the prices they can get for their product. In effect, these tools help producers and governments transfer some of the risk they face to investors in commodity markets. As such, these mechanisms offer income predictability, not necessarily income stability, and they become prohibitively expensive after one or two years. However, greater revenue predictability makes it possible for producers to make better decisions and to obtain better credit terms.

Traditionally, risk management tools are based on forward contracts between commodity sellers and buyers and on futures and options contracts available through international and regional commodity exchanges. Futures contracts offer producers the opportunity to lock in a price for a given commodity, while options can either protect producers from downside risks or allow them to benefit from a price increase. However, individual producers can find it quite difficult or even impossible to directly access organized futures and



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options markets. As such, risk hedging requires that a large entity with the appropriate resources and technical expertise serve as an intermediary between the market and individual producers or producer groups.

Multinational buyers and local banks are in positions to offer even more accessible risk-hedging tools. One innovative example is the integration of risk management into contracts for fertilizers and other inputs, which farmers must buy anyway.

## Box 2.3: Index-Based Livestock Insurance in Mongolia

In 2005, the Government of Mongolia asked the World Bank for technical assistance to design and implement a pilot programme for index-based livestock insurance in order to protect herders against major livestock losses caused by harsh winters. The request recognized that smaller, individual livestock mortality risks are better addressed through appropriate household-level risk mitigation strategies.

The product created combines a commercial insurance product (the base insurance product) and a social product (the disaster response product). The base insurance product pays when livestock mortality rates in the local administrative area (soum) exceed 6 percent. Payments are based on estimates of livestock mortality rates in soums from January through May, as estimated by the annual livestock census and, in the future, by a mid-year livestock survey. This is the first time an index insurance product has been used in Mongolia, where traditional indemnity-based livestock insurance proved unsustainable, given the extensive herding practices.

The programme is offered through the Livestock Indemnity Insurance Pool (LIIP), a public-private risk-pooling arrangement, in which participating insurers share underwriting gains and losses based on the share of herder premiums they bring into the pool. The LIIP is protected with a stop-loss reinsurance treaty, currently underwritten by the government and backed by a World Bank credit.

The LIIP has several major advantages:

- It fully insulates this line of business from other lines of insurance (an important feature, given the limited capital of the insurance industry in Mongolia, which is still in its infancy).

- It fully secures the payment of indemnities, thereby eliminating any risk of default on payments.
- It allows insurance companies to pool their livestock insurance portfolio in different regions, which allows them to take advantage of the risk diversification benefits.
- It facilitates the capacity-building of participating insurers.

The risk financing structure of the LIIP follows best practices. Insurance companies retain some portion of the risk, pool risk with other companies, and access public reinsurance for excess losses. It is expected that international reinsurers will provide capacity for the first reinsurance layers, with the government covering only catastrophic risk layers.

The first sales season started in 2006. As of 2009, the programme was being piloted in four provinces (Bayankhongor, Khentii, Sukhbaatar, and Uvs) and four insurance companies were participating. 2,400 policies were sold in 2006, more than 3,700 in 2007, and 4,100 in 2008, representing 14 percent of herders in the pilot provinces.

In mid-August 2008, following high livestock losses, a total of \$340,000 was paid to 1,783 herders. All financing systems worked as planned, with a small amount drawn from the contingent debt facility. Lenders have started offering lower interest rates and better terms for loans to insured herders. Linking index-based livestock insurance to herder loans will be an important next step in reducing delivery costs.

**Source:** Mahul, O. and Stutley, C.J., 2010, *Government Support to Agricultural Insurance Challenges and Options for Developing Countries*, World Bank, Washington, DC., pp. 85–86.



Recognizing the challenges to access that major international commodity exchanges present, national and regional exchanges have begun to develop in commodity-dependent areas. Futures markets for coffee have sprung up in Brazil, India and Indonesia. In India, there are 25 recognized commodity exchanges, three of which are national, multi-commodity exchanges.

## *Alternative Trade Initiatives*

Standards-based, alternative trade initiatives are programmes that allow agricultural producers who meet certain requirements to differentiate their products through a certification mechanism (such as fair trade or organic labels). These programmes are defined by the specification, monitoring and enforcement of sustainable production and trade practices, and are typically identified by a logo, label or certificate. Labeling

### **Box 2.4: Organic Coffee Production Reduces Small-scale Farmers' Vulnerability in Nicaragua**

There are approximately 48,000 coffee farms in Nicaragua. Eighty percent of these are micro-producers (i.e., have less than 3.5 hectares of coffee crops) and contribute only 15 percent to the total coffee harvest in Nicaragua. Organic coffee represents about 4 to 5 percent of Nicaragua's coffee exports, yet comprises a large portion of the coffee produced by small-scale farmers organized in cooperatives, most of which are fair trade-certified. These organic and Fair Trade coffee producers can not only enjoy the economic advantages associated with membership in Fair Trade cooperatives, but also benefit from the environmental factors associated with organic production.

Organic coffee production can provide numerous environmental benefits. Organic standards, for example, require coffee farms to have a structurally and floristically diverse shade cover (e.g., OCIA International, i.e., Organic Crop Improvement Association International, Inc.). This covering provides environmental services that resemble those provided naturally by forests. Coffee fields also store carbon from the atmosphere and protect watersheds by slowing run-off. Moreover, organic coffee production techniques replace inorganic fertilizers, pesticides and fungicides with organic ones, which are less harmful to the environment. Organic standards also prohibit the use of genetically modified organisms. Nicaraguan farmers cite such environmental benefits as motivations for moving

towards organic production, adding that the elimination of agrochemicals is better for their families and children, that organic production lowers expenditures for synthetic inputs, and that it helps protect the water.

While organic methods are less productive than conventional techniques of coffee production (Valkila 2009), organic production provides certain advantages that are particularly beneficial to small-scale and poor farmers. Prices for organic coffee tend to be more stable than those for conventional coffee. Access to organic fertilizers is cheaper and easier. Additionally, fair trade cooperatives provide purchase guarantees, technical assistance, and credit availability through an internal system.

Without support from cooperatives and development organizations, it would be nearly impossible for small-scale coffee farmers to acquire organic certification, due to the high cost of certifying individual small farmers in Nicaragua and the lack of organic trade channels outside the cooperative membership. Organizations such as CLUSA (Cooperative League United States of America), ADDAC (*Asociación para la diversificación y desarrollo agrícola comunal*), Campesino a Campesino, and Solidarity provide such assistance through training and financing, organizing producers in cooperatives, and securing markets for organically certified products.

**Source:** Bacon, C., 2005, 'Confronting the Coffee Crisis: Can Fair Trade, Organic, and Specialty Coffees Reduce Small-Scale Farmer Vulnerability in Northern Nicaragua?', *World Development*, Vol. 33, Issue 3, pp. 497–411; Valkila, J., 2009, 'Fair Trade Organic Coffee Production in Nicaragua: Sustainable Development or a Poverty Trap?', *Ecological Economics*, October.



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helps differentiate the certified product from conventional supply. Ostensibly, each programme's conditions will help counter the economic, social and environmental risks that producers face and offer them a price premium for the certified products. Some of the best-known initiatives are Fair Trade, Organic Certification, and Rainforest Alliance, but there are now sustainability standards and/or labeling initiatives operating in most major agricultural commodities.

Alternative trade initiatives have developed in response to the perceived failure of supply management and risk-hedging tools to address the income and social risks that agricultural commodity producers bear. Although these initiatives address risk factors variously, one of their most important elements is their stabilizing impact on prices. Depending on the criteria associated with a particular label, the price-stabilizing effect can manifest itself in many different ways. Fair Trade, for instance, stipulates that buyers pay a minimum price or a social premium if the market price exceeds the minimum. In return, Fair Trade producers and cooperatives are required to invest a portion of the price premium in community development projects. Eco labels like Organic Certifications require producers to meet ILO labour standards and to reduce or eliminate chemical inputs (e.g., fertilizers and pesticides). While these eco-label programmes do not set minimum prices, their specification of unique production requirements allows them to function as 'differentiated' markets that, due to their higher price elasticity, have reduced price volatility.



## Notes

1. Primary commodities are defined as all foods (includes basic foods, beverages and tobacco, agricultural products and oils); all metals and minerals (ferrous and non-ferrous metals, precious stones, and pearls); and all fuel (crude petroleum, natural gas and other fuel commodities) (UNCTAD, Handbook of Statistics 2009).
2. An extensive literature highlights the relationship between developing countries' dependence on extractive industries and their poor performance on key poverty-related indicators: "overall living standards in oil and mineral dependent states are exceptionally lower than they should be, given their per capita incomes". Further, the mismanagement of natural resources can increase fragility and lead to conflict. Money from oil, gemstones, minerals and timber has fuelled some of the world's most intractable wars (e.g., Angola, Sierra Leone, DRC, Liberia). See Ross 2001, DfID 2009.
3. While low commodity prices create obvious problems, even high prices can create a trap of sorts, forcing countries and producers to choose between immediate profits and future sustainability. For instance, Algeria, Nigeria and Venezuela "have fallen prey to over optimistic spending habits during commodity booms, using current and expected profits to finance social and/or politically motivated projects. Such program can quickly become unsustainable when commodity prices drop, but are typically very tricky for politicians to cut, and so tend to get funded out of borrowed money, adding to a country's debt burden" (Brown et al. 2008).
4. Since many commodity-dependent countries are also net food importers, the changes in their terms of trade have implications for the affordability of food imports and food security.
5. The share of primary commodities in total exports is measured as primary commodity export revenues/total export revenues (in current \$).
6. UNCTAD's classification of the Asia and Africa regions includes some countries from the Arab States (i.e., the GCC countries). Disaggregated analysis may well reveal interesting differences in the export portfolios (and export concentration ratios) of GCC countries relative to other Asian exporters.
7. The price index of exports from advanced economies is used to derive real commodity prices. Real commodity prices are therefore measured in terms of their purchasing power over advanced economies' exports.
8. The compounded annual rate of change in price is calculated by taking the  $n^{\text{th}}$  root of the total percentage rate of change in prices, where  $n$  is the number of years in the period being considered.
9. The indicator of price volatility used here measures the amplitude of monthly variability in price. That is the average decline in price during the months when prices decline, along with the average increase in price during the months when prices increase.
10. Crude oil prices are an average of UK Brent (light), Dubai (medium) and Texas (heavy) equally weighted (UNCTAD 2009).
11. Price instability here is measured as the absolute percentage deviation from the long-run exponential trend for the period. The measure of price instability is equal to  $[ ( | Y_{(t)} - y_{(t)} | ) / y_{(t)} ] * 100$  where  $Y_{(t)}$  is the observed magnitude of the variable.  $y_{(t)}$  is the magnitude estimated by fitting an exponential trend to the observed. The vertical bar indicates the absolute value (i.e., disregarding signs). Accordingly, instability is measured as the percentage deviation of the variables concerned from their exponential trend levels for a given month.
12. See Brown 2008, South Centre 2005, UNCTAD 2009, Page and Hewitt 2001.
13. Recently, there has been new call for reform of the global orientation in exchange rate management. Initiated by China in March 2009 with the eventual endorsement of Brazil, India, Russia, and France, the proposal outlined a reduced role of the US dollar as the world's reserve currency in exchange of a larger role of the IMF's SDRs, the value of which is based on a group of international currencies. The argument is that in today's global economy potential currency fluctuations make using a single currency for international settlements too risky. If the established reserve currency was to change to SDRs, commodity prices would be denominated in that currency and would potentially be more stable if the value of SDRs were more stable. Critics of the proposal argue that global economic insecurity results



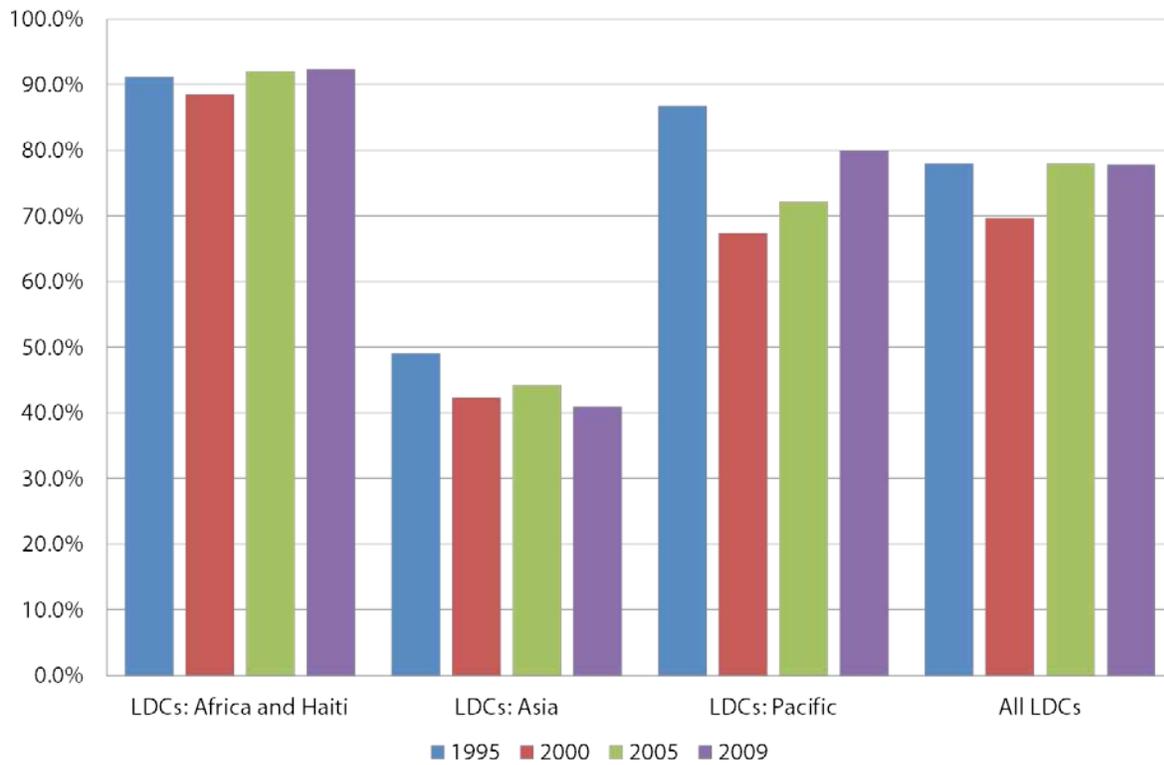
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less from concentration in a single reserve currency and more from countries pegging their exchange rates to this currency. Such action inhibits exchange rates from adjusting to economic conditions, thus correcting imbalances in the global economy. To date, however, little advancement of this proposal has been made on a global level through efforts by the IMF (Anderlini 2009, Bretton Woods Project 2009).

14. Data on GDP growth rate for 2009 taken from Global Economic Prospects (World Bank 2010).



## Annex 2.A: Share of Primary Commodity Exports in Total Exports for LDCs by Region, 1995–2009

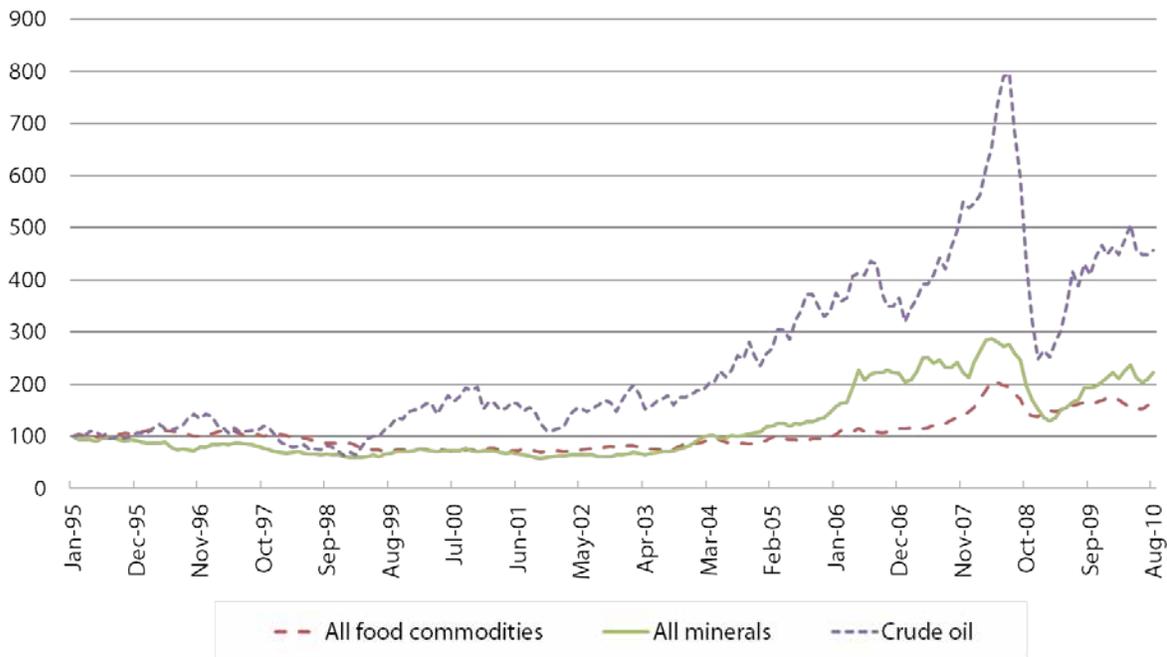


**Source:** Calculated using data from UNCTAD, *Handbook of Statistics 2009*



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## Annex 2.B: Monthly Current Price Index for Major Commodity Categories, Jan 1995–Aug 2010 (Jan 1995=100)



Source: Calculated using data from UNCTAD, Commodity Prices Statistics 2010

The general price trends of the overall index of commodity prices apply to the foods and minerals commodities groups with varying degrees of intensity and volatility. The food commodity prices index lost 27 percent of its value by December 2001. The price boom that followed increased food prices by 184 percent from December 2001 to April 2008 (closing 108 percent above 1995 price levels in April 2008). The crash that followed the global financial crisis brought prices down by 34 percent from April to December 2008. Food prices rebounded during 2009, closing the year with a 27 percent increase.

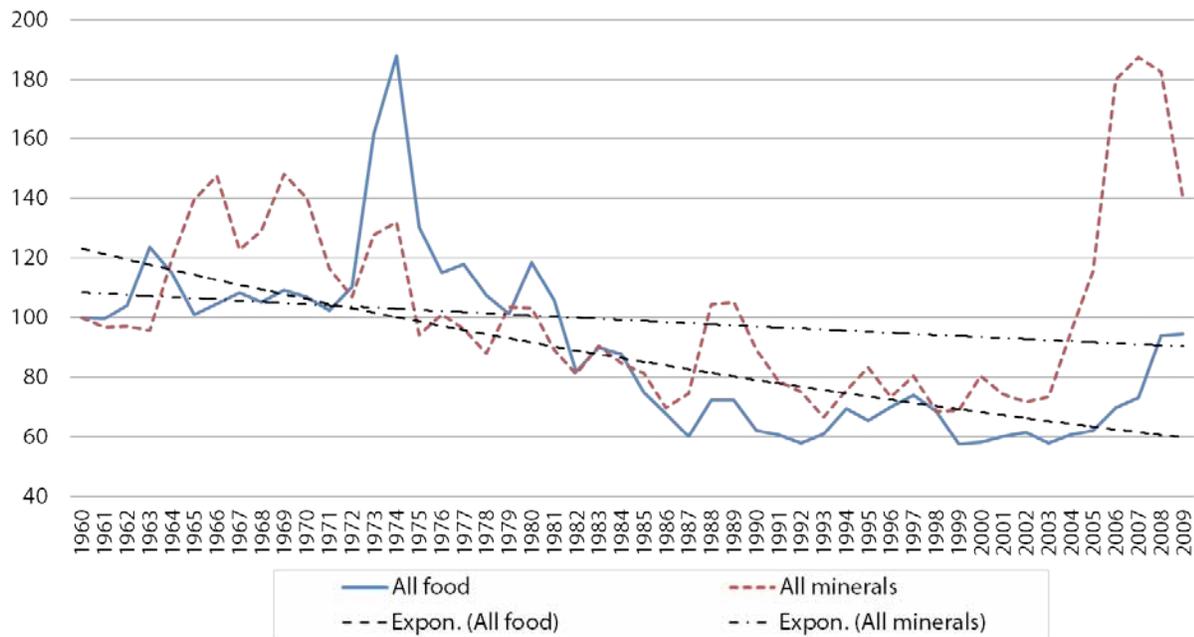
Minerals had similar trends, but with greater intensity. After a period of decline from 1995 to 2001 (minerals prices dropped by 38 percent by December 2001), prices started to rise, peaking in April 2008. From December 2001 to April 2008, mineral prices increased by 365 percent. Mineral prices crashed as a result of the global financial crisis. Mineral prices lost 47 percent of their value from April to December 2008. Prices rebounded in 2009 by 39 percent.

During the seven-year period from 1995 to 2001, crude oil prices had risen by only 12 percent. Crude oil prices then started to soar before peaking in July 2008. Crude oil prices increased by 611 percent from December 2001 to July 2008. Prices in July 2008 were nearly eight times what they were at the beginning of 1995. The 2008 global financial crisis brought down oil prices by 69 percent. Crude oil prices rebounded in 2009, increasing by 80 percent before the end of the year. As of August 2010, crude oil prices were 4.5 times what they had been at the beginning of 1995.



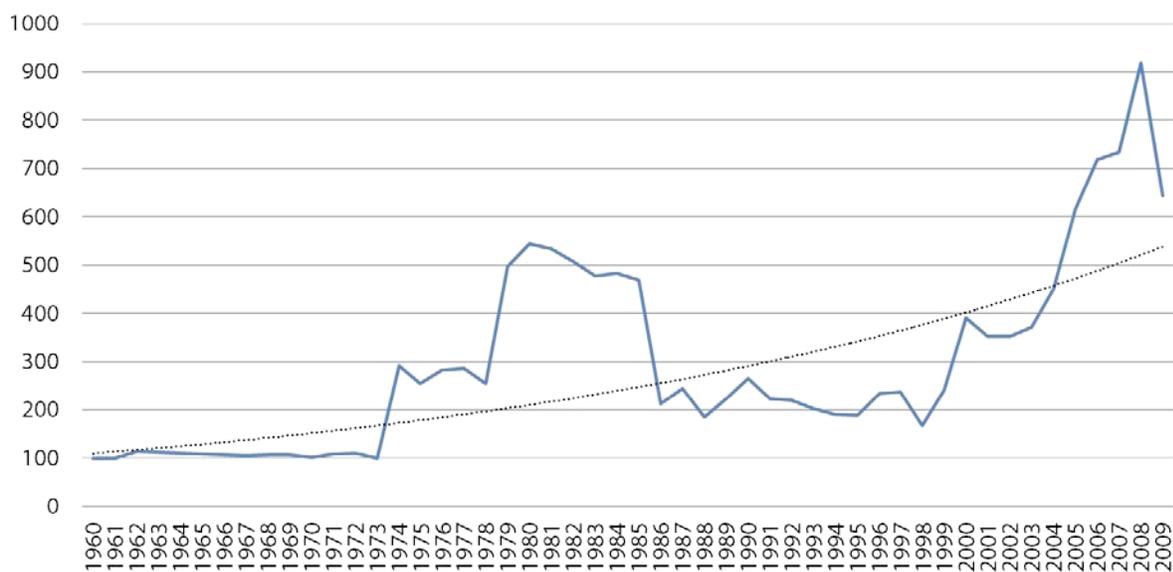
## Annex 2.C: Long-term Trends in Primary Commodity Prices

### Index of real commodity prices for foods and minerals, 1960–2009 (1960=100)



**Source:** Calculated using data from UNCTAD, Commodity Prices Statistics 2010 and United Nations data

### Index of real crude oil prices, 1960–2009 (1960=100)



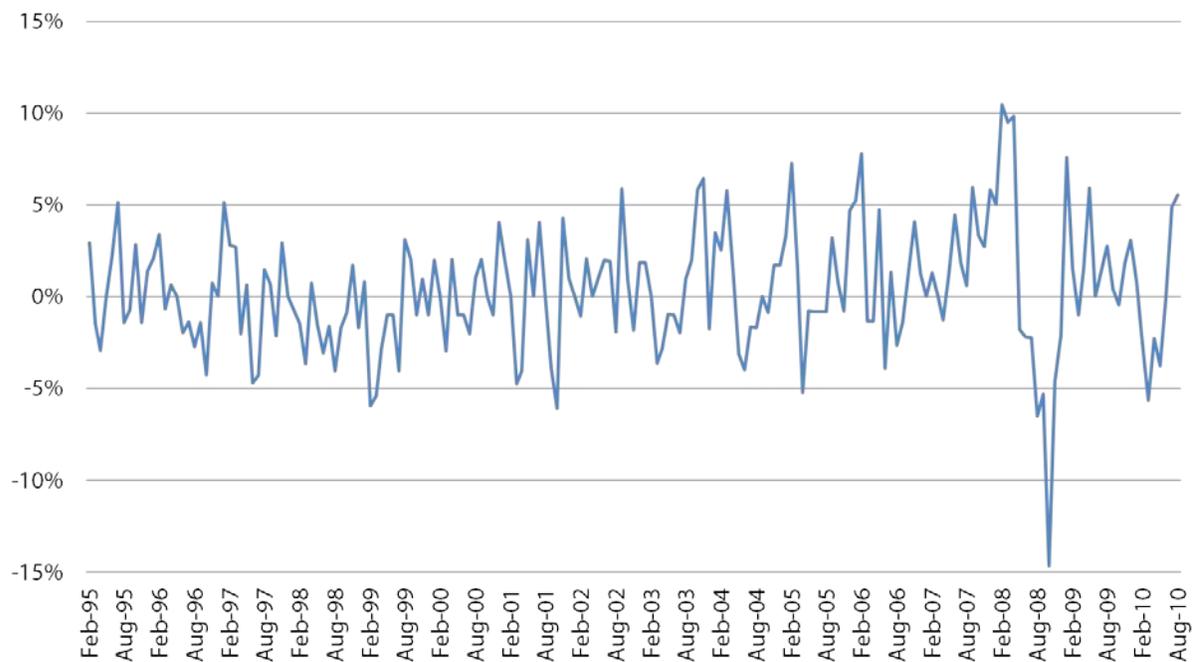
**Source:** Calculated using data from UNCTAD, Commodity Prices Statistics 2010 and United Nations data



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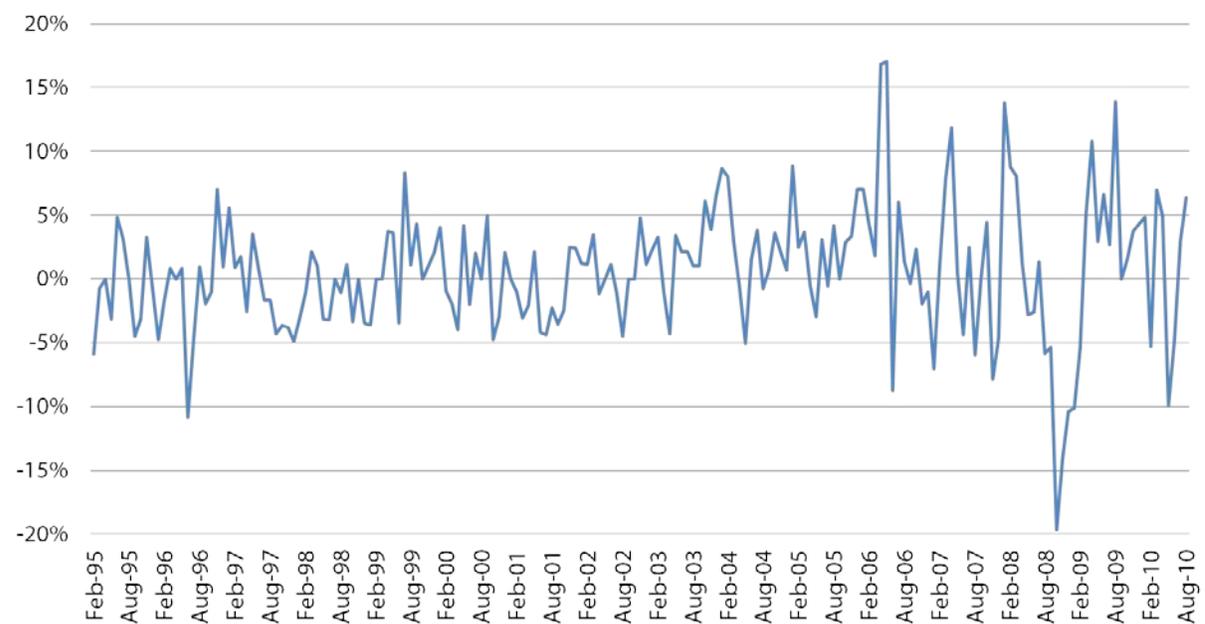
## Annex 2.D: Changes in Prices of Food, Minerals and Oil

### Monthly rate of change of food commodity prices, Feb 1995–Aug 2010



**Source:** Calculated using data from UNCTAD, *Commodity Prices Statistics 2010*

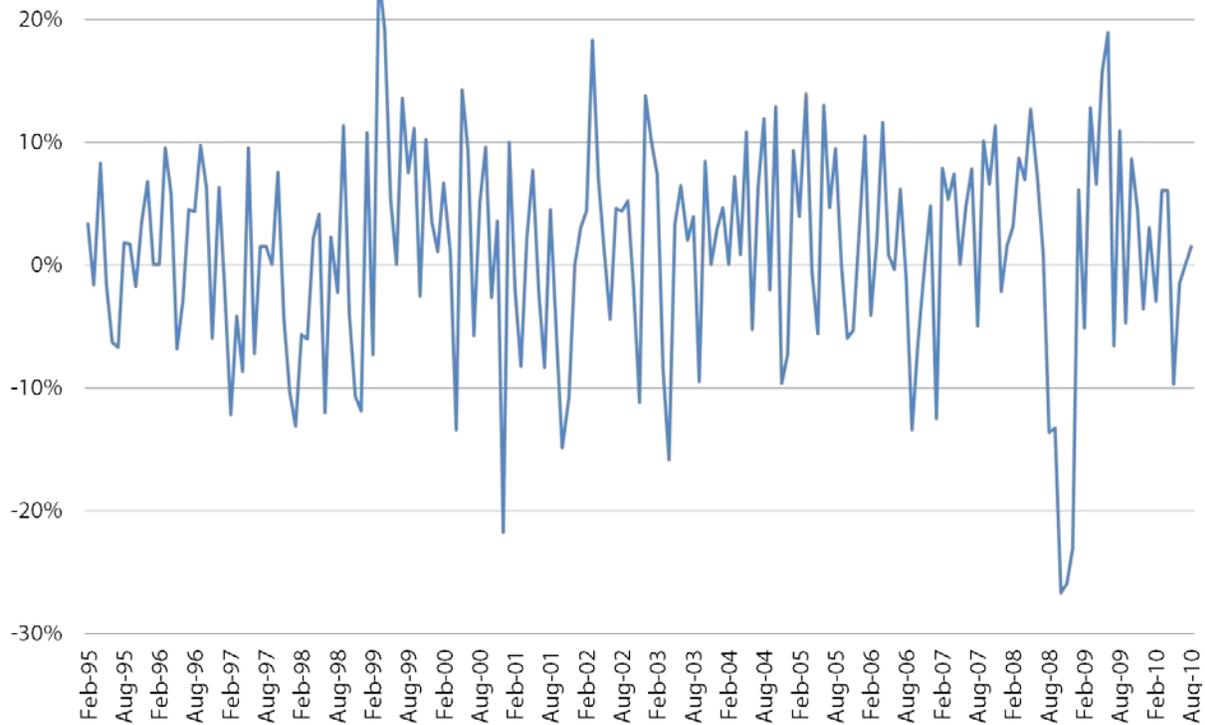
### Monthly rate of change of mineral prices, Feb 1995–Aug 2010



**Source:** Calculated using data from UNCTAD, *Commodity Prices Statistics 2010*



## Monthly rate of change of crude oil prices, Feb 1995–Aug 2010



**Source:** Calculated using data from UNCTAD, *Commodity Prices Statistics 2010*



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