World Food System Disruptions in the Early 2000s: Causes, Impacts and Cures

Joachim von Braun, Bernardina Algieri & Matthias Kalkuhl
World Food System Disruptions in the Early 2000’s: Causes, Impacts, and Cures
Joachim von Braun¹, Bernardina Algieri², Matthias Kalkuhl³

The rapidly rising and more-volatile food prices of recent years are a significant indication of changes in global markets and a signal of resource scarcity. They pose new challenges in terms of food and nutrition security at the worldwide level. This article traces the main drivers and impacts of food price increases, and proposes institutional changes in the world food system to help overcome chronic supply constraints through enhanced productivity, combined with actions to address new causes of food price volatility, such as financialization of commodity markets and linkages to energy markets. The price crises of 2008 and 2011, and to a lesser extent in 2012, have been met with often, uncoordinated national policy adjustments with international implications. To prevent such collective actions failures in the international food system, comprehensive institutional changes are proposed.

Keywords: price volatility, price crises, food security, governance

JEL Classification: F55, O19, Q02, Q18

Introduction

The spikes in food prices over the last six years and their extreme volatility, i.e., unpredictable and large swings in prices, are an expression of changes in global markets and a signal of resource scarcity. Briefly interrupted only in the mid-1970s, international real food prices recorded a declining trend that lasted for decades. Prices then stabilized around a slightly increasing trend for five to six years until mid-2007, when they started a sharp rise, reaching a twin peak first in June/July 2008 and then in December 2010/January 2011. Since then, international real prices have been volatile, with several peaks and troughs. The breaking of the long-term price decline experienced since 2008 and the extreme volatility of food prices present major challenges for the world’s policymakers, who are increasingly faced with rising food insecurity, combined with political and economic risks, like social unrests, and accelerated inflation. Lack of predictability and uncertainty associated with increased volatility hampers economic growth in poor countries (Jacks, O’Rourke, and Williamson 2011), undermines progress in nutritional status and peoples’ food security (FAO 2011), and amplifies the incidence of poverty, when the real income of the poor declines (Benson et al. 2013; Ivanic and Martin 2008). Furthermore, price volatility may complicate environmental management for commodity-dependent countries and financial planning, since companies tend to postpone investment expenditures when they experience increased uncertainty concerning future commodity prices (Ferderer 1997).

¹ Corresponding author, Professor for Economic and Technological Change, Director, Center for Development Research, University of Bonn, Germany. www.zef.de.
² Lecturer, University of Calabria, Italy
³ Senior Researcher, Center for Development Research, University of Bonn, Germany
In this context, the present study aims to examine in greater detail the causes of sustained increases in agricultural prices and price volatility in order to assess the emerging risks for developing countries and to propose a set of institutional changes in the world food system to overcome the risks of extreme booms and busts in food prices. It outlines potential approaches for coping with chronic supply constraints through enhanced productivity and suggests actions connected to the new drivers of food crises, linked to financial markets, energy, water, and climate change. Effective remedies will require a combination of new public-policy actions that foster agricultural growth and protect the vulnerable. Finally, the paper reviews several promising international initiatives carried out recently by the private sector to stabilize prices. The remainder of the paper is organized as follows: the second section investigates the main determinants of high and volatile food prices, and groups them into three main categories: fundamentals, macro-factors, and new drivers; the third section analyses the core consequences brought about by high prices and volatility; and the fourth section presents a set of policy actions to be pursued in order to curb extreme price rises and volatility, and mitigate the negative effects on the most vulnerable.

An overview of the main causes of price hikes and volatility

After remaining at historically low levels for decades, food prices started rising and becoming more volatile in the mid-2000s. In 2007–2008, the price of almost every food item sharply increased. At their peaks in the second quarter of 2008, world prices of wheat and maize were three times higher than at the beginning of 2003, and the price of rice was five times higher (Figure 1). Prices dropped thereafter, mainly because food demand slowed with the global financial crisis and recession; they spiked again in 2011 and in the third quarter of 2012.

At a more aggregated level and in real terms, the Food and Agriculture Organization's (FAO) food-price index, tracking important international food commodity prices, as well as the FAO's cereals price index which includes grains and rice replicate the price movements of the four staple crops (Figure 2). Although the FAO indices use weights based on export volumes which do not mirror the diet composition of the poor in developing countries, they give a first proxy of the magnitude of food price changes.

The fact that agricultural commodities, especially cereals, experienced three significant price spikes in about six years suggests that something serious is shaking the world's food chain. Determinants of high prices and volatility are complex and numerous, and they include traditional agricultural fundamentals as well as macro-economic factors. Additionally, they involve new determinants linked to energy and worldwide financial markets. Figure 3 provides a synthesis of the different drivers which will be discussed in more detail below.

Market fundamentals that led to price increases operate via demand and supply channels, and include greater costs of production due to higher energy and fertilizer prices, high demand coming mainly from emerging markets, primarily China and India, and general fluctuations in harvests (Abbott, Hurt, and Tyner 2008; 2011; Trostle 2008). The inelastic nature of food demand and supply exacerbates shocks as production can only respond slowly to in-
Figure 1. International grain prices

Note: y-axis: $/metric tons, nominal $. Wheat, hard red winter; Rice, Thai
Source: Authors’ elaborations on World Bank data, Global Economic Monitor (GEM) Commodities, 2013

Figure 2. Real world food and cereal price indices, 2002–2004=100

Note: Food Price Index: Consists of the average of 5 commodity group price indices (Cereals, Meat, Dairy, Oils, and Sugar) weighted with the average export shares of each of the groups for 2002–2004: in total, 55 commodity quotations are considered. Cereals Price Index: This index is compiled using the grains and rice price indices weighted by their average trade share for 2002–2004. Source: Authors’ elaborations on FAO, 2013.
World Food System Disruptions in the Early 2000's: Causes, Impacts, and Cures

Figure 1. Main drivers of food-price volatility

**Demand Factors**
- Emerging economies and structural changes in global demand
- Population growth

**Supply Factors**
- Low level of global stocks
- Negative shocks to production (adverse weather events)
- Low investments in agriculture and low productivity growth
- High oil prices (high input prices)

**Fundamental Drivers**
- High food-price hikes and volatility

**Financialization**
- Increased speculative activity in commodity market
- Excessive speculation

**Broad macro factors and market conditions**
- Exchange rate depreciation
- Loose monetary and fiscal policies
- Restrictive trade policies

**New drivers**
- Increase in biofuel demand
- Financialization

**High oil prices**

Source: Devised by author
creasing demand (Haile, Kalkuhl, and von Braun 2013). Surges in food prices are also the consequence of neglected investment in agriculture in many developing countries and the resulting low productivity (World Bank 2007). Furthermore, food prices are expected to increase in the long run, due in part to climate change, which is posing new risks and constraints. Supply and demand forces may cause maize prices to rise by approximately 100 percent by 2050 (Nelson et al. 2010), unless much larger investments in innovation are forthcoming.

At a macro level, loose fiscal policies and expansive monetary policies in many countries have created an environment that favors high commodity prices. Frankel (2008), Svensson (2008), and Algieri (2013) emphasize the high responsiveness of agriculture prices to monetary policy changes and hence to interest-rate maneuvers. There are two channels through which interest rates affect food commodity prices. The first operates through physical demand: low interest rates stimulate inventory demand because they decrease the cost of carrying inventories. This, in turn, raises commodity prices. The second channel operates through investment-fund activity, the so-called financialization of commodities, a highly debated topic that can be considered a new driver of commodity prices. Investment-fund activity, which has been increasing over the course of the last decade, exceeded US$330 billion during 2012, according to Barclay Hedge, which tracks developments in the hedge fund industry (World Bank 2013). Most of the funds have been invested in energy and agricultural commodity markets. Thus, food and financial markets have become more interlinked. These links pose new risks and uncertainties for the poor in developing countries, since these funds have sufficiently large weight to unbalance the market, which could lead to excessive price spikes and to distortions of the price-discovery mechanism (Gilbert and Pfuderer 2012).

Despite the attractiveness of commodities as asset class in times of low interest rates and high risks of inflation, investments into commodity futures are also influenced by speculation or more complex portfolio diversification strategies. Speculation may be approximated by the activity of non-commercial traders who—in contrast to commercial traders who use futures markets for hedging business risks—are supposed to be risk taking. Index funds can be used as an instrument to speculate on price movements, to hedge against price fluctuations, or to diversify a portfolio. Therefore, there is controversy whether their activity can be regarded as speculation (Stoll and Whaley 2010).

The empirical evidence of the impact of financial market on food commodity market is mixed and depends on the econometric methods and proxies used in the analyses (see Table 1 for an overview). In general, all studies report a significant and positive contemporaneous correlation between speculation or index fund activity and price levels, and disagree in the magnitude and existence of a causal relationship. As price movements influence expectations, they might also influence speculative activities. Hence, many studies use Granger-causality tests to evaluate if there is a one-way relationship, a two-way relationship, or no specific relationship between price changes and speculative activity. Granger-causality tests do not suggest systematic and strong evidence: either they establish causality only for very few commodities or they confirm causality only for short time periods (some include the years 2006–2008). The commodities and time periods where causality is detected further differ between studies. While Gilbert
Table 1. Empirical analyses of financial market impacts on agricultural commodity prices and volatility

<table>
<thead>
<tr>
<th>Considered driver</th>
<th>Methodological approach</th>
<th>Granger-causality</th>
<th>Market fundamentals</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact on price level (or returns)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Speculation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stoll and Whaley (2010)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilbert (2010a,b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Index-Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financialization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact on price volatility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Speculation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brunetti, Buyuksahin, and Harris (2011)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Index-Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financialization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Source: Own elaboration. Legend: ■ —substantial evidence; □ —weak or mixed evidence, □ —no evidence.
(2010a) gives a strong evidence of Granger-causality—using a novel index fund activity measure—others question whether Granger-causality tests are appropriate as they postulate that financial markets act slowly and do not process all available information quickly (Grosche 2012).

Studies using other identification strategies to investigate causality find a stronger relationship between speculation, index fund activity, and financialization on price levels. Some use information on supply and demand fundamentals to control for expectations (von Braun and Tadesse 2012), others use instrumental variables (Gilbert 2010a,b) or focus on specific financial products where anticipation of short-term price movements can be ruled out (Henderson, Pearson, and Wang 2012). Despite some evidence for the impact of financial market activities on price levels, the impact of speculation and index-funds on volatility is contested. Speculation of informed traders is considered to improve the price-formation process and increase liquidity in commodity markets which could smoothen transactions. Some studies report even a significant volatility decreasing effect of speculation (Brunetti, Buyukkacahin, and Harris 2011) and index funds (Irwin and Sanders 2012). On the other hand, Tang and Xiong (2012) find that agricultural commodities have become more inter-linked to other asset markets, in particular energy markets; Grosche (2013) and von Braun and Tadesse (2012) suggest that stock markets, real estate, and bond markets as well as financial crises influence the volatility of agricultural commodities; and Algieri (2012) finds a bi-directional causality between price volatility and speculation, in the sense that price volatility can be caused by arbitrage and speculation, and price volatility itself can cause a rise in arbitrage and speculation.

Further macroeconomic factors that led to higher prices are (1) the depreciation of the US dollar, the currency of choice for most international commodity transactions, which put an upward pressure on demand from non-US dollar commodity consumers and producers (Gilbert 2010a,b; Algieri 2013), and (2) restrictive trade policies. A host of authors (Yang et al. 2008; Dawe and Slayton 2010; Headey 2011; Sharma 2011; Martin and Anderson 2012) have shown that the sequence of restrictions and bans implemented by exporting countries such as India, Thailand, China, and Russia have exacerbated price increases. This is because trade restrictions protect domestic consumers from the effects of high prices at the expense of a shrinking global market which hits consumers in other countries. When, in fact, many countries adopt the same strategy, the world market becomes highly volatile (Gouel 2013). Between 2008 and 2011, 29 countries imposed export restrictions on food (Table 2) which was both a cause and a consequence of high price volatility.

Another new driver of food prices is the diversion of some food commodities, in particular maize, to the production of biofuels. Indeed, the rapid expansion of biofuel production in the past decade due to subsidies, mandates, and, in part, due to higher fuel prices has created new linkages and trade-offs. Rising demand for biofuel feedstock has introduced a fundamental change in food-price determination. In the United States, the share of the maize harvest diverted to ethanol production increased from 15 percent in 2006 to 40 percent in 2012 (USDA 2013). Several studies estimate that biofuel policies increased corn prices by more than 30 percent and other grains and food items by 10–20 percent (Hochman et al. 2011).
Table 2. Restrictive export policies (from January 1, 2008 to October 11, 2011)

<table>
<thead>
<tr>
<th>Export bans</th>
<th>Export taxes and restrictions</th>
<th>Export licenses and quotas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh (2009–2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India (2008–2011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kazakhstan (2011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kazakhstan (2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kazakhstan (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myanmar (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nepal (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakistan (2009–2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syria (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolivia (2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolivia (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil (2011)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Main consequences of hikes in commodity prices

The surging prices of agricultural commodities and extreme price volatility at international markets were transmitted to many developing countries. Several analyses reveal that, depending on the country and commodity, 10–40 percent of international price changes are transmitted to the local level (Robles 2011; Greb et al. 2012; Ianchovichina, Loening, and Wood 2012). The transmission to grain prices is typically higher than the transmission to the food price basket released by the official national statistical agencies. As the latter contains many processed foods and non-staples, it is less representative for poor people. Figure 4 shows the maximum transmission from several international commodity prices to domestic food price indices (which are despite their shortcomings the only available price indices with almost global coverage). As grains and unprocessed food have a higher share in the food basket of developing countries, food price indices in developing countries respond stronger to international prices. Although some countries like India could successfully isolate the domestic grain market from the international market through high trade barriers, their food prices are notwithstanding linked to international prices through oilseeds and vegetable oil prices.

The strong transmission of international prices undermines food security—that is, the availability of and access to sufficient amounts of healthy food and good nutrition—adversely affects a country’s political stability, and generates additional ripple effects, which will be discussed below.

Hunger, malnutrition, and food crises

Grains—especially wheat, maize, and rice—are the staple food of most people in the developing world. As the poor spend up to 70 percent of their income on these basic commodities (James 2008), increasing food prices can reduce real income dramatically, at least for net buyers of food items. Net sellers of food can, however, benefit from price increases if price increases occur at the harvesting period where cash-constrained households sell most of their production. The poorest and most food-insecure people in developing countries are landless, or typically have only small land holdings and little access to markets to sell their production surplus (Barrett 2008). A differentiated analysis by Aksoy and Isik-Dikmelik (2008) revealed that for the considered country sample higher food prices transfer on average income from the urban rich to the rural poor, but that the group of poor net-buying households can be faced with serious real income decline. The negative effects of price increases on poor net-buyers might therefore be more severe than possible negative effects of price decreases for net-sellers, introducing an asymmetry in the welfare effects of price changes.

Price spikes that result in real income changes require poor people to reduce calorie intake or the quality of their diets (e.g., Torlesse, Kiess, and Bloem 2003). Since childhood nutrition is a key element for children’s cognitive and physical development and for their productivity and potential earning ability as adults, the health and economic consequences of the lack of food and deprived diets are lifelong for both individuals and society (Black et al. 2008; Victora et al. 2008). Therefore, even when several price shocks end, the
Figure 4. Pass-through elasticities of international food and commodity prices to national food price indices

Note: A pass-through elasticity of 0.20 implies that domestic food prices increase in the long run by 20 percent if one of the international reference prices (or price indices) increases by 100 percent. The analysis is based on a large set of international grain and oilseed prices, aggregated price indices as well as futures prices. Domestically, national food price indices are considered. Pass-through elasticities which were not significant at the 10% level were set to zero. Source: Kalkuhl (2013).
adverse effects for the poor can still impair physical and mental capacities, thus resulting in human suffering and economic costs to society.

Data on undernourishment and malnutrition is highly fragmented, and the recent food crisis shed light on this issue. In particular, the numbers reported by the FAO for undernourished people are estimates, which do not account for the decrease in diet quality and related health effects (FAO 2012). Although at the global level, the percentage of people who are undernourished or affected from food insecurity has declined since 2007, the recent price spikes have temporally and locally reversed this tendency or reduced the success in improving nutrition (Tiwari and Zaman 2010; Anríquez, Daidone, and Mane 2013).

Using global panel data, Kalkuhl et al. (2013b) find a significant relationship between the volatility of food prices (measured as the coefficient of variation of food prices) and anthropometric indicators of undernourishment. Their estimated coefficients suggest that each doubling of volatility increases the prevalence of underweight of children under 5 years old by 0.6–1.3 % (depending on model specification) and the prevalence of stunted children by 0.1–0.7 %. Although these elasticities seem to be small, food price volatility in developing countries can more than triple within one year. Furthermore, the estimated elasticities are average effects over a large set of countries, implying that the effects on countries with chronic nutrition problems are likely to be larger.

When rates of hunger and malnutrition rise sharply at local, national, or global levels, a food crisis occurs. “This distinguishes a food crisis from chronic hunger, although food crises are far more likely among populations already suffering from prolonged hunger and malnutrition. A food crisis is usually set off by a shock to either supply or demand for food and often involves a sudden spike in food prices” (Timmer 2010). Therefore, the three recent acute spikes of food prices in 2008, 2011, and 2012 can be understood as three food-price crises in sequence. The simultaneous economic crisis of 2007–2008 has probably affected food security further although empirical analyses on this issue are scant4.

**Threats to political stability**

Strong increases in food prices can catalyze unrests, violent conflicts, and political instability. In developing countries with widespread poverty, political organizations may be alleged to have a critical role in food security. Failure to deliver security undermines the actual reason for the existence of the political system. When this situation materializes, the resulting protests can echo several causes, broadening the scope of the protest and masking the immediate trigger for the unrest (Lagi, Bertrand, and Bar-Yam 2011). During the first hikes in food prices registered in 2008, many governments underestimated their impacts on political security. From January 2007 to June 2008, food protests—strikes, demonstrations, and riots over food-related issues—occurred in more than 40 countries, with some countries experiencing multiple occurrences and a high degree of violence (von Braun 2008; Schneider 2008).

While “classical” food riots occurred in the countryside and involved the rural poor, “modern” food riots concentrate in cities, involve the urban middle

4 Brinkman et al. (2010) discuss the impact of the economic crisis on food security and provide some simulations. There is, however, evidence that economic crises can increase food insecurity (e.g. Block et al. 2004)) and child mortality (Baird, Friedman, and Schady 2010)
class, and are more political oriented as they focus on the role of governments in guaranteeing food security (Bellemare 2011). The patterns of relationships between the food-price crisis and political conflicts and food riots in 2008 differ from those in 2011. In 2011 the responses of protesters and governments were more complex and sophisticated than in 2008. While protests in 2011 were again partly triggered by food-price inflation, such as in Egypt, Tunisia, and recently in Brazil, coordinated protests were increasingly facilitated by improved communications through new social media such as Twitter and Facebook (Ciezadlo 2011). These riots can no longer be equated with historical bread riots or even the massive 2008 food protests; rather, they became symptoms of empowerment and part of more systematic uprisings (Bush 2010). Protests quickly turned to much larger events involving regime changes.

Empirical analyses based on cross-country observations over several decades suggest a causal relationship between food price increases and the likelihood of unrest and protests (Arezki and Bruckner 2011; Bellemare 2011) although such events depend also on the surrounding economic and political conditions. For a large set of countries and a period of six decades, Arezki and Bruckner (2011) find that increasing food prices are associated with contemporaneous changes of political regimes to become more authoritarian and with increased civil conflicts. Whether the long-term effects of food price induced political instability are positive or negative is therefore difficult to assess and requires a differentiated and country-specific analysis.

**Ripple effects**

Higher grain costs and food crises have large, economic ripple effects: they first put added pressure on non-core inflation—that is, the inflation of food and energy prices. This occurs because of substitution effects (if prices of one staple increase demand for other staple increases provoking secondary price increases). But grain prices are also linked to meat and processed food through the costs of production. Put differently, several products can increase in price as a consequence of an increase in grain prices. Non-core inflation in turn put pressures on wages and other consumption goods in particular in developing countries or emerging economies (IMF 2011; Durevall, Loening, and Birru 2013; Hui 2013). Central banks, however, typically fight only non-core inflation with monetary policy interventions neglecting food price changes as root cause of price increases (IMF 2011).

Another ripple effect of food crises is the loss of trust in trade and the reemergence of self-sufficiency policies in many countries in an effort to curtail the effects of higher global prices on domestic prices and ease the impacts on particular groups. This includes limits or bans on food exports and increasing import tariffs, as depicted in Table 2. The latter points to three main stylized facts. First, African and Asian countries have adopted the largest number of restricted policies, while Latin America has the lowest number of restrictions. Second, the most-used measures were export bans. Third, all the countries tend to adopt more tariff barriers than non-tariff barriers. The latter may be related to product standards, process standards, certification, registration and testing procedures, packaging, mark-up, labeling, and environmental barriers. Trade restrictions play a direct role
in exacerbating food price spikes. Indeed, as major regional producers reduce the regional and global supply of grain, they become responsible for increased price volatility and other negative consequences for import-dependent neighboring countries. These countries will forgo benefits from trade and externalize domestic fluctuations in supplies, further increasing volatilities in international markets (Gouel 2013). Put another way, export restrictions may reduce food-shortage risks in the short term, but they result in trade policy failures, they make the global market smaller and more volatile, and they have adverse impacts on import-dependent partners.

Prices, risk, and production

The excessive commodity price movements during 2007 and 2011 were associated with high price risk for producers: Farmers without access to futures contracts or other price insurance mechanisms face the risk of high losses if increasing prices fall suddenly. The high price volatility in wheat and maize leads to less area cultivated (Chavas and Holt 1990; Liang et al. 2011; Haile, Kalkuhl, and von Braun 2013) and to less investments into yield-increasing inputs (Haile and Kalkuhl 2013). Hence, price incentive effects from price spikes that would lead eventually to higher production are partly hampered by increasing price risks.

The fast-rising food prices have further increased commercial pressure on land and, implicitly, on water resources for agriculture (von Braun 2010, Cotula et al. 2011). It is, therefore, not surprising that prices for farmland have risen throughout the world in recent years. The global expansion of land markets is driven mostly by domestic players, but also partly by the growing transnational acquisition of land by financially strong investors, including some that act directly or indirectly on behalf of countries attempting to improve their food security, in view of domestic scarcity of land and water. In many developing countries, land rights are not well defined, which can lead to conflicts between the local population and investors (German, Schoneveld, and Mwangi 2011).

The Cures

Two kinds of policy actions to respond to high and volatile food prices must be distinguished: those largely in the domain of national governments and those best handled at the international level and requiring attention by global actors. Actions are needed at both levels. The focus in this paper is on global actions. Such actions should include the following:

1. Policies to improve agricultural productivity in the medium and long-run, targeting investments in agriculture, including research and development (R&D) and innovation, measures to improve land and water policies, and coordinated engagement to deal with climate change in order to address the root causes of price volatility;

2. Policies to reduce excessive volatility, embracing open trade, flexible bioenergy policies, grain reserves, and regulation of commodity markets;

3. Social protections and nutrition policies to alleviate chronic and acute undernourishment.

4. A redesign of international institutional arrangements and organizations for food security to address collective action failures.
1: Policies to improve agricultural productivity

Spending on agricultural R&D is an important investment for promoting growth and reducing poverty (World Bank 2007). Disseminating new technology in agriculture requires substantial up-front investments in the foundations of effective technology utilization—that is, rural education, infrastructure, and extension services. As developing countries lack funds for research expenditures, a science and technology initiative may be necessary to accelerate innovation and prevent further increases in agricultural prices. If investments in public agricultural research were doubled, agricultural output would increase significantly, and millions of people would emerge from poverty (von Braun et al. 2008). “Best bets” include innovative programs that would revitalize yield growth in intensive rice and wheat systems in Asia, increase small-scale fish production, address threatening pests like virulent wheat rust, breed maize that can be grown in drought-prone areas, and scale up biofortified food crops.

2: Policies to prevent extreme price volatility

A second set of policies should aim at stabilizing food prices and mitigating extreme volatility. To prevent extreme volatility, it is essential to ensure open trade and guarantee transparent and appropriately regulated market institutions. After deregulating commodity markets in the past decades, it is important to increase transparency of futures markets (providing information on actors and transactions) and prevent excessive price-distorting speculation. Excluding food from speculative futures markets, however, could provoke more volatility and impede the price identification process (Santos 2002; Jacks 2007). Nevertheless, food markets should not be excluded from the appropriate regulation of banking and financial systems, as the staple foods and feed markets (grain and oilseeds) are closely connected to speculative activities in financial markets.

In view of the adverse role of biofuel-subsidy policies for food insecurity in times of tight grain supplies, energy policies need to take food-security consequences, which they currently ignore, into account explicitly. Blending mandates provide low flexibility to reduce biofuel production when food prices are high. As subsidies reduce energy prices and therefore increase energy demand, biofuel subsidies are in general a costly and inefficient policy to reduce carbon emissions compared to a carbon tax or emissions trading scheme (Cui et al. 2011; Kalkuhl, Edenhofer, and Lessmann 2013a). When food prices are high, subsidies and mandates for biofuel production should be lowered to reduce pressure on food markets. Second-generation biofuel technologies may further increase the land efficiency of biofuel production and therefore lessen the trade-off between energy and food production (IPCC 2011).

Global collective action for trade and grain policies that enhance food security is needed to overcome the collective action failures in grain markets: The larger the world market, the lower the price variations needed to balance demand and supply. Trade policies should thus encourage greater integration into international markets. A key role could be played by more open trade and stock release policies by India and China, countries that sit on large grain stocks. More trade liberalization in general and in particular by these two nations could improve the global food-security situation (Ganesh-Kumar, Roy, and
Further cooperation can be achieved in building independent regional or international grain reserves (that include other nutritious foods) exclusively for emergency response and humanitarian assistance. Regional policy bodies, such as the Association of Southeast Asian Nations, the South Asian Association for Regional Cooperation, and African regional and sub-regional bodies have partly implemented joint-reserve policies, which could constitute one step in the proposed direction. A regional set of arrangements, however, is suboptimal and may run into problems of trust in regions with one or two dominating regional powers.

3: Social protection and nutrition policies

Actions related to agricultural production, trade, and reserves are necessary but not sufficient for overcoming the food and nutrition security crisis, which is not just an acute problem, but exacerbates a global chronic problem. As agricultural markets will always exhibit volatile prices due to random production shocks, health and nutrition risks have to be addressed through social transfers and health services. Most of these actions are carried out by national governments, but international support for these investments is also needed, especially in the least-developed countries (Morris, Cogill, and Uauy 2008). Setting priorities in this area requires a sound metric for targeting actions and measuring progress. Policy actions in three priority areas are called for: (1) expand social protection and child nutrition action to protect the basic nutrition of the most vulnerable; (2) take protective actions to mitigate short-term risks (such actions would include cash transfers, pension systems, and employment programs); and (3) adopt preventive health and nutrition interventions to avoid long-term negative consequences.

4: New international institutional arrangements needed

International extreme food price volatility calls for global governance action, and that requires institutional arrangements, which are currently lacking. If we were to design a global governance system for agriculture, food, and nutrition today, it certainly would not look like the current one. Action is overdue to shape a well-functioning future, global institutional architecture of agriculture and food that is capable to deliver the international public goods for food security, and it actually should limit its tasks to just that, international public goods, and not what national policies are better at delivering. Two institutional re-design mechanisms are needed: (1) a platform that facilitates public goods policy actions and (2) a global assessment mechanism to provide evidence base for strategic directions for action.

Platform for decisions: A legitimate, nimble, and innovative set of strategic bodies to help co-ordinate the actions of others (i.e., some of the existing international organizations) is needed: a platform that can facilitate global action as well as government-to-government networks, with inclusion of private sector industry and civil society actors. It should have legalized political authority to watch over and broadly facilitate public goods delivery in support of global agricultural development and food and nutrition security. A candidate could be a truly independently-governed Committee on World Food Security (CFS). It current-
ly lacks independent governance structures and budgetary authorities. A system is only as strong as its weakest parts, so this global strategic body needs to be able to rely on more effective global agencies. For that, the FAO should be re-invented and strengthened to deliver the public goods that facilitate sustainable agricultural intensification and growth under climate change, food security information, and global food safety services. Second, global nutrition policy needs an organizational home and not split among currently five agencies; Third, WFP needs to be supported to better mitigate and respond to emergency food crises by getting a reliable global food store and funding that permits flexible response. Institutional redesign would be best arranged around focus areas that facilitate IPG delivery in order to facilitate public goods inter-linkages. Three such focal clusters of organizational setups may be considered at the level of such a platform: one on food and nutrition security of the poor; a second on protection of natural resources; and a third on enhanced sustainable intensification and productivity growth.

International assessment mechanism: The current and future challenges of agricultural development and food and nutrition security require a strong mechanism for science and research based assessment as a permanent institutional arrangement. A global body tasked with this could be mapped along the lines of the Intergovernmental Panel on Climate Change (IPCC), but avoiding its well known pitfalls from the outset. It needs to have a perspective for the coming two to three decades as the agriculture and food issues are filled with uncertainties and opportunities. It is not a one-off assessment task or a set of studies, but an integral part of a sound international public goods delivery system for agriculture, food- and nutrition security. An independent IPCC-type global research body that communicates academic consensus and scientific uncertainties on agriculture, food, and nutrition is needed for delivering evidence based analyses for action with foresight. This function goes beyond the existing Consultative Group on International Agricultural Research (CGIAR), and calls on the whole international science system related to agriculture, food, and nutrition.

The re-design of the system should be done step by step. The steps could be guided by the above-mentioned cost effectiveness assessments, with adherence to the principles of legitimacy with accountability, effectiveness, and inventiveness. Coming to a meaningful implementation of this re-design option will require leadership. Leadership for change could come from the developing countries via the UN and the G20 which could play a key role to initiate the change.

Conclusions

Food-price volatility deserves much more attention in the policy arena in order to improve food security globally. Governments can act to shield their citizens from higher prices and volatility in world markets by initiating measures to stabilize food prices and by establishing social protection systems that mitigate the impact of high food prices on vulnerable groups. However, since extreme price volatility is an international concern, it does require international action. National actions such as excessively increasing grain stocks or restricting trade are inefficient and make global matters worse. Instead, three groups of policies at the international level should be accomplished: they include coordinated measures to foster production, technology, and private investment in order to allay the
root causes of price upsurges; harmonized trade, bioenergy, grain reserves, and financial policies so as to prevent excessive price volatility and speculation in food markets; and targeted social protection and nutrition policies to alleviate undernourishment. The global food governance architecture needs to be redesigned to deliver the public goods components for international food security.

References


