Since the financial and food price crises of 2007, market instability has been a topic of major concern to agricultural economists and policy professionals. This volume provides an overview of the key issues surrounding food prices volatility, focusing primarily on drivers, long-term implications of volatility and its impacts on food chains and consumers.

The book explores which factors and drivers are volatility-increasing and which others are price level-increasing, and whether these two distinctive effects can be identified and measured. It considers the extent to which increasing instability affects agents in the value chain, as well as the actual impacts on the most vulnerable households in the EU and in selected developing countries. It also analyses which policies are more effective to avert and mitigate the effects of instability.

Developed from the work of the European-based ULYSSES project, the book synthesises the most recent literature on the topic and presents the views of practitioners, businesses, NGOs and farmers’ organisations. It draws policy responses and recommendations for policy makers at both European and international levels.

Alberto Garrido is Professor of Agricultural and Natural Resource Economics and a Researcher at the Research Centre for the Management of Agricultural and Environmental Risks (CEICRAM), Technical University of Madrid, Spain.

Bernhard Brümmer is a Professor in the Department of Agricultural Economics and Rural Development at Georg-August University of Goettingen, Germany.

Robert M’Barek is an Agricultural Economist and leader of the “Agricultural trade and market analysis” group at the European Commission’s Joint Research Centre (IPTS) in Seville, Spain.

Miranda P. M. Meuwissen is Associate Professor in the Business Economics group at Wageningen University, the Netherlands.

Cristian Morales-Opazo is an Economist in the Agricultural Development Economics Division at the Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.
Chapter 13
Assessment of national policies in developing countries to combat and mitigate effects of agricultural markets’ excessive price volatility

*Mulat Demeke and Jean Balié*

Recommended citation:

13 Assessment of national policies in developing countries to combat and mitigate the effects of agricultural markets’ excessive price volatility

Mulat Demeke and Jean Balié

1 Introduction

Market risks in agriculture are related to volatility of input and output prices, availability of inputs or credit, availability of markets for farm products, and variations in income derived from farming operations. Output price volatility is of particular concern to farmers, traders, processors, and agricultural finance providers. Nominal prices of agricultural commodities are generally more volatile than those of nonagricultural commodities, mainly because of disruptions in production due to natural factors such as climate variability and pest attacks, as well as inelastic supply and demand for agricultural products in the short run. It should, however, be noted that not all price variations are problematic. Price movements will not be a problem if they move along a smooth and well-established trend and reflect a typical and well-known seasonal pattern. Price variations become a problem when they are large and cannot be predicted, leading to uncertainty and increased risks for producers, consumers, and operators along the value chain (FAO et al., 2011).

Many factors contribute to output price variability. On the demand side, an increase or decrease in income and population growth, energy prices, and biofuel production may contribute to sudden price changes. On the supply side, overinvestment or underinvestment in agricultural production could lead to fluctuations in production and prices. Price and production risks are highly interrelated, as variability in production can result in high food price instability and vice versa.

Volatile and unpredictable prices reduce the quantity and quality of investment not only by farmers but also by traders, processors, and distributors. Unstable prices prevent farmers from making adequate investments in inputs, accessing credits, and accelerating their supply responses (Poulton et al., 2006; Dawe, 2001; Timmer, 1989). If significant, food price shocks can cause major macroeconomic instability and serious development challenges. Inflationary pressures, balance of payment, and public deficits may increase with significant rise in food prices, resulting in further negative consequences for poverty and food security (Díaz-Bonilla, 2008). When faced with the challenges of inefficient international markets and highly volatile food prices during the high
food price crisis of 2007–2008, governments responded with a number of policy measures to manage excessive price risks. Policies associated with managing food price volatility can be divided into two major categories:

1. Price stabilizing strategy: policy instruments designed to reduce price volatility; and
2. Strategy for coping with price volatility: policy interventions intended to reduce the effects of price volatility on producers, consumers, processors, traders, and other value chain operators.

Table 13.1 summarizes the different types of policies that governments can adopt as part of their price stabilization or coping strategy. In practice, the merits of each policy need to be assessed from different perspectives before being applied. Governments need to know the effectiveness, implementation modalities, and time dimensions of the various policies in managing price volatility. Policies designed to stabilize prices are largely implemented in advance of the occurrence of excess volatility (ex-ante) while coping strategies are implemented right before (ex-ante) or after (ex-post) the price shock. As part of the coping strategies, government policies may encourage agents to retain and manage the risks by themselves (risk retention) or transfer them to a third-party entity (risk transfer).

Table 13.1 Policy responses in managing price volatility in developing countries

<table>
<thead>
<tr>
<th>Objective of the policy</th>
<th>Stabilize prices</th>
<th>Cope with price instability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Long term</strong></td>
<td>Develop infrastructure and logistics***</td>
<td>Develop risk-transfer mechanisms***</td>
</tr>
<tr>
<td></td>
<td>• Transport and communication</td>
<td>• Forward contracts and futures markets</td>
</tr>
<tr>
<td></td>
<td>• Storage and post-harvest technology</td>
<td>• Insurance schemes including weather-based index insurance</td>
</tr>
<tr>
<td></td>
<td>Improve market institutions***</td>
<td>Support sustainable social protection programs**</td>
</tr>
<tr>
<td></td>
<td>• Warehouse receipt systems</td>
<td>• Pensions, unemployment benefits, medical care, etc.</td>
</tr>
<tr>
<td></td>
<td>• Commodity exchanges</td>
<td>• School feeding programs</td>
</tr>
<tr>
<td></td>
<td>• Market information</td>
<td>Promote sustainable risk retention through diversification**</td>
</tr>
<tr>
<td></td>
<td>Support sustainable production and productivity growth***</td>
<td>• Enterprise diversification (e.g., livestock and crops)</td>
</tr>
<tr>
<td></td>
<td>• R&amp;D, irrigation</td>
<td>• Off-farm employment</td>
</tr>
<tr>
<td></td>
<td>• Risk management for producers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facilitate trade**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Regional trade</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Bilateral and international trade agreements</td>
<td></td>
</tr>
</tbody>
</table>
## Objective of the policy

<table>
<thead>
<tr>
<th>Stabilize prices</th>
<th>Cope with price instability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short term</strong></td>
<td></td>
</tr>
<tr>
<td>Support stockholding**</td>
<td>Promote short-term risk retention through access to finance**</td>
</tr>
<tr>
<td>• Emergency reserve</td>
<td>• Improved access to finance**</td>
</tr>
<tr>
<td>• Public stocks in landlocked</td>
<td>• Promote savings</td>
</tr>
<tr>
<td>countries</td>
<td></td>
</tr>
<tr>
<td>• Support private stockholding</td>
<td>Support targeted safety net programs***</td>
</tr>
<tr>
<td>Use border measures and trade</td>
<td>• Cash and food transfers</td>
</tr>
<tr>
<td>policies**</td>
<td>• Grain price subsidies</td>
</tr>
<tr>
<td>• Protect domestic market (e.g.,</td>
<td>• Safety net programs for producers</td>
</tr>
<tr>
<td>reduce tariffs)</td>
<td></td>
</tr>
<tr>
<td>Stimulate short-term production**</td>
<td></td>
</tr>
<tr>
<td>• Input subsidy</td>
<td></td>
</tr>
</tbody>
</table>

Expected effectiveness of the policy measure:

*** Can be highly effective on average with important variations from country to country

** Can be moderately effective and likely to induce market distortions on average with important variations from country to country

Moreover, the time dimension matters, as some policies have immediate impact while others have a long-term impact. Finally, policies may be mainly market based or government based, but it appears that all policies require private–public partnerships (PPP) to be effective.

Building on available evidence, this chapter proposes a qualitative assessment of the effectiveness of different policies adopted by governments to reduce price volatility and/or mitigate the effects of excessive volatility in developing countries. In particular, the chapter examines the challenges faced by governments attempting to manage price volatility and achieve food and nutrition security.

### 2 Policy measures to stabilize price

In low-income countries (LICs), price volatility that results from variability of agricultural production is often made worse by market failures that result from insecure property rights, incomplete information, inadequate access to essential public goods (infrastructure, logistics, essential regulations, etc.), and limited export and import options (FAO et al., 2011). Production shocks due to extreme weather, pests, and other natural calamities are exacerbated by poor infrastructure including storage facilities, high transport costs, inadequate support services, and weak institutions (World Bank, 2008).

Policy measures designed to stabilize prices in LICs therefore include facilitation of arbitrage by market actors (private sector) through improving infrastructure and logistics. But they also consider strengthening market institutions through direct intervention primarily intended to increase food availability,
access, and stability such as stockholding, changing trade policies, and promoting a sustainable production increase (Galtier, 2013; Cummings, 2012).

Poor infrastructure, high transport costs, absence of credit or insurance markets, and various policy and governance failures may compound the initial difficulty. A relatively minor climatic incident in these conditions can become a serious food crisis at a local or regional level. Again, those most affected will be poor consumers and rural dwellers, mainly smallholders in less-developed countries or regions, heavily dependent on their own production.

2.1 Market infrastructure and logistics

The importance of a good transport infrastructure, storage logistics, and port facilities in reducing transport costs and facilitating the flow of food from surplus to deficit areas is widely recognized (Konandreas, 2012). Better marketing infrastructure not only reduces transport costs but also minimizes short-term food price volatility and facilitates price transmission. Improving rural roads and market facilities such as warehouses is also important in linking smallholders to markets, thus increasing market supply and contributing to more stable prices (FAO et al., 2011).

Food and agricultural markets in developing countries lack the ability to absorb domestic shocks, even when international prices are stable, because of severe challenges in marine and inland transport. Food imports fail to stabilize prices where freight costs are high and transit delays are significant because of shortages of container terminals, inadequate and obsolete equipment, excessive bureaucracy, and lack of competition in port management and dock services. Where inland transport systems are inadequate and spatial market integration is poor, increasing market production and marketable surpluses may result in declining and volatile prices, while other areas of the same country may suffer from deficits and rising prices. In most low-income countries, price changes in urban areas or the world market are not fully transmitted to producers (Pinstrup-Andersen and Shimokawa, 2006). All of the above is particularly common in landlocked countries of sub-Saharan Africa.

As a result, the major policy objective of developing market infrastructure and logistics is to address the barriers to the movement of grains from the point of production to the point of consumption. Increasing public investment in port and transport infrastructure has the potential to reduce price volatility (World Bank, 2005), but it would take a long time for this to have a major impact in poor countries where resources are limited. Landlocked countries are unlikely to have any influence over investment in ports and the inland transport infrastructure of other countries.

2.2 Market institutions

Warehouse receipt systems (WRSs), commodity exchange, and market information systems are among the major market institutions necessary for reducing transaction costs and facilitating marketing and trade of agricultural products.
Warehouse receipt systems

WRSs protect farmers and traders from seasonal price risk variability by giving them access to secure and reliable storage and a documentary title for their produce, which can be used to obtain finance. With the WRSs, farmers can access inventory credit, avoid selling immediately after harvest, and potentially contribute to smoothing seasonal price variations. Small farmers can transact directly with larger-scale buyers, such as wholesalers, processors, and exporters, without going through multiple layers of middlemen, thereby minimizing the risk of getting unfair, low, or volatile prices (FAO et al., 2011; World Bank, 2005).

Major challenges in implementing WRSs include: (a) lack of well-established grades and standards to classify products on the basis of their quality and maintain them through adequate storage facilities; (b) absence of reliable trading platforms to ensure fair and transparent transactions and facilitate the sale of the stored commodities; (c) lack of well-developed and affordable financial markets to scale-up promising experiences and ineffective legal environments to enforce contracts. These limitations need to be addressed for WRSs to be widely utilized and provide immediate relief to problems of short-run price instability.

Commodity exchange systems

Commodity exchanges provide options to simplify title transfers, perform the “price discovery” mechanism, and deal with price risk and market uncertainty. Price discovery, a major benefit of futures markets, allows market agents to be informed of the true market clearing price quickly and efficiently, thus contributing to price stability. The futures markets provide a transparent price that can be used by traders as a benchmark to determine spot prices for a vast array of cash market contracts. Traders also make forward contract offers to farmers based upon contemporaneous futures prices. However, effective commodity exchanges to manage food system risks are rare in developing countries (though they are beginning to emerge in LICs like Ethiopia and Malawi). Small-scale farmers are also less likely to participate due to high fixed costs associated with the large underlying volumes customary in futures and options trading (World Bank, 2005). Lack of comprehensive and frequently published supply-and-demand information is also a critical bottleneck for futures markets to operate effectively in developing countries (McKenzie, 2012). It requires a sustained effort to build capacity to the point where decision makers are comfortable with the use of price risk management tools (FAO et al., 2011).

Market information systems

Agricultural market information systems (AMISs) refer to a process and tools to collect and deliver market information in order to reduce the risks and lower the transaction costs of farmers, traders, processors, and other market participants. It is widely believed that a lack of reliable and up-to-date information
on prices, crop supply, demand, stocks, and export availability contributed to the 2007–2008 high food price volatility (FAO et al., 2011). In particular, international responses to both the 2007–2008 and 2010–2011 price shocks were hampered by the lack of reliable information in relation to the level and availability of grain stocks (Gilbert, 2011). AMISs are also a major prerequisite for effective operation of commodity exchanges, contract farming, and warehouse receipt systems.

Despite the progress in the use of information and communication technology (ICT), agricultural market information systems in many countries lack key market data. Information providers often do not include data on trade volume, quality/grade of commodities, location, prices at various stages of the value chain and price trends, and production forecasts in their market information systems. Information on stocks is an essential component of food market information systems, yet reliable data on stocks of grains is often unavailable partly because it is considered commercially sensitive information and because stocks are dispersed and difficult to track among farmers, traders, and other actors (World Bank, 2012). Producing consistent, accurate, and timely agricultural market data and analysis, especially in response to weather shocks, is particularly challenging in developing countries. Because market information has a public good nature and is necessary to better adjust and respond to market price signals, governments in developing countries need to invest in sustainable and effective AMISs by supporting private operators or developing public–private partnerships (FAO et al., 2011).

### 2.3 Stockholding or buffer stock policies

In an attempt to stabilize prices, a government agency may buy grain when prices are low (and build up stocks) and sell (and deplete stocks) when prices are high. Government policies may also subsidize the private sector to hold stocks (Gouel and Jean, 2012). Depending on how they are managed, stocks can have positive or negative effects on markets. Stocks can have a more direct and immediate impact in reducing excessive volatility in agricultural commodity markets (Wright, 2011). For example, it is shown that low or uncertain stock levels are among the major reasons for excessive volatility to occur (Wiggins and Keats, 2012; Maunder, 2013). A well-managed reserve can be a powerful tool against price volatility, in addition to supporting more remunerative prices for producers, averting and responding to food emergencies, providing a market for small-scale producers, and creating a reliable source of food for social safety nets such as school lunch programs. Food reserves can compensate for shortfalls in foreign currency, a common problem in poor countries (Sampson, 2012).

Public interest in buffer stocks has changed over the last 20 years. Public stocks were considered expensive because raising producer prices above market levels and lowering consumer prices below market levels entailed considerable fiscal costs. Intervention through stocks is said to distort the market since procurement and release levels and prices often involved guesswork and created
uncertainty in the market. Public stocks can also crowd out private stocks and private trade, especially when the volume involved is substantial. In some LICs, especially in Africa, using buffer stocks failed to achieve price stability mainly due to bad governance (World Bank, 2012; Sampson, 2012). Moreover, the direct costs of stockholding programs, which include costs related to storage, transport, distribution, management, and spoilage, are high and escalate with increase in stock sizes (Deuss, 2014). These considerations led to the dismantling, downsizing, or divesting of public agencies managing public stocks in the 1980s and 1990s (Mittal, 2008).

The 2007–2008 food crisis, however, highlighted the inadequacies of relying on the market as the only strategy for addressing volatile prices in the grain markets. There has been a renewed interest in grain reserves for other reasons, such as maintaining at least a minimal level of food security, the increasing incidence of food emergencies (e.g., due to climate change), and the tendency to restrict export by several key agricultural exporters during the most recent food crisis (Sampson, 2012). As a result, public stocks in LICs have been growing since 2008, while they have been declining in HICs (World Bank, 2012).

Public stocks can play an important role in improving food security and are most effective in the short run, especially for bridging the time needed for food imports. The importance of public stocks is also greater in LICs and landlocked nations where import options are constrained by high access costs (Gouel, 2011; Gilbert, 2011). Because credit, insurance, and forward markets are incomplete in LICs, public stocks can augment private stocks and make food prices less sensitive to short-term shocks (World Bank, 2012).

In all cases, stocks need to be incorporated into a coherent long-term strategy that combines the use of trade, investments in agricultural productivity, and well-managed targeted safety net programs. For a more positive impact, policy makers need to make sure that stocks are managed with a level of autonomy similar to that of central banks, within a framework of clear and well-defined objectives and implementation arrangements. Clear triggers for market interventions and releases should be used to avoid market disruptions. As demonstrated by the experience of some countries (e.g., BULOG of Indonesia), public stocks should be limited in size to avoid a dominant position in the market (World Bank, 2012; Crola, 2012).

2.4 Border measures and trade policies

Trade is an excellent buffer for fluctuations originating in the domestic market. Year-to-year variations in domestic production can be more effectively and less expensively smoothened by adjustments in the quantities imported or exported. International and regional trade is a powerful tool to even out supply fluctuations across countries and, as a result, to reduce market price volatility. More precisely, regional trade can help reduce domestic food price volatility by allowing the flow of food staples from areas where local markets are unable to absorb surplus production to food-deficit regions.
Despite ongoing reforms, restrictive border measures have hampered trade in agricultural commodities among developing countries and between developing and OECD countries. Tariff and nontariff trade barriers have contributed to some of the grain price volatility experienced in recent years (Valdes and Foster, 2012). Among the major trade barriers are import and export bans, nontransparent licensing of importers, unrealistic import requirements in terms of price and quantity, release of subsidized food onto domestic markets (see buffer stocks above), and failure to deliver on announced state-to-state contracts. Average tariffs on agricultural and food products are estimated at 25% for MICs and 22% for HICs, higher than in LICs (Prakash and Stigler, 2011). Protectionism on agricultural products is not only higher than on nonagricultural products, it is also much more volatile (FAO et al., 2011).

In principle, border measures can be applied to insulate domestic markets from international price fluctuations. However, hampering the flow of grain between nations, as highlighted by the adoption of measures by some countries to insulate themselves from regional or international markets, can exacerbate price volatility (Anderson et al., 2014). An extreme approach is to opt for complete self-sufficiency with the use of trade only to smooth out fluctuations originating in the domestic market. However, keeping the domestic price level completely delinked from international price levels can be a very costly policy approach, greatly reducing economic welfare in the country concerned. An alternative approach can be to engage in international or regional trade, but to adjust border measures so that domestic markets are insulated from international price swings. For importing countries, tariffs are raised (if applied tariffs are not yet at their bound level) when world prices decline and vice versa when prices rise. Import subsidies can be used to counteract very high prices, but the fiscal costs can be prohibitive and unsustainable for most low-income food-deficit countries. Exporting countries have less scope for counteracting declining world market prices as export subsidies are tightly constrained by the WTO (for its member countries). However, when world prices rise, they can tax or restrict exports and the WTO imposes essentially no effective limits on these policies. In other words, governments of both importing and exporting countries can, within given limits, use trade policies to protect their domestic markets. However, using trade policies to stabilize domestic market prices could mean aggravating volatility on international markets (Tangermann, 2011).

2.5 Production support measures

Increasing and stabilizing food supply can mitigate price volatility in LICs. For production to increase, it is essential to provide the right incentives for producers and other private investors to invest more and at reduced risks and costs.
Priority areas of institutional and policy development in this regard include: (a) overall improved governance (e.g., stable macroeconomic conditions, sound structural policies, human capital development, and public services) of rural areas; (b) improved infrastructure, technology, and services, including irrigation facilities; (c) support to pro-smallholder innovations in financial markets, which often require public–private partnerships; and (d) an enabling legislative and policy environment for small producer organizations, which can greatly mitigate the risks faced by individual producers and help thicken markets and, as a result, reduce volatility (FAO et al., 2011).

The impact of production support measures on price volatility depends on whether a self-sufficiency or self-reliance strategy is adopted. Governments may pursue a policy of self-reliance or importing food from the world market when prices are cheaper than growing at home. However, this strategy came under pressure during the food price crisis of 2007–2008, when importing countries found it difficult to import the food they needed because of export bans and other restrictions by exporting countries. A self-sufficiency strategy (growing domestically all the food the country needs) has gained popularity in recent years (Demeke et al., 2014). However, it may not be necessary for policymakers to choose between self-sufficiency and self-reliance options. Rather, the focus needs to be on establishing an efficient (undistorted) and sustainable agriculture sector and identifying the extent to which this meets food needs (Deb et al., 2009).

3 Policies aimed at coping with the effects of price instability

Policy measures that accept price volatility as a given and attempt to cope with it can be implemented through the market or through government interventions. The aim of market-based instruments is to prevent (using market mechanisms) price instability from causing income instability for producers. Economic agents can protect themselves against the risks of price variations through access to finance and financial hedging instruments such as forward contract, futures, and put options. Government-based instruments support households through public subsidies and transfers when prices are too high (for vulnerable consumers) or too low (for vulnerable producers) (Galtier, 2013).

3.1 Market-based price risk management

A market-based price risk management instrument is a financial contract that allows the parties involved to reduce their exposure to risk or alleviate its consequences. It may range from a simple risk retention using bank loans, which can smooth variable income flows, to more complex risk transfer instruments such as the purchase of a weather derivative (World Bank, 2005).
Risk retention strategies: access to finance and diversification

Access to credit and formal saving mechanisms

Credit services are coping mechanisms to help individuals or firms mitigate the negative consequences of shocks. They are a low-cost risk-retention strategy for less severe risks that occur more frequently. Farmers absorb less severe losses using self-insurance strategies, such as credit and savings, as well as on-farm risk management strategies, such as crop diversification, intercropping, and plot diversification. Access to credit markets allows farmers to maintain consumption levels when incomes fall and avoid distress sales of assets.

Farmers can cope with price risks (downside price risks) if they have access to short-term loans (World Bank, 2005) or formal saving mechanisms to draw down their own savings (during bad years). Many institutions provide grace periods for loans of clients affected by disasters, while others give small and standardized loans to help clients cover basic needs. Loans issued under emergency situations may also require a grace period before repayments start (Buchenau, 2003). Farmers’ savings are likely to expand with improved access to institutions such as banks, savings and loan associations, and microfinance institutions.

Nonetheless, smallholders have limited access to finance in many developing countries. Several factors have hindered the establishment of viable rural financial systems in developing countries. Low population density, small farm sizes, and inadequate transport and communication services have translated into high transaction costs for financial institutions contemplating an entry into rural areas. Exposure of agricultural production to various risks has also affected rural financial services, including both weather and price risks, which significantly influence the outcome of farmers’ investment. Grain trading and processing are also affected by these risks (World Bank, 2005). Therefore, measures designed to promote the establishment of a well-functioning rural finance system should focus on improving: (a) policies including an enabling legal, regulatory, and supervisory framework; (b) financial sector and real sector infrastructure; and (c) financial institutions.

Diversification

Diversification allows farmers to use their resources in different activities and/or assets instead of concentrating them on one particular enterprise. Since the returns to different activities or assets are not perfectly correlated – i.e., not all farm enterprises and operations are likely to be affected in the same way by risk factors – the variance of the overall return is reduced. Hence, diversification spreads risk and is a successful risk management strategy. Some of the diversification strategies include managing multiple farm enterprises together at any one time (same season) or engaging in the same farm enterprise but in different locations. Many farmers often integrate crops and livestock to
reduce risk as well as improve their efficiency and sustainable use of their natural resource base. Farmers may also take part-time work to generate income from off-farm activities (FAO et al., 2011; OECD, 2009). Diversification may entail some disadvantages, including lack of economies of scale or specialization (because of doing many different activities). However, the advantages of averting or minimizing risk and the importance of growing staple crops for home consumption outweigh the disadvantages of diversification in Tanzania (Mutabaz et al., 2013).

Risk transfer strategies: hedging instruments and insurance

Price and production risks that are likely to be widespread and substantial can in theory be transferred from farmers to financing institutions via financial hedging instruments or insurance.

Hedging instruments (forward contracts and futures markets)

Contract farming agreements are forward contracts specifying the obligations of the sellers (farmers) who promise to supply and the buyers (processors/traders) who promise to off-take agricultural produce as agreed. Contract farming is intended to solve the problems of imperfect product and input markets, price uncertainties, and credit market failures. The description of the contract agreement may remain quite vague or be well-defined obligations with remunerations for tasks done, often with specifications of pre-agreed price, volume, quality, and time of delivery. Contract farming may carry the risk of default (due to weak enforcement mechanisms) and contract prices could be slightly below prevailing market prices, but farmers agree to these conditions because they prefer consistent and foreseeable pricing to a highly volatile informal market situation (Kaganzi et al., 2009).

In developing countries, contracting with a large agribusiness firm may be the only way for farmers to access higher-end markets, receive higher returns, and have easier access to inputs along with credit from sponsors. It is a fact that the food supply chain has increasingly become vertically coordinated in developed and emerging countries, with contract farming as the main instrument of coordination for most traditional commodities, and this trend is also likely to affect less developed economies. Over the last two decades, contract farming in the production and marketing of agricultural products has seen a rapid expansion. In particular, livestock products such as dairy, poultry, and pigs have attracted a lot of attention by agroprocessing enterprises. Contract farming has also been a useful mechanism to help farmers diversify into new, high-value crops such as horticulture, cotton, tea, and tobacco.

Hedging via forward and futures markets protects producers against price reduction, but it does not allow them to benefit from price increases. Options, on the other hand, allow producers to protect themselves against declining
prices (put option or selling option) while taking advantage of price increases. The strike price (a specified price) of the put option guarantees a price insurance to producers in the form of a minimum price floor at which they can sell their product. The main cost involved in the purchase of put options is the price of the options premium, which is paid up front. The value of the premium depends on the strike price relative to the underlying value of the options futures contract, the duration of the contract, and the volatility of the underlying commodity market prices.

It is clear that better functioning of futures markets can have an indirect impact on smallholders by mitigating international price volatility. However, this is beyond the reach of smallholders due to access costs, poor access to information, lack of training, and the usually lower quality of crops produced by smallholders. There are few relevant commodity markets in low-income countries to manage food systems through futures markets and options (FAO et al., 2011; World Bank, 2005).

Forward contracts are potentially more flexible and useful than future contracts for small-scale farmers and traders. However, future contracts are low-cost, highly liquid, and easily transferable financial instruments with no default risk. Failure to enforce forward contracts, especially for staple food crops, has meant that default risks are too high to support viable forward markets in many developing countries (World Bank, 2005). Government policies need to support the establishment of an enabling legal and regulatory framework and promote forward contracts and futures markets as complementary systems. Producer organizations need to be promoted to reduce the transaction costs of dealing with small farmers.

Insurance products: weather index and other risk management instruments

Insurance schemes are instruments designed to pool risks from a large population to cover payouts encountered by a small portion of that population. Innovative insurance schemes have become a useful tool for poor farmers in managing climatic risks, which tend to affect large number of farmers in a given area. Insurance coverage also improves creditworthiness of participating farmers. However, smallholders in developing countries have no real access to formal insurance coverage. Crop insurance, originating from either the private or public sector, is rarely offered in LICs, especially in sub-Saharan Africa, but is growing in many Asian and Latin America LICs and MICs. The main constraints are the large informational asymmetries and the high transaction costs of dealing with many small farmers.

Recent new innovative approaches in agricultural insurance markets have the potential to address the challenges of conventional insurance in the agricultural sector. Amongst the most promising “new” insurance mechanisms is the weather-based index insurance. Index insurance products apparently offer
a practical solution to many of the barriers to conventional crop and livestock insurance for smallholders: adverse selection, moral hazard, high transaction costs, and high loss assessment expenses (Roberts, 2005). However, the development of index-based weather insurance will require public investment and policy support to develop the institutions that are needed to support viable insurance markets (World Bank, 2005).

Governments often have farm safety net programs aimed at alleviating credit, savings, and liquidity constraints, providing certainty, and thus insuring households against production and market risks. Such safety net programs prevent people from adopting coping strategies, which result in depletion of assets and capital divestment. In that sense, they help poor and vulnerable households to build long-term resilience to shocks and ensure sustainable food security. Supporting households to build their asset base, including financial support for livestock production, can improve the resilience of poor households.

There are different formal or informal risk management systems, but these cannot credibly offer full protection to farmers against catastrophic risks. The purpose of farm safety net interventions is to provide protections against catastrophic risks, such as devastation from natural disasters, as well as risks due to limited access to inputs or lack of resources. Many governments create specific calamity funds, which are accumulated every normal year to provide assistance whenever a calamity or a natural disaster strikes.

### 3.2 Government-based consumer-oriented safety net programs

Safety net programs enable governments to meet the immediate needs of vulnerable households as a result of market or production shocks or natural disasters. They are critical in minimizing the negative effects of large price and production shocks in both urban and rural areas.

Consumer support schemes are mainly designed as food and cash transfer programs that can be distributed through food vouchers or in-kind distributions. Price subsidies as a means of protecting consumers from high prices are also common in many developing countries.

It is now increasingly well accepted that, to be effective, safety net programs need to be targeted and based on an analysis of the different risks and specific vulnerabilities of households and duly designed to address any gender-specific constraints. For example, a school feeding program increases attendance and reduces malnutrition, but it may include the nonneedy (difficult to feed only the poor in a given classroom) or miss the most needy (children too poor to attend school). Similarly, an unrestricted general food or input price subsidy benefits everyone, but is more costly than targeted programs.

When an economic crisis strikes, governments need effective tools and methods both to rapidly identify groups and areas in need of external assistance and to design cost-effective policies (Compton et al., 2010). One of the benefits of the safety nets is that they avoid the negative effects of tariff adjustments (i.e.,
price-volatility spillovers onto international markets). Given the limited effectiveness of government interventions on markets, emphasis should be placed on establishing well-designed and -managed safety nets (Tangermann, 2011). However, many low-income countries cannot implement effective safety net policies due to limited resources and institutional capacity. Targeting the poor requires information that may not be available and is expensive to collect. Administering safety net programs requires management, accounting, and supervision skills, which could be in short supply in developing countries (IFPRI, 2004). Another priority area for successful safety net programs may include promoting integrated measures that combine different safety net instruments with other sectoral interventions in nutrition and agricultural investment (Grosh et al., 2011).

4 Conclusions

In developing countries, the two episodes of high food price volatility of 2007–2008 and 2010–2011 have caused a significant change in the orientation of policies affecting the food and agricultural sectors. In many cases, and in contrast with their behavior in preceding decades, many governments demonstrated mistrust in markets, especially international markets and were less inclined to rely on the private sector alone to achieve food security. Therefore, they often decided to react to the global price spikes by intervening in markets. For the most part, policies in response to rising and volatile food prices have included a combination of measures targeting producers, consumers, and trade.

It is unrealistic to try to separate stockholding policies from other domestic policies. Any government program that involves buying or releasing cereals requires the creation of public stocks. The connection between stockholding programs and trade instruments becomes apparent when analyzing price volatility in countries that hold buffer stocks. Countries that reported lower overall price volatility often also implemented drastic changes in their trade policies. The fact that buffer stocks appeared to stabilize prices in countries that have isolated their economies is not surprising. Buffer stocks can only function in countries that are able to insulate their own economies from the world market; otherwise, the stabilization effects of the buffer stock dissipate into the international market. Even though buffer stocks seem to justify the presence of trade barriers, openness to international trade usually offers more price stability because it pools production risk and because international markets generally exhibit lower price volatility than domestic markets.

In retrospect, it appears that governments have generally favored short-term interventions to mitigate the effects of the high food price crisis for consumers, including through food safety net programs, over long-term development policies to stabilize prices for producers through improved market institutions or measures to support production. Indeed, many policy responses, such as border measures targeting consumers, have adversely affected incentives to production
(Demeke et al., 2014), while others reduced welfare as they significantly restricted international or regional trade (Short et al., 2014). Although a number of these interventions have managed to insulate domestic markets (e.g., in Indonesia, India, and China) from price volatility emanating from international markets, they have also tended to exacerbate instability of international markets (Anderson et al., 2014; Dawe et al., 2015).

Moreover, the policy decisions taken by countries after the crisis remained largely consistent with those adopted during the crisis, although they also tended to give more importance to long-term policy objectives. Trade policy decisions were significantly reversed compared to measures taken in the wake of the 2007–2008 crisis. Less emphasis was placed on export restrictions and more support was given to agricultural production, for example, by facilitating access to inputs through subsidized prices or improving infrastructures. Infrastructures were improved by bettering smallholders’ access to food and developing price and policy information systems (Maetz et al., 2011).

It also appears that a number of more innovative and promising policy options have remained insufficiently exploited by governments of developing countries. These included measures aiming at either mitigating the effects of food price volatility through risk retention or risk transfer measures, including insurance or even forward contracts and opportunities offered by futures markets, or stabilizing prices through more ambitious investments in market institutions and infrastructure. In most cases, these options could not be exploited because the basic requirements of improved governance and provision of fundamental public goods could not be met. For LICs to more effectively respond to new episodes of high food price volatility, the most urgent priority remains to tackle these fundamental obstacles to overall development.

Note

1 This would release land and other resources for other uses in which the country has comparative advantage.

References


Maunder, N. (2013). *What is known about the impact of emergency and stabilization reserves on resilient food systems?* London: Overseas Development Institute, March.


