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.

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FOOD & AGRICULTURE / ECONOMICS / ENVIRONMENT & SUSTAINABILITY
Chapter 1
Scope and objectives

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1 Scope and objectives

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1 The new policy and agricultural markets context

The spike in world food prices in 2007–2008 was the largest since the food crisis of 1973–1975. While there were price surges for the world’s three major cereals (rice, wheat and maize) in the years 2007 to 2008, the behaviour of world rice prices obeyed different factors than did wheat and maize prices, and it had different impacts, too. After the market turmoil of 2007–2008 and the 2011 rebound, at this writing, agricultural markets appear to be stable. According to the World Bank (2015), agricultural prices, which fell 3.4% in 2014, are projected to decline by 5% in 2015, following good harvest projections and stock-to-use ratios expected to increase for wheat and maize and most oilseeds, though decline for rice. This scenario is not conducive to export restrictions (as they were in 2008–2009), and the collapse in oil prices in 2015 (running at 50% of the highest in 2014) erodes one of the main support drivers for biofuel production in recent years. In view of the restoration of stock levels, the Organisation for Economic Co-operation and Development (OECD) also expects reduced risk of market volatility for the next years (OECD-FAO, 2014).

In 2007–2008, the phenomenon of soaring food prices surprised governments, experts and the international community. On all measures, it was a largely unanticipated series of shocks, both in the first spike in 2007 and the 2011 rebound. To find a similar episode of sudden, rapid and large increase of food prices, we have to go back to 1972–1973. The world food crisis of 1972–1973 was rooted in a severe weather shock to global grain production, although subsequent policy actions in the United States and the Soviet Union exacerbated the problem and triggered the price explosion (Falcon and Timmer, 1974). In contrast to the single-factorial and temporary 1972–1973 food crisis with its limited geographical scope, the crisis of 2007–2008 was a global, multi-factorial and sustained crisis (long-standing volatility, followed by recurrent food price spikes in 2010 and 2012).

While tensions in consumer food prices have subsided, domestic price movements have varied widely across countries, and the observed price variation in any particular country does not necessarily respond to changes
in world market prices. For developing countries, world market prices are crucially important for import bills, foreign exchange earnings, poverty reduction and food security and as signals to guide resource allocation. But it is well known that changes in world market prices are not always transmitted into changes in domestic prices due to transport costs, government policies, changes in exchange rates and market failures, including imperfect information (Conforti, 2014; Rapsomanikis, 2011; Baquedano and Liefert, 2014; Dawe et al., 2015).

Prompted by the sudden food crisis of 2007, the G20 leaders approved in the 2011 Cannes Summit an ‘Action Plan on Food Price Volatility and Agriculture’. The plan had five goals: (a) improve agricultural production and productivity both in the short and long term in order to respond to a growing demand for agricultural commodities; (b) increase market information and transparency in order to better anchor expectations from governments and economic operators; (c) strengthen international policy coordination in order to enhance confidence in international markets and to prevent and respond to food market crises more efficiently; (d) improve and develop risk management tools for governments, firms and farmers in order to build capacity to manage and mitigate the risks associated with food price volatility, in particular in the poorest countries; and (e) improve the functioning of agricultural commodities’ derivatives market. This ambitious policy programme presents unequal records of implementation and delivery, as this book will review carefully in many of its chapters. But the fact is that this political initiative was followed up by numerous others from international and supranational organisations, national governments and private foundations. The food crisis shook the foundations of the global food system.

Since the 2011 G20 Summit, uneven progress has been made at global and national levels to put in place policies, measures and initiatives to respond to the challenges of the 2007–2008 global food crisis. Important progress has been made in improving market information and early warning systems. In particular, the Agricultural Market Information System (AMIS) was set up in 2012 and housed in the UN’s Food and Agriculture Organization (FAO), complementing its price information at local levels with Global Information and Early Warning System on Food and Agriculture (GIEWS), which dates back to 1975. Famine Early Warning Systems Network (FEWS NET) was launched by USAID. The Food Price Watch, run by the World Bank, was launched in 2010, later followed by the Food Price Crisis Observatory. Notably, AMIS and the Monitoring and Analysing Food and Agricultural Policies (MAFAP, also an FAO initiative) report also detailed policy information. Despite better and more insightful market and policy information systems, key questions still linger in the policy debate: How much can the market be relied upon to provide food security? When and how much should the government intervene on behalf of this objective?

Some progress was made in strengthening the global governance (Committee of Food Security, G20 and WTO), although more enforcement mechanisms
and coordination are needed among these three global spheres. Some progress has also been made in reinforcing the regulating financial and commodity markets in the US and the EU, but this is a very difficult task from a technical and legal perspective (Massot, 2013). With hindsight, it appears that the role played by the entry of institutional investors, such as hedge funds, pension funds and investment banks, into food commodity derivatives markets may have been overstated. And yet, the UN Special Rapporteur on the Right to Food claimed that ‘Fundamental reform of the global financial sector is therefore required in order to avert another food price crisis’.

Less progress has been made in strengthening the coordination of global and national policies that influence food price volatility and food security, and even less in pushing international trade negotiations in spite of the Bali Agreement signed in December in 2013 (Doha Round of the World Trade Organization). This is perhaps one of the most commonly cited flaws of the international governance, because it goes against any national policy initiative to strike the right balance between food sovereignty, trade openness and domestic farms and consumers’ support.

Finally, unsatisfactory progress has been made in increasing public and private investment in agricultural development plans to raise food production in developing countries. Because there is now evidence that price volatility delays gains in productivity (Haile et al., 2015), and that increases in productivity reduce volatility (Alston et al., 2014), it is clear that promoting sustainable intensification is a fundamental goal to make world food systems more stable.

At the European level, just as the new Common Agricultural Policy (CAP) entered into force in the agricultural year 2014–2015, some voices have already been raised to begin considering more flexible support systems with embedded counter-cyclical features (MOMAGRI, 2015). This could be interpreted as a recognition that the new CAP for 2015–2020 was perhaps an evolutionary political outcome of the previous CAPs, but that it still lacks some flexibility, at least from the perspective of budget execution and the types of programmes the EU can implement in the event of systemic market crises.

The end of milk quotas and the upcoming end of the sugar quota have also brought about an intense debate about how these two and other markets should be managed, or whether they should be at all. The 2014 Russian veto tested the safety net mechanisms foreseen in the new CAP and, judged from the most recent assessments, it seems that its budget proved insufficient to compensate all negative impacts. Most agricultural subsectors have been deprived of specific policy mechanisms to address wide price swings. For most of the fundamental commodities in the EU, prices now fluctuate jointly with international prices, unless they drop to the intervention prices, which only apply to wheat and skimmed milk powder and are set at very low levels. It is somewhat understandable that in the EU, in parallel with the dismantling of the quotas in the dairy and sugar sectors, there is now a growing interest in using some untested mechanisms like mutual funds, revenue insurance and other more flexible farm support measures (Cordier, 2014; Bardaji et al., 2011).
Perhaps recognizing that income-support and market management policies will always face limitations, not to mention efficiency losses and redistribution effects, a renewed focus has been placed in improving the functioning of the supply chain, both in high-income and low-income countries. Important measures focusing on contractual mechanisms are being enforced in the EU, including the obligation to sign detailed sale and delivery contracts between producers and processors. Most countries in the EU also created ‘Price Observatories’, not to mention the EU milk market observatory and other national observatories of the food supply chain, which collect prices at different stages of the chain, with a view to enhancing price formation transparency and detecting non-competitive behaviour. A very likely result of all this, as this book clearly shows, is the strengthening of the value chain and the emergence of innovative price risk management strategies.

One final, but by no means unimportant, focus is food demand and the consumption of food and how food prices affect consumption habits. Research shows that the primary influences on people’s consumption habits are price, affordability and taste, with trustworthiness and convenience also having an impact. Food prices offer a double-edged perspective: from the health perspective, there are proponents of food taxes to reduce obesity and malnutrition, but the results supporting this recommendation are inconclusive. From another perspective, even in developed countries poor households can be severely hit by rises of food prices. The health effects of variations in food prices have not been established clearly in the literature, but the negative welfare effects of price rises are beyond dispute. How food price volatility affects consumers is still a field of debate in both high- and low-income countries.

2 A growing body of literature that is shaping new research consensus and also sharpening the debates

In the course of the last five to six years, renewed efforts, updated data and new research projects addressing the drivers and the impacts of markets’ instability have shaped a corpus of knowledge of significant value for policy makers. To review in full this literature and draw its main conclusions within the length of a typical journal article would leave out too much valuable information. This is one of the main motivations of putting together this collection of essays.

The factors that caused the 2007–2008 global food crisis were not just market fundamentals, but also macroeconomic (rate of exchange and interest rates) and exogenous (increase of oil prices, decrease of real estate prices and the financial crisis) shifters, multiplied by financial and commodity markets’ activity, some policy decisions (export restrictions instituted by some important net exporter countries) and climate shocks (see Chapter 2). As a consequence of all these factors, the phenomenon gained such complexity that dealing with this new era of price and market development will be from then on considered a daunting task to be tackled by the international community, with few options
for individual countries or regional initiatives to pursue any other policy than merely reinforcing their coping capacity.

At the core of any intellectual endeavour of drawing policy lessons from a past crisis, it stands that regardless of the quality of data, models and inference, there is still the problem of anticipation. Chavas et al. (2014) rightly frames the problem as follows:

[...] if price changes are not anticipated ... the econometrician needs to distinguish between what is known versus what is not known to market participants. The changes in what is not known is captured by changes in the distribution of price volatility. ... This raises the issue of empirically evaluating both changes in market conditions and changes in the information available to market participants ... how much of the 2008 food crisis was due to poor information ... about food stocks?

(p. 9)

[...] if [a market] shock is not anticipated, the economic implications are quite different. First, the welfare and distributional effects can be stronger. Second, the adjustments must be contingent on the particular shock, implying state-contingent decisions that are in the realm of insurance and risk markets. But insurance and risk markets are known to be incomplete ... [since] insurance markets do not develop easily ... the welfare costs of volatility are not large enough to justify paying the full costs of insurance.... Is it possible to improve on the welfare outcome-associated current food price volatility? What is the role of markets? What is the role of government policies?

(p. 10)

With these questions in mind and drawing on lessons learned from the global food crisis initiated in 2007–2008, these ten points seem to gather some support from recent studies:

1 Only extreme price movements should be a source of concern. Price changes along a well-established trend reflecting market fundamentals and with known cyclical patterns are less a matter of concern. From the policy perspective, food price volatility matters because it creates uncertainty, namely ex-ante unpredictability, and not because it results from ex-post variability. Risk is determined by exposure to uncertainty or unpredictability. Unanticipated shocks, as opposed to anticipated price movements, should attract most of the attention of policy makers (Munier, 2012; Chavas et al., 2014), because these shape the toughest policy dilemmas and courses of actions in times of market turmoil.

2 There is a need to develop forward-looking risk measures that are able to detect volatile periods (or potentially volatile periods) as early as possible
and that contain useful information for the construction of early warning systems. Nevertheless, it is not enough to rely on a single volatility measure, even if it is forward-looking. Instead, we need several risk measures that are linked to the economic consequences of increased volatility (Brümmer et al., 2014). In this vein, promising work (Baquedano, 2014) shows that price increases can be forecasted with reasonable accuracy based on a number of indices and factors that can now be easily monitored. This facilitates setting up early warning systems and preparedness for managing and coping with extreme price movements. However, ‘the better our predictions, the less likely are the spikes, because stocks will tend to adjust in a way that moderates the anticipated spike. In this sense, increased success in improving warning indicators is likely to reduce the evidence of their effectiveness’ (Bobenrieth et al., 2012, p. 25).

3 It would thus appear that the probability space of anticipated shocks expands at the expense of the likelihood of unanticipated shocks. This is due to (a) more powerful market information systems and modelling techniques; (b) better data collection systems of market fundamentals all over the world; and (c) the recent development of early warning systems based on market intelligence and almost instantaneous flows of information.

4 Drivers and causes leading to extreme price movements are not necessarily the same as those that sustain upward trends (higher price levels). Recent market developments show that volatility increases with high prices and low stocks, and therefore there is a strong correlation between volatility and high prices. This is partly due to the asymmetrical role of the demand for storage, which contributes to offset price drops but is rendered ineffective if stocks are very low and prices grow suddenly (Brümmer et al., 2014).

5 Initiatives to manage more efficiently supply risks that do not rely on physical stockholding, like virtual reserves (von Braun and Torero, 2009), or the risk of financial importing countries via food import financing facilities (Sarris, 2011), have not been translated into practical applications. Instead, regional and mixed (financial and reserves-based) initiatives like APTERR (ASEAN Plus Three Emergency Rice Reserve³), which is the agreement for establishing a pilot regional food reserves network for rice in some countries of Asia, holds promising potential to make the partner countries more food secure. APTERR consists of risk management elements and a combination of national and collective physical and cash reserves, which are available for the partner countries.

6 The stability and predictable behaviour of international markets can be considered a ‘public good’, from which all trading partners can benefit. However, individually each major producer or exporter would perhaps be better off implementing trade measures in the event of rapid price shocks, a factor identified as having a multiplying effect of market tensions during the crisis. There is a consensus that in the absence of more disciplines at WTO dealing with trade policy measures, there will not be complete trust in international markets (Martin and Anderson, 2012) and, in the event...
of a new crisis, countries may again resort to implementing insulation policies.

7 Despite the charges placed on speculation and the use of financial instruments by numerous commentators, which prompted G20 leaders to mandate that financial and derivatives need to be improved, it appears that these effects cannot be held accountable among the most relevant causes and drivers of the large price swings during the crisis (see Chapter 2; AULERICH et al., 2014).

8 The value chain perspective is fundamental. Well-functioning and -greased connecting markets help producers, processors and retailers react to unfavourable price movements and implement market risk management tools. In low-income countries, the lack of markets’ infrastructure, transportation and storage is at the root of alarming rates of food waste, weak market incentives, abusing market dominance and poor productivity (see Chapter 13).

9 Short-term impacts of the food crisis were considerable in poor importing countries and in the poorest households in middle-income countries. Years later, higher prices reversed the outcome, increasing small farms’ income and wages and helping reduce poverty (IVANIC and MARTIN, 2014). Recent work suggests that food price spikes may not have increased food insecurity in sub-Saharan Africa as dramatically as initially thought (VERPOORTEN et al., 2013), but clearly deepened the poverty of the poor, this being the acutest humanitarian consequence (COMPTON et al., 2010).

10 In developed countries, making nutritious and healthy food affordable to the poorest households has been identified as a key aspect to revert the alarming rates of obesity (JONES et al., 2014; COCKX et al., 2015).

3 Book goals and approach

This book seeks to improve the understanding of what happened (and why) during the food crisis of 2007–2008 on both world and domestic markets. It is the final output of the research project ULYSSES4 (Understanding and coping with food markets voLAtilitY towards more Stable World and EU food SystEmS). This project’s goal was to provide general, but sufficiently detailed, responses to the main questions that have been recently posed in the literature and debated in the political sphere: What caused the food crisis of 2007–2008? Why did markets become more volatile? Are there also long-term factors evolving in a way that will make markets more vulnerable to supply or macroeconomic shocks? How do agents in the value chain respond to markets’ instability? How do consumer food prices respond to changes in food prices? To what extent are households in Low income countries (LICs) and High income countries (HICs) affected by food price increases?

Covering a wide range of issues (drivers, spill-over effects, fundamentals, transmission, value chain agents’ perspective, impact on consumers and policies) and from different time perspectives (short-, medium-, and long-term); geographies (EU, low- and middle-income countries and global); and market
bases (frequent market data, weekly, monthly and annual prices; EU and international markets), ULYSSES aimed at drawing policy-relevant conclusions.

Underlying the questions and the evolving ideas, growing evidence and unsettled debates found in the academic and grey literature, the book’s main contribution is to synthesise the most recent findings about the instability of agricultural markets. Its specific goals are:

1. Report new measurements of price volatility and discuss its magnitude with respect to the immediate period before a crisis.
2. Review the most recent literature on volatility drivers, transparency of food pricing in the EU, transmission of volatility over the supply chain and impacts on consumers in both the EU and developing countries.
3. Showcase the views of agricultural market agents, policy practitioners and NGOs about desirable policy approaches for preventing, managing and coping with the instability of agricultural markets.
4. Report in a concise manner ULYSSES’s main findings and draw policy conclusions with a view to informing policy developments within the EU and international spheres.
5. Identify upcoming trends and emerging policy approaches that may call the attention of scholars, senior officers, trade and treaty negotiators and legislators from all over the world.

The volume is intended to help policymakers in answering the set of questions that Trostle (2014) suggested: ‘a) Who are you trying to protect? b) What are you trying to protect them from? c) How much of the perceived risk are you trying to protect them from? and d) Over what duration of time are you trying to protect them? That is, are you trying to protect producers and consumers from price swings that occur from week to week, from month to month, from season to season, from year to year or over a multiyear period?’ (pp. 367–368).

The book consists of 15 chapters, all of them drafted to meet two criterions. First, they contain the essential information that is needed to gather basic ideas on how markets’ instability arises and how to cope with it. Secondly, they are written in a non-technical language, thus facilitating the policy debate to convey the main ideas to a wide readership.

This final output of ULYSSES complements a collection of six policy briefs, thirteen scientific papers and seven working documents, all of them available from the project’s webpage (http://www.fp7-ulysses.eu/). On this webpage, one can also download materials from four seminars held in Madrid on March 27, 2014; one hosted by FAO in Rome on February 11, 2015; one in Brussels on June 24, 2015; and one at the Expo in Milan on July 9–10, 2015, this one co-organised with the Università Cattolica del Sacro Cuore (Italy) and the European Commission’s Joint Research Centre. It rounds up a communication strategy that has targeted different audiences and employed various formats, with a view to widen the group of interested listeners and readers.
Other edited volumes, published right after the first price spikes, complement our work: Prakash (2011), Safeguarding Food Security in Volatile Global Markets; Piot–Lepetit and M’Barek (2011), Methods to Analyse Agricultural Commodity Price Volatility; Arezki et al. (2012), Commodity Price Volatility and Inclusive Growth in Low-Income Countries; Munier (2012), Global Uncertainty and the Volatility of Agricultural Commodity Prices; Galtier (2013), Managing Food Price Instability in Developing Countries; and Chavas et al. (2014), The Economics of Food Price Volatility. Our work is intended to contribute to this series of relevant monographs with new findings and the voice of stakeholders who have a clear interest in agricultural markets and policies.

4 Volume overview

The book is structured into three parts. After this opening chapter, Part 1 contains six chapters devoted to synthesising the current knowledge, in four domains: volatility drivers, long-term factors, food supply chain and contextual factors, and impacts on consumers. Chapter 2 reviews the literature on volatility drivers published after the food crisis, focusing primarily on empirical works that have attempted to identify the main drivers causing wide price movements in the major agricultural markets. The chapter covers theoretical aspects of volatility analysis and spillover effects (focusing specifically on macroeconomic factors, within commodity markets, between energy and agricultural markets and between spot and futures markets). Chapter 2 provides an overview of the literature qualifying the findings based on the degree of consensus among different authors about similar questions. This chapter’s main contribution is to identify questions in need of further investigation.

Chapter 3 reviews the concepts and measurement approaches of price volatility, asks whether agricultural markets’ volatility has increased since 2007 and analyses spillovers within products of related markets.

Chapter 4 turns on the major midterm drivers of markets’ instability, offering sets of simulations that show the impact of crude oil prices, macroeconomic factors and different projections of climate change on the main commodities’ price levels and variability.

Chapter 5 summarises the main conclusions of the EU Project TRANSFOP³ and draws some policy lessons coming from very detailed and thorough analyses of the functioning of several food chains in selected EU countries. The chapter looks at the impact of business concentration and food supply consolidation and how these influence price transmission and adjustment. Building on pioneering analyses of retail scanner prices and food supply chains in Europe, Chapter 5 concludes by making four recommendations for improving the EU food supply chain.

Chapter 6 looks at the contextual factors that drive volatility of prices in food supply chains. It reviews the factors affecting price level and volatility transmission that can have desirable effects on one type of transmission, but
may have the opposite effect on the other type of transmission. This chapter covers in detail the role of contractual tools to manage price risks.

Chapter 7 reviews the literature on the impacts of increased consumer prices and volatility in both the EU and developing countries. A significant finding is that consumer prices of food and staples behaved quite differently across countries, regardless of their income level or whether they share a common currency (e.g. euro). The chapter reviews the literature on food price behaviour and the welfare effects on consumers in the EU and in low-income countries.

Part 2 provides the views of representatives of agricultural producers and food processors in the EU, one NGO and an officer of the European Commission. These shorter chapters include a piece about the use of financial contracts and derivatives (Chapter 8), commenting on the role and meaning of the so-called financialization of commodities markets. Chapter 9 is a brief policy statement about public interventions in the EU pork sector, including a list of policy requests of the German pig producers for improving the market functioning of this important sector. Chapter 10 reviews present and emerging price risk management instruments used and considered by French cereal growers and discusses the potential use of farmers’ savings accounts and revenue insurance within the present CAP. In Chapter 11, the view of a large dairy industry (a Dutch cooperative) is presented, discussing different policy options for the heterogeneous European dairy sector and industry. And finally, Chapter 12 describes the role of local solutions in developing countries to cope with food price volatility. The chapter specifically looks at the role of local food reserves (LFR) and discusses its major risks and difficulties.

Part 3 focuses on the policy sphere and addresses future research priorities. It contains three chapters, starting with Chapter 13, that makes an assessment of national policies in developing countries to mitigate the effects of agricultural markets’ excessive volatility. Chapter 14 takes the perspective of the supply agents, identifying the policies that may enable them to better manage and cope with large price movements. The book closes with Chapter 15, which summarises the previous chapters’ main conclusions and showcases the findings of project ULYSSES.

Notes
2 EU Projects Transparency of Food Pricing (TRANSFOP; http://www.transfop.eu/), Foodsecure (http://www.foodsecure.eu/), ULYSSES (http://www.fp7-ulysses.eu/)
3 http://www.apterr.org/
4 ULYSSES is a three-year project (running from August 2012 to August 2015) co-funded by the European Commission under the Framework Programme 7 (FP7), addressing the Strategic theme: KBBE.2012.1.4–05 ‘Volatility of agricultural commodity markets’. Its webpage is at http://www.fp7-ulysses.eu/
5 http://www.transfop.eu/
References


