EU Agricultural Markets *Briefs*

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Price developments and links to food security - price level and volatility

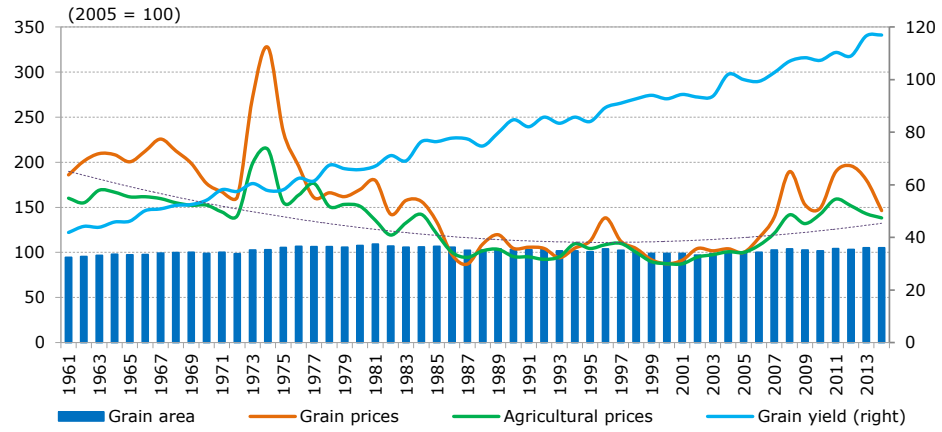
Contents

Since the mid-2000s agricultural and food prices moved to a higher level and in parallel with prices of other commodities – and at times have also been very volatile. These events led to concerns which, in different ways, brought to the forefront a debate about food security. Both developed and developing countries saw their consumers facing the impact of higher food prices, and their producers feeling the pressure from higher input costs.

Multiple factors are responsible for the developments in agricultural prices, all of which have been the focus of separate analysis. Amongst the different causes identified, we find the changes in demand growth, both for food and industrial use, the slowdown in yield growth and access to land, the co-movement of agricultural prices with energy and other commodity prices, the financialisation of agricultural markets, changes in stocks, adverse or beneficial weather events and the effects of agricultural trade restrictions. In a series of *Briefs* (on Demand, Regional influences, Supply and Stocks) we analyse evolutions in these different drivers separately and bring them together in a concluding *Brief*.

This first *Brief* sets the scene by reviewing price developments during the past 50 years.

Graph 1 Annual real farm prices, area and yield developments (2005=100)



Source: DG Agriculture and Rural Development based on data from the World Bank and USDA.

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Agriculture and Rural Development

1. Introduction

Both the level and volatility of world food prices have increased significantly in the period 2000-2010. These developments raised serious concerns both for consumers and producers. High prices hamper food security and access to food for the deprived, while price volatility threatens the stability of farmers' income. The high prices of 2007 and 2008 resulted in 40 million additional undernourished people in Asia and the Pacific, and more than 20 million additional in Sub-Saharan Africa[1]. More generally, high food prices lead to general inflation. In combination with stagnating economic growth, increased inflation is detrimental for economic recovery. More recently, prices seem to decline again, but they remain considerably above the pre-crisis level.

Finding an explanation for this upward shift in food price level and volatility still preoccupies many. Some sought to explain the imbalance between demand and supply, with demand growth exceeding supply growth, by focusing on strong food demand in China; others focused on the surge in biofuels. Combined, both were considered as introducing a major change in world stocks, which could in turn explain this sudden shift in price levels. Trade policy measures aiming at restricting trade flows were also considered to exacerbate price variations. The increased cost of production due to price movements in some of the production factors, most notably the energy component was also considered to explain this upward movement of commodity prices, reflecting an imbalance between world demand for and supply of scarce resources. A final argument, which raised a lot of attention, was the sudden interest of financial markets in agricultural commodities which took place since 2005, thus causing higher volatility (although financial markets seem to have reduced their interest in agricultural commodities more recently).

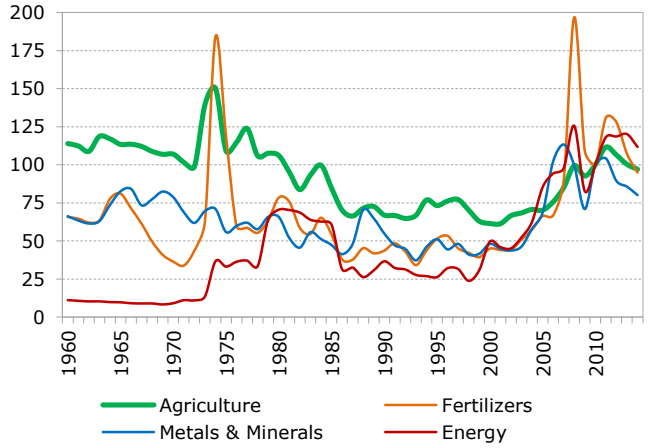
Understanding which of these drivers had the major impact on price level and volatility is key to the elaboration of appropriate policy responses. In a series of *Briefs* we will focus on these main drivers. Subsequent to this introductory *Brief*, a second *Brief* will try to put in context some of the perceptions surrounding the most obvious driver for the price spike, the worldwide increase in demand. A third *Brief* zooms in on the demand and supply changes in emerging economies; a fourth *Brief will* focus on the supply side, investigating changes in land use, yield, input intensity and Total Factor Productivity development. A fifth *Brief* will analyse whether strategic stock behaviour has changed and whether there is evidence for price co-movement. Finally, a concluding *Brief* will bring now all the above elements together.

Let's focus now on how patterns have changed during the last 50 years. To make the story more tangible, we distinguish between five periods[2] characterized by important macro-economic or geo-political events and between developed and developing countries[3].

2. Agricultural prices on the rise

After decades of decreasing agricultural prices in real terms, the turn of the era preluded a new period with increasing agricultural prices. As opposed to the sudden price shock due to the oil crisis in 1973, prices steadily increased during the first decade of the 21st century (Graph 2). It remains to be seen whether the more recent downward shift indicates a new period of declining prices or is merely a temporarily hick towards higher prices.

Graph 2 Evolution in world commodity price indices (real prices, 2010 = 100)



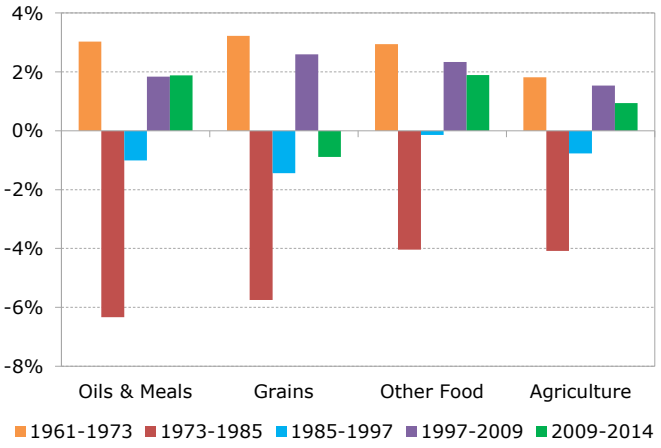
Source: World Bank, Commodity Price Data (The Pink Sheet).

[1] FAO (2012), *How to feed the world in 2050*.

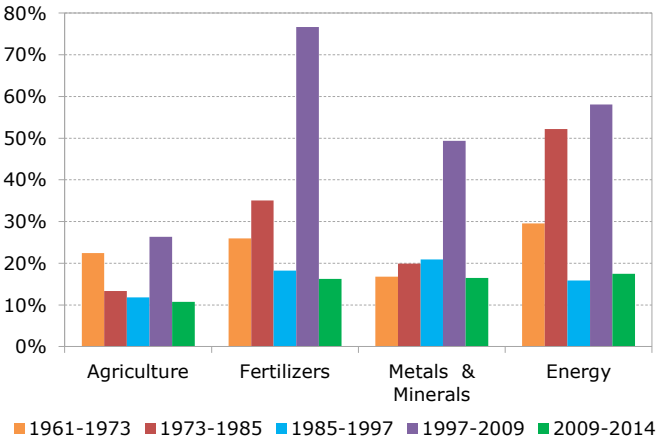
[2] The period *1961-1973* is known as the 'Golden sixties' with prosperous economic growth. The period of *1973-1985* started with the first oil crisis and was marked by high oil prices and a general recession. The period of *1985-1997* was, with the fall of the iron curtain, characterized by strong political and institutional reforms. In the period *1997-2009* world economy boomed under the liberalisation of markets and the growth of middle income countries, to end with the bubble of the financial and economic crisis of 2009. The last period, *from 2009 till today*, shows the recovery of the world economy after its major economic crisis. Choosing other periods affects the magnitude of these results but not the main trends.

[3] Following common practice, we have considered Europe, United States, Canada, Australia, New Zealand and Japan as 'developed'. In some cases and for statistical reasons, all former USSR countries have been considered as developed.

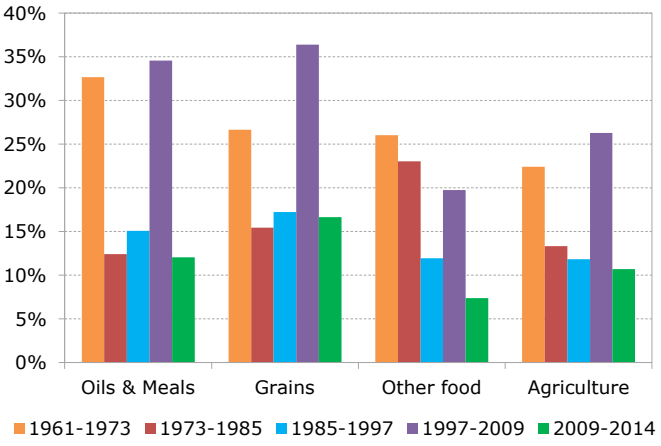
Graph 3 Annual growth rates of real agricultural commodity prices



Graph 4 Coefficient of variation of nominal prices for agriculture and other commodities



Graph 5 Coefficient of variation of nominal prices for agricultural commodities



Note: Other food includes bananas, oranges, chicken, beef, sheep, shrimp, fishmeal and sugar.
Source (Graphs 3-5): DG Agriculture and Rural Development based on data from World Bank, Commodity Price Data (The Pink Sheet).

Yet, as the change in annual growth rates[4] shows (Graph 3), agricultural commodity prices shifted from decreases in real agricultural prices before and after the 1973 oil crisis to an increase in the period '97-'09.

It remains uncertain whether this increase will continue over the current period. On average agricultural commodity prices keep on rising. The magnitude of positive change in prices is similar for oils and meals and other food, while grains show a negative growth over the current period. The latter is due to excellent harvests worldwide in 2013 and 2014 pushing prices down from the exceptionally high grain (especially rice) prices in 2009 in the aftermath of the economic crisis. While price volatility[5] was peaking in the 1997-2009 period, amongst others propelled by the financial and economic crises, prices were more stable in more recent years[6] (Graph 5).

Volatility in agriculture is also considerably lower compared to other sectors (Graph 4). Focusing on the different agricultural commodities (Graph 5), overall highest volatility is noticeable for grains (including wheat, barley, maize, rice and sorghum), followed by vegetable oils. These commodities were also affected most in the turbulent period of 1997-2009. Dairy prices, not covered in the graphs, show similar trends in growth rate and volatility.

3. Which driver is associated with increasing prices?

To establish the causal relationship between different potential drivers, such as demand growth, supply growth, changes in input prices or stocking policy, and food price growth is not straightforward.

Some analysts are convinced that recent price developments are entirely explicable by market fundamentals, i.e. supply and demand, and above all stocks, which were at a low level. Food demand for basic products is considered to be fairly price inelastic, especially in developed countries, which means that demand is not heavily affected by increasing or decreasing prices. If demand growth outpaces supply growth, prices will rise.

[4] The compound annual growth rate calculates the geometric mean annual growth rate across a period, smoothening out yearly deviations in growth rate across the period.

[5] The question whether prices are more volatile in the last few years can be approached by calculating the coefficient of variation of prices across the five distinctive periods from 1961 until 2013.

[6] This is also confirmed by recent work of J. Baffes (as presented in the 'Commodity Market Development in Europe – 2014 Outlook Workshop' organized by the European Commission). Proceedings available at http://agrilife.jrc.ec.europa.eu/documents/JRC92558.pdf

Other analysts assert that to explain recent price volatility a wider range of influences has to be taken into account. In addition to adverse weather conditions, volatility in exchange rates, stock-to-use ratios, and the impact of biofuel policies, the most important are co-movements of commodity prices (energy, metals, etc.) and increasing financialisation of agricultural commodity markets.

In the aftermath of the economic crisis, different institutions and researchers have tried to identify the main driver(s). OECD[7] link the rise in aggregate food prices mainly to macro-economic and demand related factors. Their results showed that the increased demand from emerging economies has indeed affected price levels. On commodity level, they showed that maize and wheat prices were also affected by the increased imports in China. Other studies[8] link the higher food prices mainly to evolutions in the energy market. Comprehensive studies addressing all the above mentioned potential drivers simultaneously are however scarce.

4. Price volatility and link to food security

Food purchases represent the biggest share of consumer households' expenditures in most developing countries and the lack of means to buy or produce food remains the principal cause of chronic food insecurity. Increasing food prices only worsen this situation. Rising prices in 2007/08 are estimated to have led to an increase of 60[9] to 105[10] million people living in extreme poverty. The effects of the food price spike in 2007/08 were more severe in net-food importing countries, many of them Least Developed Countries. Rapidly rising prices not only increased the number of people without access to sufficient quantities of food, but also led to deterioration in the quality and diversity of their food. The higher food prices are likely to also impact on access to other basic needs such as health and education, which can have severe and long-lasting effects.

5. Some price projections

In the coming 10 years, the OECD-FAO Agricultural Outlook (2014) expects demand to remain firm but expanding at lower rates compared to the past. They also presume a dietary shift more into the direction of higher protein, fats and sugar content. These demand projections entail that main growth is realized in livestock and biofuel production, and a relative shift occurs from staple food crops like wheat and rice towards coarse grains and oilseeds. While, as a consequence, crop prices are expected to drop compared to the recent peaks, meat, dairy and fish prices are expected to rise in nominal terms.

Effects of demand changes on prices are subject to uncertainty in the long run. Overall demand growth is expected to slow further globally. However, particularly in developing countries, demand for some income-sensitive products, such as meat and dairy products, is expected to accelerate, further tightening demand-supply balances. Also in developing countries, insufficient investments in productive capacity and R&D to increase productivity growth could keep supply response low and markets tight. Evolutions in the biofuel demand may further influence prices upward, although recent trends seem to suggest otherwise.

Global food commodity prices are likely to stay volatile in the coming future, due to production variability, macro-economic instability, uncertainty with respect to oil prices etc.

6. Conclusion

The dramatic growth in food prices in the period 1997–2009 seems to slow down more recently. Price levels however remain well above historical levels. Volatility in prices has also decreased. In a series of Briefs we try to answer how different food price drivers evolved in the past 50 years, in order to shed some light on possible explanations for the price spike as well as future expectations.

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[7] OECD-FAO Agricultural Outlook 2014-2023.

[8] J. Baffes and T. Haniotis (2010), 'Placing the 2006/08 Commodity Price Boom into Perspective'; J. Baffes and A. Dennis (2013), 'Long-Term Drivers of Food Prices'. The World Bank.

[9] FAO (2012), How to feed the world in 2050.

[10] WHO, UNICEF, World Bank. State of the world's vaccines and immunization, 3rd ed. Geneva, World Health Organization, 2009.