



POLICIES FOR THE EFFECTIVE MANAGEMENT OF FOOD PRICE SWINGS IN AFRICA

THE 2007–2008 PRICE EPISODE: FURTHER INSIGHTS ON CAUSES AND CHARACTERISTICS

INTRODUCTION

Between 2007 and 2008 the world experienced a dramatic swing in commodity prices. Food prices also increased substantially, with the FAO food price index rising by 64 percent between January 2007 and June 2008. During the same period, the international prices of traditional staple foods such as maize, rice and wheat increased significantly, reaching their highest levels in nearly thirty years. In October 2008, the price upswing decelerated and international food prices decreased sharply as expectations of an economic recession set in. Although many food prices fell in excess of 50 percent from their peaks in June 2008, they continue to remain at a significantly higher level than that of 2005.

This brief examines the recent developments in food markets and focuses on a number of factors that have not received adequate attention until now. Within an environment characterized by the rapid growth of Asian economies and the subsequent increase in the price of oil, the behaviour of food prices has been shaped by the following factors:

- the relationship between the energy and food markets through the processing of crops into ethanol; and,
- the financial crisis and the subsequent macroeconomic policies that transformed both food and non-food commodities into attractive assets for investors.

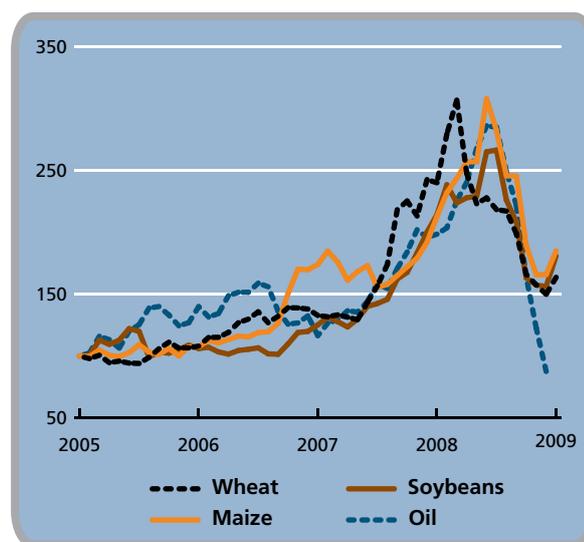
THE ROLE OF BIOFUELS

The role of biofuels in the 2007-2008 food price episode is one of the most controversial issues in any discussion on the causes of the food crisis. High energy prices and increased substitution possibilities between petrol and biofuels have led to an increased demand for crops, resulting in increasing food prices.

A number of studies have dealt with this topic, however the results are equally controversial. Some researchers suggest that the impact of biofuels on food prices may be small, while others estimate that the use of crops for the production of energy may have contributed up to 60 percent in the food price rise¹. Although it is difficult to quantify, the effect of biofuels on food prices is probably substantial and will be persistent.

Depending on agro-climatic conditions, biofuel-producing countries utilize different crops as inputs. Sugar cane is used in Brazil, while in the United States the main energy crop is maize. In Europe, biodiesel is produced by oilseed rape, while Asian countries use palm oil. The use of such a wide range of crops indicates the extent of the likely impact of biofuels on food markets. Wheat has no economically viable biofuel applications, however grains are easily substitutable in production. Increases in the price of maize, brought about by strong demand by ethanol processors, will take land away from wheat production and lead to higher wheat prices.

Figure 1 – Commodity price indices:
January 2005 to January 2009 (January 2005 = 100)



Source: FAO and International Financial Statistics of the IMF

¹ See for example Trostle, R. 2008. Global agricultural supply and demand: factors contributing to the recent increase of food commodity prices. WRS-0801, Economic Research Service, United States Department of Agriculture, and Mitchell, D. 2008. A note on rising food prices. Policy Research Working Paper No. 4682, Washington, DC, The World Bank.

ASIAN GROWTH

The increases in energy prices have been the most shaping event in the world economy over the past few years. Strong demand from fast-growing Asian markets such as China and India is widely held to be a major factor of this. This could be said to be a 'construction boom'. Intense manufacturing activities triggered by the rapid economic growth resulted in increases in the prices of metals. In emerging economies, energy has a high income elasticity of demand. Household income increases result in purchases of automobiles and other consumer durables that use energy, leading to increases in oil and electricity consumption

Food prices, however, could not have soared due to the Asian growth, at least in a direct manner. In general, food demand is characterized by low income elasticity. On average, one percent increase in income results in an increase in food consumption of approximately half a percent. Therefore, in spite of rising incomes in the emerging Asian economies, neither food consumption

nor food imports could have increased to an extent so that world food market prices surge. At the same time these economies are close to self-sufficiency. Enhanced productivity of agriculture and improved efficiency in converting grains to meat have resulted in the agricultural sectors of India and China meeting a large part of domestic food demand. Lastly, in the case of China, existing stocks of grains were used to meet higher demand, reducing the need for additional imports.

On the whole, the Asian economic growth appears to have directly contributed to the food price boom to a very small extent, if at all. Indirectly, high energy prices have affected food prices through their impact on fertilizer prices. In many countries of the developing world, oil price increases have been completely passed through to the prices of fertilizers which, especially in Africa, rose nearly twofold, significantly increasing the costs of agricultural production.

Biofuels processing costs are high

The United States and the European Union Member States have set mandated targets to limit their own greenhouse emissions by expanding the use of renewable fuels. Nevertheless, on average, the production of biofuels is not commercially viable, as costs are higher relative to the costs of oil extraction. Government intervention is therefore essential in providing incentives to the industry, and subsidies are necessary to ensure adequate biofuel production. In the United States, the world's largest maize producer, about 25 percent of maize was allocated for the production of ethanol in 2007–08, assisted by a range of policies such as tax incentives and subsidies. The production of biodiesel in the European Union is also supported by subsidies, import tariffs and other policy instruments. In Brazil, although now government intervention is minimal, the sector was initially sustained by a number of policies that achieved a scale necessary to minimize production costs and ensure profitability.

The dramatic increase in oil prices led to the integration of food and energy markets

The relationship between the prices of oil, biofuels and crops is determined by two main factors: the level of biofuels' production costs and the ease by which consumers can substitute petrol for biofuels.

- Increases in the price of oil enhance ethanol's competitiveness relative to petrol and strengthen its demand. As the price of petrol surpasses ethanol's production costs, the demand for crops by distillers increases. Since both energy and food utilize the same input, for example maize grain or sugarcane, increases in the production of ethanol reduce the supply of food and result in increases in its price. This relationship between the prices of oil, biofuels and crops arises due to the fact that, in the short run, the supply of crops cannot be expanded to meet the demand of both food and energy consumers. In brief, as long as oil prices are high and the crop's value in the energy market exceeds that in the food market, crops will be diverted to the production of ethanol which will increase the price of food.
- The extent to which biofuels affect food prices also depends on the possibilities of substitution between traditional fuels and biofuels. For example in Brazil the introduction of flex-fuel vehicles, which can use any combination of petrol-ethanol blends including pure ethanol only, allows petrol and ethanol to be readily substituted and purchased on the basis of relative prices. As such vehicles consist of a growing share of the Brazilian automotive fleet, substitution possibilities between petrol and ethanol increase. This leads to a stronger relationship between the prices of petrol, ethanol and crops.

But oil and food prices are not always related

The relationship between the prices of oil, ethanol and crops can break down for a number of reasons².

- First, a significant reduction in the price of oil, as the sudden drop that took place in September 2008, may weaken biofuels' competitiveness and result in lower demand. As smaller quantities of crops are used for the production of biofuels, their prices fall and drift apart from those of oil, being determined only by food market fundamentals.

² A detailed description of the relationship between prices of oil, ethanol and sugar can be found in Balcombe, K. & Rapsomanikis, G. 2008. Bayesian estimation and selection of nonlinear error correction models: the case of sugar-ethanol-oil nexus in Brazil. *American Journal of Agricultural Economics*, 90(3): 658–668.

- Second, high crop prices due to intensified competition for crops among food and biofuel processors may result in increased biofuel production costs, thus deteriorating the biofuels' competitiveness relative to petrol. Indeed, during the 2006 oil price upsurge in Brazil, there were instances that ethanol prices were at least equal to petrol prices at the pump. In these cases, consumers switch back to petrol and food prices settle down, until biofuels become competitive again. Such changes in the forces that determine crop prices can be abrupt and may cause increased food price volatility.

- Finally, the extent to which supply responds to high prices determines the availability of inputs for both the production of biofuels and food. The capacity of the agricultural sector to respond rapidly to the increased demand of the biofuels' processing sector is also central in determining the relationship between food and energy prices.

MACROECONOMIC POLICIES: BOOMS AND SLUMPS

As early as the 1973–1974 price spike, many researchers emphasized the importance of macroeconomic and financial factors in determining both food and non-food commodity prices. Increases in the supply of money affect food prices mainly through changes in the levels of the exchange rate and interest rates.

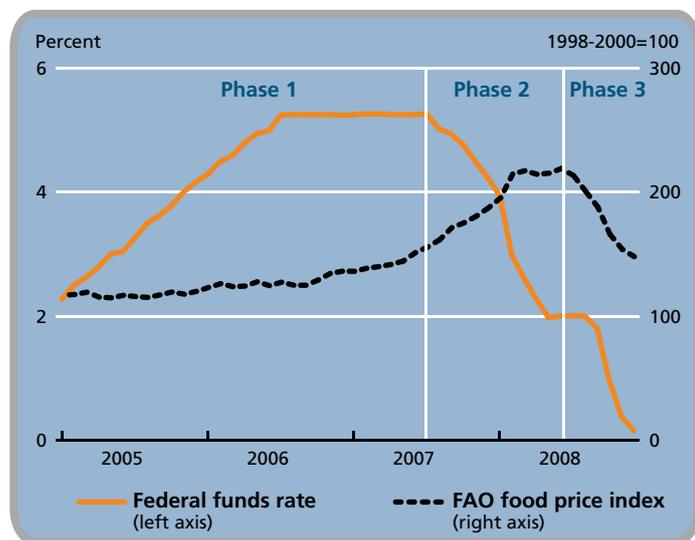
US Dollar depreciation may have contributed to the price boom but to a limited extent

Since 2000, monetary expansion in the United States and the current account deficit have led to the depreciation of the dollar. As international commodity prices are denominated in US dollars, this depreciation has contributed to the commodity price boom. Nevertheless, the extent to which the US dollar parity changes pass-through to domestic markets depends on many factors, including the composition of imports and the substitution between products. On the whole, the depreciation of the dollar appears to be responsible for a small part of the increase in food prices. Evidence provided by the International Monetary Fund suggests that if the US dollar had remained at its 2002 level, oil prices would have been lower by US\$25 per barrel, and the increases in non-fuel commodity prices would have been lower by only 12 percent³.

Low interest rates may result in high commodity prices

The most significant impact of increases in money supply on commodities is realized through the interest rate. Monetary expansion leads to low interest rates which, in turn, make commodities more attractive to hold. Especially when the prices of storable commodities are increasing, the expected return from holding stocks is higher than the interest accrued by holders of money. This strengthens the incentive to build stocks up, rather than keeping money in the bank. As quantities are withdrawn from the market and brought into storage, commodity prices increase. Alternatively, high interest rates may result in low commodity prices through the sale out of stocks and the flight of money towards interest-earning deposits.

Figure 2 – Food prices and interest rates, January 2005 – December 2008



Source: Source: FAO and US Federal Reserve

interest rate set by the United States' central bank. During this second phase of the price episode, the rate of increase in food prices accelerated rapidly as investors found commodities more attractive. Food prices reached historically high levels in July 2008. Overall, this second phase of the food price upswing appears to have been determined by monetary and financial factors, in conjunction with tight food markets. In September 2008, when the financial crisis spilled over to the world economy with the dramatic collapse of financial institutions, prices fell sharply. The slow-down in economic growth all over the world led to the abrupt collapse of oil prices from US\$140 to under US\$50 per barrel. Food commodity prices were also

The effect of interest rates on food prices during the 2007–2008 commodity price episode is not immediately evident. Although interest rates increased between 2005 and the third quarter of 2007 (see Figure 2 - Phase 1), food prices were following an upward trend, instead of falling. It is unlikely that the theory would hold precisely at all points of time, given all forces that shape the behaviour of commodity prices. It is possible that rapid increases in the demand for crops by the ethanol processing sector have more than offset the negative effect of increasing interest rates on prices. Increases in food prices may have contributed to building expectations for higher prices, thus strengthening the incentive to hold inventories in spite of the relatively high interest rates.

Policy responses to the financial crisis may have affected food prices

The emergence of the financial crisis in July 2007 called for a decrease in the Federal Funds rate, the

³ Lipsky, J.P. 2008. Commodity prices and global inflation. Council on Foreign Relations, New York City, May 8.

significantly affected, falling in September 2008 by about 50 percent from their peak levels in June of the same year (see Phase III in Figure 2).

Commodities may have become a new 'asset'

There is an additional factor in explaining the abrupt behaviour of food commodity prices in the midst of the financial crisis of 2008. Many researchers suggest that commodities – especially commodity futures – have become a new 'asset class'⁴. First, returns to commodity futures are negatively correlated with returns to traditional financial assets such as equities and bonds. This relationship indicates that commodity futures offer an attractive vehicle for portfolio diversification that reduces the volatility of portfolio returns. Second, comparisons between returns of commodity futures with those of traditional financial assets, such as stocks and bonds, indicate that investment in commodity futures is profitable. Futures and stocks have similar returns, amounting to about 5.2–5.6 percent per annum. This is twice as high as the return from investing in bonds.

These observations suggest that commodity futures are not only regarded as providing insurance against price risk for farmers and food processors, but also as an asset which generates returns and can be used to diversify traditional financial portfolios.

Trading in agricultural futures has also increased dramatically

Agricultural futures prices increased dramatically over the 2005–2008 period, and the question whether the food price rise was a phenomenon similar to a 'speculative bubble' lingers in the minds of many observers. Such a bubble in food markets is a possibility, with traders following the price trend and buying into increasing prices to obtain short-run gains. This speculation may have exerted upward pressure on futures prices, which, in turn would result in spot price increases that do not correspond to food market fundamentals.

This decade has witnessed a significant increase in commodity futures trading, as well as the entry of a new class of traders composed of institutional investors, such as pension funds, banks and sovereign wealth funds. These investors regard commodity futures as an asset class and their behaviour in futures markets is different than that of the traditional market participants, such as physical traders and speculators. First, they engage in trading by taking positions on a number of commodities as a group, both food and non-food, rather than in specific markets. Second, they take long positions, 'buying and holding' futures contracts, as opposed to short positions taken by the traditional speculators who buy and sell rapidly. On average, the share of institutional investors in agricultural futures contracts has been approximately 25–35 percent. The exception is wheat futures contracts, with investors holding about 40 percent of the total value of these contracts⁵.

There is a lack of evidence on the impact of institutional investors on agricultural futures markets

It may be likely that such large investments affected agricultural futures prices, as agricultural markets are smaller and significantly less liquid than energy or metals markets. In the less liquid agricultural futures markets, the trading of a large amount of contracts could have increased the incidence of abrupt price changes and thus volatility. As institutional investors regarded commodities as an asset and invested in a number of them at the same time, their response may not have always been in line with market-specific fundamentals. Energy futures, which make up the larger part of the commodity futures portfolio, may have dominated investors' behaviour, and expectations for increasing oil prices may have triggered increases in investment in all commodities. This may have transmitted upward (or downward) movements in oil prices to food commodities, increasing the correlation across all commodity futures and providing another link between the energy and food markets.

With the outbreak of the financial crisis in the summer of 2007, it is also likely that investment in commodity futures may have intensified, as investors lost confidence in financial assets and other options. Research on the impact of institutional investors on agricultural markets is sparse and the issue awaits more analysis in order to clearly explore the effect.

However, there is some evidence indicating that such investments have not distorted agricultural commodity futures prices overall⁵. Nevertheless, in some cases short-lived speculative price bubbles may have emerged due to the amount of money invested or the agricultural futures trading practices.

⁴ See for example Gordon, G. & Rouwenhorst, K.G. 2004. Facts and fantasies about commodity futures. NBER Working Paper No. 10595, Cambridge, USA, NBER and Caballero, R.J., Farhi, E. & Gourinchas, P.O. 2008. Financial crash, commodity prices and global imbalances. NBER Working Paper No. 14521, Cambridge, USA, NBER.

⁵ See Gilbert, C. L. 2008. How to understand high food prices. Paper presented at FAO Experts' Meeting on Policies for the Effective Management of Sustained Food Price Increases, Trade and Markets Division, Rome, 10–11 July 2008 and Gilbert, C. L. 2008. How to understand high food prices. Paper presented at FAO Experts' Meeting on Policies for the Effective Management of Sustained Food Price Increases, Trade and Markets Division, Rome, 10–11 July 2008.