



Key points

- The international food price crisis in 2007/08 corresponded with significant price increases in domestic markets across the developing world
- Prices rose in most Asian countries, but not to world levels. China, India and Indonesia saw no significant increases
- Africa saw very high maize price increases, though uncorrelated with international movements, reflecting local co-incident factors and imported inflation via oil prices

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Food price transmission: rising international cereals prices and domestic markets

Sharada Keats, Steve Wiggins, Julia Compton and Marcella Vigneri

From take-off in January 2007 to peaks in the first half of 2008, maize prices increased by 74%, wheat by 124%, and rice 224%.¹ Rising prices for these key staples rang alarm bells. Poor families in low-income countries spend over half their income on such foods. In Bangladesh, rice alone accounts for 70% of average calories consumed, compared with just one quarter of calorie consumption from all cereals combined in the UK. With ensuing protests and riots across the globe, the food security of vulnerable people began its own spike up the international development agenda.

Modellers were quick off the block to assess likely impacts. In April 2008, World Bank Group President Bob Zoellick said: 'Based on a very rough analysis, we estimate that a doubling of food prices over the last three years could potentially push 100 million people in low-income countries deeper into poverty'.²

Such analyses make some basic assumptions about price transmission from international to domestic markets. But how valid were

these assumptions for the 2007/08 crisis? Several studies have addressed this question: a recent ODI study synthesised their findings, complemented by some simple analyses (Keats et al., 2010).

What is meant by price transmission?

If markets are efficient and policies are not an obstacle to their operation, changes in the world price of any given commodity should be similarly reflected in changes in domestic prices – known as 'price transmission'.

There should be only a short lag – equivalent to the time taken to physically transfer product between local and world markets. In reality, however, local prices may not change as expected in response to movements in the world market, owing to border measures, domestic price policies, fluctuating exchange rates, transport costs, and market imperfections (see Box 1).

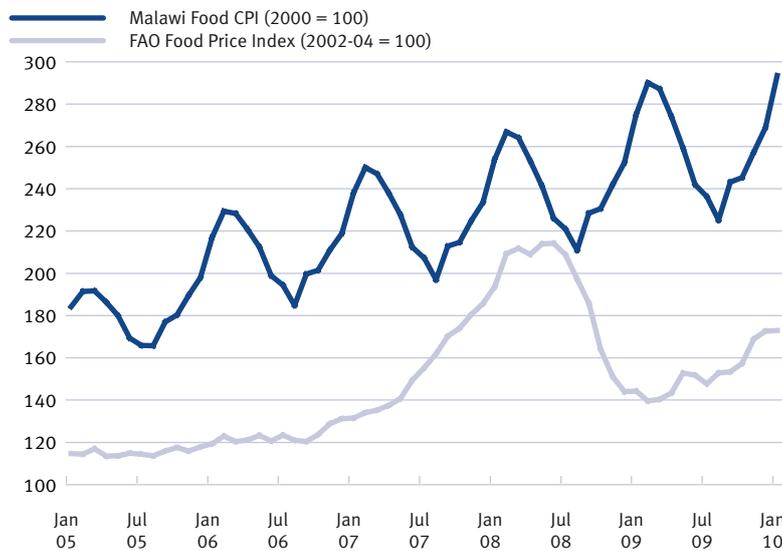
A wider consideration is that around twice a decade, price rises in some countries – for

Box 1: Why don't prices always transmit?

- **Public policy.** Border measures – tariffs, quotas, bans, taxes – and interventions on domestic markets, by means such as price controls and subsidies, are some of the ways that local prices can be insulated from world markets.
- **Changes in exchange rates.** The rise in cereals prices on world markets was accompanied by, to some extent caused by, a decline in the US dollar.* Some developing countries saw their currencies appreciate against the dollar such that prices in local currency rose by less than they did internationally.
- **Transport costs,** when substantial, will cause a rise in the world price to be under-reflected in import parity prices and over-reflected in export parity prices.
- **Market imperfections.** Traders with monopoly power in markets may impede transmission to their advantage.

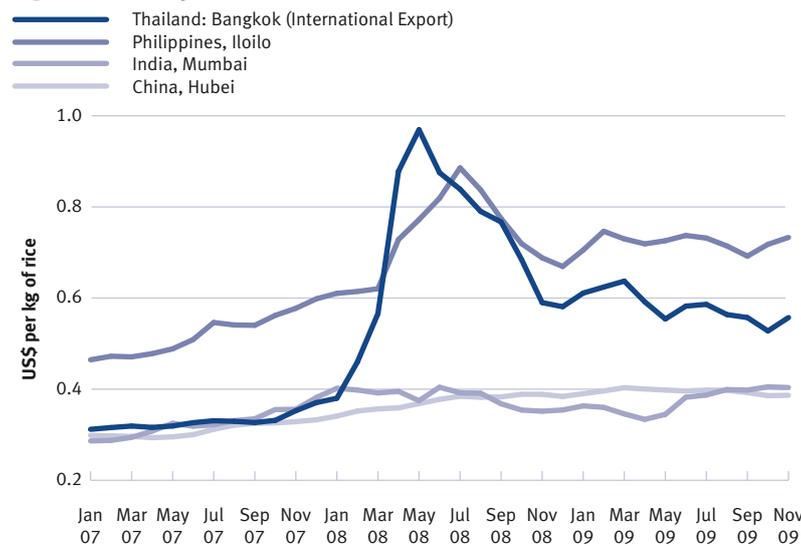
*For more detail on causes, see ODI report 'What caused the food price spike of 2007/08? Lessons for world cereals markets' (<http://bit.ly/cM3UBU>).

Figure 1: Monthly food price indices (2002-04 = 100)



Source: Reserve Bank of Malawi and FAO.

Figure 2: Rice price variation in Asia



Source: FAO GIEWS domestic prices dataset.

example a number in Southern and Eastern Africa – equal or outstrip those on world markets. By contrast, this has happened to world prices only twice in 34 years. Consumers in such countries also tend to experience sharp seasonal price volatility. See the example of intra-year food volatility in Malawi in Figure 1.

How did prices transmit over the food price crisis 2007/08?

In most developing countries, clear and significant rises in domestic prices for maize, rice and wheat were seen when world prices spiked. Despite a great deal of variation across countries and commodities, a few broad patterns can be seen.

1. Domestic prices for rice and wheat rose in most countries – albeit with some time lag (generally

between one to six months). These increases correlated with movements on international markets. In most cases, however, transmission was muted. For example, increases seen on domestic rice markets in the Philippines were 20 to 30% of international price rises; in Viet Nam, 25%; in Cambodia, 44%, etc. In Latin America, rises in wheat prices were 40-70% of international price rises. There were, however, significant exceptions. China saw virtually no increase in rice prices. India managed to dampen the increase to just 10-20% of world increases. Thailand, on the other hand – perhaps the Asian rice economy which least attempts to control prices – saw rises at 60% of the international level. Free trading countries experienced greater transmission than countries that typically stabilise food prices through considerable intervention in cereals markets (see Figure 2).

2. Across Africa, in contrast, very high increases in maize prices occurred, far higher than those seen on world markets. But in most cases, they did not correlate with international prices. Short-term maize price movements in Colombia and Mexico were similarly uncorrelated with international price movements, although here price increases were less than those on world markets. We focus here on the short term because the sharp increases in international prices occurred over less than 12 months.

An African puzzle

So many maize markets, at least in Eastern and Southern Africa, are protected from world prices by high costs of transport so that export and import parity prices only apply when domestic harvests are unusually high or unusually low. So changes in international prices should generally have little or no effect on local markets.

An exception would be where domestic harvests failed in 2007 and countries had to import significant amounts of maize. Kenya is the only country that falls into this category.

Why then did some staple prices in Africa go through the roof at the time of the international price spike? Although the answer is not clear, there are five possible contributory explanations, as follows:

1. Fluctuating local supplies. Markets in much of Africa are not well-integrated; transport costs are high, and most production is rain-fed. Every time the harvest is less than planned, prices rise. Past experience shows that local prices can double or treble when harvests fail badly.
2. Governments make mistakes. They may overestimate supplies (a common practice in Malawi and Mozambique, according to some researchers) and thus not act quickly enough when problems are mounting. Some researchers believe maize production is in fact routinely

‘With the worsening of this “world food crisis”, the issue of hunger is back at the forefront of the global political agenda, and deservedly so. The deeper truth, however, is that for hundreds of millions of people in the world, extreme hunger and malnutrition was a “normal” part of life long before the current crisis made the front page.’

Devereux et al. (2008).

over-estimated in some countries for political reasons. Governments may intervene in staple food trading, both internally and across borders. This creates further uncertainty and impedes private responses to whatever the original imbalance may have been – see Figure 3.

3. Local prices were pushed up to some extent by indirect effects from world markets. This is because (i) oil price increases transmit and raise costs throughout the economy, including for farmers, transporters and the food chain; and (ii) the price of nitrogen fertiliser rose strongly during the price spike and almost all fertiliser in the region is imported.
4. Expectations may also have played a role. Traders expecting rising world prices to reach local markets may have caused them to over-order, over-stock and generally mark prices up. This could also lead to panic. In much of Africa, markets are relatively thin, with only one main producing season per year. When prices rise sharply enough, households and traders concerned they are the harbingers of stock-outs may pay almost

anything to get supplies into larders and stores. This is a further reason why governments are so anxious to intervene in markets.

5. Finally, substitution effects may have helped raise maize prices. As better-off consumers shifted away from more expensive imported wheat or rice, additional demand for local maize may have caused some prices to rise, although it is unlikely this would explain more than a small fraction of the increases seen.

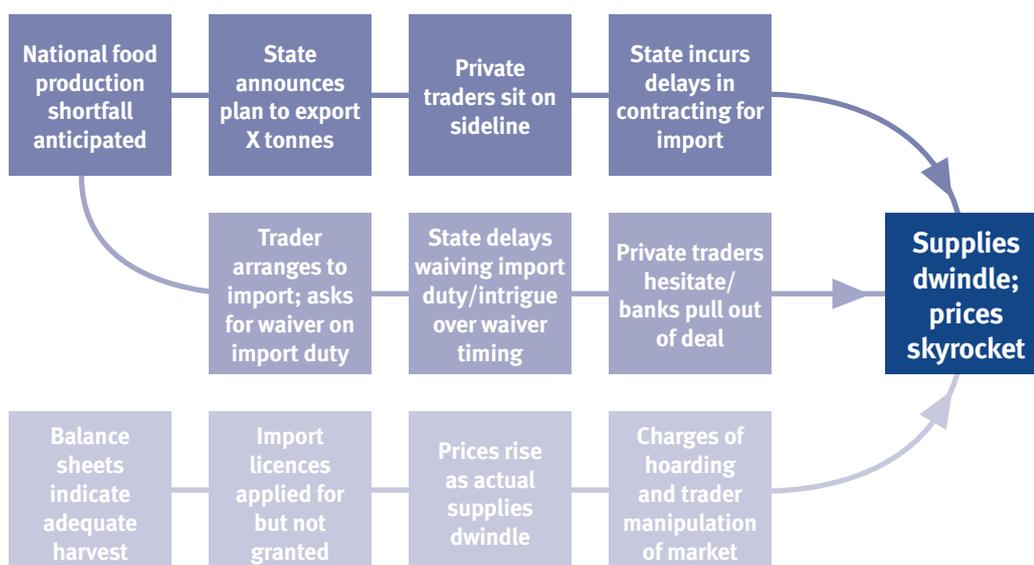
Although, as we have said, it is difficult to be sure what caused the sharp rise in maize prices in parts of Africa, the suspicion is that domestic factors not related to the international spike played a major role.

Previous experience of markets for maize and other food staples in East and Southern African have shown considerable volatility at times when the world market price was low and stable.

Summary

- When world cereals prices spiked in 2007/08, there were corresponding rises on domestic markets across much of the developing world.
- Price transmission was, however, uneven. In most countries in Asia, for example, rice prices rose, but by less than on world markets. There were important exceptions: in China, India and Indonesia rises were much smaller than world price movements.
- Very high increases in maize prices were seen

Figure 3: Public/private coordination failure in cereal importation



The arrows outline three processes, believed to have contributed to a number of crises in Eastern and Southern Africa

— Zambia 01/02, Zambia 02/03, Malawi 01/02, Malawi 05/06

— Zambia 05/06, Kenya 03/04, Kenya 08/09

— Malawi 08/09, Zambia 08/09

Source: Adapted from Jayne and Tschirley (2009a, b).

across Africa, far more than on world markets. But these did not correlate with international prices. It is likely they responded more to co-incident local factors, and perhaps also to inflation imported through rising oil prices.

Implications of findings

- Some countries were able to dampen price rises on local markets and thus protect consumers against higher world food prices. Most notable were China, Indonesia and India. There are lessons to be learned about how and at what cost they did this. Where export bans were used, there were also costs to other countries.
- Much of the understanding of the impact of the price spike has been generated by models that assume high rates of transmission from international to domestic prices. For some countries, especially in Asia and Latin America, this is a reasonable, if exaggerated, assumption. However, since transmission is generally incomplete and uneven, models ideally need to use different assumptions for different countries about the degree of transmission.

- In Africa, however, assuming any rate of transmission when modelling appears to have little basis. Analysis should be specific to each country, based on observed price movements and not those imputed from international movements.
- Cereal prices inland in Africa tend to be highly variable, no matter how stable international prices may be. Inland markets are remote from ports, transport costs are high, and governments (understandably) try repeatedly to intervene to prevent spikes. These localised spikes are often severe enough to constitute food crises. While there are options to mitigate high volatility, those that would substantially reduce variations – such as holding large reserves in stock – are not cheap. The international food price spike has refocused attention on this longstanding issue.

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Endnotes, references and project information

Endnotes:

1. Benchmark prices from IMF, in US dollar terms: For maize, US #2 yellow export; for wheat; Gulf of Mexico #1 Hard Red Winter, and for rice FOB Bangkok 5% broken.
2. This extrapolates from a study (Ivanic and Martin, 2008) which used a sample of nine countries (Bolivia, Cambodia, Madagascar, Malawi, Nicaragua, Pakistan, Peru, Viet Nam and Zambia), assumed 66% price transmission from international to domestic markets, and measured poverty using the \$1/day threshold.

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Project Information:

This paper is part of 'High and Volatile World Food Prices', a two-year programme by the UK Department for international Development's (DFID) Food Group, and the Overseas Development Institute. We are producing a series of project briefs on causes, impacts, responses and options for the future in dealing with international food price spikes. The authors would like to thank David Dawe for helpful comments on an earlier version of this paper. Any errors remain with the authors. To read more from ODI on the food crisis, visit <http://tinyurl.com/foodpricesodi>