Contribution from the World Bank to the G20 Commodity Markets Sub Working Group

Transmission of Global Food Prices to Domestic Prices in Developing Countries: Why It Matters, How It Works, and Why It Should Be Enhanced

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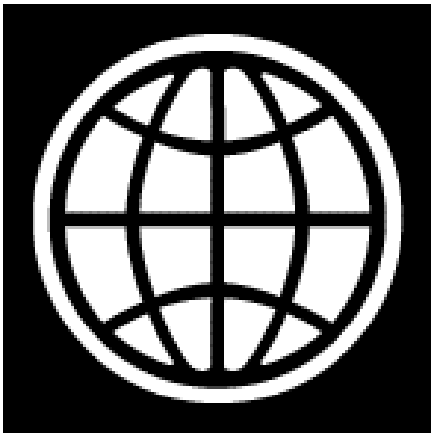


CONTRIBUTION TO G20 COMMODITY MARKETS SUB WORKING GROUP [1]

Transmission of Global Food Prices to Domestic Prices in Developing Countries: Why It Matters, How It Works, and Why It Should Be Enhanced

Why it matters

Transmission of international food prices to domestic prices is essential to pursue comparative-advantage-based, sustainable agricultural production, and to ensure domestic production responds to global food scarcity or surplus. (i) International prices are opportunity costs for most price-taking developing countries and are crucial in determining an efficient distribution of domestic resources. When the long-term trend of international prices is transmitted slowly and imperfectly to domestic markets, consumers and producers make decisions based on prices that do not represent their real social costs and benefits. There is strong empirical evidence from both developing and developed countries that any large, sustained deviation of domestic prices from world prices in either direction leads to substantially sub-optimal outcomes and slows the rate of economic growth; and (ii) as international food prices reflect global scarcity or surplus, their transmission to domestic prices can help improved the global responsiveness of the food system to shocks.

The recent increase in the volatility of international food prices is, therefore, a big concern. These volatile and unpredictable prices may undermine incentives for farmers to respond to high price levels with the critical increase in production needed to bring food prices down. In practical terms, farmers deciding what to plant and countries deciding when to import face uncertainty in the likely distribution of world food prices and greater consequences when using past price levels and distributions to guide current decisions. This uncertainty keeps food prices high for a longer period, leading to fundamental food security risks for consumers and governments.

But preventing the pass-through of international prices to protect consumers is counterproductive. It may make sense for some countries with a large share of food in total imports to mitigate excessive fluctuations in the short term to protect consumers (through reduction of import tariffs, emergency food reserves, and safety nets), but in the medium to longer term the international prices are the best proxy of opportunity costs to guide economic decisions on allocation, consumption, and distribution. Most efficient and sustainable response to international food price spikes is to permit domestic prices to rise (to stimulate an efficient supply response) while increasing assistance to the poor through safety nets. Faster and fuller price transmission (i.e. stronger market integration) is desirable and necessary in most instances.

To achieve more efficient domestic price formation, policy actions need to focus on (i) strengthening the integration of local markets with international markets (through investments in infrastructure and market-oriented policies), especially local markets that are more volatile than international markets, (ii) reducing global food price volatility, including through more discipline on trade policy, and (iii) strengthening safety nets to rapidly and cost-effectively protect the poor and vulnerable from the food price spikes.

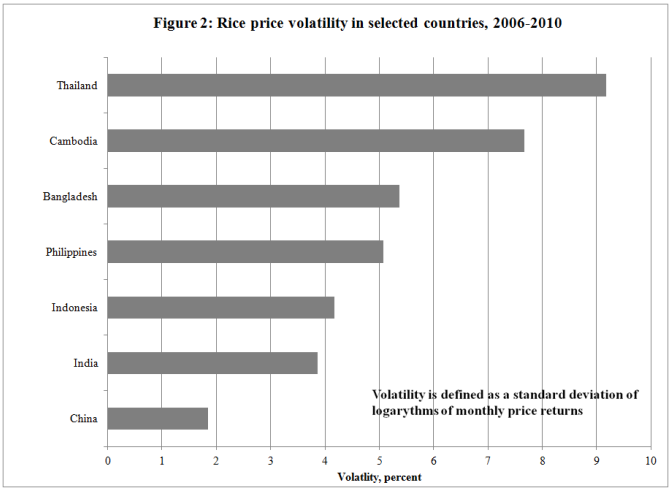
[1] This Note is prepared by World Bank Staff Sergiy Zorya, Robert Townsend, and Christopher Delgado (ARD), with the inputs from Marc Sadler (ARD) and Jose Antonio Cuesta Leiva (PRMPR).

How it works

The extent to which global prices are transmitted to domestic markets depends on transport and marketing costs, policy measures, local currency valuation, market structure, and degree of processing of final consumption goods as summarized in the 2011 international organizations' joint report to the G20[2]:

- *Transport and other marketing costs*, when substantial, cause a rise in world prices to be under-reflected in import parity prices and over-reflected in export parity prices (see Box 1);
- *Policy measures* such as export bans, import duties, export taxes, non-tariff barriers, or domestic policies such as price support all influence the extent to which the price changes in domestic markets mirror those on international markets;
- When the *local currency* of a country appreciates against the US dollar, food prices in local currency rise less than they do internationally;
- *Market structure* is also important. In monopsonistic markets, whether private or state controlled, higher international prices may not always result in better prices for producers or consumers; and
- The *degree of processing of final consumption goods* also affects price transmission. The higher the cost share of raw production in the final product and the less scope is for substitution, the more a price change for the raw product will be transmitted into a price change for the final product.

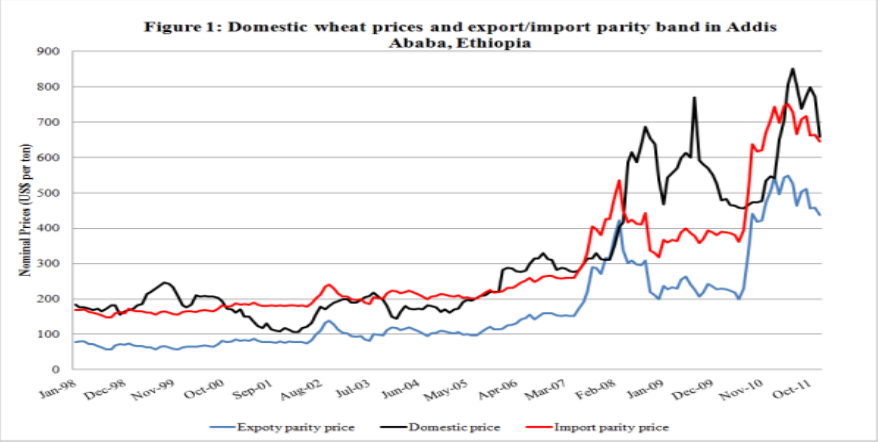
The extent to which domestic prices are transmitted to global prices depends on the market share of production and consumption, and domestic policies. Large producing and consuming countries can impact global prices, conditioned by their domestic policies. Restrictions such as export bans, tactical cuts in import tariffs, and other *ad hoc* trade measures implemented by one country increase global volatility, which triggers policy responses by other countries, which trigger yet more volatility. The result is fundamental destabilization of international prices, which will fluctuate more and for longer periods around the underlying fundamental value (i.e., the price that should be influencing consumption and production/investment decisions). Insulating policies of some countries in Asia, for example, lead to higher volatility of international rice price (5 percent broken fob Bangkok) (Figure 2)[3]. These policies may serve the short-term interests of the implementing countries in question but neither for the world nor for those countries in the longer term, which would be suppressing the price signal necessary for their own efficient supply response.



[2] Price Volatility in Food and Agricultural Markets: Policy Responses, June 2011, prepared for the G20 by international organizations, http://www.worldbank.org/foodcrisis/pdf/Interagency_Report_to_the_G20_on_Food_Price_Volatility.pdf.
[3] Martin, W. and K. Andersen (2011): Export Restrictions and Price Insulations during Commodity Price Booms. World Bank Policy Research Working Paper 5645, Washington. D.C.

Box 1: Interplay between transport costs and policy measures in price transmission in African countries

In Ethiopia, high transport costs result in a large gap between export and import parity prices. This makes private trade profitable only when domestic harvests are unusually high or low. In 2011, for example, the import of wheat was profitable only when domestic prices were above US$700 per ton, while export was profitable at domestic price of below US$450 per ton (Figure 1). Changes in international prices within this US$250 per ton structural price band would have no effect on countries like Ethiopia. However policy measures, such as import registration and licensing of private traders, and *ad hoc* public imports, including through government-to-government contracts, can result in domestic price far exceeding import parity prices as was the case in 1998, 2006, and 2008-09 (Figure 1).



In Malawi and Kenya, domestic maize prices are not linked with the prices in South Africa (international reference price for whiter maize) even when these countries import maize from South Africa because import is typically carried out by governments themselves and later sold at below market prices. In Zambia, when maize production shortfall is large, the government steps in to import and sell maize domestically at subsidized prices. Thus, during the periods of high imports there is typically a break between South African and Zambian prices, while during the periods of good harvests and active cross-border trade carried out by the private sector, the long-term price relationship between Zambia and South Africa holds.

Source: Meyers, R. and T. Jayne (2010): Price Transmission under Multiple Regimes and Thresholds with an Application to Maize Markets in Southern Africa. Department of Agriculture, Food and Resource Economics, Michigan State University, and World Bank (2009): East Africa: A Study of the Regional Maize Market and Marketing Costs. The World Bank, AFTAR Report 49831, Washington, D.C. and Meyers, R. and T. Jayne (2011): Multiple-Regime Spatial Price Transmission with an Application to Maize Markets in Southern Africa. American Journal of Agricultural Economics 94(1): pp. 174-188.

Stylized facts pertaining to recent cereal price transmission

While these stylized facts are limited to cereals, the main food security staples, they are similar for most agricultural commodities. This analysis is based on recent country- and region-level studies and is presented by region and type of cereal (maize, rice or wheat)[4]. Most of

[4] The references of the elasticities of price transmission and other information in the section are based on the following reports: on Africa: Minot, N. (2011): Transmission of World Food Price Changes to Markets in Sub-Saharan Africa. IFPRI Discussion Paper 01059, Washington, D.C.; World Bank (2009): East Africa: A Study of the Regional Maize Market and Marketing Costs. AFTAR Report 49831, Washington, D.C. On Asia: Dawe, D. (2008): How Recent Increases in International Cereal Prices Been Transmitted to Domestic Economies? The Experience in Seven Large Asian Countries. UN FAO-ESA Working Paper 08-03, Rome; Robles, M. (2011): Price Transmission from International Agricultural Commodity Markets to Domestic Food Prices: Case Studies in Asia and Latin America. IFPRI, Washington, D.C.; Groshray, A. (2011): Underlying Trends and International Price Transmission of Agricultural Commodities. Asia Development Bank Economics Working Paper Series 257, Manila. For Latin America: Robles, M. (2011): Price Transmission from International Agricultural Commodity Markets to Domestic Food Prices: Case Studies in Asia and Latin America. IFPRI, Washington, D.C. On Middle East and North Africa: Ianchovichina, E. and J. Loening (2011): How Vulnerable is the Middle East and North Africa to Global Food Price Shocks? World Bank, Washington, D.C.

the studies use monthly price data, from late 1990s/early 2000s and ending in 2009-2011, and capture price transmission during the 2008 and 2010/11 international price spikes[5]. The most frequently used international reference prices are: (i) Maize (US No. 2 yellow, fob Gulf of Mexico, and South Africa SAFEX white maize); (ii) Rice (5 percent broken, fob Bangkok); and (iii) Wheat (US No. 1 Hard Wheat, fob Gulf of Mexico).

During the recent international food price spikes, there were significant differences among regions and products in the speed and degree to which world price movements were felt in regional or local markets. From mid-2007 to 2010/11, 48 out of the 155 domestic cereal price series monitored by the UN Food and Agriculture Organization's GIEWS in Africa, Asia and Latin America, rose by more than the change of the international prices. In 50 cases, domestic prices rose by 50-100 percent of changes in international prices, and in the remaining 57 cases they increased by less than 50 percent[6]. The changes in domestic prices were significantly lower during the second spike (2010/11), mainly due to increased domestic production.

Not all the changes in domestic prices were due to price transmission from global markets. Some local markets are not integrated with international markets and in those cases domestic events drive prices (see Figure 1). Typically these are in the countries with large infrastructure deficits and/or countries that pursue insulating policies. Landlocked countries are more likely to be disconnected from international price movements than those with the access to the sea. But even if international price movement are not important in the short- to medium term, in the long term they matter, albeit indirectly though better-integrated neighboring countries, substitution effects, and in shaping their domestic agricultural strategies and policies.

For countries where domestic prices are linked to international prices, there can be lags of several months for changes in international food prices to be reflected in local prices. Changes in international prices begin being passed through to domestic prices within 3-6 months, depending on the local production situation, access to markets, and import/export logistics.

Even where markets are integrated, changes in international prices are rarely fully transmitted. The average pass-through ranges from 20 to 70 percent (i.e. a 1 percent change in international prices results in a 0.2 to 0.7 percent change in the domestic price). But even a 20 percent increase of local food prices can make a big difference to the poor.

In most developing countries, prices are spatially transmitted quite well. The extent of spatial price transmission differs by country (e.g., domestic markets are better integrated in Kenya and Uganda than in neighboring Tanzania), but in many countries price signals are transmitted back and forth from production areas to consumption areas, within and across borders. Thus, once global prices are transmitted to local consumers, price signals are passed further. There is considerable evidence of large improvements in spatial market integration in developing countries over recent decades (though it still lags behind developed countries).

The extent and speed of price transmission from domestic consumer to farm-gate prices is determined by rural connectivity and agricultural policies. In countries with poor rural connectivity, marketing costs are high, slowing down the transmission of higher consumer prices

[5] The Agriculture and Rural Development Department (ARD) of the World Bank, together with the Rural Policies Thematic Group, the Development Economics Group, and the Poverty Reduction and Equity Anchor, is currently carrying out the price transmission study applying the same methodology to a group of countries for the same period of time. The results of that work will be available to public in July 2012.

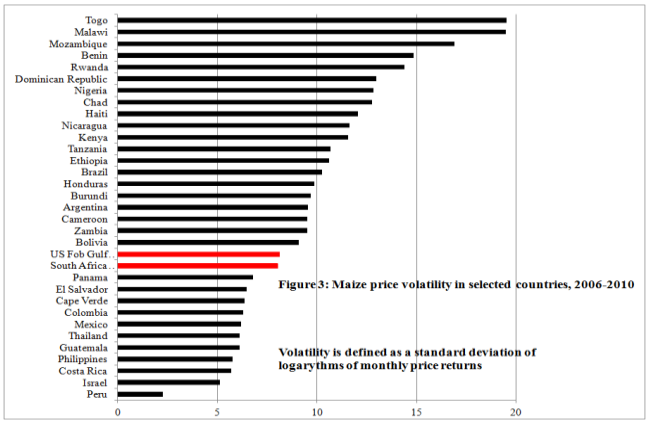
[6] Sharma, P. (2011): Review of Changes in Domestic Cereal Prices during the Global Price Spikes. FAO Food Outlook, November 2011.

to farmers, necessary for timely agricultural supply response. Consumption subsidies and producer support may also hamper spatial arbitrage. In addition, if higher food prices occur in tandem with higher crude oil prices, price transmission declines due to the increase in transportation and farm production costs.

Local rice prices in many countries appear to be more integrated with international prices than prices of wheat and maize. In Latin America, domestic prices in most countries are linked to international prices, with the average long-term price transmission elasticity estimated at 0.18. In Africa, rice prices are transmitted fastest to the countries in the west, which import a lot of rice. Out of 17 African rice markets studied by IFPRI in 2011, eight markets were linked with international prices (47 percent), in contrast to the much smaller share for maize (10 percent) and sorghum (25 percent). In Asia, the long-term price transmission elasticities are largest in countries open to trade such as Bangladesh (0.34), Cambodia (0.70), and Vietnam (0.51). Price transmission has also been large for China (0.46) as it stabilizes local prices around the world market price trend. In the Philippines the long-term transmission is small (0.23), due to its insulating measures. India and Indonesia appear to be decoupled from international market. India is largely self-sufficient, while Indonesia, pursuing food self-sufficiency policy, imports irregularly and seeks to break the link between international and domestic prices. When the price link is broken, imports or export from these countries are difficult to anticipate, making the world rice market more volatile.

In the large wheat importing countries of the Middle East and North Africa, wheat prices are transmitted relatively quickly. Long-term price transmission coefficients average 0.2 to 0.4. The pass-through effects are notably higher for West Bank and Gaza, Djibouti, Egypt, Iraq, and the United Arab Emirates. By contrast, in Algeria and Tunisia, price transmission is very small, due to high food subsidies and controlled prices. In Latin America, transmission is relatively high in Ecuador, Nicaragua, and Dominican Republic, while in Asia price transmission elasticities range from 0.11 in India (a more closed economy) to 0.41 in Pakistan and 0.74 in Bangladesh (more open economies).

Transmission of international maize prices appears to be the lowest, in particular in Africa. This is because most African countries are close to self-sufficiency in white maize (with yellow maize mainly traded internationally) and thus local prices are driven more by local factors[7]. In addition, the reasons for weak transmission include high infrastructure costs, small quantities for trade, and *ad hoc* trade policies. Prices in only four maize markets out of the 40 markets studied by IFPRI have any relation to international prices. As a result, domestic food prices are mainly determined by local and regional factors, and are often more volatile than international prices. Figure 3 shows that



[7] Yellow maize is not a perfect substitute for white maize in food consumption. Yellow maize is mainly used as feed.

from January 2006 to December 2010 the price volatility in many African countries was much higher than for international prices of both yellow maize (US Fob Gulf) and white maize (South Africa), in spite of recent increases in the volatility of international grain prices.

By not participating in international trade, African countries cannot use international markets when needed. Volatility of internationally tradable products in many African countries is lower than that of commodities that are non-tradable or tradable only on regional markets. Wheat, rice, and cooking oil – products imported to the African continent – exhibit lower price volatility than the prices of domestically produced staples. The prices of maize, beans, and cowpeas, which are mainly traded locally and regionally, are more volatile, on average 20-30 percent above the price volatility of internationally traded commodities. Therefore, to lower domestic price volatility, many African countries should reduce their protection levels and improve infrastructure to allow food to be more easily exported at times of bumper harvests and more easily imported during production shortfalls.

What can be done to enhance price transmission?

First, countries should invest in domestic market infrastructure and align policies to better integrate domestic and international markets. Even in the current more volatile price environment, many countries would benefit from a stronger integration with international markets first, to import lower volatility onto their domestic markets, and second, to help guide their economic decisions based on opportunity prices. Investment in market infrastructure (ports, roads, etc.), along with more market-based trade policies and domestic competition reforms, are essential to induce price transmission. At times of price spikes, instead of introducing export bans, countries should target their cash and food transfer programs to the poorest (through safety nets), and permit prices to be transmitted to domestic markets to induce a timely supply response and ensure that consumption adjusts to opportunity costs. Promotion of crop diversification, making more diverse food available for consumption, is another way to strengthen resilience to volatility.

Second, policy makers should pursue open trade policies to regain the trust of many countries in international markets. Irrespective of the extent of price transmission in the short term, recent volatility has been so dramatic that many governments reverted to isolationist policies. This has already influenced the many national agricultural investment plans, moving them in the direction of a bias towards food self-sufficiency objectives. This may lead to further price volatility. What is needed is for countries pursuing food self-sufficiency policies shift away from price support to less distortive types of farm support, to reduce spill-over effects on international markets and promote sustainable growth. More discipline in trade, particularly on reducing export bans, is necessary to reduce incentives to beggar-thy-neighbor policies and increase confidence of food importing countries in international trade.

Third, countries should strengthen their safety nets and effectively use them focusing on the poor and vulnerable to mitigate the impact of price spikes, while allowing domestic prices to rise to induce a food supply response. Untargeted support often leads to large amounts of scarce public resources flows to the higher-income consumers, thus targeting the programs to the poor and vulnerable is essential to provide social protection without jeopardizing fiscal sustainability. Support can be provided by giving conditional and unconditional cash or food transfers, offering short-term employment, and discouraging negative mechanisms for coping with the setbacks caused by a food price crisis. Investing in safety nets before crisis

allows their rapid and cost-efficient scale up. Even relatively small-scale programs may provide the administrative infrastructure, including the rules of operation and eligibility that can be adapted to a major crisis without costly implementation bottlenecks.