



Recent Global Food Price Shocks: Causes, Consequences
and Lessons for African Governments and Donors
by
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Recent Global Food Price Shocks:
Causes, Consequences and Lessons for African Governments and Donors¹

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Abstract

Dramatic increases in international agricultural commodity prices began in 2006 and peaked in July, 2008. An equally remarkable and rapid decline of those prices then ensued, accompanied by extreme volatility in those prices. The trend in food prices lagged the rapid increases in other commodity prices, including oil and metals, but accompanied those other prices in the downward part of the cycle. Not all agricultural commodities increased to the same extent – grains and oilseed prices increased the most, with rice among the most expensive at the peak and rising as much as crude oil, while prices of some African exports (cocoa, coffee and cotton) increased to a much smaller extent than the grains.

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High commodity prices quickly raised farmgate prices in developed countries. In developing countries poor market integration and border barriers may have limited pass-through of these prices to the farmgate, but there was more rapid food price and general inflation than occurred in many developed countries. Countries were impacted to differing extents, and food riots occurred in the most affected cases. It has been noted that underlying fundamentals of food price inflation differ by extent of development, as poor countries have smaller distribution costs but higher budget shares in basic staples. Import dependence, tradable versus non-tradable status of grains, and whether there were home goods substitutes influenced the extent of price transmission.

Many developing countries reacted by altering trade and domestic agricultural policies, and attempted to stabilize domestic markets. Importing countries reduced tariffs and taxes in many cases, and food subsidies were increased in some cases. Export taxes were enacted to protect domestic users, and bans of exports were applied in some extreme cases – explaining the especially large increase in rice prices. While impacts on domestic prices vary across country cases, disentangling the role of policy response from market integration would require further work.

Policy responses were complicated by disagreement at the time that prices were rising as to whether the increases would be permanent or short lived, which in turn depends on the root causes of the increases – over which there has been considerable debate. Consensus has emerged on some factors, while controversy over macroeconomic relationships persists. They were also complicated by dynamic adjustments of related prices, which were not instantaneous. For example, fertilizer prices did not fall until several months after grain prices fell.

Policy responses of national governments in Africa and elsewhere in the developing world contrast sharply with initiatives recommended by the international community. International organizations, development banks and donors emphasize emergency relief and longer term agricultural development, whereas national governments heavily utilized market interventions through trade and domestic policy.

In this paper we will first explore the factors that have been offered to explain the run-up and subsequent down-turn in agricultural commodity prices. Explanations have included supply and utilization events, competition for grains and oilseeds as food versus fuel, and financial factors such as currency changes that exaggerated prices measured in dollars. Interactions between these factors will matter to the resulting outcomes, so specific contributions cannot be assigned. Moreover, debate persists on the exogenous mechanisms driving these changes, which are often interrelated (e.g. worldwide economic boom and then global recession, speculation in commodities). The goal will be to identify factors likely to drive commodity prices in the future, and to provide some understanding of the dynamics and persistence of the observed global price changes.

The next part of the paper will explore how those global price changes were transmitted to developing country markets. The extent of farmgate price changes and retail food price adjustments will be documented to the extent feasible. The roles of border policy, domestic agricultural policy, market integration, and retail food margins will be considered. Special emphasis will be placed on what actual policy adjustments were taken, and how well they worked.

Given the presumed underlying causes of high and then low food prices, and the uncertainty of future global commodity prices, policy options now available to developing countries will be explored. These will include short run safety nets, market interventions, and long run incentives to agricultural development. In this part special emphasis will be put on what happened in Africa, and how it should respond in the future. Some of the key issues in the current debate on expanding African agricultural sectors, including price stabilization and fertilizer subsidization, will be explored. In the process we will evaluate how far various methodologies have taken us in providing an understanding of the consequences of these recent events, and providing a sound basis for policy recommendations.

Recent Global Food Price Shocks: Causes, Consequences and Lessons for African Governments and Donors

Introduction

Commodity prices have experienced dramatic increases over the last couple of years, peaking at historic levels in mid 2008. The recent drop in international commodity prices since summer 2008, coupled with the financial crisis at the same time and current looming global economic recession, could have momentarily diverted attention from the previous episode of food price boom. However, today commodity prices remain well above 2000-2005 averages and drivers that triggered the escalation are still topical, feeding the idea that prices will remain higher than past norms and that food crisis is not yet ancient history.

Whereas the developed world has witnessed rather few social and policy reactions to this unusual event (rather the opposite with farmers realizing record incomes at that time), both consumers and farmers from developing countries have faced hard consequences: increased food and overall inflation, deteriorating terms of trade, increased farm input costs, burdening fiscal and financial positions and aggravating hunger and poverty. Subsequent worldwide demonstrations of social and political unrest have restored food security debates and have triggered massive policy responses to address the food crisis at both national and international levels. While developing country governments reverted to isolationist policies to protect domestic consumers, the donor community committed to substantially increased amounts of aid directed at both emergency food aid and longer term agricultural development.

Understanding of the causes of the food price rise and assessing the impacts on developing countries are keys to analyzing the adequacy and efficiency of the observed government responses as well as suggesting policy options for the future. In this respect this exercise requires focusing on a number of specific issues: to what extent were international price fluctuations passed through at the national level? How successful were policy responses in isolating domestic markets? What impacts have the combination of price changes and policy responses brought to importing developing countries? to international markets? What policy lessons can be drawn from these experiences for both national governments and donors? While this study draws somewhat on developing country cases around the world, it focuses attention to African countries specifically to provide elements to address these questions.

Two disconnects in the ongoing debate about policy responses to the food crisis are highlighted here. Imperfect price transmission means border prices changes were not fully reflected in domestic prices or food inflation. This results from both stabilization policies adopted and from weak market integration. Whether impacts were on hunger, food inflation or macroeconomic performance depends on the extent of stabilization achieved. The policy responses of national governments, focusing on market interventions and broad consumer support, exhibit sharp contrast from the recommendations emanating from international community discussions, which emphasize safety nets and longer term agricultural development targeted to smallholder farmers.

First this paper sets the scene, recalling the latest developments in commodity prices and exploring causes and outlook. Then the impacts on African countries will be assessed, looking at

price transmission and actual trends observed in domestic markets. The paper then examines policy responses taken by African governments and donors to address the food price rise and puts them in perspective relative to what we know about best practices for these interventions. Eventually, policy recommendations for national governments and the international community will be explored, and implications for economic research are considered.

1. Trends and causes of fluctuations in international commodity prices

After remaining for several years at relatively low and stable levels, international commodity prices started to steadily increase since 2002. Agricultural commodity price increases were delayed, but climbed spectacularly over the last couple of years to attain historically high (nominal) peaks in mid 2008. The IMF Commodity Price Index, including both fuel and non-fuel prices, nearly tripled between 2003 and 2008. Figure 1 shows recent trends in agricultural commodity prices, highlighting peaks reached in mid 2008 after a slower build-up starting in 2006.

When looking closely at the sequencing of the commodity boom, the agricultural price rise lagged behind crude oil or fertilizer price increases. The price of crude oil increased by five times from 2002 to mid 2008. Pushed by strong surging demand and tightness in supply, fertilizer prices followed the energy trend and in early 2008 levels were four times 2002 values. Figure 2 shows world crude oil and fertilizer price trends relative to agricultural commodity prices.

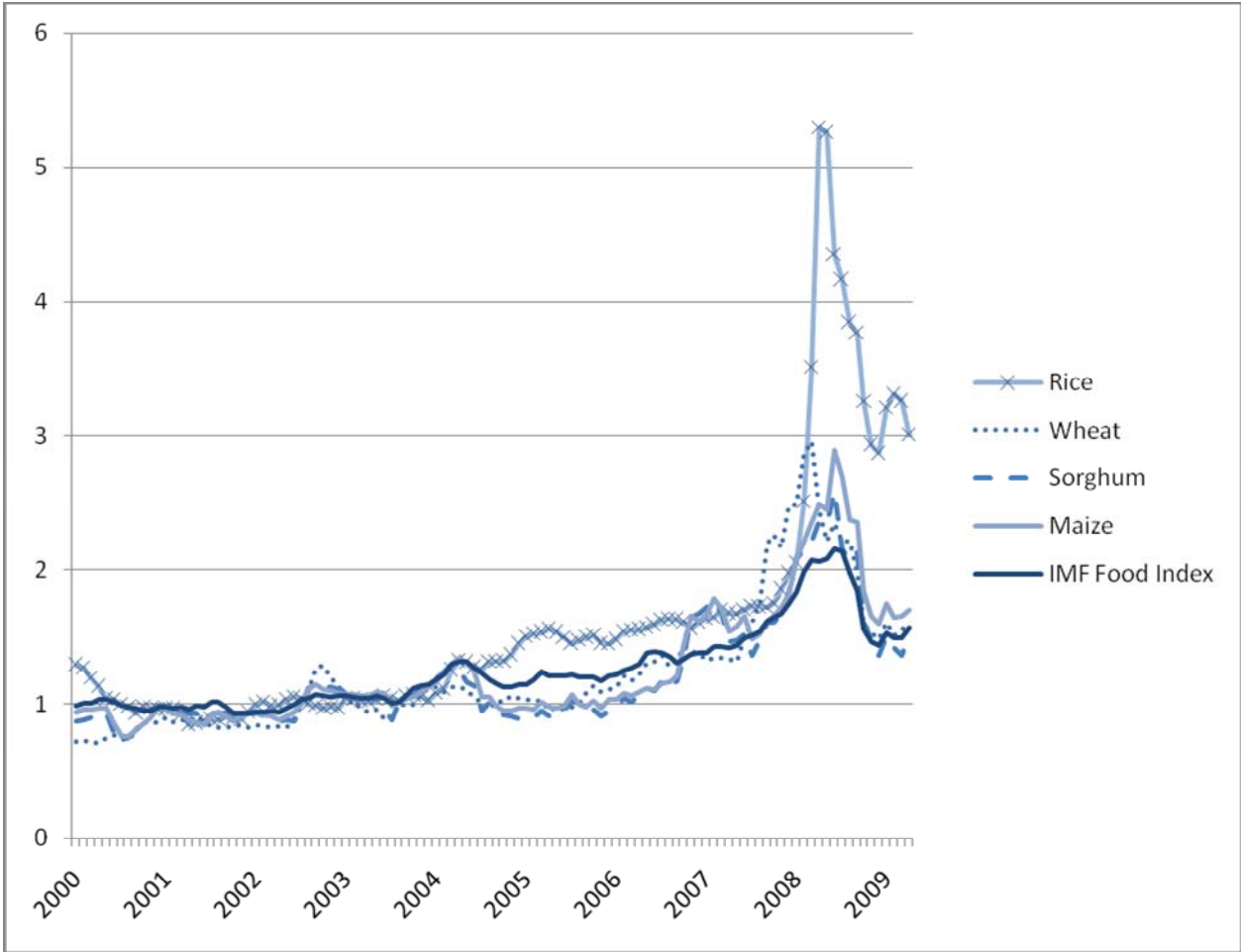
The steep increases in agricultural commodity prices followed somewhat later than the general commodity boom, around mid 2006. Wheat was the first grain to peak, achieving a 200 percent increase between 2002 and March 2008. But the most impressive boom was experienced by rice: its price rise started in 2004 from very low levels and accelerated in late 2007 to reach 430 percent of its 2002 value in April 2008. Maize prices peaked somewhat later in June, followed by sorghum and soybeans. Agricultural commodity events drove fertilizer prices even higher, to eight times 2002 levels at their peak, and they did not fall until October 2008. All agricultural commodity prices plummeted from the summer of 2008, even faster than they rose. By December, prices plummeted to 187 percent of 2002 value for rice and 59 percent for wheat. Nevertheless, grain and input prices remain substantially higher than 2002-2005 norms.

In both Figure 1 and 2 it is apparent that the IMF Food index lagged both commodity price increases generally and the prices of grains on world markets. Many agricultural commodities never increased as much as crude oil, metals, or grains. In particular, African commodity exports, including coffee, cocoa and cotton, experienced smaller and later price increases than were realized for other commodities.

Many analysts have compared these events to the 1973-75 food crisis, and have deflated prices in order to make those comparisons. Figure 3 shows real prices, using the US CPI to deflate, for rice, maize and the IMF food price index. It shows substantial real decline in prices over four decades, driven by structural transformation and productivity growth in agricultural production –

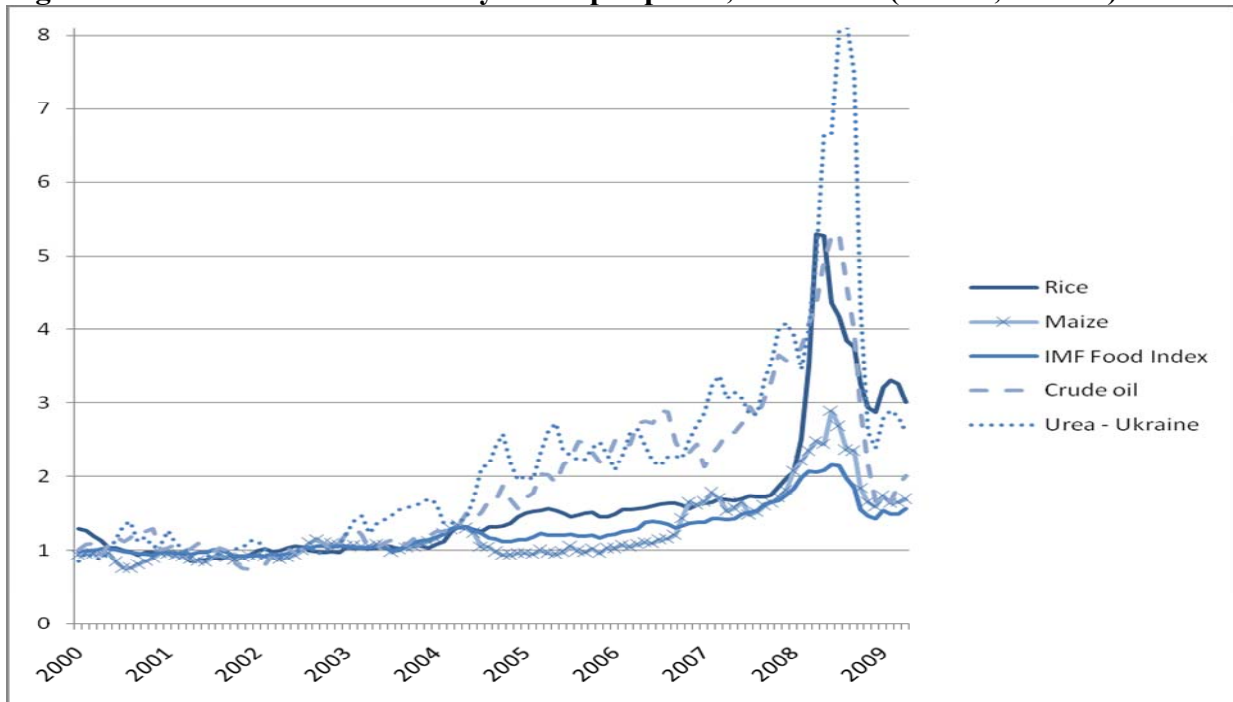
especially for developed country exporters. Prices just before the 1973-75 crisis were roughly double the price levels in 2002, and relative changes in grains and oilseeds prices were comparable. Rice prices more than tripled in 1973-75 and quadrupled in 2007-08. Maize prices roughly doubled in both periods. The increase in the IMF food index was greater in the early period, as products typically imported in African countries (grains and oilseeds) increased by substantially more than the food index, while prices of several export commodities (coffee, tea, cocoa and cotton) increased by much less than the index during the recent crisis, having increased by more in the earlier crisis. Thus, this event was somewhat different than the 1973-75 crisis, with similar relative changes from quite different real price levels, and with a different mix of commodities most severely affected. Causes of the recent crisis are somewhat different, as well.

Figure 1 - International agricultural commodity prices, 2000-2009 (indices, 2002=1)



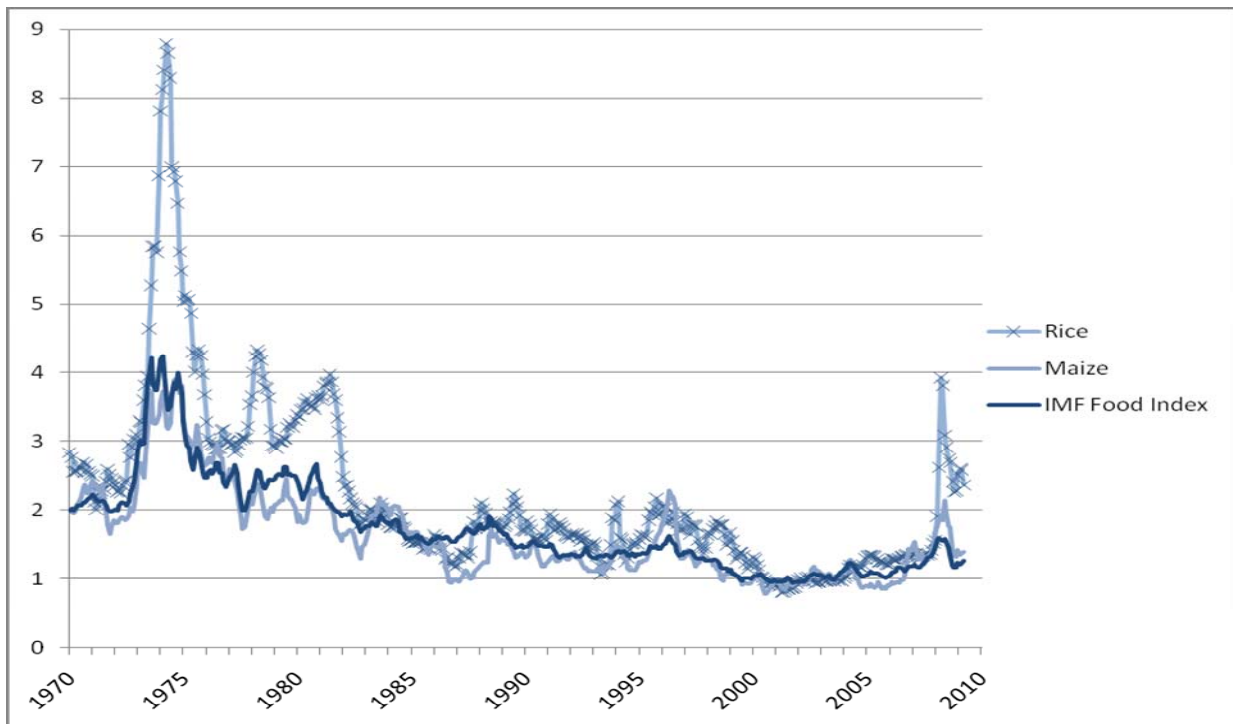
Source: IMF, *International Financial Statistics*, 2009.

Figure 2 – International commodity and input prices, 2000-2009 (indices, 2002=1)



Source: IMF, *International Financial Statistics*, 2009.

Figure 3 - Real food and agricultural commodity prices, 1970-2009 (indices, 2002=1)

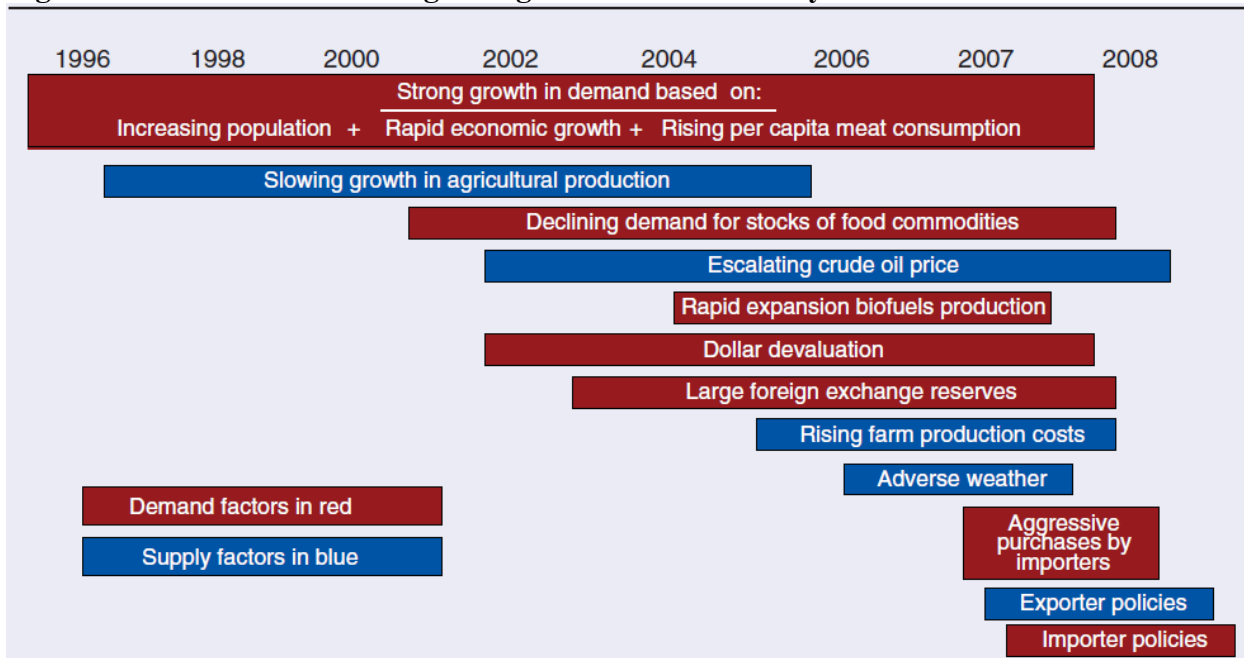


Source: IMF, *International Financial Statistics*, 2009.

A mix of commodity supply and demand driven causes for rising prices

Recent literature analyzing the causes of the commodity price spikes is huge. Despite some controversies, consensus is found in the fact that a combination of supply and demand factors matter, driven by long term global developments as well as responses to short term or confined events. Explanations have included supply and utilization events (Australian drought, Chinese and Indian meat demand, reduced stocks), competition for grains and oilseeds as food versus fuel (corn demand for ethanol and the consequent links between corn and petroleum prices), and financial factors such as currency changes that exaggerated prices measured in dollars. Some factors determine longer run trends, while others help explain the short term nature of these price spikes. These possible explanatory factors have been arranged over time in a USDA report (see Figure 4 from Trostle, 2008) and can be summarized as follow. The underlying rising global demand, pulled by population and economic growth, notably in developing countries, put pressure on food and feed supply and depleted stocks. Burdening further supply tightness, low investments in agriculture as well as low prices contributed to the decline in agricultural production growth. The resulting low stockpiles made markets more inelastic, exacerbating effects of quantity shocks. Aggravating specific factors occurred at the time when commodity prices were booming, involving the crude oil- corn price connection, rising input costs and biofuels demand, bad weather events and aggressive ad hoc policy responses to high food prices.

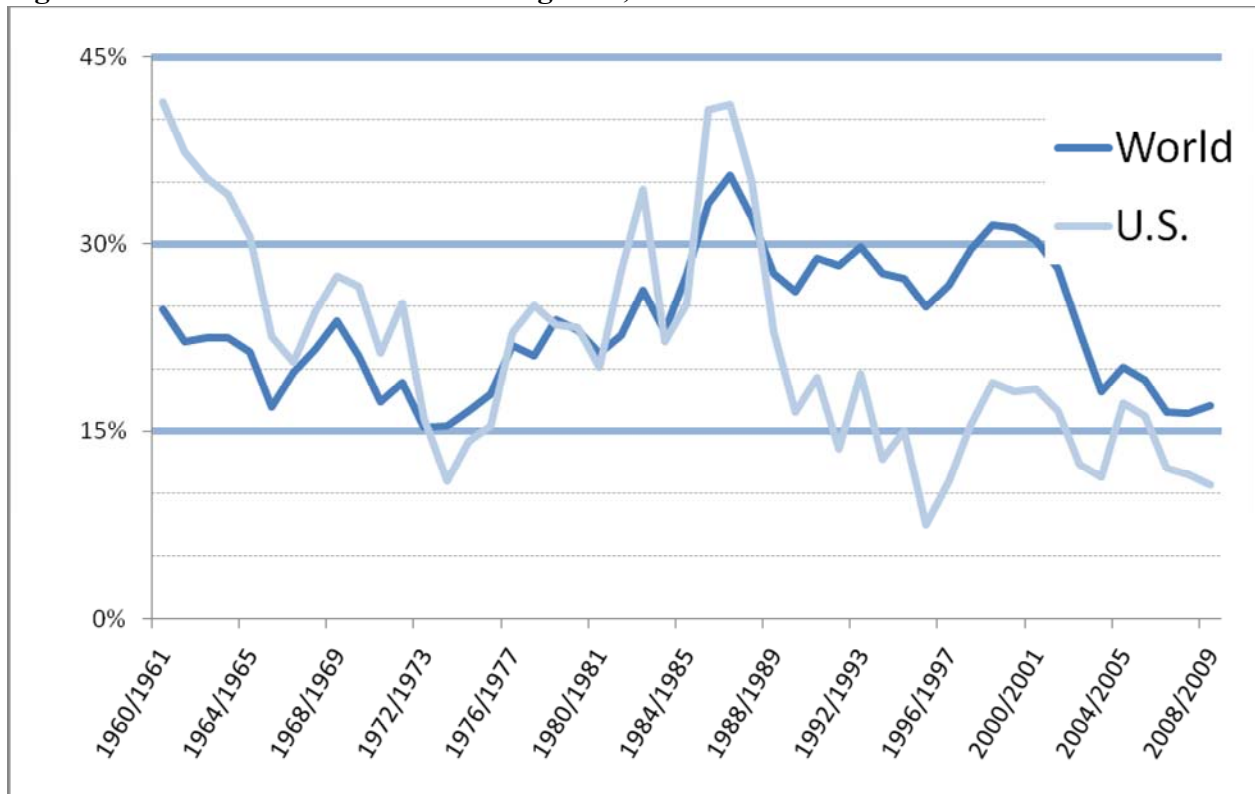
Figure 4 - Factors Contributing to Higher Food Commodity Prices



Source: Trostle, 2008.

Expectations from economic actors and interactions between causes do not allow assessing the contribution from each factor. Nevertheless low stock level expectations are commonly agreed to be significant contributors to the increase in agricultural commodity prices (World Bank, 2008; Diouf, 2008; Timmer, 2008; Abbott et al, 2009). Figure 5 shows stocks to use ratios for world stocks as well as U.S. stocks, highlighting the low values for these ratios in periods when prices are high. There is some disagreement, at least related to world stocks, however. A large share of world stocks are held by China and India, and those stocks respond to domestic market conditions much more so than world market prices. Moreover, the Chinese were drawing down stocks as they exported grain after 2000 (Lohmar and Gale, 2008). U.S. stocks to use ratios are not as obviously low during the recent crisis relative to earlier years in this graph, but expectations at the time when prices peaked in April-July, 2008 were for lower stocks than were actually realized and so shown here (WASDE, 2009), Moreover, the persistent biofuels demand meant expectations for stocks a year later were low, even given expected normal production in the fall of 2008 and again in 2009. Regardless of actual outcomes, expectations of low stocks to use ratios surely contributed to the high grain prices in mid 2008.

Figure 5 - Stocks to use ratios for total grains, world and U.S. in 1960 to 2009



Source: Abbott, Tyner and Hurt, 2009

Many studies attribute a large part of responsibility of the 2007-08 commodity spike to crude oil price trends, notably for corn (Agricultural Food and Policy Center, 2008; OECD, 2008). While high crude oil prices created incentives to divert agricultural commodities from the food and feed market in favor of the energy industry, they simultaneously raised the costs of inputs (fertilizer and transportation). The expansion of capacity in the biofuels industry created persistent and large new demands for agricultural commodities, most evident in the demand for about one-third of the U.S. corn crop to produce ethanol. Supply has to catch up to this new demand, which occurred at a time of low stocks to absorb the required adjustments. An important characteristic of this factor, noted above, is that the new biofuels demands would persist over future years.

Eventually, a number of publications examined how worldwide isolationist policy measures to protect domestic consumers from high food prices have aggravated the trend. In thin markets, these trade policy adjustments had big effects on world prices (for rice notably, Timmer (2008) pointed out tax and quantitative export control measures taken by major exporters). Both exporters and importers used policy to isolate domestic markets, exporting instability rather than adjusting to it.

Abbott et al (2008) and Diouf (2008) highlighted a couple of factors, often presented as plausible components of the commodity price spike, that may have been over estimated. First, it seems that adverse weather probably did not particularly mattered to production in 2006-2007, with the possible exception of wheat (mainly due to the Australian drought). Second, population and economic growth in China and India, increasing feed and food demand, could have driven agricultural commodity prices high, but these countries were net exporters of food at the time of the crisis (Lohmar and Gale, 2008). It is therefore likely that domestic production has kept up with enhanced demand for food in these rapidly growing countries (at least for most staple commodities) and that consumers are eating higher quality food and diversified diets based mostly on domestic supplies. Those countries also pursued policies to separate domestic markets from world markets, to varying degrees according to commodity. For example, China is increasingly reliant on soybean imports but highly self sufficient in rice. While these more normal supply-use trends mattered to arriving at low stocks by 2007 and 2008, shocks in 2007 and 2008 ordinarily would not have led to the dramatic price increases observed. They occurred within an unusual macroeconomic environment that exacerbated effects, on top of the new factors including adverse policy response and the persistent biofuels demands for industrial use.

The financial factor debate

The most prominent unresolved debate on causes of high international grain prices concerns the role of speculators, and of the infusion of money by institutional investors and hedge funds into commodity markets, that some believe account for much of the price rises in 2008. Von Braun and Torero (2009) of IFPRI and Trostle (2009) of USDA highlight this factor, which has also been stressed in many reports in the popular press and by many other economists. Those who have spent their careers working on futures markets almost unanimously reject this argument however (e.g. Wright, 2009a and b; Sanders, Irwin and Merrin, 2008; Irwin et al, 2009), and raise grave concerns that the regulatory solutions proposed to limit participation in those markets will do more harm than good. The coincidence of events and magnitude of investments in commodity funds convinces many of the importance of this factor, but futures market experts

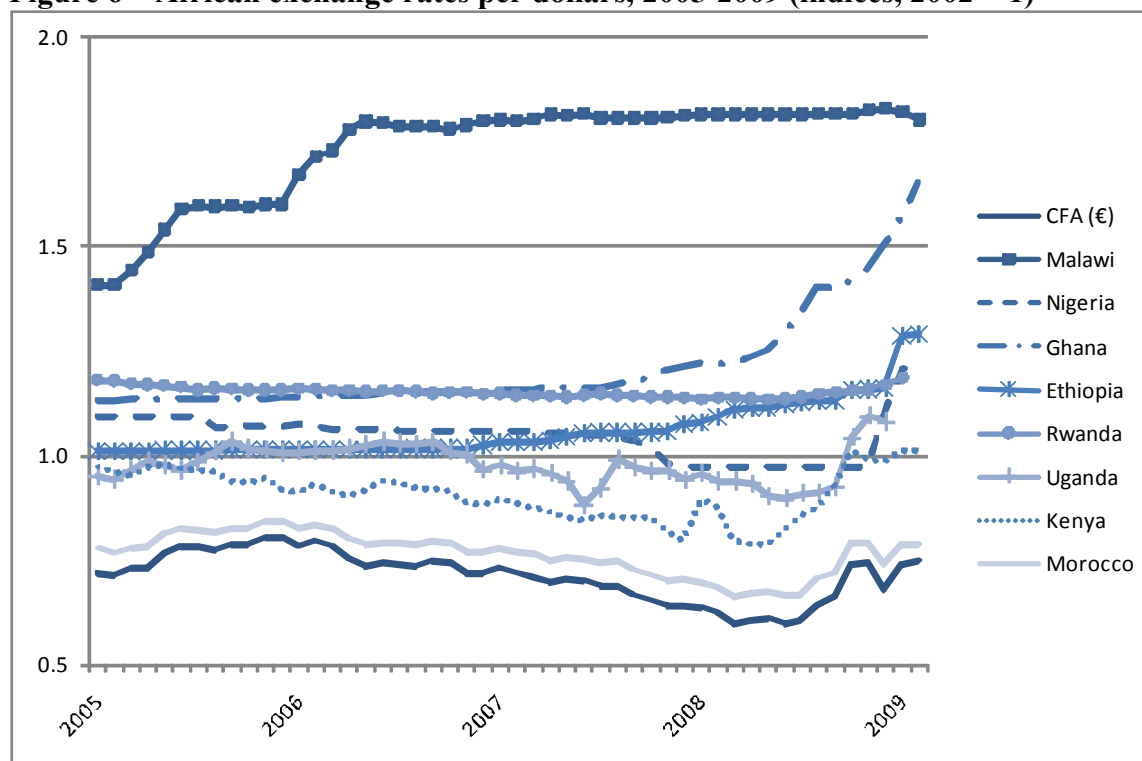
assert that price changes must be accompanied by quantity adjustments – some end users must be paying the high prices for final uses or stockholding. They further argue that transactions volumes are not out of line with past high price events, and in fact there may be inadequate speculation in the markets (Sanders, Irwin and Merrin, 2008). Others argue that the price changes of 2008 can be explained by supply-utilization events coupled with energy price and exchanges rate changes, and policy responses. One need not resort to mysterious speculation linkages (Abbott, Hurt and Tyner, 2009). Timmer (2009) highlights exports taxes in the rice market, and physical speculation in the form of hoarding by farmers and local traders, rather than speculation on futures markets, accounting for the extreme spike in rice prices. These opponents to the speculation argument highlight very inelastic demand when stocks are low. Gilbert's (2008) econometric evidence leads to much weaker conclusions even about the correlation of speculative capital and agricultural prices than does von Braun and Torero (2009). The one point of agreement is that at higher prices volatility increases.

A second factor over which there has been both confusion and disagreement is the role of bilateral exchange rates. Initial reports discounted this factor, utilizing a dollar exchange rate index produced by USDA for agricultural goods that heavily weights currencies pegged to the dollar (e.g. Collins, 2008). Abbott, Hurt and Tyner (2008), however, show the significant divergence between commodity prices, including crude oil and grains, when expressed in dollars versus Euros. For example, relative to prices in 2002, crude oil prices had increased 430% in dollars and 150% in Euros to July, 2008, and corn prices had increased 177% in dollars versus 29% in Euros over that same period. Changes in currencies coincided strongly with movements in commodity prices: as the dollar experienced strong depreciation from July 2007 to July 2008 crude oil prices surged and grain prices experience their largest increases. Since July 2008 the dollar has appreciated against the Euro and many other currencies, reversing this effect on local border prices. The consequence is that prices in countries whose currencies appreciated against the dollar did not seem to rise as much, so there was less of an incentive to curtail imports, and when the dollar appreciated and commodity prices fell, the drop in prices was less in local currency terms.

While this effect was highly variable across countries, depending on the exchange rate regime in place, many African countries experienced exchange rate variations similar to those of the Euro, and so saw the same effects on their border prices for grains. In the CFA zone of West Africa, for example, the currency is pegged to the Euro, so the effect is essentially the same as was the case for the Euro. Figure 6 presents currency changes over time for a set of African countries where we will later explore transmission of border prices to domestic prices, and this exchange rate effect must be taken into account for that assessment. It shows that many African currencies appreciated relative to the dollar until about July, 2008, and most have depreciated rather substantially afterwards. Some were pegged to the dollar for long periods, but experienced occasional devaluations, while others followed their own paths until July, 2008, but most have depreciated substantially since then. Table 1 shows the extent of currency appreciation from 2002 until July 2007 and then from July 2007 to July, 2008 important dates in the evolution of world crude oil and grain prices. It then shows the extent of depreciation since July 2008. It is intended to highlight the coincidence of grain price changes and exchange rate movements relative to the dollar. It also highlights the lesser extent of real depreciation since mid 2008. The

high food and general inflation brought on by the commodity boom also had contributed to pressure for depreciation.

Figure 6 – African exchange rates per dollars, 2005-2009 (indices, 2002 = 1)



Source: Calculated from data in IMF, *International Financial Statistics*.

The exchange rate must be seen as a symptom in this process, and not really a cause of high prices. While the price linkage at a country's border means exchange rate changes directly alter price relationships, underlying economic trends determine those exchange rate movements. The weakness of the dollar can at least in part be attributed to the huge current account deficit that the U.S. was experiencing, and the unwillingness of international lenders to send capital to the U.S. when interest rates were lowered to fight recession, starting in August, 2007. Monetary policy also contributed, as the U.S. began cutting interest rates in August, 2007 to fight recession, precisely when the dollar began to substantially weaken. The European Union central bank waited until nearly a year later to also cut its interest rates and combat recession, at the time when the dollar began to appreciate. The turn-around for the dollar began in July, 2008 when it was realized that economic performance was worse in Europe and Asia, and less was being done there to combat recession. The ensuing financial crisis also led to the dollar's reemergence as a safe haven for financial assets, contributing further to its strength. The heavy toll taken by the financial crisis on trade and global economic performance has contributed significantly to the depreciations of currencies experienced by developing countries, including African countries. This in turn has affected agricultural markets significantly (von Braun, 2008). The financial crisis and global recession have contributed not only to lower incomes, reducing import

demands, but also to high domestic prices as a consequence of depreciating currencies and other factors. Prior to July, 2008 it was believed by many that these problems would be mostly in the U.S., but now it appears problems are worse in developing economies.

Table 1 - Currency movements relative to the dollar as international commodity prices changed, 2002 to January 2009

Country	Nominal Appreciation		Nominal Depreciation	Real Appreciation	Real Depreciation
	2002 to July 2007	July 2007 to July 2008	July 2008 to Jan 2009	July 2007 to July 2008	July 2008 to Jan 2009
Africa					
Nigeria	-5%	7%	24%	8%	17%
Ghana	-16%	-15%	22%	-9%	9%
CFA Zone*	31%	12%	23%		
<i>Burkina Faso</i>				11%	16%
<i>Mali</i>				11%	18%
<i>Niger</i>				12%	15%
<i>Senegal</i>				12%	20%
Ethiopia	-5%	-7%	15%	5%	-10%
Rwanda	-15%	1%	4%	3%	-5%
Uganda	8%	1%	20%	2%	14%
Malawi	-81%	-1%	0%	1%	
Kenya	14%	0%	23%		
Morocco	25%	11%	18%		
Asia					
China,P.R.	8%	10%	0%	11%	0%
India	17%	-5%	14%	-4%	11%
Bangladesh	-18%	0%	1%	4%	-2%
Sri Lanka	-17%	4%	6%	14%	
Vietnam	-6%	-2%	3%	5%	-6%
Latin America					
Brazil	38%	17%	46%	16%	45%
Haiti	-20%	-12%	2%	-7%	-4%
Guatemala	2%	3%	5%	6%	2%
El Salvador	0%	0%	0%	0%	-2%

* Pegged to the Euro

Source: Calculated from data in IMF, *International Financial Statistics*

More volatile and generally higher outlook for agricultural commodities and input prices

In mid 2008 a sharp reversal in commodity price trends that very few had forecast occurred. High prices over 2007 and 2008 had driven record supply response and forced demand to adjust (ERS, 2009), repealing former low stocks to use expectations. Later on the looming economic recession, coupled with slowing income growth, an appreciating dollar and the crude oil price decline, have suddenly brought world prices down. The forces that brought this rapid decline in prices are the same as those identified as principal causes behind the earlier surge in prices. In developing countries depreciating exchange rates have helped to keep prices relatively high longer.

At the time of writing commodity prices remain well above pre-crisis levels and predictions seem to converge toward higher than 1996-2006 prices in the medium term (OECD and FAO, 2009; USDA, 2009; World Bank, 2009). Factors supporting those forecasts had previously contributed to the price inflation episode: biofuels production is likely to continue fostering persistently greater demand for grains and oilseeds and worldwide growth in demand for food commodities will certainly remain high once economies recover. Given both the recent spike in prices and expectation of continued high prices, social and financial consequences of this outlook are worth noting. Higher agricultural commodity prices and energy prices would mean higher food and import bills, worsened balance of payments, and the other effects to be delineated below that were impacting developing countries during the food crisis.

Some uncertainties remain, aggravated by the current global economic recession. In particular, to what extent prices will be more volatile in the future than they were before the food price spike is still unclear. As noted earlier, several studies warn that higher prices may lead to enhanced volatility as a result of speculation. The factors linking agricultural commodity prices more closely with crude oil prices and exchange rates increase uncertainty – rather than volatility per se. That is, it is not simply that higher prices mean higher variances in prices, but that expectations on mean agricultural commodity prices have become more difficult to forecast, and are linked more closely to variables (the crude oil price, macroeconomic performance worldwide, and exchange rates) that are especially difficult to forecast. Thus, factors that lead to the expectation of continued high food prices – energy prices, worldwide demand, and exchange rates – are critically dependent on the extent and trajectory of the global recession. Recently increasing oil prices have pushed corn prices up, as well.

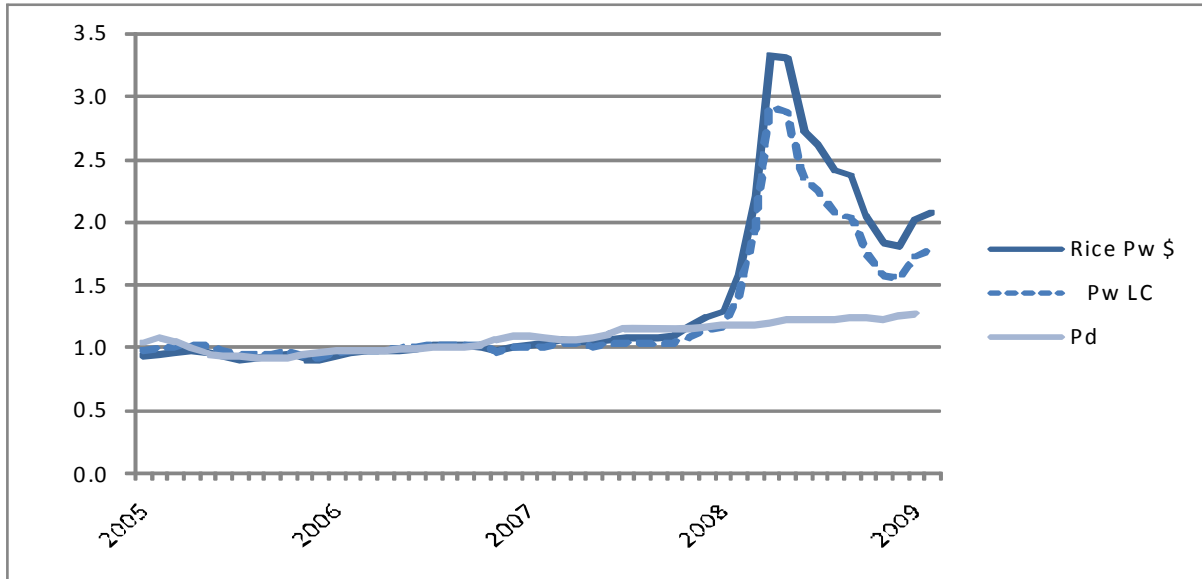
2. Impacts of international commodity price rise on African countries

International price increases may not be automatically reflected at the national level. Analyzing the impacts of international commodity price swings on domestic markets requires examining exchange rate developments and the extent of price transmission across borders. As explained earlier, exchange rate changes have played a significant role in determining in-country prices, depending on the exchange rate regime. Appreciation of a currency would mute world price increases, while depreciation would diminish the effect of declining world grain prices on border prices in local currencies. Figure 7 shows this in connection with assessing price transmission for the extreme case of wheat in Brazil, who experienced greater appreciation and then depreciation

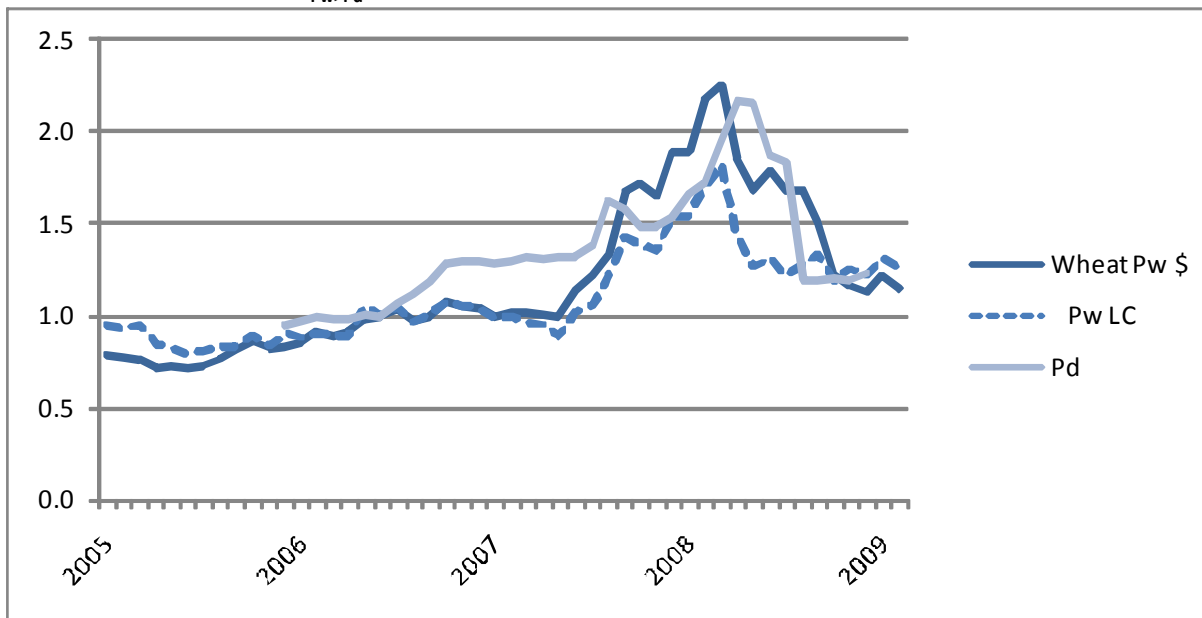
against the dollar by almost a factor of two relative to the Euro. Divergence between border wheat prices expressed in dollars, the top line, and in Real (Brazilian currency), by the next line, are evident. Figure 7 also shows the case of Chinese rice, reflecting the extent to which the Yuan was pegged to the dollar for long periods. As a consequence, prices in Yuan at the Chinese border followed more closely prices denominated in dollars, but price transmission across the border was quite small, nevertheless.

Figure 7 – Price and exchange rate transmission of world dollar prices to domestic prices, Chinese rice and Brazilian wheat

Chinese Rice -- $\epsilon_{Pw>Pd} = 0.15$



and Brazilian Wheat -- $\epsilon_{Pw>Pd} = 0.97$



Sources: Calculated from data in IMF, *International Financial Statistics*; FAO, GIEWS ; and Fulponi, OECD for food inflation collected from various national sources.

Domestic price trends also depend on the degree of border price transmission. Imperfect price transmission would result in either lags in transmission or incomplete adjustment. A number of economic and political factors may mute price changes when international prices cross the border or may disconnect internal prices between urban and rural areas. The extent to which international price changes are passed through to domestic prices depend on the degree of market integration of the country (linked to both its self sufficiency position and transactions costs) and on policy and trade measures both at the border and internally. The latter component will be explored later in the paper when studying the policy responses of African governments to the food price crisis.

Figure 7 also illustrates measurement of price transmission in two extreme cases. In China, the domestic price of rice was nearly unaffected by the surge in international prices, so the estimated price transmission elasticity is nearly zero (0.15). In the case of Brazilian wheat, domestic prices follow border prices closely, if with a lag in timing, yielding a price transmission elasticity very close to one. In general, a price transmission elasticity should be close to one when domestic and world markets move closely together, and borders are open. Closed borders, weak market integration and stabilization policy can all result in price transmission elasticities well below one.²

At the time of the food price escalation, the World Food Program (WFP, 2008a) for poor countries, as well as Blein and Longo (2008) and Daviron et al. (2009) for African countries specifically, provided elements to better understand conditions affecting the transmission of international prices to domestic markets. Their findings suggest that domestic prices have actually experienced an unusual rise - and some are still experiencing it - but that they only partially reflect the developments of international prices. Price transmission varied widely across countries, according to the dependence on imports, the availability of domestically produced food, the diversity of the diet and existing food substitutes on domestic markets, as well as the economic situation more broadly. Availability of non-traded food alternatives (including non-tradable grains such as millet and sorghum as well as roots and tubers), was especially important to determining the extent of transmission of border price changes to both domestic grain prices and food inflation.

Importantly, the degree of transmission of international prices also influences input prices. Many developing countries are net importers of fertilizer and crude oil. Costs subsequently may have increased at higher rates than the food bill. Unfortunately, good data on both domestic and

² A price transmission elasticity is the percent change in a domestic price of a good (P_d) in response to a one percent change in the border price (P_b) of that good. The border price is typically in domestic currency, so $P_b = e P_w$ where e is the exchange rate and P_w is the world price, in foreign currency (e.g. dollars). The simplest approach to estimating this parameter is to regress P_b on P_d in the specification $P_d = b_0 + b_1 P_b + \epsilon$. Variants on this specification are common, especially to sort out lags in the timing of transmission (see Daviron et al. 2009 for a discussion of this methodology). Unfortunately, specifications have not been pursued to sort out the effects of trade or domestic policy versus weak market integration in explaining imperfect price transmission.

international fertilizer prices is lacking. Consequences for farmers are diminished incentives to produce when input prices rise faster than output prices. As a result, observed policy measures also tried to mitigate the transmission of higher input prices to domestic markets, with more or less success. Fertilizer subsidies were common policy responses, and a large part of the FAO's Soaring Food Price Initiative.

Highly variable transmission to domestic commodity prices and food inflation

Using international commodity prices, exchange rates (to convert world prices to local currency) and domestic commodity prices, simple regression calculations have been undertaken to assess price transmission from international grain prices to domestic prices in a selection of African countries. We also determined net border and domestic price changes at key dates during the recent run-up and subsequent down-turn of the recent food crisis. Findings highlight that African domestic grain prices did not fully reflect world price changes, but experienced a certain eventual rise in domestic commodity prices and food inflation – a rise that persists even after the reversal in international market trends in mid 2008. In our discussions with those exploring price transmission, particularly in Africa, many noted that food crises existed in several countries independent of world market events. Subsequent graphs (Figures 8-11) show divergences in domestic impacts across countries, with the degree of divergence varying according to exchange rate changes and the extent of price transmission (See Annex Table A1 for the extensive analysis). Lags are quite evident in the response of domestic prices to border price changes.

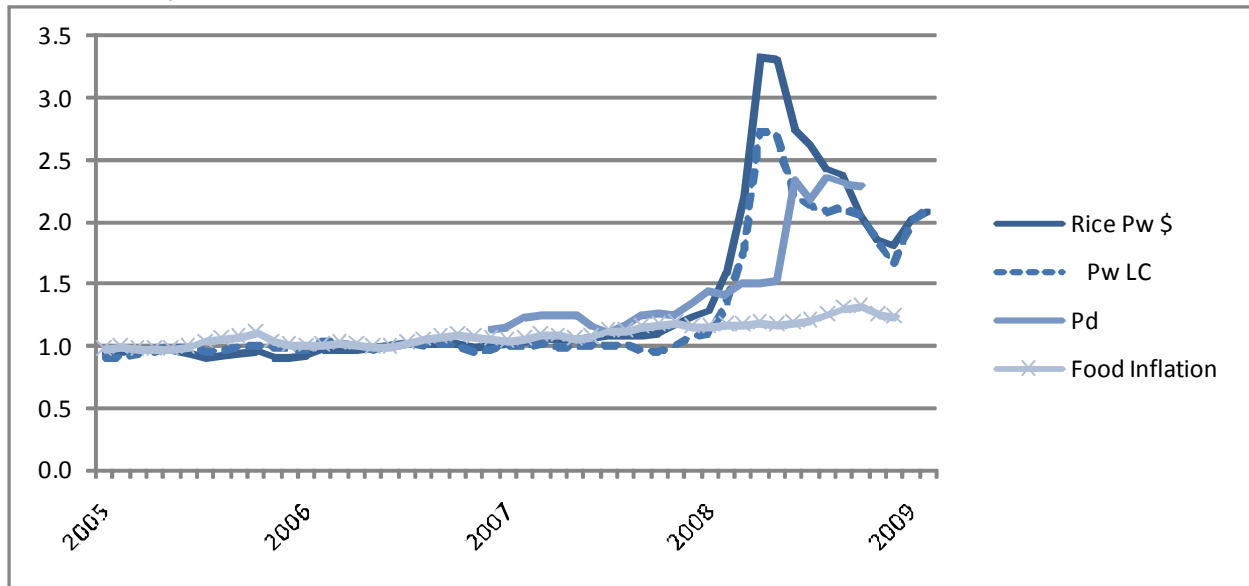
Results from estimating price transmission elasticities show a few countries where prices seem closely linked to world markets (Nigeria, Ethiopia). There are also intermediate results, suggesting that lags and pressure from world prices matter, but domestic market institutions resist pressures from world prices. They also show divergences across commodities within a country. It was not uncommon to find much greater price transmission for a highly tradable commodity in a country (e.g. rice) than is found for products that are essentially home goods (e.g. millet or sorghum). These behaviors, and the extent of price transmission, are highlighted in Figures 8 and 9 for rice and millet or sorghum in Senegal and Burkina Faso and are also found for Niger and Mali. Ethiopian wheat (Figure 8) exhibits a case where price spikes are somewhat independent of (much behind and greater than) international price changes, suggesting apparent transmission may be an artifact of coincidence of short time series data showing a domestic shortfall, or they may be exhibiting both long lags and overshooting. Malawi also exhibits a pattern that at least demonstrates long lags in the transmission of world prices across borders (Figure 9). There are contradictions to these generalizations (e.g. Nigeria for millet and sorghum), reflecting the fact that this methodology depends on very short times series for price data, and does not take into account domestic market conditions. Moreover, even when transmission is strong, prices may only partially adjust to the extreme changes in world prices.

Results tend to confirm previous study findings, notably that import dependent countries have higher price transmission rates and are consequently more severely impacted. This is the case for rice in Senegal, Mali, Burkina Faso, Niger, Malawi and Ghana, sorghum and millet in Nigeria, maize in Malawi and Uganda, and wheat in Ethiopia. Moreover, domestic production status has also contributed to determining the degree of price transmission: Niger and Mali consume mostly

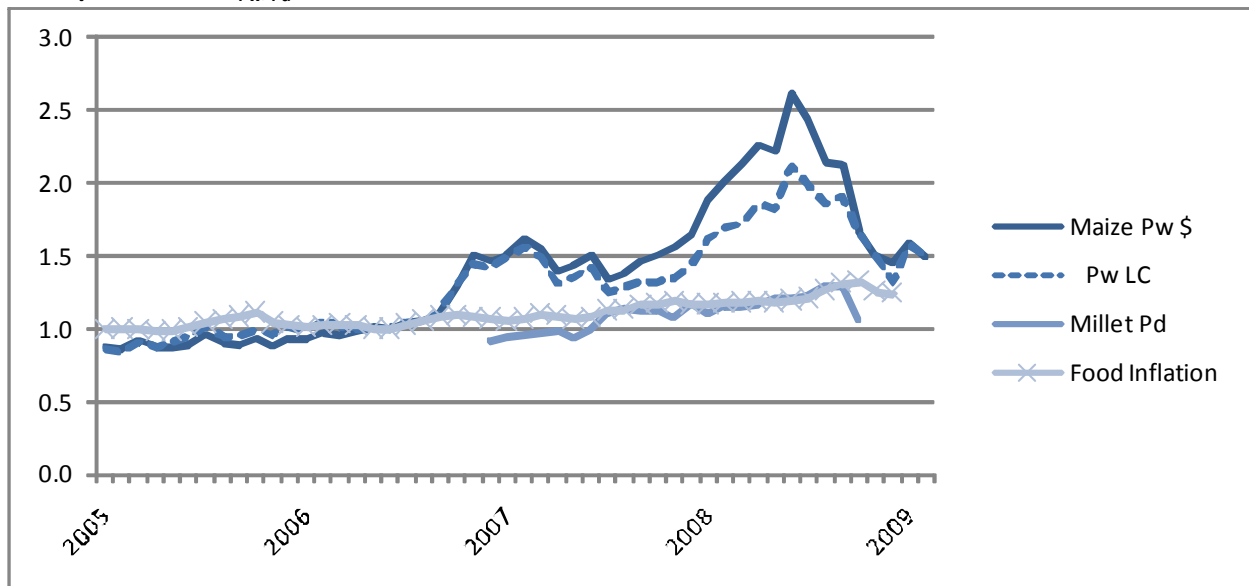
sorghum and millet, most of which is home produced. This partly explains the very low level of price transmission for these commodities.

Figure 8 - Price and Exchange Rate Transmission of World \$ Prices to Domestic Prices and Food Inflation, Senegal

Rice -- $\epsilon_{Pw>Pd} = 0.53$



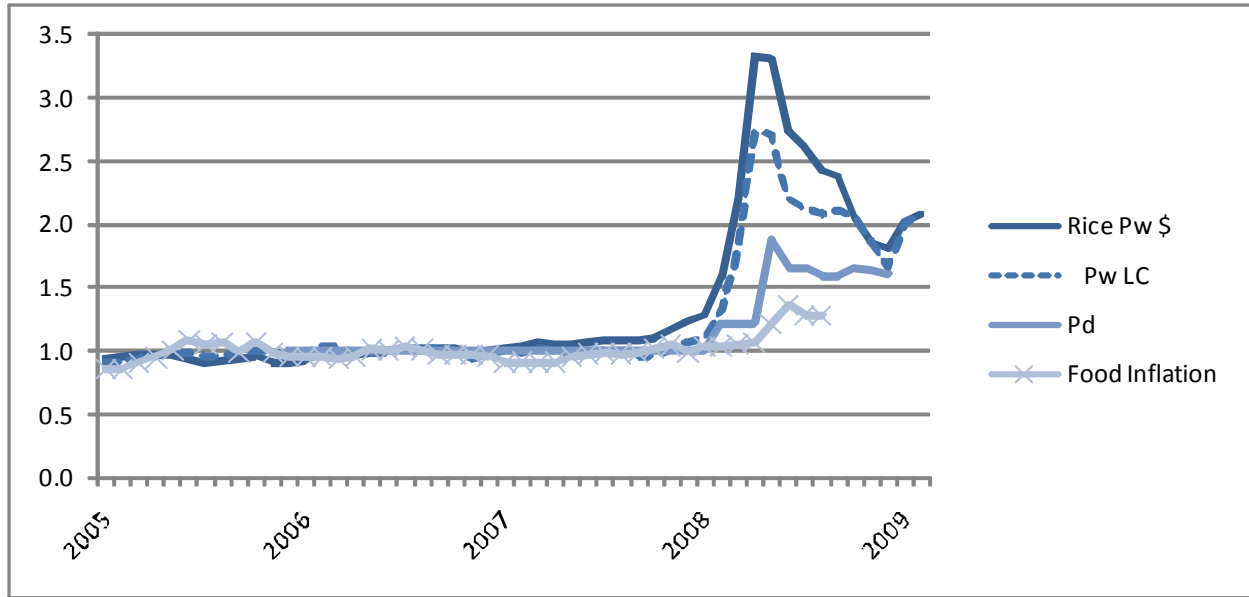
Maize/ Millet -- $\epsilon_{Pw>Pd} = 0.28$



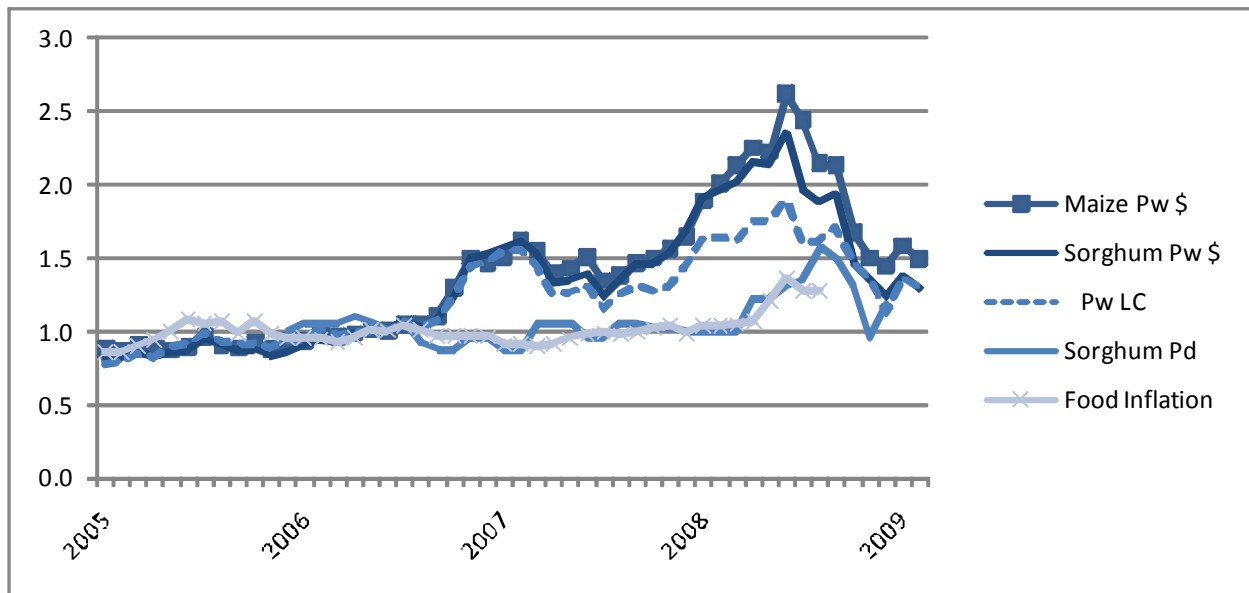
Sources: Calculated from data in IMF, *International Financial Statistics*; FAO, GIEWS ; and Fulponi, OECD for food inflation collected from various national sources.

Figure 9 - Price and Exchange Rate Transmission of World \$ Prices to Domestic Prices and Food Inflation, Burkina Faso

Rice -- $\epsilon_{Pw>Pd} = 0.45$



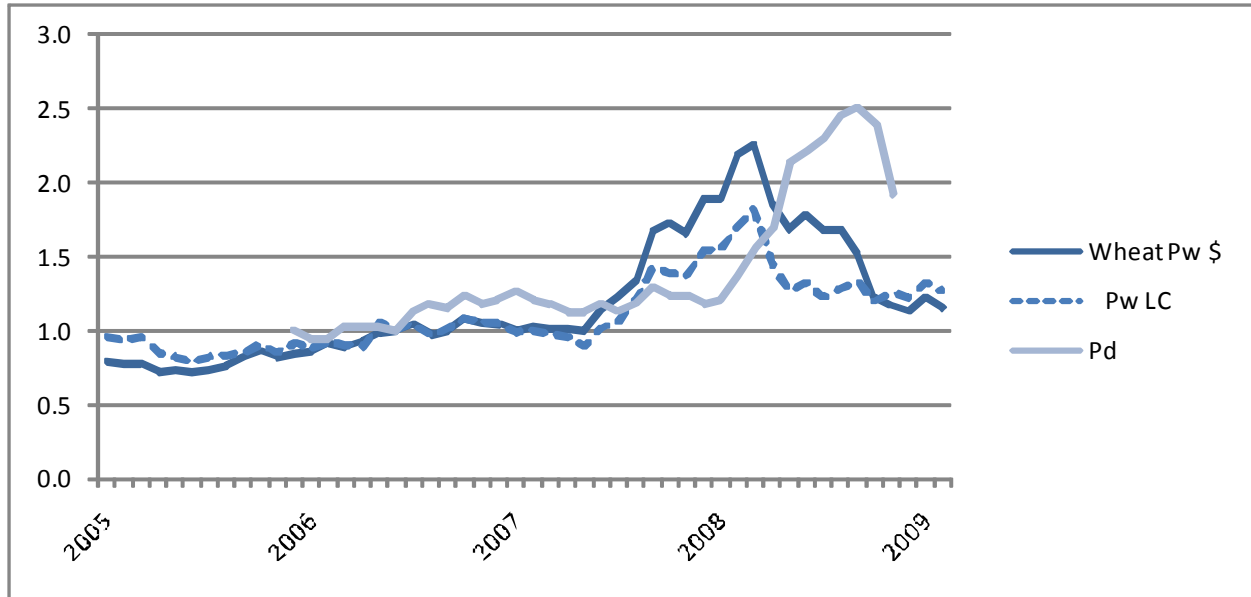
Maize and Sorghum -- $\epsilon_{Pw>Pd} = 0.30$



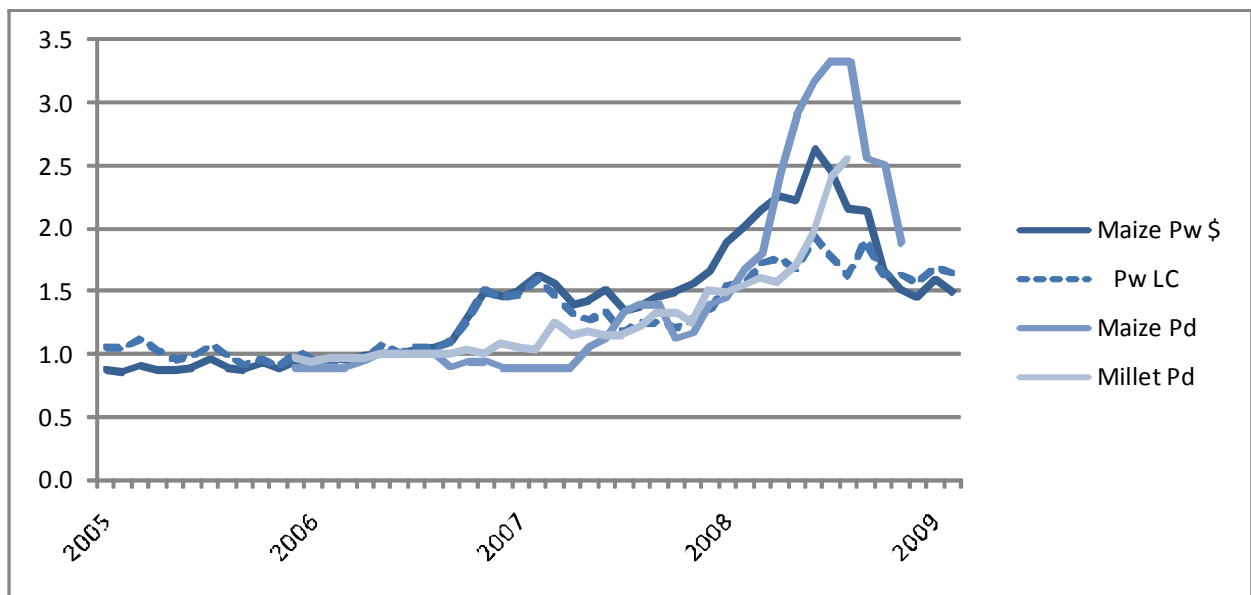
Sources: Calculated from data in IMF, *International Financial Statistics*; FAO, GIEWS ; and Fulponi, OECD for food inflation collected from various national sources.

Figure 10 - Price and Exchange Rate Transmission of World \$ Prices to Domestic Prices and Food Inflation, Ethiopia

Wheat -- $\epsilon_{Pw>Pd} = 0.79$



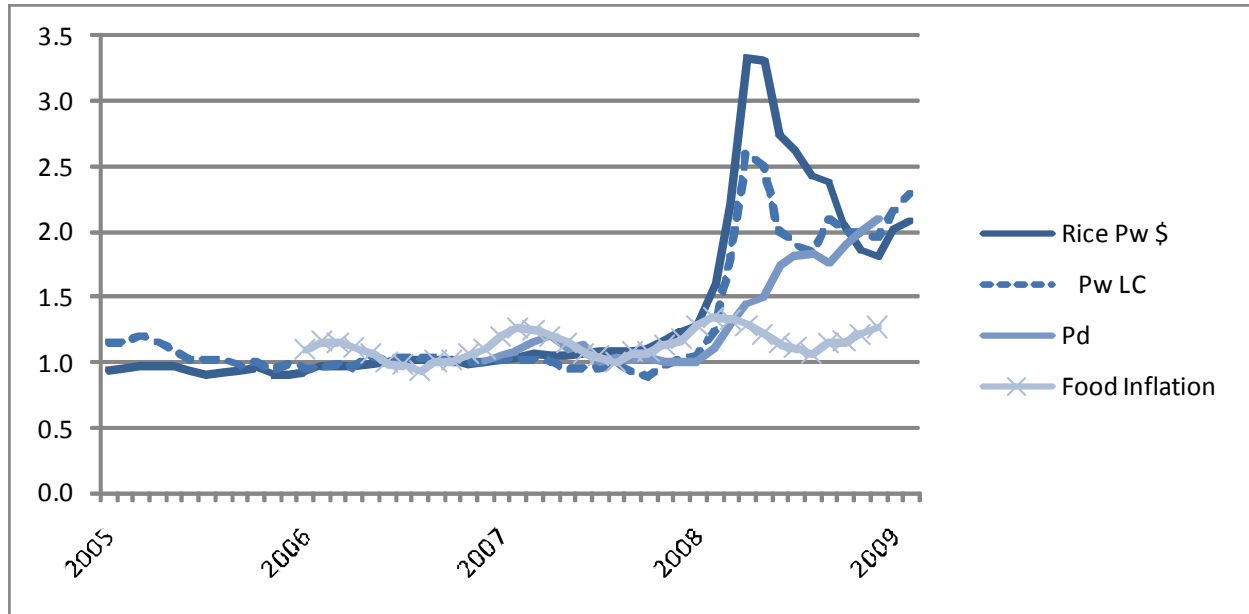
Maize and Millet -- $\epsilon_{Pw>Pd} = 2.03, 1.03$



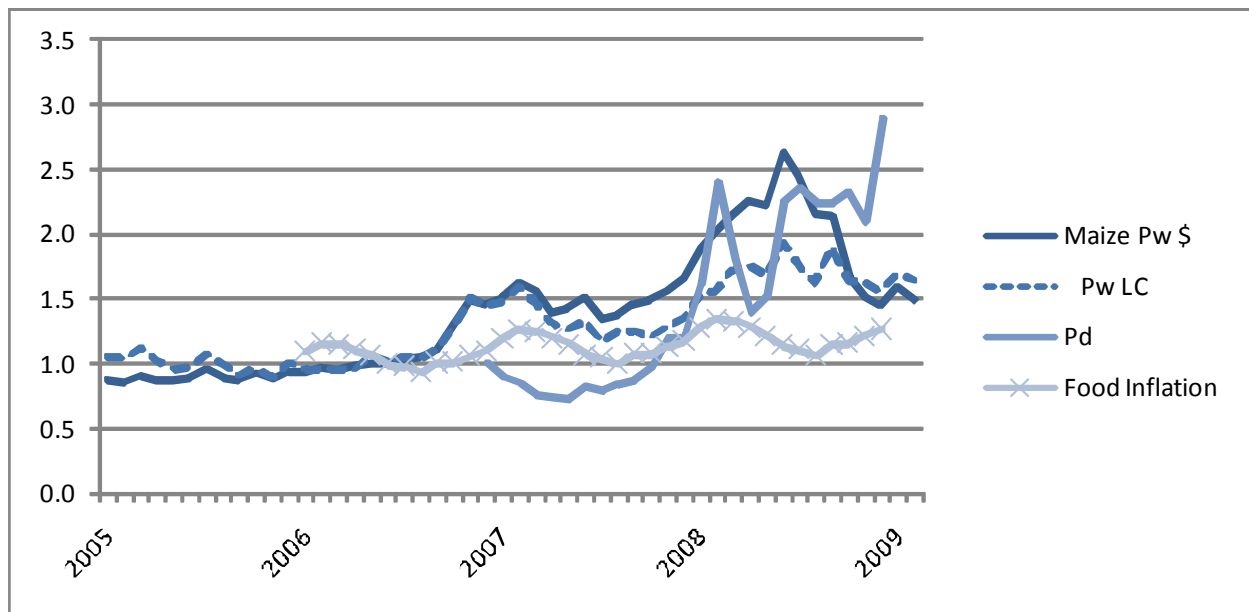
Sources: Calculated from data in IMF, *International Financial Statistics*; FAO, GIEWS ; and Fulponi, OECD for food inflation collected from various national sources.

Figure 11 - Price and Exchange Rate Transmission of World \$ Prices to Domestic Prices and Food Inflation, Malawi

Rice -- $\epsilon_{Pw>Pd} = 0.55$



Maize -- $\epsilon_{Pw>Pd} = 2.25$



Sources: Calculated from data in IMF, *International Financial Statistics*; FAO, GIEWS ; and Fulponi, OECD for food inflation collected from various national sources.

Exchange rate variations had the effect of muting border price changes as commodity prices boomed, keeping local prices high as world prices fell. They help to explain why prices remain high in many African countries, as the previous discussion on depreciating African currencies emphasized. Figures 8-11 show the different paths followed by border prices expressed in dollars versus local currency, influencing the lagged adjustment of domestic prices and resulting in prices that in many instances remain higher than before the crisis.

Food inflation data offers a further understanding of in-country impacts of high international commodity prices. Many developing countries experienced double-digit food price inflation and African countries are not an exception as illustrated in last year's OECD-FAO Agricultural Economic Outlook (OECD and FAO, 2008). Rapid food inflation in Africa included: Botswana (18.3 percent), Kenya (24.6 percent), Senegal (10.9 percent) and South Africa (13.6 percent). The exceptionally high rates of inflation in developing countries, notably relative to what has been observed in developed countries, is explained by a higher share of staples in consumer diets and lower capacity of marketing margins to absorb rather than pass on costs to consumers.

Furthermore, the food inflation data corroborate the price transmission findings in the sense that increases in international prices were only partially transmitted to consumer food costs, with great variability in the degree of transmission. In Figures 8 and 9 for Senegal and Burkina Faso, it is evident that food inflation followed more closely the lesser affected home goods (e.g. millet or sorghum), rather than the imported good (rice). Figure 11 shows in Malawi food inflation at rates much lower than grain price increases, even if food inflation is high. Availability of other calorie sources, notably roots and tubers, also limited food inflation in some instances. (Data in Annex Table A1 also suggest food inflation increases at a slower rate than did imported cereals costs in most cases.)

Worsening macroeconomic environment

Alongside the differences among countries, food inflation and the costs of policy responses had a tendency to contribute to varying degrees to deteriorating macroeconomic conditions. In the case of perfect price transmission (i.e. no policy intervention, open borders and low transactions costs) increasing food prices would spill over into higher general inflation rates. Especially in developing countries, where food represents a large share of consumer expenditures, it fueled changes in the consumer price index. Between February 2007 and February 2008 4.4 percent of overall inflation in Senegal was attributed to the food price increase, and up to 12.4 percent in Kenya, while in the cases of USA, France, UK or Japan this contribution did not go beyond 0.8 percent (OECD and FAO, 2008).

Rising international commodity prices had mixed impacts on the balance of payments of developing countries, depending on the net trade situation. Both food and oil imports have become more expensive, whereas some commodity exporters have benefited from the commodity boom. The fact that export prices for African export commodities increased less than grain or oil prices means in few cases did this increased export revenue offset much of the oil or grain import costs. The one set of countries that surely did benefit were energy exporters. Table 2 illustrates the IMF's estimated impacts of commodity price changes on balance of payments in sub-Saharan countries between 2007 and 2008. Results show that food import costs have

increased for all countries, amounting to an additional 0.1 (Zambia) to 4.5 (Liberia) percent of GDP. But for most countries, oil dependence has even further contributed to balance of payments problems. The IMF (2008) emphasized that oil price increases and consequent balance of payments effects had bigger macroeconomic consequences than did food price increases (whereas the high food prices had a bigger impact on the poor, however). On the other hand, oil producer countries have experienced a positive impact due to higher international prices, leading to huge increases in national reserves of these countries.

Mitigating policy measures to protect domestic consumers (e.g. tariff and tax cuts, consumer subsidies) have come at a cost, reducing government revenue and depleting public budgets. Developing countries which implemented isolating measures have faced reduced “fiscal space” in the sense that these measures preclude alternative expenditures. For those who let world prices cross borders, enhanced food inflation, poverty and hunger resulted.

Aggravating hunger and poverty

Looking at the social dimensions of food inflation, income and welfare are also adversely affected. In developing countries where food expenditure shares are relatively higher than in developed countries, rising food prices are likely to substantially erode consumer income. Literature shows that an increase in agricultural commodity and food prices hit first net buyers of food, be they in urban or rural areas (Ivanic and Martin, 2008), and the poorest people - whose food share of expenditures are biggest (OECD and FAO, 2008). Recent declarations from the international community claimed that the food price episode had pushed millions of people into hunger and poverty: FAO (FAO, 2008) and USDA (Rosen and Shapouri, 2008) respectively estimated 75 million and 133 million additional hungry people due to this crisis. The World Bank announced that 105 million more people have fallen under the extreme poverty line (World Bank, 2008). The WFP anticipated that high food prices would push 130 million people deeper into poverty and hunger (WFP, 2008b).

Many international organizations and NGOs have long advocated in favor of higher food prices to help developing countries get out of poverty – and the World Bank’s *World Development Report 2008* recently reinforced the belief that poverty was a rural phenomenon (e.g. in sub-Saharan Africa 200 million extremely poor people live in rural areas, while 50 million are in urban areas). They argue that most people in developing countries depend on agriculture for their living: higher prices would therefore increase their income and facilitate poverty reduction. This benefit is obviously conditioned by the degree of price transmission to rural productive areas in developing countries and raises concerns on the ability of farmers to make the appropriate investments and production plans in response to higher prices. A related concern is that many in rural areas, even farmers, may be net buyers of food, so their welfare also declines with higher food prices. Mixed results in the poverty impact literature are found due to this effect – but cases where the high food prices led to poverty reduction usually occurred in the few cases where most farmers are net sellers (Ivanic and Martin, 2008). Although household surveys and price change

studies are needed to get better estimates, one can say with certainty that the food price crisis has increased the share of poverty in urban areas.³

Table 2 - Balance of payments (BOP*) impacts of commodity price increases in sub-Saharan Africa

	Food	Oil	Other Commodities	Total Shock	Reserves Change %
Low Income Countries					
Ghana	-2.3	-8.1	-5.5	-4.9	-49.6
Kenya	-0.8	-3.6	0.3	-4.2	-38.8
Tanzania	-0.9	-4.6	1.7	-3.8	-35.1
Mozambique	-1.1	-3.1	0.5	-3.8	-24.3
Zambia	-0.1	-2.7	-0.1	-2.9	-28.8
Rwanda	-0.4	-2	0.3	-2.2	-14.4
Sao Tome & Principe	-0.4	-2	0.3	-2.2	-8.9
Senegal	-1.5	-4	0	-5.5	-39.4
Uganda	-0.7	-2.1	0.8	-2	-12.3
Niger	-0.7	-0.8	36	2.1	-12.1
Cote d'Ivoire	-1.1	2	2.1	3	9.3
Liberia	-4.5	-11.1	0.3	-15.3	-96
Guinea Bissau	-1.1	-7.6	0	-8.8	-31.5
Eritrea	-2.4	-6.1	-0.1	-8.8	-407.7
Togo	-0.4	-5.6	0.6	-5.5	-33.6
Comoros	-2.7	-2.9	-0.9	-6.5	-24.7
Malawi	-0.8	-2.9	-1	-4.7	-58.2
Ethiopia	-0.8	-2.6	0.4	-3	-71.7
Burkina Faso	-0.3	-2.7	0.5	-2.5	-22.1
Mali	-0.6	-2.9	5.4	1.9	-22.4
Oil Exporting Countries					
Cameroon	-0.7	5.3	0.5	5.1	35.4
Nigeria	-0.7	16.1	0	15.5	49
Chad	-0.3	22.8	0.5	23	179.9
Gabon	-0.3	26.1	0.1	26	258.8
Congo	-0.6	33.1	0.1	32.6	126.5
Angola	-0.5	37.7	0	37.2	188.6

* The BOP impact is calculated as the trade balance change resulting from changes in the terms of trade for each low-income country in SSA. It measures the effect of the expected increase in prices of exports and imports in 2008 compared to 2007, taken as given the 2007 volumes of trade, as a share of GDP. The oil prices used in the calculations are \$71.1/barrel in 2007 and \$112/barrel in 2008.

Source: IMF Africa Department, 2008.

³ Poverty and hunger impact estimates are generally taken from model projections, and require strong assumptions on both income distribution and price changes. More recent household survey data is needed to corroborate these findings and determine the extent of poverty and hunger realized from this crisis.

Low incentives for supply?

One concern expressed in the high food price debate is that developing countries farmers have been excluded from the opportunities by the policy responses taken. Some have argued that worldwide supply response has been mostly from exporters. In rural areas, where markets are allegedly less connected to international markets due to poor infrastructure and information, incentives for farmers to respond to high food prices are likely to be lower. However, massive supply responses from all over the world have been observed from 2006 (FAS, USDA). Table 3 reports grain production growth rates for major exporters and developing country regions since 1970, with detailed annual results for the years surrounding the current crisis. World grain production grew impressively by 10.3 percent per year from 2006 to 2009, pulled up by major exporters such as Canada, Brazil, the European Union and the United States. Developing countries have also increased production, with Sub-Saharan Africa experiencing a 13.9 percent growth rate over this same period of time. These good results suggest that despite weak market integration and isolating policy measures, the food price boom has actually provided incentives for many producers.

African production data is somewhat difficult to interpret. After three decades of low production growth rates, African grain production grew at 3.9% per year from 2000 to 2005. Especially strong growth in 2005-06 was followed by a continuation of the earlier trend. While the high prices of 2007-08 may not have accelerated production, this unusually strong growth did not diminish during this food price crisis, and it is unlikely that more rapid growth would have occurred.

Table 3. Grain production – Annual growth rates (percent per year)

	1970-80	1980-90	1990-2000	2000-05	2005-06	2006-07	2007-08	2005-08
World	2.9%	2.2%	0.4%	1.8%	-0.8%	5.8%	5.1%	3.3%
Major exporters	3.6%	1.5%	0.8%	1.0%	-6.4%	11.5%	4.5%	2.9%
United States	3.7%	1.5%	0.9%	1.3%	-7.6%	22.8%	-2.8%	3.3%
European Union	3.5%	1.4%	-0.1%	0.5%	-5.8%	-2.4%	21.1%	3.6%
Argentina	3.4%	-2.6%	5.0%	-1.0%	26.3%	1.9%	-39.0%	-7.7%
Brazil	4.8%	1.1%	3.9%	2.0%	10.9%	16.2%	-7.7%	6.0%
China	3.7%	4.0%	0.0%	1.5%	6.2%	1.0%	5.6%	4.2%
India	2.1%	3.2%	2.1%	0.2%	1.0%	8.5%	0.9%	3.4%
Africa	2.6%	1.3%	1.8%	4.4%	9.6%	-1.5%	3.7%	3.9%
North Africa	1.9%	3.3%	0.0%	5.9%	19.1%	-18.1%	3.6%	0.3%
Sub-Saharan Africa	2.8%	0.8%	2.3%	3.9%	6.8%	4.1%	3.8%	4.9%

Source: FAS, USDA, Production, Supply and Distribution Online. Accessed March, 2009.

<http://www.fas.usda.gov/psdonline/psdQuery.aspx>

If agricultural receipts have increased, the rise in input prices that accompanied high commodity prices may have simultaneously aggravated costs to farmers. To what extent has the price episode made African farmers better off in terms of net revenues? Import dependence is often greater for energy and fertilizer than for grains, and therefore the input price rise may have been more fully transmitted to domestic markets. Inputs are generally traded on commercial rather than traditional markets, as opposed to agricultural commodities, and so are more connected to international markets. Eventually, impacts of these food and input price increases on farmer revenues could be negative. On the other hand, input markets are often state-managed or oligopolistic in Africa, price transmission is therefore likely to be lower. Many of the policy responses, and efforts to foster more rapid agricultural development, have subsidized fertilizer use, muted price transmission, or even delivered supplies to countries. In any case the use of modern inputs is relatively low now in Africa (Bertini and Glickman, 2009), possibly little impacting farmers.

Policy responses in Africa

As in other developing countries, African economies have massively resorted to policy actions over the past two years to mitigate the impacts of the food price crisis. The FAO surveyed 81 countries in December 2008 to determine what had been done by national governments in response to this crisis. Table 4 presents the measures taken by the 33 African countries surveyed. African countries, like other developing countries, frequently made use of trade measures to isolate domestic markets from international price spikes. While some countries restricted or banned exports most of African governments favored tariff reductions on imports, given their trade status. Interestingly, not only exporting countries, but also importing countries, made use of export restrictions to prevent food from crossing borders in anticipation of a reversal of trade flows as domestic producers were attracted by high international prices. Many countries also implemented short term domestic measures aimed to protect consumers broadly (cash transfers, food subsidies, stock releases, reductions of taxes, price controls...) or compensate farmers (mainly through production support).

The pattern of policy responses in Africa is broadly consistent with measures taken on other continents. In Africa, Asia and Latin America, over half of the countries surveyed utilized trade policy measures (Annex Table 2 looks at the prevalence of each measure across Africa, Asia and Latin America.). Broad domestic measures, such as tax cuts or administered prices, were somewhat more prevalent in Africa than elsewhere. Safety nets were more prevalent outside Africa, with a strong concentration of cash transfers in Latin America where institutions to implement these safety nets already existed.

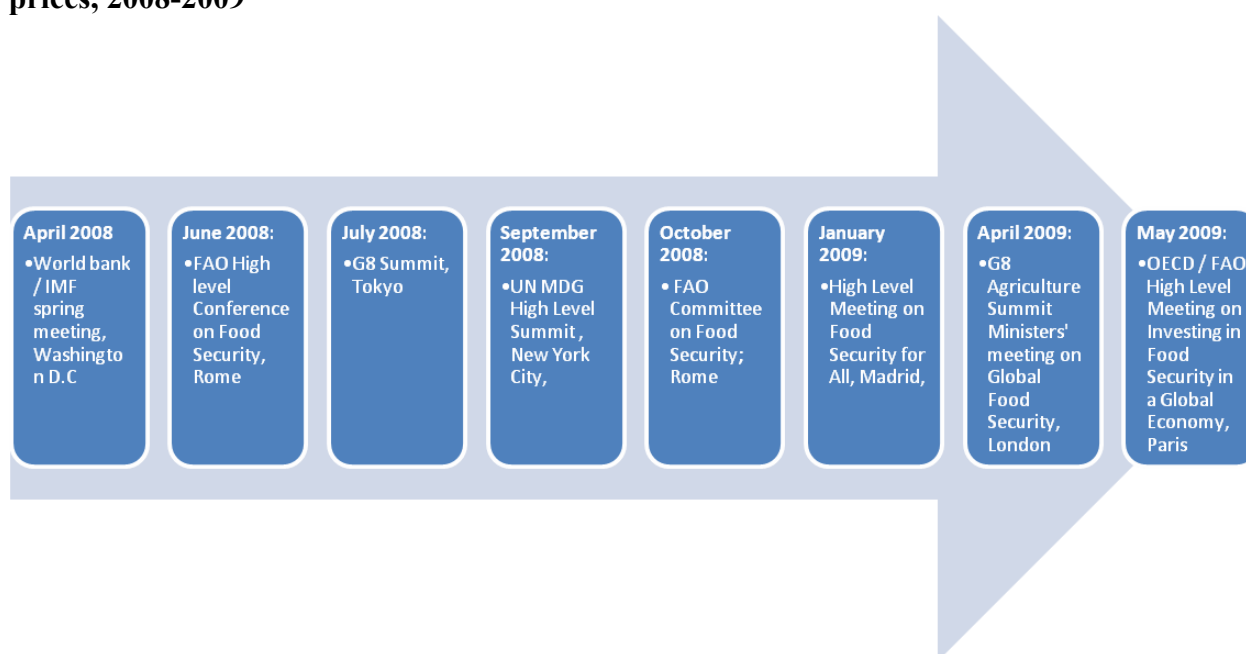
Table 4 – Examples of policy responses to the food crisis in 33 African countries

	Market Interventions				Production support			Consumer safety nets		
	Trade Policy	Domestic market measures			Production support	Production safety nets	Fertilizer and seed program	Market interventions	Cash transfers	Increase disposable income
	Reduction of tariffs and customs fees on imports	Restricted or banned export	Suspension or reduction of VAT or other taxes	Released stocks at subsidized prices						
Algeria				x	x			x		
Angola										
Benin	x			x	x					
Burkina Faso	x		x		x		x		x	
Cameroon	x	x		x						x
Cape Verde	x									
Central Afr. Rep.					x					
Congo			x							
Djibouti			x	x				x	x	
Egypt		x		x				x	x	x
Eritrea				x						
Ethiopia		x	x	x				x	x	x
Gambia	x									
Ghana	x				x					
Guinea	x	x				x				
Ivory Coast	x		x							
Kenya	x	x	x	x		x				
Lesotho			x							
Liberia	x				x	x			x	
Libya	x									x
Madagascar	x		x		x	x				
Malawi		x		x						
Mauritania	x			x						
Morocco	x		x							
Mozambique			x						x	
Niger	x									
Nigeria	x			x	x		x			
Rwanda	x									
Senegal	x		x	x						
Seychelles					x					
Sierra Leone				x						
South Africa									x	
Sudan			x							
Tanzania		x				x				
Togo				x						
Tunisia					x	x	x	x		
Uganda			x				x			
Zambia		x					x			

Source: authors' compilation, adapted from Demeke, Pangrazio and Maetz, 2008

In early 2008 international donors had already voiced concerns with the adverse consequences of rising prices for developing countries. Global commitment from the international community has triggered two types of outcomes since then. On the political front bilateral donors and international organizations have revived policy dialogue and promoted new partnerships and frameworks for better coordinated action and enhanced aid effectiveness. This gave birth to a series of initiatives over 2008 and 2009 focusing on food security issues, encompassing food aid, safety nets and efforts to promote agricultural production. Importantly, a wide range of earlier calls and commitments from donors and international agencies since the new century (notably the 2000 Millennium Development Goals, the country Poverty Reduction Strategy Papers, the 2004 Maputo Declaration, the World Bank's *World Development Report 2008* on agriculture, the 2005 Paris Declaration and 2008 Accra initiative), showed a renewed interest in agricultural development and its role in poverty reduction, as well as the impetus for donor cooperation, which have dominated international discussions. Figure 12 indicates the various high level meetings that have taken place since April, 2008 to foster that international dialogue in response to the current crisis.

Figure 12 – Timeline of international community high level dialogue to tackle high food prices, 2008-2009



Authors' compilation, adapted from various sources.

Global policy dialogue has been accompanied by enhanced donor commitments and proposals for greater funding of agricultural development. While consensus was found on allocating aid flows to both short term (safety nets) and long term (agricultural development) purposes, along the lines of the two prongs of the Comprehensive Framework for Action adopted by the UN High Level Task Force in July 2008, new funding programs have proliferated. Bilateral donors, international agencies and regional development banks have pledged hundreds of millions of dollars to both address the current crisis and prevent future food crises (see Table 5).

Table 5 – Global responses to the food crisis of 2008-2009

	Committed amount as of today	Framework	Purposes
United Nations			
WFP	1 billion dollar	755 million dollar Emergency Funding Appeal	Close the critical funding gaps in programs due to soaring food and fuel prices with additional commitments (WFP, 2008)
FAO	1, 7 billion dollar	Soaring Food Prices Initiative	Distribute seeds, fertilizer, animal feed and other farming tools and supplies to smallholder farmers (FAO, 2008c)
UN Central Emergency Response Fund	100 million dollar	Set aside of existing funds, announced at the 2008 Food Summit	Respond to the most immediate lifesaving activities in sectors directly linked to the effects of this crisis, namely food, food security and agriculture, health, and nutrition, for priority countries (UN, 2008c).
IFAD	200 million dollar	Reallocation from existing loans and grants	Provide an immediate boost to agricultural production in the countries in which it finances projects, and which were negatively affected by food price increases, through support to increased staple production by smallholder, family farmers and support to improve land fertility and sustainable land and water management (IFAD, 2008).
Development Banks			
World Bank	2 billion dollar	Global Food Crisis Response Program	Specific wide-ranging programs to the neediest countries, covering various areas as social protection, financial instruments and agricultural production (World Bank, 2009b).
African Development Bank	1 billion dollar	African Food Crisis Response	Reduce vulnerability of the poor to high and unstable food prices; support broad-based growth through increased agricultural productivity, strengthen government policies for sustainable agricultural development; and strengthen government capacity to ensure an enabling environment for sustainable agricultural growth, including private sector participation (AfDB, 2009).
Asian Development Bank	500 million dollar		Provide immediate budgetary support to member nations hit hardest by soaring food prices in Asia and the Pacific (ADB will increase its lending for agriculture and rural development to more than 2 billion dollar in 2009) (ADB, 2008).
Islamic Development Bank	?	1.5 billion dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries over five years (FAO, 2008c)
Inter-American Development Bank	2 billion dollar		(GDPRP, 2009)
Bilateral Donors			
European Union	1 billion euro	Food Facility Plan	Respond to growing food security problems in the 23 countries worse hit, over three years, through measures to improve access to agricultural inputs and services, other small-scale measures aiming at increasing agricultural production (microcredit, rural infrastructure, training...) and safety net measures (Europa, 2009).
France	?	1.5 billion dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries over five years (FAO, 2008c)
Japan	1,5 billion dollar	150 million dollar announced at the 2008 Food Summit	(GDPRP, 2009)
Korea	100 million dollar		(GDPRP, 2009)
Kuwait	?	100 million dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries (FAO, 2008c)
Netherlands	?	75 million dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries (FAO, 2008c)
New Zealand	?	7.5 million dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries (FAO, 2008c)
Spain	200 million dollar	773 million dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries over four years (FAO, 2008c)
United Kingdom	?	590 million dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries (FAO, 2008c)
United States	1.5 billion dollar	5 billion dollar announced at the 2008 Food Summit	Support agriculture in the poorest countries (FAO, 2008c)

Source: Authors' compilation, adapted from various sources.

African country governments' focus on stabilization

Variable success in stabilizing and isolating domestic markets has been observed across African countries. It is difficult to assess how much of the incomplete price transmission resulted from policy measures versus weak market integration – methods employed to date do not permit that. A better understood example from Asia illustrates this point. Rice export policy in China has clearly isolated the domestic market, bringing down price transmission to a very low level, but high transportation costs to outlying areas may mean in the absence of that policy border price transmission would still be low (see Figure 6). A limit to the efficiency of tariff reduction though stems from the structure of tariffs: African countries' tariffs are generally low as a result of the Uruguay Round Agricultural Agreement commitments and the past decade of structural adjustment programs (Dewbre and Borot de Battisti, 2007). This leaves little room for lowering further current rates and therefore limits the efficiency of such changes as a stabilization tool. Common external tariffs on grains of the several African customs unions are also relatively low, and the high world prices originated outside those unions. In those cases again tariff reductions are very limited as instruments to combat the extreme prices realized in 2008. If tariffs were the only policy adjustment available, their reduction from low levels could have only very limited impact on muting price transmission.

But both weak market integration and domestic policy adjustments also contribute to low price transmission. Nearly half of African countries implemented domestic measures, such as administered prices, tax cuts or released stocks. The former measure was likely to be ineffective or problematic if it ran counter to supply and demand drivers and was not accompanied by quantity adjustments. Stocks could influence supply quantity and therefore lower prices in weakly integrated economies only. Those are the countries that felt less the impact of high prices in any case. In well integrated economies stocks adjustment would affect the level of imports but not prices. But tax cuts and consumer subsidies are domestic measure that may also limit price transmission in a manner similar to trade policy. Domestic policy clearly mattered to transmission of high world prices across African borders, but again low prior taxes cannot explain the extent of diminished response seen in domestic prices or food inflation. That price transmission differed between highly tradable grains (rice and wheat) and home goods (millet, sorghum and even maize to some extent), means that weak market integration has played a significant role in muting international price increases onto domestic markets.

When governments implemented restrictions aiming to isolate domestic markets they simultaneously muted price signals to domestic producers. As a result, farmers would not gain from higher prices nor adequately increase production. However, our previous analysis of the supply incentives to and response of farmers has shown that 2005-2008 growth illustrates a strong supply response. Before concluding that policy measures have not been fully effective in mitigating international price swings, it is important to remember the potential role of input provision. Production support coupled with seed and fertilizer supply has been used by many African country governments as another type of observed response to the commodity price crisis.

Whether these observed measures were adequate policy responses deserves further attention. The difficult tradeoffs faced and conflicts between domestic and international outcomes demands that

trade policy research revisit old issues on stabilization policy – and that work needs to consider both domestic policy and market integration, not just border measures.

If some country cases have succeeded in protecting domestic markets in the short run, it is well known that isolating policy measures have the perverse effect of exporting price instability outside borders onto international markets (Bale and Lutz, 1979). As a consequence, exporting countries were strongly criticized as they implemented restrictive measures. Indeed, a large part of the extraordinary surge in rice price has been attributed to the export bans from several of the major exporters, namely India, Cambodia, Vietnam, Indonesia and China (Timmer, 2008). Most paradoxical is that tariff reductions used by many importers have been favorably received, since that change had been advocated by international trade institutions. But these were ad hoc policy responses with no intention or likelihood that they would remain after the high food price episode. Varying tariffs with world price also exports a country's instability – the original basis for this argument was the European Union variable levy. These trade measures reflect short term stabilization priorities for developing country governments as well as the lack of reliance on international trade. The more that countries choose to use such measures to stabilize their own domestic markets, the more unstable is the world market they face. A fundamental unanswered question is: Would the degree of stability offered by world trade have been sufficient had countries not adopted these isolating measures? Research on this is quite dated (Tyers and Anderson, 1992). That work also assumed perfect transmission after relaxation of border measures. Market integration and domestic policy also matter to the degree of international market stability that would occur under freer trade. Whether the stability realized even under those extreme assumptions is sufficient is a political issue that must be addressed in this debate.

Whereas the Doha Round was putting emphasis on development, completion of the negotiations as part of the solution to the crisis is now regarded with caution and suspicion by an increasing number of countries. Stabilization has been a major concern for developing countries in Doha negotiations and as this crisis revealed, recognizing this concern is essential for future international agricultural policy discussion progress. As of now, tariff reductions and export taxes or bans are not disciplined beyond reporting requirements in existing or proposed WTO agreements, and the only mechanism addressing the stabilization issue has been the safeguard proposal in July 2008. Safeguards were a key factor that stalled negotiations in 2008. Many think that the current Doha Round mandate is too limited to address issues raised in this crisis, but conversely, is not likely to worsen the situation.

International trade and financial institutions (such as the WTO, the OECD, the IMF...) are under scrutiny, and trust in international markets is at a low level, inhibiting efforts to coordinate country responses based on reliance on open trade. At the regional level, policy measures have followed their own path despite warning and guidelines from regional organizations. In Africa in particular, some countries have reportedly violated regional trade agreement commitments by closing borders. Simultaneously, calls for greater self sufficiency have come from around the developing world in response to this crisis. (e.g. La Grande Offensive pour la Nourriture et l'Abondance launched in April 2008 by the Senegalese president).

One major drawback of the short term stabilization policy responses observed in African countries relates to national government expenditures. Lowering tariffs or reducing taxes

inevitably reduces government revenues. When domestic market oriented support comes on top of trade measures (i.e. consumer subsidies, released stocks or reduced domestic taxes), especially when poorly targeted, it increases costs even further (Wodon and Zaman, 2008). Controversies on food stockpiling remain as well: this solution has been brought up by several developing countries and international agencies, despite long experience and literature warnings of its inefficiency and high costs. Well-targeted consumer support policies are more efficient and should be preferred (World Bank, 2008b; UNHLTF, 2008). Contrary to what has been widely observed in developing countries, domestic measures should focus on the poor specifically rather than consumers broadly.

Donors' twofold response on emergency and agriculture development

Whereas developing country governments have heavily concentrated their efforts on stabilizing domestic markets, donors have remained consistent with the strategy of alleviating hunger and poverty. This explained why aid flows have targeted emergency relief on the one hand and longer term broad development programs on the other hand. Some donors, led by the World Bank, have also supported national strategies, however, as they provided resources to rebuild public budgets depleted by lost border revenue and costly domestic support.

Food aid and emergency relief more broadly were applauded for being timely and substantive compared to the past. WFP, the traditional organization in charge of this type of aid, managed to attract historic amounts of commitments. Its appeal for 755 million dollars was oversubscribed to almost one billion dollars! However, the WFP points out that the 100 million people this food aid reaches are only a small share (10 percent) of people in need. Safety nets also emerged at that time as innovative tools to combat the impacts of higher food prices. Here again, targeting (i.e. directing resources to those with the lowest incomes and at greatest risk of malnutrition) is essential to ensure efficiency and cost effectiveness of this tool as well as allowing the broad economy to adjust to market signals.

Despite the number and diversity of emerging initiatives from donors, agricultural development was commonly agreed as a key objective for the medium to long term. Evidence from country cases and literature acknowledge that agriculture is essential for growth with poverty reduction (World Bank, 2007; OECD, 2006). However, controversies still fuel debates among donors on how to best spend committed funds. Input subsidy proposals, drawn from the Malawi case, have been often cited as a successful example to follow. That subsidy and delivery of fertilizer and credit to Malawian farmers have brought significant increases in input use and agricultural production there. What is less often stated is the counterpart high costs the government has to bear, and the extent to which that is financed by aid. Apart from the unsustainable characteristic of such a proposal, the main risk is that this does not address more fundamental concerns, namely missing markets and poorly functioning institutions. That is, rural credit and agricultural input market failures are well recognized, particularly in Africa (World Bank, 2007). But the nature of those failures is such that simply lowering their price will not bring sustainable, functioning markets. The interventions in Malawi and elsewhere may succeed where Western donations make up for those missing markets, but the concern is what will happen after that aid is withdrawn. Efforts in those projects work to create institutions that last beyond the aid project. These markets, particularly for export crops, were often lost as a result of privatization

initiatives. This implies recognizing that the state has an important role to play (and history proves that relying too much on the private sector can be counter-productive).

The fundamental underlying question raised is: what is the best strategy to develop agriculture? Much knowledge has been accumulated with some successes experienced in developed, emerging and developing countries. The green revolution model offers a package of required ingredients that has proved to lead to agricultural development (AGRA, 2009). They can be summarized as provision of public goods (i.e. agricultural research and extension, market information, infrastructure), functioning institutions and markets (notably input and credit, infrastructure, and market information), an enabling macroeconomic environment, and committed government. If the agronomic and economic components of the recipe can be reasonably achieved with the support of donors, the role of national governments is critical in the process and must be understood by the countries themselves.

The debate on targeting smallholders has also animated recent international discussions. More and more agencies and donors have highlighted the importance of small-scale farming in responses to the crisis, arguing that targeting smallholders can yield both poverty alleviation and agricultural productivity improvement. But some cost benefit analyses raise doubts on this being the most efficient solution. Moreover, this highlights potential conflict between donors' focus on poverty alleviation and the broader interests a national government must serve. Donors are clearly focused on the poverty alleviation goal, more so than both the potential effects of developing agricultural and addressing broad consumer interests. Agricultural progress must be part of a broader development strategy and must be envisaged in a dynamic context. It cannot leave out interest groups critical to a government's survival.

As a proposal to support this smallholder empowerment initiative, the Financial Coordination Mechanism (FCM) came out of the January 2009 Madrid meeting (Ad Hoc Advisory Group, 2009). Although details on the allocation and management of this new fund remain unclear, the FCM arose to explicitly address on-going debate on aid effectiveness and co-operation among donors. Quite ironically, whereas African representatives' participation in international debates was far from systematic, the role for the New Economic Partnership for African Development and the country ownership component of the Paris Declaration have been constantly stressed.

4. Lessons and policy implications for governments and donors

How to deliver aid and how to develop agriculture have been extensively studied and there is considerable experience over many decades. Policy advice must surely be drawn from these lessons, but should also learn from the recent food price episode in order to prevent or better manage future crises. However, some limiting factors persist on national and international fronts that retard agricultural development and more efficient policy responses.

Lessons from the crisis

The call for and delivery of food aid at the time of the food crisis has been timely and efficient, proving that past experience has allowed drawing lessons for better coordination and

organization of emergency relief. Safety nets have been at the center of high level dialogue and field implementation. Targeting of this aid has been highlighted both in the literature evaluating food aid (Barrett, 2002) and in reforms of food aid delivery. An improved understanding of their efficiency among national governments and donors has led to shared best practices, such as increased use of cash transfers and local procurement by the WFP.

In light of the knowledge accumulated on agricultural development, it seems clear that failures come more from political failure rather than from inadequate agronomic or economic understanding. Moreover, agricultural policies should fit into a broader, coherent national strategy: this requires coordination across sectors, reconciliation of short and long term responses, and integration within the regional frameworks. The crisis has further proved that individual isolationist policy responses can stabilize (at least somewhat) domestic markets, but those measures certainly are counterproductive on the international scene, exporting instability and potentially shrinking supply.

Nevertheless, the most revealing evidence is the supply response observed in developing countries. While it is unclear that will result in continuing high income for producers - and global assessments agree on the negative impact of the food price increase on poverty and hunger – it proves once again that agriculture in developing countries responds to incentives. Missing output markets lead to price collapse, to the benefit of domestic consumers, a problem that must be addressed in agricultural development initiatives. The rise in commodity prices has also highlighted the idea that missing credit and input markets prevent agricultural development success and that confined donor programs aiming to distribute fertilizers and seeds (Ad Hoc Advisory Group, 2009) are not enough to solve a deeper market failure.

Challenges and roadblocks to be overcome

Recent reviews of agricultural development assistance that preceded the recent food crisis (e.g. World Bank, 2007; Pardey et al, 2006) point to a number of roadblocks that could limit aid effectiveness. Each of these constraints highlights the important role that must be played by national governments in facilitating agricultural development.

Public goods in agriculture are still often underfunded, although they are known to be essential contributors to agricultural development: research and extension, infrastructure and information are all basic components of successes in the sector. Research has been recognized as a critical component of this strategy. One major challenge is to ensure that knowledge is adapted to local conditions through breeding, highlighting the importance of national research institutions. Another lesson is that better varieties require more intensive input usage, and markets to supply those inputs and sell additional output. Functioning markets and sustainable institutions are equally necessary to facilitating the creation and adoption of new technologies, lowering transaction costs for farmers and raising agricultural productivity. Elimination of parastatals as part of structural adjustment often brought quality deterioration, missing markets, risk management, and institutional problems in marketing.

At the national level, governments may lack human and resource capacity to implement and coordinate agricultural development strategies. More critical is the lack of interest and

commitment: national policy responses to the crisis have focused on immediate consumer protection through short term isolation and stabilization measures, whereas bilateral donors and international agencies have prioritized safety nets and agricultural development to reduce poverty. Disconnection between national governments' and donors' objectives undoubtedly retards development and renders aid less effective. Similarly, reconciling of national strategies and regional commitments with donor interests are keys to increasing the voice of African countries in international negotiations and to increased policy cooperation and aid effectiveness.

While some progress has been observed in commitment to coordinate donor support, controversies still fragment action and multiply initiatives. The search for cooperation and harmonization has revived debates on mandates and efficiency of international agencies and bilateral donors. Only long lasting and coherent commitments from donors to shared priorities (with national governments) can best support national strategies.

Summary and Conclusions

Dramatic increases in international agricultural commodity prices began in 2006 and peaked in mid 2008. An equally remarkable and rapid decline of those prices then ensued, accompanied by extreme volatility in those prices. The trend in food prices lagged the rapid increases in other commodity prices, including oil and metals, but accompanied those other prices in the downward part of the cycle. African agricultural export prices lagged even the grains.

The factors that have been offered to explain the price run-up also explain the subsequent downturn in agricultural commodity prices. Explanations have included supply and utilization events, competition for grains and oilseeds as food versus fuel, and financial factors such as speculation and currency changes that exaggerated prices measured in dollars. Interactions between these factors matter to the resulting outcomes, so specific contributions cannot be assigned. Moreover, debate persists on the exogenous mechanisms driving these changes, which are often interrelated (e.g. worldwide economic boom and then global recession, high oil prices, speculation in commodities). Nevertheless, low stocks to use expectations due to long run trends, the persistent new demand for biofuels and subsequent tighter link between agricultural and energy commodity prices, and macroeconomic factors expressed through exchange rate movements stand out as important causes behind these extraordinary events.

Country impacts of higher commodity prices varied widely depending on import dependence, the availability of domestic substitutes and the efficiency of policy responses. Although market integration is generally poor in developing countries, rising food and input costs have hurt consumers, governments and some farmers (evidence is mixed for this last category). Countries linked to world markets saw higher grain prices and food inflation. The subsequent impact on poverty and hunger is sometimes aggravated by worsened balance of payments and the macroeconomic environment for crude oil importing countries. This assessment was accomplished using new information on domestic and international price data and on estimates of the extent of transmission of world prices onto domestic markets for selected African countries.

Assessing the contribution of policy measures to imperfect price transmission would require additional tools and data, going beyond the objectives of this study. It is therefore unclear how successful policy responses were in isolating domestic markets, but it appears that domestic policy mattered as much as trade policy, and national governments massively implemented both options, pursuing a stabilization objective for consumers. The countries that had the capacity to use such tools faced high costs. Others saw rising world prices result in food inflation, poverty and hunger. Financial and macroeconomic situations are worsening as countries face the global economic recession bringing related contraction of demand. Depreciation of African currencies has helped to keep food prices high in spite of more recent world market trends.

Despite uncertainty due to current global economic turmoil, the future outlook is that commodity prices are likely to remain higher and more volatile than historical levels, providing a more conducive environment for agriculture development. For farmers to fully seize this opportunity, remaining challenges include establishing sustainable domestic market institutions (notably for credit and inputs) and functioning and predictable international markets. Instead of incriminating higher food prices, governments must envision the new outlook as a long term challenge. They need to turn away from the idea of cheap food and under-investment in agriculture. Key to this is recognizing that the state has a role to play and that national policies should be committed and time consistent. Our review of strategies to foster more rapid agricultural development highlights the critical role of political institutions to realize the benefits from improving agricultural and economic science. Lessons highlight public goods provision and institutional changes that governments need to foster. Coherence between national governments and donors is key to aid effectiveness, and partnerships that have emerged to address this crisis need to more effectively engage national governments.

Policy responses of national governments in Africa and elsewhere in the developing world contrasted sharply with initiatives recommended by the international community. International organizations, development banks and donors emphasized emergency relief and longer term agricultural development, whereas national governments heavily utilized stabilizing market interventions through trade and domestic policy.

Considering transition to a future of higher food prices, efforts should be made to reconnect short run (isolationist to protect consumers) and long run (effective to develop agriculture) policy strategies. Improved efficiency of policy actions requires enhanced coherence between beneficiary governments' and donors' priorities as well as increased integration and cooperation with regional activities. This will have to be done with budget constraints at the time when public finances from donors and developing countries are depleted by the global financial crisis and economic recession.

A number of directions for future economic research have been identified. Some methodological and analytical gaps remain and require attention if we are to understand further the impacts of such a crisis and draw policy recommendations for the future. Priorities can be seen to better understand the impacts on hunger and poverty as a result of actual experience and policy responses invoked, the extent to which those responses achieve domestic and international market stability, and whether the focus of subsequent agricultural development initiatives is proper.

Much of the current literature has addressed hunger and poverty impacts, utilizing models benchmarked to dated household surveys and based on strong assumptions on price changes. That work needs to be verified using more recent household survey data that encompasses this episode and well as actual price outcomes realized. Systematic comparisons could elicit how well alternative policy responses fared in mitigating impacts from this crisis.

The contrast of international responses with those of national governments highlights the need to better understand consequences of policy measures at both national and international levels. It also highlights the importance of market stabilization. Tightly linked is the price transmission issue: being able to evaluate lags in adjustment or incomplete transfers would be a useful indicator to anticipate in-country impacts of commodity price variations. More importantly, a more robust approach could eventually divide imperfect price transmission into the market integration and policy factors. That work could then be coupled with the household survey work, asking if safety nets adequately protect the poor should governments collectively rely more on free trade to achieve greater market stability. Both domestic market studies and studies of international markets under alternative policy regimes are needed. The medium to long run impacts of policy measures also needs to be considered in light of better information on price transmission and market integration, especially to rural areas.

There has been much work summarizing lessons learned from agricultural development experience. Two controversies that stand out in the current debate are the effectiveness of input subsidies and of targeting only small holder farmers. That work must ask if proposed interventions not only increase input use cost effectively, but also if interventions solve the institutional and missing market problems that exist. Work on effectiveness of targeting smallholders has to show whether ignoring a broader set of interest groups means this is as or less effective as an agricultural development strategy than as a poverty reduction strategy. The tradeoffs that must be faced by national governments in making these policy decisions need to be more openly and explicitly addressed.

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Annex Table A1 - Food Price Changes and Price Transmission in Africa

	Nigeria	Ghana	Burkina Faso	Mali	Niger	Senegal	Ethiopia	Rwanda	Uganda	Malawi	Kenya
Food Inflation											
June 2006 to June 2008			31%	15%	12%	16%				16%	
June 2008 to Dec 2008				-4%	15%	4%				12%	
Rice											
June 2006 to April 2008											
Pw in \$		225%	225%	225%	225%	225%		225%	225%	225%	
Pw in LC		152%	167%	152%	152%	167%		152%	152%	152%	
Pd		75%	21%	15%	21%	32%		53%	47%	45%	
April 2008 to Dec 2008											
Pw in \$		-46%	-46%	-46%	-46%	-46%		-46%	-46%	-46%	
Pw in LC		-25%	-39%	-25%	-25%	-39%		-25%	-25%	-25%	
Pd		0%	33%	10%	41%			-14%	-18%	45%	
€ Pw>Pd		49%	45%	22%	30%	53%		47%	38%	55%	
Sorghum/ Millet											
June 2006 to June 2008											
Pw in \$	118%		118%	118%	118%	118%	118%				
Pw in LC	77%		77%	77%	77%	77%	77%				
Pd	117%		25%	15%	6%	32%	94%				
June 2008 to Dec 2008											
Pw in \$	-47%		-47%	-47%	-47%	-47%	-47%				
Pw in LC	-40%		-40%	-40%	-40%	-40%	-40%				
Pd			-10%	-19%	0%						
€ Pw>Pd	93%		30%	3%	8%	28%	103%				
Maize											
June 2006 to June 2008											
Pw in \$	151%	151%			151%		151%	151%	151%	151%	151%
Pw in LC	84%	84%			84%		84%	84%	84%	84%	84%
Pd	147%	167%			68%		217%	60%	76%	124%	67%
June 2008 to Dec 2008											
Pw in \$	-45%	-45%			-45%		-45%	-45%	-45%	-45%	-45%
Pw in LC	-19%	-19%			-19%		-19%	-19%	-19%	-19%	-19%
Pd		-24%			-30%			-13%	-1%	29%	1%
€ Pw>Pd	120%	140%			43%		203%	34%	135%	225%	58%
Wheat											
June 2006 to March 2008											
Pw in \$					117%		117%				
Pw in LC					75%		75%				
Pd							39%				
March 2008 to Dec 2008											
Pw in \$					-50%		-50%				
Pw in LC					-33%		-33%				
Pd											
€ Pw>Pd							79%				

Sources: Calculated from data in IMF, *International Financial Statistics*; FAO, GIEWS ; and Fulponi, OECD for food inflation collected from various national sources.

Annex Table A2. Trade based policy measures commonly adopted worldwide (as of 1 December 2008)

	Africa	Asia	Latin America	Overall
Countries surveyed	33	26	22	81
Market Interventions				
Trade policy				
<i>Reduction of tariffs and customs fees on imports</i>	18	13	12	43
<i>Restricted or banned export</i>	8	13	4	25
Domestic market measures				
<i>Suspension/reduction of VAT or other taxes</i>	14	5	4	23
<i>Released stocks at subsidized prices</i>	13	15	7	35
<i>Administered prices</i>	10	6	5	21
Production Support				
Production Support	12	11	12	35
Production Safety Nets	6	4	5	15
Fertilizer and Seed Programs	4	2	3	9
Market Interventions	4	9	2	15
Consumer Safety Nets				
Cash transfers	6	8	9	23
Increase Disposable Income	4	8	4	16

Source: adapted from Demeke, Pangrazio and Maetz, 2008.