SAFEGUARDING FOOD SECURITY IN VOLATILE GLOBAL MARKETS

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Safeguarding food security in volatile global markets

Edited by Adam Prakash

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Chapter 18

Coping with food price surges

Christopher L. Gilbert and Alexandra Tabova[1]

Agricultural prices, along with the prices of primary commodities in general, were both high and volatile over much of 2006-10. These developments impact particularly acutely on the poor and other vulnerable non-farm households who devote a high proportion of their incomes to the purchase of food. Households are affected differently by changes in food price depending on their production and land ownership characteristics. In this chapter, we argue that the plight of vulnerable groups may fail to be apparent in aggregate statistics at the national level. In particular, a general improvement at the national level may occur at the same time that vulnerable groups suffer increased hardship from rising food prices. In designing policy responses to food price surges, governments and multilateral agencies must take into account the diversity of household situations and target policy at those most in need.

The summary argument is that compensatory finance schemes, aimed at offsetting temporary shortfalls in export revenues, have little relevance to the current period of high food prices as food-importing low-income countries do not primarily face a problem of lack of resources but instead wish to keep food prices, at least for vulnerable groups, relatively stable. Governments need to focus on reinforcing existing food security policies in which our preference remains for trade-based policies over national food stockpiles. Both the World Bank and the European Union responded to the 2006-08 high food price event plus financial crisis with useful short-term programmes, but these were based on the perception that the turmoil and crisis would be temporary. Instead, food prices are likely to remain high and volatile over the medium term. This calls for a different approach. We recommend that, where possible, this be based on a market approach to food security which would tend to reinforce trade-based food security policies and efforts to strengthen food markets where they are not working well (i.e. where government responses create disincentives for agribusiness investment). We recognize that other approaches may be required for countries importing foods where markets work poorly, rice being the obvious example.

The recent food price and volatility experience

An initial issue is whether we should be concerned by the level or the volatility of prices. These concepts are often confounded in popular discussion. Volatility refers to the variability

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of a price. As a matter of logic, it is possible for prices to be high but show little variability or to be low but variable. In practice, price levels and volatilities tend to be positively associated, in part because a low carryover from the past will reduce current availability, exerting upward price pressure, and will reduce the possibility of using inventory to meet positive demand or negative supply shocks, thereby increasing volatility (Gilbert & Morgan, 2010).[2] Typically, therefore, when prices are high they are also volatile.

High food prices erode the living standards of non-farm households. Volatile food prices result in these becoming vulnerable to such erosion. This erosion can be substantial for poorer households for whom food expenditure is the major budget item - a household with daily income at the poverty level of USD 1.25 per capita, spending 50 percent of its income on food and facing a 50 percent increase in food prices, will require a post-increase income of USD 1.56 per capita to purchase its original basket of goods. In most developing countries a large proportion of households will be only modestly above the poverty line and hence rises in prices of staple foods can substantially increase poverty. Volatile food prices are therefore of concern because they create the risk that more households will be brought below the poverty level.

Households will be affected differently according to their circumstances. Farm households will benefit from rises in world food prices and poor farm households may do so sufficiently to lift them out of poverty. As changes in food prices tend to be correlated with changes in the prices of non-food commodities, such as tropical export crops and metals, the same may be true of households engaged in these commodities - coffee or cocoa farmers and artisanal miners. While the overall effects of rising food prices may be complicated, the incidence will be adverse on urban households and on most landless rural households. We look at high food prices in the context of countries' terms of trade later in the chapter.

This discussion indicates that high and volatile food prices will impact most acutely on poor and other vulnerable non-farm households. While such households will be found in all economies, they will be particularly numerous in the poorest economies. For this reason, we focus on the impact of food price volatility on Low-Income Countries (LICs), as defined by the World Bank.[3]

World prices of grains and vegetable oils, which had generally been flat over the first half of the initial decade of the century, rose sharply from 2006-07. Figure 18.1 shows these rises for maize, palm oil, rice, soybeans and wheat over the period crop year 1990/91 - 2009/10. The prices are deflated by the United States Producer Price Index (all items) and normalized at 1999/2000 = 100.[4] The price rises were substantial with palm oil, rice and wheat doubling in price in 2007/08 relative to the 1999/2000 base and maize and soybeans increasing by more than three quarters. Despite rises in the late summer of 2010, prices have remained lower than those at the 2006-08 peak.

It is also apparent from Figure 18.1, that even at their 2007/08 peak, real prices were comparable with those in the late nineteen nineties. Wheat and rice prices were somewhat higher than at the earlier 1995/96 peak while maize prices were slightly lower. Both soybeans and palm oil were higher in real terms than at their previous peaks (in 1996/97 and 1997/98 respectively). A much longer perspective shows all five prices to be lower in real terms in 2007/08 than in the mid- and late-nineteen seventies.

It is also evident from Figure 18.1 that, although prices were variable over 2006/07-2009/10, this has also been true of previous high volatility episodes. It is well known that

2 Availability is carryover from the previous crop-year plus production in the current crop-year.
3 See http://data.worldbank.org/about/country-classifications
4 Source: IMF, International Financial Statistics.

Figure 18.1: Real food prices: 1990/91–2009/10

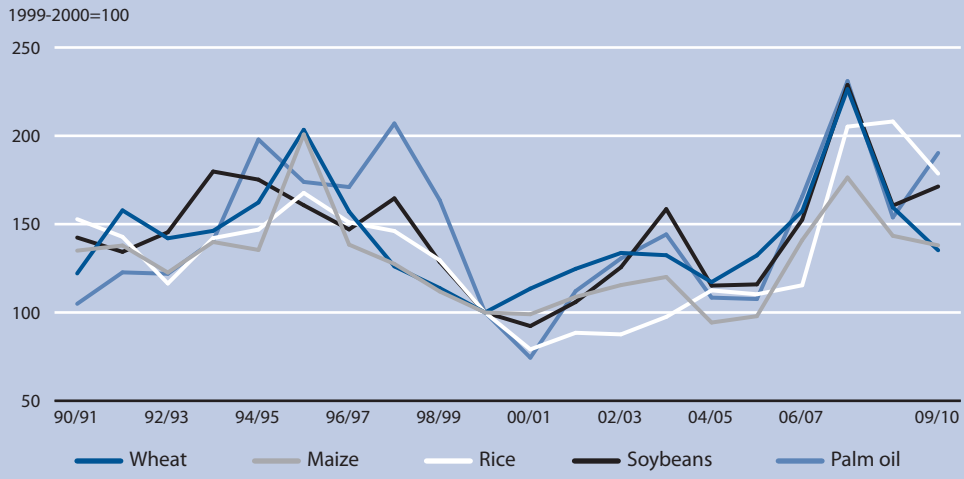

Table 18.1: Volatility in commodity prices (selected years)

Volatilities (selected years) %					
	Maize	Palm oil	Rice	Soybeans	Wheat
1971/1972 – 1974/75	22.4	38.9	22.7	34.0	33.7
1999/2000 – 2005/06	15.8	23.3	11.5	19.9	16.2
2006/2007 – 2009/10	28.5	31.8	28.0	24.7	32.4

Note: Intra-crop year volatilities of nominal returns at an annual rate, averaged over crop years.

periods of high volatility tend to bunch together. Table 18.1 compares volatilities over the most recent high volatility period (the four crop years 2006/07 to 2009/10) with that in the previous six crop years, over which time prices were very stable, and also with the high volatility period around the nineteen seventies commodity price boom (the four years 1971/72 to 1974/75).[5] Volatility was around twice as high for the three grains over 2006/07 to 2009/10 compared with 1999/2000 to 2005/06 but comparable with, or only modestly higher, than in the earlier high volatility period. In the case of palm oil and soybeans, the increase in volatility in 2006/07 to 2009/10 was less dramatic and these resulting levels were lower than those experienced in 1971/72 to 1974/75. These results accord with those reported by Balcombe (2011), Gilbert & Morgan (2010) and Huchet-Bourdon (2010).

As noted, volatility is positively associated with price levels. Taking the forty year period 1970/71 to 2009/10, the correlations range from 0.17 for rice to 0.63 for soybeans.[6] Perhaps less obviously, high volatility is associated with high cross-commodity correlations: averaging volatilities across the five commodities, this shows a correlation of 0.42 with the intra-

[5] Volatilities are calculated as the standard deviations of monthly nominal returns (changes in the logarithms of monthly average prices) within each crop year averaged over crop years.

[6] Maize 0.22, palm oil 0.24, wheat 0.42.

crop year cross-correlations of the five commodities.[7] Price co-movement therefore tends to increase in periods of high volatility. We therefore tend to see periods in which food prices in general are high and volatile. This was true of the period from the end of 2006 as it was in the first half of the nineteen seventies.

These numbers demonstrate that, although the prices of food commodities were both high and volatile over the period from the end of 2006, neither the levels nor the variability of these prices was historically unprecedented. The shock of high and volatile prices is to be seen in the context of the low and stable prices over the so-called Great Moderation and the likely impact of these developments on attainment of the Millennium Development Goals.

Food prices and the terms-of-trade

Economists often measure the overall impact of changes in world prices on a particular country by the terms-of-trade, defined as the ratio of the country's export to its import prices. If food prices had risen in isolation, they would have implied a deterioration in the terms of trade of food importing countries.

The-terms-of trade are a very imperfect welfare measure. They do not take into account movements in the prices of non-traded goods (including staple foods) or of goods which are not traded at current border prices as the resulting redistribution of welfare is internal. Neither do they take into account the incidence of price changes across households which may be quite different for imported and exported goods. There are also practical problems in measurement. Products only have uniquely defined prices in economics text books. In practice, even narrowly defined products will be bought and sold at different prices depending on precise grades or product specifications, the quantity and location of the transaction and delivery conditions and the bargaining power of the parties involved. This makes it problematic to obtain a practical measure corresponding to the theoretical concept.

There are two approaches. First, trade statistics, such as those for agricultural goods in FAOSTAT, provide estimates of both the United States Dollar value and the quantities of imports and exports of narrowly defined products. These data allow one to infer unit values (the ratio of United States Dollar values to quantities) which may be interpreted as the prices which, when multiplied by the reported quantities, generate the reported United States Dollar values. There are well-known problems with these methods. First, they fail to take into account quality-improvements in manufactured goods with the result that unit values tend to exaggerate the extent of price increases. For LICs, who import most manufactures, this will lead to a general tendency to over-estimate the decline in the terms-of-trade over time (Lipsey, 1994). Second, reported values may reflect the effects of hedging, transfer pricing and other practices (some legal and some illegal) which distort unit values away from the original prices they are supposed to represent.

The second possibility is to use world prices. These are well-defined for most primary products, including food products, but do not necessarily relate closely to the prices particular countries pay when importing or receive when exporting. Furthermore, clearly defined world prices are only available for primary products, but even in these cases, they may not accurately reflect the prices at which countries trade. In part, this can be because of grade and quality differences, in part because transport costs may drive a wedge between a country's fob prices

[7] The ten cross-commodity correlations are averaged for each crop-year. The correlation of this average correlation with the average deflated price is also positive at 0.25. High cross-commodity return correlations are indicative of common demand shocks - see Chapter 11.

Table 18.2: Changes in price indices and primary terms-of-trade, selected Low-Income Countries: 2005-2008 and 2010

	Price indices			Terms of trade	
	All imports	Food imports	All exports	Raw	Adjusted
Percentage change 2005 - 2008					
Benin	50.5	38.4	36.7	- 9.2	- 14.2
Kenya	38.2	53.6	38.6	- 8.3	- 10.1
Malawi	44.9	51.8	34.6	- 7.1	- 13.1
Nepal	45.4	53.7	33.6	- 8.1	- 13.2
Percentage change 2005 – 2010 H1					
Benin	32.0	24.8	46.0	10.6	1.9
Kenya	23.8	39.7	39.3	12.5	7.6
Malawi	30.8	29.8	52.4	16.6	2.7
Nepal	30.2	37.0	43.5	10.2	0.9

Note: The first four columns of the upper panel of the table report the changes in the price indices from 2005 (year average) to 2008 (year average). The lower panel reports the changes to 2010 (January-June average). Column 4 reports the same changes for a primary terms of trade index defined as the ratio of the primary export (column 3) to primary input (column 1) indices. Column 5 adjusts these estimates to take into account lack of balance between import and export values based on average trade values over 2006-08. Source: Gilbert (2010).

and world prices and in part because the supposed world price does not closely correlate with the prices which countries pay for food imports - see Chapter 7 in relation to the world rice price.

Gilbert (2010) uses this second procedure to consider the primary terms-of-trade, being the ratio of primary export to primary import prices calculated as base-period value-weighted averages of world prices for 67 major primary commodities, for four LICs - Benin, Kenya, Malawi and Nepal. These statistics are reproduced in Table 18.2. The final column adjusts the crude measure to take into account the fact the value of primary imports exceeds the value of primary exports and supposes no change in the balancing flows. Over the four year period 2005-08, the four countries saw increases in import prices ranging from 38 percent (Kenya) to 51 percent (Benin) but export prices also increased by between 34 percent and 39 percent.[8] The resulting term-of-trade deterioration was therefore a more modest 10 percent (Kenya) to 14 percent (Benin). Furthermore, this deterioration had been reversed by mid-2010 as import prices fell back but export prices continued to rise.

The implication is that high and volatile food prices from 2006 have not, in general, translated into an adverse movement in the terms of trade for LICs. This is because the rise in agricultural prices has happened at the same time, and for some of the same reasons, as the rise in energy and metals prices. LICs have low manufacturing exports and rely on

[8] Weights are import and export value shares averaged over 2004-06 - see Gilbert (2010) for methodology and data sources.

primary exports, together with remittances and overseas assistance, to cover their imports. Many LICs have therefore benefited as much or more, at the aggregate level, from rising export prices as they have suffered from rising import prices.

The relatively little movement in terms-of-trade over the most recent years does not imply that high and volatile food prices have had no effect as the incidence of rising export prices will generally have been different from that of rising import prices. Furthermore, the trajectories of the prices consumers in different LICs were required to pay may have differed significantly from those of world prices (Gilbert, 2011). What the result does imply is that aggregate measures of well-being can conceal the impact of high food prices on vulnerable groups. It follows that policy should be more concerned with the form and direction of assistance than with the level of resources provided.

Compensatory finance schemes

Compensatory finance schemes formed an important plank in international commodity policy aimed at assisting countries in adapting to volatility in the prices of their export goods. They emerged in the late nineteen seventies and the nineteen eighties when commodity prices were generally falling. The main schemes which we cover are the IMF Compensatory Financing Facility (CFF), the European Union STABEX facility and the FLEX facility which replaces STABEX. The issue we examine here is whether these schemes have lessons for the current period in which LICs face volatile food import prices but in the context of generally strong export prices.

The IMF's CFF was created to help countries which experience a sudden loss of export income or a sudden rise in imported cereal prices owing to fluctuating world prices.[9] It suffered from strict eligibility requirements and costly financial terms and as a result, countries were often able to secure better loan terms with fewer conditions from different facilities. The CFF was not used after 2000 and was officially abolished in April 2009.

The CFF generally failed to accomplish its primary goal: stabilization of export earnings. And even in those countries for which it did achieve some success in stabilizing, this was temporary and on the whole insignificant in terms of overall impact (Finger & deRosa, 1980,Lim, 1987, Lim, 1991; and Herrmann et al., 1990). The CFF was criticized for the significant compensation time-lags: it not only failed to effectively stabilize export earnings, it even had destabilizing effects as transfers became pro-cyclical (Brun J & Laporte, 2001).

The main benefit for those countries which made use of the CFF was that of an additional IMF window. Although disbursements were triggered by shortfalls in exports earnings, repayments were not contingent on the subsequent recovery in exports revenues. As repayments were governed by the CFF loan schedule and the loan was subject to a below market interest rate, countries typically chose to remain with the repayment schedule rather than to repay as their export earnings increased. This lack of symmetry of disbursements and repayments on the scheme had the result that the CFF became a source of general development assistance (Lim, 1987) undermining "the unique function" (Finger & deRosa, 1980) that the scheme was designed to fulfil.[10] Nevertheless, the facility may have been valuable despite the fact that it was not stabilizing.

[9] The IMF CFF and ESF schemes are also discussed by Konadreas (2011) in this volume.

[10] Finger & deRosa (1980) claimed that as countries chose "not to make repayments in such a way as to increase export stability indicates that they do not consider stability a particularly important benefit". That argument is invalid - once the CFF loan was in place, governments naturally chose to repay in the least cost manner.

Prior to its abolition in 2009, the CFF was modified on a number of occasions. Originally, only shortfalls in merchandise exports were eligible for compensation, but the facility was expanded in 1979 to cover shortfalls in receipts from tourism services and workers' remittances. In 1981, coverage was expanded further to include excess cereal import costs. An oil element was temporarily introduced in 1990 to compensate for increases in fuel import costs in the run up to the first Gulf War, although it was allowed to expire at the end of 1999 (see IMF, 2004). The final pre-abolition change, in 2000, concerned drawings under balance of payments weaknesses. It was also established that CFF would be available in the context of an IMF arrangement. This modification reflected the recognition that the stand-alone mode of CFF assistance was rarely likely to be appropriate as the balance of payments assistance would normally need to be associated with adjustment programme. Effectively, the CFF became "mainstreamed" within standard IMF assistance programmes. It was then only a matter of time before it was absorbed by them and ceased to exist as an additional facility.

In addition, two other smaller but continuing IMF schemes qualify to be included in the compensatory finance suite. The Exogenous Shocks Facility (ESF) was established by the IMF in 2006 to provide quick and easy access to concessional financing for LICs facing exogenous shocks such as adverse commodity price swings, natural disasters, and conflicts or crises in neighbouring countries. Conditionality is focused on measures needed to adjust to the shock, with less attention to the structural adjustment measures more commonly associated with Poverty Reduction and Growth Facility (PRGF) assistance, now renamed as the Extended Credit Facility (ECF). In 2008, access was made more flexible and the earlier requirement that countries must have PRGF in place was dropped. Just two ESF arrangements were active in November 2010 (out of a total of twelve granted up to that date), as against 29 arrangements under the ECF.[11]

The Standby Credit Facility (SCF) provides financial assistance to LICs with short-term balance of payments needs. The SCF was designed as part of a broader reform to make the Fund's financial support more flexible and better tailored to the diverse needs of LICs, including in times of shocks or crisis. It provides support under a wider range of circumstances, allows for higher access, and can be used on a precautionary basis. As with the ESF, just two SCF arrangements were active in November 2010.[12]

Turning now to the European Union facilities, the STABEX scheme operated over the period 1975-2000 as part of the succession of Conventions signed by the European Union member countries and the African, Caribbean and Pacific Group of countries (the ACP). Its aim was to remedy "the harmful effect of the instability of export earnings" by providing compensation for shortfalls in the export earnings of the ACP states, caused by price or quantity fluctuations, or both. With many governments dependent on export taxes, often levied on an ad valorem basis, declines in export revenues translated directly into declining tax revenues. Budgetary support was intended to finance government expenditure over what was seen as likely to be temporary shortfalls in tax revenue.

The European Union STABEX scheme was an all-grant scheme, targeted on selected agricultural commodities only, excluding products such as sugar, meat and tobacco, which were crucial for many of the ACP countries. It was designed to deal with the budgetary effects of export earnings instability on the developing countries and not with the causes of this instability. The conditionality revisions in the four Lomé Conventions highlight changes in the objectives of the scheme but also underline its implications.

[11] For Ethiopia and the Maldives. See IMF Financial Activities - Update November 18, 2010: http://www.imf.org/external/np/tre/activity/2010/111910.htm

[12] Honduras and the Solomon Islands.

The early STABEX schemes can be seen as complementing domestic marketing board and *caisse de stabilisation* schemes to stabilize domestic prices - see Knudsen & Nash (1990) for a review. STABEX provided governments with the revenue support, while the domestic schemes protected farmers against short-term price fluctuations. The extreme flexibility in allocating compensatory funds built into the design of the Lomé I scheme gave governments the option to use the funds to assist diversification among other possible objectives. As these domestic schemes broke down or were either abandoned or modified in the period 1985-1995 market liberalization process (see Akiyama et al., 2001), STABEX moved towards greater sectoral focus and increased conditionality in order to ensure direct support to the farmers. The flexibility in the early schemes was replaced by requirements that funds be directed towards the sectors suffering from export decline. This blocked the diversification option and created an incentive towards further concentration of exports. In conjunction with tighter funding limits, increased conditionalities also slowed disbursement.

SYSMIN was the mineral twin brother of the agricultural STABEX. It operated over the period 1980-2000. It was targeted at the alleviation of fluctuations in revenue arising from the production and sale of minerals (bauxite, aluminium, copper, cobalt, iron, tin, phosphates, manganese and uranium). The precious metals were excluded from the product coverage. The twins were not identical reflecting the domination of the minerals sector by mining companies. SYSMIN funds were allocated to governments but could be transferred to mining companies "in need of restructuring, with a view to preventing difficulties in the future" (European Commission, 2000). Otherwise, the design of the scheme was similar to STABEX as were the problems associated with its operations. In addition, owing to its eligibility criteria SYSMIN was criticized as unfairly favouring only a small group of ACP countries (Maennig, 1988; European Commission, 2000). Country evaluations of SYSMIN signalled problems in project identification and project design. More specifically, the process of project identification and preparation was significantly under-funded with less than 1 percent of the project cost allocated for this purpose, while standard practices suggest a budget of 3 percent to 5 percent of the expected total project cost for the identification and preparatory stage (European Commission, 2000). The complexity of the procedures for project appraisal and execution have been cited as crucial factors in hindering the rapid and effective utilization of SYSMIN resources (ACP, 1999).

An important characteristic of both STABEX and SYSMIN was the commodity-by-commodity structure, i.e. fluctuations in one sector could trigger a compensatory transfer regardless of what happened with aggregate export receipts at the country level. This raised two important issues. First, the scheme was imperfectly counter-cyclical as it was possible to obtain compensation for falling export earnings of one commodity at the same time as the overall balance of payments was improving (Hewitt, 1993, Brun J & Laporte, 2001). Second, STABEX was never intended to directly stabilize total export earnings of the countries. Instead, it aimed to contribute to the reduction of total export earnings instability indirectly by stabilizing farmers' income. As Aiello (1999b) has noted, the stabilization of export earnings of triggering sectors alone is not "sufficient to establish a sounder economic structure in each ACP economy". Empirical research demonstrates this and shows that while STABEX was successful in stabilizing export earnings of the sectors concerned (Aiello, 1999b), it had a negligible stabilizing impact on total export earnings (Aiello, 1999b, Lim, 1991, Brun J & Laporte, 2001, Faber, 1984, Herrmann et al., 1990). The product coverage and time lags between the occurrence of the export shortfall and the date of disbursement, caused by the complex analysis for the justification of payments (Brun J & Laporte, 2001), also contributed

to this unsatisfactory result. As a consequence, the literature has tended to regard STABEX, like the CFF, as an aid allocation mechanism more than a stabilization scheme (Hewitt, 1993).

The European Union responded to the unsatisfactory operation of STABEX and SYSMIN with the establishment of the Fluctuations of Exports scheme (FLEX) in 2000. As the view became prevalent that mandating a large part of European Union development funding to the "traditional" commodities was not efficient from a general development standpoint and that these schemes did too little to encourage diversification, the European Union reincorporated the STABEX and SYSMIN funds within the overall development budget. Like the CFF, STABEX and SYSMIN were mainstreamed. FLEX incorporated the principles of the predecessor schemes, but its design implements the lessons learned from the operational problems of its predecessors. Firstly, the new scheme aims at faster disbursement of funds to eligible countries, and secondly, disbursement is triggered by losses of overall export earnings as opposed to the commodity-by-commodity operation of STABEX and SYSMIN, and in the context of the country's overall development potential and attainments.

It is fair to say that the expectations raised by FLEX have largely disappointed. It has been criticized for its complex procedures, slow disbursements and insufficient resources.[13] These factors have contributed to FLEX failing to achieve its objective - see Griffith-Jones & Gottschalk (2005), Griffith-Jones & Ocampo (2008) and Aiello (2009).

Compensatory finance is inevitably backward-looking. Slow speed of disbursement was an endemic problem with both CFF and STABEX-SYSMIN-FLEX with the result that neither did much to reduce the variability of government receipts. In some cases, in which disbursements coincided with price upturns, outcomes may have been pro-cyclical (Collier et al., 1999; Brun J & Laporte, 2001; Hewitt, 1993). This has driven the movement towards mainstreaming.

If they are to be defended (few economists have risen to this task), this must be as ODA (overseas development assistance) in the form of uncommitted budgetary support to governments of countries which had, at some earlier date, suffered a substantial decline in export earnings. They should be judged against the criteria for general development assistance (Lim, 1987; Finger & deRosa, 1980; Aiello, 1999a). The important questions in relation to recipient countries is whether this assistance was additional to that which would have been forthcoming otherwise, and the extent to which assistance was diverted towards countries which had either greater needs or where the assistance was more valuable. Neither the academic nor the policy literature has much to contribute on these questions.

A (see Chapter 11, the compensatory finance history has only limited relevance to the current environment of high and volatile food prices. We have seen that LICs have not in general suffered from declining terms-of-trade over the recent period as their export prices have been buoyant. LICs have faced the problem of how to spend their buoyant export revenues effectively, and to what extent they should save part of these revenues, and not revert to the shortfall problem which the compensatory finance schemes addressed. As stressed in earlier discussion, the current problem is not one of resource availability *per se*, but rather how resources can be directed towards poor and vulnerable households hit by rising food prices but not necessarily in receipt of elevated export revenues.

[13] For example, in 2003 a total of 17 countries met the eligibility criteria for FLEX support. However, only 13 received financing because the other four country-specific resources were already exhausted (Griffith-Jones & Ocampo, 2008). The FLEX budget includes a ceiling for every ACP country.

Global safety nets

Global safety net schemes emerged onto the multilateral stage as a specific response to the 2008 financial crisis and to the coincident rise in the prices of food commodities. It was widely recognized that the sharp decline in the prices of industrially-consumed commodities has the potential to cause problems for many commodity-exporting countries, but that these declines, albeit severe, were also likely to be temporary. Rises in food prices do not generate a need for budgetary support, at least in the first instance. Rather, they require that governments develop or enhance targeted domestic safety net policies to maintain the living standards of poor households whose dependence on purchased food will make them particularly vulnerable to rises in food prices. Multilateral support therefore needs to be directed towards reinforcement of countries' own Poverty Reduction Programmes. The World Bank has led the pack in this direction.

The World Bank's Vulnerability Financing Facility (VFF) is a dedicated facility designed as a response to the financial and economic crisis to streamline support to the poor and vulnerable. The VFF combines two separate programmes: the pre-existing Global Food Crisis Response Programme (GFRP) and the new Rapid Social Response (RSR) Programme that focuses on social interventions. Both programmes provide technical and financial assistance to support governments in their immediate and longer-term crisis responses. It is currently intended that the VFF will terminate at the end of 2011.

The GFRP, created in May 2008, is a fast disbursing facility designed to assist countries to respond to the recent high food price event. It aims to reduce the negative impact of high and volatile food prices on the lives of the poor. It also aims to assist countries in the longer run by supporting governments in the design of policies to mitigate the adverse impact of volatile food prices and supporting farmers in production strategies that enhance productivity and reduce their vulnerability to future crises. The programme is financed through World Bank resources and several external-funded trust funds. As of January 2011 GFRP has approved a total of USD 1 443.6 million and 75 percent of the approved funding has been disbursed. World Bank-funded GFRP projects amount to USD 1 238 million in 35 countries and 80 percent of these funds have been disbursed - see Table 18.3. Additional USD 205.4 million have been approved under externally funded GFRP trust funds.[14] The size of the facility was increased to USD 2 billion in April 2009 and in October 2010 it was extended to June 2011, amid concerns over heightened food price volatility.

The GFRP envisages three types of intervention:

- Policy instruments to reduce consumer prices through targeted reductions in food taxes and import tariffs.
- Safety nets to provide access to cheap food to the targeted poor. According to de Janvry & Sadoulet (2009), 68 percent of participating countries followed this approach.
- Financing and technical assistance focusing on agricultural supply response, in particular through the supply of seeds and fertilizer and investment in improved irrigation for small-scale farmers.

GFRP funds are channelled through two types of financing: development policy operations (DPOs) and investment loans. Table 18.3 shows the breakdown between the two categories up to September 2010. Development policy operations (DPOs) are quick-disbursing budget support measures, designed to be delivered more quickly than standard International

[14] These include 10 Multi-Donor Trust Fund-funded projects, two Russian Federation Food Price Crisis Rapid Response Trust Fund-funded operations, and 11 European Union Food Crisis Rapid Response Facility-financed operations.

Table 18.3: World Bank-funded projects under the Global Food Crisis Response Programme: status as of January 2011

Country	Approved amount (USD m)	Type of financing	Approval year
Afghanistan	8	Investment loan	2008
Bangladesh	130	DPO	2008
Benin	9	Investment loan	2008
Burundi	10	DPO	2008
Cambodia	5	DPO	2009
Central African Republic	7	Investment loan	2008
Comoros	1	Investment loan	2009
Djibouti	5	DPO	2008
Ethiopia	275	Investment loan	2008
Guinea	10	Investment loan, DPO	2008
Guinea-Bissau	5	Investment loan	2008
Haiti	15	Investment loan, DPO	2008, 2009
Honduras	10	DPO	2008
Kenya	55	Investment loan	2009
Kyrgyz Republic	10	Investment loan	2008
Lao People's Democratic Republic	5	Investment loan	2009
Liberia	10	Investment loan	2008
Madagascar	22	Investment loan, DPO	2008
Mali	5	DPO	2008
Moldova	7	Investment loan	2008
Mozambique	20	DPO	2008
Nepal	83.8	Investment loan	2008, 2010
Nicaragua	17	Investment loan	2009, 2010
Niger	7	Investment loan	2008
Philippines	200	DPO	2008
Rwanda	10	DPO	2008
Senegal	20	Investment loan	2009, 2010
Sierra Leone	10	Investment loan, DPO	2008, 2009
Somalia	7	Investment loan	2008
Southern Sudan	5	Investment loan	2008
Tajikistan	9	Investment loan	2008
United Republic of Tanzania	220	Investment loan	2009
Togo	7	Investment loan	2008
West Bank and Gaza	8.4	Investment loan	2008, 2010
Yemen	10	Investment loan	2008

Source: World Bank GFRP Project Status http://www.worldbank.org/foodcrisis/pdf/GFRPProjectStatus.pdf.

Development Association (IDA) and International Bank for Reconstruction and Development (IBRD) operations. The World Bank claims that disbursements typically start immediately after Board approval and prior to completion of all project administrative and project procedures. They also state that several GFRP projects have been processed within eight weeks of the start of the application procedure. Investment loans finance investment operations that focus on the long-term (5 to 10 years) and finance goods, works and services that support economic and social development projects.

The major success of the GFRP has been its record rapid disbursement but arguments remain as to whether the assistance has been on a sufficient scale. De Janvry & Sadoulet (2009) argue that, with nominal tax rates of only around 10 percent, compensation of governments for the revenue loss arising out of reduction of import tariffs on food has little effect in the face of price increases of the order of 150 percent . That argument supposes a unit pass-through. In practice, pass-through may be substantially less than this in which case a 10 percent offset becomes more important. These same authors also argue that while for the majority of recipient countries GFRP funds target safety nets, these may not always encompass the most vulnerable. For example, many of the rural poor will not be covered by school feeding programmes. To the extent that domestic safety nets lack coverage, this will also be true of GFRP assistance; but equally, to the extent that domestic safety net programmes do assist vulnerable groups, the GFRP will enhance their ability to do so in the context or high and volatile food prices.

The GFRP is designed explicitly as a short-term means of mitigating the impact of high food price swings. Agricultural investment development remains the best long-term food security strategy and in most LICs this will imply development of smallholder agriculture (Abdulai & Delgado, 1995; de Janvry & Sadoulet, 2009). In the context of the G20 food security agenda, World Bank President Robert Zoellick noted that "Eighty-six percent of staples in poor areas come from local sources, so support for country-led efforts to bolster smallholder agriculture is critical".[15] The Global Agriculture and Food Security Program (GAFSP), a multilateral trust fund founded in April 2010 that specifically targets structural agricultural and food security programmes in LICs, complements the GFRP in the provision of longer term financing.[16] As of January 2011, GAFSP has awarded a total of USD 321 million to 8 countries. For each country the funds are implemented through the World Bank or Regional Development Banks such as the African Development Bank. Table 18.4 provides details on recipient countries and amounts approved under the GAFSP.

The GAFSP finances longer term projects in LICs that are vulnerable to rising food prices and have weak capacity to provide social safety nets. For example, in Ethiopia the funds support programmes for sustainable increase in rural incomes and national food and nutrition security, particularly by developing the potential of well-endowed areas. In the Niger the aim is to increase the availability of agricultural products through water harnessing and to support the development of small scale irrigation. In Mongolia the financing aims to raise the productivity and quality of livestock, increase access to domestic and regional markets for livestock commodities, improve market information systems, and strengthen the capacity of producer groups and cooperatives. The financing for Rwanda targets projects aimed at the reduction of hillside erosion, while for Haiti the goal is to improve access to seeds, fertilizers and agricultural technology.

The Rapid Social Response Program (RSR) is the second window under the World Bank's VFF alongside the GFRP. The RSR is a new programme designed to assist countries address

15 "Free markets can still feed the world", Financial Times, 5 January 2011.

16 See: http://www.gafspfund.org

Table 18.4: Global Agriculture and Food Security Programme: status as of January 2011

Country	Amount (USD m)	Approval date
Bangladesh	50	June, 2010
Ethiopia	51.5	October, 2010
Haiti	35	June, 2010
Mongolia	12.5	October, 2010
Niger	33	October, 2010
Rwanda	50	June, 2010
Sierra Leone	50	June, 2010
Togo	39	June, 2010
Total	321	

Source: GAFSP http://www.gafspfund.org.

urgent social needs stemming from the recent financial and economic crisis. The financing is aimed to: (i) help provide access to basic social services such as maternal/infant health and nutrition, and school feeding programmes; (ii) scale up existing safety net programmes and build capacity where such programmes are nonexistent; and (iii) assist in the income support of the unemployed, training, placement and similar employment initiatives. Projects focus on four general themes: improving the functioning of labour markets, social safety nets, social protection and risk management, and social risk mitigation. Under the RSR all IDA- and IBRD-eligible countries are eligible to access the fund which eliminates the need for further eligibility assessments and approvals and as such ensures a more timely disbursement of resources. As of November 2010, total allocations amounted to USD 12 billion, including USD 4.1 billion for fiscal year 2009, USD 3.9 billion for fiscal year 2010, and USD 3.9 billion for fiscal year 2011. The majority of allocations to date, 77 percent , have been towards social safety nets projects and around 20 percent of lending commitments have targeted IDA countries (World Bank, 2010).

The European Union's contribution to global safety nets is less extensive of than that of the World Bank. V-FLEX was an ad hoc short-term facility established by the European Commission in 2009 to address the budgetary consequences of the 2008 financial and economic crisis in the ACP countries. It was designed to ensure timely disbursement to cope with financing gaps as a consequence of the crisis providing financing, on request, to the most vulnerable ACP countries. Its total budget was EUR 500 million for the two year period 2009-10. The financing took the form of grants and provided primarily budgetary support intended to help countries maintain priority spending. V-FLEX allocations were based on forecasts of fiscal losses with the objective of ensuring timely disbursements to help ease the impact of the crisis. This was in contrast to FLEX which has been criticized for slow and untimely disbursements partly because eligibility is determined using historical data on exports. Although V-FLEX has the advantage of quick and sizeable disbursements, it is a temporary facility designed to disburse funds for a two year period only.

Table 18.5: Allocation of resources under V-FLEX for 2009-2010 (EUR millions)

	2009	2010	Total
Antigua and Barbuda		9	9
Benin	25	13	38
Burkina Faso		14	14
Burundi	14	15	29
Cape Verde		9	9
Central African Republic	8	13	21
Comoros	5		5
Democratic Republic of Congo		50	50
Dominica	5		5
Ghana	35		35
Grenada	5	4	9
Guinea Bissau	8	9	17
Haiti	30	26	56
Lesotho		21	21
Liberia		13	13
Malawi	25	19	44
Mauritius	11		11
Samoa		6	6
Seychelles	9		9
Sierra Leone	12	10	22
Solomon Islands	15		15
Togo		12	12
Tonga		6	6
Tuvalu		2	5
Zambia	30		30
Zimbabwe		16	16
Total	236	264	500

Source: European Commission. Amounts agreed for financing for 2009 and 2010.

V-FLEX resources were in addition to the EUR 1 billion European Union Food Facility adopted in March 2009 and the allocation of EUR 200 million under the European Development Fund (EDF) in 2008 to help developing countries cope with higher food prices. These grant resources are complementary to the loan-based assistance of the World Bank, the International Monetary Fund and other regional development banks. Table 18.5 lists allocations under the scheme.

Both the World Bank and the European Union have learnt from the compensatory experience in avoiding budgetary support and by designing rapidly disbursing assistance

directly targeted at the most vulnerable groups. This is an appropriate policy response to the current turmoil, seen as short-term. However, if, now (2011) as seems likely high and volatile prices continue over a longer period of time, LIC governments will need to work towards enhanced food security, including through the development of a more efficient smallholder sector, and more comprehensive and inclusive safety net arrangements. The multilateral agencies can assist in this process.

Food security

The global safety net schemes discussed previously were conceived as stop-gap crisis response measures and, as such, they have enjoyed some success, but if food prices continue to be volatile and generally high, LICs and other developing countries will require longer term policies to address food security. Here, we address the policies available to them in limiting price volatility acting on a unilateral basis.

Increased food prices and the associated volatility have brought food security concerns back into prominence. Standard definitions of food security run in terms of the availability of adequate food and access to this food - see, for example, Pinstrup-Andersen (2009). We can think of food security at the national or the household level. Access problems arise at the household level as even if a country has potentially adequate food availability, not all households will have adequate access to food.

Maxwell & Smith (1992) discuss the relationship between poverty, vulnerability and food security. At the household level, food insecurity correlates with poverty. National poverty lines should be defined such that a non-poor household will have sufficient resources to purchase adequate food but, as poverty is a broader concept than food insecurity, not all poor households will necessarily lack adequate food (consider subsistence farmers with little cash income). Just as poverty statistics are snapshots, so are food security statistics based on availability measures. Vulnerability may be thought of as the probability that a non-poor, food-secure household finds itself poor or with inadequate access to the food in the future. In that sense, it is reasonable to state that a household is food-secure if it not only currently has access to sufficient food but if it can also reasonably expect continued access in the future. Many poor households will lack this guarantee even if they do currently possess adequate food.

At a national level, a country may be said to be food secure if it can guarantee adequate food to its citizens with a reasonable degree of certainty over the future, even if access problems may prevent some households from obtaining adequate food. This allows us to distinguish, at the national level, between precautionary and distributional food security policies, the former relating to continuing food availability and the latter to access.

Food security, in this precautionary sense, is not a problem in the major developed market economies. No developed economy experienced problems in obtaining the food its citizens required in 2006-08 and there does not appear to be any likelihood of food availability problems in the future. Contrast the situation of grains with energy where it is easy to envisage political conflict which closes the Straits of Hormuz drastically limiting petroleum availability. High food prices will erode living standards, even in developed economies. However, the share of food total household expenditure in the 1990s was less than 20 percent in all developed economies and as low as 8 percent in the USA (Mitchell et al., 1997). Because the farmgate share of many food products is also as low as 20 percent , a doubling of farmgate food prices will have a significant but not serious impact of around 1-5 percent on the overall household budgets, greater for the poor and less for the rich.

Food-importing countries

Food security remains important for many food importing developing countries. High food prices are likely to impact particularly on the urban poor and on landless rural households. These groups will typically have few assets on which to fall back and will be vulnerable in that adverse shocks may have negative impacts with much longer duration than the shocks themselves. Co-insurance at the family or village level is ineffective for common shocks which impact the insurer as well as the insured (Dercon, 2005). Developed economies use targeted social and family support policies to protect vulnerable groups of this sort. Targeting is less important in developing economies where larger and often more homogeneous groups are vulnerable. In these cases, there may be arguments for either public food security stocks or variable tariffs (or export controls for an export crop) to ensure that domestic grains prices do not rise too far or too fast.

The standard argument from economic theory that private stockholding will be adequate to control volatility loses its validity in poor economies. That argument is based on an absence of externalities and the ability of stockholders to offset their price exposure on futures markets - see Chapter 11. Futures markets will be absent or inaccessible in these countries. To the extent that it does store food, the private sector will do so to meet the likely purchases and not the needs of the poor and vulnerable groups. On top of this, policy risk may imply that they do even less than this. Because staple foods form a large part of the budgets of poor households, food prices and availability become acutely political issues.

Governments are therefore unable to credibly and effectively commit not to intervene in the event that a shortage arises. However, this makes it unattractive for private merchants to store grains until government has announced its intervention decisions. By the time governments have made these decisions, it is likely to be too late for the private sector to act effectively. In turn, governments justify intervention by reference to the unpreparedness of the private sector (Jayne & Tschirley, 2010). These problems are largely absent in middle income and developed economies in which governments typically follow policies based on pre-announced intervention rules. Finally, food price volatility may impose negative externalities (Gardner, 1979). The major impact of these externalities will typically be on supply chain intermediaries, in developing countries particularly acutely on locally-based intermediaries with limited access to credit and futures markets. The consequence is that such intermediaries will often operate at inefficiently small scale and will be at a competitive disadvantage relative to multinational competitors (Dana & Gilbert, 2008; Gilbert, 2009).

National food security policies can be through control of domestic marketing, by stockpiling or through trade policy, or a combination of these options. The right combination of policies is likely to vary according to whether the country is net importer or a net exporter of the commodity and whether imports or exports are normal or occasional (for example, in a broadly self-sufficient country which imports in occasional drought years). Policies may either be universal, as when governments intervene to limit rises in national prices, or targeted, as when governments allocate subsidized food to groups (such as school children or hospital patients) seen as being most in need.

Control of domestic marketing, for example through a monopoly-monopsony marketing board, allows government to stabilize prices in relation to local harvest variation. Monopsony-monopoly arrangements can result both in cost inefficiency, through elimination of competitive incentives to reduce intermediation costs, and distortions, through bureaucratically imposed pan-seasonal and pan-national prices. Governments can respond to high availability (i.e. a good harvest) by stockpiling or exporting excess production.

They can respond to a shortage by destocking, to the extent that they have carryover from previous years or importing, perhaps subsidizing the imports. Commitments to a fixed level or ceiling for food prices is fiscally dangerous - once introduced, subsidies are difficult to end, they destabilize the fiscal balance and unfunded commitments can lead to a potentially unbounded expenditures. In the end, the choice therefore remains between stock and trade-based stabilization, irrespective of the organization of marketing.

National food security stocks are particularly attractive for landlocked countries where transport costs are high and can also rise sharply in the event of an urgent requirement to transport large quantities. Nevertheless, the experience over a number of decades indicates that national stock policies have been costly - the grain is vulnerable to deterioration, they tie up scarce resources, they are vulnerable to corruption and theft and, like internationally held stocks, they discourage private stockholding. In an authoritative review, Knudsen & Nash (1990) concluded that stabilization schemes should "avoid handling the commodity when possible". If other options are available, they are likely to be preferable. Nevertheless, and contrary to the view expressed by Knudsen & Nash, the Asian experience with national rice stockpiles has been generally positive - see Sicular (1989) and Timmer (2010).

Timmer (1986) argued for a move away from national food security stocks towards food security via trade and production based on comparative advantage. This view was reflected in the policy advice offered by the multinational development agencies over the two decades prior to the recent food price surge. If supply (harvest) shocks are largely uncorrelated across countries, governments can import when they need to do so without, on average, paying high prices. A trade-based food security policy requires access to foreign exchange but does not tie up resources in those years in which supplies are adequate. It is less vulnerable to corruption. However, trade based food security works less well if imports are required at a time when a demand shock has driven up prices on world markets, and are less attractive in landlocked countries than in countries with good port access.

The response of rice exporting countries to export controls in 2006-08 and the similar response of the Russian Federation in wheat in 2010 have persuaded many developing country governments that trade fails to deliver on food security in precisely those circumstances in which it is required - see Christiaensen (2009). This has resulted in a reversal of the move towards trade-based food security and a revival of interest in food security stocks. Post-2008 attempts by countries to restore grain stock levels in what was already a tight market may have been a contributory factor behind the renewed rise in food prices in 2010.

The World Food Programme (WFP) makes a valuable contribution to food security in many LICs. In particular, WFP imports are often effectively targeted at the vulnerable. Nevertheless, it remains problematic to rely on the WFP as a strategy for dealing with food prices spikes. The WFP works against a nominal budget constraint and hence high grains prices will reduce the quantities of food that the WFP can supply. The budget constraint can be relaxed through appeals for additional funds, but this takes time forcing governments to make their own arrangements in the interim.

Of the major grain markets, it is that for rice which functions least well. It was also shortages of, and high prices for rice which generated most of the 2008 food price riots. A pragmatic approach might therefore distinguish between those countries which depend on wheat or maize imports, and those which depend on rice. In current circumstances, LICs can probably rely on being able to import additional maize or wheat if this proves necessary, but may justifiably be worried about being able to do so for rice. That points towards a need for

contingency arrangements for rice - either a food security stocks, or formal trade agreements with rice exporters or, where this is feasible, a move towards rice self-sufficiency.

The most recent rise in food prices, which started in the 2010 northern hemisphere summer, has left food-importing LICs in a difficult position. This would be an expensive time in which to accumulate a food security stock but the 2008 experience has suggested to many governments and commentators that reliance on trade may be ill-advised. We argue that this conclusion is, in general terms, misconceived. Maize and wheat markets functioned well over 2006-08 and continue to function well now. The problem with these markets is the unpredictability of the prices that importers will need to pay, not availability of the grains themselves. It is this price unpredictability that governments need to address. Stockpiling is an expensive way to do this. We explore alternatives in the next section.

Food-exporting countries

Food exporting countries face a different situation. Prices obtained for exports relate to those on world markets. The price impact of supply and demand shocks to the world market will therefore be imported into domestic markets. Commercial policy - export taxes, quotas or outright restrictions - allow governments to insulate domestic prices from shocks to the world market. In countries which are close to self-sufficiency, export controls can be used in conjunction with a food stockpile to reduce the costs of stockpiling - see Timmer (2009). Because taxes and controls are typically imposed when world prices are high, they redistribute purchasing power from producers to consumers and from the countryside to the cities.

By insulating domestic producers and consumers from the world market, export restrictions and variable export taxes force the burden of adjustment on importing countries. In many cases, these countries may be poorer and less well-equipped to cope with the price volatility than the exporters. Widespread resort to controls reduces the depth of the world market and increases the volatility of prices on what can become a residual market of last resort. Variable export taxes result in incomplete or absent communication of price incentives for increased production to producers in exporting countries. Quantitative restrictions or bans on exports are likely to reduce availability at the world level at just the time shortages are occurring. Restrictions may also rebound on the exporting countries themselves as the possibility that a country may limit exports in a shortage situation reduces the attractiveness of exporters in that country as counterparties. Consequently, during normal export years, the country will tend to export at a discount to world prices to cover its performance risk.

The world rice market is often believed to have this character. As noted above, the response of rice exporting countries to export restrictions in 2006-08 persuaded the governments of many food-importing developing countries that trade fails to deliver on food security in precisely those circumstances that it is required. Faced with this high volatility, importing countries find themselves obliged to institute food security stocks. Seen in this light, export restrictions generate a familiar Prisoners' Dilemma: both exporters and importers are better off if in the long-run if exporters forbear from restricting exports but the governments of exporting countries are unable to commit not to resort to such controls if they become expedient in the short-term. The consequence is a "bad" equilibrium in which importing countries run national food security stockpiles and aim for food self-sufficiency despite the high costs involved and exporting countries are unable to fully exploit their comparative advantage and their farmers are unable to profit from periods of high world prices.

How can the world escape from this "bad equilibrium"? There is a growing consensus for discussion of possible limitation of the use of export controls within the WTO. In this spirit, Fan (2010) has argued that "governments should be encouraged to eliminate existing export bans and refrain from imposing new ones". It would also be necessary to limit, but probably not prohibit, the use of variable export taxes because a sufficiently high tax is equivalent in its effects to an export ban. At the same time, any new protocol would need to recognize the right of exporting countries to take reasonable steps to limit the extent to which they import volatility from the world market. This will require a balancing of interests on both sides – see Chapter 17 for a discussion.

Overall, the lessons from domestic food price stabilization schemes in developing countries is that they can be successful in protecting countries against price shocks but they are also redistributive, perhaps unfavourably so, and can be expensive both in terms of domestic costs and the costs imposed on other countries. Export bans and restrictions, which can be effective in isolating domestic grains prices in exporting countries from shocks in the world market, have pernicious effects in increasing the impact of these shocks on importing countries. This argues for a new protocol, perhaps within the WTO, which would bind countries to limit actions of this sort.

A market-based approach to food security

The market approach to grains price volatility involves setting up structures and institutions which allow governments and supply chain intermediaries to cope with price volatility instead of attempting to reduce or eliminate this volatility and without resorting to extraordinary government intervention. This approach has been discussed in Dana et al. (2006), Sarris et al. (2006, 2011a,b), Dana & Gilbert (2008), Sarris (2010). While the global safety net schemes discussed earlier respond to food price spikes as and after they occur, the market-based approach aims to establish structures in anticipation of possible food price rises which, if effective, should obviate the need for the global safety net.

The principal instruments involved are futures and options contracts or "over the counter" (OTC) instruments, by means of which providers (usually international banks) intermediate the hedging instruments to the governments or entities concerned. Prior to the most recent decade, the use of these instruments was typically discussed in relation to protection of commodity exporters against price falls. However, they turn out to be even better suited to the protection of commodity importers against price spikes.

Consider a government which wishes to protect itself against a possible grains price spike. By buying futures contracts in the appropriate grain, the government locks in the grain purchase price. It will typically not take delivery on this purchase and will close out at the time it, or the national importing companies or agencies, purchase spot grain. On average, this hedge should neither lose nor make money and there will be a modest reduction in the variability of grain purchase prices. The major advantage to the hedger is that the purchase is known more or less accurately[17] at the time the hedge is initiated.

In practice, government access to futures contracts is likely to be constrained by credit requirements and the need for daily management of margin calls (which require immediate cash outlays), which can be operationally difficult to support. Additionally, futures may not

[17] The hedge is only approximate because of "basis risk", i.e. the fact that the country's import prices will be less than perfectly correlated with the exchange price. As basis risk increases, the usefulness of the hedge declines - see Dana & Gilbert (2008).

be a useful instrument for governments as there is an unknown liability associated with taking a futures position. If prices move down against a government that has entered into a long futures position (i.e. by buying futures contracts), the government will be responsible for paying, to the market counterparty, the difference in price movements. This is not likely to be a practical or palatable hedging strategy for Ministries of Finance in low income countries who will need to publicly explain, and be responsible for, the financial outcomes of the hedging strategy.

An alternative to hedging with futures contracts is hedging with option contracts, which allow a government to secure price protection at a certain level in return for a fixed premium which is usually paid in advance. For importers, a call option has the effect of putting an approximate ceiling price on the contracted quantities. A ceiling price is particularly attractive if the intention is to hedge against a price spike in which case the "strike" (i.e. contractual ceiling) price of the call option can be significantly above the market price level at the time of contracting. This is called purchasing an "out-of-the-money" option.

A major advantage of the call strategy is that it has a market price. The cost of protection is therefore known (and will typically also be paid) in advance. Purchasers can decide on the level and duration of protection that they require or can decide that the cost is too high and they prefer to remain unprotected. In developed and middle income economies, the cost of staple grains is no longer a major component of household budgets and the resulting diversification implies that self-insurance is likely to be the preferred outcome. On the other hand, many LICs may value this type of price protection. Others may regard it as inappropriate or too costly. Call options can be structured either on a purely financial basis (i.e. using exchange-traded contracts), or on a physical basis (i.e. by integrating the price "cap" into a purchase or supply agreement). In countries where food import prices are not closely correlated with world prices (the basis risk problem), physical option strategies (i.e. contingent purchase agreements) might be more suitable. For many LICs, interest in a purely financially settled product may not be useful as it would not result directly in food shipments moving into the country, typically an important priority for a country facing a shortage or food price shock. Finally, governments may decide that the funds required for payment of the premium could be better spent on other projects. The result of these complex dynamics will be that this sort of strategy becomes appropriate for those for whom it has the greatest value. As a result, it may be significantly less costly than the establishment of an international grain reserve which will offer a uniform (but low) degree of protection to all grains consumers.

In general terms, the cost of "out-of-the-money" call-based protection for 12 months for a single government or intermediary, will range from 7-12 percent of the value of the commodity protected. In landlocked countries, transport costs from the nearest port or railhead can be substantial and can also be highly variable. Ideally, the contract should also lock in transport prices - see Dana & Gilbert (2008). Such countries will need to evaluate whether they are better protected by national food security stocks or through call-based protection. There is no clear a priori answer to this question. In addition to governments, market intermediaries might also choose to use call options. If governments wish to encourage this approach they can create incentives for traders and suppliers who hedge, for example by reducing import tariffs or by directly co-financing premium payments.

Although these approaches are not likely to be useful as a general panacea against food price spikes, there is scope for looking at the way these approaches could be customized to help provide a cushion against price spikes, and create the basis for better signalling to market actors about the intentions of government. To the extent that this form of hedging

does impact prices, it should also stimulate additional storage as storage companies would form natural hedge counterparties.

Market-based protection against grains price spikes is feasible for many countries and is likely to be affordable for at least some. The fact that not all governments will wish to purchase this form of protection is probably an advantage as it will ensure funds are not wasted. Unlike public storage, this approach also encourages additional private storage and trade finance. These additional benefits in terms of strengthening the roles of private actors suggest that these ideas deserve further and wider discussion. They should be seen not so much as substitutes for the global safety net arrangements discussed previously but rather as an evolution of these arrangements such that a new arrangement does not need to be negotiated every time that food prices move up. They may be seen as reinforcing trade-based food security policies and thereby obviating the need to retreat back to more expensive stock-based policies.

A role for the international community?

Food security problems may either be local or global. Local problems arise as the result of a crop failure, civil war or some other disruption in a particular country or region. Examples are the periodic droughts which affect many Southern African countries. Global food security problems arise when there are food shortages at the world level which drive up the prices food importing countries need to pay for their supplies. Governments need to worry about both problems irrespective of origin, but local shortages can be adequately managed through a combination of trade and food aid, provided timely decisions are made. Trade helps less with global food shortages and high prices work to limit the availability of food aid.

The World Bank's VFF and the European Union's V-FLEX were both attempts to provide assistance to food importing developing countries in a situation which was, at the time the programmes were initiated, seen as temporary. That judgement no longer seems valid. The issue becomes how assistance of this form can be extended into the future.

One option would be simply to continue with VFF after its current end-2011 termination date. That would be feasible and, from the point of view of potential recipients, attractive, but it would also pre-empt resources from other valid development objectives. The FAO has also considered, but not implemented, a revolving scheme for financing food imports into LICs - the Food Import Financing Facility (FIFF). This proposal is discussed by Sarris (2010) and in 17 of this volume. The FIFF would aim to circumvent this constraint through multilateral guarantees for the finance for food imports at the margin. The scheme has not been implemented, largely because potential donors balk at the fiscal cost of a new set of guarantees.[18]

Both the VFF and the proposed FIFF are rationalized by the perception that food importing LICs are constrained by lack of finance and therefore have difficulty in meeting the additional cost of food imports resulting from a price spike. The terms-of-trade discussion earlier suggests that, on the contrary, the coincidence of high food prices with buoyant export revenues implies that the availability of foreign exchange should not be a problem. Indeed, by absorbing foreign exchange, food imports may help in the maintenance of competitiveness in the tradables sector. However, unless accompanied by subsidies, high price food imports will result in increased domestic food prices and hence impact negatively on vulnerable groups.

[18] Guarantees count as government liabilities and hence raise debt levels even though they do not imply a financing requirement unless exercised.

These arguments make the market approach, as outlined previously, attractive and suggest that donors might look for ways to assist LICs in organizing arrangements of this type. Many multilateral donors have long taken the view that trade-based food security policies are less costly and more effective than policies based on national food stockpiles. However, as noted earlier, trade-based policies proved unreliable in 2008 forcing many food importing LICs to incur additional costs in satisfying their food import requirements. A combination of an agreement to limit the use of export restrictions with the adoption of market-based food security strategies would go a long way to avoiding this outcome.

One possibility would evidently be to finance contracts of this form but this would detract from ownership and in any case may result in countries committing to contracts which offer them little value on the basis that any aid is valuable. Recognizing that derivatives contracts can be difficult to understand, an alternative would be for multilateral agencies to act as intermediaries. This would enable the agencies to work with government departments and food security agencies to evaluate needs and, either directly or through collaborators, provide appropriate contracts at a potentially lower cost than would likely be available to the countries themselves. Market counterparties would contract with the multilateral agency. Governments would pay the agency for the optionality elements of the contracts, and perhaps also a small fee, although such payments might come out of budgetary support funding, if available. They would remain responsible for their own import costs and hence would pay the provider if the contracts result in a physical exercise. Schemes of this sort might either be discretionary, based on crop forecasts, or be rolled over on an annual basis to provide continuous support.

Conclusion

High food price volatility is not the same as a high level of prices, but the two tend to arise at the same time. The five years 2005-10 have witnessed both volatile and high prices for the major food commodities on world markets. Prices rose sharply in 2007 and the first half of 2008, fell back in the closing months of 2008 and the first half of 2009 with the impact of the economic and financial crisis and have risen again, albeit to a more limited extent, in the second half of 2010. This volatility is high but not unprecedented and, along with the comparable volatility and high prices experienced in the markets for industrially consumed commodities, is probably the consequence of rapid growth in China and other emerging economies. The likelihood is therefore that both prices and volatility will remain high over the medium term unless there is a further interruption of emerging markets growth.

High and volatile food prices cause acute problems for poor and vulnerable non-farm households who spend a high proportion of their income on food. Although such households exist in all economies, Low Income Countries (LICs) generally have a high proportion of households who fall into these groups. There is thus a need for policy to address food price volatility.

Compensatory finance schemes have aimed at offsetting the budgetary impact of adverse movements in the terms-of-trade of commodity exporting countries. Despite rising food prices, LICs have not generally seen an adverse movement in their terms-of-trade and governments are not in need of budgetary support, or at least not because of high food prices. Instead, high and volatile food prices hit the poor and other vulnerable groups. Any multilateral assistance should therefore be targeted to reinforce countries' own domestic safety net policies.

Countries have available a variety of tools that they can use to stabilize food prices. Options differ depending whether the country is a food importer or exporter. Food exporters can use export restrictions or duties to insulate domestic consumers from the impact of volatility imported from world markets but this will be at the expense of their own producers, both in the short-term, when they are deprived at the possibility of selling at the high world prices, and in the longer term, as they come to be seen as unreliable counterparties. Furthermore, export restrictions exacerbate the food security problems of food importing countries. There are thus strong arguments for introduction of some limitations on the ability of countries to unilaterally impose such restrictions.

Food importing countries must rely on either trade or national food security stocks. There was a general movement over the two decades prior to the 2006-08 price spike in favour of trade-based policies. However, trade appeared unreliable in 2008 largely because food exporters acted to insulate themselves from the global price spike. These problems were particularly acute for rice importing countries. We have argued that, while it is probably preferable to reinforce rather than move away from trade-based policies in general terms, rice importers should consider non-trade based policies, both rice stockpiles and, where feasible, moves toward rice self-sufficiency.

The World Bank and the European Union both responded to the 2008 food price spike and subsequent financial crisis by establishing global safety net schemes with the objective of assisting countries in financing food imports. These schemes have been valuable but they were both set up as crisis response measures and for a limited duration. As high and volatile prices look likely to continue, what is now required is a longer term response.

We have argued that a market-based approach, reliant on the purchase of call options, provides the most attractive way forward. This approach would enable food importing countries to limit the impact of spikes in world food prices on their domestic markets and could be integrated with national food security structures. It is a natural extension of the trade-based policies advocated by multilateral donors prior to 2008. We have suggested a structure through which multilateral agencies would intermediate optionality such that costs and ownership remained with the countries themselves. Taken together with an agreement to limit use restrictions on food exports, the market-based approach can re-establish food security on a trade basis and obviate the need for costly national food stockpiles.

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