

## **Alternative mechanisms to reduce food price volatility and price spikes**

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### **1. Background**

#### **2007-08 Food Price Crises**

The 2007–08 food price crises caused hardship on a number of fronts in countries throughout the world. The steep rise in food prices led to economic difficulties for the poor and generated social and political turmoil in many countries. Haiti, Egypt, Bangladesh, Cote D'Ivoire, Uzbekistan, Yemen and Indonesia are among the 33 countries that saw violent food riots, demonstrations, or social unrest as a result of rising food prices. In addition to the economic, social, and political impacts, the crisis may also lead to long-term, irreversible nutritional damage, especially among children. For example, across several Latin American countries, simulations have shown important reductions in calorie intakes at both the national level and within vulnerable households with children 0-2 years of age. In all countries, poorer households that were already consuming at levels below the calorie adequacy threshold showed greater reductions in calorie intakes (Robles and Torero 2009). These reductions in calorie consumption are likely to be combined with even stronger reductions in diet quality, inducing long-term health effects that are especially detrimental to already vulnerable populations and should be taken into account on the cost side as solutions to these price spikes are examined.

As long-term solutions to the food price crisis are sought, it is important to understand the root causes of the problem. The crisis was triggered by a complex set of long-term and short-term factors, including policy failures interacting with market overreactions. One important factor in the crisis was the entry of significant financial resources into futures markets, including food commodity markets, which contributed to a price spike during the first six months of 2008. See Table 1 for a more complete discussion of the different demand and supply-side factors that contributed to the recent food price crisis. This episode highlights the need to modify the architecture of international financial and agricultural markets to reduce price volatility, especially given the extreme impacts they have on the livelihoods of the poor (von Braun et al., 2008; von Braun, 2008a,b,c; Bakary, 2008; Brahmabhatt and Christiaensen, 2008; OECD Policy Report, 2008; Sommer and Gilbert, 2006; UNCTAD Policy Brief, 2008; and World Agricultural Outlook Board, 2008).

## **Food Price Instability**

For several decades, the dominant approach for managing food price instability has been to stabilize income without affecting prices. The idea behind this approach is that prices guide behavior, so any attempt to change prices damages this mechanism for resource allocation. At the same time, the “natural” insurance that comes from the negative correlation between harvest size and price level stabilizes producers’ incomes. Thus any effort to stabilize food prices reduces the correlation between prices and harvests and disrupts the natural equilibrium that exists. Under this strategy, private insurance and hedging instruments, along with public instruments targeting vulnerable households, are used to manage risk and stabilize prices. However, in the changing global economy, prices do not always convey the appropriate information to the economic agents whose responsiveness may also be impaired by lack of infrastructure and finance. Price stabilization then becomes essential in order to eliminate the endogenous component of price instability without affecting the natural price instability component.<sup>1</sup>

## **Price Volatility and Lack of Buffer Stocks**

Although the difference between too little and adequate grain stocks is relatively small, a lack of sufficient stocks can lead to large price increases and a breakdown of functioning markets. Both 1973 and 2007 showed global grain stocks hitting record lows, prompting global food crises. The difference in global ending-year stocks in 2004-05 and 2007-08 was only about 60 million tons, or 2.7 percent of global production, but with prices rising sharply in 2007-08, this difference in grain stocks, combined with the price increases, was enough to cause serious problems in the market and specially in the more concentrated commodities as the case of rice (Timmer 2009).

In the short-term, both supply and demand for grain are very inelastic. In addition, droughts, floods, or any other severe weather shocks can have a significant impact on supply because grain production is so sensitive to weather. Together with the inelasticity of demand, any supply shocks can lead to price spikes and hoarding by farmers and traders in order to take advantage of higher prices in the future. At a regional level, on the other hand, grain production is less affected by weather and production shortages in certain areas can be compensated for by higher production in other areas. As a result, international trade can reduce the need for large national level grain reserves. However, because so many countries had reduced their public grain reserves by 2007, many governments had no mechanism for stabilizing their grain markets when prices began to rise. A few countries did have sufficient reserves but did not want to sacrifice their reserves to stabilize the global market. Governments in a few exporting countries further worsened the situation by temporarily establishing export barriers and reducing import barriers—by adding upward pressure on commodity markets, global market stability was sacrificed in order to stabilize domestic prices.

## **Financial Crises**

In addition to the effects of the price increases, the financial crisis also served to further restrict trade flows and exacerbate the problems cause by decreased stocks and price volatility. Due to a variety of factors, including decreased investment, decreased consumer incomes, and increased household

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<sup>1</sup> For more information, see Galtier, 2009

savings rates, the demand for capital goods was reduced, thus impacting the trade of such goods.<sup>2</sup> In addition, as a result of the credit crunch, short term credit devoted to trade activities (trade finance) has been contracted, raising directly the cost of trade. With this contraction in the lower part of the balance of payments, the capacity of several developing countries to finance their imports has also been severely affected. The decreased activity in developed countries has led to a fall in remittances and FDI flows, further limiting the payment capacity of several countries.<sup>3</sup> In order to adjust, most developing countries have devalued their currency at the cost of losing real income valued at world prices, leading to decreased demand. These factors remained in force even after the international prices came down and led to high prices at national levels in some countries. Finally, although the protectionist pressures have been largely controlled, trade policies have also been impacted by the financial crisis.<sup>4</sup> The protectionist effect of certain tariffs increases automatically as prices fall. Due to the collapse in demand, there has been a sharp decrease in merchandise prices since the beginning of the crisis; with a fixed tariff, the percentage of the price represented by the tariff increases when the price falls.

**Table 1: Explanations for Rise in Agricultural Commodity Prices**

<b>Factors</b>	<b>Mechanism</b>	<b>Effects</b>
<b>Demand-side factors:</b>		
<i>Income growth, population growth, and urbanization</i>	Cereal demand has been growing at 2–3 percent per year, thanks to rising incomes in China, India, and, more recently, Sub-Saharan Africa. Meanwhile, yield growth in these cereals has declined from 3 percent in the 1970s to 1–2 percent in the 1990s.	This resulted in a significant reduction of cereal reserves to less than 400 million tons in 2007 from 700 million tons in 2000.
<i>Ethanol/Biofuels</i>	With oil prices at an all-time high of more than US\$120 a barrel in May 2008 and with the United States and the European Union subsidizing agriculture-based energy, farmers have shifted their cultivation toward crops for biofuels.	Impacts vary from Lipsky (2008) estimating that the increased demand for biofuels accounted for 70 percent of the increase in maize prices and 40 percent of the increase in soybean prices to Rosegrant et al. (2008) estimates of long-term impact on weighted cereal prices of the acceleration in biofuel production from 2000 to 2007 to be 30 percent in real terms.
<b>Supply-side factors:</b>		
<i>Increased oil/fertilizer prices</i>	Oil prices increased significantly.	Affected directly transportation costs and indirectly price of fertilizers (See <i>IMF Fiscal Affairs</i> , 2008).
<i>Low R&amp;D investments in agriculture</i>	The neglect of agriculture in public investment, research, and service policies during the past decade has undermined its key role for economic growth.	As a result, agriculture productivity growth has declined and is too low.
<i>Droughts/Climate change</i>	Occurring in large grain-producing nations, droughts and climate change have lowered worldwide production	More volatile weather patterns related to climate change increased.
<b>Other fundamental factors:</b>		
<i>Dollar devaluation</i>	The indicator prices of most commodities are quoted in U.S. dollars, and the dollar went through a substantial depreciation.	Even though when adjusted for inflation and the dollar's decline (by reporting in Euros, for example), food price increases were smaller but still dramatic.
<i>Large excess of liquidity in G7 countries</i>	Large excess liquidity in several non-G7 countries, nourished by the low interest rates set by G7 central banks.	Commodity prices are the result of portfolio shifts against liquid assets by sovereign investors, sovereign wealth funds, partly triggered by lax monetary policy, especially in the United States (For details, see Calvo 2008 and Rojas Suarez

<sup>2</sup> Average projected GDP growth in developing countries is a quarter of what was expected during the first half of 2008; average growth in Eastern Europe, Central Asia, and Latin America and Caribbean is projected to be negative (IMF, World Economic Outlook). According to the International Labor Organization (ILO) projections (2009), an additional 30 million people will be unemployed in 2009 worldwide, 22 million of which are estimated to be from developing countries. The reduction in the incomes of final consumers, fueled by decreasing profits for firms and increased unemployment, further reduced demand for all consumption goods and services, including imports. As the household savings rate increases, the share of income that households devote to consumption also decreases.

<sup>3</sup> The World Bank estimates a 7.3 percent fall in remittances inflows to developing countries in 2009 (World Bank, 2009), while UNCTAD projects a 40 percent fall in global FDI flows for 2009 (UNCTAD, 2009).

<sup>4</sup> See Bouet and Laborde, 2009 for further discussion

### ***Second Round effects***

#### ***Protectionist measures***

Ad hoc trade policy interventions, such as export bans or high export tariffs or high import subsidies were partly triggered by the price crisis and exacerbated the crisis symptoms. As of April 2008, 15 countries including major producers imposed export restrictions on agricultural commodities, thereby narrowing the global market

2008).

Policy responses such as export bans or high export tariffs may reduce risks of food shortages in the short-term for the respective country, but they are likely to backfire by making the international market smaller and more volatile. IFPRI simulations with the MIRAGE global trade model had shown that these trade restrictions can explain as much as 30% of the increase in prices in the first six months of 2008

#### ***Speculation***

The flow of speculative capital from financial investors into agricultural commodity markets was significant. From May 2007 to May 2008, the volume of globally traded grain futures and options increased substantially.

Robles, Torero, and von Braun (2009) implemented Granger causal test to identify to what extent indicators for speculative activity can help forecast spot price movements. They show evidence that speculative activity partly explains the price spike since January 2008

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## **Climate Change**

With the financial crisis fuelling the economic, social, political, and global health problems associated with already volatile food prices, a third factor must also be taken into account. The more variable temperatures, changes in precipitation patterns, and increased occurrences of extreme weather events such as droughts and floods accompanying climate change will increasingly affect the global food supply. As a result, the global community will have to deal with the issues prompted by the food price and financial crises of recent years more and more as prices are increasingly affected by both supply and demand issues around the world. What is evident from these crises is that national governments will have a hard time dealing with these issues at a national level.

In summary, if there is something we can have confidence in, it is that agricultural commodity prices will be very volatile in the coming years; therefore, a careful analysis of different policies that could be implemented to reduce or diminish the effects increasing price volatility and especially to reduce the probability of significant price spikes is necessary. The price spike episode of early 2008 clearly highlights the need to modify the institutional architecture of international financial and agricultural markets to address their effects on the livelihoods of the poor.

## **2. Review of policies proposed/implemented to reduce price volatility in the past**

Physical reserves have been used at the national, regional, and international levels at different times throughout history in order to control price spikes and reduce price variability. For decades, large countries such as China and India have kept a significant level of physical reserves due to their size and the effects that their entry into world markets during harvest shortfalls would have on prices. The U.S. operated a farmer-owned reserve for several decades that gave farmers loans and money towards storage costs in exchange for following requirements on when this stored grain could be sold. The farm bill passed in 1996, however, virtually eliminated physical grain reserves.

Many African countries, including Burkina Faso, Mali, Mozambique, Niger, Ethiopia, and Tanzania, established nationally based food security reserve stocks between 1975 and 1980. This was during a time of heavily managed agriculture, and because global grain prices were extremely high, many of these governments did not trust world markets to be a secure source of grains during an emergency. However, it proved to be quite difficult to accurately estimate how much grain was actually needed in these reserves. There was a tendency to overestimate the amount of grain needed in an emergency. Quantities were based on estimates of what people eat normally when, in fact, people facing budget

constraint consume less and often switch to cheaper foods which then make up some of the shortfall. A number of other difficulties, including use of the reserves in normal market operations by the parastatals, insufficient resources to replenish reserves, and the unwillingness of donors to support these activities, eventually led to the disappearance of these food security reserve stocks in most countries. Interest in the establishment of strategic grain reserves was revived following the liberalization of the cereals markets during the structural adjustment of the 1990s. Governments attempted to insure against the failure of the private sector during this period, but many of the experiences in managing these reserves were similar to previous attempts. Mismanagement, corruption, damaged donor relations, and erroneous estimates of consumption and production plagued governments as they tried to manage these reserves.

Interest in regional reserves also increased after the last food price spike in 1973/74. FAO (1980) noted the establishment of ASEAN's Food Security Reserve (which was never operational) and also a proposal by CILSS (Inter-State Committee on Drought in the Sahel) to establish a regional reserve in the Sahel. FAO provided technical assistance to support these initiatives. The idea of creating a regional food reserve for Mediterranean countries was also put forward. It was not until the recent food crisis, however, that the ASEAN initiative was reactivated. To ensure food security in the region, ASEAN has established various cooperation programs and the East Asia Emergency Rice Reserve (EAERR) is one such program. EAERR is a regional cooperation program among the ten ASEAN Member States, China, Japan and the Republic of Korea. Specifically, it is an initiative of the ASEAN Ministers on Agriculture and Forestry and the Ministers of Agriculture of the People's Republic of China, Japan and the Republic of Korea (AMAF+3) to provide food assistance, strengthen food security in emergencies caused by disasters, and alleviate poverty. The EAERR is therefore a mutual assistance system to share rice stocks among the 13 countries. It also aims to contribute to price stability of rice in the region. The EAERR plans to develop a proposal to upgrade the pilot project to become a full-fledged scheme among the ASEAN Plus Three countries. A Draft ASEAN Plus Three Agreement on Emergency Rice Reserve for this purpose is in the process of being developed. However, the realization of a permanent scheme is subject to internal consultation, further assessment and evaluation of the outcomes of the pilot project. For a mechanism such as the EAERR to work, political support from the ASEAN Plus Three countries is necessary. The EAERR Pilot Project is closely related to the ASEAN Food Security Information System (AFSIS) Project<sup>1</sup> and the work of ASEAN Food Security Reserve Board (AFSRB)<sup>5</sup> in establishing food security in the region

International commodity agreements (ICAs) were established to stabilize individual commodity prices at the global level after World War II. However, most of these agreements collapsed and by the early 1960's, only the agreements for wheat, sugar, coffee, tin, and olive oil remained. Although opinions differ on the details of why these agreements were unsuccessful, few ICAs played any role in stabilizing prices. The rubber ICA actually had procedures to deal with increases and decreases in its price bands, but because it followed market prices for the most part, it was only able to smooth rather than stabilize prices. The cocoa and sugar agreements were simply too weak to accomplish their objectives while the tin agreement was trying to hold prices too high without necessary financial backing. Coffee is argued to have been the most successful in raising and stabilizing prices before it lost consumer support and collapsed. Although some of the bodies that govern the ICAs still exist today,<sup>6</sup> these days they mostly

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<sup>5</sup> The AFSRB is an ASEAN mechanism for sharing of rice stocks in times of shortage, particularly through the trigger of a collective operation of the committed "ASEAN Emergency Rice Reserve (AERR)". Currently, the total quantity of the AERR is 87,000 metric tonnes for emergency purposes

<sup>6</sup> Coffee (ICO); Cocoa (ICCO); Cereals, oilseeds (IGC); Sugar (ISO); Jute (IJSJ); Rubber (IRSG); Bamboo, Rattan (INBAR); Tropical timber (ITTO); Cotton (ICAC); Olives, olive oil (IOOC)

assist their respective industries by publishing relevant statistics and studies rather than stabilizing prices.

Price stability and a stable supply of wheat were maintained during the early years of the International Grains Council (previously the International Wheat Council); however, this is most likely due to the relative stability of supply and demand during that time; the agreements broke down during the 1973-74 food crisis. Prompted by the price shock, international interest in grain reserves was again generated and the United Nations Conference on Trade and Development (UNCTAD) organized discussions on the possibilities of establishing international grain reserves (Wright and Bobenrieth 2009). The idea was to hold stocks nationally while managing them internationally, but issues of trigger price levels, stock levels and contributions, and special provisions for developing countries led to failed talks and the proposed international grain reserve wasn't established.

### **3. Review of policies proposed as result of current price strike**

Following the recent food price crisis, there have been numerous proposals put forward to prevent such an event from occurring in the future. The proposed plans address a range of ideas for improvement, including physical reserves at different levels, virtual reserves, improvements in information and coordination, trade facilitation, and others. In terms of storage, emergency reserves for food aid, internationally coordinated public grain reserves, and national and regional stocks have been proposed. Some combination of reserves will likely be necessary, but three key challenges arise with maintaining these types of strategic reserves that will need to be addressed: the determination of optimum stock levels, the level of costs and losses associated with these reserves, and the uncertainties that strategic reserves can bring out in the market place. Not only is the process of determining optimum stock levels politically loaded, but reserves are also highly dependent on transparent and accountable governance. In addition, predicting supply, demand, and potential market shortfalls can be extremely difficult. In terms of costs, physical reserves are expensive and must be rotated regularly. The countries that most need reserves are generally those least able to afford the costs and oversight necessary for maintaining them, and the private sector is better financed, better informed, and politically more powerful, which puts them in a much better position to compete than most of the governments that would be managing these reserves. Finally, the uncertainties that strategic reserves can introduce into the marketplace can be problematic. They distort markets, and any mismanagement and corruption associated with these reserves may actually exacerbate hunger rather than resolving food security issues.

The establishment of virtual reserves is another plan that has been proposed by von Braun and Torero (2008, 2009) in order to prevent speculators from driving up futures market prices and thus moderate spot market prices. Critics have argued whether rising futures prices actually lead to increased spot market prices, but several studies suggest that changes in the futures prices of certain commodities generally lead to changes in spot prices.<sup>7</sup> In addition, the recent analysis of Hernandez and Torero (2009) complements these earlier studies by examining causal relations in the current decade with a much more developed futures commodity market. Their analysis used both linear and nonparametric Granger causality tests and identified a causal link in all cases. Results indicate that spot prices are generally discovered in futures markets. In particular, they found that changes in futures prices in the markets analyzed lead changes in spot prices more often than the reverse. Thus, from a policy perspective, these findings support the viability of implementing a global virtual reserve to address excessive spikes in grain prices through signals in the futures market and, if necessary, market

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<sup>7</sup> See Garbade and Silver, 1983; Brorsen et al 1984; Crain and Lee, 1996.

assessment in the exchange of futures. However, one of the biggest criticisms of this type of virtual reserves is how difficult it will be for whoever is responsible to be certain that markets are out of equilibrium and that proposed interventions will not do more harm than good under any given circumstances (Wright 2009). In this sense there is clearly a need for further research in identifying ways to predict better significant price spikes resulting from excessive speculation as for example using extreme value at risk theory (see Filho and Torero 2009 for more details).

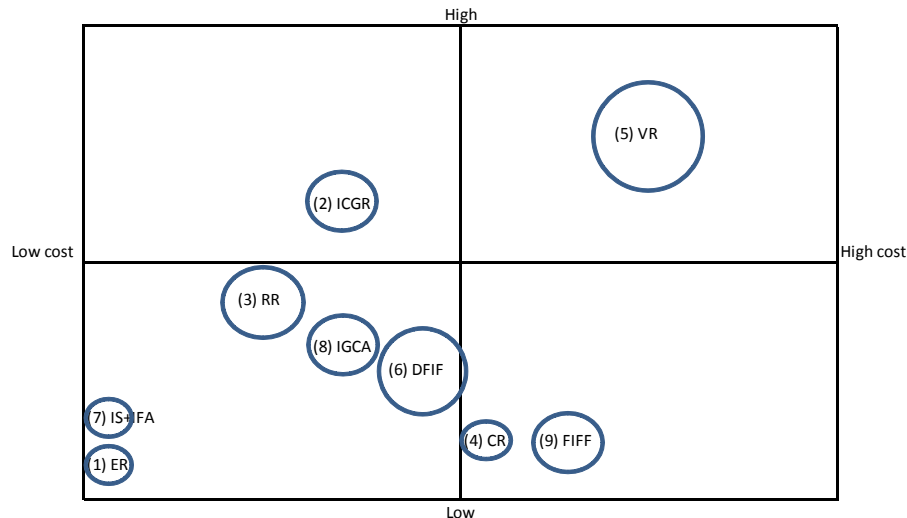
Several options to improve information and coordination have also been proposed to increase market confidence and relieve temporary disruptions in supply. Wright (2009) proposes the creation of an international food agency modeled after the International Energy Agency that would report on stock levels and develop protocols for international collaboration to improve the global response to shortages and help prevent the onset of market panic. Other proposals aim to facilitate trade in order to reduce risks in grain trading when supplies are low and avoid disruptions in grain market. Sarris (2009) proposes a type of food import financing facility that would alleviate financing constraints as well as a clearinghouse to ensure the availability of staple food imports. This international clearinghouse would reduce risks that exporters renege on contracts when supplies are tight by guaranteeing contracts for grain deliveries. Wright (2009) and Lin (2008) take a different approach to trade facilitation with plans to prevent export bans in order to avoid any disruption of supplies. Although the hardest part would clearly be getting countries to commit to this and then actually stick to it when faced with a food crisis, this would be clearly an efficient way to avoid future disruptions in supply. When faced with a choice between breaking international agreements regarding exports or protecting their citizens and ensuring national food security, however, it is difficult to believe that export bans will not occur in the future regardless of any action taken to prevent them.

The predominant strategy to stabilize income without affecting prices failed during the 2008 food crisis because private insurance and hedging instruments never developed for foods and the public instruments designed to help vulnerable households were unable to prevent the nutritional situation of these poor households from deteriorating. As a result, there has been a shift in thinking towards a rationale that is based on structural change rather than risk management. The shift proposed by Galtier (2009) requires a structural transformation of agriculture that will lead to more stable prices, but needs transparent and credible price stabilization policies to facilitate this process. In addition, public instruments are still necessary but they require modification to ensure healthy nutritional statuses for poor households. Under this new rationale, risk management instruments are still necessary but can be better utilized by governments to protect themselves from instability as they implement public interventions. Galtier proposes the development of price stabilization policies that would be implemented at the regional level because of the interconnectedness of food markets located in the same regions. Similarly, the modernization of markets would need to occur at the regional level, taking into account infrastructure and market institutions, such as quality standards, warehouse receipt systems, and exchanges. However, as demonstrated by the numerous countries that banned cereals exports during the recent food crisis, there certainly are potential difficulties associated with any regional policies in the event of a crisis (Wiggins and Keats 2009).

In Figure 1 we try to classify the major proposed initiatives based on their cost (horizontal axis), on their effectiveness in reducing price volatility (vertical axis), and on the required research needed to be able to implement them properly (size of the circle). It is important to mention that only these three dimensions are used in this paper because the major objective of the paper is to identify the existing mechanism proposed and how effective they are in reducing price volatility. In that respect, some of these initiatives, such as the emergency food reserves (Torero & von Braun 2009), or the Food Import

facility (Sarris 2009), had different objectives than to reduce price volatility and therefore they are ranked low in that dimension but this does not mean they are not effective policies for their core objective. On the other hand, policies as the virtual reserves (von Braun & Torero, 2009), the internationally coordinated grain reserves (Lin, 2009), the regional reserves as the ASEAN, or the International Grain Clearance Agreement (Sarris, 2009), rank as more effective in reducing price volatility although they vary significantly in the amount or resources needed for their implementation and in the amount of additional research is needed to be able to implement them properly.

**Figure 1: Different proposals to reduce price volatility**



**Note:** The size of the circle refers to the needed research for its implementation, the vertical axis refers to the potential effect in reducing price volatility and the horizontal axis to the costs required for its implementation.

(1) **ER** = Emergency Reserve, Von Braun & Torero (2009), it requires US\$ 7.5Mpa but is to alleviate requirements of WFP during food scarcity and not to reduce price volatility

(2) **ICGR** = Internationally coordinated grain reserves, Lin(2009), it implies opportunity costs and coordination costs (approx US\$ 1.05B pa) and it could have an impact in reducing volatility but high risks of coordination failure, requires capacity to predict price spikes, and not necessarily effective to tackle speculation in futures market. Timmer (2009) proposes a similar idea only for Rice given how concentrated this market is we expect it to have a higher effect in reducing volatility in this specific

(3) **RR** = Regional Reserves as the one of ASEAN, it implies opportunity costs and coordination costs, depending on the market share on the commodities of the countries involve it could have an impact in reducing volatility, but very high risks of coordination failure, and could distort market prices, patronage problems, and other principal agent problems.

(4) **CR** = Country level reserves, this could imply significant relative costs at the country level, significant distortions and little effect on volatility given low effect over international markets.

(5) **VR** = Virtual Reserves, Torero & Von Braun (2009), it requires US\$ 12-20 B, risk of coordination failure, requires capacity to predict price spikes, could be effective in tackling speculation in futures market, requires certainty that markets are out of equilibrium to avoid distortion of interventions.

(6) **DFIF** = Diversion from industrial and animal feed uses, Wright 2009, it implies opportunity costs, could distort market efficiency, and necessarily effective to tackle speculation in futures markets

(7) **IS+IFA** = Better information on Storage and International Food Agency (Wright 2009), very low cost

not clear effectiveness in reducing price volatility

(8) **IGCA** = International Grain Clearance Arrangement, Sarris (2009). Not too costly, not clear how it will operate, not clear size of margins, not clear if it will work when stocks are tight, and not necessarily effective to tackle speculation in futures markets

(9) **FIFF** = Food Import Financing Facility, Sarris (2009). Similar to IMF's food import facility, could be costly, possible moral hazard problems, and not effective to tackle speculation in futures markets.



## Conclusion

The international food price crisis of 2007/08 led to economic difficulties for the poor, generated political turmoil in many countries, and could have severe effects on confidence in global grain markets, thereby hampering the market's performance in responding to fundamental changes in supply, demand, and costs of production. More importantly, they could result in unreasonable or unwanted price fluctuations that can harm the poor and result in long-term, irreversible nutritional damage, especially among children. This episode highlights the need to modify the architecture of international financial and agricultural markets in order to address the problem of price spikes.

Appropriate global institutional arrangements for preventing these market failures are missing. A global solution that prevents excessive price volatility in food markets may be costly, but given the losses created by food price crises like the one in 2007–08, it will still have large positive net returns. It is clear that the incentives for speculation in food commodities, as one of the components behind the price volatility, could be reduced by (1) changing regulatory frameworks to limit the volume of speculation versus hedging, (2) making delivery on contracts or portions of contracts compulsory, (3) imposing capital deposit requirements when each futures transaction is made, or all three. These regulatory measures could be implemented case by case or as a platform through an international “alliance of commodity exchanges”. Therefore there is a clear need (a) to undertake a policy debate about exchange regulation and the role of speculative traders and (b) that debate is very likely to include the issue of international harmonization. There is also a clear need to improve the quality of information and of forecasting of price spikes for any of the potential policies to work properly.

Several of the proposals to reduce price volatility or the effects of the price crises will require significant and quick investments in further research on their implementation and potential risks and benefits. In addition many of them target different objectives and therefore could substantially complement each other. For example, IFPRI has proposed two global collective actions to meet these goals: (a) First, a small physical food reserve should be established to facilitate a smooth response to food emergencies and (b) an innovative virtual reserve should be set up to help reduce the probability of significant market price spikes that could have severe effects on the poor. The first one is not to target price volatility but just to reduce the risk of scarcity of commodities for the most vulnerable during similar crises.

The second proposal is not designed to stabilize prices in general, but to prevent damaging price spikes and the collapse of confidence in the international grain markets. It can also clearly complement the Linn's (2009) proposal of an international coordinated regional reserve<sup>8</sup>, and Wright's (2009) proposal for better information on storage and the development of an international food agency. Moreover, within the concept of virtual reserves, there is an institutional design that includes an intelligence unit that will not only improve information on storage but also enhance capacity to better monitor the probability distribution of price spikes. It is clear that the proposed actions will entail costs, but the modest costs of the required organizational elements must be balanced against the benefits of more effective international financial architecture. These benefits will include prevention of economic hardship and political instability, improved market efficiency, and stronger incentives for long-term investment in agriculture.

All other proposals focus on different objectives and don't seem to have the potential to significantly reduce price volatility; nevertheless, they may have positive effects for other issues, such as trade

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<sup>8</sup> See von Braun, Linn and Torero for a joint proposal.

financing (Sarris 2009) or long term effects of some of the variables behind the changes in supply and demand fundamentals (Wright 2009).

In the meantime, we observe a mixed set of policy actions being taken: many countries try to build up costly national reserves, others focus on increasing self sufficiency, and still others engage in FDI to secure national food security through transnational land acquisition, rather than trade, because of lost confidence in trade due to uncertainty around volatility. In addition, some are pressing for more regulation of exchanges, which would not avoid extreme price spikes and could even further distort markets. All of these policy actions threaten to move food agriculture further away from efficient market designs. A more promising step may be regional coordinated reserves as planned by ASEAN recently. However, a global problem needs global institutional responses.

One clear message from all these proposals, is that a strong research based “intelligence unit” is needed to provide independent and trusted information to the decision making body of a possible virtual reserve system (von Braun and Torero 2009), internationally coordinated regional reserves (Lin 2009), a international food agency (Wright 2009), a international grain clearance arrangement (Sarris 2009), a food import financing facility (Sarris 2009) or any of the physical reserves options. All of these alternatives will clearly benefit from this and at the same time it will allow a better evaluation of the costs and benefits of each of them.

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