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FOOD SECURITY STOCKS AND EMERGENCY RESERVES FROM A EUROPEAN UNION CAP PERSPECTIVE*

Continuing world food market instability has created much concern about negative impacts internationally as well as within the European Union (EU). While there are many policies that have been proposed to deal with market volatility, the only ones that can change market fundamentals are those that deal with physical stocks. However, there are many misunderstandings and controversies concerning the institution and management of price stabilization and food security stocks. The paper reviews these issues and also the economics of storage, and indicates the various ways in which physical stocks can be deployed to manage market instability. It also reviews governance, informational and trade facilitation issues, and the potential role of the EU, within the constraints of the Common Agricultural Policy (CAP) and the World Trade Organization (WTO) to contribute to global food stocks. Refs 21. Figs 5.

Keywords: EU Common Agricultural Policy, food market, food security, international trading system.

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ЗАПАСЫ ПРОДОВОЛЬСТВЕННОЙ БЕЗОПАСНОСТИ И ЭКСТРЕННЫЕ РЕЗЕРВЫ В КОНТЕКСТЕ ПЕРСПЕКТИВ ОБЩЕЙ СЕЛЬСКОХОЗЯЙСТВЕННОЙ ПОЛИТИКИ ЕС (CAP)

Продолжающаяся нестабильность на мировом продовольственном рынке ставит много вопросов о негативном влиянии на экономику как в целом, так и в ЕС. Несмотря на то что существует много мер, предназначенных для борьбы с рыночной волатильностью, только те из них, которые связаны с физическими запасами, способны изменить рыночные основы. В статье дана оценка результатов этих мер и рассмотрено значение экономики накопления, определены различные пути, при помощи которых физические запасы могут быть задействованы для управления рыночной нестабильностью. Рассматриваются управление, информационная и торговая помощь и потенциальная роль ЕС в рамках общей сельскохозяйственной политики (CAP) и ВТО, которые могут способствовать глобальным продовольственным запасам. Библиогр. 21 назв. Ил. 5.

Ключевые слова: общая сельскохозяйственная политика ЕС, продовольственный рынок, продовольственная безопасность, международная торговая система.

1. Introduction

The period since 2006 has seen considerable instability in global agricultural markets. Between September 2006 and February 2008, world agricultural commodity prices rose by an average of 70 percent in nominal dollar terms, with prices in some products rising by much more than that. The strongest price rises were observed in wheat, maize, rice, and dairy products. Prices fell sharply in the second half of 2008, although in almost all cases they remained above the levels of the period just before the sharp increase in prices started. In 2010 sharp price rises of food commodity prices were observed again, and by early 2011,

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* This article is partly based upon the ideas presented in some papers previously published by the author and further elaborates on the issues [Sarris, 2011; 2013].

the FAO food commodity price index was again at the level reached at the peak of the price spike of 2008. In 2011 and 2012 prices fell again and then rose again considerably in early 2013, and 2014. In other words within the past seven years many food commodity prices increased very sharply, subsequently declined equally sharply, and then again increased rapidly to reach the earlier peaks. Such rather unprecedented volatility in world prices creates much uncertainty for all market participants, and makes both short and longer term planning very difficult. It has also led to calls for more internationally coordinated market management.

The sudden and unpredictable increases in many internationally traded food commodity prices in late 2007 and early 2008 led to many short term policy reactions that may have exacerbated the negative impacts of the price rises. Given that several such interventions were in many cases inadequate or inappropriate, many governments, think tanks, and individual analysts called for improved international mechanisms to prevent and/or manage sudden food price rises. Similar calls for improved disciplines of markets were made during almost all previous food market price bursts, but were largely abandoned after the spikes passed, largely because they were deemed difficult to implement.

Staple food commodity price volatility, and in particular sudden and unpredictable price spikes, creates considerable food security concerns, especially among those, individuals or countries, who are staple food dependent and net buyers. These concerns range from possible inability to afford increased costs of basic food consumption requirements, to concerns about adequate supplies, irrespective of price. Such concerns can lead to reactions that may worsen subsequent instability. For instance excessive concerns about adequate supplies of staple food in exporting countries' domestic markets may induce governments to take measures to curtail or ban exports, thus inducing further shortages in world markets and higher international prices. The latter in turn may induce permanent shifts in production and/or consumption of the staple in net importing countries, with the result that while subsequent global supplies may increase, import demands may decline permanently altering the fundamentals of a market.

The purpose of this paper is first to review several issues relevant to global food commodity market volatility as it pertains to food security, and then to review issues relevant to designing a new global agricultural markets management framework that pertains to food security stocks and emergency reserves. The discussion will be developed from the perspective of identifying first the market insufficiencies that can be dealt with by security stocks and emergency reserves, and then reviewing the issues that relate to their implementation and management. It will also focus on the role of the EU via its Common Agricultural Policy (CAP) to contribute to food security and market management.

The objectives of the CAP, since its beginnings in 1962, have included market stabilization, guarantee of availability of supplies, and provision of food at reasonable prices to consumers. The policy instruments used by the CAP to achieve these objectives, mainly variable tariffs coupled with storage interventions, have been quite successful in insulating EU domestic markets and prices from some of the considerable market volatility experienced in world markets. However, the use of these market intervention instruments, and in particular their relation to the setting of intervention prices, tended to be make them instruments of farm price support, and at increasing budgetary cost. In particular the CAP has traditionally made heavy use of storage interventions, for the purpose of defending pre-agreed price floors for farmers. This policy had the effect in the past of accumulation of

significant amounts of publicly held stocks of various commodities. The shift in emphasis in the CAP to more market orientation since 2002 opened EU farmers to more exposure to external market instability. With the implementation of the Single Farm Payment (SFP), and lower tariffs, EC producer prices have declined, and EC held public stocks in most commodities have declined or disappeared, but the storage policies remain in the arsenal of the European Commission (EC). The global food crisis of 2007–8, the subsequent steep price decline after the middle of 2008, especially in grains and dairy products, and the renewed market upheaval of 2010 and more recently have brought the issues of market volatility to the fore of EU and international discussions. Several political and policy statements have emphasized that the EU must have an agricultural model with the tools necessary to stabilize markets and deal with price volatility. Hence security and emergency stocks must be assessed in relation to these broad issues and objectives.

The EC currently does not have a policy of security stocks, or emergency reserves for any products. However, there are two market management measures that remain at the disposal of the EC after successive CAP reforms, that effectively result in stock building. First intervention purchasing and withdrawals now operate like a safety net for certain products (e. g. soft wheat, milk powder). Purchases can take place at fixed prices and for limited quantities, but these quantities and prices can be changed when circumstances dictate. Second, aid for private storage under certain market conditions has the effect of building stocks beyond what the market would support. It is applicable to a range of meats, as well as sugar and olive oil.

2. Defining market crises and extreme volatility that may be dealt with by stocks

A policy for security stocks and emergency reserves must refer to specific instances of "insecurity" or "emergencies" that could be dealt with by the specific policies. In the EU under the Health Check reforms the policy framework exists to permit market interventions in sectors that are affected by crises and disasters. A policy of security and/or emergency reserves of some commodity cannot be envisioned or instituted unless the circumstances that necessitate the policy are articulated in detail.

Generally speaking food insecurity is not currently an issue within the EU, albeit it was a major issue in the early post World War II years. Within the EU food security is determined by access to food, and this is in turn determined by per capita income and income distribution. Both average incomes (high) as well as income distributions (equitable) within the EU are favorable to low food insecurity. The average food budget share is only 14 percent and this implies that food price crises do not affect the purchasing power of final consumers by too much. The EC has estimated that the 2007–8 price spikes caused only a 0.7 percent decline in EU average real purchasing power [European Commission 2008b]. This does not imply that there are no pockets of food insecurity within the EU. However, in most EU member states (MS) there are safety nets and direct income and consumption support policies to deal with such issues.

Generally the various recent calls for policy intervention to "stabilize markets" have been motivated by assessments that "excessive volatility" in agricultural markets is not in the interest of producers or consumers, and must be controlled. It is, however, by no means easy to define "excessive" volatility or a related "crisis".

Price volatility affects agriculture in several ways. It increases the risk premium attached to investments and hence farm and overall agricultural growth. Similarly price volatility in a value chain could increase the risk of contracts, thus inviting larger risk premia and margins. Finally given that many farmers, especially in the EU, operate under low profit margins, market price volatility could lead to disproportionate income variations.

The most important types of risk affecting agriculture are yield or production shocks, and price and market shocks. While yield and production shocks affect normally a limited number of farmers, and hence are more amenable to normal insurance, market shocks usually affect a larger number of farmers and hence are more amenable to public interventions. In agriculture, much as in all other sectors, price variations serve as signals to market participants about changing market conditions. Market prices respond to news about impending fundamentals of supply, demand and policy.

Market volatility or instability refers to period to period changes in indicative summary market variables (such as prices). Such instability is due to unpredictable changes in the market fundamentals (such as production costs and volumes, demand, government policies, macroeconomic factors, etc.) which change the perceptions of market participants about the current and future values of the commodity, and is a normal phenomenon of all agricultural markets. To deal with market instability and spikes one must first comprehend the forces that determine market volatility and unpredictability, and market participants' behavior under unpredictability.

In the food commodity markets there have been five periods of sudden price increases (and subsequent declines), in the last forty years (1973–75, 1978–79, 1986–87, 1995, and 2007–8), that may be termed as extraordinary, and of these only the one of 1973–75 was of comparable magnitude to the recent one in 2007–8. How can one understand and interpret these sharp food commodity price swings?

There have been many analyses of the recent food price surges [Abbott et al., 2008; von Braun et al., 2008; Mitchell, 2008; Gilbert, 2010]. Recently Headey and Fan [2008] made an assessment of all the various explanations and factors that have been proposed to explain the food price surge of late 2007 and 2008, and found that among the many factors proposed only a few are consistent with the underlying facts of the crisis. However, market volatility is not only about a single event of sharply rising commodity prices. It is about a continuing pattern of unpredictable changes in prices, both positive and negative. It is this unpredictability that affects medium and long term investments and hence patterns of production, but also consumption.

Recent price changes of agricultural commodities have been quite substantial in the EU. For instance between August 2009 and August 2010 the prices for soft wheat in the EU MS changed from a low 7 and 9 percent in Slovenia and Portugal respectively to a high of 72 and 76 percent in Germany and France respectively (EU average change was 44 percent). For maize the EU average price change during the same period was 39 percent, for barley 40 percent, for Skimmed Milk Powder (SMP) 33 percent and for butter 41 percent with significant variations among MS. On the other pole over the same period the average price change for durum wheat was — 8%, for beef –1%, for pork — 3% and for poultry 4%, again with significant variations among MS[1]. Two things are clear from these events. First price changes are not uniform across agricultural commodities, and second that the price

[1] Source EC DG for Agriculture and Rural Development. CM D(2010) 785171.

changes are not uniform across EU MS. It is thus difficult to talk about a EU price spikes, since price developments are different in various MS. Nevertheless, some markets in the EU are larger and hence more representative, so the issue of designating a representative market or a set of such markets is surmountable and has been so in the application of other market management measures, such as variable levies.

On the other hand consumer prices for the various food items that are related to these commodities change by much less than the commodity prices. For instance during August 2009–2010, the EU average consumer price for bread changed by 0.2%, for meat by–0.1%, for milk, cheese and eggs by 0.5%, and for oils by 2.9%. For all food the change was a mere 1.8%. Clearly the large commodity price changes are not reflected in final consumer prices. This implies that the major absorption of the price swings takes place at levels in the food chain close to the producer, and hence it is producers that are most vulnerable to food commodity price shocks. Figure 1 and 2 illustrate this for two value chains, cereals and cereal based consumer products and meats as well as consumer meat products, for the EC market over the period 1997 to 2010. It can be seen that the price fluctuations are much larger at the commodity level (e. g. wheat) than at the level of the final product which includes the commodity (bread). Similar figures apply for other food product groups, such as dairy.

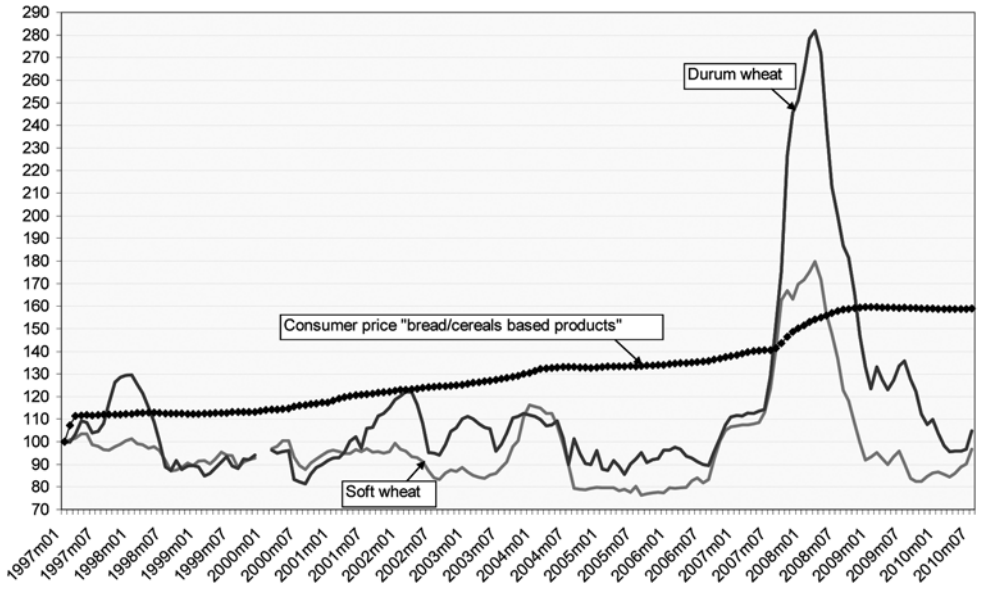

Figure 1. Cereals/bread and cereals based products: EU agricultural market and consumer price developments (Jan 1997 until Aug 2010, Jan 1997=100).

Source: [Commodity Price Dashboard…].

There is a debate on the issue of whether price volatility of agricultural commodities has increased. While popular views suggest that it has, some recent analyses suggest a mixed picture. Gilbert and Morgan [2010] examined the price volatility of 19 internationally traded agricultural commodities over the period 1970–2009, and when they compared the two twenty year periods in this range, they found that volatility had statistically significantly

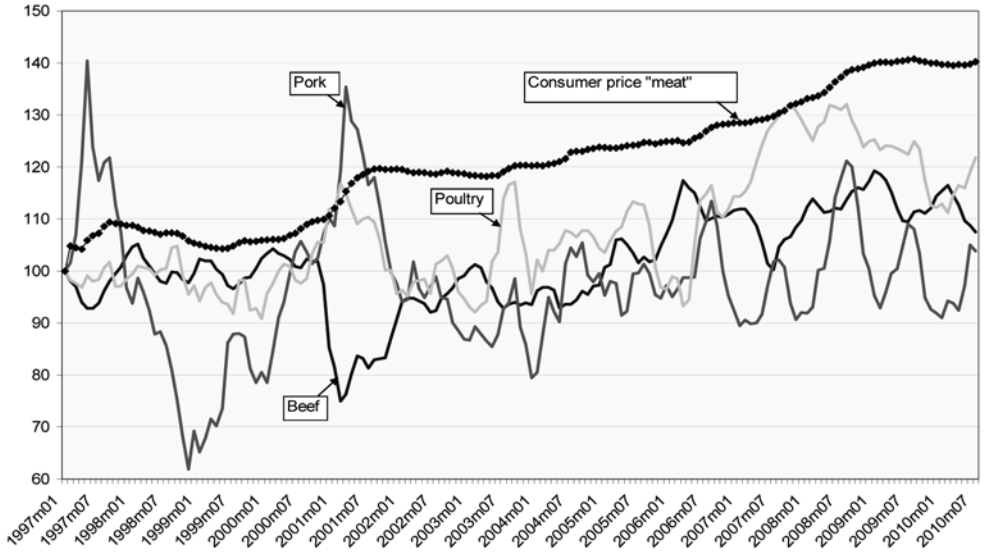

Figure 2. Meat: EU agricultural market and consumer price developments (Jan 1997 until Aug2010, Jan 1997=100).

S o u r c e: [Commodity Price Dashboard…].

increased in only three of these (rice, sorghum and bananas), while it had significantly fallen for 9 commodities (cocoa, sugar, soybeans, groundnut oil, palm oil, soybean oil, beef, lamb, fishmeal) and had insignificant changes one way or the other in the others. Concerning prospects for future volatility, Gilbert and Morgan assessed a range of factors and judged that three were likely to have a positive impact on volatility (demand for food crops for biofuel feed stocks, futures market speculation, underinvestment in agriculture), while other factors, such as inventory levels, climate change, price transmission, etc. were likely to have minimal influence on future volatility. Balcombe [2010] also found that there is conflicting evidence on the trend of volatility of agricultural commodities. He found that volatility depends on the volatility of several explanatory variables, such as petroleum price and the US dollar exchange rate. On the other hand EC analysis[2] suggests that historic volatility of several agricultural commodities has increased in the recent decade or so. Matthews [2010] also found that within the EC markets price volatility seems to have increased over time, and in some commodities it is now higher than world market volatility.

Theoretically volatility of commodity prices should be larger when the commodity price level is larger (implying shortage of the commodity and hence larger reaction to any news about fundamentals) and when stock levels are smaller (implying that there is smaller buffer against any short term supply/demand disturbances). Figure 3, taken from EC published analysis[3], indicates that volatility in the most representative international market for wheat, namely the Chicago Mercantile Exchange (CME), seems to have increased over time. It also indicates that higher nominal prices are normally but not always associated

[2] EC DG for Agriculture and Rural Development Directorate L. Economic Analysis and evaluation. L5 Agricultural trade policy analysis note of 16/07/2009 on Historical Price Volatility.

[3] Op. cit.

with higher volatility, as expected from theory, and that higher volatility is associated with lower levels of global end of season stocks.

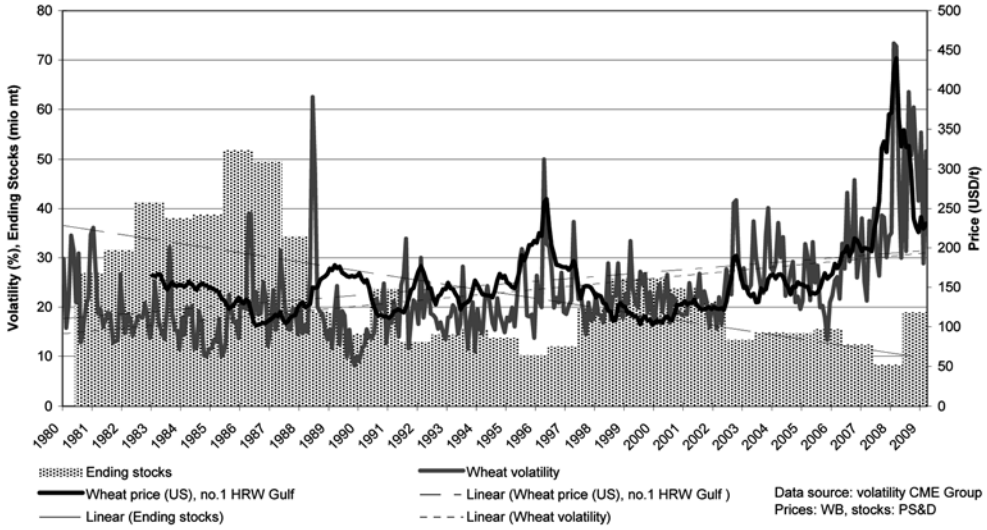

Figure 3. US Wheat volatility, US ending stocks and Price Monthly.
S o u r c e: [European Commission. Directorate-General for Agriculture…].

Needless to say the results as to the developments in volatility depend on the data utilized. The data is some organized commodity markets with futures and options, such as Chicago, Paris, London etc. do not necessarily behave in the same way as prices in spot markets. This presents a dilemma as to the type of price indicator to utilize to determine any kind of intervention.

Another rather less obvious indicator of market volatility is what has been termed "implied volatility". Implied volatility represents the ex-ante assessment of the market as to the possible changes in subsequent prices. It cannot be observed directly, but can be inferred from readily observed prices of contracts whose prices depend on such assessments. Such contracts are options on future price developments. An "option" gives the buyer the right to sell a commodity (put option) or buy a commodity (call option) at a specified price and at (or before) a specified future date. Normally commodity option contracts are not written on actual physical contracts, but rather on futures contracts that are openly traded in organized commodity exchanges like the Chicago CME or the London Euronext. Hence they are financial instruments and can be traded. The price of an option depends on the expected movement of price over the period of the option, and it is this feature that permits the inference of the underlying market determined uncertainty or volatility about the future movement of the commodity price. Clearly the more uncertain the market agents are about the subsequent development of the commodity price, the higher will be the option price.

Figure 4 exhibits some estimates of the implied volatility (measured by the implied standard deviation of expected price over the average of that expected price) of some basic agricultural commodities in Chicago CME. A notable feature of this figure is that over the past 20 years implied volatility has gradually increased considerably in all three commodities and peaked in late 2007 in the height of the recent food crisis, before declining,

but to still high levels, in late 2010. Combining figure 3 and 4 it can be seen that implied and actual observed volatility indices for wheat have been moving with a similar trend, which is comforting, as implied volatilities can be observed for only a few commodities for which organized futures and options markets exist. Similar results can be observed for other traded agricultural commodities.

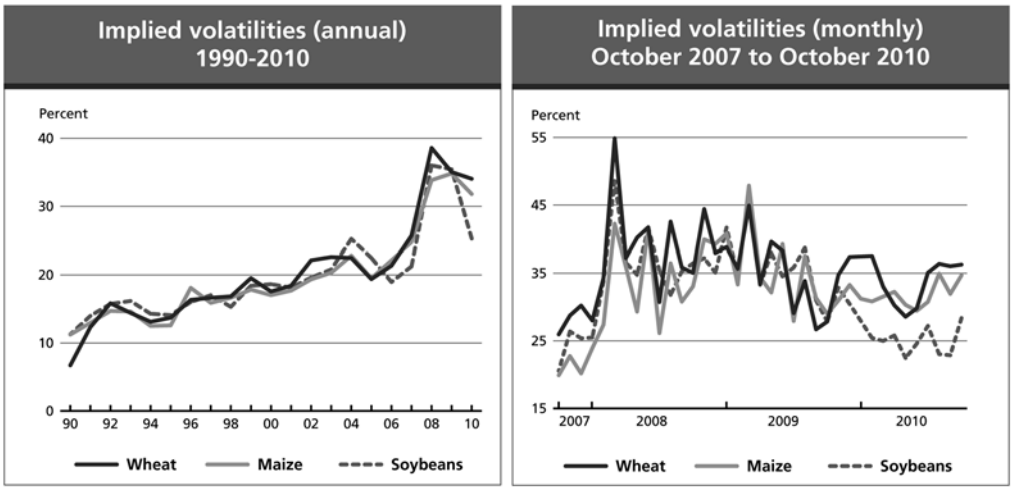

Figure 4. Implied volatilities of wheat maize and soybeans in Chicago CME.
Source: [FAO Food Outlook…].

Irrespective of whether price volatility has increased or not, it is not necessary that the incomes of EU farmers have become more variable. This is because of the presence of the SFP in EU, which gives a measure of stability to farm income. This appears to have been the case in the post 2000 period compared to the 1990s [European Commission, 2008a]. If, of course, the SFP is revised post 2013, and declines as a share of total farm income, then the prospect of increased farm income volatility is quite real. From the above discussion, it appears that the major arguments for policies and measures to ensure market stability in the EU are efficiency and growth related rather than welfare related.

Given the above discussion, it appears that three types of useful indicators that are relevant and could be utilized by the EC in managing excessive market price instability. The first is nominal prices of relevant commodities in some specific market(s). An indicator could be designed around specific price ceilings and/floors which, when breeched, would call for market intervention. This is the simplest type of indicator for action and it is the one utilized in the past. However, it has the weakness that someone must specify the relevant price bands, and this is invariably technically difficult but also highly political.

Ideally, in order to have an index or measure on the basis of which to provide a trigger for interventions to manage commodity market volatility, one would want to have an estimate of the underlying equilibrium average market price for a commodity for each period, and a probability distribution of prices around such an average again for each period. One could then design an appropriate price band that would be expected to be breeched once every so many periods, depending on the probability distribution. The band could change over time as the underlying average price changed and also as the probability

distribution changed. Unfortunately, such variables are quite difficult to estimate, and if estimated they are subject to considerable errors. Furthermore, changes in the underlying trends and distinguishing them from temporary shocks are not easy to estimate. It has been a recurrent mistake in past programs, to interpret a temporary price spike or price decline as a permanent shift, with the consequence that market interventions aimed at changing market fundamentals are misapplied. Nevertheless, such simple indicators have the great advantage of transparency and ease of calculation.

A second type of useful market indicator could be an estimate of observed market volatility. This indicator could be built around observed changes in the prices of certain basic commodities in given markets relative to changes observed in the past. Large and persistent observed deviations of the observed changes from past averages could be used as triggers for intervention. Of course one would have to define the frequency of price observations (daily, weekly, etc.), the period of time over which changes must be observed before intervention is triggered, the way changes are measured, and the amount of deviation beyond which measures should be taken. Such indicators have not been utilized in the past but they seem relevant for the issue of dealing with market volatility. Considerable work would have to be done to explore ex-post the types of interventions that would have been triggered in the past with such indices.

A similar type of market indicator could be built around observed implied volatilities of some commodities. However, given that such indicators must be inferred from prices of options in organized exchanges and given that such option trading is quite limited in the EU, it seems that this type of indicator would be less useful.

The third type of market indicator could combine price levels with indices of volatility. In other words one could stipulate that if prices change considerably but slowly, then this may not be ground for market intervention, as the market may be reacting to slowly evolving fundamental forces which are to a large degree predictable. However, large and sudden changes in prices may reflect market disorientation about the fundamentals, and hence erratic and potentially wasteful reactions to unpredictability. In such case intervention maybe aimed at restoring market confidence in fundamentals and reducing unpredictability in the subsequent price evaluation.

Concerning the issue of what may be termed "excessive", it appears that within the EU, farmers as well as consumers have a range of options to deal with normal market fluctuations. It is unusual market events, for instance market upheavals that may occur once every twenty years of so, that are quite unpredictable, that may need additional policies. Such infrequent events maybe characterized by "cognitive failure" namely the inability of private agents to identify the true risks and hence make plans that do not take into account low probability but rather high consequence events. It is such events, which may justify security related and emergency interventions.

Apart from market price related events that may provide triggers to stockholding interventions, a related issue is what type of event is to be prevented or insured against in a market like the EU. Is it for instance the whole market that needs to be stabilized or only some parts of the market or market participants that maybe deemed vulnerable?

3. The economics of storage. When are stocks most effective in market management and regulation?

Physical inventories are an indispensable part of any market of a storable agricultural commodity. During any given period of time total supply of a commodity is equal to production during the period, and start of period stocks, while total demand is equal to consumption (direct or indirect via processing), net exports (if one is discussing a trading country or region) and end of period stocks. For a seasonally produced commodity at the start of marketing period (namely after harvest) stock of the commodity is largest, and as the season progresses it declines as the commodity is consumed, and is usually lowest just before the onset of the next harvest of production. Prices normally follow the inverse pattern, being lowest at the start of the season, and gradually increasing until the end of the season. The end of season stocks are an important determinant of the conditions of the market during the next period, as they indicate the degree of buffer available in case production falls short of expectations of demand is stronger than expected.

A commodity crisis is normally triggered by very low end of season stocks, coupled with some unanticipated supply or demand disturbance that cannot easily be buffered by preexisting reserves of the commodity. Just before the 2007–8 crisis the global stocks to use ratios of basic (such as cereal) commodities reached the lowest levels of the previous thirty years at less than 20 percent. This coupled with some small production shocks, such as the Australian low wheat production, as well as some demand shocks (largely from the biofuel and oil sectors) led to large price spikes. If stocks had been at larger levels it is unlikely that such a large price spike would have been triggered. This was evidenced in 2010 in the cereals sector where end of season stock to use ratios for the 2009–10 season were considerable (at around 25 percent) compared to close to 20 percent in 2007. A significant world wheat supply shock that amounted to as much as 4.7 percent of global production gave rise to a brief price spike in the summer and fall of 2010, which was much smaller than that of 2007–8, and which that did not last long, as stocks were adequate.

Clearly, the availability of end of season stocks is a major stabilizer of markets. However, in order to have larger amounts of end of season stocks, someone must take them out of the market during some earlier period and put them into inventory, and it is this that creates the problem of stock management. The private sector normally holds all the stocks in a commodity in anticipation of physical consumption or processing needs (for which the private sector is willing to pay a storage cost), or in anticipation of higher prices (namely for speculative purposes). At the end of a season the private sector holds stocks over and above what may be termed minimum pipeline stocks, only when a profit is anticipated from carrying inventories in the next period. Clearly this depends on expectations of prices, and it is these expectations that are highly volatile and can change so as to create a crisis. If, for instance, some events create expectations that there will not be adequate supplies in a future period, then everyone will try to anticipate the shortage by hoarding some extra amounts of the commodity. The simultaneous tendency by many market participants to obtain extra amounts of the commodity for profit hoarding, to secure market operations, or to assure consumption, all at the same time, creates a price spike. The role of extra commodity stocks, therefore, is to prevent market expectations from exaggerating any particular fundamental market development.

In high income markets, such as the ones in the EU, consumption and hence demand of any commodity is usually not very responsive to price, because the commodity constitutes a small part of the final value of the consumed product. This implies that the buyers of the commodity for further processing or handling do not vary their volumes of commodity in response to minor changes in price, and instead they are likely to increase the amount they pay for the commodity to secure the volumes they need. It is this tendency (or "inelasticity") that may create sudden price spikes, as small changes in market expectations may give rise to large price changes to secure needed supplies.

Figure 5 reproduced from Wright (2009) illustrates the above points. The figure indicates the total demand for a commodity, which is the sum of the demand for consumption and processing (assuming no net exports) and demand for end of season stocks. The demand of the former is quite inelastic as per the discussion above and is illustrated by the linear portion of the curve in the left of the diagram. Demand for the latter is a function of the difference between the expected price (not shown) and the current market price. For a given expected price, the lower the current market price the larger is the demand for carryover stocks, and it is this that creates the less steep part of the total demand curve at lower market prices. When the current market price is large, then the demand for carryover stocks (over the above minimum pipeline stocks) is essentially zero. The figure illustrates the fact that the same supply shock, if it occurs in the context of a market with zero or small stocks will result in higher price changes. Availability of extra stocks (such as those held by a public agency), would shift the point at which the demand for stocks joins the demand for consumption to a higher level, and hence would make the response to a give shock much smaller.

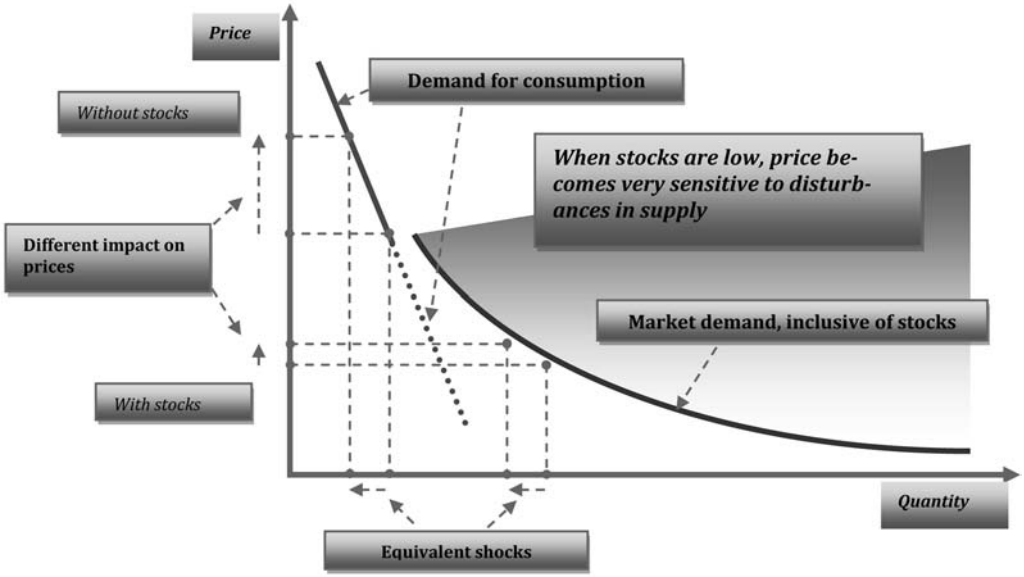

Figure 5. The role of stocks in buffering shocks.
Source: [Wright, 2009].

The point of the above discussion is that stocks in order to be able to diminish or avoid price spikes must be adequate to make a positive difference in the total amount available to the specific market that is targeted for intervention.

4. Private versus public stocks

Reserves of agricultural commodities have the obvious advantage that they can be drawn on when harvests are damaged or there are surges in demand. Large end of season carryovers tend to hold price levels down. The issue is whether the public sector should be holding reserve stocks of above and beyond the willingness of the private sector to hold stocks.

Theory and practice suggest that at any one time, and given the total volume of stocks available, the market, in the absence of any public intervention, will create conditions that will allow the private sector to carry the stocks. This involves appropriate prices, as well as location of inventories. Models have been developed to explore what may be termed the appropriate amount of carryovers in a market framework. When the public sector interferes with the purpose of securing physical inventories, the private market adjusts so as to accommodate the reduced level of stocks available for private storage.

If the commodity market is well functioning with good information flows and no credit constraints, and if the policy of the public sector *vis-a-vis* the management of the stocks is known and is credible, then the private sector will react so as to fully counteract what the public sector is doing. In other words when the public sector accumulates stocks, the private sector will decumulate them, and if all the perfection conditions mentioned above hold, then the private stock changes will be equal in magnitude and opposite in direction to what the public sector is doing. The net effect may be no change in the total volume of carryovers from a period to the next. The point is that public stocks will make a difference to total stock held only if the commodity markets exhibit some degree of imperfection. Even then the net additions to total stocks will be larger the more imperfect the private markets. In developed countries, such as those of the EU, private commodity markets are well developed, so one would expect that any public stockholding intervention by the EC would lead to opposite and counteracting actions by the private sector. This implies that the net amount of stocks carried over from one period to the next may be smaller than what is accumulated by the public sector alone.

Nevertheless, there some problems with total reliance on private storage for national commodity supplies. First in a free market and in a period of high prices only those with adequate incomes can access the commodities. This creates equity issues. The second is that in food emergencies governments are pressured by consumers, and they may resort to policies of price controls, forced surrender of stocks by traders, etc.

Holding public reserve stocks also faces three key issues: their *costs* (and who should pay), *monitoring* the level and quality of stocks (and who should manage them), and *enforcement* of agreements to buy and release stocks according to some transparent rules. Each of these issues has been difficult to resolve even in the case of national stocks.

5. Physical reserves for specific purposes

The issues reviewed above suggest that physical reserves may be best if they are targeted to specific objectives or issues. In addition to specific objectives, physical reserves need to

be accompanied by clearly specified rules for their operation. It is against this background that a review of some such issues and objectives is attempted below.

5.1 Emergency reserves for food aid

International Food Policy Research Institute (IFPRI) has proposed the institution of an emergency reserve of around 300,000 — 500,000 metric tons of basic grains—about 5 percent of the current food aid flows of 6.7 million wheat-equivalent metric tons [von Braun and Torero, 2009]. The idea is that the reserves would be supplied by the main grain producing countries and funded by a group of countries participating in the scheme (that is, the Group of Eight Plus Five (G8+5) countries (Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, the United States, Brazil, China, India, Mexico, and South Africa) and maybe others. This decentralized reserve would be located at strategic points near or in major developing-country regions, using existing national storage facilities. The reserve, to be used exclusively for emergency responses and humanitarian assistance, would be managed by the World Food Program (WFP). The WFP would have access to these grains at pre-crisis market prices, to reduce the need for short-term ad hoc fundraising. To cover the cost of restoring the reserve to its initial level, (i. e. the difference between the post-crisis price and the pre-crisis price times the quantity of reserves used by WFP), an emergency fund should be created and its level maintained by the participating countries. This arrangement could also be defined under a newly designed Food Aid Convention.

Food aid in general is about providing food and related assistance to tackle hunger, either in emergency situations, or to help with deeper, longer term hunger alleviation and achieve food security (where people do not have to live in hunger or in fear of starvation). It can be divided into food assistance programs or transfers, such as food stamps, food subsidies, food price stabilization, food for work, etc., and international concessional flows in the form of food or cash to purchase food in support of assistance programs.

The types of food aid include "program food aid" namely an in kind aid, where food grown in the donor country is distributed or sold abroad to support some aid objective. It is typically a government to government transfer and recipient countries typically purchase it with money borrowed at lower than market interest rates.

Relief or emergency food aid is given in emergency situations such as war, natural disasters, etc. when food is distributed for free. Some of this, however, and in some countries plagued by chronic food insecurity problems, tends to become regular food transfers. Finally project food aid is associated with a specific development project that promotes agricultural development nutrition, etc. Programs such as food for work, and other conditional cash transfer (CCT) programs are beneficiaries of such type of food aid.

There has been a shift over time in food aid away from long term development to short term humanitarian relief. Currently around 65–75 percent of global food aid is for humanitarian reasons. European countries and the European Commission (EC) have generally shifted away from in-kind food aid, preferring to purchase locally or help facilitate local purchases instead.

A major problem with food aid shipments especially of the humanitarian type is that there is usually some delay between the need for relief based on a particular disaster and the subsequent arrivals of the necessary food supplies. Normally, it is a government that must declare a need for humanitarian assistance, the size of the need has to be assessed, an appeals procedure has to be launched for aid and food aid in particular, commitments made

by various countries, and finally shipments to those affected. For a variety of reasons many of these steps take time, and hence there are delays in the actual delivery of needed supplies of food. By the time supplies arrive in a stricken region significant hardship may have been incurred by the affected populations. The negative effects may involve starvation of people or animals, destruction or sale of productive capital items and other livelihood sources, unduly large price rises in some local markets, and other negative consequences. Clearly timely availability of food supplies could alleviate many of these short term problems.

While in most such emergency cases donors are mobilized quickly and supplies eventually arrive, the delays can mean that the eventual food aid is less effective. It is to counteract such delays that an emergency reserve can contribute towards. In other words, the emergency reserve could serve as a quick buffer, which could disburse supplies for emergencies as per WFP estimates, in anticipation of eventual replenishment from donor transfers. The proposal rightly includes a mechanism for replenishment of drawdowns in the form of a food aid emergency fund, which would be replenished when utilized to draw down some of the emergency relief stocks. In this fashion the physical reserve would be maintained over time, and be available in every year.

There are some issues as to where the stocks would be located, the conditions and rules that would govern the withdrawals, whether the emergency reserve could be drawn down without purchases (namely whether it can be considered as a free emergency resource), and how the various food aid systems of different countries can be accommodated (for instance the EU grants food aid for free, while the US grants it at terms more favourable than market, namely not for free). These however, are technical and can be worked out once the principle is agreed upon.

The instrument has the great advantage of providing a buffer for ensuring timely availability of emergency relief supplies. It has the disadvantage that it must be coordinated with other donors, but given its small size relative to overall food aid flows it could be instituted by one donor only. If the EU decided to take the initiative to start it, and to be the principal underwriter of such a system, it could crowd in other donors, and would be a cost effective way to deliver timely humanitarian assistance.

5.2. Internationally coordinated grain reserve

One of the problems any food crisis similar to that of 2007–8 is that many importers are shut out of the international markets not only for lack of resources, but for lack of physical supplies available for purchase. Also many international contracts are not honoured. This clearly creates a crisis of confidence, and it is maintenance of confidence in world markets that is needed to avert spikes.

Given this crisis of confidence many countries now are trying to achieve grain self-sufficiency and rebuild their own public reserves. While the motivation of each country is justifiable, the result will be a very inefficient global production system, a large total global reserve, and a thinner global grain market.

One of the main causes of the food price spike was the low ratio of stocks to use, as Wright [2009] has argued. Clearly if there were adequate internationally held physical stocks a price spike could be averted. Von Braun, Lin and Torero [2009] have proposed that there be a UN agreement internationally where countries would hold public stocks in addition to any private storage as a percentage of annual use. The proposal would be an agreement by a group of a few important world grain market participants that would

include members of the G8+5 as well as major grain exporters such as Argentina, Thailand and Vietnam. The members would commit to hold specified amounts of publicly owned grain reserves, in addition to those held by the private sector.

These stocks would then be released onto the world market when a price spike was forming, and according to directions by a "high level technical commission" appointed by the group on a permanent basis. The Commission would have full decision making authority. The proposal sounds feasible so long as international agreement and discipline are forthcoming. These, however are important reservations. When markets are under stress governments tend to look first inward to satisfy their domestic constituents before they fulfill international commitments. In fact this tendency seems to have been one of the main contributors to the recent 2007–8 price spike. Furthermore, it could be difficult to get agreement on the fraction of grain use to be stored and at what threshold to release stocks. Moreover, would countries really commit to release their public stocks to the world market if prices were rising and domestic interests appeared threatened? If public stocks are increased, it may well be that private traders will reduce theirs, so that to achieve a net increase in stocks may require much larger stocks than envisaged.

The proposal structure in principle looks similar to the principle of the International Monetary Fund (IMF), which collects monetary reserves from its members and releases them to financially stressed members when needed. The IMF members have agreed on rules of release and replenishment, and it is the credibility of these rules that have maintained confidence in the financial markets over time. Would it be possible to obtain such an agreement for basic food commodity markets? Rules that could be considered involve the amounts of reserves contributed by members, the types of situations or events when reserves would be available to participating members, the types of members that would participate and would be eligible to draw supplies from the system, the rules for replenishment of supplies withdrawn, etc. For instance it could be stipulated that withdrawals would have to be made by a country to meet emergency domestic food market problems, and not to any private market participant. All of these issues could be resolved at a technical level, as they have been resolved at a financial level for the IMF.

While the markets of food commodities are simpler than those of currencies, there are some issues that are different. First, the maintenance of physical reserves is costly. A global reserve of say 10 million metric tons of grain would cost around 150 million US dollars a year to maintain, clearly a non-negligible amount. Given, however, that supplies could be secured for delivery in international exchanges such as Chicago and others, the global food reserve could consist of purchases of futures contracts in organized exchanges that could be rolled over each year to avoid physical storage costs. If needed to supply some members, these contracts could be held to delivery and transformed into physical supplies. Under such a system the costs of maintenance would be only the interest on the margin required to maintain the futures positions and would be rather small and manageable.

As discussed above the idea is quite different than the idea of commodity agreements which were much in fashion during the 1970s and 1980s, and which have been plagued by the problems of agreeing on price bands for market stabilization, as well as on the rules of operation of the attendant buffer stocks.

The idea of internationally coordinated basic commodity stocks could evolve into a global food security stock, that could be utilized to supply some extraordinary needs of members under some extreme but well specified circumstances. It needs to be further studied from this perspective.

5.3. National and regional stocks

The desire for national stocks and/or regional stocks normally comes about from a realization that under an open markets regime market sometimes behave in ways that are contrary to domestic policy objectives, relating to food security. For instance domestic food price stability cannot be maintained when a country's food markets are integrated with international markets. The recent food crisis has led the governments of several countries to realize that the international market cannot always be a reliable supplier of basic food staples, and this may cause domestic upheavals. All these governments realize that to maintain control of domestic food markets in times of crises, they need a tool of market intervention that can be deployed unilaterally. National food stocks offer such a possibility, and several countries are reported to have started building national publicly owned food reserves. Many counties in Asia have utilized such policies to control domestic rice markets with considerable success in the past. In the EU and the US, publicly owned stocks in the past were the unintended result of price support policies, and not of a conscious food reserve policy.

The major advantage of owning national food stocks is that they can be deployed fast to defuse a crisis. Thus, any policy of national stockholding for strategic or other purposes must be accompanied by clear rules as to how the stocks are to be managed and by whom. For instance, while a policy to support a minimum price level will result in stock accumulation, and this has happened with EU CAP policies in the past, there must be some limits concerning how much is to be accumulated, and under what conditions will the accumulated stocks be released and how. This is, however, where most national stock policies fail or are inadequate. The reason is that the objectives of stock policies are vague (e. g. to maintain price stability or prevent price spikes) and do not prescribe specific rules for management.

Another problem with national stock management is that they frequently mix a price objective with a quantity or welfare objective. For instance if the objective is to maintain a price ceiling, then this implies that sales out of a security stock would have to start as soon as a market price index is above a certain upper limit. However, it is normally not known, when such an occurrence is realized, what is the demand for the commodity at that price, and hence whether the price can be maintained with the reserve quantities available. An additional problem is that national markets, especially those of the EU, are not isolated from international markets. The EU in the past could isolate its domestic market via variable import levies, but this is not the current policy. In a large (from the perspective of a commodity) open economy, such as the one of the EU, a price ceiling or floor, would effectively mean a price band for the world. This is the situation the USA found itself in earlier years when it ended up providing a global security stock of grains, and that the EU found itself with stocks of some other commodities like milk powder and butter. In a world with much less control of domestic markets via trade policies, such a policy could create much larger EU stocks and hence would be costly. In other words a national stock policy may not be implementable without an attendant targeted trade policy.

A way out of this impasse, and in case a national emergency stock is deemed appropriate, would be for the EU to specify in detail the conditions under which stocks would be accumulated, as well as the conditions for release, and also specify the specific areas of the commodity market targeted. If, for instance there is a pocket of vulnerability to

food price spikes within the EU, then a stock policy could be aimed at making sure that this part of the market is supplied at adequate prices and up to a limit.

Concerning regional stocks the problems of national stock holding are compounded by the fact that policies must be coordinated in some way, so as to prevent one country taking advantage of another. One way is to have a unique agent managing the stocks on behalf of the group of regional participants. Another is to have coordination of policies *vis-a-vis* national stocks. This is a problem when individual participants in a regional stock have different policy objectives. It is this feature that has prevented many initiatives on regional reserves in Africa and Asia, for instance from becoming realities, beyond token actions. This, however, is less of a problem in the EU, since there is a common market for agricultural products and a unique institution for implementing any policy. A EU specific commodity stock will of necessity have a regional character, as stocks may be accumulated in different parts of the common market.

5.4. Determination of optimum stock levels

As indicated earlier any stockholding policy must specify several things. First the objective that is to be dealt with, second the types of rules of operation, namely how accumulation and decumulation of the reserves is to be managed, and third the context within which the stock policy is deployed. For instance if the objective is market management and price stabilization, the context is quite different than when the objective is to achieve timely arrival of emergency supplies to vulnerable and affected populations. Hence the concept of an optimal stock level must be carefully specified if it is to be operational.

Most estimates of optimal stock levels specify a target for a quantity of the commodity that must be maintained at some market level (for instance minimum consumption of a vulnerable group or a region) and then try to specify a probability distribution of this quantity under existing market structures. A stock level could be specified that could deal with an "excessive demand" for such a quantity at a certain level of confidence. In the past several such simple calculations were made referring to national level production or demand of some commodities and specifying the level of stocks that would be needed to cover a certain part of the variations around the mean level of the variables [Konandreas et al., 1978]. The underlying logic of such calculations is that of inventory theory and practice for any product, namely that a stock is available to deal with a variable demand, and is replenished when there is some level of drawdown. The higher the level of the stock, the longer the time for its depletion, as the probability of an event that will be large enough to deplete it is low. The technique is largely mechanical and straightforward once the underlying variable and related probability distribution are specified, which, however, may be far from trivial as one must specify and analyze all the related processes and variables that impinge on the variable of interest, and also specify probability distributions on those determining variables that are stochastic.

A logic of this type could, for instance, be applied to determining the optimal stocks to hold for emergency preparedness. The difficulty, of course is to specify the variables and attendant probabilities which will affect the variable which the stock will defend.

A complication in this relatively straightforward exercise is that both decumulation as well as accumulation must be done at some prices, and this generates costs and revenues that must be also estimated to complete the picture of an "optimal stock", as there will normally be limitations on what can be spent for the stock policy. This may not always be easy, but

can be estimated either through simulations, or by reference to existing stockholding operations.

It must be emphasized, that a stock of a commodity, designed to afford insurance against an undesirable event, must be maintained even after its first depletion. This is something that has not always been understood by policy makers, as there is a confusion between the flows that are arise from actions of decumulation and accumulation, and the level of stock. The level of the stock should be such as to accommodate a variety of possible flows, depending on when it is called to deal with the underlying undesirable problem. A stock is meant to be like insurance, and hence the "capital" namely the amount of the stock must be maintained to have the insurance.

5.5. Costs and losses associated

Any stockholding policy will entail costs of accumulation and maintenance, and will obtain revenues in case the reserves are sold at some price. A stocks policy, however, must be considered as an investment in insurance. The value of the underlying stock, can be considered as the capital cost of the investment, while the maintenance cost can be considered as the operational cost of the capital stock, or the premium of the insurance.

For instance if one is to store 1 million metric tons of wheat for some purpose (and this would constitute about 0.5 percent of global estimated wheat stocks) , then at an average international price for grains of 200 USD per metric ton (mt) this could amount to an initial investment of 200 million USD, and would incur an annual storage cost of around 15 million USD. To this one must add the cost of tied capital to maintain the stock, as well as the operational cost of maintenance, which may involve rotation of the stock. For a well maintained stock, such as the ones normally under EC control, physical losses would be small.

As was indicated above the costs may be different if the choice was to maintain a long position on stocks in some organized market where delivery of the physical commodity could be assured. As for the cost to the EU, this would depend on the contribution that the EU would make to any international initiative.

5.6. Governance issues

A stock policy needs to be well specified and flexible in order to be effective. This suggests that any such policy must be managed centrally and competently, namely with adequate information. In the case of the EU, the EC has long experience in managing the CAP, and hence there should not be any problem in managing any stock policy that is deemed appropriate for the EU. Issues concerning the location of a stock, the maintenance, the composition, etc. could be easily managed by the EC, given its past practices and should not present any major problems.

6. Virtual reserves

The idea of this policy, proposed by von Braun and Torero [2009], is to avert speculative bubbles caused by hoarding and speculation in basic food commodity markets, namely to avoid price spikes of the type that occurred in 2007–8, or earlier.

The basic motivation is first that the actual trading in a commodity is influenced by the price signals in organized exchanges. This is because many of the physical traders

utilize the exchanges for pricing decisions based on the prices of futures contracts, or hedge their physical transactions with futures and options in the organized exchanges. The second motivation is that a lot of the price spikes in commodity markets are the result of speculative long trading in organized commodity exchanges, especially with the recent advent of commodity funds, and may lead the market prices to be "irrationally" high. The proposal is to counteract such long speculative trading with "naked" short selling (namely not backed up by any physical commodity stocks) by an outside agency, so as to prevent prices from spiking.

The virtual reserve would be implemented as a coordinated commitment by the member countries (the Club), which may consist, for instance, of the G8+5 plus some other major grain-exporting countries (such as Argentina, Thailand, and Vietnam). Each country would commit to supplying funds, if needed, for intervention in the futures market. The fund would normally consist not of actual budget expenditures, but of promissory financing by the members. These funds would be drawn upon by a high-level "Technical Commission" only when needed for intervention in the futures market. At that stage they would become actual budget expenditures.

The envisioned intervention would consist of executing a number of progressive short sales (that is, selling firm promises— futures contracts—to deliver the commodity at a later date at the specified price) over a specific period of time in futures markets at market prices at a variety of different future positions until futures prices and spot prices decline to levels within pre-estimated price bands. In other words a level of high prices at which short sales would start would be estimated by an "intelligence unit", which would signal to a Commission the need to start the short sales to avert an impending speculative bubble. The increase in the supply of short sales is supposed to reduce spot prices and to make speculators move out of the market, so as to make spot prices return to their levels dictated by fundamentals.

The innovative concept behind the virtual reserve is the signal that it gives to markets, including speculators, with its presence alone being likely to divert speculators from entering this market. Nonetheless, the commission must be ready to trade grain when necessary and to assume the costs if in the future it must buy back contracts at a higher price than it sold them for.

The proposal has the advantage, that if successfully implemented, it may avert global speculative bubbles in basic commodity markets. However, it has several shortcomings. The fist concerns the underlying assumptions of the idea. The first assumption is that the prices in the futures markets cause the prices in the spot market, in the sense that spot markets follow the signals in the futures markets. It is true that spot and futures markets move together, and that many market participants use the futures markets to price their spot transactions. Both types of prices are affected by the same fundamentals. However, when the futures markets go into some kind of speculative bubble, much as the one of the recent period, many operators in actual markets seize to utilize the futures market signals for their transactions, as they may regard the futures prices as outside the range of what the fundamentals dictate. In such a case the important link that forms the basis of the logic of the proposal is broken. While it is quite difficult to examine empirically this issue, informal information from market participants suggests that it happened during 2007–8.

The second assumption is that the price spikes are due to irrational speculation. It is impossible to distinguish between rational investment behavior based on expected

price changes and irrational speculation. Any logical market participant who anticipates a price increase would strive to increase his/her long position, and this would drive both spot and futures prices up and this can hardly be called "greedy speculator" behavior. The consequence of this is that it maybe very difficult if not impossible to specify price limits at which any intervention should start. Basically the only remedy against a commodity bubble is to make available physical amounts to satisfy the excess demand. Such stocks, if previously accumulated, should become available when prices rise enough to justify sales now rather than later. A bubble in fact may induce some release of existing stocks. When such supplies are not available, then it is expectations that are destabilized in response to available shortage information, and prices tend to increase without limit, and no manipulation of the futures market can bring them down.

The second shortcoming is that the proposal pertains only to commodities that are traded in organized exchanges with futures. However, the recent price bubble, as well as previous ones, were not limited to commodities with organized futures markets, or to organized markets that exhibited investments by commodity funds, which have allegedly caused many of the recent spikes. For instance a commodity like rice is not traded in organized exchanges, so this proposal could not be implemented for rice. In any case the recent rice price bubble was mostly induced by government policies, rather than speculation.

Another issue is the amount of money needed in case of intervention. Braun and Torero estimate that the funds to be committed would amount to 12–20 billion USD. This is substantial sum, which when called for may not be available. For instance, if such a system was in place at the time of the recent 2007–8 commodity bubble, it is not clear that the governments of the club of member countries would commit the money and fast. In fact if the money was not forthcoming fast, it would not be able to counteract any speculative bubble, and the system would become ineffective. In addition, even if the money was available, it may not be able to withstand a speculative attack, that may consume the available funds in a short period of time. For the money to be available when needed, it would have to be precommitted, and it is hard to see how the various club member countries would precommit such large sums of money. The proposal has also been criticized on its technical merits by analysts such as Wright [2009].

Virtual reserves may be useful in another way in increasing physical stocks, rather than managing futures markets. The idea would be to interfere in organized commodity markets when the stocks and prices are low, to obtain a long position, much like the commodity funds do. This was discussed earlier. Such positions would mimic the establishment of a physical stock, but with much lower cost and could be rolled over to maintain a given size of stock, and could be liquidated when prices exceeded certain limits. The advantage would be that they would be much more economical than a physical stock. Nevertheless, a stock of this type, just as any other stock, would have to be combined with specific purposes, such as for instance to ensure export commitments to vulnerable importing countries, to make it effective.

7. Improved information and coordination

One of the lessons of the recent commodity price bubble was that many governments and private agents acted in response to imperfect information, and overreacted, causing a bubble over and above what could be justified by the fundamentals. This seems to have been

the case in past commodity upheavals. Hence it would appear that enhanced information could help all agents in making more rational decisions, and thereby averting crises.

There are three kinds of information that are relevant in this context. The first refers to information about physical supplies and stocks. While information on production and trade is available, albeit imperfectly, information on available stocks is not. It is this latter information, however, which may make a difference in agents' responses to the market developments. This is however, an area that has been neglected. While stock information is imperfect, given the large number of market agents holding inventories, it may be possible to make reasonable estimates, at least for major market participants. Given the global public good nature of this information, the natural agency to collect and disseminate such information should be an international multilateral organization. In addition, countries should make a commitment to provide timely such information, which would be to the benefit of all. This is clearly an area that merits further support, and in addition it may be very cost effective, as it may make all market participants more aware of a more comprehensive market picture.

The second type of information refers to domestic market developments in a range of commodity trading countries. Such information is relevant as it dictates the countries demand for import or supplies of export quantities. However, apart from some developed countries, such information is not generally widely available, sometimes not even to the governments of the countries concerned, with the consequence that these governments may make decisions about their domestic markets and polices that may be destabilizing. The recent rice crisis is a clear case in point, as it was induced by policy responses to inadequate information.

The third type of information that seems underprovided is information on public commodity related policies. Again such information may help governments make more rational decisions by considering the types of policies applied or envisioned by others and avoiding costly overreactions.

The EU could play a major role in enhancing market information systems, by financing market information initiatives, especially in developing countries, and by facilitating the availability of such information through publicly available databases.

8. Trade facilitation

If countries or other agents can be assured their commodity supplies through trade, then they would need to carry lower levels of security stocks. Hence trade can be an important substitute for carrying costly physical inventories. Trade, however, can be impeded by a variety of problems. Policies aimed at facilitating commodity trade, may therefore obviate the need for policies to carry costly security or emergency physical stocks, both nationally and internationally. In the recent as well as previous food crises, there were three major trade facilitation related problems that caused governments to examine carrying larger security stocks. The first concerned unexpected and uncoordinated export bans by key exporters, which tended to increase international prices. The second was the unavailability of import financing for several lower income food importing countries, and the third was the uncertainty about international contract enforcement in a time of rising prices. The sequel discusses proposals to deal with these problems.

8.1. Can export bans be prevented?

Export bans are very disruptive to international markets, as they disturb established trade flows and cause significant losses to traditional trading partners of the countries that import from those imposing export bans. As export bans are a trade measure, the appropriate international forum to discuss this is the World Trade Organization (WTO). Currently export bans are not forbidden by the WTO agreement. While article XI paragraph 1 forbids explicitly quantitative restrictions on both imports and exports, paragraph 2a of the same article allows temporary export prohibitions to prevent critical shortages of foodstuffs. This is so as the concern of WTO members in the past was with low prices and hence import restriction measures, rather than high prices, which are reinforced by export bans. It would cost little to implement such an agreement among WTO members, once they agreed to it, and it would involve a small change in existing WTO rules. This, however, is not assured, as some members may not want to abandon the flexibility to control their domestic commodity markets via such an instrument. Clearly the EU would have a large role to play in revising the WTO rules in this direction.

8.2. Food import financing and a dedicated food import financing facility (FIFF)

A major problem facing least developed countries (LDCs) and some net food importing developing countries (NFIDCs) is financing for both private and parastatal entities of food imports, especially during periods of excess commercial imports. The financing constraint arises from the imposition, by both international private financial institutions and domestic banks that finance international food trade transactions, of credit (or exposure) limits for specific countries or clients within countries. These limits can easily be reached during periods of needs for excess imports, or periods of high prices, thus constraining the capacity to procure finance for food imports and as a result, food import capacity. To this end a FIFF was proposed in 2005 to the WTO by FAO and UNCTAD and recently elaborated further by Sarris [2009], to overcome this problem.

The purpose of a food import financing facility (FIFF) would be to provide financing to importing agents/traders of LDCs and NFIDCs to meet the cost of excess food import bills. The FIFF is not intended to replace existing financing means and structures; rather it is meant to complement established financing sources of food imports when needed. The financing will be provided to food importing agents. It will follow the already established financing systems through central and commercial banks, which usually finance commercial food imports using such instruments as letters of credit (LCs). The extra contribution of the FIFF would be to provide guarantees to these financial institutions so that they can increase their exposure to the importing countries. It will do so by inducing the exporters' banks to accept the LCs of importing countries in hard currency amounts larger than their credit ceilings for these countries. A key aspect of the FIFF is that it will not finance the whole food import bill of a country, but only the excess part induced by a food crisis. In this way "co-responsibility" will be established, so that only real and likely unforeseen needs will be financed, and the cost of excess financing will be kept at a low level.

The basic feature of the proposed FIFF is to provide the required finance at a very short notice, and exactly when needed, once the rules of operation are agreed upon in advance. Thus, the delays common to past ex-post insurance or compensation schemes that rely on ex-post evaluation of "damages" can be avoided. The proposed FIFF will operate in real

time. Its financial strength would be based on guarantees provided to the FIFF by a number of countries or international financial institutions.

The costs of a FIFF would be minimal costs through risk pooling for a large number of countries and food products, and owing to its risk management activities, the low operational costs. The principal risk for the FIFF is that the guarantees that it provides will be called to finance non-repayments. This risk could be managed actively. As the facility would not set out to disturb the normal functioning of international food trade, there is a "non-zero" risk that the local or central banks cannot be reimbursed by their local food importing clients. This would primarily be the concern of the domestic and central banks of each country, and not the FIFF. Nevertheless, lack of reimbursement by the ultimate beneficiaries of the finance may lead commercial banks to default on their obligations (or delay repayment) to the FIFF.

The FIFF would benefit from guarantees from a number of countries. Ideally, this would include a number of OECD countries, which would enable the FIFF to borrow at AAA terms, when needed. But any group of countries could provide guarantees; the risk rating of the FIFF is then likely to be that of the best-rated among these countries.

A food import financing facility has existed in the IMF since 1981 under the Compensatory Financing Facility (the IMF CFF). The objective of that was not food import financing, but rather compensatory financing to countries facing balance of payments problems, and hence could not import food. Despite its availability it has been utilized very little, largely owning to the conditionalities imposed on borrowers by the IMF. The proposed FIFF would be different from the CFF in the sense that it would provide guarantees for normal food import finance, and would act in a much more timely fashion, namely before the undesirable event, rather than after.

While the FIFF envisioned in the current proposals is an international initiative, it could operate also as a policy of a major food exporter, such as the EU. The US already operates a system very similar to this under its GSM-102 program of the Commodity Credit Corporation. The EU does not have a system of this type, despite the fact that many major agricultural commodity exporting firms and financial institutions operate in the EU.

8.3. A system to guarantee food import contracts

A problem that is acute during food crises is counterparty performance risk, namely the risk of reneging on a delivery contract, faced by many food importers. In other words, the problem in this case is not so much unpredictability of food import costs, or high food import prices, or financing, but rather assurance that supplies will be delivered. This does not only pertain to short term contracts but also longer term contracts. The basic reason for non-performance of international staple food import contracts is adverse price movements or adverse financial events that prevent a food exporter or trader to fulfill an import contract. There seems to be no contract enforcement mechanism in international staple food grain transactions.

Contracts in organized commodity exchanges are enforced because there is a clearing house which is responsible for making sure that all transactions are executed. Similarly contracts within one national legal jurisdiction can be enforced as there is a legal system to ensure contract enforcement, albeit a court based legal enforcement system is quite slow. Most international contracts are very similar to Over the Counter (OTC) contracts in the sense that is it only the financial and reputation status of the two parties that instills

confidence in contract enforcement. There is no mechanism for international contract enforcement, and whatever juridical procedures exist are slow, uncertain, and costly, and cannot deal with the immediate risk of contract cancellation.

The basic missing institution is an international clearing house type of arrangement similar to the clearing houses that are integral parts of the organized commodity exchanges, which ensure that all contracts are executed. The key question is whether an international clearing type of mechanism can be envisioned to ensure the performance of staple food type of import contracts. A proposal to that end was made by Sarris [2009] for the institution of **International Grain Clearing Arrangement (IGCA).** The objective of an IGCA would be to guarantee or insure performance of grain import trade contracts (short, medium and long term) between countries or private entities.

A major function of a commodity exchange clearing house, apart from the settlement of the financial contracts, which amount to the bulk of settlements, is to ensure that physical delivery can take place, if needed. This is for instance one of the functions of the Chicago Mercantile Exchange (formerly the Chicago Board of Trade), and to ensure this a variety of rules and regulations with respect to delivery obligations are adopted by the exchange and the clearing house. In most organized exchanges physical delivery is a very small portion of all transactions, but if a trader insists on delivery then this must be arranged by the exchange. Many exchanges have arrangements with warehouses so that physical deliveries can be made against a futures contract, and there are severe penalties for anyone with an open contract who either does not fulfill the financial terms or does not deliver a physical commodity on it. It is these properties that would need to be emulated by an envisioned IGCA, in order to it to be viable as a guarantee institution in international staple food transactions.

Probably the best way to implement something on an international scale resembling the functions of the clearing houses of existing organized exchanges would be to **link existing or envisioned commodity exchanges**, with their respective clearing houses. In other words, it may be appropriate to think of how parts of contracts bought on one exchange could be guaranteed not only by the clearing house of the exchange in question but by clearing houses of other linked exchanges.

The problem is that delivery at a recognized warehouse, e. g. near Chicago where the CME delivery locations are, may not be what the importer wants, and may need to incur considerable cost to transport those amounts to his desired import location. Hence what would be desirable is to have the possibility of taking delivery of the same amount of grain but at a location much closer to the importer's desired destination. One way to do this would be to establish links between various commodity exchanges around the world, so that the price difference between grain stocks in different locations would be equal to the relevant cost of transport and other transactions charges.

The IGCA could be envisioned as a branch of the linked commodity exchanges which would in essence consist of some parts of the underlying clearing houses of the exchanges. The IGCA would try to guarantee that physical supplies around the world at various exchanges are available to execute the international contracts in its member exchanges. This could be done, for instance, if part of the financial reserves of the clearing houses that are members of the IGCA could be transformed into a physical reserve, via for instance holding warehouse receipts in various reliable locations around the world. The advantage of transforming part of the financial reserves into physical reserves would be two fold.

First, the value of the underlying reserves would fluctuate with the price of the underlying commodity. This is like marking the underlying assets to market. This would obviate the need by contracting parties to post additional margins in case the price of the commodity increases suddenly.

Second, and this is perhaps a major positive aspect, if some of the financial reserves of the IGCA were to be transformed into warehouse receipts, the physical execution of the underlying contracts, and not only their financial settlement, could be guaranteed. The commitments in futures or warehouse receipts of the IGCA could be liquidated once the actual deliveries on the relevant contract were executed. The liquidation of the physical positions or futures holdings of the IGCA would provide the funds to return to the contracting parties their posted insurance margins. In fact, since the liquidation of the IGCA margins would result in a variable amount as prices fluctuate on the underlying warehouse receipts or futures contracts, the restitution to the contracting parties of their initial margins would be variable and close to a fixed share (minus some transactions cost) of the underlying transaction value. Hence the true cost to the two parties to an international contract would be the interest foregone or paid for the posted good faith margin. Given all the other transactions costs in an international staple food import contract this may not be too high.

The IGCA would guarantee the execution of contracts by pooling the resources of several exchange related clearing houses. This would ensure that there would be liquidity in terms of physical reserves to honor individual contracts in case of non-performance by a participant. In fact, the major underlying benefit of the IGCA would be that by investing a small part of its reserves into physical warehouse receipts or deliverable futures contracts, it would create a global physical commodity reserve stock that could be utilized to execute international staple food contracts in case of non-performance of the exporting party to a transaction. The major difference, however, of such a stock and stocks envisioned in previous discussions on global price stabilization would be that this reserve stock would be used only to make the market work, namely ensure physical delivery and not to change the fundamentals of the market, as most of the other stock holding ideas envision. In other words, the stocks held in the form of warehouse receipts or other physically executable contracts, would perform the function normally done by so-called pipeline stocks, which are held by various market participants to ensure that there is uninterrupted performance of the normal market functions of the agent. Their function would not be to stabilize or speculate, but simply to ensure liquidity in the market, much as the financial reserves of the commodity clearing houses ensure liquidity to execute all underlying financial contracts. The necessity for an international arrangement to have such stocks is that there is no such physical liquidity mechanism internationally. In other words one of the main functions of the IGCA would be to ensure global physical grain liquidity. The IGCA could spread the risk of non-performance or country problems by holding its commodity reserves in several geographic locations, as well as several organized exchanges.

A major risk of such a IGCA would be that a sovereign country in whose territory, the warehouses of the underlying stocks in which the IGCA has invested are physically located, could impose export restrictions or bans that may make the physical release of stocks impossible. Here, however, is where appropriate export related disciplines could be formulated in the context of the World Trade Organization (WTO), or another regional arrangement, to prevent exactly this type of phenomenon, as discussed above. Also if major

international financial institutions (IFIs), such as the World Bank, the IMF, and other IFIs are financiers of such a IGCA, then the sovereign type of default could be guaranteed by these IFIs, perhaps in the same manner they provide sovereign guarantees and insurance for other investment projects. In other words, default on any of the contracts insured with the IGCA would entail default with the IFIs behind it, and this may make it harder to default. On the downside, the relevant IFIs may be required to devote part of their sovereign guarantee capacity to this.

Another major risk of the IGCA maybe the possibility of default by a party. This does not have to be only a supplier (in case for instance of increased prices), but could also be the buyer (in case of suddenly decreased prices), who may not be interested in a contract at some prices that may now be considered too high. In such a case the seller would be losing a portion of the value of the contract due to the decrease in price. Given that the IGCA would be an extended arrangement among viable commodity clearing houses, it could compensate the seller by the difference in the original and current value of the contract insured through the relevant exchange or clearing house.

An essential element then of the proposed IGCA is the internationalization and linkage of commodity exchanges. This implies that the additional performance guarantees that are envisioned here can be obtained if two conditions exist. First appropriate exchanges must exist in different geographic locations around the world. Such locations should most likely be near the major production areas for the commodity in question. Second most importers of the food commodity would hedge their subsequent purchases in such exchanges. This can become part of most food importers trading practices, and it probably is already a practice by many importers. The existence of more exchanges would probably reduce the basis risks and hence make trade more efficient.

Clearly this idea needs more thinking and analysis as there are many details that need to be elaborated. This could be done by a group of knowledgeable market analysts, but if implemented it could go some way to instill more confidence in global food commodity markets. The EU could clearly contribute in this area by supporting further examination of the concept.

9. A fund for the establishment of an internationally coordinated "Global Financial Food Reserve" (or GFFR) of basic food commodities

The only sure way to avoid excessive market upheavals is to have some amounts of previously accumulated stocks, but every proposal along these lines runs up against coordination and financing problems. The idea of the proposal here is to combine the best parts of the two proposals on reserves that have been discussed considerably, namely the establishment of a coordinated global physical reserve and a virtual reserve aimed at calming futures market speculation. The idea is to have a market based global safety net which would create physical or financial resources in times of price spikes.

The major problem with all proposals that have been proposed and deal with market volatility is that they purport to try to prevent the occurrence of a price spike. This, however, is very difficult to accomplish within a globalized market system, and may need very large and uncertain amounts of financial resources, that rightly makes donors uneasy and unwilling to consider. However, if the major objective of a system to deal with market volatility is to prevent the weakest members of the international community from paying

the price for an upheaval, which for the most part is not their fault, then one could consider a limited and much cheaper safety net system to ensure support only for those countries.

The proposal made here would be an agreement by a group of a few important world grain market participants that would include members of the G8+5 as well as major grain exporters and other donors, to commit funds that could be utilized to hold specified amounts of publicly owned long positions in organized exchanges. In other words the proposal calls for the establishment of an international publicly held "global commodity fund" specifically targeted to basic foods. Given low margin requirements, this fund could assure, with relatively modest financial resources, control over a considerable amount of physical reserves. This could then be considered to be a "virtual commodity reserve", but in its concept it is very different from what has been proposed before by von Braun and Torero [2009], Braun, Lin, Torero [2009], as the fund would consist of actual and committed long positions, and would basically act a dormant physical reserve. The fund's positions would be rolled over from period to period, much like the commercial commodity funds do.

The fund's positions would be dormant and passive when markets are operating in normal conditions. Hence its resources would not be used for any "stabilization operations". However, when markets go into an unusual spike, which could be signaled by either the breeching of some prespecified price upper ceiling, or an estimate of a large probability of such an occurrence, as outlined earlier, the fund would have the option to either take physical delivery, so as to utilize the physical stocks for prespecified purposes, or to sell off the long positions. In either case the fund would command at a time of a price spike either physical stocks or financial profits from its long positions, if liquidated under market spike conditions. These physical stocks or profits could be utilized to promote a global safety net to assist most affected poor countries in obtaining food commodity imports at lower than spiking market prices. In other words the fund and the stocks it could support would not be utilized for market or price stabilization but rather for supporting assistance to needy countries.

Given that the fund's purpose would not be to stabilize markets, but rather to assure market weak participants that their excess food import costs would be covered, the GFFR could be restricted in size to what is estimated as needed for additional or extraordinary assistance to needy food importing countries in times of a food crisis.

The cost of such a reserve would be modest. For instance between 2006 and 2008 the total cereal import bill of LDCs increased by roughly 20 percent or about 4 billion US$. If 10 percent of that could have been considered as extraordinary cost of vulnerable poor countries that would be compensated by developed countries as extraordinary aid under some global safety net, then this would amount to 400 million US$. This is much smaller than the funds that were committed in support of developing countries in the context of the global food crisis by developed countries. If the fund before the crisis was of a size of 100 million US$, and it was all invested in cereal stocks via long future positions, then at 5 percent margin it would have commanded physical amounts, worth about 2 billion US$. The profits from a 20 percent increase in prices during the spike (and the actual increase during a spike would have been much larger than this) would then have been around 400 million US$, which would have allowed the fund to compensate some low income developing countries for the extraordinary costs of the import bills. Needless to say that these calculations are very quick and simple but are intended to give an order of magnitude to the amounts involved.

The GFFR would act as a global market based safety net. As its major market operation would be to roll over positions in each period if needed, it would not interfere in the normal functioning of the commodity markets. The allocation of the proceeds or the profits of the GFFR from any price spike to needy developing countries could be a separate process that would entail allocation according to some prespecified development criteria.

10. Conclusions and the way forward for the EU

The above exposition suggests that there are several ways in which the EU can contribute to global food security and orderly food market functioning, in the areas related to physical reserves. We outline these areas below and indicate the types of EU policies that would be most appropriate.

A. Should the EU help stabilize world prices with physical stocks and how?

It is apparent that unexpected high and low world prices create problems for many countries as well as many consumers and producers. While agricultural market participants are used to dealing with market uncertainties and price variabilities, they are much more vulnerable to very infrequent and extreme price volatility. It is these extremes that should be managed and/or avoided if possible, as it is for these cases where a role for the public sector is called for. Up until now the system of public intervention in the EU has worked in a context of downward trending long term real commodity prices, and low price volatility, and with a view to supporting EU domestic producer prices. A new scenario, which seems quite likely in fact, is that international prices may enter in a long-term stable or upward trend with increased volatility and upward spikes. So the role of using storage — publicly run or privatively run with public support—to protect consumers' interests both in the EU and in poor countries, must be examined in this new environment

The best way for the EU to contribute to an objective of stabilizing world prices, would be to decide to define a wide price band around the global prices, or their EU equivalents, of certain basic agricultural commodities around which several governments, as well as the EU, would interfere to prevent markets from moving outside the prespecified ranges or to protect vulnerable constituencies. The major characteristics of such bands would be that they would be wide around the estimated average values (for example two standard deviations around the mean), so as to intervene not more frequently than once in about fifteen-twenty years. Asymmetric price bands could be considered so as to render the probability of intervention equal on both sides. The band should be adjusted for shifts in the underlying trend of the average prices due to technological and other fundamental developments. While the practical problem of estimating the underlying equilibrium price, on the basis of which price bands should be defined, is a real one, a wide price band would guarantee that any errors of estimation would have small costs as any intervention would be triggered infrequently.

The price band could be supplemented with a measure of volatility that would trigger intervention when surpassed, and the upper level of the price band is breeched. In other words, while the low limit of the band could provide the unique trigger of intervention purchases, the high level of the band would not be the unique trigger of intervention, but the first trigger. Only when the breech of the upper limit of the price band is combined with an increase in volatility would intervention be triggered. Such a measure of volatility should consider the day to day price movements or the highest frequency price movements

available. A double trigger intervention at the high end of rices, would have advantages over a single trigger intervention, in the sense that it would intervene in the market when there was unusual and unexpected market uncertainty, and hence when speculative pressures and hoarding tendencies are likely to lead prices to levels above justified by market fundamentals.

The intervention means on the low price side would be public reserve purchases (within certain financial limits) to safeguard against very low prices. These purchases in the case of the EU would occur within the EU and in markets where prices fell below the minimum of the band. Given that prices differ in different EU member states, the purchases could be combined with a priority list of countries and markets where purchases would occur first, so as to guarantee that any stabilization function would benefit the weakest members of the EU. The purchases would be placed into storage. On the high price side, and in case of a price spike that crossed the upper threshold, and a measure of volatility that exceeded a prespecified limit (under a double trigger intervention) the accumulated stocks could be disposed of by prioritizing for distribution certain vulnerable population groups within the EU and abroad, so as to combine the market stabilization role with a welfare role. In other words the reserves would not be auctioned in the market, but delivered or sold at the ceiling prices to those deemed most vulnerable (in the EU or abroad).

The combination of market operations (at the high or low price band levels) with targeted purchases (at low prices) or targeted sales (at high prices) would prevent the EU from being the sole global market stabilizer. In other words, if other countries decided to join the price band mechanism then they could supplement what the EU has committed in doing and help with global price stability. If there are no other countries, then the EU could play its role unilaterally, and be regarded as providing domestic and international assistance to avoid the adverse consequences of extreme price volatility but for vulnerable groups only. A market stabilization role would be combined with a welfare role, hence affording the EU with a double dividend. It would also help to place a limit on the budget that would be allocated to such activities. Physical stock operations could be supplemented by relevant trade policies (supplementary tariffs in cases of very low prices, and reduction in tariffs, or export incentives in cases of high domestic EU prices).

Such a wide band could be maintained either by the EU alone, or, and this would be much more appropriate, in collaboration with other major basic food trading countries. The envisioned system would provide a stabilization means for EU and global markets, and would create a double dividend, in the sense of promoting market stability and EU and global food security, as well as global cooperation.

A caveat would be the starting conditions of such a policy. Clearly, no stock disbursement can take place before the stocks are accumulated, and this would require low prices to initiate the system. If, however, it is deemed that price spikes are a much bigger threat than low prices, then the system could be initiated by exceptional one-time purchases dedicated to be stored, but at prices, that are above the minimum lower band prices. These prices and purchases could be defined so as to benefit the producers in the EU with the biggest need for price support, and in the countries and regions with the lowest prices. The stock could be instituted at a fraction of the envisioned maximum physical stocks, so as to allow for room for eventual price depressions that would trigger additional purchases. Once the initial stock is accumulated, then any subsequent additions would be made at the designated low levels of the price band.

B. Should the EU contribute to a strategic physical reserve for emergencies?

This was already discussed above and the answer is positive. First, the amounts involved are not large, and hence such a reserve would not be expensive to acquire or maintain. Second, it would provide the EU with considerable flexibility to assist in food emergencies, even in times of high prices. While it would be best if such reserves were shared with other major donor countries, the amounts involved are relatively small, and hence the EU can consider the maintenance of such reserves as an ongoing part of the regular EU foreign aid budget.

The major advantage of such a scheme would be that it would provide supplies to affected regions and people much faster and without having to wait for lengthy bureaucratic delays in evaluation and assessment of a crisis, as well as the delays inherent in tendering for emergency food supplies when needed. Control of the reserves could be maintained by the EC or the World Food Program (WFP), albeit it would be the WFP that would have the primary claim on these reserves.

The accumulation of such reserves could be done at any time, as their function is distinct from the function of a stabilization reserve. Of course it would be best not to accumulate emergency stocks in a period of high prices but this would depend on the drawdowns of the emergency reserves and not on any market condition. The emergency physical reserve could be regarded as part of a premium for an ongoing emergency insurance fund. Such a fund need not consist only of physical food reserves, and it could also include financial reserves earmarked for emergencies. The fund could as well be utilized to replenish any supplies withdrawn at any one year. A combination of physical and financial reserves, along with prespecified rules of disbursement of both, could go a long way to improve the role of the EU as an emergency food provider in the world.

The modality under which such a system could be financed, would be to have a regular budget item that is dedicated to emergency food reserve operations, both physical and financial. On the physical side, the emergency reserve could be maintained in a variety of EU locations, from which it would be easy to distribute them for whatever envisioned contingencies arises.

A policy of EU contribution to a strategic physical reserve would have to be kept conceptually, financially, and perhaps also operationally within the EU, separate from a policy to contribute physical stocks for market stabilization. This is because food emergencies in the form of requirements for fast physical commodity deliveries to affected people and regions are mostly caused by adverse environmental or political events, and are accompanied by severe negative income and food insecurity shocks of those affected. As such they occur in a manner quite independent of global market gyrations. While a price spike, for instance, can be considered as a food security threat by some vulnerable populations, it is not the type of physical emergency that is normally handled by organizations such as the WFP, and it is the latter's operations and flexibility that an EU contribution to an emergency reserve should enhance. Hence price spikes and policies to deal with them should be handled differently and separately from policies related to physical food security threatening emergency operations.

C. Should the EU contribute to a virtual food reserve?

Here the answer seems to be an emphatic no. The discussion of virtual reserves above indicated the pitfalls of the proposal, let alone its cost. For the EU to allocate a substantial amount of financial resources to fight speculators, and with uncertain payoffs, would seem

to be a policy that could not easily be justified financially or politically. As mentioned under section A above, the EU could help stabilize prices in conjunction with a welfare role in a much more cost effective way.

D. How can the EU contribute towards better information availability and coordination?

As already discussed above, more and timelier information can go a long way to prevent food crises, or to make responses to such crises, more reasonable. The EU could play a major role in enhancing market information systems, by financing market information initiatives, especially in developing countries, and by facilitating the availability of such information through publicly available databases. The EU could also play a major role in promoting global food security, by participating actively, as well as helping to finance, international fora aimed at reviewing developments and mutual information sharing about policy developments.

D. Should the EU contribute to changing the WTO rules concerning export bans?

As discussed above this seems to be an area worthwhile pursuing, and would cost little. It may buy the EU some international goodwill, albeit a change in the relevant WTO rules could be resisted by some exporting countries that are concerned with domestic market stability. As a minimum, the EU should not oppose any such efforts by other countries.

E. How can the EU contribute towards more trade finance for developing food importing countries?

Under the trade facilitation chapter above, the idea was discussed to enhance the availability of trade finance for food imports of low income food deficit countries. A major way, in which this could be done by the EU unilaterally, would be to emulate the US GSM-102 system of guarantees of export credits for basic food commodities of the Commodity Credit Corporation. This could be done for EU based exporting companies and EU originating basic food products, destined for low income food deficit countries. A second way, in which this could be achieved, would be for the EU to support, via guarantee funds, an international Food Importing Financing Facility (FIFF). While the institution of such a facility would require cooperation by several other food trading countries, if the EU put its weight behind such a proposal, it may sway other major trading countries to follow suit.

F. Other EU policy contributions

The above suggestions pertain to policy directions that are mature for adoption or initiative by the EU.Nevertheless, there are several other policy areas, where the direction is not so clear, but where the EU could pursue further research and analysis for future action. Such areas include the logic of an International Grain Clearing Arrangement (IGCA) that was mentioned under the trade facilitation section above.

Related to this would be the topic of instituting or enhancing the presence of more commodity exchanges in the EU and abroad. This is a market information and transparency initiative that could enhance not only the provision of information around the world but also create a market environment, where producers and consumers could find it easier to hedge their commodity risks, thus rendering the EU needed physical or financial interventions less and saving money in the long run. A first concrete step in this direction would be to examine the feasibility of instituting several commodity exchanges in the EU region.

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