

## Chapter 2 – Price Instability and Market Failures: A Case for State Intervention

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The necessity of agricultural market regulation is a long-standing controversy in economics. Over the last fifty years, development prescriptions have shifted from very interventionist, to liberalized market-led policies. None of these policies have been widely successful in promoting food security, and the existence of failures under both approaches is now widely recognized. This consensus will be the starting point for our analysis. A lot of academic studies have analyzed these topics and the experiments undertaken in the last fifty years. This section aims to point out main areas of consensus and main controversies, and try to document them using economic theory.

### 2.1 Is Direct Public Intervention on Prices Desirable?

#### The Key Role of Prices: Coordination of Decentralized Decisions

From a theoretical point of view, standard economic theory tells us that no intervention is needed if markets are functioning properly. In this case, private actors concerned with their own interests only are led to act in such a way that the economic system reaches an optimal situation. In particular, private trade and storage will transfer the necessary quantity of products through space and time; prices will be stable and predictable.

The basic market coordination mechanism is price. Market prices signal buyers' willingness to pay a set amount for a good or a service, and potential suppliers are then willing to incur the costs of supply this good or service if these costs are lower than the price. This is how market economies function, and history has proved the superiority of this system over state-led decisions. Markets then have the difficult task of generating prices able to efficiently drive actors' behavior for the satisfaction of consumers. Prices have the key role of coordinating individual decisions conveying the information necessary for efficient decisions. Any surplus or shortage can be eliminated with market clearing at equilibrium price. In economic jargon, the marginal utility of each consumer equates price, so that it would be impossible to increase the welfare of one consumer without depriving another from the same quantity of happiness. Even more, any intervention on prices at this stage is likely to introduce black markets, bribery, and other illegal behaviors, generating unnecessary rents.

## The Negative Effect of Price Variation

For the above reasons, some agricultural economists consider that lowering price variation may actually be a cost. Yet, the large price variations that can be seen on actual markets have obvious costs too: when a price goes from 0 to 3 in the space of a few months, it is impossible to conclude that such a change reflects a corresponding change in the marginal cost of production. Now, any discrepancy between the price and the marginal cost means that either the consumer or the producer incurs a loss, while the other side benefits. However, elementary economic theorems show that the winners always benefit less than the losers lose. Thus, in this case, price volatility is not a blessing. Moreover, if actors cannot correctly forecast future prices because of price variability, the basic function of markets—i.e. determining prices equating supply and demand and conveying adequate information to actors so that they can make efficient decisions—is not fulfilled.

Another point to be considered is that the mean price level is not the only determinant in producers' decisions. The risk involved in price variations is also important for producers. When there are large price variations, credit will be more difficult to obtain, impeding modernization and capital accumulation. This is especially important for poor farmers in developing countries: they are poor because, due to a lack of capital, the productivity of their labor is low. If they could borrow, they could increase the quantity of capital in operation, and therefore increase productivity. But banks do not grant loans to poor people subject to large variations in the price of their outputs...

The above considerations, thus, cast a new light on the price variation issue. While small, progressive price changes are obviously desirable, large, sudden swings are detrimental, and do not guarantee an optimal state of the economic system, quite the contrary. Indeed, they stand as a major obstacle to the efficient use of existing resources, lowering production, and, in the long run, increasing the mean price level at the expense of the consumer, without any benefit for the producer. In such a situation, according to the most orthodox economic theory, it is the public authorities' duty to correct excessive and unnecessary price variations in order to let the economic system return to path to long-term equilibrium from which it should have never been diverted. This is the basic justification of the State intervention in agricultural markets.

However, while price intervention for stabilization purposes is justified, it has also to be efficient, that is, curing the evil at its root and avoiding unexpected side effects. To achieve such a target, a careful examination of the causes of price variations is necessary. Without such careful examination, one runs the risk of curing only the symptoms at considerable cost without having a deep and lasting effect. Let us now turn our attention on this issue, which is also the subject of controversy.

## The Causes of Agricultural Price Instability

Agricultural markets exhibit very unstable prices. The reason for the high volatility of agricultural prices compared to the prices of manufactured products is a point of agreement among economists: little reaction in demand in response to price variations (called in economic jargon “low elasticity of demand”), high dependence on natural conditions, high transportation and storage costs in relation to the value of the product, and production lags. All these specific characteristics stand as obstacles to smooth market operation, and explain large fluctuations.

The low elasticity of demand means that even large changes in prices will not change the quantities demanded by very much. This is because food is a very basic need. Consumers need a certain amount of calories and proteins. They are willing to give up any other satisfaction to meet this need. At the same time, as soon as the required food objective is met, any other increase in food consumption is deemed futile, thus implying that no consumption increase is to be expected, even for free. For this reason, per capita food demand is relatively constant whatever the price. If price is really too high, a fraction of consumers dies, and some elasticity is added to the demand curve. However, everyone agrees that such a situation is not desirable.<sup>1</sup>

**Furthermore, agricultural markets try to match a fluctuating supply, which is fixed in the short term because of the long production lags associated with high storage and transportation costs, with a rigid demand. In these conditions, a small supply shock results in large price changes.**

All economists agree that this is the basic reason for agricultural price volatility. They disagree strongly, however, on the consequences of this phenomenon and whether or not it justifies public intervention in markets. Because demand is generally seen as relatively stable,<sup>2</sup> the question becomes: what causes supply shocks?

## Self-Regulation Mechanisms

In theory, private storage and trade activities should solve the problem, allowing the dilution of supply variations through space (market enlargement) and time (storage). But, as explained in Box 2, transfer costs from one market to another, through space or time, define a band that can be wide if transport and storage costs as well as risks are considerable. It explains why prices sometimes move independently from one market to

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<sup>1</sup> Of course, the above argument should not be taken too literally. Some foods are “elastic,” for instance goose liver or champagne. An increase in the price of goose liver would certainly decrease the demand for this commodity by a significant amount. But in such a situation, the demand for goose liver would probably shift to other foods, leaving the total demand for calories unchanged. Indeed, because of substitution, it is possible to observe high values for the demand elasticity of a specific product taken in isolation, but this high elasticity does not imply much flexibility in the overall demand for food.

<sup>2</sup> Even so, the total demand for food and agricultural products does change, first because the number of consumers and their food habits change, and second, because there is a non-food demand for agricultural products. However, these evolutions are generally progressive and foreseeable.

the others, separated by space or time. Within the band, domestic price instability is affected neither by trade nor by storage, and domestic policies have no harmful impacts on commercial partners. Symmetrically, even stable international prices do not provide stable domestic prices within the band.

The most natural explanation for supply shocks is indeed the subject of a consensus among experts: shocks are a result of nature, which creates different conditions for plant growth. Some are “better,” others are “worse” than “normal.” For instance, a drought can decrease yields over large areas. An epizooty can kill a large fraction of cattle. Conversely, a small amount of rain at the right time can increase yields by a surprising amount.

It has been claimed that such events carry their own remedies themselves: when supply is low, prices are high, thus maintaining farmer incomes by offsetting the loss of quantity with the increase in price (and conversely in case of “large” production). This constitutes **natural insurance** against price instability and, in this case, public intervention in markets aiming at stabilizing prices will worsen producers’ situation by destabilizing income. This might be true in a narrow market, where all producers are subject to similar weather conditions. As soon as markets are widened to allow for natural shock dilution, this is no longer true since a given farmer can very well be subject to natural conditions entirely different from those that trigger the change in price. In addition, while such a mechanism might protect farmers’ incomes, it never works for net buyers, which is the status of numerous poor producers in developing countries, and leaves unresolved the situation of consumers, who may suffer from high prices. Thus, this argument should not be invoked to justify blind faith in markets’ capacity for self-regulation.

When shocks are the consequence of nature, it is usually possible to rely on the “law of large numbers” to mitigate their consequences. The law of large numbers says that **many independent small shocks cancel out each other**, in such a way that their sum is null. This is the theoretical basis for insurance. Because each contract is “small” in comparison to the total portfolio held by an insurance company, and because the damages on one contract are independent of those on another, the overall outlay of the company is fairly constant, thus allowing costs computations and the definition of contract prices. Of course, the independence of risks is a prerequisite for insurance: companies never contract risks likely to be tied to each other. For instance, drought is rarely insured, because droughts affect not only one farmer (leaving the others untouched), but all farmers in a region. In this case, the reimbursement of all simultaneous accidents would jeopardize the liquidity of the company, and must be avoided. However, even in this case, insurance can be envisaged if the risk of drought is spread over a very large area in such a way that the weather in one sub-area can be seen as independent from the weather in another sub-area.<sup>3</sup>

This reasoning is behind the doctrine of the WTO and other organizations that says that liberalization is the best way of stabilizing world agricultural commodity prices: **if supply**

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<sup>3</sup> We have to mention that experiments in developed countries have not been encouraging. When there are no subsidies, demand for insurance by farmers has been very low.

**shocks occur because of weather and other fortuitous events, since such events are not spread over the entire world, and most of the time are independent from one region to another, then merging markets at world level should normally secure a fairly stable overall supply, hence a stable world price.** On this point, all economists agree.

The same line of reasoning also applies over time. Droughts (and more generally, weather events or epizooties) are independent from one year to the next, thus allowing for a pooling of risks over a large number of years. Of course, any step in this direction involves financial considerations, since transactions through time implies lending and borrowing. But with a financial system as developed as it is nowadays, this should not be a problem. “Catbonds,” “futures markets” and similar instruments should provide all the necessary facilities for that.

The only difficulty in this case (and the main difference between risk sharing across time and risk sharing across geography) is that physical supply is roughly constant across geography, but not across time. Thus, while financial risk sharing can be efficient in protecting producers’ incomes, it does not resolve issue of consumers facing famine... But this problem can be solved with storage. And, in theory at least, private storage should do the job: to make money, the speculator holding an inventory should buy when prices are low (thus pushing up prices when they are “too low”) and sell when prices are high (thus pushing down prices when they are “too high”).

As explained in Box 2, price stabilization based on these self-regulations mechanisms will be hampered by transfer costs between markets. Because these costs are high for agricultural products, especially in poor countries due to poor infrastructures and high risks, domestic price instability will remain high even if international prices are stable. This emphasizes the need for direct public intervention (C-instrument), on national isolated markets. The facts that prices instability remains high despite market expansion and after more than 30 years of globalization, is therefore explained partly by these costs and partly by an only partial liberalization process as numerous states continue to intervene in agricultural markets.

However, following this line of reasoning, safety nets are currently the main recommendation to protect the poorest from huge variations, while others buy insurance. The social implications of such an option should not be underestimated. To some extent, it implies that a large segment of the population of the poorest countries will be marginalized, because of resource access, if they are not able to leave the agricultural sector. In the current international context, opportunities for development outside the agricultural sector are few and far between.

**Box 2 : Price Transmission Between Markets**

The law of one price stipulates that in a perfect world, without transport costs and officials barriers to trade (such as tariffs), identical goods will sell everywhere for the same price if they are expressed in the same currency as a direct result of the profitability of buying a product at a low price on one market to sell it at a higher price on a different market. In reality, transfer costs from one market to another are high for agricultural products. This includes transportation costs and all transaction costs—that is, all costs related to negotiations and contract searching costs, risk-induced costs, and the costs incurred by meeting the licensing or other requirements of rent-seeking government agencies or officials. Market liberalization policies aim at reducing this last kind of cost. But other types of costs remain. They constitute a protection, especially important for landlocked countries, but also for all cases where risk is high. They act exactly as a tariff, making prices in the country higher and then increasing supply and lowering demand, decreasing trade compared to a situation without transfer costs. Overvaluation of the exchange rate also acts in exactly the same way.

Transfer costs determine a price band within which trade is not profitable and domestic prices are not stabilized by the international market. For example if the price is 100 on the international market and transfer costs are 50%, it will not be profitable to import (export) before the price on the domestic market reaches 150 (66). Within the band, which can be wide especially when transport facilities are poor and risks high as is often the case in LDCs, domestic price instability is not affected by trade providing space for domestic policies to deal with this harmful phenomenon without destabilizing external markets.

Domestic markets are connected to the international market when the domestic price equals the upper or lower limit of the band. Then, international price fluctuations will be transmitted to the domestic markets, in proportion to the exchange rate, while the volume of exports or imports will affect the world supply and demand balanced by the international market. If the country has an important share of world trade, this variation may affect the world price. This is not the case for small countries.

It is by this price transmission mechanism that the market is enlarged by trade, with the price equating world supply and world demand and allowing for the dilution of small independent local accidents. The same mechanism is at work when import prices rise, increasing domestic prices when the country is importing or exporting, at the expense of domestic consumers. It is impossible to obtain prices stabilization through international trade without accepting to share the burden of adjustment and thus tolerate some import price volatility. But, as explained above, instability will be removed only if it is generated by shocks related to natural events and resulting in prices exceeding the band. One positive aspect of this phenomenon is that, within the band, a public stockpiling scheme may stabilize domestic prices (let us say between 80 and 120, to continue with the example above) without destabilizing external markets.

The same mechanism applies over time according to storage activities. Transfer costs from one period (which include storage costs but again also risk and other transaction costs) to the next determine a band where private activities aiming at transferring the product supply from one period to another is not profitable and where prices fluctuate independently.

Some instruments aim to minimize transfer costs between markets through space and time, thus minimizing the band where prices fluctuate independently (A-instruments). Decreasing storage and transportation costs will indeed improve the market functioning and decrease price instability. Lowering risk-related costs is, unfortunately, much more difficult.

Price transmission is not limited to vertical linkages. The fundamental role of exchange rates was mentioned above. The importance of the costs of transfer from one market to another indicates a first link with energy markets. Energy markets also determine input prices and therefore production costs. Moreover, the recent development of biofuels creates new strong links between energy and agricultural products. Agricultural product markets are also linked together through to major channels: (i) consumers' choices and arbitrations between products according to relative prices that create a strong link between product prices, with the substitution effect transmitting price variations from one product to another, and (ii) the competition for land and other scarce production factors necessary to agricultural production that generates contagion phenomena.

### **Self-Regulation Failures Related to Expectation Errors**

Another explanation for price vagrancy exists, however. It is based on supply dynamics and the difficulties of forecasting in situations of large price fluctuations. Ezekiel (1938), followed by Boussard (1996) and many others shows how production lags combined with the low demand elasticity and the difficulty of future prices forecasts generate endogenous price instability and that this instability has no chance to be reduced by trade.

Because prices variations are due to either natural shocks, as explained above, or the issuing of a signal that more (or less) supply is necessary to satisfy consumers, it becomes very difficult for actors to decode the information provided by markets. Prices variations are sometimes signals, reflecting changes in fundamentals and requiring supply adjustments but sometimes they are the result of accidents requiring no changes in supply. This problem holds true for both farmers and traders. It occurs on domestic markets and on the international market. In this way, markets do not fulfill their role of providing the appropriate information to actors, leading to coordination failures.

When deciding what and how to produce in what quantity, the producer never knows what the price will be at harvest time. Actually, any economic calculations at planting time have to be made on the basis of "expected" (not "equilibrium") output prices. In case of a discrepancy between the expected price and the real price, the producer may either earn an unjustified reward or receive a dramatic punishment. Bad forecasts generate inefficient decisions; supply will be too high or too low to meet consumers' needs, generating huge prices variations and widespread drop in real incomes.

Another complication comes from the necessity of funding investments (long-term investments such as building a stable, and short-term investments such as buying seeds or fertilizers, with the latter applying in particular in the case of poor peasants, even when they do not trade on markets: in shortage situations, they sometime eat the grain normally reserved to make seed, thus pushing famine back to the following year). If incomes were low last year, money to fund investments this year will be lacking, thus decreasing supply.

In this case, the problem arises because of expectation errors: if, at a certain time, all producers expect a “high” price, they will probably all increase production, often going into debt to do so. It might happen that the overall increase in production goes beyond consumers’ capacity to buy. Prices then collapse. As a consequence, the next year, farmers see price as being “low,” which does not encourage them to invest again, especially as their incomes had dropped, they have to repay their previous loans, and they are short of money. As a result, production is low, prices soar, and so on... This mechanism is called a “cobweb” because the diagram used to illustrate it for on a basic supply and demand scheme actually resembles a cobweb.

The same mechanism affects storage decisions, hampering market operation: too often, speculators drive prices even higher in the case of shortages, and even lower in the case of gluts. This is because they are wrong: they expect prices to rise or fall even more (see Box 3). In these cases, fluctuations are generated by expectation errors due to imperfect information and the major influence of expectations on the commodity price formation process (Mandelbrot, 1973). As already emphasized, this happens on domestic markets as well as on international markets.

### Box 3 : The Controversial Role of Speculation

International markets for agricultural products are often coupled with futures markets, which allow the exchange of the risk associated with price fluctuations with a premium through forward contracts. They offer a way to manage price instability. However, transaction costs (especially for small farmers in poor countries) are high and they are better suited to traders than to farmers. Moreover the duration of contracts is around one year, which is too short to allow investment planning. Speculators are key actors on the markets because they are willing to bear the risks other actors like to avoid. When the markets are running smoothly, speculation stabilizes prices, diluting shocks in space and time exactly in the same way that trade and storage do. Because speculation is at the heart of fervid discussions, it is interesting to refer first to its definition. Derived from the Latin word *specular* (to observe), to speculate is to buy or sell in the hope or deriving monetary gain. Useful arbitrations in space and time by merchants belong to this category. They stabilize the prices when markets are functioning well and expectations are accurate, and destabilized it when herd behavior, panics, crashes, and other destabilizing behaviors take place on the market. The heart of the question is still the same: expectations and their accuracy, the fact that they may completely change in a few seconds, and the key role they have in the price formation. The financiarization of the commodity, which is the fact that investors, in their search of uncorrelated assets, recently entered agricultural markets, may magnify the risk of destabilizing behaviors.

Many types of cobwebs have been described in economic literature. But all of them share the fact that they **are not curable by the same recipes** that work for shocks generated by natural events. For instance, while two isolated markets fluctuate in “anti-phase” (high prices in one market correspond to low prices in the other), merging them will just result in phase “synchronization.”



Insurance schemes are not feasible, first because prices are the same for everybody at the same time, thus precluding any geographical risk sharing, but also because there is an almost perfect autocorrelation between two adjacent periods, ruling out any sound financial risk sharing across time.

In presence of this category of shocks, **the market itself is at the origin of fluctuations**. If one wants to avoid these fluctuations, the only possibility is to intervene directly to regulate market operation. The idea is not at all to suppress the market, just to help it play its role of informing producers of consumers' wants and consumers of production difficulty. Various possibilities exist for that, and will be described below. Yet, a very general rule must be pointed out: it consists in creating the conditions so that a minimal supply can occur. If a minimal supply is "sure," then prices cannot soar up to a very high level. And because prices cannot be too high, they also cannot be too low because producers are never encouraged to overproduce. The practical enforcement of this rule depends upon circumstances, especially the scale of the production basins over which it is applied and the capacity of governments to manage imports and exports, as will be seen below. The important thing is that to avoid excessive price volatility, we need to be sure that a regular and sufficient quantity will be provided on markets.

### **Coordination Failures Justify Direct Public Intervention in Markets**

In other words, while liberal recipes stand as the best solution to get rid of shocks from nature, there are other sources of fluctuations that are best cured by State intervention. Unfortunately, in practice, both sources of fluctuations are at work: harvest sizes are affected by the weather, and actors expectations are not always fulfilled. The difficulties involved in accurately assessing the causes of a given price variation is perfectly illustrated by the ex-post analysis of the 2006-2008 price surge (Box 4). As seen above, the problem is that the appropriate remedies are completely different in each case, but the sources of large fluctuations are inextricably intertwined. To cure the first kind of shocks (caused by nature), measures aiming at improving the market operation by providing a better environment for private storage and trade activities and lowering transfer costs through improved information and transparency on markets (A-instruments) are well suited. Insurance could resolve the problem for the remaining instabilities of this kind due to transfer costs (B-instruments). But, for the second kind of instability, generated by the market itself in an uncertain world, direct public intervention in markets is necessary. The importance of agriculture, both as the provider of basic food and as the main source of income for the large majority of the poor, makes ex-post instruments such as safety nets (D-instruments) impossible to use. Beyond issue of human dignity, the governments of poor countries do not have access to the necessary financial resources. It is also worth considering that if safety nets are necessary in cases of extreme events; their use will be far less costly if direct public interventions on markets minimize the probability of occurrence of such events. Moreover, these instruments have the same implementation difficulties as direct public intervention (rent-seeking and so on). This is what makes setting up a sound agricultural and food policy is so difficult.

The controversy turns around the relative importance of the two kinds of instability described above. For some, the instability related to the difficulty of self-regulation in agricultural markets is negligible and, because of the inter-relationships between markets, it is better not to intervene so as to not to transmit price instability to other markets. Compensation, outside the market, could be used, if necessary, for the poorest while others will take out insurance. Coordination failures do not take place. For others, despite the difficulties and costs associated with public interventions, building a conducive environment for private activities is necessary but unlikely to be enough, at least in the medium term. Public intervention is required.

### Price Instability, Dynamics Involved, and the Poverty Trap

Food markets often exhibit very unstable prices. **Does this mean that they are unpredictable?** If not, the worst impacts are concentrated on poor consumers, who often spend more than half of their budget on food, which can be compensated for, avoiding at the same time social unrest and economic instability. Instruments that aim to compensate the poorest, such as safety nets (D-instruments), could then be used. **If so, they lead to inefficient behaviors by actors.** For producers, as explained above, risk discourages investments and even market participation for the poorest. It may explain why some economies seem stuck in a low equilibrium trap (Dorward *et al.*, 2004; Poulton *et al.*, 2006; Timmer, 2000). **Then, in certain circumstances, and at least at a specific stage of development, market-related public policies can be necessary to escape from vicious circle of low labor productivity leading to low incomes and low investments.**

Impacts are also considerable in developed economies as the business is too risky to allow efficient investment decisions. Periods of low prices, generating farm bankruptcies, especially among indebted farmers, are followed by periods of high prices due to scarcity. Even if the impacts on consumers are lower because consumers are richer and consuming highly processed goods in which raw material costs account for a small share of the final price, the general impacts on the economy are not negligible. Moreover this does not allow for progresses in terms of sustainable agricultural development.

The problem of economic policies is not only—and not even primarily—to allocate a fixed supply between consumers but to create conditions such as, in the long run, supply be large enough to smoothly match at least the basic needs of the population with practices not too detrimental to the environment and product safety. At the same time, this target must be hit with an efficient use of existing resources, without squandering them in over-supply. The question, then, is whether a completely free market and large price fluctuations can help reach this target.

In presence of large price variations, capital is often wasted. This is because when prices are high, producers tend to overinvest. When prices fall afterward, they cut production, and part of the investment is left unused (hence, squandered). Most of the time, when prices rise again, the unused share of capital is not usable anymore (or only usable at

high cost), so new capital must be invested again...Obviously, this is not an efficient process. It is therefore detrimental for the general welfare.

These are very strong cases for price regulation indeed, even assuming “risk neutrality.” But the detrimental effects of risks also have to be considered. When planning production on the basis of expected prices, a farmer (or the farmer’s banker) cannot ignore the fact that expectations might not be met: this puts constraints, including precaution, on decisions, and advocates for a prudent use of existing resources, especially credit. In this way, many development opportunities are missed, and the poorer the farmers the more opportunities are missed: the poor are, in general, more “risk averse” than the rich. This may explain (along with the lack of capital) most of the “backwardness” often negatively attributed to traditional peasants. In any case, risk considerations in general prevent resources from being fully utilized.

This is the basic rationale for direct intervention on markets. Far from negating the virtues of a liberal economy, they should be designed to increase the quality of the messages carried by prices in order to inform producers of consumers’ desires, and inform consumers of the difficulty in producing, without forgetting externalities which are not carried out by the markets as widely explained by economic theory.

Finally, every one agrees on the fact that private activities such as storage and trade are necessary, and that the provision of public goods in the form of infrastructures is essential to allow markets to function as well as possible. **The controversy is whether or not it is enough to avoid coordination failures.** Empirical evidence all over the world seem to prove it is not (Dorward *et al.*, 2007), but some argue that this is due to a partial liberalization process that discourages private activities (Kerralah *et al.*, 2002; Jayne *et al.*, 2002).

When referring to the coordination failure associated with price instability, it is impossible to manage this type of failure through ex-post instruments aiming at compensating the losers because coordination problems affect the whole system. Food prices are indeed key variables, determining wages, employment and inflation in less developed countries, as well as social peace and political stability. The risk is therefore systemic, and the option of ex-post compensations, as a safety net, becomes too expensive.

All these considerations explain why a purely economic approach may lead to the conclusion that large and sudden price variations are not efficient and should be avoided as much as possible. It does not mean that price signals must be neglected: obviously, techniques and preferences vary over time and relative prices must vary to indicate these changes to producers and consumers.

However, these evolutions are generally smooth, and take a long time to become significant, thus leaving ample room for progressive adaptation. For instance, the long-term trend of dropping agricultural prices (something between 1% and 5% per year) reflects technical progress for the benefit of consumers. But it is not the kind of price

variation facing most farmers, especially in poor countries. Most commonly, a given agricultural price goes from 1 to 2 and then to 0.5 in the space of three years. What message does this send to producers? How can they interpret it

### Which Level for Action?

When public interventions should be envisaged, one has to decide at which level. Should it be a task for an international authority, a local community, a government, or a group of regional governments?

As pointed out in Boxes 2 and 4, there are no (or very few) completely independent markets, whether geographically or over time. Any decision taken at any level at any time is likely to impact other entities, at the same instant or at another time.

For instance, during the 2007-2008 crisis, some governments decided to cut rice exports in order to maintain domestic prices at reasonable levels as far as possible. They undoubtedly increased the world-wide penury, which let prices soar to incredible levels. They were severely condemned by the world public opinion for doing so. At the same time, they not only protected their own citizens as consumers, but they also avoided too much enthusiasm among their producers for increasing production next year. And that was sound, given the fact that the price of rice decreased by a large amount the following year. Indeed, because they were large operators, by doing so, they helped stabilize prices in the year after the peak.

#### Box 4 : Ex-Post Analysis of the Causes of the 2008 Price Spike

Over the period 2007-2008, most international agricultural prices doubled or even tripled. Milk was the first product to be affected, with the quick increase taking place during the spring of 2007, followed later in 2007 by spikes in wheat and maize prices. The price of rice, the last commodity to be affected, skyrocketed in a very short period during the first half of 2008. Almost all agricultural food products were affected with the exception of sugar. Tropical products and meat fared better than grains. A few months later, prices began to drop. The sudden rise in prices and the sharp drop a few months latter were unexpected. At the time, neither economic models nor international institutions predicted the price spike; experts were mainly concerned about the long term downward trend in agricultural prices.

Several studies have analyzed ex-post the possible causes of the food price spike. The main causes that have been identified are: (i) rapid economic growth in certain developing countries such as China and India which, together with higher incomes, led to a nutritional transition and increased demand for grains; (ii) adverse weather conditions in certain key production regions such as Australia and eastern Europe; (iii) a weak US dollar; (iv) high oil prices leading to higher production costs for agricultural products; (v) biofuel production; and (vi) speculative behavior (see, among others, Abbott *et al.*, 2008, 2009; Von Braun J., 2007). There is a widely shared opinion that these different causes act together and that it is difficult to evaluate the impact of each one individually. Using the Aglink model, Dewbre *et al.* (2008) found each of these factors to be equally important. The resulting impact, when all shocks are combined, is much lower than the price increase that was seen, underlining the fact that other mechanisms may have been neglected in the analysis.

#### Some Causes Are Controversial

Headey and Fan (2008) argue that neither the argument involving growth in middle-income countries—China and India do not show trade deficits for agricultural products over the period—nor the weather shock argument—the fall in output in several countries in 2007 was offset by increased production in other countries (Argentina, Kazakhstan, Russia, United States) and ultimately world grain production declined by 1.3% in 2006 but increased by 4.7% in 2007—are convincing.

Several studies have focused on the biofuel explanation. As underlined by Keyzer *et al.* (2008), it is clear that in the context of a scarcity of fossil fuels, biofuel production increases competition for land, fertilizer and labor. Moreover, the policy adopted results in high production subsidies for biofuels, and generates a completely rigid demand that bears a significant share of the responsibility for the food crisis. Some experts stressed the fact that, while the explanation is convincing for maize, it is less persuasive for wheat and rice (Headey and Fan, 2008). But Mitchell (2008) explains how the substitution effect induced by land competition for crops not directly concerned by the demand for biofuels may generate contagion phenomena.

Another controversial issue is the role of speculation in the process. In the press, financial speculation has often been accused of being responsible for the price spike. It is true that increased financial activity took place at the time of the price rise but the causal link is not at all clear. One must remember that higher volatility necessarily induces speculation because of speculators' function in markets (bearing risks). Consequently, as underlined by Headey and Fan (2008), speculation may be a symptom more than a cause of price volatility, "*l'écume sur la vague*" (the foam on the wave) (Chalmin, 2008). Despite several studies, it is difficult to assess precisely the role of speculation in the phenomenon, underlying the difficulties in economics of discriminating between alternative processes. As underlined by Gilbert (2008), uninformed speculation may be destabilizing and generate explosive price behavior. A new class of actors has entered commodity markets through index-based investment, viewing commodities as an asset comparable to others. The money involved may be substantial. However it is difficult to evaluate its influence on the price boom.

Finally explanations focusing exclusively on fundamental factors leave an important share of the price hike unexplained. Moreover, the rapid rise in prices followed by the quick fall some months later suggests a bubble phenomenon. Piesse and Thirtle (2009) explained the rice price increase by panic leading to export bans from major exporters, and underline that such behavior is costly for the world community.

On the other hand, Boussard, Gérard and Piketty (2008) show a model that, in 2005, predicted the phenomenon fairly well from purely endogenous relations and market mechanisms, without requiring any other assumptions such as drought, biofuels, changes in consumption, or speculation. It has been said that their model was a good predictor only by chance, just as a stopped clock indicates the right time twice a day. Yet, this model at least does not contradict the "endogenous hypothesis." In addition, similar results have been found with another model (Munier, 2010).

This observation leads to the conclusion that a world authority should be in charge of the problem. Yet, there are objections. The most important is that it will be very difficult to determine the proper international prices or bands of prices. Whatever steps are taken to stabilize markets, they will generate instant private rents or preclude private gains. Moreover, as seen above, international price stabilization will not affect a large share of domestic price instability, the portion that takes place within the band defined

by transfer costs from one market to another. Because most poor consumers face very high transaction and transport costs, large price fluctuations will remain in poor countries sucking them into the poverty trap. Furthermore, local communities do not have the logistical and financial capacity to regulate markets. For these reasons, the practical level for action is national governments or groups of governments. However some supports of the international community are needed. It will be addressed in the fourth section.

At present, national governments are largely deprived of power because of the multiple international agreements in force. In particular, the WTO ban on most technical measures to stabilize domestic markets is a serious impediment in this regard. The WTO agreements should therefore be revised to allow governments to define the agricultural policies necessary to improve food security. In this respect, one must emphasize the fact that, according to jurists, the Marrakech treaty provides almost all the necessary provisions to allow government intervention if it is deemed necessary, so that a formal renegotiation of the treaty would probably not be necessary. Only a strong reversal in how it is enforced should be envisaged.

## **2.2 Is Price Stabilization Feasible?**

While direct public intervention in agricultural markets seems necessary under certain circumstances, the success of such intervention is, however, dependent on political and institutional conditions. Inadequate or untimely public interventions discourage private activities in commercialization (eviction effect) and generally decrease efficiency. Sometimes, they even increase uncertainty (Jayne *et al.*, 2006). It has been demonstrated that, in a context of price jumps, public intervention aimed at containing the leap could indeed worsen it, because of a lack of predictability (Chapoto and Jayne, 2009; Nijhoff *et al.*, 2002; Mwanaumo *et al.*, 2005). The private sector cannot operate in an environment where governments intervene in a discretionary and unpredictable way making prices even less stable (Byerlee *et al.*, 2006). State intervention is in this case seen as lowering efficiency by limiting local competition and private sector development. State interventions also generate rent-seeking behaviors and are the sources of maneuvers expected to serve the interests of specific actors. Thus, political economy consideration of existing contradictory interests and institutional contexts is necessary to understand food price policy designs and implementation as well as the difficulty of reforming agricultural markets (Jayne *et al.*, 2002).

These analyses, applied to price stabilization policies, are consistent with more general analyses of the forms of governance that prevail in policy elaboration and implementation. They insist on the capacity of diverse stakeholders (governments, lobby groups, etc.) to meet their objectives. At the World Bank, Kaufman considers that society engagement and state performance form the two pillars of good governance (Kaufman *et al.*, 2005; World Bank, 2005). His works led to the definition of six governance indicators that measure “government capacity to formulate and implement policies in an efficient way” and the “respect of citizens and [the] state for the institutions that govern their social and economical interactions.”

Somewhat summarized, these works suggest that the processes through which food price stabilization policies are elaborated and implemented can count as much as the content of these policies (how things are done counts as much, and maybe even more, than which things are done), and that, as a result, we have to analyze the forms of governance that drive policy elaboration and implementation. How is food price stabilization elaborated? What are the specific interests served by these policies? Which stakeholders participate (or not) in policy elaboration processes? How are food price stabilization policies implemented? Are these policies predictable enough? Are they effectively enforced by the State and respected by private actors? Among the many institutional factors that influence the ability of policies to smooth price volatility, three can be distinguished: policy effectiveness, policy predictability, and policy appropriateness to a plurality of interests.

### **Policy Effectiveness**

Policy effectiveness is related both to the financial capacity of States to implement policies and to States' capacity to control policy enforcement and compliance (dissuasion and punishment of policy-circumventing strategies).

### **Policy Predictability**

Policy predictability is linked to the State's capacity to elaborate and implement policies in a transparent way, so that private actors can correctly anticipate government actions and position themselves on food markets.

### **Policy Appropriateness to a Plurality of Interests**

Policy appropriateness to a plurality of interests is related both to the capacity of private actors to define and represent their interests and to the capacity of the State to take into account these interests (pluralist system of interest representation, control of corruption and rent-seeking behaviors, arenas for discussion and negotiation, enhancement of capacity-building programs among different stakeholders, etc.).

In short, state interventions should be based on collaboration between public and private actions. They should be rules-based and relatively predictable, as well as credible, which implies sure and flexible access to financial resources and expertise. To be legitimate, intervention has to be the result of actors' discussions and negotiations, which in turn means that institution-building for organizations such as farmers' organization may be a necessary prerequisite. Rent-seeking behavior should be avoided as much as possible through transparency, the existence of press/media freedom, and exemplary punishment of adverse behaviors.

These institutional factors are likely to express themselves differently according to the level in question, given that prevailing stakeholders are different. In the next section, we will illustrate how these factors influence policies' ability to reduce food price volatility at the national level. At the regional and international levels, the prevailing stakeholders are different from those that are most influential at the national level. As a result, governance issues tend to differ a lot.

If we want to analyze the processes of elaborating and implementing food price stabilization, we need to consider a wide variety of stakeholders. For example, at the international level, States, traders, experts and non-governmental organizations influence these processes and should be taken into account. Considering States, we need to consider a great variety of stakeholders as well. In broad outline, we can distinguish between: (i) “high income states” that tend to support agricultural revenues (employment and farm problem, producer-side) and “low income states” that are more likely to defend food security (urban food problem, consumer-side); (ii) between “importing” and “exporting” states; (iii) between “small” and “large” states related to international trade, etc.

Policy effectiveness, predictability and appropriateness to a plurality of interests have much to do with the forms of coordination that prevail on the international level. Crucial governance issues arise. If one decides to regulate food prices at the international level through policies, should forms of coordination rely exclusively on intergovernmental agreements? How can one ensure policies’ long term financing, enforcement, transparency, and capacity to serve the general interest? Nowadays, there is no relevant international organization to ensure these four conditions (they are not covered by the mandates of either the World Trade Organization or the Food Agriculture Organization). Proposals have been made on setting up a new organization, the International Food Safety Agency, but many questions remain as to how to ensure this new organization’s effectiveness.

### **Theoretical Aspects: A Few Concluding Remarks**

Finally, a consensus exists as to the difficulties and costs associated with state interventions in agricultural markets. The subject of controversy is the consequences of these difficulties and costs, and the way forward. For some experts, all of these considerations, added to the facts that high transaction costs hamper market operation and that public budgets are scarce, point to the argument that it will be more useful to invest in public infrastructures (roads, health, education) and in agricultural research and extension than in food price stabilization (Cumming *et al.*, 2006). While some agree that di-

rect public interventions may be useful because of the harmful effects of price instability, they argue that direct public intervention is associated with so many adverse effects that the cure is worse than the disease.

For others, coordination failures justify intervention, especially in LDC countries because of the dynamic gains to be expected in economies stuck in the poverty trap. Building an environment conducive to private activities is necessary but unlikely to be enough. In this case, direct public intervention in market is required.