

DEVELOPMENT, THE ENVIRONMENT AND FOOD: **TOWARDS AGRICULTURAL CHANGE?**

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Agricultural price volatility has returned to centre stage since 2008. Since then, economists and politicians have debated its causes, with bio-fuels and speculators as two prime suspects. But rather than addressing the root of the problem, the political response, from the G20 in particular, seems focused only on treating its effects.

INSTABILITY IN AGRICULTURAL PRICES: A COMFORTABLE TRUTH

The commodity price rises that occurred between 2006 and 2008, and subsequently during the winter of 2010 to 2011, have attained a profile in media and political debates that is higher than that reached by these products since the price increases of 1974 and 1979, which were concurrent with the two oil crises. Agricultural price movements on international markets were usually only subject to media attention because of apparent relentless decline (Figure 1). After an optimistic pause in the 1970s, at the turn of the century the world, and especially the developing world, rediscovered the tribulations of excess. Oil itself did not escape the curse of abundance, prompting the still famous “Drowning in Oil” article in *The Economist*, concerning the inexorable decline of oil’s market price¹.

In this context, the 2006-2008 and 2010-2011 crises have a special resonance. Both have surprised by their magnitude and abruptness. The IMF’s commodity price index was set at 100 in 2005, in July 2006 it was raised to 130, in November 2007 it was more than 157, and by July 2008 it stood at 219; i.e. more than doubling within three years. After a decline during the financial crisis, the index rebounded and in March 2011 it reached 210. For comparison, the average figure for the period from 1992, the year the index was established, until 2004, would be just 60. How is it possible that such a phenomenon was not anticipated by politicians, who were wholly unprepared for its impact on disposable income, purchasing power and

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1. See “Drowning in oil” and “The next shock” in *The Economist*, 4 March 1999, in which the British newspaper reported that the price of oil could go under \$10.

inflation; and why was the market itself incapable of anticipating the scarcity? Is it because the fine adjustment of supply and demand is such an elusive and mysterious process, that prices are suddenly able to double or triple in value within a few months, even though in many cases markets have been established for more than a century, with prices remaining stable or on average declining for periods of almost 20 years?

In a collective response, the G20 countries have taken onboard these two issues and focused not on identifying the causes of instability, but on the treatment of its effects (Box 1). This approach, to which the realists will give a free rein, is motivated firstly, at least officially, by the need for visible action, and by the observation that the causes are uncertain and controversial, and therefore difficult to target. In short, we are facing new crises and the key is to limit their intensity and effects.

The conclusions of the G20 agriculture ministers were met with a favourable, even rapturous, reception. Only a few dissenters stressed that key issues had not been dealt with and that the delay in addressing the causes would certainly allow a deal to be reached, but that it would be an agreement without any real scope. For the dissenters, it was of particular significance that trade liberalization had been dismissed as potentially culpable, that the role of biofuels had not even been

BOX 1 G20 AGRICULTURE MINISTERS' RESPONSES TO MARKET INSTABILITY

At meetings in Paris on 22 and 23 June 2011, G20 agriculture ministers adopted an action plan on food price volatility and agriculture. The action plan is to be submitted to G20 heads of state at the November 2011 summit in Cannes. The action plan has five major elements:

Increase of food production – There are commitments to implement “a broad scope of actions to boost agricultural growth”, and the strengthening of research and innovation with, as a first step, the launch of an “International Research Initiative for Wheat Improvement (IRIWI)” to coordinate research efforts on this crop; and to encourage and increase public and private investment in agriculture.

Information and market transparency - The G20 will launch, within the FAO, the “Agricul-

tural Market Information System (AMIS)” to encourage major players in agri-food markets to share data, to enhance existing information systems, to promote greater shared understanding of food price developments and to promote political dialogue and cooperation. This database will be implemented “as soon as possible” and will be complemented by a satellite observing system that will share satellite images of agricultural production to enable the effects of climate change on world agricultural production to be accounted for.

International policy coordination - The action plan recommends the implementation of a “Rapid Response Forum” placed within the FAO. This mechanism for immediate action, composed of senior G20 officials, will help make

decisions in the shortest possible timescales in the event of a drop in supply from a major producer, allowing countries to consult and respond collectively. Any decisions made during a crisis will be taken within the Rapid Response Forum.

Reduce the effects of price volatility for the most vulnerable - Ministers agreed on the objectives, principles, modalities and timing of an agriculture and food security risk management toolbox, and supported the development of a proposal for a targeted emergency humanitarian food reserves system (to complement existing regional and national food reserves).

Financial regulation—G20 Finance Ministers and Central Bank Governors are “strongly encouraged” to make appropriate decisions for “a better regulation and supervision of agricultural financial markets”.

mentioned, and that the commitments against financial speculation were vague and inconsistent².

This article balances these two views by first examining the potential causes that have been put forward by relevant institutions and stakeholder groups since 2006, and then reviewing the state of scientific knowledge on these issues. We start with trivial questions: ‘agricultural prices are unstable, so what?’ before examining the potential liability of trade liberalization, biofuels and speculation. In conclusion, we find that there was no reason for the G20 to exclude or defer the inclusion of the latter two factors in their restricted agricultural governance plan.

AGRICULTURAL PRICES ARE UNSTABLE, SO WHAT?

Two terms are used alternately to describe market price movements of agricultural commodities: instability (of markets) and volatility (of prices). The same measurement method is generally used, which is derived from the financial world, to provide information on price dispersion around the average. The greater this dispersion, the more frequent the major variations (“major” relative to the average) will be, and the greater the market instability and price volatility (Box 2).

The fact that a market is unstable with volatile prices poses no economic problems itself. Such phenomena only become problematic when they are a source of uncertainty and risk for economic operators (producers, investors, buyers...) – a risk so significant that these agents modify their behaviour and distance themselves from what is both in their own interest and that of the community. Unstable prices may not necessarily create risks, either because operators do not perceive the risk in question, or because there are means to guard against it – such as through insurance. The state of the world referred to when measuring economic gains and losses related to instability is therefore not a world where prices are stable, but a world where all risks are insurable. Operators are free to insure themselves or not.

2. This viewpoint was espoused by La Confédération paysanne (Peasant Confederation), la Coordination rurale (Rural Coordination) and MODEF.

BOX 2 MEASUREMENT OF PRICE VOLATILITY

The most common measure of long-term volatility or “historical annualized” volatility is obtained by calculating the standard deviation of price variations (usually expressed as a logarithm) over a given period, multiplied by the square root of the frequency of observations:

$$\text{Volatility} = \sigma \sqrt{T} \text{ with } \sigma = \sqrt{\sum_{i=1}^n (r_i - \mu)^2 / (n - 1)}$$

and $r_t = \ln(P_t) - \ln(P_{t-1})$, n is the number of observations, μ is the mean variation of the logarithms of prices (r_t) and T is the frequency of observations (252 for daily data, 12 for monthly data etc).

When price fluctuations represent uninsurable risks, producers produce less (than would otherwise have been produced if the risk was null or insurable), investors invest less and consumers consume less (if not necessarily the product in question, then other products may be eschewed to meet the need for “products with unstable prices”). Ultimately, the consumer is the first loser. Indeed, the risk (uninsured) linked to instability reduces production and investment (and therefore long-term production) compared to a “risk-free” situation. With a constant demand, which is the case in agriculture where demand is assumed to be inelastic, i.e. low price sensitivity, a lower production will result in higher prices. The consumer therefore bears the cost of the risk perceived by the producer by paying more for the product (than would have been paid in risk-free situations or with an insured risk). The market transfers a part of consumer wellbeing to the producer, via prices that on average are higher (compared to a risk-free universe). Instability is therefore

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a redistribution mechanism. It should be noted that there is another loser: poor producers. Such producers are, empirically, more risk-averse than rich producers. Rich producers see profit opportunity in instability, while poor producers feel the threat of bankruptcy and ruin. Poor producers are

therefore more likely to avoid high-risk crops than rich producers, thus guarding against the negative effects of instability – lower prices in this case – but will not be able to take advantage of the benefits – record-breaking revenues when prices soar. Within the production sphere, instability again serves as a redistribution mechanism. Redistribution towards the rich in this case.

The significance of this setup is that the risk (not covered) linked to instability creates two types of problems: it is a source of inefficiency (higher prices are paid on average for products than in a risk-free world) and inequity (it is to the detriment of poor households). But the risk is not universal. Insurance mechanisms are being developed in some regions (in brief, OECD and some emerging countries) and less in others (LDCs). However, poor rural households occur in higher proportions in areas such as LDCs than in others (OECD). What is true for households is also true at the national scale. Agro-exporting countries can gain from instability, while agro-importing countries will lose out through bearing the costs of risk, the importation of inflation and by having to divert resources and savings towards the purchase of food at the expense of other imported products. Thus, it appears that market instability is primarily an economical problem that affects the poor, which may be its only universality.

DOES TRADE LIBERALIZATION MAKE MARKETS MORE UNSTABLE?

Price rises (as distinct from an increase in volatility, which is itself only very relative) between 2006 and 2008, and then in 2011, occurred in a context of globalization and

market liberalization, suggesting that the two phenomena could be related³. This idea is not absurd, gaining support from theories that were formulated even before the events in question occurred. The problem is that these theories are incompatible.

The first “theory” emphasizes the benefits of agricultural trade liberalization on instability. By considering instability as a result of external shocks on the supply or demand (weather shocks, but also political shocks or “externalities”, for example through the introduction of unilateral measures such as subsidies or export tax), the gradual integration of domestic agricultural economies into a large global market attenuates price instability through compensation of weather shocks (a good harvest somewhere in the world compensates a poor harvest somewhere else) and through mitigation of political shocks or “externalities” (a progressive ban on subsidies and taxes for example). It could be said that liberalization takes the edge off the shocks.

This does not mean the resulting prices are stable; in theory, prices are expected to be less unstable, in other words, that their distribution becomes closer to established laws of probability and that they become insurable under the law of large numbers. They are therefore more “stable” in the narrow sense that they are “more insurable”. In fact, global prices are generally more “insurable” under classical financial techniques than domestic prices.

A competing theory is that the beneficial effect of shock compensation that globalization brings is, on average, offset by the negative consequences of the dismantling of public policies for the stabilization of domestic prices, which is a consequence of globalization. The disappearance of guaranteed price policies that were developed in OECD countries after the Second World War (or shortly beforehand in the United States) has increased uncertainty and risk for the producer, who is left exposed to market price fluctuations. Without the availability of an insurance mechanism (or without wanting to seek recourse to insurance since it requires payment, while public policies cost nothing) the producer makes erroneous production decisions by producing too much or too little, and so prices are never in equilibrium but adjust constantly according to the whim of the producer. Instability is endogenous. It creates risk, which creates error, which creates instability.

Both theories are valid. Neither can be proven superior by empirical testing.

However, empirical observations do suggest that, in retrospect, long-term international prices of most agricultural commodities have never been as unstable as during the 1970s (Figure 2), which was the golden age of agricultural policies. In contrast, most prices have never been as stable as in the 1990s, which was a major era of domestic and trade liberalization (LDCs undergoing structural adjustment and MacSharry’s 1992 CAP reforms). Moreover, the observed relationship between stability and agricultural policies and trade liberalization has remained true for a long time. Periods of increased instability (as opposed to price rises) have since 1700 been associated with periods of restrictions in international trade (Jacks et al. 2010).

3. This argument is particularly salient in the opinions of organizations such as la Confédération paysanne or Via Campesina.

Furthermore, we observe that on average agricultural prices are unstable during increases and stable when heading downward. Depression is long and steady while increases are sudden and condensed. This is a constant of agricultural markets. The reason being that when surplus occurs, farmers do not uproot their vines or cocoa trees, nor do they put their land into fallow (they hope that their neighbours will), thus the downturn spirals. When prices are high, even if hectares are available to convert, it takes time for production to react, which according to a producer's risk aversion may be one or two seasons – a precise period overlooked by the market, hence leading to instability. The recent phenomenon is not extraordinary when considered over the long term; it is in fact quite marginal when compared to events in the 1970s.

Can we not find political grounds for the present instability – regardless of its relative historical importance? It is worth recalling that in 1994 WTO member countries agreed to abandon policies of domestic price stabilization. The objective being to stabilize revenues, rather than domestic markets. A gradual redirection of public intervention was intended, away from the setting of a price floor

WHEN PRICES ARE HIGH, EVEN IF HECTARES ARE AVAILABLE TO CONVERT, IT TAKES TIME FOR PRODUCTION TO REACT, WHICH ACCORDING TO A PRODUCER'S RISK AVERSION MAY BE ONE OR TWO SEASONS.

towards direct revenue aid – handouts. The producer was left alone to manage savings and investment choices, like any entrepreneur (in reality not exactly like any entrepreneur because small businesses do not receive the equivalent of 20,000 euros in subsidies for a full-time equivalent worker, which is the average for OECD farmers). Two consequences were expected from liberalization: that domestic prices would be more unstable

(due to the elimination of domestic stabilization policies); and that global prices would be more stable in the sense defined above, i.e. more insurable (due to the increase in the geographic scope of trade which then reduces “exported” instability caused by domestic stabilization policies that lead to surpluses or irregular and unpredictable imports onto global markets). Basically, it was expected that instability would be levelled out and equalized, and that financial instruments (futures contracts and options) could be used to limit it.

The WTO agricultural policies “package” therefore combines trade liberalization, subsidies to producers to facilitate the transition, and the use of financial instruments for risk protection. The package is inaccessible to LDCs, which is to be expected since the WTO agricultural agreement was neither written by nor aimed at LDCs.

The management of instability through the natural effect of market expansion and of the dismantling of public price stabilization policies in fact discriminates “against” households and poor countries that lack access to direct aid or financial instruments for risk management. They only have access to external markets, an access that lacks sufficient power to stabilize their revenues, which the other two elements of the “package” provide. As mentioned above, instability poses a fundamental problem of inequality, as does its contemporary management if we consider the “package”

of measures that was institutionalized by the WTO agricultural agreement. Even if liberalization does not increase the instability of agricultural markets, it does mean that poor households are more consistently exposed.

ARE BIOFUELS RESPONSIBLE?

The new link between agricultural commodity markets and energy markets is difficult to contest. The rising global need for maize imports was concurrent with that of the increase in US domestic demand for maize for ethanol production, which currently stands at about 29% of maize consumption in this country. As Collins (2008) emphasized, expansion of maize usage for ethanol production has truly accelerated from 2004/05, with the enactment in the US of the Energy Policy Act during a period of a sharp increase in oil prices, which had the explicit objective to increase the share of biofuels in the country's energy "mix". Agricultural markets and energy markets are therefore linked due to the anticipation of high oil barrel prices along with the US need to secure energy supplies.

Similar concerns occur in Europe in the "climate and energy package" adopted by the European Parliament on 17 December 2008, which stipulates that each Member State of the Union must meet the 10% target of biofuels in the final energy consumption in transport by 2020. This objective implies that, by the stated date, 60% of Europe's consumption of vegetable oil will be for biofuel production (European Commission, 2007). Retrospective and prospective data collected by Goldman Sachs (Currie, 2007) show that in 2004 there was a "spike" in the demand for agricultural products for energy, and the legitimate expectation that an increase in biofuel supply would continue.

Considering cereal production as a whole, USDA estimates show that the US maize demand for ethanol production accounts for one third of the growth in global demand for these commodities (compared to one quarter for animal consumption and about 45% for food). For some, these figures put US maize ethanol demand into perspective regarding its culpability for the rise in global prices of wheat and other cereals – and ultimately in the rise of agricultural prices as a whole.

It is true that aggregate data seems to clear biofuels of blame. According to Agrimonde (a prospective project led by CIRAD and INRA) estimations, less than 5% of the total worldwide production of calories of plant origin is for non-food uses, including agrofuels. According to the International Energy Agency, in 2005 1% of cultivated land was used to produce agrofuels, replacing 1% of the global consumption of fossil fuels. However, the announced rise in the use of cereals for agrofuels has increased the attractiveness of the market for financial speculators interested in agricultural commodities so that, according to Bricas and Bru (2008), "it is more the anticipation of an increase in demand, rather than an actual increase, that accounts for the price surge". Furthermore, the use of globally aggregated data consistently underestimates the statistical share of North American maize energy consumption out of all produced and consumed cereals. According to the same authors: "It is not the current volumes of agricultural commodities used for agrofuels

TABLE 1: ESTIMATIONS OF THE SCOPE OF THE EFFECT OF INCREASED US BIOFUEL PRODUCTION ON CEREAL PRICES

Author	Proportion of increase accounted for	Product
Lipsky (2008)	70%	Maize
	40%	Soy
Collins (2008)	60%	Maize
Rosegrant et al. (2008)	47%	Maize
	26%	Wheat
	25%	Rice

that explain the rise in prices, except at a local level for US maize providers, who are the main producers of these fuels.” The fact that US maize prices “surge” due to an increase in energetic demand may be sufficient to align maize prices in various places of export or import across the world, with the price of US maize remaining the reference in international trade. If one accepts the idea that prices are established at the marginal value of the quantities traded, the price of maize may be determined by the price of (US) ethanol, even though it only accounts for a small share

of the aggregate or average consumption globally.

While rising US maize and cereal prices can be explained by the rapid increase of domestic demand for maize for biofuel production, there are discrepancies between the different analyses on the contamination effect of rising US prices that reaches across the world and spreads to other products. Even though the figures are questionable (especially given the absence of firm counterfactuals), it is important to consider the orders of magnitude of the quantitative simulations conducted to determine the contribution made by the increased supply of US biofuel maize towards generating the global agricultural price surge of 2006-2007 (Table 1).

It is also important to consider that the tension caused by the actual or anticipated scarcity of food maize on the North American market has had direct impacts on soy and wheat prices, by their replacement in crop rotations, which has contributed to the increase and exceptional amplitude of price; even if the exact measurement of this contribution is impossible, as is its relative measurement, in the available global models. Biofuel policies seem to be the last instrument of national sovereignty in agriculture. In the case of “large countries”, their effects go beyond national borders and they become objects of multilateral coordination, thus necessitating inclusion on the G20 agenda.

IS SPECULATION IRRESPONSIBLE?

In the final version of its Communication on commodities and raw materials on 2 February 2011, the European Commission acknowledged the existence of a “strong correlation between positions on derivative markets and spot prices”. This statement replaces one contained in a previous version that read: “There is no conclusive evidence on the causality between speculation in derivatives markets [on the one hand] and increased volatility and price increases in the underlying physical markets [on the other hand].” To balance Nicolas Sarkozy’s demands to regulate speculation with Angela Merkel’s reluctance on this issue, the Commission has used the term “strong correlations” as a skilful and prudent compromise, demonstrating the extent to which the role of speculation in commodity price instability is both politically

sensitive and scientifically controversial. So, is there any empirical evidence for the liability, or neutrality, of speculation in terms of causing the spike in commodity prices? Here we present the most salient reasoning on this subject, produced by economics experts since the 2006-2008 spike.

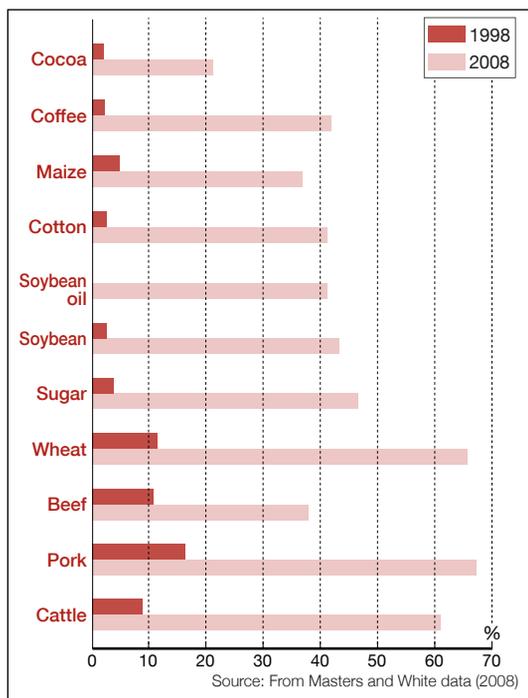
Three observations emerge. The first is that economics does not provide a complete and coherent explanatory model of the observed price developments on a given market, whether it is “spot” or “futures”. The second observation is that to fill this gap, the empirical evidence to blame or exonerate speculation is sparse and often contradictory. Finally, considering the precautions imposed by the two previous points, the temporary and fragile idea seems to prevail that derivatives markets are at least partly responsible for the increase of instability.

WHAT HAVE WE LEARNED FROM THE 2006-2008 CRISIS? Speculation is only one factor among several that researchers and international institutions have identified as causal agents of the increase in prices and the volatility of commodity markets after 2006. It is also the focus of the media today. The rising profile of the subject is due firstly to the hesitancy of economists themselves who, all things being equal, are unable to definitively measure the contribution of one variable in isolation from others, so that today we are still no closer to establishing the hierarchy of causes that has led to the tripling of prices for some products⁴. Secondly, the general denunciation of “speculation” following the bursting of the US financial bubble, has meant that both subprime speculation and the very ordinary type on wheat or soy futures prices have been tarred with the same brush. Finally, the uproar created by the July 2008 testimony of an investment fund manager hasn’t helped the reputation of speculation: in “The Accidental Hunt Brothers – How Institutional Investors Are Driving Up Food and Energy Prices”, Michael Masters and his co-author Adam White firmly put the blame on systematic long-only institutional investors (those that always “go long”), that speculate on commodity indices such as the Goldman Sachs Commodity Index or the Dow Jones-AIG Commodity Index.

At the heart of the Masters and White argument is the fact that the proportion of positions taken by index speculators on futures markets has experienced an unprecedented rise between 2005 and 2008, during the “spike” in prices. In 1998, physical hedgers held 77% of the positions in commodities futures markets, traditional speculators (“non commercial”) accounted for 16% and index speculators 7%. In 2008, the proportions were reversed. The physical hedgers (or “commercial”) held 31% of positions, traditional speculators 28% and index speculators 41%. This proportion approaches 70% on certain products, in particular wheat and livestock (Figure 3). There were 2.7 million commodities futures contracts bought by index speculators

4. Credit should be given to Gohin and Dronne (2008) in their attempt to integrate all the potential causes of the price rise into one model: “Les principaux déterminants de l’évolution des prix agricoles internationaux,” mimeo INRA. Their model, however, fails to explain, as noted by the authors themselves, nearly half of the price movements observed.

FIGURE 3 THE GROWING IMPORTANCE OF INDEX SPECULATORS



Depending on the product, between one third and two thirds of futures purchases were made by index speculators in 2008, against an average of less than 10% in the ten previous years. A growing role that can only enhance the rise in agricultural prices.

“speculating”. Buying or selling futures, whether these operations are accompanied by a transaction in the physical market or not, are inherently “speculative”, reflecting a bet or a belief about the future development of prices. Thus, systematically “long-only” investor positions have met systematically “short-only” investor positions, the fact that the latter are “hedgers” or “commercial” does not exclude them from having the intention to speculate. We can just about infer that a systematic purchase position, such as that taken by the index investors between 2005 and 2008, makes the demand for contracts insensitive to price – in economist jargon, demand becomes “rigid”. It is known that a rigid demand has a particular ability to make the market overreact, because adjustment is no longer made through quantities (demand for quantities does not vary, whatever the price) but through prices.

A last, more intuitive, element can help comprehend the role of speculation. In the current episode of rising commodity prices, a number of causal (or supposedly causal) factors that were present in 2006-2008 are absent or seriously attenuated, such as: there is presently no particular tension regarding oil, there remains no drastic increase in demand from emerging countries or for biofuels, and there are no particular fears that a speculative bubble in the assets markets will burst. If there is only one causal factor present again this time, it is “speculation”, and perhaps this

between 2003 and 2008, compared to 1.4 million by traditional speculators and less than 900,000 for hedgers. According to Masters and White, there has clearly been a bubble.

CORRELATION DOESN'T PROVE CAUSATION All is not straightforward though. To paraphrase the cautionary language of the Commission, the findings of Masters and White demonstrate correlation, but not causality. Work of the French Ministry of Agriculture has stressed in particular that the arrival of index speculators precedes the rise in prices by nearly two years, and also that the number of open positions (unsettled purchase contracts) remained unchanged during the increase. Some econometric work on the futures market of the Chicago Board of Trade suggest a causal relationship between index speculation and price inflation in the case of soy – but only for soy, thus concluding overall that there is only limited evidence that index speculation has caused changes in commodity prices between 2006 and 2008.

An objective weakness of these works is to associate “speculation” with a particular market player – the “non commercial” speculator, as opposed to “physical hedgers” that supposedly buy and sell futures without

is indeed the culprit. Instead of reaching this conclusion through intuition, it would have been better if we could rely on more consistent evidence. Ahead of the next crisis, it is vital that economic science, which was caught out this time, makes itself useful in a debate that completely evades it at present.

CONCLUSION

Are the causes of instability really so elusive that we can justify only focusing on its effects? There exists an economic challenge to deal with the causes – according to the efficiency argument, any “problem” must be treated at its root. The ability to deal with the effects is also morally justified, because the poorest are most at risk. It therefore seems that the G20 agriculture ministers choose to favour coordination for moral reasons of justice, more than for efficiency. Our literature review shows that there is a realistic preconception behind such a choice. Indeed, no studies have isolated one single factor from amongst several, as responsible for the bursts of instability experienced by the agricultural markets.

However, there is no reason to exclude the political “disturbances” that the support policies for biofuels constitute, especially in North America, or the deregulation policies of the agricultural financial markets since the 1990s, especially when the rationale behind the current governance of agricultural trade (i.e. the WTO rules) is based on the elimination of disturbances in exterior markets, which is created by various public policies. The provisional result of the agricultural G20 is inconsistent in this respect.

Regarding biofuels, as for the agricultural futures markets, the systematic purchase of positions has created the conditions for price instability: anticipation errors were compounded by a demand that has somehow become more rigid. The globalization of trade and the financialisation of markets should have made this demand more elastic to the price than it was previously – the agent benefiting from increased opportunities for arbitrage, buying or selling according to market variation. However, index speculators have systematically been buyers. As were the ethanol producers due to the subsidies allocated to the sector. The rigidity of demand has amplified the few imbalances in production, which in retrospect, were not exceptional and did not justify such price movements. ■

REFERENCES

- BRICAS N., BRU E., 2008, *La hausse des prix alimentaires au Sud: causes, conséquences, propositions* (disponible sur: <http://www.cirad.fr/fr/actualite/communiqu.php?id=919>).
- COURLEUX F., 2008, "De la hausse à la baisse des prix: impacts de la crise économique sur l'agriculture et les industries agro-alimentaires", Working Paper, Ministry of Agriculture and Fisheries, Prospective et évaluation, n°1, November 2008.
- COLLINS K., 2008, "The Role of Biofuels and Other Factors in Increasing Farm and Food Prices", supporting material for a review conducted by Kraft Food Global, Inc.
- COURLEUX, Frédéric and LECOQ, Pierre-Emmanuel, 2011, "Que peut-on dire de la financiarisation des marchés agricole ? Constats et réponses", Sfer Seminar, 14 January 2011.
- CURRIE, Jeffrey, 2007, "Food, Feed, and Fuels: An outlook on the Agriculture, livestock and biofuel markets", Goldman Sachs International, March.
- EUROPEAN COMMISSION, 2007, *The impact of a minimum 10% obligation for biofuel use in the EU-27 in 2020 on agricultural markets*, AGRI G-2/WM D(2007).
- GILBERT, Christopher, 2008a, "Commodity Speculation and Commodity Investment", Discussion Paper 20, Università Degli Studi Di Trento.
- GILBERT, Christopher, 2008b, "How to Understand High Food Prices", Discussion Paper 23, Università Degli Studi Di Trento.
- GOHIN, Alexandre, and DRONNE, Yves, 2008, "Les principaux déterminants de l'évolution des prix agricoles internationaux", mimeo Inra.
- IRWIN Scott, and MERRIN Robert, 2008, "The Adequacy of Speculation in Agricultural Futures Markets: Too Much of a Good Thing?", Marketing & Outlook Research Reports, Univ. Illinois.
- JACKS, David, O'ROURKE, Kevin and WILLIAMSON, Jeffrey, 2010, "Commodity price volatility and world market integration since 1700", NBER working paper 14748.