

Understanding the World Food Crisis And Its Effects in Mexico

Ciro Murayama*



Cheryl Ravelo/Reuters

International economic attention is focused on rising food prices and the anticipated consequences for large segments of the world's population. It appears the era of cheap food has come to an end. The objective of this article is to explain the causes of this new context of global food scarcity.

CURRENT PANORAMA

Over the last year, international food prices increased by 50 percent,¹ intensifying a situation in which 800 million people around the world suffer food insecurity.²

These price increases are due to factors involving both supply and demand. We can see in Graph 1 that while the aggregate food supply may have grown—the displacement of the curve from S_0 to S_1 —it did not increase as much as the

demand—the displacement from D_0 to D_1 . This is reflected in a rise in market prices, although the volumes traded have also increased.

PROBLEMS ON THE SUPPLY SIDE

The last century's so-called "green revolution" seems to have reached its peak, and it is estimated that the rhythm of expansion in the food supply will be more modest in the future. The Food and Agriculture Organization (FAO) warns of a decreased rate of expansion in agricultural production, expected to drop an average of 1.5 percent annually in the coming decades.³

One of the factors in this reduced dynamism in agriculture is water scarcity, with the world's average amount of water available per capita decreasing from 700 to 600 cubic meters over the last 25 years.⁴ On the average 70 percent of the world's water is used in agriculture.

*Professor in the Economics School, UNAM.

In addition the intensification of droughts and flooding, as consequences of climatic change, reduces the elasticity of the global food supply. These phenomena will tend to concentrate in countries with populations characterized by greater food vulnerability.⁵

The increase in prices of oil and its derivatives has negative effects on the costs of agricultural production, since hydrocarbons are used as raw material in making fertilizers.

While unrelated to the crisis in agriculture, the world's food supply will also decline in the area of fish products, since two-thirds of the world's fishing grounds are overexploited.⁶

In Graph 1, the supply curve S_1 is less elastic—more vertical—than S_0 , reflecting decreased growth in productivity, as well as a rise in prices for inputs needed in food production.

PROBLEMS ON THE DEMAND SIDE

Among the various explanations for increased food prices, there is consensus about the role of emerging Asian economies in relation to demand. Economic growth in these nations—which are going through rapid urbanization and managing to bring millions out of extreme poverty every year—⁷ is having an impact on their populations' diet (see Table 1). Specifically, people in these countries are consuming more cereals and meat as their incomes rise.⁸ These are countries characterized by very low levels of initial development and low income populations. Consequently, the dynamism in their economies in recent decades is translating particularly into an increased demand for basic goods, some of which have greater nutritional value (meat, milk). However, the consumption pattern anticipated in Engel's Law has not yet emerged clearly.⁹

According to FAO estimates, at the international level, the average daily food intake per person in 1960 was 2,280 calories, and has now increased to 2,800 calories.

Another element contributing to increased prices for agricultural products is the increased demand for their use in biofuel production. And it is important to add the impact from subsidies for their use in ethanol production.

In Graph 1, the displacement to outside of the demand curve is due, first of all, to an increase in the income levels of countries with populations with a high tendency toward marginal consumption of food. In addition, since some agricultural products are substitute goods for non-renewable raw materials in energy production, the increase in oil prices exerts

Among the various explanations for increased food prices, there is consensus on the role of emerging Asian economies' higher demand. People in these countries are consuming more cereals and meat as their incomes rise.

pressure toward an increase in demand in the food market. In other words, there are endogenous elements—both direct, as in the increase in human consumption of cereals, and indirect, as in the increase in meat consumption, which generates more demand for livestock forage—and there are exogenous elements—particularly growth in the demand for agricultural products to replace fossil fuel sources of energy. And all these elements push prices in the same direction.

PORTFOLIO PROBLEMS AND UNILATERAL DECISIONS

With the average reduction in financial returns in international markets, buying agricultural commodities in futures markets has become a profitable option, and this has caused food prices to rise. In addition, the concentration of the market supply of cereals—five corporations control more than 80 percent of the sector's profits—¹⁰ favors speculation.

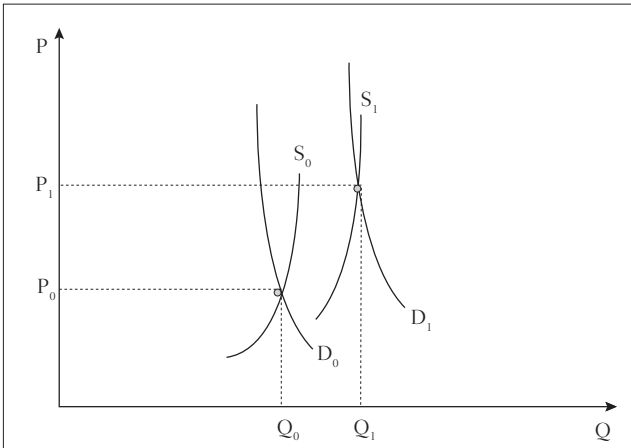
Other factors to consider include the initial reactions of a number of countries which, in order to assure their supply—by restricting exports, for example—may contribute to an increase in international prices. Unilateral actions in

TABLE 1. CHANGES IN COMPOSITION OF FOOD CONSUMPTION IN DEVELOPING COUNTRIES (PERCENTAGE)

Product	Percentage by periods	
	1961-1963	2001-2003
Milk	2	3
Meat	3	7
Pulses	3	5
Sugar	4	6
Roots and tubers	9	6
Vegetables	6	2
Cereals	60	52
Other	13	19

Source: Developed by the author, based on FAO document *The State of Food and Agriculture* (Rome, FAO 2007).

GRAPH 1. CHANGE IN EQUILIBRIUM PRICES AND VOLUMES IN THE WORLD FOOD MARKET



Source: All graphs were developed by the author.

which each participant does what it deems best for its own interests in response to what others do (or may do),¹¹ may generate non-cooperative Nash equilibria, and this is what appears to be happening in agriculture internationally.

FOOD TRADE AND CONSEQUENCES OF HIGH PRICES

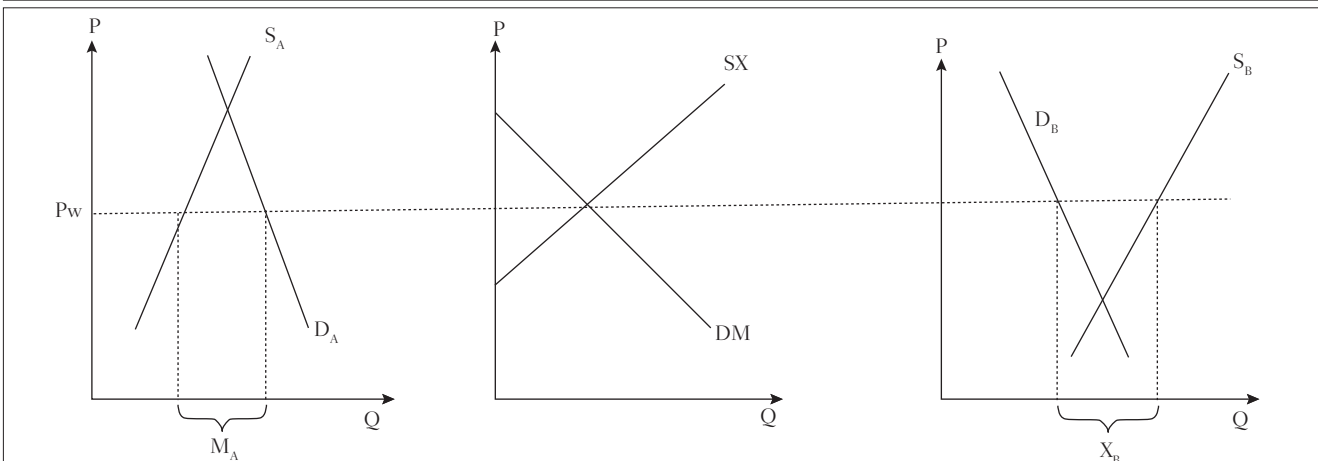
The qualitative changes produced in food trade during the last four decades explain the seriousness of the current crisis, as well as the vulnerability of certain economies. For example, in 1960, the agricultural surplus in developing countries

The qualitative changes produced in food trade during the last four decades explain the seriousness of the current crisis, as well as the vulnerability of certain economies. The effects from the current situation in the world food market will be distributed unevenly among countries, and also within countries.

was US\$7 billion; 20 years later this positive current account balance for agriculture had disappeared; and during the last two decades, developing countries have become net food importers. Excluding Brazil, the agricultural deficit in developing countries reached a level of US\$20 billion in 2000, and US\$27 billion four years later, according to the FAO. Currently, imports in these countries are, on the average, twice as high as exports.

The effects from the current situation in the world food market will be distributed unevenly among countries, and also within countries. On the one hand, nations that are net importers will be more gravely affected, while exporting countries will find their income and trade balance improved (see Graph 2, particularly export supply and import demand functions). And in all countries drastic increases in food prices will affect the families and sectors of the population that dedicate the greatest proportion of their income to buying food. A direct consequence from rising food prices may be less spending, and consequently, less consumption in

GRAPH 2. EXPORT SUPPLY AND IMPORT DEMAND



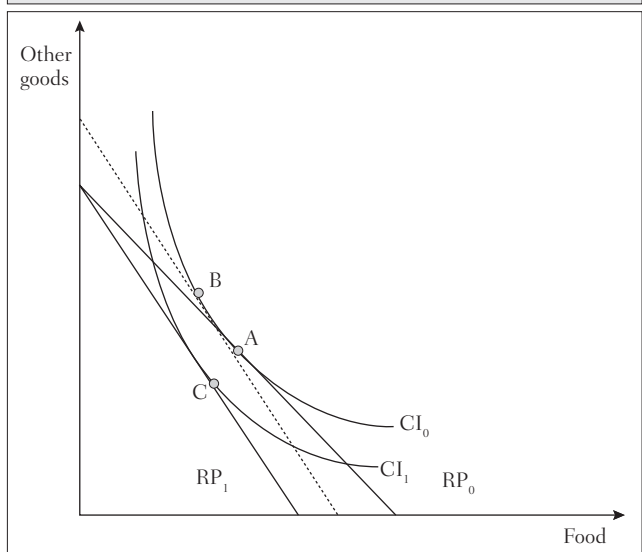
Country A (for example, Morocco) is not very efficient in food production, or in reaching internal equilibrium, with elevated prices, and therefore excess local demand (versus supply) is covered through the international market. Country B (for example, Argentina) empties its domestic market at lower prices, allowing Pw to have surpluses for exporting.

The dynamics of national supply and demand have led to increased imports of agricultural products, putting Mexico in a situation in which the sector's trade deficit has been rising for nearly two decades. Clearly we are one of the countries that will be negatively affected by rising international prices.

the areas of health and education for the most disadvantaged families, since in the case of food, there is low elasticity in the demand price. This indicates that a negative income effect—produced by the increase in the price for a good to which a significant portion of personal resources are dedicated, reflected in an “inward” rotation of an individual's budget restriction—will result in a low substitution effect for other goods (see Graph 3).

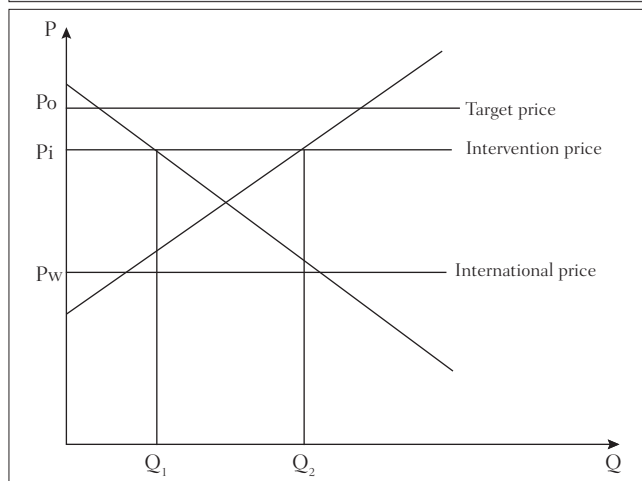
The economic asymmetry among nations is especially clear in agricultural trade. The agricultural chapter remained on the sidelines of the General Agreement on Tariffs and Trade (GATT) agenda for decades, since it was not until the Uruguay Round in 1986—38 years after the GATT's first conference in Geneva—that it was incorporated into deliberations. Currently, it is estimated that for less developed coun-

GRAPH 3. INCOME EFFECT AND SUBSTITUTION EFFECT FROM AN INCREASE IN FOOD PRICES



The movement from A to B represents the substitution effect, according to which less food will be consumed as a result of the increased prices of food, in comparison to other goods. C is the point of final consumption, considering the income effect (loss of well-being) and a rigid price elasticity of food demand.

GRAPH 4. EFFECTS OF THE COMMON AGRICULTURAL POLICY (CAP)



Without subsidies for production, the EU would be a net food importer. With the cap, producers receive a premium price that may go from P_i to P_w or from P_o to P_w . An “exaction” is also added to imports, elevating their prices to P_o . Thus, in addition to subsidies, there is also protection for local producers.

tries, the costs of agricultural subsidies in the developed world will reach US\$24 billion annually, considering only its static effects—trade being diverted.¹² Organization for Economic Cooperation and Development (OECD) tariffs for developing nations are up to four times higher than those established for imports originating from OECD member countries.

The European Union, with its Common Agricultural Policy (CAP), has gone from being a net importer to a net exporter of food and agricultural products. This radical change has been the result of massive aid, and not a change in comparative advantages generated by the market.¹³ Graph 4 illustrates an intervention price works, constituting a type of perfectly elastic demand for European agricultural producers. This price is much higher than the international price, and makes it possible for the European Union to have surpluses.

MEXICO

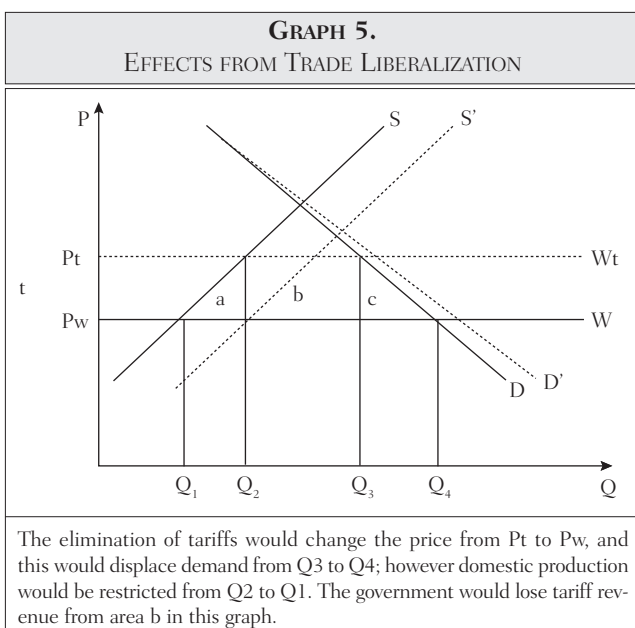
Over the last decade or so, the growth rate for Mexico's agricultural sector was below the average for the overall national economy (from 1996 to 2002, for example, this sector grew at an average annual rate of 1.3 percent in real terms, compared to an average of 3.7 percent for the entire economy).¹⁴ The dynamics of national supply and demand have led to increased imports of agricultural products, placing us in a situation in

which the sector's trade deficit has been rising for nearly two decades. With this panorama, it is clear that Mexico is one of the countries that, in net terms, will be negatively affected by rising international prices, while there may be certain groups of producers who will see an improvement in their situation.

In response to the emergency created by rising prices, Mexico's federal government defined three main areas of action: 1) eliminating taxes on food imports; 2) promoting food production and agricultural productivity; and 3) protecting the incomes of the poorest families.¹⁵

This strategy has received a number of criticisms. Some of them consider free trade to be the optimal solution, as long as certain conditions are met, one of which would be a perfectly elastic international supply (see Graph 5, in which areas *a* and *b* would be the losses due to inefficiency in production and trade deviation caused by the introduction of tariffs, and *c* would be a transference from consumers to the government through tariffs). However this situation is far from that prevailing in the world food market. Another criticism is that tariff liberation will facilitate expensive food imports that will affect the producers who could be incorporated into production if they did not have to deal with the external competition favored by liberalization measures.¹⁶ In Graph 5, Mexican producers could produce Q_2 , but would produce Q_1 after the implementation of trade liberalization policy.

The policy of transferring resources to low-income families would displace demand to D' in Graph 5, thereby counteracting the effect on consumption from rising prices.



Government policies for increasing production are limited, since it is likely that only 15 percent of producers receive loans for machinery and equipment —specifically, market-oriented producers— leaving a significant portion of the backward conditions in the agricultural sector unresolved. This suggests that more ambitious public policies are needed to modify the structural conditions in Mexican agriculture (in order to displace the supply from S to S' in Graph 5).

The food sector should be given priority in development policies implemented in Mexico, especially in an international context in which a supply of cheap food cannot be expected. ■■■

NOTES

- ¹ J.L. Machinea, "El alza de los precios de los alimentos castiga a los más pobres," *El Correo del Sur*, April 27, 2008.
- ² World Bank, *Informe sobre el desarrollo mundial 2008: Agricultura para el desarrollo* (Washington, D. C.: World Bank, 2008).
- ³ Food and Agriculture Organization, *The State of Food and Agriculture* (Rome: FAO, 2007).
- ⁴ J. Carabias and R. Landa, *Agua, medio ambiente y sociedad. Hacia la gestión de los recursos hídricos en México* (Mexico: UNAM/El Colegio de México/Gonzalo Río Arronte Foundation, 2006).
- ⁵ N. Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press, 2007).
- ⁶ J. Sarukhán, "Los retos del desarrollo sustentable en el contexto de los cambios ambientales globales," E. Florescano, F. Toledo and J. Woldenberg, comps., *Los desafíos del presente mexicano* (Mexico: Taurus, 2006).
- ⁷ A UNDP report published in 2005 estimates that between 1990 and 2002, a total of 130 million Chinese were lifted out of extreme poverty, and the figure for the last quarter of a century is 220 million. Some calculations are even higher, estimating the number of Chinese lifted out of poverty since 1978 to be 400 million. See J.E. Navarrete, *China: la tercera inflexión, del crecimiento acelerado al desarrollo sustentable* (Mexico: UNAM, 2007).
- ⁸ Table 1 illustrates that some food products, such as roots and tubers (potatoes and yucca, for example), as well as pulses (lentils, beans) are "inferior goods" since their consumption decreases as income increases.
- ⁹ This is one of the strongest empirical regularities, and states that the proportion of a family's total expenditures on food decreases when its income increases. See A. Roncaglia, *La riqueza de las ideas. Una historia del pensamiento económico* (Zaragoza: Prensas Universitarias de Zaragoza, 2006), p. 404.
- ¹⁰ According to Miguel Mora in "Un planeta de famélicos y obesos," *El País*, June 3, 2008, p. 3.
- ¹¹ A. Przeworski, *Democracia y mercado* (Cambridge: Cambridge University Press, 1995), p. 33.
- ¹² J. Stiglitz and A. Charlton, *Fair Trade For All* (New York: Oxford University Press, 2005).
- ¹³ T. Hitiris and J. Vallés, *Economía de la Unión Europea* (Madrid: Prentice Hall, 1999), p. 196.
- ¹⁴ R. Escalante, L. M. Galindo and U. Campos, "El agro mexicano y el TLCAN: ¿agro sin campesinos?" R. Cordera, comp., *La globalización de México: opciones y contradicciones* (Mexico: UNAM, 2006).
- ¹⁵ Presidencia de la República, "Para vivir mejor" (press release) (Mexico City: May 25, 2008).
- ¹⁶ R. Cordera, "La circulación de los déficit," *Nexos* no. 366, July 2008.