



TORTILLA CRISIS IN MEXICO (2007): THE RISE OF COMMODITIES, FINANCIAL INSTABILITY AND FOOD SECURITY

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The long upward trend in commodity prices showed signs of exhaustion at the end of 2014 (Chart 1). It is too early to evaluate whether it is the beginning of a down cycle, with considerable problems for exporting countries and possible relief for those dependent on imported commodities, including food. However almost certain is recurrent instability in the markets for these products, with strong influence of financial factors in price formation.

It may be useful to remember the remarkable episode in Mexico eight years ago when prices reached unprecedented levels and the effects strongly affected population due to internal factors. As occurred in that country, the combination of international instability with domestic elements can have dangerous implications for food security of vulnerable populations.

1. The 2007 crisis and food security in Mexico

On January 31, 2007, tens of thousands of people protested in Mexico City against the dramatic increase in tortilla prices, from \$5.00 to \$20.00 in the period of a year. The protesters demanded price reduction and changes in economic policy (DENIS, 2007; KABC, 2007; CONTEXT; 2007). President Felipe Calderón faced many similar protests occurring across the country. (Navarro, 2007)

Mexico consumes 630 million tortillas a day (SMALL, 2007), a staple for more than 50 million people despite a reduction of consumption between 1998 and 2007 as a result of rising per

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capita income and the withdrawal of price subsidies (GILES, 2008). Corn is the main ingredient for tortillas, and because of its significance in the national economy and identity, many Mexicans agree with the expression “sin maíz no hay país” (“without corn there is no country”). (ESTEVA e MARIELLE 2003).

The Government reacted by setting tortilla prices at \$8.50 through the Agreement to Stabilize Tortilla Prices (AEPT), in addition to taking other steps to combat speculation and ensure tortilla supplies. The President announced his willingness to enforce the law and fight against speculators, who were denounced as responsible for the unjust rise in prices. (SÓLIS, 2007).

The tortilla crisis exposed a food security problem in Mexico. Similar situations occurred in the following years in several countries: very strong fluctuations in food prices in a context of trade liberalization and policy developments of domestic production based only on prices.

The problems were fueled by the oligopolistic structure of the tortilla market and by speculative movements in Mexican markets. There was no drop in production and supply in the country (table 1).

The effects of financial and trade liberalization also had a significant influence. Mexico liberalized its market through the North American Free Trade Agreement (NAFTA) while the United States kept the subsidies to its production, which lowered corn prices with harmful effects to small Mexican farmers and increased the power of the large producers. Despite having increased its output of white corn, basically used for human consumption, Mexico was unable to meet its demand for yellow corn. When the United States started subsidizing ethanol production, the demand for yellow corn consequently increased. Then, speculative movements on prices of corn were combined with the expectations of growing incentives to biofuels, strong rise of oil prices, instability in commodity markets and movements toward devaluation of the dollar.

2. Food security in the era of financial instability

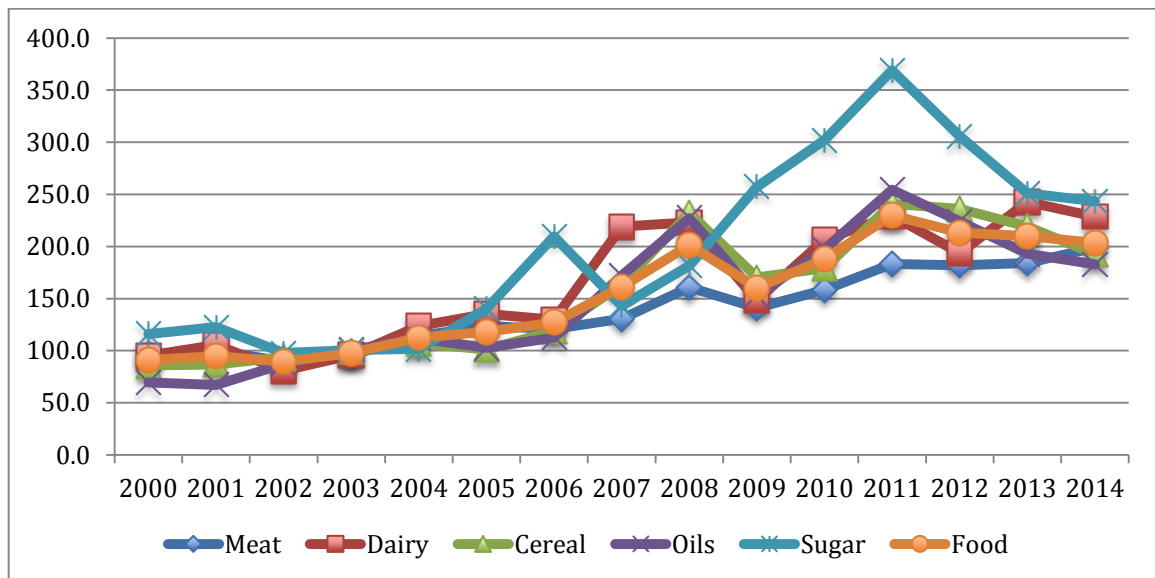
The tortilla crisis highlighted that food insecurity is caused more often by high prices than supply constraint. This problem coexists with the traditional concern with the occurrence of balance of payments crises in importing countries and the price fluctuations in food exporting countries.

Concerns with food security predate the tortilla crisis. In the 2003 report on Trade Reforms and Food Security, the United Nations Food and Agriculture Organization (FAO) discusses its evolution as an operational public policy concept and points out more than two hundred definitions that appeared since the 1970's. The official definition adopted in 2001 in The State of Food Insecurity is: “Food security exists when all people, at all times, have physical and economic access

to enough safe and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle”.

Food securitization has become a very important issue for the international community and has required action from Nation States. The rising trend in commodity prices and their volatility (Chart 1) are both the subject of growing concern in recent years.

Chart 1 – Food Commodity prices index (2002-2004=100)



Source: FAO, Food Commodity Price Index

There is much controversy about the determinants of these trends (SILVA; SCHETZ; TAVARES, 2008; PRATES; 2011). There is ample agreement in the fundamentalist field on the effects of increased demand stemming from changes in eating patterns in the most populous Asian countries. However, there are divergences over the magnitude of the effects of demand for biofuels, whether for direct use (such as corn for ethanol) or by the use of fields previously utilized for food production. On the supply side, it is pointed out that production continues to increase, which should moderate prices, but the counterpoint of the more frequent occurrence of climate problems is stressed, albeit in certain periods and regions.

Pressures coming from the rapid growth of Asia have suggested the term “Sino-centric world”, characterized, among other factors, by the prolonged increase of demand for commodities in general. In the case of foodstuffs, it is argued that this trend should persist for a long time, with changes in eating patterns of countries experiencing rapid growth and the combined effect of urbanization and income increase. As is well known, the lower the per capita income in a country, the higher the income elasticity for food products, as well as the larger amount of grains required to feed livestock for beef production.

On the supply side, despite the increase in food production, “extreme and increasingly frequent climate events, unsettle the economic calculations of producers and feed speculators” (SILVA, 2011). “The impact of climate change in agriculture has been quite evident in the past few years. Drought and flooding are recurrent in some areas. In the long term, climate changes will probably reduce global food production, keeping prices at a high level for a long time”(VIGNA, 2009).

Fear of food shortages impels many highly import-dependent countries to make purchases ahead of time in spot markets in future markets, which greatly increases pressure on demand in some instances (BID, 2011, p. 3).

Another analysis of the causes of price volatility points to the so-called “financialization of commodities” as an explanatory factor of price instability. Food prices are increasingly formed in organized markets, with high liquidity and strong connections to other financial markets (stocks, currency exchange), which favors the action of speculators and traders (large corporations that commercialize these products) who can operate in all markets. As a result, food prices begin to incorporate the volatile expectations about interest and exchange rates in the short-to-medium term and about the profitability of financial assets generally. Schulmeister (2009) proposes the expression “bull-bear assumption” to characterize the volatility effects of financial markets on commodity prices in spot markets.

With financial deregulation and the wide interconnection among markets, commodities became the target of speculative movements, following the intense price fluctuations of financial assets and currencies.

“The financialization of commodity markets derived from the incorporation of stock exchanges and over the counter markets that trade in derivatives linked to those goods by the financial globalization process. Historically, such derivatives were used as a hedging instrument against the high volatility of the prices of those items by the so-called commercial investors (producers and consuming industries). Since the start of the 1990’s, financial (or non-commercial) investors came to treat these goods as a new class of financial assets, side by side with stocks, bonds and real estate. ” (PRATES, 2011, p. 12-13).

Mayer (2010) argues that the motivation to operate in commodities is linked to the fact that in the long run the same average yield from applications in stocks can be obtained, but with lesser volatility. Applications in commodities were a more profitable alternative, mainly after the crises of “dot com” corporations in 2000, and even more in the initial phase of the *subprime* crisis, between the mid-1970’s and September 2008.

Schulmeister (2009) also defends that bull-bear hypotheses are a better explanation of the rise in commodity prices than the fundamentalist theories especially since food production broke records in 2007, which should have inhibited price rises.

In the context of the “reorganization” of the international monetary system, financial speculation entered the agenda of the financial G20. At that time, the French President Nicolas Sarkozy proposed measures to contain commodity speculation (NETTO, 2011).

3. Subsidies from the central countries and biofuels

The analysis of price formation should include the question of the effects of long-term subsidies to producers by the central countries, which depress prices and lead to disorganization of the productive structures in many agricultural countries. In 2008, food prices fell but hunger worsened because indebted small producers were no longer able to buy seeds and fertilizers (CHADE, 2009, p. 32; THE ECONOMIST, 2010). Without support from their governments, small producers in the poorest countries do not have enough incentives to produce nor do they benefit when price rises occur.

In addition to these factors were the search for the substitution of fossil energy by biofuels, the rise in oil prices and global concern over the environment. The tortilla crisis brought to the fore a confrontation, on the one hand, between international entities and organizations that questioned the production of the so-called “green fuels”; and, on the other hand, biofuels producing countries and ethanol entrepreneurs in the United States.

The controversy over the issue is broad and there are a large variety of analyses due to the diversity of focus and of interests involved. The FAO had questioned the high subsidies by rich countries to the production of biofuels, which utilize 5% of grain production and contribute to the price rise (CHADE, 2009, p. 25). The articles “How Biofuels Could Starve the Poor”, by Rudge and Senauer, and “Food for Fuel?” with the participation of Dashle, both published in Foreign Affairs in 2007, strongly blamed biofuels for the rise in food prices. The controversy grew up with research that attributed to biofuels an impact of 75% on grain food prices.

Another study, from the International Food Policy Research Institute (IFPRI) by Mark Rosegrant (*apud* VON BRAUN, 2008), acknowledges that the impact of biofuels should have been 30% in the weighted average of grain prices and 39% in the case of corn - the highest rise among grains.

For Machado (2008) the debate is conditioned by groups opposed to the production of biofuels, ranging from interests linked from oil to “World Bank, IMF, United Nations and European Union high officials, all of them pointing an accusing finger to the shifting of plantations to ethanol

production and hence to food inflation”. The author also mentions the action of lobbyists hired by the Grocery Manufacturers Association (GMA), which brings together powerful groups from the food and beverage sector – Coca Cola, Nestlé, Campbell, Sara Lee, Procter & Gamble and Unilever.

“To blame ethanol for the crisis became a matter of passion. Not even within the United Nations specialists agree. The Briton John Holmes defended ethanol, while another faction in the organization argued for a moratorium on the production of that biofuel. The UN ended by admitting that ethanol production could be one of the factors responsible for the crisis, but only subsidized production. That is, the American (from corn) and the European (from grain). For this reason the organization requested rich countries to restrict subsidies to the sector. No government, however, listened to the UN” (CHADE, 2009, p. 26).

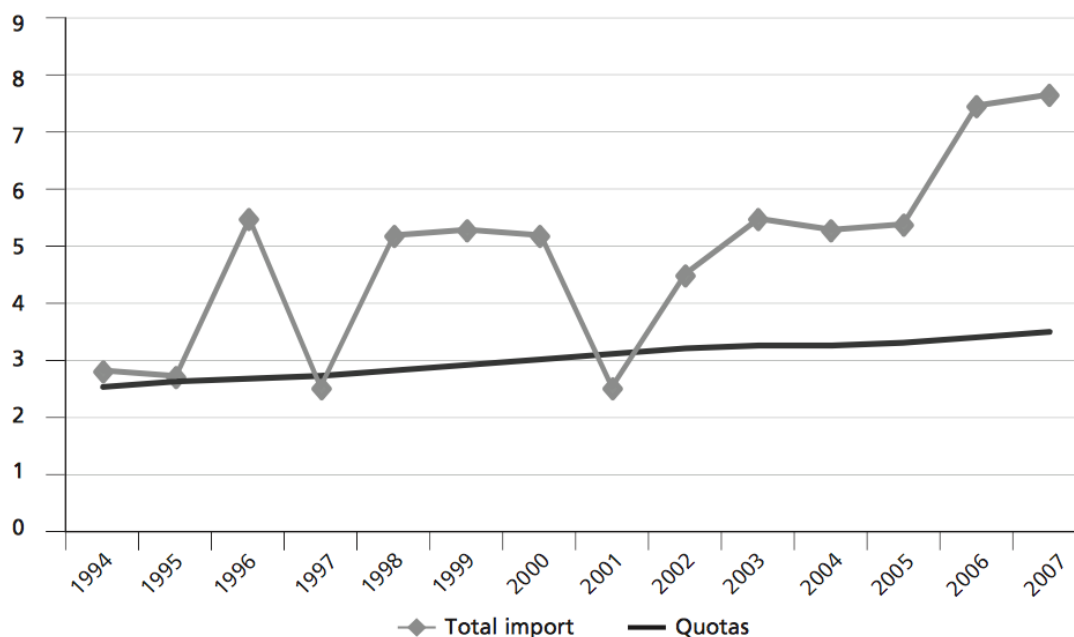
One must add that Brazil tried to defend itself from criticism against the impact of ethanol on food production by arguing that its production is based on sugar cane, which is able to generate fuel with much higher efficiency at much lower cost than corn ethanol. In the beginning of 2010, the Environmental Protection Agency (EPA) of the United States, assisted by the Institute of International Trade and Negotiations (ICONE, in Portuguese) unveiled the results of research that describes ethanol from sugarcane as an “advanced fuel” which reduces carbon dioxide emissions (CO₂) by 61% in comparison with gasoline, thus contributing to the reduction of the emission of greenhouse gases.

4. NAFTA and subsidies for corn production in the United States

Critical evaluations of the effects of NAFTA highlight the impoverishment of Mexican producers in the face of competition from strongly subsidized corn in the United States. The World Trade Organization (WTO) condemns this kind of subsidy. It is estimated that corn prices have fallen by 70% as a result of such measures, which renders its production by Mexican farmers impracticable. The pressure of imported corn discouraged and impoverished small farmers and provoked a sharp decline in rural employment (AUDLEY et al, 2004, p. 17, 20)

While the free trade agreement allowed Mexico to maintain market protection for fifteen years, growing demand led the government to liberalize imports just in the first few years of the treaty (UNITED STATES, 2009a). Imports have exceeded by a large margin the quota established in NAFTA in almost every year since 1994 (Chart 2). Mexican losses due to subsidies and other United States’ commercial practices would have amounted to US\$11.1 billion from 1990 to 2008, according to Wise (2009, p. 23)

Chart 1- Corn imports originating in the United States and quota established by NAFTA (2004-2007)(In million tons)



Source: Mexico (2007, p. 10).

Table 1 emphasizes the foreign trade relations and food security in Mexico in the years before the crisis and indicates that imports came to represent one fourth of the supply between 2005 and 2008.

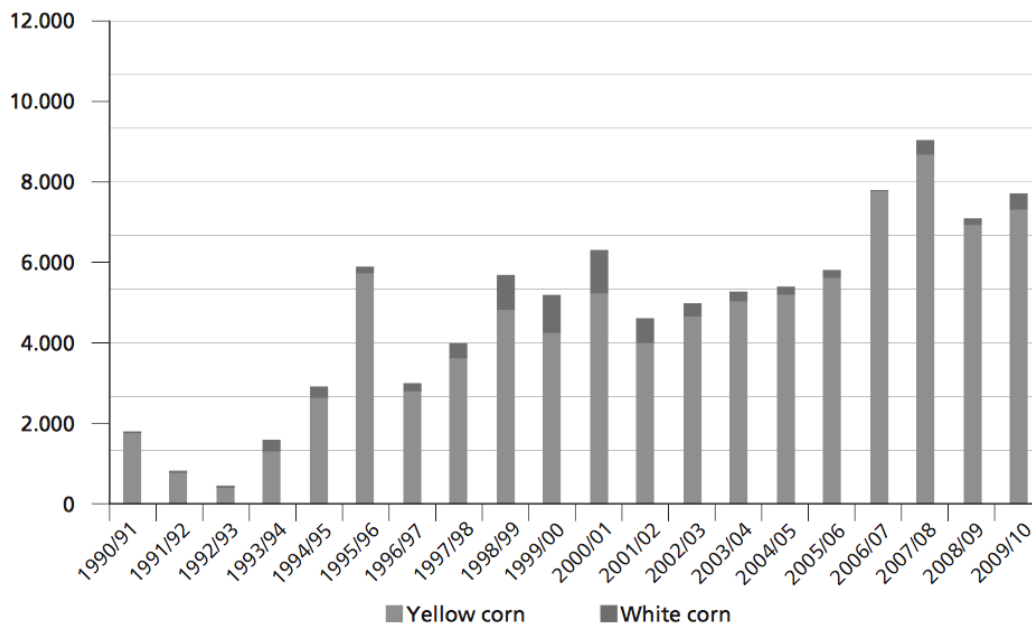
Table 1 - Foreign trade and corn food security

Year	Foreign trade			National offer	Apparent consumption	per capita Consumption (kg)	Food security Index
	Production	Imports	Exports				
2000	17.56	5.33	0.0058	22.89	22.88	232.00	77%
2001	20.13	6.14	0.0074	26.27	26.27	263.00	77%
2002	19.30	5.50	0.1640	24.80	24.63	244.00	78%
2003	20.70	5.74	0.0066	26.44	26.43	259.00	78%
2004	21.69	5.52	0.0071	27.21	27.20	264.00	80%
2005	19.34	5.74	0.0530	25.08	25.03	243.00	77%
2006	21.89	7,61	0.0184	29.50	29.48	279.00	74%
2007	23.51	7.95	0.2640	31.47	31.20	293.00	75%
2008	25.12	8,20	0.2350	33.32	33.09	310.00	75%

Source: Mexico (2009, p. 2).

Corn production in Mexico increased by 73% after NAFTA if compared with the 1984-1993 average, pushed by an expansion of irrigated plantations. Even so, the Mexican government had to surpass the export quotas stipulated by NAFTA, especially with regard to yellow corn used as livestock fodder, and of starch products (Chart 3) as outlined above.

Chart 3 - U.S., corn exports to Mexico consist primarily of yellow corn (1990/91 – 2009/10)
(Mil. metric tons)



Source: Mexico (2007, p.10).

In the pre-crisis years, Mexico was practically self-sufficient in the production of white corn and depended on imports of yellow corn (MEXICO, 2007, p. 6). White corn, used mainly to make tortillas and other foods for human consumption, stands for less than 5% of Mexican exports. However, due to the growth of livestock consumption, more than 1 million tons of white corn were devoted to animal fodder in 2006. On the other hand, between 1995 and 2008, annual per capita consumption of tortillas dropped from about 120 kg to approximately 89 kg (ARREOLA, 2008, *apud* United States, 2009a), due to the substitution by other products in the face of the increase of per capita income. As a result, the exports of white corn from the United States to Mexico decreased almost uninterruptedly between 2000 and 2007. In 2008, however, exports of the white variety reached 528 thousand tons, the highest level since 2002 (UNITED STATES, 2009a). Divergences about the effects of NAFTA persisted in the face of the sharp rise in prices in 2007 and in the beginning of 2008.

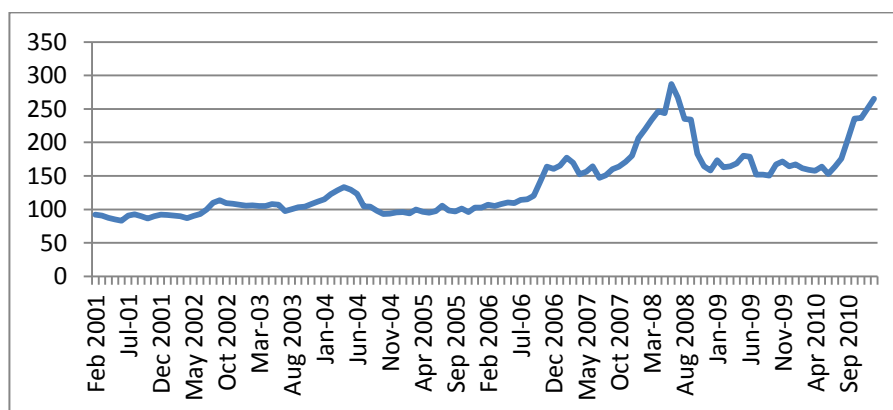
5. The 2007 crisis and the formation of prices in the domestic market of Mexico

The price of tortillas jumped from \$5.00 per unit in January 2006 to up to \$20.00 one year later, when there were popular protests. The government decided to set the price at US\$8.50 in the (AEPT), under the justification that a fair price for the population had to be maintained, speculation should be combatted, and supply assured. It must be observed that the National System for Market Information and Integration (SNIIM) records average tortilla prices after 2007 only and for January of that year the data show an average price around \$14.00. Prices vary among the states and the US\$20.00 levels were probably the maximum in some of them.

Corn prices showed a different pattern. According to CEFP, corn jumped from \$2.10 dls/bu in May 2000 to \$3.52 dls/bu in June 2007, i.e. 67,1% in seven years. From August 2007 to April 2008 the increase was 57,9%, peaking at US\$5.48 dls/bu in June 2008, 68% above August 2007 (as in all other markets, there was a sharp decline since mid-2008 and in October corn was back at US\$3.99 dls/bu – a fall of 27.2% below the June peak). Thus, the jump in the price of tortillas took place long before the strong increase of corn prices, which remained until mid-2008 as seen in chart 4.

Chart 4 - Maize (corn) – Monthly Price

(US Dollars per metric ton)



Source: USDA Market News *apud* Index Mundi (2011). Modified by the authors.

Obs.: U.S. No. 2 Yellow, FOB Gulf of Mexico, U.S. price.

However, even after the sharp decline in corn prices in 2008 (chart 4), the price of tortillas stayed at \$9.17, well above levels prior to the 2007 increase (SNIIM, 2010). The sharp divergences between the prices of tortillas and corn may be ascribed to differences in market structure, with a

strong concentration of companies in corn flour and high participation of small producers in tortillas.

The combination of such diverse market structures would help to explain, at least in part, the differences in price trends: the increase might have been induced by a rise in the price of corn flour, promoted by the large companies in the sector, where commercialization is dominated by only three enterprises: (SAGARPA, 2010, p. 175). According to data provided by Quintanilha (2008, p. 81), in Mexico there are only 48 companies devoted to this sector, of which 22 concentrate 95% of the jobs and 99% of the added value. A single one, Gruma, commercializes 60% of the total, with the production of 738 tons yearly, in addition to other foodstuffs from corn and wheat (QUINTANILHA, 2008, p. 91).

In the sector of production and sale of tortillas, the trend should be of an alignment of prices with those of flour and other costs incurred by the sector. It is a segment with a significant number of small establishments, with easy access to new producers and competition with other products. Suffice to recall that, as mentioned before, the consumption of tortillas had declined by 10% in the ten years prior to the crisis, due to the substitution by other products in the face of the increase of per capita income and the elimination of price subsidies (GILES, 2008).

“The production of bakery and tortilla items generates 425.4 thousand jobs and congregates 121.000 economic units. 28% of total manufacturing production and 84% of the food industry subsector. This branch is mainly composed of family companies, with small size production units. Tortilla factories are usually smaller than bakeries and both use grains as raw material (corn and wheat) initially processed by the flour industry by grinding. The flour is then distributed to tortilla factories and bakeries” (SAGARPA, 2010, p. 147).

This suggests a complex market structure in which both big producers and a large number of very small ones coexist. However, there are other problems to be considered in the formation of tortilla prices. According to the Federal Competitiveness Commission (CFC, 2010), there are several municipal regulatory barriers, which include limitations in the number of *tortillarias* and a minimum distance between them. Another problem is the regional concentration of corn production in the states of Sinaloa and Jalisco. The remaining Mexican states face transportation and storage costs, with a precarious structure in both sectors in Mexico.

FINAL NOTES

The crisis of tortillas in Mexico highlighted the risks of the sharp combination of two elements: (1) fluctuation in international prices of agricultural commodities; (2) structural markets problems. Mexico is simultaneously producer and importer of a product essential to the food security of its population. The possible change of the medium-term trend in commodity prices should not eliminate the instability of markets, linked to the so-called "financialization" of

commodities, next to the uncertainties about the supply and demand for these products. In Mexico, there was the influence of subsidy policies to US corn and domestic pricing problems, corn and tortillas, due to peculiar aspects of Mexican domestic markets.

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