

The Food Price Crisis of 2008:
Impacts and Responses
with a Case Study on Argentina

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The Food Price Crisis of 2008:
Impacts and Responses
with a Case study on Argentina

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Abstract

The food price crisis of 2008 has had varied impacts on producers, consumers, governments, and international markets; equally varied have been the responses to the food price crisis by governments around the world. There are five major causes of the food price crisis. These include high energy costs, weather related shortages, depreciation of the dollar, increased demand from developing countries, and low reserve levels. The timeline during which the food price crisis and its causes took place can be categorized into three phases: phase one from 2002 to May 2007, phase two from June 2007 to the summer of 2008, and phase three from the summer of 2008 to the present. Impacts of the food price crisis are observed in four categories, the impacts on consumers, producers, governments, and international trade. Consumer oriented, producer oriented, and trade oriented country responses as well as the positive and negative consequences of those responses are examined. A case study on Argentina's political responses to the food price crisis allows for a better understanding of how some country responses affected consumers, producers, governments, and international trade. Finally, future crises and food insecurity can be prevented in the future through increased R&D efforts, the removal of trade barriers, reduced protectionism, increased transparency and global coordination, increased incomes for the impoverished, and supply side risk management.

Introduction

The effects of the food price crisis of 2008 have been felt all around the world. Food has been pushed in to the focus of more than just the most impoverished and hungry citizens. This paper explores the food price crisis in detail and examines the impacts on consumers, producers, governments, and international markets. Argentina will serve as a case study for a more in depth look at how some country policy responses have compounded the affects of the food price crisis. Also, six recommendations for preventing food price crises in the future will be explored.

There are several likely original catalysts of the food price crisis. This paper discusses the high cost of oil, weather related shortages, the depreciation of the dollar, increased demand from developing countries, and low global reserves as the five major likely causes of the food price crisis. High energy costs affected the cost of farming inputs such as fuel for machinery, the price of fertilizer, and transportation costs. Increased biofuel production was encouraged by high energy prices. Government mandates for biofuels, the increased price elasticity of supply, and the diversion of resources away from food and feed crops to biofuel crops all contributed to increased biofuel production and increased upward price pressure on agricultural goods. Also, successive droughts in Australia and regional flooding in areas such as Latin America caused supply shortages and speculation about future shortages which put more upward pressure on prices. Additionally, commodity prices generally increase as the United States dollar depreciates. From 2002 to 2008, approximately 20% of food price increases are attributable to the depreciation of the dollar (Mitchell, 2008). Increased demand from developing countries also contributed to high global prices. Demand increased as

populations increased but also as incomes increased in countries such as India and China. Finally, grain production deficits over the last several years left grain reserves low on a global scale. Trade liberalization influenced some countries decision to keep lower grain stocks. Speculation about low reserves likely increased food prices, but the lack of coordination on a global scale to release reserves kept prices unnecessarily high.

The global time frame examined in this paper is 2002 to 2009 during which time three phases are explored. From 2002 to 2007 food prices steadily climbed on the world market with price increases led by grains in the early 2000s. During the second phase, June 2007 through the summer of 2008, prices sharply increased; the commodity food price index increased 57% (“FAO’s Initiative”, 2008), and prices peaked. Food aid struggled to meet increasing demand. In the current phase many countries are relying on external assistance despite global decline in food prices.

The food price crisis has impacted consumers, producers, governments, and international markets. Overall, poverty has increased as a result of the food price crisis (Ivanic & Martin, 2008). As prices for goods increase, consumers will substitute away from costlier goods even at the expense of health. Consumers also hoarded food, hoping to buy and stockpile goods before prices increased further. Producers hoarded goods as well hoping to keep them as long as possible under the speculation that prices would continue to rise and profits could be maximized. Increased food prices caused civil unrest and inflationary pressures for governments. Governments also implemented export restrictions in an attempt to keep domestic prices low. Net food importer’s trade balance was negatively affected and their foreign currency reserves were reduced. Overall, a general feeling of distrust in the market and in free trade has impacted international markets positively or negatively

depending on ones position on protectionism and free trade. This distrust has led to protectionist policies and a desire to be self sufficient in some countries.

Country responses to the food price crisis were varied. This paper discusses the positive and negative consequences of consumer oriented, producer oriented, and trade oriented country responses to the food price crisis. Consumer based subsidies were given in over 50 countries (Benson, Minot, Pender, Robles, Von Braun, 2008). Conditional cash transfers were another country response. Some countries utilized price controls to keep prices low for consumers. Anti-hoarding measures were taken by some countries to keep consumers from creating shortages by hoarding goods. Input subsidies for inputs such as fertilizer and fuel were provided to producers in some cases. Trade oriented responses were among the most popular. Countries responded by reducing import tariffs, releasing reserves, increasing imports in order to store reserves and calm consumer fears of shortages, and restricting exports.

Argentina, a country that is rich in agricultural goods, has also had its share of agricultural restrictions due to price increases on the global market. Political responses by Argentina to rising global food prices included, primarily, export restrictions and price caps. These measures were taken, according to the Argentine government, to enable the government to redistribute wealth as well as to keep prices low for consumers. The impact of these policies on consumers, however, was negative due to the resulting farmer strikes and shortages that followed. Additionally, producer's profit margin was reduced as a result of the policies and estimated production is down for 2009. The farmer strikes that were held in reaction to the government's sliding-scale tax interrupted the flow of goods both in the country and abroad. Ultimately, the Argentine policies created an instable environment in the

country and resulted in the loss of tax revenue for the government. On an international level, supply was decreased.

Finally, this paper explores ways that the food situation can be improved so that similar food price crises can be avoided in the future. Recommendations include increased R&D efforts, the removal of trade barriers, reduced protectionism, increased transparency and global coordination, increased incomes for the impoverished, and supply side risk management.

Understanding the Food Price Crisis

The food crisis that the world has experienced in recent years has not been born solely out of shortages. Indeed, it is not that the world has suffered so much a food crisis as it has suffered a food price crisis. A myriad of factors converged on the food market to create an environment of high global prices. It is widely agreed that high energy costs, adverse weather conditions, the depreciation of the dollar, increased demand from developing countries such as India and China, and low reserves all have had an effect on rising food prices. It is difficult to quantify the impacts of these factors and the direct as well as indirect effects that they are having on the market; therefore no statistical models will be used here for analysis. Stages of the food price crises provide an outline helpful for understanding the time frame within which these events took place. Once cause is discussed within a timeframe, it is easier to explore the impacts of the food price crisis on consumers, producers, governments, and international trade.

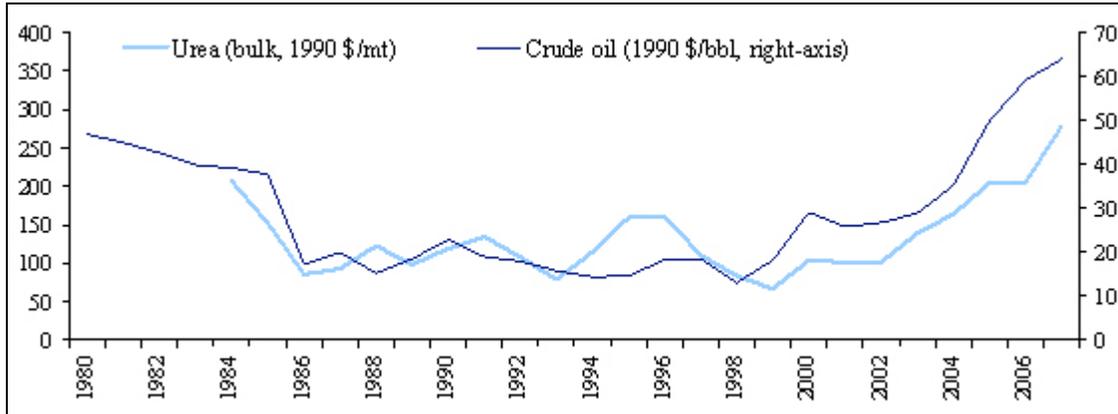
Likely Causes of the Food Price Crisis

High Energy Costs

Inputs.

High energy prices led to higher agricultural input costs. Agriculture, especially mechanized agriculture, is a high energy user. Fuel for machinery becomes an increasingly expensive input when energy prices rise. This affects producers primarily in developed countries where the largest amount of mechanized farming takes place, but has an affect on any farmer using machinery. It should be noted that a possible long term effect of increased oil prices may lead to decreased mechanization in developing countries where farmers may not be able to take on the up front price increase. As mechanized farming is more efficient at producing higher yields than traditional farming, a decrease in mechanization could lead to a decrease in yield production which would ultimately put even more upward pressure on food prices. Alternatively, producers may pass the higher energy costs on to consumers, permanently increasing food prices. Agricultural production costs also increase with the price of fertilizers. Seventy five to ninety percent of fertilizer production costs are attributed to the cost of natural gas ensuring a close link between energy and fertilizer prices (World Bank, 2007, p. 66). As seen in figure 1, the price of fertilizer has closely followed the price of crude oil since the mid 1980s. In the long run, increased fertilizer prices might discourage the use of fertilizer in agricultural production which has the potential to decrease yields and, if undertaken by a large enough percentage of the farming population, decrease global production therefore increasing global prices even further. If farmers choose to pass the higher input costs of fertilizer on to consumers instead, food prices increase permanently.

Figure 1. Real prices of crude oil and fertilizer on the global market.



Note. From “What are the Facts about Rising Food Prices and their Effect on the Region?” by The World Bank Group, 2008, The World Bank, p. 6.

High energy prices also increase the price of food through increased transportation costs. In the global economy food is shipped all around the world and higher oil prices translate directly into higher food prices. In Latin America, for example, transportation and logistics costs average 16-26% of GDP and attribute to 18-32% of the end product value (The World Bank Group, 2008).

It is important to note that oil prices began declining in July of 2008 and have remained relatively low since. The decrease in oil prices provided financial relief to more than just the farming sector. However, it is equally important to note that low oil prices and decreased demand during the economic recession have caused the supply of oil to constrict as OPEC countries have reduced output (Chazan, 2009). The decrease in oil supply could lead to another rise in oil prices if demand should rebound more quickly than supply.

Biofuels.

High energy prices make biofuels particularly attractive. Despite the fact that maize ethanol, the primary biofuel produced in the United States, has only recently acquired a positive energy balance (Von Braun, 2008), the European Union and the United States government legislated biofuel mandates years ago. In 2001 the European Union passed legislation requiring that by 2010 5.75% of fossil fuels used for transportation purposes be replaced with biofuels while the United States passed similar legislation in 2005 that was updated in 2007 to require one billion gallons, or 13.17% of biodiesel replace fossil fuel use by 2012 and a collective total of 15 billion gallons of maize ethanol by 2022 (Mitchell, 2008).

In order to insure that these goals are met, governments in countries with biofuel mandates are providing incentives to farmers and producers all along the production chain. Domestic production is being encouraged by the creation of import tariffs. The European Union has an import tariff of €0.192 per liter of ethanol which translates to approximately \$0.97 per gallon of ethanol and the United States has an import tariff of \$0.54 per gallon of ethanol (Mitchell, 2008). Import tariffs reduce the likelihood of international competition and encourage domestic growth on the supply side. Production is further encouraged by government subsidies. For example, fuel blenders in the United States receive \$0.51 subsidy for every gallon of maize ethanol blended, this particular subsidy is promised through the end of 2010 (Mufson, 2008). Not only are U.S. biodiesel fuel blenders receiving direct subsidies, they are also eligible for a \$1 tax credit for every gallon blended (Mitchell). In a move to encourage biodiesel production in the EU, various countries provide similar tax exemptions to biofuel blenders.

Biofuels have increased the price elasticity of a traditionally inelastic supply curve for crops used in biofuel production and farmers have indeed been quick to respond to high market prices. The supply curve elasticity is increased by the increased incentive for profit due to government subsidies for biofuel crops. Price elasticity of supply measures the sensitivity of quantity supplied to price change. An inelastic supply curve indicates that quantity supplied is not responsive to a change in price. The responsiveness of supply to price can be easily visualized on a supply and demand graph (see Figure 2). A perfectly inelastic curve is represented on a graph as a vertical line and a perfectly elastic curve is represented as a horizontal line. As elasticity approaches zero, the curve becomes steeper. Agricultural supply is typically slow to respond to a change in price of agricultural goods due to its inelastic supply curve. However, biofuels have increased the elasticity of the supply curve for crops being used in biofuel production making supply more sensitive to changes in price.

Figure 2. Increased price elasticity of supply due to biofuel production.

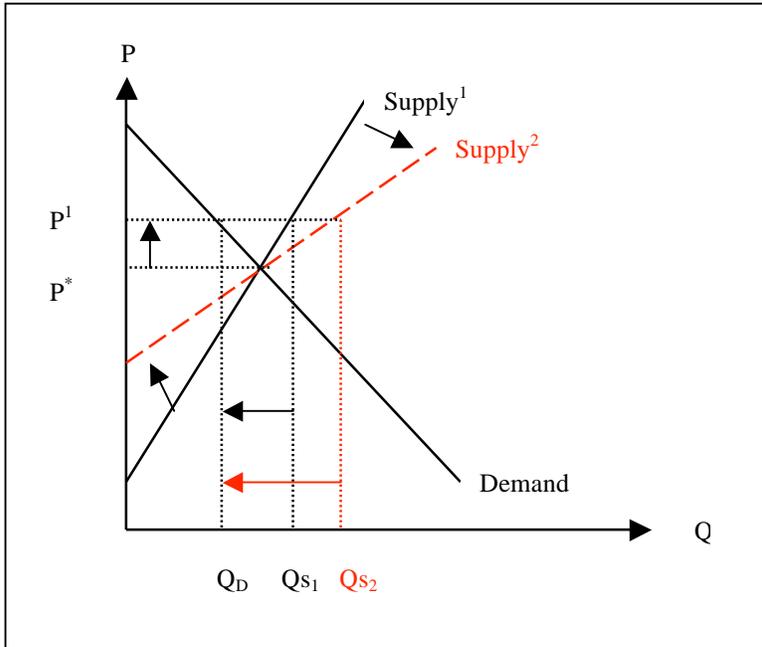


Figure 2. As supply becomes more elastic, the gap between quantity supplied and quantity demanded grows at any given price change.

High profits for biofuel crops, such as maize and oilseeds, have increased the incentive to divert resources away from the cultivation of food crops. Farmers that might usually plant wheat, for example, have redirected land away from wheat and toward maize earmarked for biofuel production. Land use changes have been particularly noticeable for wheat (Mitchell, 2008) especially as genetically modified maize can be grown in regions traditionally better suited to other crops. Farmer's switchover from wheat to biofuel crops was facilitated by the government in the United States where farmers that once grew wheat were paid wheat subsidies in 2007 on a total of 15 million acres no longer being used to grow wheat (Morgan, 2008). As less food makes it to the global market and the global supply of

food falls, global prices rise. Subsidies are also something of a tax on food, raising prices above free trade value. Care should be taken to evaluate the necessity of subsidies; they should never be used as a long term solution. Though subsidies may be useful in certain situations they are often difficult to get rid of once in place and they distort the market value of the goods they support. Therefore, subsidies should only be given in the short run to ensure that prices are not unnecessarily distorted. Subsidies should also be constantly reviewed so that any subsidy having a net negative impact can be removed as necessary.

Another result of biofuel production is the price increase of animal feed. High biofuel profits have increased the incentive to divert resources away from crops once used to make animal feed. An increase in the price of feed will increase the cost of keeping animals ultimately used for food, such as chickens or cows. This increase in costs is passed to the consumer increasing the price of eggs, meat, and dairy products.

Don Endres, the chief executive officer of the maize ethanol plant VeraSun, believes that technology will increase the yield on corn allowing greater yields without taking up more land over time (Mufson, 2008) thus enabling enough corn to be produced to provide for human consumption, animal feed, and biofuels on the land currently being cultivated. Even with technological advances that allow for greater corn yields, farmers will still plant what is profitable. If the demand for maize ethanol continues to increase and farmers can earn a higher return on the corn grown for biofuels, which is different than the corn people eat, then they will continue to plant more biofuel maize and fewer other crops. Also, yields cannot increase indefinitely; even if corn yields increase due to technological advances there is a limit to what can be produced on the land currently being cultivated. If farmers are going to keep land in programs such as the United States conservation reserve program, then the

government may have to pay a higher dollar amount per acre to make the incentive high enough to keep the farmer from planting on it.

There is much debate over what percentage of food price increases are attributable to biofuel production. The World Bank believes that 65% of food price increases can be attributed to biofuels (Mitchell, 2008). The International Monetary Fund (IMF) estimates that 70% of maize price increases and 40% of soybean price increases can be traced to increased demand for biofuels (Mitchell). Reports vary even within countries. For example, the USDA has made public statements acknowledging that biofuels have greatly increased the price of food (Mitchell) while the Agricultural Secretary for the United States has defended biofuel production, saying that only 2 to 3 percent of food price increases are due to biofuels (Lynch, 2008).

Weather Related Shortages

Adverse weather conditions have also impacted food prices. This impact is most notable in the wheat market. Global production of wheat decreased by 4.5% in 2006 and rebounded by only 2% in 2007 (Mitchell, 2008). Drought in Australia during 2006 and 2007 reduced grain exports, mostly wheat, by over 18 million tons (Mitchell). This shortfall in the wheat market would only marginally have affected global prices as world production of grains increased on average over the same two year span by 3.4% (Mitchell); however the decreased wheat production coupled with speculation about wheat prices in particular would have had some impact on global prices in the grains market. Drought continues to be an influencing factor as wheat production prospects are down for the 2008-2009 season due to drought in countries such as Syria, Iran, and Iraq (USDA). Drought is not the only weather

related factor that has had an impact on food shortages; flooding also decreased output regionally. In Latin America countries such as Bolivia, Ecuador, and the Dominican Republic had excessive rains in 2007 and 2008 (The World Bank Group, 2008). Global warming, which increases the risk of both drought and floods, will continue to place agricultural yields at risk. Von Braun (2008), the director general of the International Food Policy Research Institute (IFPRI), suggests that by 2020 agricultural GDP will decrease by 16% on a global scale due to global warming alone. Therefore it is likely that agricultural output will continue to be affected by adverse weather conditions, which, unless adjusted for, could mean increased food prices in the future due to supply shortages.

Depreciation of the Dollar

As the dollar depreciates, commodity prices generally rise; when the dollar appreciates commodity prices fall. Food prices, as a subset of commodities, tend to follow this pattern. In fact, food price increases actually lagged behind other commodity price increases such as oil and metals (Abbott, Hurt, & Tyner, 2008). According to Gilbert (1989), dollar denominated commodity prices with an elasticity between 0.5 and 1.0 will increase in price with the depreciation of the dollar. From 2002 to 2008 the dollar depreciated 35% against the euro and 26% against most Asian currencies (Mitchell, 2008). During this same time period, Mitchell estimates that 20% of food price increases were attributable to the depreciation of the dollar.

Increased Demand from Developing Countries

Increased population growth and increased income in developing countries such as China and India increased demand. In Asia, real GDP increased by more than 9% per year from 2005-2007 (Von Braun et al., 2008). As income increased, people diversified their diet and demanded more animal products and fresh vegetables (Minot, 2008). An increase in the demand for animal products also increases the demand for feed grains. As demand for animal products increased in some developing countries more resources such as land and water were used to produce enough to meet demand; this shifted resources away from the production of other crops and put upward pressure on prices (Von Braun et al).

Reserve Levels Low

Grain stocks were unusually low for 2007/2008. As globalization increased trade, many countries allowed their reserves to decline leading to grain reserves totaling 16.5% of production for 2007/2008 (Lin, 2008); lower than reserves had been since 1973 just before the last major global food crisis. Seven of the eight years from 2000 to 2008 had a grain production deficit. In other words, with the exception of 2004, the world consumed more grain than it produced. With consumption outpacing production, grain reserves fell to extremely low levels. By 2006 global grain stocks were at their lowest levels since 1981; however, world grain stocks for that same year when taken as days of consumption bottomed out at 57 days, the lowest level since 1973 (Eco-Economy Indicators). Speculation about low grain stocks likely contributed to increased prices. Lack of global transparency regarding grain reserves or perhaps inadequate information about the market is the probable cause behind countries failure to release an adequate amount of grain reserves into the market when

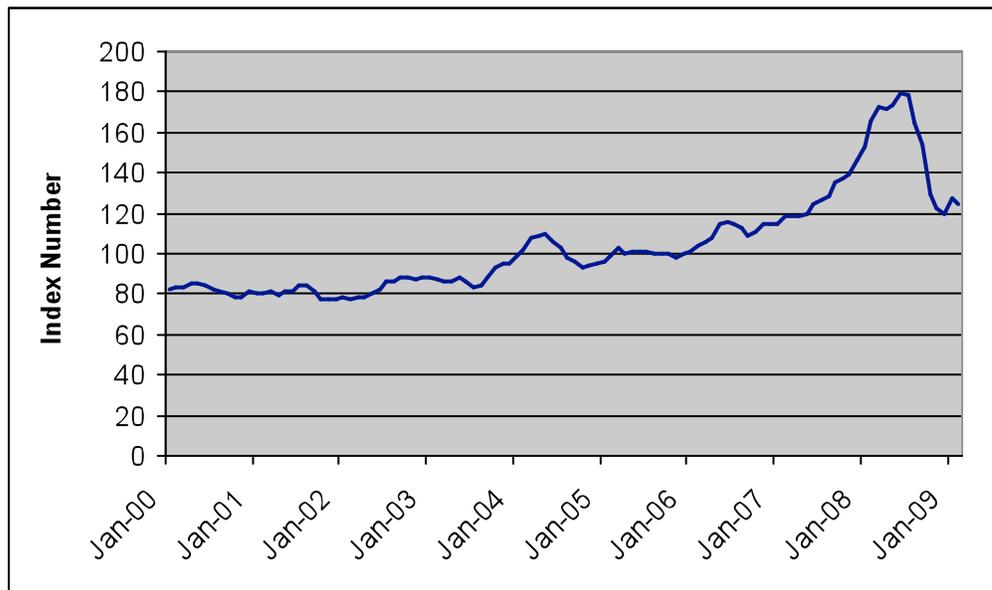
prices began to rise. Unfortunately, many countries responded by hoarding reserves which increased prices further.

Phases of the Food Price Crisis

Phase One

When did the price crisis begin? It is difficult to say exactly. Josette Sheeran, the executive director of the World Food Program, points out that the crisis can be broken down into three phases (2008). Sheeran believes the first phase began in 2004 with mild, but steady, price increases. This phase lasted through May 2007. It is probably more accurate to say that phase one began in 2002 (see Figure 3) when prices began a steady climb lead by grains. But as discussed previously, even before that, global production fell behind global consumption leading to unusually low grain reserves.

Figure 3. Commodity food price index from January 2000 to January 2009.



Note. Data from Index Mundi.

Phase Two

According to Sheeran (2008), phase two began in June 2007 as prices began climbing at an increasingly steep rate. This phase lasted through the summer of 2008 when most prices maxed out before descending back down the price ladder. Wheat, for example, reached its max price in March of 2008. From March 2007 to March 2008 the commodity food price index increased 57% (“FAO’s Initiative”, 2008). During phase two, food aid institutions were struggling to provide food for an increasing number of people newly priced out of the food market (Von Braun, 2007). Even toward the end of phase one, food aid was drastically decreasing. Between 2003 and 2007, global food aid fell by over 42% (World Food Program, 2007). Reduced global food aid means less help to those hit hardest by the food price crisis, the world’s poorest citizens. The poor spend a larger percentage of their incomes on food,

and therefore are the most affected by food price increases. Increased food prices for the world's poorest citizens translate into skipped meals, and less money available for healthcare and education.

Phase Three

Phase three would be best described as beginning in the summer of 2008 after food prices began to fall. Many countries were relying on international assistance in order to feed their populations by that point (Sheeran, 2008). Certainly the ramifications of the food price crisis, as discussed later in this paper, are still being felt all around the globe.

Impacts of the Food Price Crisis

Consumers

When the price of staple goods increases, it is the poor who suffer most. Ivanic and Martin (2008) found that the recent food price crisis had a negative impact on the poverty gap and therefore increased poverty overall. As food prices increase, essentially real income decreases. For the poorest of consumers who earn 1,000 USD or less per person per year, 60% or more of consumption expenditure is represented by food ("FAO's Initiative," 2008). It follows that for net consumers in developing countries food is generally a larger percentage of overall consumption than in developed countries. Even farmers can be net food consumers, particularly if they are subsistence farming. When food prices begin to rise, consumers substitute away from more expensive products towards cheaper goods even when

it means substituting away from more nutritionally sound food choices. For example, as food prices increased in 2008 families in Burkina Faso that used to eat goat meat and vegetables switched to less expensive goods such as dried fish and baobab leaves (Sullivan, 2008). In addition to substituting, consumers in developing countries decrease food consumption expenditure by approximately 0.75% when food prices increase by 1% (Von Braun, 2007). As consumer concern over the rising cost of food increased, consumers that could afford to began stockpiling staple foods in hopes of buying up supplies before prices increased any further. Storekeepers all around the world reported consumer hoarding; China, India, Japan, the Philippines (Faiola, 2008a). Peter Timmer, a professor at Stanford University, put it this way, “ If every country, or individual consumer, acts the same way, the hoarding causes a panic and extreme shortage in markets, leading to rapidly rising food prices,” (Cha, 2008).

Producers

Hoarding was not only a problem on the demand side; supply side hoarding took place as well. Producers that could afford to hold on to stocks would do so if they believed that prices would increase further, hoping to get as much profit as possible from their harvest. Increased food prices have the potential to translate into increased profit for certain sectors of the economy and farmers stood to gain a profit in instances where input price increases did not outpace profit gains. One farmer’s gain could mean another’s loss. For example, as corn farmers enjoyed higher prices, farmer’s raising chickens were faced with the increased input cost of feed. It is important to note that the benefit to farmers of increased prices comes only from the sale of their goods, if farmers are not able to sell their goods due to government restraints as discussed later in this paper, then deadweight loss is created and there is an

efficiency loss. Government restraints such as price ceilings, taxes, and subsidies can all create allocative inefficiency, or deadweight loss, where consumer and producer surpluses are decreased (see Figures 4 and 5).

Figure 4. Consumer and producer surplus at free market equilibrium price.

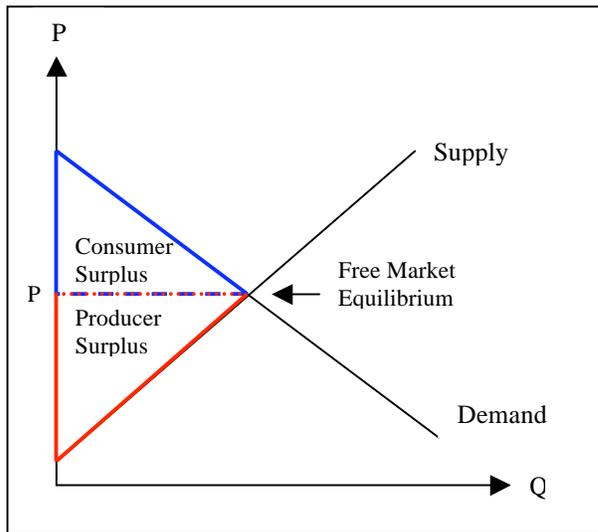


Figure 4. When prices are at free market equilibrium, the market is allocatively efficient, and producer and consumer surplus is maximized. Producer surplus is represented by the red triangle and consumer surplus by the blue triangle.

Figure 5. Deadweight loss caused by market interference.

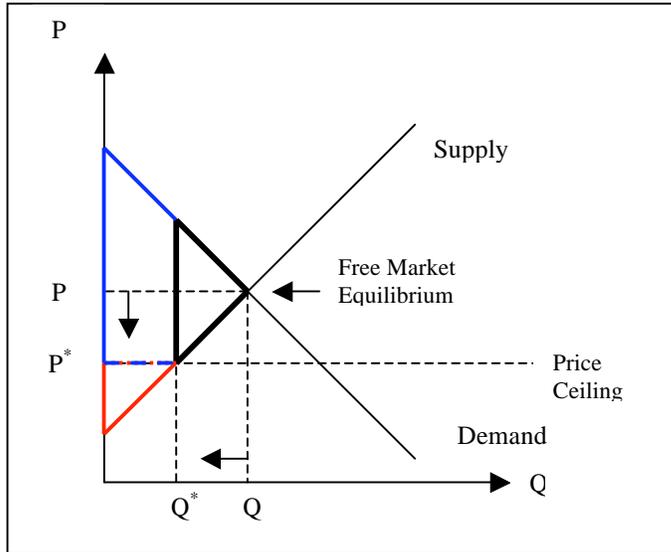


Figure 5. When prices are artificially lowered below free market equilibrium, the market is allocatively inefficient, and deadweight loss is created. The dark black triangle represents deadweight loss, the red triangle on the bottom is the new producer surplus, and the blue trapezoid is the new consumer surplus.

Governments

More than 50 countries have reported food related protests, strikes or street riots (Benson, Minot, Pender, Robles, Von Braun, 2008). Civil unrest due to high food prices can destabilize a government. The Malaysian Prime Minister, for example, suffered a political blow due to constituents angry over the high price of food (Faiola, 2008a). Other countries have struggled to maintain peace in the midst of protests turned violent; Haiti, Bangladesh, Morocco, and Kenya are a few of the countries who have seen violent rioting, resulting in casualties in a few cases (Benson et al.). Increasing consumer subsidies is one way countries

have attempted to quell unrest. Benson et al. found that two-thirds of the countries experiencing violent protests in the recent food price crisis eventually provided consumer subsidies.

Inflation is another concern when food prices increase. Food is generally a larger percentage of the consumer price index (CPI) in developing countries than in developed countries. As income increases, the percentage of food expenditures in the CPI decreases (Organization for Economic Co-Operation and Development [OECD] & Food and Agriculture Organization of the United Nations [FAO], 2008). Therefore, food price inflation has a larger impact on the overall inflation rate in developing countries. The percentage of food expenditure in the CPI is just under 10% in the United States but is more than 50% in many countries; Bangladesh has almost 65% food expenditure as a percentage of CPI (OECD & FAO). The percentage of price inflation attributed to food price inflation varies accordingly, for the United States it is only 0.5%, but in Bangladesh it is 9.2% (OECD & FAO). Of course actual impacts vary per household and the poor, who are most likely to spend the majority of income on food, are most incapable of coping with higher food prices. Inflationary expectations and speculation encourage overall inflation rates. This is especially true in wage inflation. Food price inflation puts upward pressure on wages as populations expect prices to increase further.

Governments joined individual consumers and producers in hoarding food supplies. Some countries bought up grains to build their reserves and provide price pressure relief to consumers. The Philippines increased imports in 2008 in order to attain a 30 day rice reserve (Demeke, Maetz, Pangrazio, 2008). Other countries restricted exports in order to keep supplies at home; for example, China banned all maize and rice exports, India banned all

exports of non basmati rice, and Ethiopia banned all cereal exports (Von Braun et al., 2008). The United States, who maintained exports and whose products were appealing on the global market due to the weakness of the U.S. dollar, supplied a lot of wheat in 2008 to countries who usually bought elsewhere (Morgan, 2008).

Trade balance was also affected by the food price crisis. In countries that are net food importers, trade balance is affected negatively by a food price increase. Negative affects to the trade balance also negatively impact the strength of the countries currency. Foreign currency reserves are also likely to be depleted in net food importing countries. In net food exporting countries, trade balance is positively affected by food price increases which in turn positively impact the strength of the countries currency.

International Trade

To begin with, subsidies, such as those given for biofuel crops, and other trade barriers may have distorted the free market price of food globally. Without such trade restrictions or distortions in place, the price of food may have risen more gradually and with less shock to the market. However, even as food prices have begun to retract, there seems to remain a general feeling of distrust toward the market place and the free trade of food. Many net importing countries believed that liberalizing the food market would work, and for a time it did. Countries were able to purchase food at a lower price than they could produce it themselves; this was especially useful for developing countries whose poor consumer base needed access to cheap food. Because of access to inexpensive food on the global market, some countries diverted resources away from food security and into other projects.

Mauritania, for example, moved money once used to encourage agricultural production into industries such as ore mining (Faiola, 2008b).

This distrust in the market has led to contractions of free trade; as discussed later in this paper, countries are increasing funds for agricultural production via producer subsidies, government policies have restricted exports and imposed price controls, and countries are looking for ways to improve food security by producing food at home. Self sufficiency has increased as a goal among many countries including China, Malaysia, Indonesia, and the Philippines. Where countries are too small to hope to be self sufficient, regional agreements have been made such as the agreement of the Southern African Development Community to establish a regional food reserve facility (Demeke et al., 2008). In another protectionist move to ensure domestic food supply, countries with ready capital, such as China, have been acquiring land abroad to outsource farming for domestic consumption (Demeke et al.). The general feel of distrust can be summed up by the French Agriculture Minister Michel Barnier, “We must not leave the vital issue of feeding people to the mercy of market laws and international speculation,” (Faiola, 2008a).

Country Responses to the Food Price Crisis

Consumer Oriented

According to Benson et al. (2008), over 50 countries are currently providing consumer based subsidies as a means to alleviate the high price burden of food. Conditional cash transfers are another form of consumer relief (Demeke et al., 2008); providing food or

cash to families who send their children to school, take their children in for regular check ups at health clinics, or perhaps attend specific training programs are all possible ways to provide assistance to those who need it. Though this may provide temporary relief from the high cost of food, in the long run subsidies and cash transfers can be difficult to get rid of once established and can lead to inflation if the government is financing the subsidies through monetary expansion or increased taxes if by deficit.

Price controls are another means by which governments attempt to keep prices low. Price ceilings can be potentially difficult to enforce. In Ecuador, the government established price controls and enforces them via police checks at markets, storehouses, and shops; the penalty for noncompliance is a fine from USD100-1000 and six to 24 months in jail (Demeke et al., 2008). Low prices can have the effect of reducing domestic production which may create shortages and drive prices up further. Without profit for incentive, farmers may switch to another crop that has no price limitation. Creation of a black market in which prices are even higher is also a concern. In 2008, Egyptian authorities arrested 12,000 people for selling flour on the black market (Garber, 2008).

Anti-hoarding policies have been implemented in order to keep prices low. The Philippines have enacted a very strict anti-hoarding policy that threatens noncompliance with life imprisonment (Demeke et al., 2008). These policies are meant to keep those along the value chain, from farmers to grocery stores, from holding product due to speculation that prices will continue to rise and profits will be greater in the future.

Producer Oriented

Input subsidies, especially in the way of fertilizer or fuel subsidies, have been used in some countries to help producers overcome the obstacle of high input prices (Demeke et al., 2008). Malawi has been reasonably successful at their implementation of targeted subsidies of fertilizer and seeds for farmers in need of assistance while India has focused on subsidizing electricity used to power electric pumps for irrigation (Demeke et al.). Producer oriented subsidies incur the same difficulties as consumer oriented subsidies, namely the difficulty governments traditionally have phasing them out in the long run and the risk of increased inflationary pressures in governments financing through monetary expansion and higher future taxes for governments financing through deficit.

Trade Oriented

Trade oriented efforts to reduce prices were probably among the most widely used. Import tariffs were heavily cut in Morocco where wheat import tariffs were cut from 130% to 2.5% and Turkey where the import tariff for barley was reduced from 100% to 0% (Demeke et al., 2008). Cutting import tariffs is one of the less expensive government responses, but import tariff reduction most likely effects prices only where the change is significant.

Releasing food from reserves should also lower prices by increasing the supply available on the market (see Figure 5). For this to have any real affect on stabilizing prices, however, the supply must be large enough to meet the population's demand and alleviate fears of shortages. China was able to release enough of its reserves in 2008 to slow food price inflation in comparison to other Asia-Pacific countries (Demeke et al., 2008). India has released a substantial deal of wheat and rice into the country's market at a subsidized price

(Demeke et al.). On a global scale, countries with sufficient grain reserves declined to release reserves onto the global market, choosing instead to insulate domestic consumers (Lin, 2008). A coordinated global release of grain stocks may have prevented such high prices on the global market. An option countries such as the Philippines and Saudi Arabia have taken is to expand imports in hopes to store up reserves and alleviate consumer fears of shortages; this is not a viable option for some of the poorest countries however who haven't the funds to increase imports (Demeke et al.).

Figure 6. Effect on price of releasing reserves into the market.

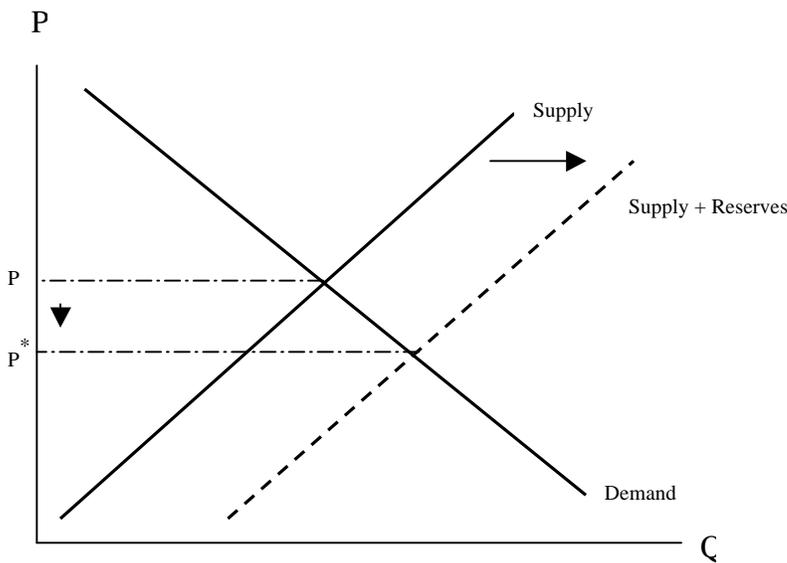


Figure 6. As the release of reserves on to the market increases the supply, the supply curve shifts to the right and prices fall.

In an effort to keep supplies at home, and therefore curb inflationary pressures, some countries restricted exports. Trade restraints such as export bans or quotas effectively reduce global supply and therefore increase prices further. The USDA suspects that in 2008 20% of wheat wholesale price increases were attributable to export restrictions (“Export Curbs,” 2008). In countries that are net food exporters, export restrictions may inhibit farmers from selling their goods. In the Ukraine, farmers were unable to sell all the grain harvested domestically and due to export quotas they could not sell it abroad; they ended up throwing away \$100 million worth of grains gone bad (“Export Curbs”). Export restrictions may also encourage farmers to switch to a crop not currently under restrictive trade barriers. Net food importers are worse off when net food exporters restrict exports and countries that are dependent on food imports to feed their consumers may have difficulty procuring food. Inhibiting the export of goods may also cause exporting farmers to lose their connections abroad making it more difficult for them to find buyers once restrictions are no longer in place.

Argentina

Argentina, one of the world’s top suppliers of many agricultural goods such as wheat, corn, beef, and soy, is an interesting country to examine in respect to the food price crisis. In order to understand the policy decisions Argentina made in response to high global food prices, it is important to understand something of their political and economic environment. In 2001, Argentina defaulted on its sovereign debt. The default has yet to be settled as 24%

of the debt is still held by bondholders who refused the governments deal to pay out only 30% of the bonds worth (Roberts, 2008). The massive default along with the governments refusal to pay the remaining bond holders, most of whom are foreign creditors (Roberts), has damaged the country's image in the eyes of potential investors. Indeed, in August 2008 Standard and Poor downgraded Argentina's debt rating to a B which is five grades below investment grade (Roberts). The rating will not only diminish foreign direct investment (FDI) it will increase the cost of borrowing for Argentine businesses. In contrast, Standard and Poor upgraded Brazil to investment grade in 2008 making it a much more attractive investment candidate than its neighbor, Argentina.

Corruption is another problem for Argentina according to the Corruption Perception's Index; Argentina ranked 105th out of 179 countries (Argentina information on economic freedom, 2009). FDI may also be deterred by such an unfavorable corruption ranking. The perceived corruption extends to the Argentine National Institute of Statistics and Consensus (INDEC), the organization that publishes the national rate of inflation. The official inflation rate published by INDEC in 2006 and 2007 has hovered between 8-9% while the true inflation rate is thought to be over 25% (Airriess, 2008). It is interesting to note that the published low inflation rate allows the Argentine government to make lower interest payments to bondholders (Roberts, 2008).

Cristina Fernandez de Kirchner, a member of the Peronist Party, succeeded her husband as the President of Argentina in 2007. In spite of the country's debt default, diminished investment rating, and inflationary concerns, under the Kirchners, the economy has grown at an average of about 8% annually (Roberts, 2008). However, it is suspected that growth is slowing and that the economy will contract by over 1% in 2009 (Forero, 2008).

Agricultural Production

It was against this political and economic background that the food price crisis took place in Argentina. Agricultural production is particularly important to the Argentine economy, accounting for more than 50% of exports (Argentine information on economic freedom, 2009) and 9.2% of GDP. Since the default of 2001, the country has a history of increasing agricultural export taxes. Indeed, the Argentine government relied heavily on revenue from agricultural export taxes to stabilize the economy after the debt crisis of the early 2000s (“Argentina’s Tax,” 2008). In 2002, the original export taxes on agricultural goods were around 20% (“Argentina’s Tax”) but that percentage has been steadily increasing. For example, up until high global prices provided an incentive to impose a sliding-scale tax in 2008, export taxes on soy were at a fixed rate of 35% (“Q&A,” 2008). In the past the government has used export tax revenue to fund various programs and subsidies. For example, in 2007 at the very end of phase one of the food price crisis, the export tax increase for soy raised around \$400 million that the Argentine government redistributed as subsidies to millers, animal-feed producers, and dairy producers (Misculin, 2007). This redistribution of funds was intended to help keep food prices down for consumers. This same trend continued into 2008 as the government responded to the food price crisis by creating policies intended to gain revenue from high agricultural export prices and keep prices low for domestic consumers.

Political Responses to Rising Global Food Prices

The two most notable types of policy changes made in 2008 by the Argentine government, and therefore the two discussed within this paper, were export restrictions and price caps. Price caps on agricultural goods were imposed in an effort to keep consumer prices low. According to the Argentine government, export restriction on grains, oilseeds, and beef were intended to keep goods in the country and therefore push domestic prices downwards (Airriess, 2008). Limiting the amount of goods Argentine farmers were able to export on the global market, the government closed down export registries for agricultural products such as wheat and beef (Popper, 2008a). In addition to their attempts to control inflation, the Argentine government also had an incentive to protect domestic prices in order to protect wages. Rising prices put upward pressure on wages, especially the wages of government employees.

Argentina imposed a sliding-scale tax on the export of grains and oilseeds on March 11, 2008 that was particularly controversial. With a sliding-scale tax, rates increase as prices rise. Under the new tax system, the tax on many agricultural goods was increased immediately. Soy, for example, went from its fixed rate of 35% to 46% instantly under the sliding-scale tax (“Argentina Misses Out,” 2008). Redistribution of wealth was the main reason given by the Argentine government for the tax changes (Airriess, 2008); stabilizing farmer prices was another reason often given (Popper, 2008a). The government’s need for revenue was most likely the driving force behind the policy. Taxing agricultural exports at a time when prices on the global market were so high would allow the government to raise revenue fairly easily. Increased revenue would have enabled the government to pay off debt,

finance government projects, or spread wealth around by increasing subsidies in other sectors.

The new tax system was unpopular with agricultural producers and led to over three months of strikes and rioting. To avoid a Supreme Court ruling, President Kirchner sent legislation to Congress to be approved. A tie in the Senate left it to the Vice President, Julio Cobos, to cast the tie-breaking vote. Cobos voted against the legislation and the sliding-scale tax was repealed on July 18, 2008 (“Et tu, Julio?,” 2008). However, the policy had already impacted Argentine consumers and producers, the government, and international trade.

Impacts of Policies

Consumers

As far as Argentine consumers were concerned, price caps and export restriction served one main purpose: to keep domestic prices low. The Argentine government aimed to stabilize consumer prices and ward off inflation. In reality, this was not necessarily the case. Price caps will keep consumer prices lower than market prices, but have a tendency to lead to reduced supply. As producer’s incentive to produce decreases, fewer goods are available on the market. So even though the goods may be cheaper than the free market price, there is a supply shortage which can lead to a black market for goods that are sold at higher prices. By keeping goods in the country through export restrictions such as the sliding-scale tax and the closure of export registries, the Argentine government hoped to ease inflationary price pressures for domestic goods. Also, Argentina wanted to make sure that producers didn’t

leave the domestic market unsupplied by exporting all of their goods on the increasingly profitable global market. Increased supply should ensure lower prices domestically. However, farmer protests and strikes over the new policies lead to shortages for local markets as farmers refused to sell their goods until the sliding-scale tax was repealed (“Q&A,” 2008). In the end, consumers were negatively affected by the price cap and export restriction policies due to the supply shortages they created.

Producers

The Economy Minister, Martin Lousteau, at the time the sliding-scale tax was first announced, claimed that the new tax system would provide price stability for farmers (Popper, 2008a). The President of the Association of Argentine Cooperatives (ACA), Egidio Mailland, was of a different opinion. Mailland put it this way, “If I don’t know how much tax I’m going to be paying in three months, I can’t put a value on the grains within three months” (Popper, 2008a, para. 7). Indeed, the sliding-scale tax was dependent on global market prices. With prices on the global market increasing so rapidly, farmers had no way to guess what tax they may be paying on the next day’s crops. At the same time, input prices such as fertilizer and fuel for machinery continued to increase. According to the Economist (2008), after income taxes and export taxes had been paid, and the cost of production and transport had been considered, soy farmers in the country were receiving on average only \$0.06 profit per dollar invested, or a 6% return on the harvest. (“The Kirchners,” 2008). This reduced profit margin would be especially damaging to small producers who may not enjoy the economies of scale that their larger counterparts benefit from. Under this profit margin, it wouldn’t be

unreasonable to suspect that if a small-scale farmer lost his crop due to poor weather, disease, or any other misfortune, he may not be able to survive financially.

Decreased profits will decrease a farmer's incentive to produce. Farmer's will respond to a decline in profits by switching to more profitable crops. For example, due to market interference by the Argentine government wheat farmers will sow an estimated 12.7% less land area in wheat in 2008/2009 than in 2007/2008 (Popper, 2008a). The wheat area sown in Argentina is estimated to drop to 4.8 million hectares, the smallest area sown since before 1993 (Popper, 2008a). According to Sean Cameron, the president of the wheat growers association AAPROTRIGO, wheat area is being reduced for political reasons (Popper, 2008b). Cameron says that farmers feel they are not, "receiving fair value for [their] crops," (Popper, 2008b, para. 5) and have therefore cut back the amount of wheat sown. A survey conducted in March 2008 by the ACA shows members plan to plant 30-40% less wheat in the 2008/2009 growing season due to the government's export taxes (Popper, 2008a).

Unrest in the farm sector due to political interference led farmers to hold strikes and protests. Farmers held strikes off and on during the 3 month period between the sliding-scale tax's enactment and its repeal. During these strikes the sale of grains and meat was stopped; no exports and no sales to domestic suppliers (Airriess, 2008). Streets were blockaded by farmers and farm machinery; trucks carrying agricultural goods were either sent back or overturned in the street ("Argentine Farm," 2008). These strikes and the resulting interruption of the flow of goods to markets created shortages for Argentine consumers. In response to these strikes, the President of Argentina treated the farmers with hostility calling the strikes "extortion" (Schweimler, 2008). The hostility Kirchner showed the farmers had

the opposite effect intended. Urban dwellers joined the farmers in street protests against the government's policies, having been moved by their plight (Airriess).

The strikes affected other jobs as well. Transporters of goods such as grains were out of work for as long as the farmers refused to ship their harvest (Airriess, 2008). Some export companies were unable to meet their contract quotas due to the farmers strike; ships that would have carried those exports were also out of work ("Argentine Farm," 2008). Even processing plants were affected. According to the Economist (2008), as farm production declined and the strikes caused fewer goods to be available on the market, some processing plants closed down due to their inability to remain profitable ("The Kirchners," 2008). Even services such as long distance busses were stopped due to the road blockades (Schweimler, 2008).

Though the Argentine government claimed that the export tax revenue was being collected in order to enable the government to redistribute wealth, farmers were frustrated that they had not seen any of this money reinvested in the rural communities (Schweimler, 2008). The BBC reported on one small rural farmer who put it this way, "what we pay to the state is not returned to us in the form, for example, of subsidies to buy fertilizers or to promote the social and educational development of our communities" ("Argentine Farm," 2008, para. 8).

Government

The government was also affected by the farmer strikes and riots. The clash of farm rioters with pro-government rioters created an instable environment. Fortunately for Argentina, the protests within its borders were nonviolent. In countries such as Bangladesh,

Egypt, Peru, and Thailand food related rioting turned violent and even deadly in some situations (Benson et al., 2008).

Overall, the agricultural policies were divisive for the country. Not only were the country's citizens divided pro-farmer versus pro-government, but legislators were divided as well. Many rural leaders sided with their farm constituents ("Argentina Misses Out," 2008). When the vote to ratify the sliding-scale tax came before the Senate, the vote was evenly divided, 36-36 ("Et tu Julio?," 2008). The ultimate division came when the country's vice president, Cobos, voted against President Kirchner to defeat the bill. By the time the bill had been defeated, President Kirchner's approval rating had fallen from 56% in January 2008 to approximately 20% that July ("Argentina Misses Out"). Perhaps most notable, the agricultural sector was divided from the government. The President's refusal to negotiate disenfranchised the farmers and set the government against the citizens.

The government's divisive policies also led to the resignation of the Economic Minister, Martin Lousteau. Lousteau had recommended that export taxes be reduced and that agricultural producers be allowed to export excess product free of charge. Because of his disagreement with Kirchner's export policies, Lousteau resigned in April 2008 (Airriess, 2008)

Perhaps the largest impact of the government's agricultural policies on the government itself was the loss of tax revenue. Though the government's intention was to increase revenue, the farm strikes held in protest of the government's revenue raising sliding-scale tax had the opposite effect. The government lost an estimated \$6 billion in export revenue in 2008 due to the farmer strikes (Forero, 2008). If Argentina had left tax rates at their fixed levels, it is likely that farm exports would have increased due to high global prices

and Argentina would have been able to increase tax revenue without introducing the sliding-scale tax. Indeed, due to Argentina's export restriction policies, export revenue from agricultural goods is expected to continue to decline in 2009 reaching a low of \$25 billion down from \$40 billion (Forero, 2008). The loss of so much export revenue may prevent Argentina from expanding its social aid programs and paying down its debt in 2009.

It is worthy to note that the sliding-scale tax and price cap policies may lend themselves to increased government corruption. If, as was mentioned earlier, price caps had led to the creation of a black market, such as the black market for flour in Egypt, officials may be bribed to allow the illegal market to continue. In the same way, government officials may also be bribed for export licenses when the number of licenses given is severely restricted. Argentina may be particularly susceptible to this due to its high corruption rate.

International Trade

As discussed previously, the Argentine government's price caps and export restrictions reduced domestic agricultural production for crops such as wheat. As one of the world's largest agricultural exporter of crops such as wheat and corn, a reduction in production of these crops affects the world's supply. Reduced supply puts upward pressure on global prices. Supply of grains and beef were cut off to the global market entirely during the farmer's strikes putting even greater upward pressure on prices during a time when global prices were already high.

A reduction in exports would have affected those countries importing a lot of their agricultural goods from Argentina the most. Countries that would have typically imported a lot of Argentine grain may have had to look elsewhere for supplies during the food price

crisis due initially to the export restrictions imposed by the government and then by the export strikes held by the farmers. Even before the sliding-scale tax, the World Trade Organization (WTO) had issued statements urging Argentina to eliminate trade barriers such as export tariffs (Allgeier, 2007) in order to facilitate trade with its neighbors.

Foreign creditors may also have been among those to benefit had Argentina been able to capitalize on export tax revenue from agricultural exports while global prices were high. Revenue gains might have been used to pay down foreign debt. With the loss of \$6 billion in export revenue, however, Argentina was unable to take advantage of high prices on the global market.

The Current Situation in Argentina and Likely Future Trends

Currently, prices are dropping as the global economic recession worsens. In Argentina, farmers have been affected by price decreases in the agricultural market, seeing as much as a 40% price decline in crops such as wheat and corn (Forero, 2009). With falling agricultural prices and an economy predicted to contract this year by more than 1% (Forero, 2008), Argentine farmers may have a difficult season ahead of them. An economic recession could mean a continuation in decreased demand, especially for biofuel crops such as corn, one of Argentina's main export crops. A recession also means reduced access to credit, which could be particularly troublesome to small farmers if the current drought reduces output.

The drought Argentina is currently going through will likely reduce agricultural output in 2009. Cattle ranchers have already seen a reduction in their herd. As of February 2009 an estimated 1.5 million cows had died due to the drought (Partlow, 2009). In response to the droughts affect on the average weight of a cow, the Argentine government lowered the minimum required weight allowable for market to 575 pounds from 615 pounds (Partlow). Though not a huge weight difference, the weight change is indicative of the trouble the cattle market may be in for 2009. Cow pasture is often now less fertile than it was only a few years ago as more fertile land was made available for soy and cow pasture was pushed to less fertile soil (Partlow); the pasture difference is now evident as the country suffers from a lack of rain.

Export restrictions for products such as beef are still in place in Argentina and the wheat export registry also remains closed. Output may be further reduced if farmers who typically export their goods are incapable of doing so on account of government restrictions. Reduction in output is likely to put upward pressure on prices again. Instability in the export market has been created because farmers cannot predict when or what exports the government will restrict and because the government has a history of curbing agricultural exports (Leiras & Soltz, 2006).

Europe and the United States are not the only countries passing legislation requiring a certain percentage of ethanol and biodiesel be used. The Argentine government has mandated 5% ethanol and biodiesel use by 2010 (Allgeier, 2007). This mandate may contribute to the increased production of biofuel crops such as corn and bring with it all of the associated problems previously discussed about biofuels such as higher energy and crop prices.

Argentina may also subsidize the production chain in order to meet the quota by 2010, which, as discussed earlier, would also put upward prices on agricultural goods.

Recommendations

To reduce food insecurity and avoid similar food price crises in the future, preventative steps should be taken on a global scale. Through increased R&D efforts, the removal of trade barriers, reduced protectionism, increased transparency and global coordination, increased incomes for the impoverished, and supply side risk management, food insecurity should decrease globally. It should be noted that as countries move to reduce food insecurity, policies should be well thought out and made with caution; policies, like subsidies, can be difficult to remove once in place.

Recommendation 1: Increase R&D

Governments should increase agricultural R&D. Though the private sector, such as the international company Monsanto, has invested heavily in agriculture in the last decade these companies are not interested in endeavors such as creating recyclable seeds. This gap in research should be filled by governments. In developing countries agricultural R&D averages a 43% rate of return (Von Braun, 2008) making it a profitable investment that is likely to yield results. Through R&D initiatives in the past, agricultural productivity has been

increased and transportation costs decreased (Von Braun, 2008). Currently, countries should focus agricultural R&D toward increasing crop yields so that farmers can increase supply without increasing land or water use. Developing countries should particularly look to increase agricultural R&D. In some instances, developing countries might be able to benefit from the spillover effect of developed countries R&D efforts, however, developed countries R&D is not always applicable to developing countries needs. Developing countries should focus on their own region specific as well as crop specific research areas. Perhaps equally important as increasing the R&D initiative is being able to disseminate information from the researcher to the farmer; countries should take great care to make sure new advances in the industry are efficiently passed along to those who need them.

Recommendation 2: Remove Barriers to Trade

Removing barriers to trade such as import tariffs on food and farming inputs, export quotas, export bans, and export taxes including Argentina's sliding-scale tax will allow countries with comparative advantage to produce goods at the lowest cost and then sell them on the global market place. For this to truly work, countries would collectively need to make an effort to reduce trade distorting subsidies. Removing, or reducing, barriers to trade and trade distorting subsidies would benefit both food and biofuel agriculture and prevent distorted price signals for these goods on the global market. Of course, political considerations hinder the effectiveness of such actions domestically, and international competition is generally difficult to effectively coordinate.

Recommendation 3: Avoid or Reduce Protectionist Policies

The increased protectionism via self sufficiency policies that countries such as China, Malaysia and the Philippines have begun to undertake as discussed earlier in this paper, are detrimental to efforts to increase global food security. Consumers in the protectionist country pay more in the long run for agricultural goods; higher prices reduce purchasing power and food security of the most impoverished. Domestic production is susceptible to disruption from agricultural inputs that are imported which also increases food insecurity. If domestic production is disrupted in a country that has discouraged or banned imports, it may be difficult to procure the necessary goods in the short run required to keep consumption from falling. A decrease in exports due to protectionist policies such as Argentina's sliding-scale tax and export registry restrictions decreases foreign cash flow coming in to the country.

Recommendation 4: Increase Transparency and Global Coordination

As discussed earlier, a failure to coordinate the release of grain reserves on a global scale kept prices high on the global market. Though reserves were low, the coordinated global release of grains may have been enough to keep prices from rising so quickly in phase two of the food price crisis. Increased transparency and communication on a global scale is needed in the area of global grain reserves. Countries should reach an agreement to maintain an adequate global grain reserve that is monitored by some appointed international agency that can quickly and easily share information between countries. Additionally, an agreement

should be made to release said global grain reserves when certain criteria are met on the global market, such as the high prices seen in the food price crisis of 2008. By increasing transparency and communication, it may be possible to prevent such a crisis in the future.

Recommendation 5: Reduce Poverty Gap by Increasing Income of the Most Impoverished

Decreasing structural food insecurity in the long run will help consumers be more prepared should another food price crisis arise. Structural food insecurity is a demand side problem and could be largely solved by increasing the incomes of those most impoverished (Ingco & Nash, 2004). The lack of purchasing power of the poor keeps them from translating their need for food into a demand for food. If incomes of the most impoverished are increased, demand will increase. An increase in demand will increase the incentive for suppliers to increase production and the economy as a whole is likely to benefit. However, this is more of a long-run solution since the increase in income can only be achieved through an increase in productivity, which requires significant increases in education and training. Otherwise, a nominal increase in incomes would result in an equivalent increase in inflation.

Recommendation 6: Implement Supply Side Risk Management

Food insecurity can also be reduced by implementing effective supply side risk management. Poor farmers are often unable to escape poverty or increase production past subsistence levels due to their inability to take on more risk (Brown & Gentilini, 2007). Enabling farmers to take on risk that is likely to increase profits, such as growing riskier but more profitable crops, may help farmers increase aggregate output. Brown and Gentilini suggest the implementation of weather related insurance that would protect farmers if crops were lost due to weather related conditions such as drought or flooding. Access to such risk management tools may also increase the poor farmer's access to credit as lenders might recognize a farmer with weather related insurance as a less risky investment. It should be noted that risk management such as weather related insurance could be offered by the private sector and need not necessarily be funded by the government.

Conclusion

Studying the causes, impacts, and responses of the food price crisis of 2008 will aid in a better understanding of how to prevent future food price crises. By understanding the five causes behind the food price crisis: high energy costs, weather related shortages, the depreciation of the dollar, increased demand from developing countries, and low reserve levels, the global community will know how to avoid similar situations and similar crises.

Overall, the food price crisis had a negative affect on consumers, producers, governments, and international markets.

It is equally important to study the secondary affects of the food price crisis stemming from government responses, such as those made by Argentina, and the affects of those responses on consumers, producers, governments, and international markets. Trade oriented responses were among the most popular responses implemented globally. Countries responded to the food price crisis by reducing import tariffs, releasing reserves, increasing imports in order to store reserves and calm consumer fears of shortages, and restricting exports. Argentina responded to the food price crisis by implementing trade oriented measures as well, including a controversial sliding-scale tax that, in the end, negatively affected consumers, producers, the government, and international trade.

Most importantly, countries should now focus on preventative measures that will reduce the likelihood of food price crises in the future. Emphasis should be given to increased R&D efforts, the removal of trade barriers, reduced protectionism, increased transparency and global coordination, increased incomes for the impoverished, and supply side risk management. Combined, these six areas in particular, should increase food security globally and reduce the likelihood of another food price crisis like the one of 2008.

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