Policy responses to high food prices in Latin America and the Caribbean

Country case studies

Policy responses to high food prices in Latin America and the Caribbean

Country case studies

Edited by:

Ekaterina Krivonos
and
David Dawe

TRADE AND MARKETS DIVISION
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2014

E-ISBN 978-92-5-108458-8 (PDF)

Photo credits:
Front cover: © FAO/Joan Manuel Baliellas
Back cover: © FAO Saul Palma

CONTENTS

CONTRIBUTORS

Liliana Balbi
Senior Economist
Trade and Markets Division
Food and Agriculture Organization of the United Nations (FAO)
Rome, Italy

Joaquim Bento de Souza Ferreira Filho
Professor
Escola Superior de Agricultura "Luiz de Queiroz"
University of São Paulo
Piracicaba, SP, Brazil

David Dawe
Senior Economist
Agricultural Development Economics Division
Food and Agriculture Organization of the United Nations (FAO)
Bangkok, Thailand

Carlos Eduardo de Freitas Vian
Professor
Escola Superior de Agricultura "Luiz de Queiroz"
University of São Paulo
Piracicaba, SP, Brazil

Ekaterina Krivonos
Economist
Trade and Markets Division
Food and Agriculture Organization of the United Nations (FAO)
Rome, Italy

Hector Maletta
Professor
Graduate School of Social Sciences
University of Buenos Aires
Buenos Aires, Argentina

Julio J. Nogués
Independent researcher
Member of the National Academy of Economic Sciences
Buenos Aires, Argentina

Norberto A. Quezada
Independent researcher
USA

Luis Rivera
Universidad de Costa Rica
San José, Costa Rica

Isidro Soloaga
Professor
Department of Economics
Universidad Iberoamericana
Ciudad de México, Mexico

Sara A. Wong
Professor
Polytechnic University (ESPOL)
Guayaquil, Ecuador

FOREWORD

Food price volatility and the policy challenge

For most of the past fifty years, real agricultural commodity prices followed a downward trend punctuated by short-lived peaks that were not matched by equally pronounced and short-lived price falls but rather were separated by extended price troughs. Since around 2002 it appears that food prices have departed from this secular decline: prices have now been above trend for longer than at any time in the previous forty years and food price inflation has been faster than overall inflation in most countries. Prices have also become increasingly volatile with successively higher peaks in 2007-2008, 2010-2011 and, most recently, 2012. The 25 percent increase in international grains prices in July 2012 was the third such price spike in the last five years. Some price volatility is typical of agricultural markets but these recent events have been widely described as "excessive volatility" reflecting "abnormal market conditions" although these terms are hard to define precisely. Each resurgence of high food prices prompts fears of a repeat of the "2007-2008 world food crisis" threatening increasing food insecurity, rampant food price inflation and civil unrest. Fortunately, prices have stabilized and these fears have proved unfounded. Nevertheless, many commentators expect relatively high and volatile agricultural commodity prices to persist and to continue to challenge the ability of consumers, producers and governments to cope with the consequences.

Most countries in Latin America and the Caribbean, and especially the food importers, felt the impacts of these price shocks. Domestic prices did not necessarily move to the same extent and did not move simultaneously. A variety of local market factors and policy measures meant that in most cases transmission of price shocks was less than 100 percent and was delayed. The magnitude of the domestic impacts depended on the degree of exposure to international market developments and the vulnerability of sections of the population. Poorer net food importing countries fared poorly. For food exporters, higher prices on world markets offered a chance of windfall gains although higher volatility made their exports earnings less stable. While higher prices tend to be associated with greater volatility, it is very important to distinguish clearly between the two especially from the policy point of view and to be clear which policy priority is being addressed.

The impact of high and volatile food prices on consumers is clearly negative: poor consumers spend the biggest share of their

income on food and their diets often lack diversity limiting their ability to switch to cheaper foods. High food prices reduce the quantity and the quality of the food they can consume, worsening food insecurity and malnutrition and pushing more households, at least temporarily, below the poverty line. Overall, Latin America and the Caribbean have the capacity to produce sufficient quantities of basic foods to meet the region's needs. In the last twenty years, the region has increased its contribution to global supplies of beef, cereals, oils and sugar, although this has been primarily due to the expansion of production in a few countries in the Southern Cone. Nevertheless, access to food remains limited for a large share of the low-income population so increases in the prices of basic food crops, such as maize, rice, and wheat, that play an important role in the region's diets, are seen as a threat to food security in the region. In practice, the relationship between food price hikes and volatility and food insecurity is complex. Attribution and measurement are difficult. Nevertheless, most governments in Latin America and the Caribbean took steps to shield their consumers from the international price hikes.

In principle higher prices should be good news for producers and exporters. Provided the rents arising from higher prices are not taxed away by government but rather go to producers, they should provide both an incentive and financing for increased investment and a positive supply response. However, in practice those incentives and a positive supply response did not materialize for all producers in the region. Partly this reflects the less than perfect transmission of international prices of agricultural products but in some cases it was the result of policy choices. It also reflects relative price shifts. Input prices, especially for oil-based fertilizers, can increase faster than output prices leaving producers no better off. Supply-side constraints such as transport and storage limitations or lack of access to inputs and credit can also prevent producers from capitalizing on higher prices. For poor food producers price volatility means uncertainty and increased risk that deter the investments essential to increasing food production and reducing vulnerability. Many governments in Latin America and the Caribbean recognized that to preserve food security they also needed policy interventions to encourage production and to foster an enabling environment that supported the channelling of increased producer revenues into investment and growth.

Responding to high and volatile food prices involves trade-offs or even conflicts between policy objectives as measures compete for scarce budgetary resources and too few policy instruments seek to address too many policy objectives. Policy incentives to encourage production may not be compatible with measures to protect the food security of poor consumers. The policy problems created by food price volatility also have a macroeconomic dimension. Rising food prices fuel inflation while increasing and volatile food import bills threaten exchange reserves and disrupt development budgets, slowing growth and development. Where agricultural commodity exports are significant, price volatility on international markets can be transmitted to government revenues, the exchange rate and the rest of the economy. Governments in Latin America and the Caribbean have struggled to reconcile competing demands for lower food prices and consumer safety nets with those for maintaining price incentives and input subsidies all against the background of domestic budget constraints and international financial problems.

In this complex policy environment, policy choices have understandably often been dominated by short-term considerations attempting to address the immediate priority of real income losses of poor food consumers at the expense of suppressing incentives to producers to invest in improving resilience through improving productivity. Trade policies in particular have been seen as quick and cheap responses in this respect but were also problematic. Reductions in applied tariffs by food importers made little impression against the sharp increases in food prices while export restrictions introduced by food exporters, although permissible under WTO rules, were criticized internally for suppressing incentives and externally for disrupting international trade and driving prices even higher. In many cases, therefore, trade policy measures introduced had limited effects and inflicted collateral damage either to domestic markets requiring counteracting additional distortionary policies or in some cases to international markets. Policy objectives were further complicated by the need to raise fiscal revenues in some countries facing current account difficulties as a result of the global financial crisis. Export taxes were one mechanism to do that.

The experience of the 2007-2008 food price crisis exposed the lack of preparedness and low level of resilience to international food price surges in many countries around the world. Most countries in Latin America and the Caribbean were better suited to react because they had in place policies and programmes that could be activated or scaled up when the need arose, albeit at some budgetary cost. Reactions to the short-term problem could be rapid in most cases. However, coping with food price volatility in the medium term requires increasing resilience. For most poor countries a healthy agricultural sector is essential to reduce vulnerability to international price volatility, to overcome hunger and poverty and to provide the platform for overall economic growth. The substantial increases in investment needed to reduce vulnerability to international food price volatility and enhance food security have not yet been widely achieved.

The Latin American and Caribbean policy experience can provide important lessons for other countries facing similar food price inflation and volatility problems. This book describes and reviews how policy-makers in Latin America and the Caribbean have responded to food price hikes and increased price volatility. It looks at a cross-section of eight selected countries – Argentina, Bolivia, Brazil, the Dominican Republic, Ecuador, Mexico, Nicaragua and Peru – that differ widely in their economic structures, trade orientation and food security status. The focus is particularly on the first international price spike in 2007-2008 and the short-run policy responses aimed at restraining prices and limiting the threat to food security. Each case study provides insights into the economic and policy environment at the time, analyses the policies and programmes that were introduced, reviews their impacts on consumers, producers and the overall food security situation, and provides an assessment of their effectiveness. The final chapter of the book then provides an overview of the different types of policies that were utilized and makes a general assessment of their advantages and disadvantages in different country contexts.

There is obviously no "one size fits all" solution to coping with price volatility. The different experiences presented in the case studies illustrate policy choices available and how they worked in the specific country circumstances. Given the diversity of the countries' political, economic and social environments that determine the policy space and the outcomes, it is neither desirable nor possible to derive universal conclusions and policy recommendations from these studies. However, the results do provide insights into the effectiveness of the different measures in achieving the intended food security goals and the challenges encountered in their implementation in particular sets of circumstances. The importance of some of the Latin American case-study countries in world agricultural trade also makes their domestic policy actions a matter of global interest. These Latin American and Caribbean case studies can therefore make a useful practical contribution to the global debate on appropriate policy responses to food price inflation and volatility.

David Hallam
Director
Trade and Markets Division

ACRONYMS

ADESS	Administradora de Subsidios Sociales
ADOFA	Asociación Dominicana de Factorías de Arroz
AGF	Aquisições do Governo Federal
ASERCA	Apoyo y Servicios a la Comercialización Agropecuaria
BCE	Banco Central del Ecuador (Central Bank of Ecuador)
BCN	Banco Central de Nicaragua (Central Bank of Nicaragua)
BDH	Bono de Desarrollo Humano (A conditional cash transfer programme)
BFB	Basic food basket
BFP	Bolsa Família Programme
BNF	Banco Nacional de Fomento (The national bank for the agricultural sector)
BONOGAS	Bono para Compra de Gas
BPA	Bono Productivo Alimentario (Food Production Transfer)
CeP	Comer es Primero
CET	Mercosur's common external tariffs
CFP	Company (Companhia de Financiamento da Produção
CIF	Cost, insurance and freight
CNA	National Agricultural Census
CO	Contrato de Opções
CONA	Comisión Nacional Arrocera
CONAB	Companhia Nacional de Abastecimento –
CONEVAL	Consejo Nacional de Evaluación de la Política de Desarrollo Social
CORPEI	Corporación de Promoción de Exportaciones e Inversiones (Private institution that promotes exports and FDIs in Ecuador)
CPI	Consumer Price Index
DE	Decreto Ejecutivo (Executive Decree)
DGA	Dirección General de Aduanas (Customs Office)
DIGEPRES	Direccion General de Presupuesto
DP	Direct Purchase from Family Agriculture
ENABAS	Empresa Nicaragüense de Alimentos Básicos (Nicaraguan Basic Food Company)
EPH	Encuesta Permanente de Hogares
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEDEAGRO	Confederación Nacional de Asociaciones de Productores Agropecuarios, Venezuela (National organization of farm producers from Venezuela)

FOB	Free On Board
FTA	Free Trade Agreement
GCPS	Gabinete de Coordinación de Políticas Sociales
GMOs	Genetically modified seeds
IAD	Instituto Agrario Dominicano
IBGE	Instituto Brasileiro de Geografia e Estatística
IBRD	International Bank for Reconstruction and Development
IDB	Interamerican Development Bank
ILAE	Incentivo a la Asistencia Escolar
INDEC	Instituto Nacional de Estadísticas y Censos
INEC	National Institute of Statistics and Census Institute)
INESPRE	Instituto de Estabilización de Precios
INE	Instituto Nacional de Estadística
INIDE	Instituto Nacional de Información de Desarrollo (National Statistics
IPEA	Instituto de Pesquisa Econômica Aplicada
KG	Kilogram
LDP	Local Direct Purchase with Simultaneous Donation
MAGFOR	Ministerio Agropecuario y Forestal (Ministry of Agriculture)
MDA	Ministério de Desenvolvimento Agrário
MDS	Ministério de Desenvolvimento Social e Combate a Fome
ME	Ministerio de Economía
MIFIC	Ministerio de Fomento Industria y Comercio (Ministry of Industry and Commerce)
MINED	Ministerio de Educación (Ministry of Education)
MINSA	Ministerio de Salud (Ministry of Health)
MINTRAB	Minsterio del Trabajo (Ministry of Labour)
MoA	Ministerio de Agricultura
MPs	Market prices
MZ	Manzana (0.7 Hectares)
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Cooperation and Development
ONCCA	Oficina Nacional de Control Comercial Agropecuario
QRs	quantitative export restrictions
PAA	Programa de Aquisição de Alimentos –
PAE	Programa de Alimentación Escolar (A government school food programme)
PAL	Progama de Apoyo Alimentario –
PANN	Programa Nacional de Alimentación y Nutrición (A government food and PPP Purchasing Power Parity nutrition programme)
PATCA	Proyecto de Apoyo a la Transición Competitiva Agroalimentaria
PAZM	Programa Alimentario para Zonas Marginadas
PEP	Premio de Escoamento de Produto –
PEPRO	Equalizing Premium to Producers (Premio Equalizador Pago ao Produtor
PGPM	Programa de Garantia de Preços Mínimos
PNA	Programa Nacional de Alimentos (National Food Programme)
PNAIR	Programa Nacional de Agroindustria Rural (Rural Agribusiness Programme)
PNF	Programa Nacional Forestal (National Forestry Programme)
PNAD	Pesquisa Nacional por Amostragem de Domicílios

POLSSAN	Política Sectorial de Seguridad y Soberanía Alimentaria Nutricional (Food PPP Purchasing power parity
PPA	Programa Productivo Alimentario (Food Production Programme)
PROMASA	Programa de Apoyo a la Industria Molinera y del Nixtamal
PRONAF	Credit to family agriculture, known as the
PROP	Prêmio de Risco para Aquisição de Produto Agricola Oriundo de Contrato Privado de Opção de Venda
PRORURAL	Programa de Desarrollo Rural Incluyente (Inclusive Rural Development Programme)
PSD	Purchase and Simultaneous Donation and Nutrition Security and Sovereignty Policy)
QQ	Quintals (1 qq equals 100 pounds or 45.45 kilograms)
RO	Registro Oficial (Official Registration)
SAFP	Sistema Andino de Franjas de Precio (Andean Community system of price bands)
SAGARPA	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
SF	Stock Formation
SIGAGRO	Sistema de Información Geográfica y Agropecuaria (Geographical and agricultural information system)
SIUBEN	Sistema Único de Beneficiarios
SPAR	Sistema Productivo Agropecuario Rural (Rural Agricultural Productive System)
SSAN	Ley de Soberanía y Seguridad Alimentaria y Nutricional (Food and Nutrition Security and Sovereignty Law)
STE	Subsidio a Tarifa Eléctrica
TCB	Total Consumption Basket
TEC	External Common Tariff
UEPI	Unidad Ejecutiva de Pignoraciones
UNA	Unidad Nacional de Almacenamiento (The national storage unit for agricultural products)
UPA	Unidad Productiva Agropecuaria (A farm unit)
USDA	United States Department of Agriculture
VAT	Value added tax
VEP	Product Flowing Value (Valor de Escoamento de Produto)
WPI	Wholesale Price Index
WTO	World Trade Organization

INTRODUCTION

INTRODUCTION

DAVID DAWE AND EKATERINA KRIVONOS*

The level of world prices, as measured in nominal terms by the Food Price Index of the Food and Agriculture Organization (FAO) of the United Nations, doubled between 2005 and 2011, registering two sharp peaks – during the second quarter of 2008 and the first half of 2011 – and remaining well above the 2000-2005 level in the following years. Persistently high food prices since 2006 have eroded the purchasing power of poor households. At the national level, high food prices had a severe negative impact on the trade balances of net food-importing countries, while net food exporters benefitted from growing export revenues and agricultural incomes.

Latin America and the Caribbean have the capacity to produce sufficient levels of basic foods. In the past decade or two, the region has increased its contribution to the global supply of products that are vital for food security (e.g., cereals, oils, bovine meat, and sugar), although this has been primarily due to the expansion of production in a few countries in the Southern Cone. Despite adequate supplies, access to food remains limited for a large share of the low-income population, thus threatening food security in the region. Therefore, the increases in prices of basic food crops, such as maize, rice, and wheat, that play an important role in the region's diets have placed food security atop the political agenda in Latin America and the Caribbean, in particular for those countries that depend heavily on food imports. This prompted a number of policy responses to mitigate the negative effects of high prices on poverty and hunger during the world food price crisis of 2007-2008.

Most countries adopted policies in an attempt to influence domestic prices directly through border measures and price controls or, more commonly, to create incentives for increasing domestic supply and boosting social protection measures. The majority of countries adopted some measures to stimulate production, for example by providing greater access to credit or inputs. Safety nets, including cash transfers and food distribution programmes, were expanded. These policies were typically not introduced as completely new interventions, but rather existing policy frameworks were built up by expanding coverage.

Among trade policy instruments, export restrictions and the elimination of import tariffs have been the preferred policies to address food security

* Senior Economist, Agricultural Development Economics Division and Economist, Trade and Markets Division, FAO.

concerns. Border measures were particularly attractive for policy makers because they represented a quick option for containing the negative effects of global price increases on domestic consumers. Moreover, export taxes were also seen as measures to boost fiscal revenues, especially for those countries that faced current account difficulties as a result of the global recession triggered by the financial crisis in 2008. The set of trade instruments depended mainly on whether the country was a net importer or a net exporter of the products that are most widely consumed in each country, and focused on the key products that make up the basic consumption basket.

This book presents evidence with regard to the effectiveness of policies and programmes introduced in response to rising food prices in eight selected Latin American countries: Argentina, Bolivia, Brazil, the Dominican Republic, Ecuador, Mexico, Nicaragua and Peru. The eight country case studies provide insights into the economic and policy environment at the time of the first price spike of 2007-2008, analyse the measures that were introduced to counter rising prices and discuss the evidence on the effects on consumers, producers and the food security situation. The final chapter of the book then provides an overview of the different types of policies that were utilized, including a general assessment of their advantages and disadvantages in different contexts.

No universal policy recommendations can be drawn from these studies, given the heterogeneity of the countries' political, economic and social environments that determine the policy space and the outcomes. The results do however provide some insights and lessons learned in terms of the effectiveness of the different measures in achieving the intended food security goals, including the challenges encountered in their implementation. This evidence thereby contributes to the debate on appropriate policy responses to future price shocks.

CHAPTER 1

THE EVOLUTION OF FOOD PRICES IN LATIN AMERICA

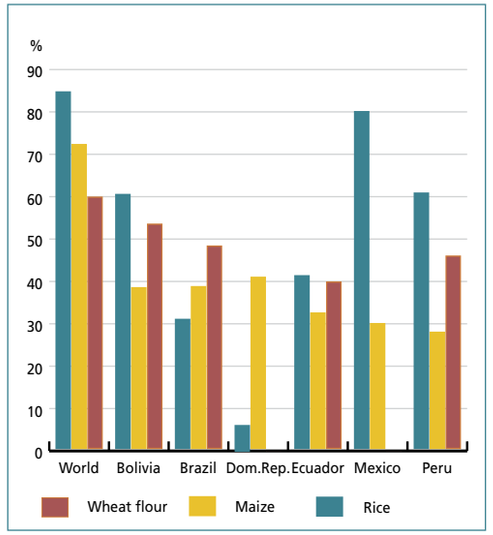
Country experiences

DAVID DAWE AND EKATERINA KRIVONOS*

Inflation-adjusted annual prices for rice, maize and wheat on the world market increased by 84, 72 and 59 percent, respectively, between 2006 and 2008, the largest shocks since the early 1970s. Generally speaking, none of the countries analysed in this book were immune to these shocks, although not all countries had the same experience or the same degree of price increase. For rice, maize and wheat flour, for all countries for which data are available, real annual average domestic prices increased between 2006 and 2008 by at least 25 percent in all cases (Figure 1) except for one (rice in the Dominican Republic, see discussion below). At their monthly peaks in 2008, prices paid by consumers were often more than 50 percent higher than in early 2006. Thus, although domestic prices increased less than international prices, the implications for food security were severe, even for countries that utilized a wide range of policies in an attempt to insulate the domestic food economy from the price shock.

* Senior Economist, Agricultural Development Economics Division and Economist, Trade and Markets Division, FAO. Helpful comments from David Hallam and Jamie Morrison are gratefully acknowledged. Any errors are the responsibility of the authors.

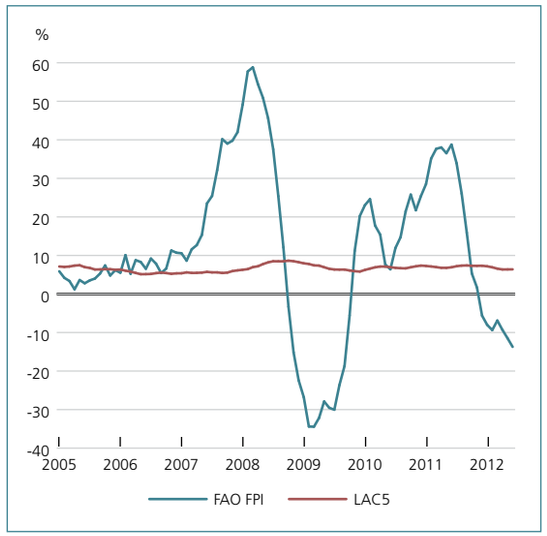
FIGURE 1: PERCENTAGE INCREASE IN ANNUAL REAL WORLD MARKET AND DOMESTIC WHOLESALE CEREAL PRICES, 2006-2008



Notes: For rice in Brazil, the data refer to 2007 to 2008. For the world market, data refer to wheat grain, not wheat flour. USA long grain prices are used as the measure of world rice prices.
Source: FAO (2013b), USDA (2013) and country chapters.

Figure 2 shows the GDP–weighted average annual changes in the consumer food price index in a subset of countries (Argentina, Brazil, Colombia, Mexico, and Venezuela) for which data are available since 2005, together with FAO's Food Price Index (FPI) that

FIGURE 2: YEAR-ON-YEAR FOOD PRICE INFLATION IN LATIN AMERICA AND THE CARIBBEAN, COMPARED TO YEAR-ON-YEAR CHANGES IN THE FAO FOOD PRICE INDEX (FPI), 2005-2011



Note: LAC5 is a gross domestic product–weighted average of food inflation (official data) in five countries: Argentina, Brazil, Colombia, Mexico, and Venezuela.
Source: FAO, Regional Office for Latin America and the Caribbean, based on official country data.

measures the evolution of international prices (Krivonos, 2013). In general, price increases were steep during 2006-2008, but much less pronounced in domestic markets than globally, partly because of currency appreciation in many of the countries and partly because some staple crops are grown and consumed domestically, without much interaction with global markets, as is the case for white maize in Mexico. However, border measures and domestic policies also played a role in insulating the domestic prices of internationally traded commodities, such as cereals, from fluctuations in world markets.

The analysis by product shows the differences in interactions between the international and the domestic markets in different countries, depending on the structure of production and trade and the policy measures taken in response to rising food prices.

Rice

In the case of rice, the first point to note is that the level of domestic prices varied widely across countries before the crisis (see Figure 3; all domestic prices in the graph are at wholesale level)[1]. Throughout the period 2007-2009, domestic prices were highest in the Dominican Republic, Mexico and Nicaragua, all three of which are consistent importers of rice. Importers have a general tendency to provide protection (raising domestic prices above world prices using tariffs and/or quotas) in an effort to increase domestic production and the rate of self-sufficiency, thereby reducing reliance on world markets for national food security[2]. Such a strategy is popular with importing countries because the high level of domestic prices (above world prices) means that the relatively inexpensive imports can generate revenue for governments through tariffs (e.g., Dominican Republic, Nicaragua).

During the 2007-2009 period, among the countries analysed, prices were consistently lowest in Brazil and Ecuador. Ecuador is a small net exporter of rice, and Brazil is a small net importer and a sporadic exporter – thus, they have fewer concerns about securing supplies on the world market. Their status as exporters results from their marginal costs of production being lower than in other countries. This comparative advantage, along with the fact that exporting countries have to incur transport costs in order to sell to importing countries, explains why domestic prices tend to be lower in exporting countries.

[1] The discussion here is confined to those countries in which rice was a case study. Although rice was not discussed in the Argentina, Bolivia and Peru chapters, rice prices increased substantially in all those countries.

[2] It is true that importers often reduce or eliminate tariffs when world prices increase, but this is a policy designed to promote price stability in times when world prices are high. On average, over time, prices are higher in importers because they make use of tariffs, especially when world prices are low or at "normal" levels.

The percentage increase in annual domestic wholesale rice prices varied widely across countries between 2006 and 2008, with an increase of just 6 percent in the Dominican Republic as compared to an increase of 79 percent in Mexico (Figure 1). While there was wide variation across countries, the increase in real domestic rice prices was 30 percent or more everywhere except in the Dominican Republic.

Price volatility (as measured by the coefficient of variation, CV, of monthly real prices over the period 2006-2009; see Table 1) was lower in all countries than in the United States, which is used as the reference world market for this region. Ecuador and the Dominican Republic had lower CVs than the other countries, and this is visually evident from the graph. Rice is the main source of dietary energy (19 percent of the total in 2006-2007) in both these countries (Ecuador and the Dominican Republic) – given this importance, both of these countries used a wide range of policies to stabilize domestic prices, including border measures, support prices and others, as described in the country chapters.

Rice is also an important item of food consumption in Nicaragua (16 percent of total dietary energy in 2006-2007, but less than the 25 percent from maize), but domestic prices were not particularly stable. This probably reflects Nicaragua's large exposure to the world market – imports accounted for about 40 percent of domestic consumption in 2007 and 2008, much greater than in the Dominican Republic (where it was about 3 percent). When a country is as reliant as Nicaragua is on the world market, it is not possible to insulate the domestic economy from such a large shock without large across-the-board subsidies to consumers. But this is extremely costly in fiscal terms and most countries are not willing or able to provide such large subsidies. Consumers in the Dominican Republic did not experience such a large shock, however, they had to bear the burden of relatively high prices even before the crisis hit (and after the world price declined) due to substantial import restrictions.

Brazil's level of per capita GDP is higher than in the Dominican Republic, Ecuador and Nicaragua. In addition, rice accounts for a smaller share of dietary energy (11 percent of dietary energy in 2006-2007). These factors combine to make rice price stability less important than in poorer countries and may account for the fact that there seems to be more political willingness in Brazil to accept market price fluctuations (although the government still engages in purchases and sales of rice, see the country chapter for more details). Finally, Mexico has an even higher level of per capita GDP than Brazil, and rice accounts for just 2 percent of dietary energy (compared to 32 percent for maize), so at the national level it is not a crucial commodity for food security, although it may be in some regions.

This cross-country analysis of rice prices suggests that countries' use of interventionist price and trade policies depends on whether the country is a net importer or a net exporter, the importance of the commodity in the local diet and the level of per capita income. The ability of countries to shield domestic prices

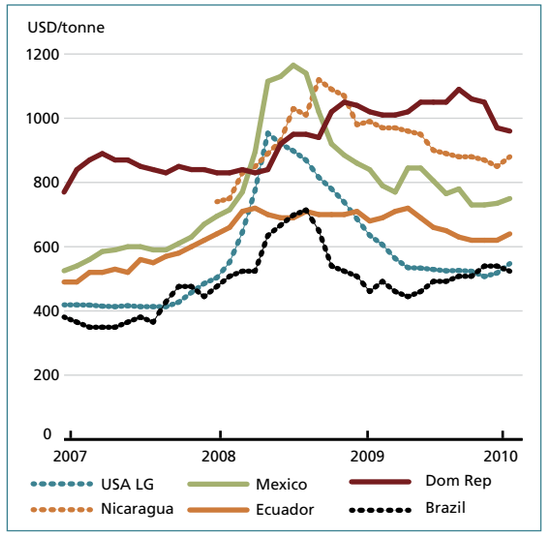
TABLE 1: COEFFICIENT OF VARIATION (CV) OF INFLATION-ADJUSTED MONTHLY RICE PRICES, 2006-2009

Country	CV (%)
Bolivia	22.4
Brazil	14.4
Dominican Republic	9.4
Ecuador	13.2
Mexico	26.8
Peru	18.7
World (USA)	28.6

Note: Nicaragua's CV is not included in this comparison because data are not available for 2006 and 2007. Calculations for Brazil pertain to 2007-2009 due to lack of data for 2006. All calculations are done in real local currency terms.
Source: Authors' calculations.

from international shocks (if desired) depends on the level of import dependency (the share of imports in domestic consumption), which in turn depends on the policies that are in place before the surge. For example, Nicaragua (with a high import dependency) was vulnerable to world price shocks, while the Dominican Republic was less vulnerable due to its low import dependency. But it is crucial to note that the Dominican Republic reduced its vulnerability by resorting to very high levels of domestic prices in "normal" times, with prices roughly double the level in the United States in "non-crisis" times, as shown in Figure 3. Basically, it has adopted a regime where prices are always high instead of occasionally high. The cost of these higher prices is often greater poverty, as the bottom quintile of the income distribution is usually a net consumer of food (although this is an empirical issue and is not necessarily true for all countries).

FIGURE 3: NOMINAL WORLD MARKET AND DOMESTIC WHOLESALE RICE PRICES, JANUARY 2007 TO DECEMBER 2009



Note: LAC5 is a gross domestic product–weighted average of food inflation (official data) in five countries: Argentina, Brazil, Colombia, Mexico, and Venezuela.
Source: FAO (2013b), USDA (2013) and country chapters.

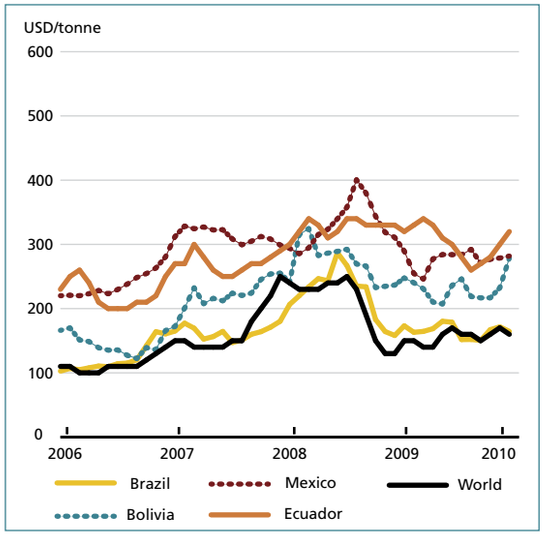
Maize

Maize is more complex than rice in that most demand is for feed rather than food. In Argentina, the Dominican Republic and Ecuador, ignoring indirect consumption through meat and other products, maize accounted for just 2-3 percent of dietary energy in 2006-2007. The corresponding figure was 7 percent in Brazil and Peru, and 14 percent in Bolivia. Maize is much more important in Mexico and Nicaragua, however, where food demand for white maize is comparable to or exceeds feed demand for yellow maize. In those two countries, it accounted for 32 and 25 percent of dietary energy, respectively. As a result, the price data in Figures 4a and 4b for Mexico and Nicaragua are for white maize (which is typically consumed directly by people), while in the other countries it is for yellow maize (which is typically consumed by animals).

As with rice, the lowest domestic prices are found in exporting countries – in this case Brazil, which usually exports between 10 to 20 percent of its production, and Bolivia, which is typically a small net exporter. All of the other countries are maize importers, and their level of domestic prices is higher than in Bolivia and Brazil.

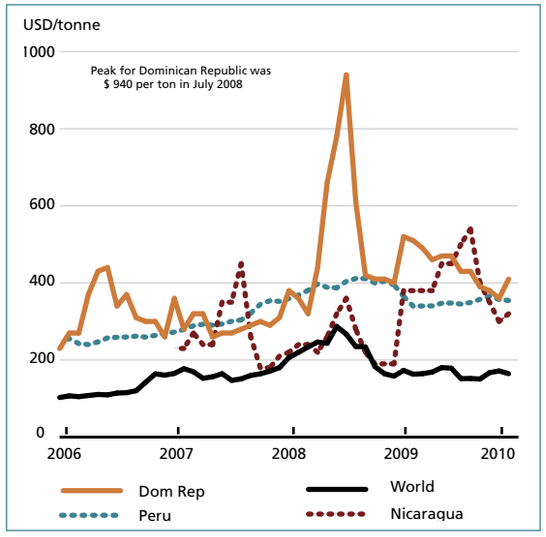
Domestic maize price volatility was generally greater than in the case of rice, and in the Dominican Republic and Nicaragua the CV of domestic prices was greater than the CV of world prices (in both nominal US dollars and in real local currency). For Ecuador, Mexico and Peru, the CV in real local currency terms was lower than that on world markets. Some of this reduced variability was due to local currency appreciation – the CV of world prices in real local currency terms was less than the CV of world prices in real US dollars. But most of the reduced volatility was due to other factors such as natural barriers provided by transport costs. Policies such as temporary tariff reductions in Mexico may have played a role in the reduced volatility, but Peru adopted

FIGURE 4A: NOMINAL WORLD MARKET AND DOMESTIC WHOLESALE MAIZE PRICES, JANUARY 2006 TO DECEMBER 2009



Source: FAO (2013b) and country chapters.

FIGURE 4B: NOMINAL WORLD MARKET AND DOMESTIC WHOLESALE MAIZE PRICES, JANUARY 2006 TO DECEMBER 2009



Source: FAO (2013b) and country chapters.

a *laissez-faire* approach and achieved an even greater reduction in volatility. In the case of Brazil, domestic prices tracked world prices very closely – not surprising for the world's third largest exporter. Despite a plethora of policy interventions such as tariff reductions and export bans, Bolivia's domestic prices also roughly followed world prices, with a CV similar to that for Brazil.

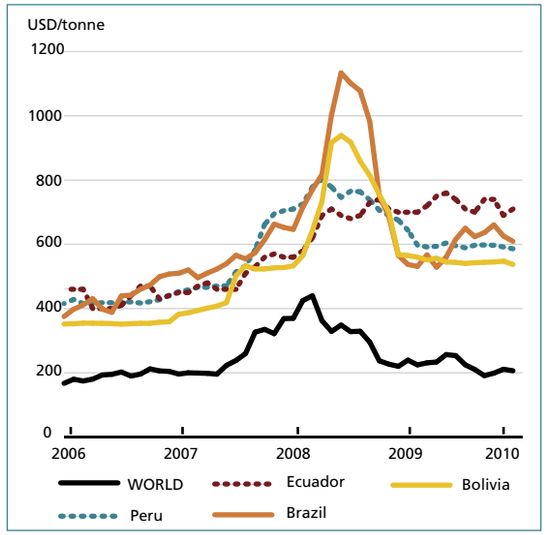
Wheat

In the case of wheat, all of the countries studied in this book rely on imports for a substantial share of domestic consumption, with Argentina being the only exception. Average import dependency ratios for 2006-2009 ranged from about 35 or 40 percent in Bolivia and Mexico to essentially 100 percent in the Dominican Republic, Ecuador and Nicaragua (with Brazil and Peru intermediate between the two groups). With such high import dependency ratios, all of these countries are vulnerable to rising world prices, and Figure 5 shows that domestic wholesale wheat flour prices rose substantially in all countries. In real local currency terms, domestic prices increased by 39 to 53 percent between 2006 and 2008 (based on annual averages). It is also evident from the graph that there is less variability in cross-country experience for wheat than for rice and maize – prices moved up and down in roughly similar fashion across countries, and the price peak was sharp, with prices falling relatively rapidly afterwards. This happened because all of the countries shown in the graph are heavily reliant on imports. Thus, temporary tariff reductions were a common policy intervention for wheat.

Argentina is one of the world's top ten wheat exporters[3], but it is also heavily reliant on trade – between 2006 and 2009, 68 percent of production was exported on average. Argentina did try to insulate domestic prices from rising world prices by

[3] Argentina is not shown in Figure 5 because we have no data on domestic wheat flour prices on a monthly basis for 2006-2007.

FIGURE 5: NOMINAL WORLD MARKET WHEAT GRAIN PRICES AND DOMESTIC WHOLESALE WHEAT FLOUR PRICES, JANUARY 2006 TO DECEMBER 2009



Source: FAO (2013b) and country chapters.

imposing quantitative export restrictions and increasing export taxes, but nevertheless domestic wheat flour prices more than doubled (in nominal terms) from 2007 to 2008.

To summarize, there were some commonalities across countries and commodities, but there were also many important differences. Some of these differences were due to the nature of the specific policies employed in different countries in response to the first price spike in 2006-2008, but the particular circumstances in each country, including the general patterns of production, consumption and trade and the underlying drivers of these, such as the comparative advantages and market structure, also played an important role, as the eight country chapters discuss.

CHAPTER 2

ARGENTINA

JULIO J. NOGUÉS*

Introduction

This chapter seeks to evaluate the impact of changes in Argentina's agricultural trade policy since 2006 on domestic producer and consumer prices. One of the driving concerns for analysing food prices is their impact on social conditions as can be evidenced by recent trends in social indicators, and the different drivers of the increases in consumer prices. Relative price shifts also impact on the patterns of production. The evolution of trade policy and domestic subsidies is also key to understanding how rising prices have been mitigated. Since the changing nature of policy interventions has affected the utilization of land by producers, current trends in agricultural land use have shifted.

Trade policy affecting the agricultural sector

From 1989 to 1995 Argentina implemented far-reaching trade liberalization measures. In spite of the severity of the 2001-2002 recessions, this import liberalization was reversed only to a small extent, since Argentina complied with its obligations under the Uruguay Round and more importantly, with Mercosur's common external tariffs (CET). On the export side, starting around 1990 most export barriers were dismantled and the open trade regime remained relatively unchanged until 2001.

Cereal production grew dynamically during the 1980s and the 1990s. Trade liberalization as well as technological improvements through imported machinery and other farm inputs contributed to agricultural productivity growth.The historical monopoly on fertilizer production and distribution ended with trade liberalization, allowing fertilizer imports at competitive international prices and boosting the application of fertilizers in Argentina (Reca and others, 2010). Finally, Argentina together with the USwasan early adopter of genetically modified seeds (GMOs). The productivity breakthrough started with soybeans but has now expanded to several other products such as maize and cotton. These innovations, closely linked to open trade policies, had clear effects on the growth of cereal production.

However, trade openness did not appearto have had as much of an impact on meat production. Part of the explanation lies in the higher and faster

* Independent researcher, member of the National Academy of Economic Sciences, Argentina.

rate of return to cereal production compared to bovine meat production. The cereal production cycle lasts one year, allowing for the faster adaptation of investment and productive decisions, while the meat production cycle lasts around three years.

Export taxes

Following the liberal trade regime applied during the 1990s, export measures were gradually reintroduced as a consequence of turbulent macroeconomic conditions. Argentina's sovereign debt default, declared in early 2002 resulted in the country being cut off from international financing. The deep recession that followed, and the attendant depletion of treasury revenues, forced successive, short-lived governments to search for ways to mitigate increasing levels of poverty. Export taxes, then under the control of the president, were one of the most expedient ways to raise revenue.

The first announcement was made through Resolution 11/2002 of the Ministry of the Economy (Ministerio de Economía – ME) in March 2002. According to this resolution, export taxes pursued three main objectives: (i) increase government revenue in order to mitigate the negative social impacts of the economic crisis; (ii) stabilize internal prices in the light of the dramatic devaluation of the Argentine peso; and (iii) shield the domestic prices of food and fuel from the negative potential consequences of rising international prices.

Table 1 shows the share of export taxes in the total value of exports included in the World Trade Organization (WTO) trade policy review of Argentina (WTO, 2007). Since 2002, export duties have been applied on all tariff lines, except for some dairy products. Between 2002 and 2005, export taxes rose as a percentage of export values in particular on agricultural, food and mineral products, which continued to represent more than 50 percent of total export value[1].

From 2006 to 2012 export duties increased further: In 2006 the maximum rate was 45 percent, but in 2012, the rates varied between 5 and 100 percent (WTO, 2013). The share of export duties in total tax collection increased from 11.8 percent in 2006 to 20.5 percent in 2011 (Table 2). The largest share of these duties is collected on agricultural exports. Export taxes on agricultural and food products have become the third most important source of treasury revenues after value added tax (VAT) and income tax.

Following Resolution 11/2002, a number of successive announcements further increased tax rates. Table 3 shows the most recent changes in tax rates on major crops and bovine meat. The taxes rose rapidly in 2007 and 2008 on all products except meat, but declined after that, returning to April 2002 levels for maize, bovine meat and wheat[2], but remained high for soybeans and sunflower seeds. The peaks are associated with the introduction of variable tax rates imposed by Resolution 125 of the ME on 12 March 2008. In this short-lived scheme that was adopted as world prices were peaking, the rates were tied to international prices. These measures provoked a series of protests by agricultural producers. The legislature voted against Resolution 125. After four months, as international prices stabilized, export taxes returned to fixed rates.

In addition to the high levels and the wide coverage of export taxes, another salient characteristic is the escalation of taxes that follows from the rate structure that benefits agro-industrial processors at the cost of primary producers. This has been attributed in part to the imbalance between the interests of thousands of dispersed primary producers with little capacity to organize and concentrated processors who are able to act cohesively.

[1] During the final revisions of this chapter, a more recent Trade Policy Review was completed (WTO 2013), however the new analysis does not change the conclusions in this chapter.

[2] For what the tariff declined to 23 percent, somewhat higher than the 20 percent in April 2002.

TABLE 1: EXPORT TAX COLLECTION AS A PERCENTAGE OF EXPORTS: 2002-2005

		2002	2003	2004	2005
01	Live animals; animal products	4.0	5.6	5.3	5.7
02	Vegetable products	8.0	17.8	17.2	17.0
03	Fats and oils	9.0	19.7	17.8	18.2
04	Prepared foodstuffs, etc.	6.8	15.0	14.7	14.4
05	Mineral products	6.2	7.8	9.6	13.9
06	Products of the chemical or allied industries	2.8	4.0	3.7	3.8
07	Plastics and rubber	2.9	4.0	3.7	3.8
08	Hides and skins	2.9	4.3	4.3	4.3
09	Wood and articles of wood	2.9	3.9	3.3	4.1
10	Wood pulp, paper, etc.	3.1	4.7	4.3	4.2
11	Textiles and textile articles	3.0	4.9	4.3	4.2
12	Footwear and headgear	2.6	4.5	4.6	4.4
13	Articles of stone	2.9	4.3	3.7	3.7
14	Precious stones, etc.	0.1	0.2	0.2	0.2
15	Base metals and articles of base metal	3.0	4.3	4.2	4.0
16	Machinery and appliances	2.7	3.9	3.8	3.9
17	Transport equipment	2.9	3.1	3.0	2.8
18	Precision instruments	2.8	3.2	2.9	3.4
19	Arms and ammunition	2.8	5.0	4.6	4.6
20	Miscellaneous manufactured articles	2.5	4.0	4.3	4.3
21	Works of art, etc.	2.0	1.8	2.2	2.3

Source: WTO (2007).

TABLE 2: EXPORT DUTIES, 2006-2011

Export duties	2006	2007	2008	2009	2010	2011
Total collected (Arg$ million)	14 712	20 450	36 055	32 042	45 547	54 163
Growth rate (%)	19.4	39.0	76.3	11.1	42.2	18.9
As a percentage of total tax revenue	11.8	18.7	24.3	21.3	22.1	20.5
As a percentage of the total value of merchandise exports	10.3	11.8	16.4	15.5	17.1	15.7

Source: WTO (2013).

Quantitative export restrictions

As international food prices began rising steeply in 2006, Argentina also gradually introduced a number of quantitative export restrictions (QRs) in an attempt to stabilize food prices to consumers. Initially these restrictions applied to bovine meat and wheat exporters but over time they were also extended to maize. QRs have particularly affected the primary agricultural products that have the highest incidence in the basic food

TABLE 3: EXPORT TAXES, 2002-2011 (%)

Resolution	Issue date	Sunflower seeds	Soybean	Wheat	Maize	Bovine meat
ME 11 02	3 March 2002	13.5	13.5	10.0	10.0	15.0
ME 35 02	8 April 2002	23.5	23.5	20.0	20.0	15.0
ME 10 2007	1 January 2007	23.5	27.5	20.0	20.0	15.0
ME 368 2007	9 November 2007	32.0	35.0	28.0	25.0	15.0
ME 125 2008 (1)	12 March 2008	41.0	41.4	33.0	24.4	15.0
ME 64 2008	2 June 2008	41.0	46.0	33.0	31.4	15.0
ME 80, 81 y 82 2008	21 July 2008	32.0	35.0	28.0	25.0	15.0
ME 26 2008	23 December 2008	32.0	35.0	23.0	20.0	15.0
ME 11 02	3 March 2002	13.5	13.5	10.0	10.0	15.0
ME 35 02	8 April 2002	23.5	23.5	20.0	20.0	15.0
ME 10 2007	1 January 2007	23.5	27.5	20.0	20.0	15.0
ME 368 2007	9 November 2007	32.0	35.0	28.0	25.0	15.0
ME 125 2008 (1)	12 March 2008	41.0	41.4	33.0	24.4	15.0
ME 64 2008	2 June 2008	41.0	46.0	33.0	31.4	15.0
ME 80, 81 y 82 2008	21 July 2008	32.0	35.0	28.0	25.0	15.0
ME 26 2008	23 December 2008	32.0	35.0	23.0	20.0	15.0

Source: On the basis of information provided by the Bolsa de Cereales.

basket (BFB). The share of bovine meat in the BFB is 30 percent while the share of wheat-based products is 16.5 percent.

Export quotas are determined on the basis of estimates of total domestic demand, but are not regulated by any published policy decision. In the case of wheat and maize, the government announced that around six million tonnes of wheat and eight million tonnes of maize are needed to supply the domestic market[3]. Nevertheless, the exports and production figures in Table 4 show that in some years the domestic supply net of exported quantities has exceeded these levels, while at other times it has fallen short.

The significant decline in output levels during 2009[4] was caused by low yields due to one of the most severe droughts in recent history, although it has been argued that trade restrictions have also played a role in shifting land allocation away from wheat (as shown in Table 9). As a consequence of the drought and export controls on beef, bovine meat production has also declined drastically resulting in significant price increases during 2010 and early 2011.

While wheat is essentially used in basic food products such as bread and pasta, maize has been increasingly used for cattle feed and also in the production of chicken and pork. As a result, the bulk of the maize that is not exported is absorbed by the domestic meat industry.

Soybean exports have been essentially free of quantitative export restrictions. Only a small share of soybeans is exported directly, since the bulk of soybean production is transformed into soybean oil, and Argentina has become one of the most important

[3] See for example the interview with the Minister of Agriculture, Julián Domínguez, published in Página 12 on 12 December 2010.

[4] In 2009, wheat output in Argentina declined 43 percent relative to the 2006-2008 average (FAO, 2010).

TABLE 4: PRODUCTION AND EXPORTS OF WHEAT, MAIZE AND SOYBEAN (MILLION TONNES): 2006-2010

Product	Production and exports	2006	2007	2008	2009	2010
Wheat	Production	12.6	14.5	16.3	8.4	7.5
	Exports	9.4	9.4	8.5	5.0	3.0
Maize	Production	14.4	21.8	22.0	13.1	22.7
	Exports	10.3	14.7	15.0	8.3	14.5
Soybean	Production	40.5	47.5	46.2	31	52.7
	Exports	8.2	12.0	11.8	4.5	11.7

Source: On the basis of information provided by the Bolsa de Cereales.

world exporters of this product. The share of vegetable oils in the basic food basket used to calculate food price inflation is rather small explaining why this product has been less affected by export controls than other food products such as bovine meat, maize and wheat.

It is not clear how export quotas are established or how they are allocated among exporters, since no written rules regulating quotas have been published. The absence of such regulation exposes primary production to higher uncertainty than in the case of predetermined ad-valorem export taxes for example. The price distortions caused by export restrictions, in combination with the uncertainty effects, imply that the cost for many small and medium-sized farms may be high.

In addition to export taxes and QRs, the government has also implemented many non-automatic import licenses that although permitted by the WTO, are less transparent and add to the uncertainty that both exporters and importers face. In some instances, imports have been stalled, including imports of machinery used in agricultural production and processing.

Finally, bans and quotas have also raised tensions with some importing partners. For example, the bovine meat bans resulted in Argentina's exporters being unable to comply with previously signed delivery contracts, raising complaints from importing countries such as Russia.

Government subsidies

Direct government subsidies to food processors, managed by the ONCCA, have also been used to address rising food costs. The initial subsidies were announced in early 2007 for wheat and maize mills, but since then, the programme has expanded to cover several other food products, notably meat and dairy products. An important share of these payments has gone to wheat mills and meat producers. In the case of wheat, the government set a target price at which mills should sell wheat flour to the domestic market. If the market price is higher, then the government covers the price difference with a subsidy, which constitutes an additional benefit to mills on top of the implicit subsidy of export restrictions on wheat and maize. The objective of this policy package was to lower the retail prices of bread and pasta[5].

Table 5 shows the total value of subsidies that were authorized by the ONCCA for different food products during the 2007-2009 period. Using the average exchange rate between 2007 and 2009 of Arg$3.35:USD 1, the total of authorized subsidies during the period was equivalent to USD 1.93 million[6].

[5] Until 2011 when it was closed, resources for the ONCCA subsidies came from the Treasury.

[6] A more precise estimate would have used the exchange rate at the time of payment instead of authorization but this date is not published. There is a time difference between ONCCA's authorization dates and the moment of effective payment.

TABLE 5: SUBSIDY AUTHORIZATIONS ACCUMULATED DURING 2007-2009

Product	Number of payments	Value (millions of pesos)	Average value per authorized payment (millions of pesos)
Wheat flour (mills)	1 477	1 713.7	1.2
Maize flour (mills)	45	13.0	0.3
Dairy firms	181	615.9	3.4
Chicken farms	860	1 274.5	1.5
Milk producers	153 989	782.1	0.005
Wheat producers	25 613	338.6	0.013
Pig meat producers	2 048	89.4	0.044
Bovine feed lots	4 506	1 324.0	0.3
Other	778	11.8	0.015
Total	189 559	6 450.9	0.034

Source: On the basis of information provided by the Bolsa de Cereales.

The largest shares of subsidies were allocated to wheat mills, bovine feed lots and chicken farms[7].

Trade barriers and domestic prices: A conceptual framework

The purpose of this section is to present a brief conceptual framework for analysing the impact that trade policies have had on prices received by primary producers and those paid by consumers.

Producer prices

The analysis of the price impact of trade barriers on domestic prices is divided into the impact of export taxes and QRs.

Export taxes

In the absence of QRs, the analysis of first-order effects of export taxes on domestic prices received by producers is straightforward, and is based on calculating the difference between the FOB and the FAS (free along ship) price. The FAS price for product *y* can be calculated as:

$$FAS_y = FOB_y\,(1-ET_y-f_y) \qquad (1)$$

Where ET_y is the export tax rate, and f_y are other costs such as those associated with the movement of merchandise within the ports[8]. Given that the last component usually does not vary much over time, in the long-run its effect on the variability of domestic prices can be disregarded. Assuming that export tax is the only type of cost added to the exports of primary products, we define the "theoretical FAS" (or "FAS teórico", FAST, as it is often referred to in Argentina), by the following expression:

$$FAST_y = FOB_y\,(1-ET_y) \qquad (2)$$

In some cases, this difference has been important and to this extent, the above-mentioned figure is an overestimate. According to information obtained from conversations with some primary producers, the delay between authorization and effective payment can be over a year.

[7] White meat has been targeted by the government as a substitute for bovine meat and as a consequence, this industry has been growing quickly.

[8] These are usually called fobbing costs and typically amount to 3 percent of the FOB price.

Figures 1 and 2 present the evolution of the two components of FAST (FOB export prices and export taxes) for maize, soybeans and wheat. The export prices show relative stability until mid-2006 and then rapid growth until around mid-2008. After a short decline following the international financial crisis in the second half of 2008, prices began to rise again in 2010.

Figure 2 shows the monthly export tax rates since January 2001. As discussed in the third Section, export taxes on wheat and maize were increased in November 2007 and then again in March 2008 for wheat when Resolution 125 entered into effect, lasting until August 2008. Since January 2009, export tax rates have stabilized at 20 percent for maize, 35 percent for soybeans and 23 percent for wheat. Both the FOB prices and export tax rates for these commodities peaked between June and July 2008.

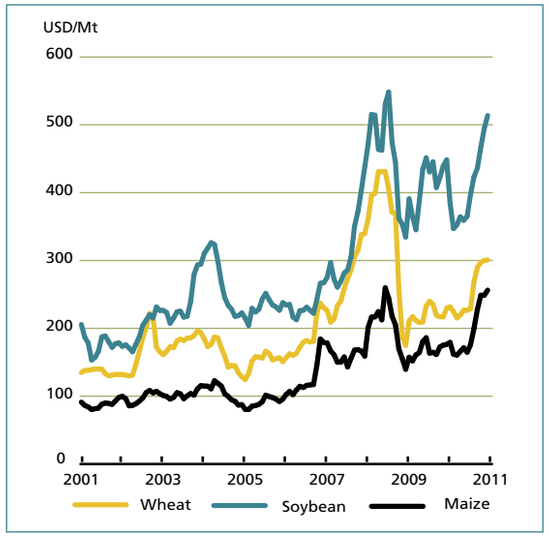
Quantitative export restrictions (QRs)

- Assuming that Argentina's policies had a marginal effect on world prices, the gap between what producers of cereal y would had received in the absence of quotas (FAST*y*), and the market price they actually received, MP*y* can be calculated as:
- DQR*y* = FAST*y* - MP*y* (3)
- The ad-valorem export tax equivalent of the quota (AVE*y*) can then be calculated as:
- AVE*y*=DQR*y*/FOB*y*=(FAST*y*-MP*y*)/FOB*y* (4)
- Equations (2) and (4) will be used for the quantitative analysis of producer's prices presented in the next section.

Consumer prices

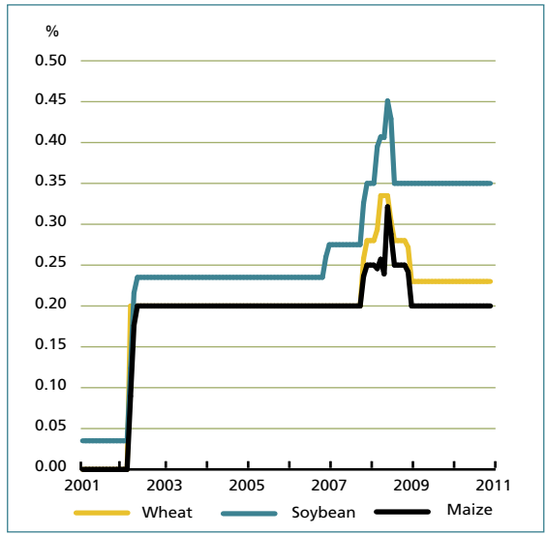
Taking wheat as an example, several factors determine the relationship between producer prices of wheat and consumer prices of wheat-based products such as bread. Several inputs other than the raw material (wheat) are used in the manufacturing of the final product and the costs of these can have an important effect on retail prices. Examples include processing and transport costs, rent and wages. Greater incidence of the costs of

FIGURE 1: MONTHLY FOB EXPORT PRICES: MAIZE, SOYBEAN AND WHEAT



Source: Ministry of Agriculture (http://64.76.123.202/site/agricultura/precios_fob_-_exportaciones/02-series%20históricas/index.php).

FIGURE 2: MONTHLY AVERAGE EXPORT TAX RATES



Source: Data provided by Bolsa de Cereales on the basis of official export tax rates.

primary inputs in the total production costs of the final food products would likely mean greater correlation between producer and consumer prices. The costs of other inputs, for example salaries and transport costs are usually much less volatile than the prices of raw commodities, and therefore in the short-run the changes in these relative to the changes in producer prices would be much smaller.

How closely the prices of primary commodities and the final food items are correlated depends on the product in question. In the case of wheat flour and bread the share of inputs other than wheat in total costs can be significant, and therefore government interventions to control wheat prices may not necessarily influence the price of bread significantly.

The data indicate that the incidence of wheat in total mill costs is around 48 percent, while the incidence of flour in the production of bread by bakeries is around 20 percent[9]. Therefore, the incidence of wheat in the cost of bread production is approximately 10 percent (48 percent x 20 percent; see Nogués and Porto, 2007)[10].

Based on these incidence estimates, Table 6 presents the results of simulations of the cost effects of eliminating export taxes and QRs on the price of bread. The elimination of export taxes and QRs would increase the price of wheat by 30 percent and 25 percent respectively[11]. Together, the elimination of export barriers would increase the local price of wheat by 75 percent[12]. Given the incidence of wheat in the operating costs of mills, the cost of flour would increase by 16 percent and 12 percent, respectively, when export taxes and QRs are eliminated independent of one another. The combined effect of the elimination of both export barriers would lead to a 36 percent increase in the price of wheat flour and only a 7.2 percent increase in the price of bread.

As mentioned earlier, apart from export barriers for wheat, flour mills benefit from direct subsidies on flour sold on the domestic market. The price effect is not as straightforward as in the case of export barriers. First, it is not clear whether all of the approximately 150 mills are selling wheat flour for domestic consumption at the price targeted by the government. An important

[9] Bakeries (panaderías) are represented as a separate unit in the input-output table. While selling other products as well, most panaderiasare specialized in bread production.

[10] Other studies such as one published by the Sociedad Rural Argentina (2006) report similar numbers.

[11] The 20 percent ad-valorem equivalent of QRs on wheat exports (AVEw) is approximated by using equation (4) on December 2010 data.

[12] Because this policy would increase Argentina's exports, world prices of wheat could potentially fall, reducing somewhat the impact of the policy change on domestic prices.

TABLE 6: FIRST-ORDER EFFECTS OF THE ELIMINATION OF EXPORT BARRIERS FOR WHEAT ON THE PRICE OF BREAD SOLD BY BAKERIES

Price effects in the wheat production chain		Export tax (23%)	QRs (20%)	Export tax+QR
			%	
Change in the price of wheat	(1)	30	25	75
Incidence of wheat in wheat mill costs	(2)	48	48	48
Change in the production costs of flour mills	(3)	14	12	36
Incidence of flour in the production costs of bakeries	(2)	20	20	20
Change in the bread price	(3)	2.9	2.4	7.2

Source: Nogués and Porto (2007).

gap between the market price of bread (in a range of Arg$7 to Arg$9 per kilo in the analysed period) and the targeted price of Arg$2.50 per kilo is observed. The capacity of the government to supervise mills' compliance with the target price is rather limited.

Trade barriers and producer prices

This section presents and analyses the evolution in the domestic prices of the main commodities in Argentina. The purpose is to distinguish between the impacts of export taxes and those of QRs using monthly price data from January 2001 to December 2010.

Wheat

As explained in the earlier sections, during the last decade barriers to wheat exports (both export taxes and QRs) have varied substantially. The increase in export barriers had clear negative effects on producer prices and the purpose of this section is to estimate by how much they have fallen compared to a situation of unrestricted trade.

Until early 2006, that is, before increases in export taxes and the introduction of QRs, we would expect producer prices of wheat to be close to $FAST_w$ as defined by equation (2). After that, export barriers were increased, which in turn would mean lower than $FAST_w$ producer prices.

The following monthly data were used to calculate FOBw and FASTw prices as shown in equation 2: (i) international FOB prices in dollars published by the Ministry of Agriculture; (ii) export tax rates; and, (iii) dollar prices paid to producers in the Mercado a Término de Buenos Aires[13]. The results are shown in Figure 3. As expected, from January 2001 until March 2002 when there were no export barriers, the series coincide, but after March 2002 as export taxes increased, so did the gap between the two sets of prices. On average, between March 2002 and December 2010 the difference between FOBw and FASTw equalled USD 48 per tonne.

As QRs were introduced in 2006[14], prices received by producers dipped below FAST prices (Figure 4). As shown in the graph, there is a strong correlation between the two price series. The difference between them was large between 2006 and 2008, reaching a peak in February 2008 at USD 93 per tonne.

Finally, the relation between the difference $FAST_w$-MP_w and FOB prices as a measure of the equivalent ad-valorem tax rate of the QRs (AVE_w) is depicted in Figure 5 showing that AVE_w increased after QRs were introduced in early 2006. The average AVE_w between May 2002 and December 2005 was 12 percent while from December 2005 to December 2010, it was 17 percent. With the export tax rate of 20 percent, this means that the effective tax burden, which includes the tax equivalent of the QRs, is almost double the official export tax rate.

This means that from December 2005 until December 2007 wheat producers in Argentina received prices that were on average USD 106 per tonne lower than the FOB price, corresponding to an aggregate taxation of around 40 percent (23 percent export tax plus 17 percent, the equivalent rate of controls).

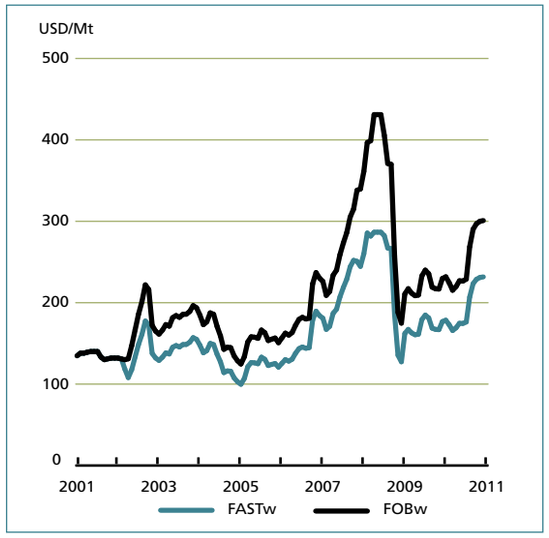
Maize

Figure 6 shows the evolution of the international FOB prices of maize (FOB_m) and the theoretical FAS ($FAST_m$). During 2001 the series coincided but after that the gap gradually increased reflecting the growth in the export tax rate from the initial 9 percent to 20 percent in May 2002 and then to 32 percent when Resolution 125 was in effect.

[13] Auction prices at the Mercado a Término corresponding to deliveries during the same month, taken as a proxy for spot prices paid to producers (MPy in tables that follow).

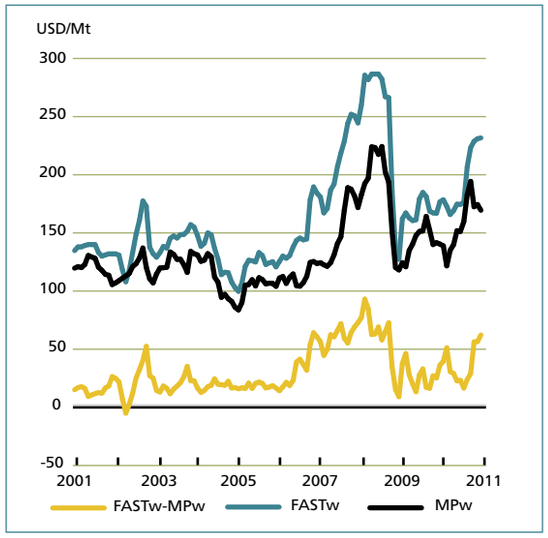
[14] The first wheat export bans were introduced in May 2006.

FIGURE 3: FOB AND FAST PRICES OF WHEAT



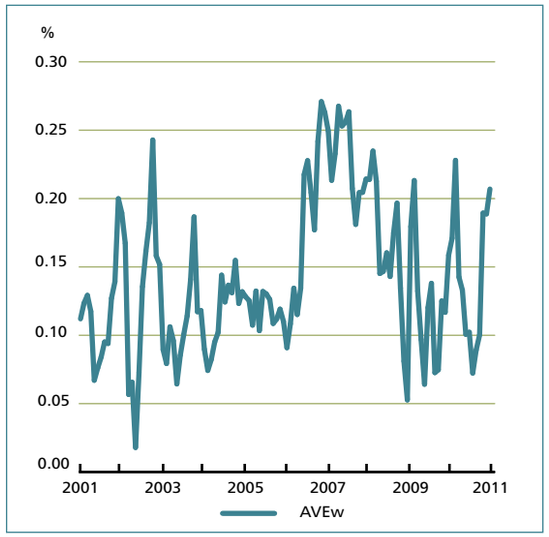
Source: Based on data referenced in the text.

FIGURE 4: FAST AND MARKET PRICES OF WHEAT



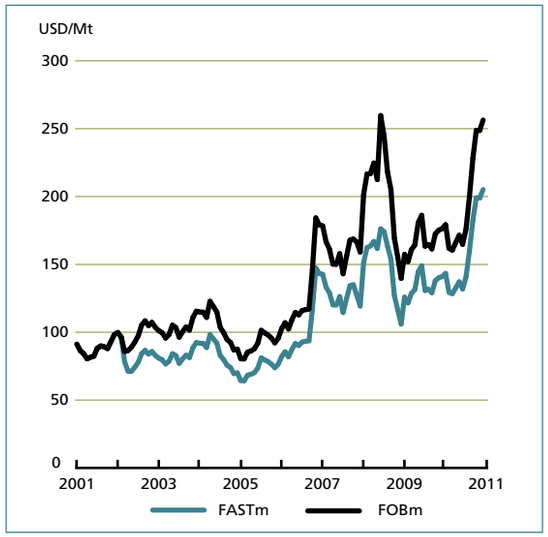
Source: Based on data referenced in the text.

FIGURE 5: EQUIVALENT AD-VALOREM TAX RATE OF QRW



Source: Based on data referenced in the text.

FIGURE 6: INTERNATIONAL FOB AND THEORETICAL FAS PRICES OF MAIZE



Source: Based on data referenced in the text.

Figure 7 shows that starting around mid-2006 when QRs on exports were introduced, the gap between $FAST_m$ prices and the market prices of maize (MP_m) began increasing. Until February 2009 the difference fluctuated but remained low (equivalent to USD 8.2 per tonne on average between July 2006 and February 2009), but since then it increased substantially to USD 22.4 per tonne (in the March 2009-December 2010 period).

Figure 8 shows the ad-valorem tariff equivalent of QRs on maize (AVE_m). The figures show that starting in early 2009, AVE_m increased to reach a peak value of 21 percent in May 2009, which is higher than the 20 percent export tax that was applied in the same period. On average, between May 2009 and December 2010, the AVE_m equalled 12 percent.

Soybean

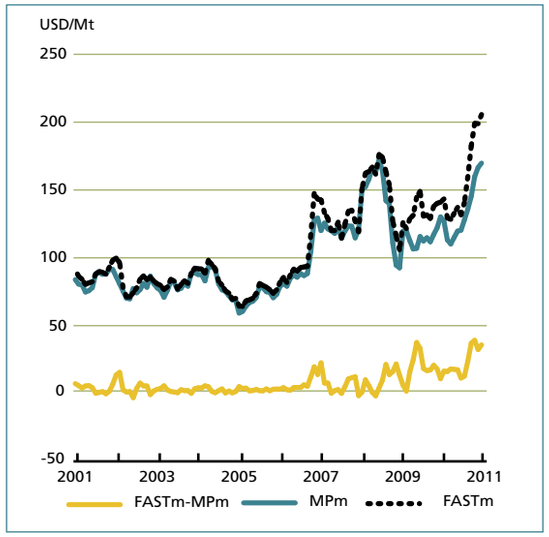
Among the crops analysed in this report, soybean has been the most heavily taxed by legislated export taxes. Apart from the higher export tax, soybeans have not been influenced by other policy interventions. Soybeans and their derivatives, in particular soybean oil, have a small weight in the basic consumption basket and the total cost of living. Therefore, the difference between the FASTs and market prices (MPs), as a proxy for price distortion caused by export restrictions and other policies beyond export≠ tax, has been much smaller than in the case of maize and wheat and sometimes negative, as shown in Figures 10 and 11. This explains, in part, why in attempting to minimize uncertainties and risks associated with QRs, primary producers have been allocating an increasing share of land to this crop.

The time series of the ad-valorem equivalent of quantitative controls on soybean exports presented in Figure 11 confirms that these controls have had little impact on market prices which have been close to FASTs. Between January 2007 and December 2010, the average AVE was 1 percent which is negligible in relation to the ad-valorem export tax of 35 percent and significantly lower than the levels of AVE calculated for wheat and maize. Moreover, as international prices peaked in mid-2008, the level of AVE was very low (close to zero).

Aggregate export taxation

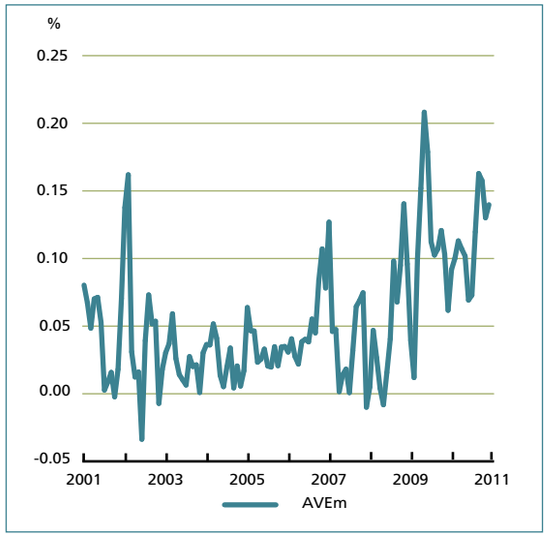
Figure 12 shows monthly values of the share of prices received by producers to FOB prices as a proxy for the implicit aggregate level of taxation of maize, soybean and wheat exports,

FIGURE 7: THEORETICAL FAS AND MARKET PRICES OF MAIZE



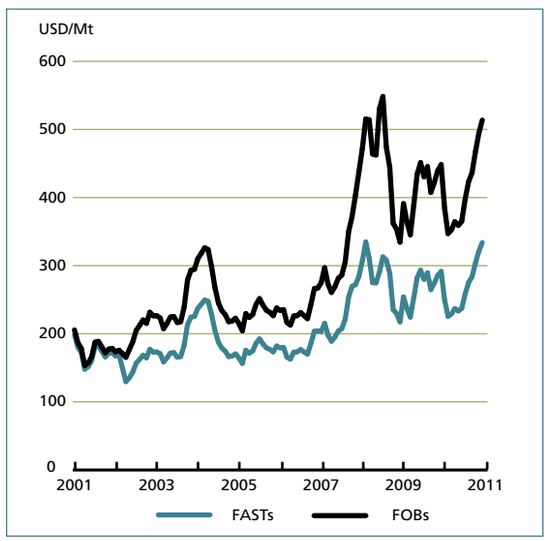
Source: Based on data referenced in the text.

FIGURE 8: AD-VALOREM EQUIVALENT OF QUANTITATIVE CONTROLS ON MAIZE EXPORTS



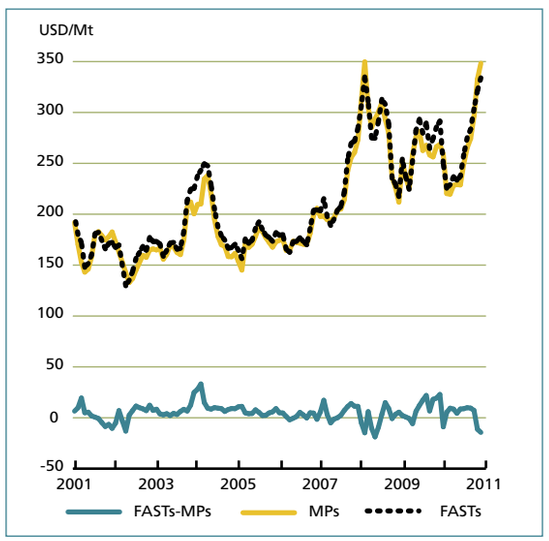
Source: Based on data referenced in the text.

FIGURE 9: INTERNATIONAL FOB AND THEORETICAL FAS PRICES OF SOYBEANS



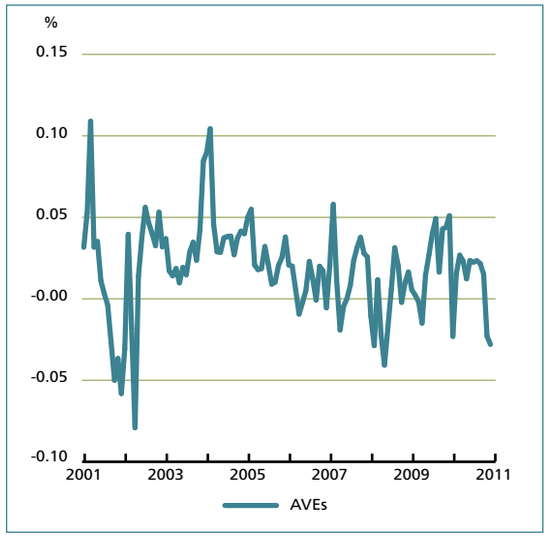
Source: Based on data referenced in the text.

FIGURE 10: THEORETICAL FAS AND MARKET PRICES OF SOYBEANS



Source: Based on data referenced in the text.

FIGURE 11: AD-VALOREM EQUIVALENT (AVE) OF QUANTITATIVE CONTROLS ON SOYBEAN EXPORTS



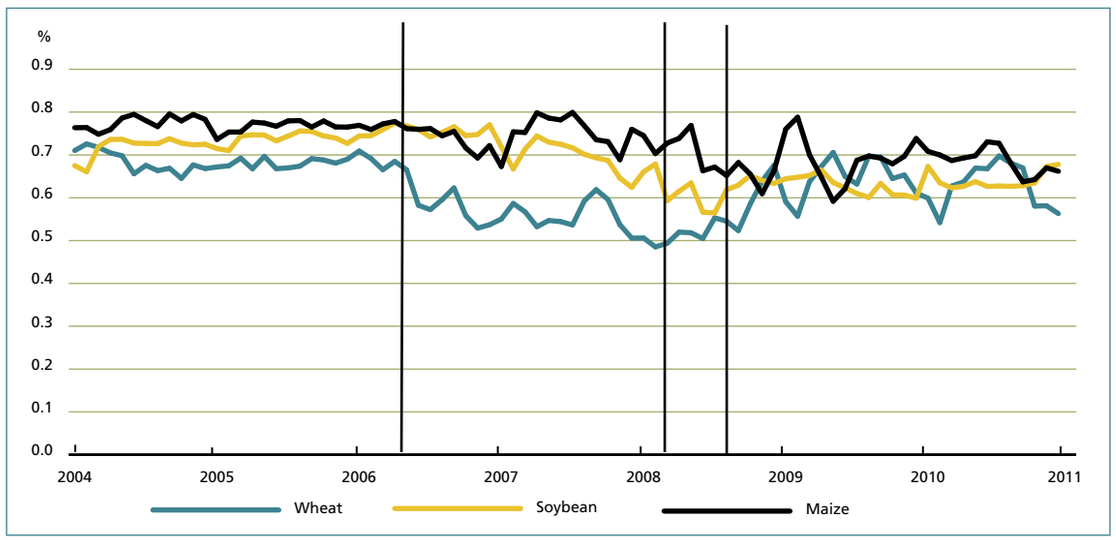
Source: Based on data referenced in the text.

combining official export taxes and AVE. Two general characteristics can be observed: (i) a slight downward trend in all three series meaning that with time producers received prices increasingly below international FOB prices, especially for wheat; and (ii) greater variability in the share since early 2006.

The figures in Table 7 show that in fact the average rate of total taxation increased after 2006 when export controls were tightened. In the case of wheat, the rate increased from 29 percent to 40 percent and in the case of maize it grew from 24 percent to 29 percent. In contrast, for soybeans the change in the average rate of the implicit export taxation has been small. The last column shows that for maize and wheat the share of quantitative export restrictions in total taxation increased between the two periods while for soybeans it decreased.

As Figure 12 shows, between late 2007 and early 2008 aggregate taxation on wheat exports increased rapidly, driven in particular by QRs. The gap between producer and FOB maize prices has also been increasing steadily. One possible explanation for the tightening of export quotas on maize exports may have been the importance of maize for animal feed. The lower domestic prices on maize and wheat caused by export

FIGURE 12: RATIO OF PRODUCER PRICES TO FOB VALUES FOR MAIZE, SOYBEAN AND WHEAT (JANUARY 2004-DECEMBER 2010)



Notes: The three lines depict, from left to right: a) initial ban on wheat exports: March 2006; b) implementation of variable export taxes (Resolution 125): 3 March 2008; c) dismantling of variable export taxes: 18 July 2008.
Source: Based on data referenced in the text.

TABLE 7: EXPORT TAXES AND AGGREGATE EXPORT TAXATION FOR WHEAT, MAIZE AND SOYBEAN (%): 2004-05 AND 2006-10

	2004-2005		2006-2010		Export taxes/aggregate export taxation	
Product	Export taxes	Aggregate export taxation	Export taxes	Aggregate export taxation	2004-2005	2006-2010
Wheat	20.0	29.0	23.4	40.0	69.0	58.5
Maize	20.0	24.0	21.3	29.0	83.3	74.4
Soybean	23.5	32.5	32.0	34.0	72.3	94.1

Source: Based on data referenced in the text.

restrictions constitute a transfer to the major buyers of these crops, which in the case of wheat are the flour mills and in the case of maize are the meat producers as well as the biodiesel industry.

Government policies and consumer prices

This section analyses the changes in consumer prices for wheat- and maize-based products as well as meat prices between 2005 and 2010. Meat and wheat products such as bread and pastas have important shares in the basic consumption basket in Argentina, while maize is mostly used for animal feed.

Wheat

Bread, crackers and packaged flour are the wheat-based products included in this analysis[15]. From 2005 until 2007 annual data

[15] Unfortunately, the basic consumption basket that we used for this report did not include pasta.

for Mendoza province are used[16]. These data are supplemented with monthly data from SEL Consultores[17]. Figure 13 includes three price indices that use 2005 as the base year: wheat prices paid to producers; consumer prices of packaged flour; and a combined index for the price of wheat-based products (bread and crackers[18]).

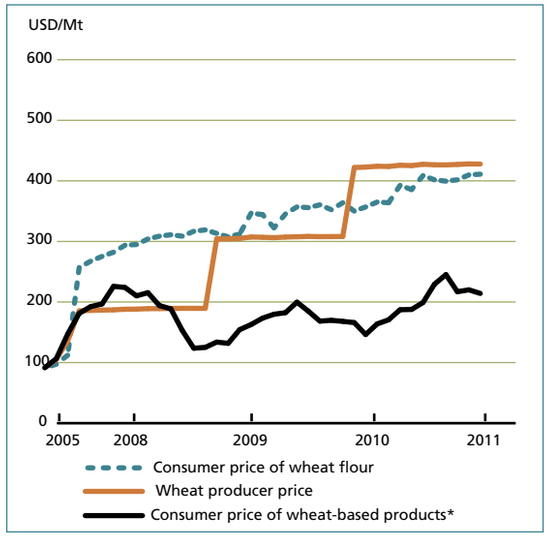
Between 2005 and 2007, the three series were closely correlated, but after that, the consumer price of wheat-based products increased much faster than the prices of wheat paid by producers. For example, by mid-2008 the index of prices of flour to consumers tripled relative to the level of 2005 and continued to grow after that, while the index of wheat producer prices was at 224 in mid-2008 and declined in the second half of 2008. It does not appear therefore that export restrictions succeeded in restraining increases in the prices of wheat-based products. On the contrary, consumer prices increased at a much faster pace than wheat producer prices. One likely explanation is that the prices of inputs other than the raw material (wheat), such as rent and labour costs, could have had an important effect on the price of the final product (bread and flour).

[16] After the methodology for the collection of consumer prices was changed by INDEC, the government of Mendoza province continued to collect market prices using its own historical methodology. Although there are some differences in the levels of consumer prices in Mendoza and Buenos Aires, the price changes over time can be assumed to be very similar across the country.

[17] Bread is the exception because in its statistics SEL price series remain constant at Arg$2.5 per kilo, the government suggested price, which, according to the author's observations, does not reflect the market price during that period. For example, for the "pan tipo flauta", a popular bread, the price range in most bakeries varied between Arg$7 and Arg$9 per kilo. For this product, we have therefore linked the 2007 average price from Mendoza (Arg$2.62 per kilo) with an assumption of a price of Arg$8.00 prevailing during 2010.

[18] The weights for bread and crackers are 94 percent and 6 percent, respectively.

FIGURE 13: WHEAT PRODUCER PRICES AND CONSUMER PRICES OF WHEAT-BASED PRODUCTS (BREAD AND CRACKERS) AND PACKAGED WHEAT FLOUR IN ARGENTINA, (2005=100)



Source: http://www.deie.mendoza.gov.ar/ and SEL Consultores.
* Bread and crackers.

Maize

Maize is mostly used as feed for animals and for biodiesel production. Keeping maize prices low has been a policy priority in order to influence consumer prices of meat. Figure 14 compares maize producer prices with maize flour prices to consumers. Two periods can be clearly identified. The first runs from 2005 to 2008, when producer prices increased at a faster pace than consumer prices and the second, from 2008 until 2010 when both moved in a similar manner, although towards the end consumer prices grew faster than producer prices. In general, unlike the prices of wheat and wheat-based products, the prices of maize and maize flour appear to be correlated and the effects of policy changes on both series seem to be similar.

The weight of maize flour in the basic consumption basket is very low at only 0.2 percent (Nogués and Porto, 2007) and therefore it is more important to evaluate the

extent to which efforts to contain the growth in maize prices have had repercussions for meat prices.

Bovine and chicken meat

Figure 15 shows the prices per kilo of different bovine meat cuts[19]. Consumer prices remained relatively stable until 2009; they started to increase in early 2010. Although all prices increased during 2010, the cheapest cuts such as *carne picada* and *falda con hueso*, increased somewhat less.

Figure 16 shows the evolution in producer prices in relation to a weighted average consumer price index for different meat cuts[20]. The two price series appear closely correlated.

Between 2006 and 2009 government controls on bovine meat exports succeeded in maintaining consumer prices relatively low, however in the medium term the market fundamentals and the natural bovine reproductive cycle both played an important role, undermining the effect of export restrictions on consumer prices.

Distributive effects of export barriers

This section discusses the distributional effects of Argentina's export barriers. The economic effects of export restrictions (a tax or QR) are depicted in Figure 17[21].

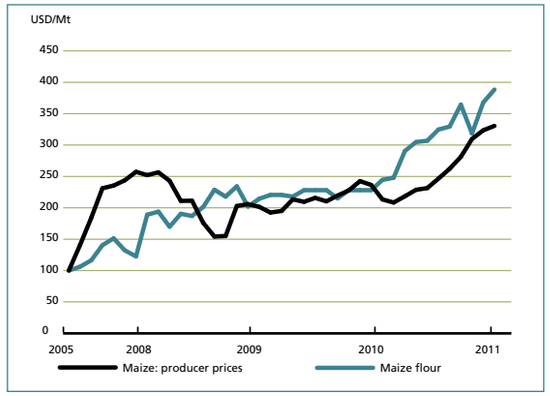
This tax *d*=AB reduces domestic prices from OA to OB that in turn triggers several distributive effects. First, there is an increase in consumption from BD to BE and the income gain that accrues to consumers is equal to ABEC. Exports decline from CG to EF

[19] Given the fact that the names of different meat cuts are idiosyncratic, in this section we will refer to the originals in Spanish.

[20] The weights are borrowed from the basic consumption basket prevailing in December 2006 (Nogués and Porto, 2007, Table 11).

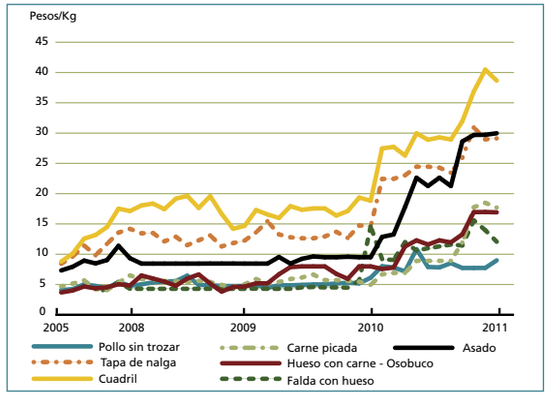
[21] Under the assumption of a small country that does not affect international prices. In the case of Argentinathis assumption is more realistic for wheat and maize than soybeans.

FIGURE 14: MAIZE PRODUCER PRICES AND CONSUMER PRICES OF MAIZE FLOUR (2005=100)



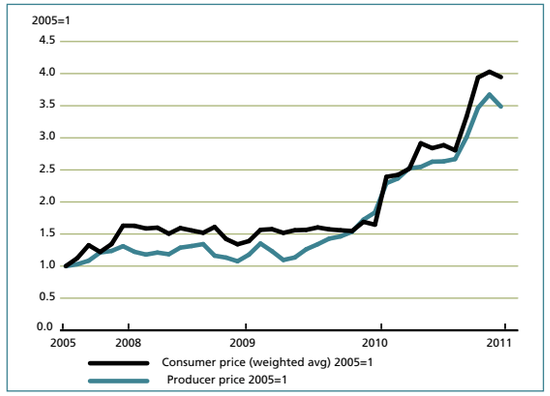
Source: SEL Consultores data.

FIGURE 15: CONSUMER PRICES OF DIFFERENT BOVINE MEAT CUTS (PESOS PER KILO)



Source: SEL Consultores data.

FIGURE 16: PRODUCER AND CONSUMER PRICES OF BOVINE MEAT CUTS



Source: SEL Consultores data.

and output from OJ to OI. The burden of the tax rests on producers who see their income decline by an amount equal to AGFB, part of which goes to consumers (ABEC), part to the treasury (EKLF) and part is a deadweight loss. The extent to which this redistribution is progressive or regressive (improves or worsens income distribution) depends on the income levels of domestic consumers that benefit from the price reduction, as well as the nature of the government's spending of the extra revenue.

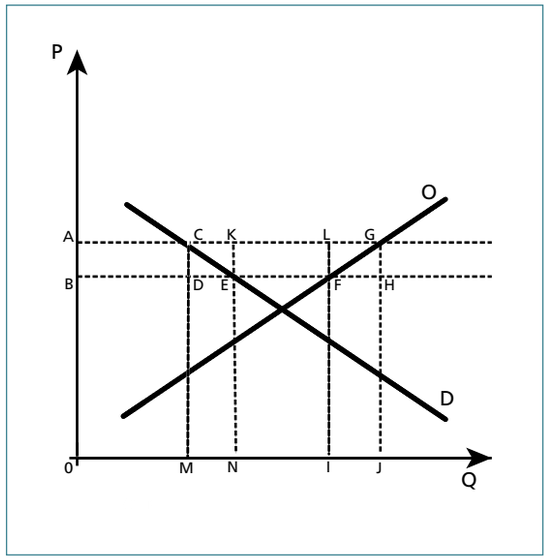
Suppose now that instead of a tax, the government applies a QR that has an ad-valorem equivalent of *d*. In this case, the government does not necessarily collect revenues. Area EKLF represents rents generated by the quota and the recipient of this quota rent is unclear. If these accrue to the wealthier part of the population, the regressive impacts of QRs are likely to be higher than under an export tax. Finally, managing an export quota requires substantial administrative resources and exporters invest time and entrepreneurial talent in seeking the rents generated by the quota. Therefore, the total welfare losses are likely to be higher than under a tax regime.

Trade barriers and income redistribution: the case of wheat

A recent study by Dente (2011) has quantified the redistributive effects of wheat policies for the four most recent harvests: 2006/07, 2007/08, 2009/10 and 2010/2011. The results are summarized in Table 8.According to this study, total transfers from wheat producers to other segments of society amounted to USD 4.61 million of which only 36 percent went to fiscal revenue and towards increasing the consumption of wheat-based products by the poor[22]. Net transfers to the state budget are calculated as the difference between the additional taxes collected and the subsidies disbursed.

According to the study, 42 percent of the revenue generated from trade barriers went to subsidies to the non-poor. Wheat and wheat flour exporters are also subsidized by the imposition of QRs.

FIGURE 17: DISTRIBUTIVE IMPACTS OF EXPORT TAXES AND QRS



Source: SEL Consultores data.

Allocation of land

Although export barriers that were introduced implied taxing producers, the amount of land allocated to the major crops has been increasing. For example, in 2005 the total area planted with maize, soybean and wheat was 23.8 million hectares. In 2009 this area increased to 25.5 million hectares, or by 7 percent(Table 9). To a large extent, this development is driven by rapid increases in international commodity prices, although these have only been transmitted partially to producers.

Allocation of land among different crops has been affected by the relative taxation

[22] Because this study assumes that bread is being sold at Arg$2.5 per kilo, the transfer to poor consumers is likely to be overestimated.

TABLE 8: REDISTRIBUTIVE EFFECTS OF SUBSIDY AND TRADE BARRIERS ON WHEAT PRODUCERS TO OTHER SECTORS DURING FOUR HARVESTS: 2006/07, 2007/08, 2009/10 AND, 2010/2011

Concept	Amount (USD million)	USD per tonne	%
Export taxes	3.339	62	72
QRs	1.269	24	28
Total transfers	**4.608**	**86**	**100**
Beneficiaries			
Treasury	796	15	17
Poor population	854	16	19
Sub-total	1.650	31	36
Non-poor population	1.954	36	42
Wheat exporters	463	9	10
Flour exporters	152	3	3
Foreign competitors	389	7	9
Sub-total	2.958	55	64
Grand-total beneficiaries	**4.608**	**86**	**100**

Source: Dente (2011).

TABLE 9: PLANTED AREA BY MAIN CROP

	Million hectares			Share in total of wheat, maize and soy		
	Wheat	Maize	Soy	Wheat	Maize	Soy
					%	
2000/01	6.5	3.5	10.7	31.5	16.9	51.6
2001/02	7.1	3.1	11.6	32.6	14.0	53.4
2002/03	6.3	3.1	12.6	28.6	14.0	57.3
2003/04	6.0	3.0	14.5	25.6	12.7	61.7
2004/05	6.3	3.4	14.4	26.0	14.1	59.8
2005/06	5.2	3.2	15.4	21.9	13.4	64.7
2006/07	5.7	3.6	16.1	22.4	14.1	63.6
2007/08	6.0	4.2	16.6	22.2	15.8	62.0
2008/09	4.7	3.5	18.0	18.0	13.3	68.7
2009/10	3.6	3.7	18.3	13.9	14.4	71.7
2010/11	4.6	4.6	18.9	16.3	16.3	67.4
2011/12	4.6	5.0	18.7	16.4	17.7	66.0

Source: Ministry of Agriculture data (http://www.siia.gov.ar/index.php/series-por-tema/agricultura).

across commodities. The figures in Table 9 show that there has been a significant reduction in the share of land allocated to wheat production. The share of wheat in the total land allocation for maize, soybeans and wheat declined from 22 percent in 2005 to only 14 percent in 2009. The 3.5 million hectares of wheat planted in the 2009/2010 harvest is close to what Argentina allocated to this crop at the end of the 19th century.

The average area dedicated to wheat between 2002/03 and 2006/07 was 5.9 million, but in the following five years the area declined to 4.7 million hectares, corresponding to a 20.5 percent reduction[23]. Between the same two periods the area planted with maize and soybeans increased by 29.1 percent and 24.0 percent, respectively. Harvest years 2009/2010 and 2011/2012 are the only years in recent history that had more land planted with maize than with wheat. The decline in the planted area of wheat is more significant when we recall that in many areas, wheat and soybean can be cultivated in the same planting season. On average, the wheat harvest is completed in December after which soybean can be planted. The figures suggest that despite the advantages that this alternative offers, some producers have chosen to divert some of the land away from wheat to other crops, considering the uncertainty regarding wheat policies too high. Emerging trends suggest that the area planted with other winter crops, such as barley, are increasing quickly, and accounting for a higher share of area planted.

Technological innovations and international price trends explain why in spite of the high export barriers introduced in the recent years, areas planted with cereals and soybeans continued to increase. Nevertheless, the numbers also indicate that the difference in policies across crops also could be an important determinant of land allocation.

[23] Given the soybean boom of the last fifteen years, the share of land of practically all other crops in total cereal production is likely to have declined.

Policy suggestions

The discussion below considers the relative advantages and disadvantages of the policy measures that have been applied in Argentina to counter high food prices.

Trade policies and subsidies

Quantitative restrictions (QRs)

The main argument for introducing QRs has been to lower the cost of basic food products for the population. If this is the objective, it is worthwhile to inquire whether there are other, less costly, ways of achieving it. As discussed earlier, QRs do not automatically generate fiscal revenues and can trigger rent-seeking activities. Moreover, their administration requires substantial management capacity, and this function until recently was carried out by the ONCCA and more recently by the Secretary of Commerce. In the case of Argentina it has been shown that QRs have provided greater benefits to agro-industrial chains, while reducing prices received by farmers well below the FAST price. Finally, the benefits to consumers have not been that evident.

For these reasons, QRs are not desirable, as other types of policies can achieve the stated goal with smaller welfare losses. Once the QR is in place, however, there is still room for improving administrative arrangements to reduce losses. First, by officially announcing the exact size of the export quota, the government would reduce uncertainty regarding the future level of exports. Second, the distribution of the quota among different exporters should be made more predictable and transparent. One alternative is to introduce competitive bidding, which would allow the government to collect the rent generated by the quota.

Export and land taxes

Like QRs, export taxes reduce domestic prices and distort investment incentives with negative impacts on producers and sector growth. But in contrast to QRs, they generate fiscal revenues and as importantly, they are easy to collect. Furthermore, for any given FOB price they expect in the future, producers can easily calculate the revenues that would accrue to them after paying the export tax. Although the export tax benefits the state budget, elimination or reduction of the export tax would have several important effects, including:[24]

- positive dynamic effects on total primary output and employment and perhaps some medium-term negative effects on the agro-industrial sectors that use primary products as intermediate inputs; and
- higher land values driven by the net present value of the future income flows.

Of these two effects, the first is far more relevant, since primary production and employment are important economic variables. In view of the potentially negative effect of export tax reduction on the agro-industrial sectors, a gradual implementation of the reform would be desirable to allow for smooth adjustment.

The fiscal effects of eliminating the export tax can be substantial, as the Government would have to forego approximately one-third of the original export tax collected, according to Nogués and Porto (2007)[25]. Although this revenue loss could be mitigated to some extent by more efficient expenditures, the government would have to find ways to compensate for the loss of this revenue source. Given the higher land values that the elimination of export taxes would bring, one suggestion might be to close the eventual shortfall with a land tax. The major challenge of implementing such a tax is to ensure that this policy is flexible and that the level of taxation will decline when international prices decline and vice versa. In the case of an ad-valorem export tax the adjustment is automatic. A land tax should have the same degree of flexibility.

High taxation rates on primary agricultural production in Argentina implied a significant shift of domestic terms of trade in favour of industry, distorting resource allocation and reducing the rates of agricultural and industrial growth well below the potential that can be realized given the country's productive resources if Argentina exploited its comparative advantage to a greater degree (See Nogues 2011 for an analysis of the country's growth patterns since 1875 under open and closed trade regimes). Regardless of the policy choice, perhaps the most important message is that a high degree of predictability and transparent rules are necessary for achieving higher rates of growth and poverty reduction.

Export tax escalation

The argument for taxing primary production relatively more than processed food products is that such a structure strengthens processing incentives. Although theoretically this could be the case, Argentina remains one of the most efficient agricultural

[24] Perhaps for products like soybeans where the country holds some monopoly power in international markets, a reasonable export tax could be maintained during the transition period to a more open trade regime. After the US and Brazil, Argentina with an annual production of around 50 million tonnes, is the third largest soybean producer with a world market share of around 18 percent (http://www.fyo.com/granos/estadisticas/soja.asp).

[25] Two compensating effects are at play when export taxes are reduced or eliminated. First, the higher prices received by producers after the elimination of export barriers will increase revenues from different taxes, especially from the value added tax and the income tax. Second, the elimination of export taxes would increase agricultural incomes on which additional taxes would be collected. Further details are presented in Nogués and Porto (2007).

producers but shows little value added to its primary products. The development of the agro-industrial complex has perhaps been hampered by long-run macroeconomic instability and the incentives generated by taxing primary production have played a lesser role.

In much the same way that uniform tariffs are preferred to escalated tariffs, export taxes if they are to remain, should be as uniform as possible. Over time this structure has been shown to reduce rent-seeking activities.

Government subsidies

As discussed in earlier sections, the government has accompanied export barriers with subsidies that seek to reduce the retail price of specific food products including bread and other wheat-based products, different types of meat, and dairy products. There are subsidies directed to primary producers as well as food processors. In much the same way that export barriers represent an implicit and generalized consumption subsidy, the governments' subsidies suffer from the same drawbacks outlined earlier, namely that the benefits accrue to all of the population, including high-income groups, and not only to the poor.

The additional shortcoming of these subsidies is the inefficiency of central management. For example, very few of the small farmers that are eligible for these subsidies have in fact received them: Only about 300 of the 9,000 eligible wheat producers have actually received subsidies that are intended to compensate them for the losses caused by the export quota regime[26].

[26] By some estimates, there are around 60,000 small and medium-sized farmers many of whom raise cattle, or harvest maize and soybeans or produce milk but only a small fraction of those that are eligible have actually applied for and received subsidies.

Conclusions

During 2007 and 2008 Argentina substantially increased export taxes for its most significant cereal products. Tax rates peaked around mid-2008, and although they were subsequently returned to their April 2002 level in the case of maize and wheat, they are still high at 20 and 23 percent, respectively. A higher rate (35 percent) is applied to soybeans. Since early 2006, export taxes have been complemented by quantitative restrictions that have at times included export bans.

This chapter discussed the possible impact of Argentina's recent agricultural trade policies on prices received by producers and those paid by consumers. The analysis shows that export restrictions have kept the prices paid to producers below international prices. The ratio of producer prices to the FOB price actually declined during the 2006-2008 period, especially in the case of wheat. At the same time, export restrictions and food subsidies did little to reduce consumer prices.

The path of consumer prices in Argentina has been uneven throughout the period of the first global price spike, with bovine meat prices remaining stable from 2006 until 2009 but with rising prices of wheat-based products. Between 2005 and 2008, bread and wheat flour prices increased by 93 percent and 166 percent, respectively. With regard to wheat, one of the reasons why export restrictions may not have contained bread and pasta prices is that the relationship between the producer prices of wheat and the retail prices of wheat-based products is not as strong as commonly assumed. One possible explanation is that the rising costs of other inputs such as rent and labour used in the production of bread and other wheat-based products has had a stronger effect on final prices than the policies implemented to keep raw wheat input prices low. Controls on bovine meat markets kept meat prices low for some time but after 2009 both consumer and producer prices increased substantially.

The loss of welfare of producers caused by export restrictions, combined with the low impact of these policies on consumer prices, means that export barriers may not have achieved the objective of improving food security by controlling the rise in food prices. Also, the high level of taxation and export quotas are likely to explain the significant decline in the area planted with wheat in recent years.

Another point to consider is the efficiency of export restrictions as measures to promote food security relative to other possible measures. Compared with export taxes, quantitative restrictions would not be the optimal policy instrument since they do not produce fiscal revenues, their administration is rather cumbersome, and they can trigger rent-seeking activities and welfare losses that exceed losses from equivalent export taxes.

The domestic debate on agricultural policies should focus on identifying appropriate measures that minimize the negative impact of high food prices on the poor without excessively hampering the incentives to producers. Since it appears that additional export restrictions had only limited impact on the consumer prices of basic food products while acting as a disincentive to producers – at least in the case of wheat – ensuring food security at times of high food prices may be better served by targeted social protection measures rather than introducing barriers to exports. However, given the contribution of agricultural export taxes to government revenues, any significant reduction or elimination of these taxes would have to be spread over a number of years to allow a smooth substitution by other types of taxes and/or expenditure savings.

References

Cavallo, A. 2012. Online and official price indexes: measuring Argentina's inflation. *Journal of Monetary Economics*.

Dente, R. 2011. Intervención en el trigo costo USD 4.608 millones, *La Nacion*, 11 January 2011. Available at http://www.lanacion.com.ar/1341380-la-intervencion-en-el-trigo-costo-a-la-produccion-us-4608-millones

Dominguez, J. 2010. Interview published in *Página 12*, 12 December 2010. Available at http://www.pagina12.com.ar/diario/economia/2-158526-2010-12-12.html

Nogués, J. 2008. The domestic impacts of export restrictions: the case of Argentina. *International Food and Agricultural Trade Policy Council*. Available at http://www.agritrade.org/ExportRestrictions.html

Nogués, J. 2011. *Agro e industria: del centenario al bicentenario*. Madrid, Editorial Ciudad e Hispaniola. Available at http://ciudadargentina.com.ar/site/

Nogués, J. & Porto, A. 2007. *Política agroindustrial: fundamentos para el desarrollo sostenido de la agroindustria*. Foro de la cadena agroindustrial de Argentina. November 2009. Available at http://www.foroagroindustrial.org.ar/home.php

Reca, L., Lema, D., & Flood, C. 2010. *El crecimiento de la agricultura Argentina: medio siglo de logros y desafíos*. Facultad de Agronomía, Universidad de Buenos Aires.

Sociedad Rural Argentina. 2006. Precios del trigo, harinas y pan. *Anales,* 2006.

WTO. 2007. *Trade policy review: Argentina*. WTO. Geneva. Available at http://www.wto.org/english/tratop_e/tpr_e/s176-00_e.doc

WTO. 2013. *Trade policy review: Argentina*. WTO. Geneva. Available at http://www.wto.org/english/tratop_e/tpr_e/tp377_e.htm

CHAPTER 3

BOLIVIA

HECTOR MALETTA AND LILIANA BALBI*

Economic and policy setting

After the hyperinflationary-recessive collapse of 1981-1985, the government of Bolivia enacted a comprehensive programme of economic reform after several decades of state-led policies initiated by the 1952 Nationalist Revolution. Public enterprises were privatised, including those in mining and hydrocarbons, and large sections of economic activity were deregulated. Import tariffs were lowered substantially and a floating exchange rate regime was introduced. Public finances improved after the enormous deficit accumulated during the crisis of 1984-1985.

The economy grew steadily from the lows of the mid-1980s until 1998 when growth began to falter. This slump continued until the early 2000s as Bolivia was negatively affected by the successive drops in the international prices of its major export commodities, including natural gas, metals and soybeans. The GDP growth rate fell sharply in 1999 and was only about 2 percent (just above demographic growth) in 2000-2003. It recovered in 2004 to its former level of about 4 percent, due chiefly to better international prices.

* Professor, Graduate School of Social Sciences, University of Buenos Aires, Argentina and Senior Economist, Trade and Markets Division, FAO, Rome, Italy.

The free-market policies prevailing from 1985 to 2005 fell into increasing popular disfavour, which led to the political shift of 2005 when a socialist coalition triumphed in the elections. Popular support for the coalition was amply ratified in subsequent polls. However, the new government found support mainly in the Andean half of the country, while mostly alienating the eastern Lowlands and parts of the intermediate valleys, where most of the country's modern economic activity is located (including commercial agriculture and agro-industry, oil and gas, and other key industries). Government agricultural policies affected industry during the surge in international food prices.

Political change resulted in adjustments to economic policy, although short-term economic management remained largely prudent, with floating exchange rates and relatively sound fiscal finances, reinforced by the surge in gas and soybean prices. On the structural and institutional side, the oil and gas sector was fully renationalized in the late 2000s (however, joint ventures with private oil and gas companies remain in place). Other policy changes focused on more active interventions in foreign trade and stressed the importance of the concept of 'food sovereignty.' This concept places emphasis on self-sufficiency and shaped the responses

to the food price surge of the late 2000s, as discussed later in this report.[1]

Cereal supply and demand

The dietary energy supply in Bolivia in 2006 (prior to major international price surges) is estimated to have been 2 091 kilocalories per day per person, of which 991 kilocalories came from cereals. Cereal food energy consumption included 374 kilocalories from wheat, 313 from rice and 282 from maize. Thus 969 kilocalories (or 98 percent of all cereal food consumption) comes from these three major cereals. In addition to this direct cereal food consumption, hard yellow maize (mixed with soybean cake and other feedstock) is used to feed milking cows, poultry and swine.[2] In 2006 the country consumed 354 000 metric tonnes of maize as food (mostly soft white corn), and 320 000 as animal feed (mostly hard yellow maize). The total domestic supply of cereals (2 135 000 metric tonnes) was composed mainly of wheat (538 000) and maize (872 000), with a lower share for rice (315 000). Other cereals, chiefly sorghum and barley, representing a domestic supply of 410 000 metric tonnes, are for the most part not used as food (Table 1).

Bolivia is roughly self-sufficient in rice and maize, with small imports and exports of each, but the country is a wheat importer. Domestic wheat production covers just one quarter to one third of domestic demand. Thus, the most traded cereal is wheat. However, the present analysis will also include maize because developments linked to world price increases in 2007-2011 resulted in a surge in maize imports and a corresponding impact on the price of related animal products, chiefly chicken meat.

The supply-demand balances in recent years for these two cereals (Table 2) confirm that nearly two-thirds of wheat are usually imported, with almost no export of wheat products; in the case of maize, local production supplies most of the domestic demand, with relatively small (and recently fluctuating) export and import flows. Maize trade resulted in a small trade surplus in 2005-2007, as well as in 2009, and a deficit in 2008, 2010 and 2011. The volume of maize imports surged strongly in 2010 and 2011 due to significant falls in domestic production after a peak in 2007.

The country produces about 2 million tonnes of cereals, half of which are maize. Until recently, Bolivia was nearly self-sufficient in maize and rice, with occasional imports or exports of relatively small magnitude, and a tendency to have a small exportable surplus. Its main cereal import is wheat, where local production covers between 25 percent and 30 percent of total demand. The kind of maize traded is yellow hard maize, mostly destined to animal feed (especially poultry) and mainly produced in the eastern Lowlands. The poultry industry is predominantly located in the eastern city of Santa Cruz and the valley city of Cochabamba. The main agriculture-based export is soybeans and related products such as soy oil cake. In recent years, Bolivia has had a trade surplus, both overall and in agricultural trade. The international commodity price surge did not cause any deterioration in Bolivia's balance of payments or agricultural trade balance.

The impact of international price increases on domestic prices is analysed next, first for wheat and then for maize.

Food import prices in Bolivia, 2005-2011

Prices paid for Bolivian imports of staple foods followed the course of international markets.

[1] For analysis of recent developments in agricultural and food policies and agricultural development in Bolivia see EU, 2004; Ormachea, 2009; and Zeballos, 2011.

[2] In 2007, Bolivia had a daily per capita supply of 68 kilocalories from poultry and eggs, 46 kilocalories from swine meat, and 42 kilocalories from milk.

They reflected changes in both the cost of the staple at origin plus the cost of transportation, which was itself influenced by steep fuel price hikes.

Bolivia imports both wheat grain and wheat flour, though the proportion of flour has been increasing and is lately the dominant form of wheat importation.

The CIF cost of imported grain went from $200 to over $400, and that of flour from $240 to $640 (Figure 2). Wheat grain and flour prices declined sharply in the second half of 2008, and plateaued at about $250 and $350, respectively in 2008-2010 (thus not returning to their pre-surge levels of about $200). Both rose again, albeit more moderately, in 2010-2011, to about $300 for grain and $400 for flour, declining slightly in late 2011 and early 2012.

Maize imports in Bolivia are rather sporadic: as seen before, the country had been largely self-sufficient before the price

TABLE 1: BOLIVIA: CEREAL FOOD BALANCE SHEET, 2006

	Production	Imports	Stock Change	Exports	Domestic supply	Feed	Seed	Processing	Other uses	Food
	000 mt									
All cereals	1 717	414	62	59	2 135	630	40	54	285	1 125
Wheat	144	363	35	4	538		12		67	458
Rice (milled eq.)	298	1	23	8	315	2	5		22	285
Barley	75	40	3	0	118	53	8	54	2	0
Maize	894	5	0	28	872	320	12		186	354
Oats	7	3		0	11		1			10
Sorghum	271	1	0	11	262	255	1		6	
Cereals, (other)	28	0	1	9	20	1	1		1	17

Figures (in thousand tonnes) may not exactly add up due to rounding. "Other uses" includes also waste and losses. "Processing" refers to barley processed into beer. "Food" does not include beer.
Source: FAOSTAT (Food balance sheets).

TABLE 2: BOLIVIA: MAIZE AND WHEAT SUPPLY AND DEMAND BALANCES, 2005-2011

	2005	2006	2007	2008	2009	2010	2011(p)
	000 mt						
Wheat							
Production	161.5	165.1	202.5	251.7	240.1	241.6	218.5
Imports (grain equivalent)	399.8	352.3	434.2	420.2	472.3	331.7	322.5
Exports (grain equivalent)	1.0	2.0	4.0	0.0	0.0	0.0	0.0
Domestic supply	560.3	515.4	632.7	671.9	712.4	573.3	541.0
Maize							
Production	880.7	991.0	1 100.3	969.4	984.4	909.0	966.3
Imports	2.6	2.1	14.3	15.7	2.2	40.4	85.9
Exports	4.3	25.3	24.3	10.5	34.4	4.6	1.4
Domestic supply	879	967.7	1 090.3	974.5	952.2	944.7	1 050.8

(p) 2011 preliminary forecast.
Source: INE data on production and trade.

surge, with small amounts imported or exported in different years. Bolivia mostly avoided the surge in maize prices in 2008-2009, because local production was nearly sufficient to meet domestic demand. In fact, the country exported some amounts during those same years. The small amounts imported in those years were obtained from neighbouring countries at prices below the international average (Figure 3).[3] However, as shown before in the cereal balance, imports rose precipitously in 2010-2011, and during the worst part of the second price surge, for reasons related to domestic policy that will be explained below.

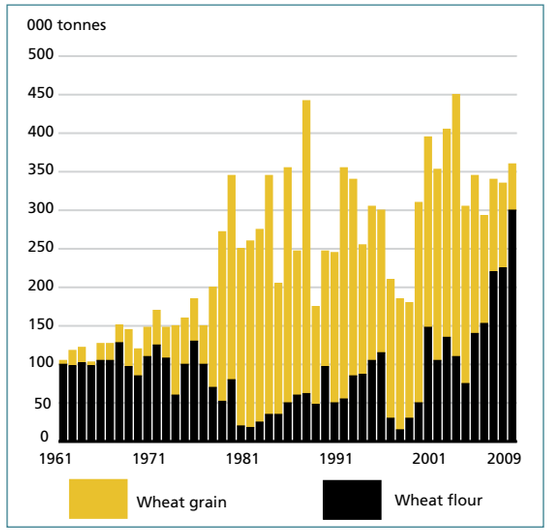
Since the policies and results were different for the two cereals, they are discussed separately in the next sections.

The case of wheat

An overview of import prices and consumer prices

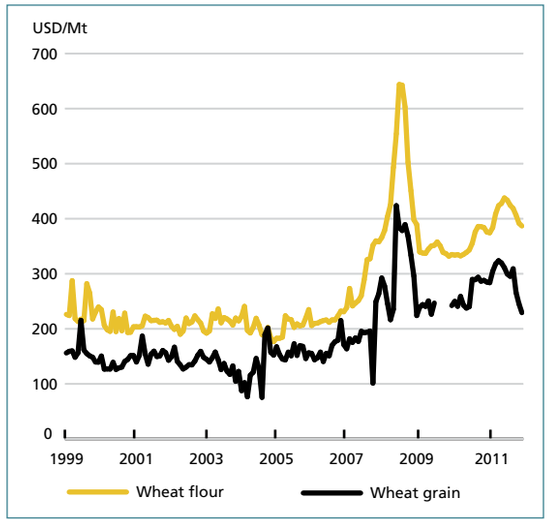
Prices paid in recent years for imported grain and flour have followed the ups and downs of international prices. As shown before (Figure 2), the dollar CIF prices of imported wheat grain and flour stayed quite stable through 2006, but they surged during 2007 and the first half of 2008: the corresponding index numbers (January 2005=100) peaked in 2008, at 250 for grain in June and 350 for flour in August, then decreased to around 200 for flour and 150 for grain, and then surged again though less strongly in 2010-2011, to 240 for flour and close to 200 for grain. Both prices slightly subsided at the end of 2011 and in early 2012. The proportional increases in the consumer prices of bread and pasta, instead, followed a simpler pattern: stable until 2006, gradually doubled in 2007-2008, and then stabilized by mid-2008 at twice their pre-surge level, where they stayed until 2011 (Figure 4). It is important to note that consumer prices remain at the level

FIGURE 1: WHEAT GRAIN AND WHEAT FLOUR IMPORTS, 1961-2009



Source: FAOSTAT.

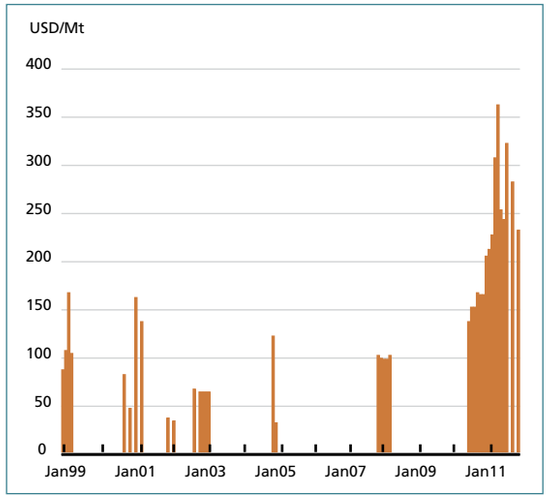
FIGURE 2: MONTHLY CIF UNIT VALUE OF WHEAT GRAIN AND FLOUR IMPORTS, JAN. 1999-JAN. 2012



Source: FAOSTAT.

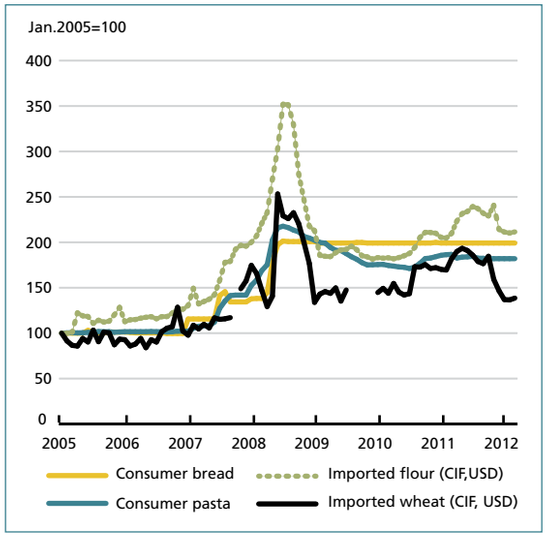
[3] Wheat and maize imports can reach Bolivia mainly from three sides: by ships unloading at the Chilean port of Arica, where Bolivia holds a custom-free zone, and then by land to the landlocked territory of Bolivia; or by land routes from the grain markets in Rosario (Argentina) and southern Brazil. Land routes from southern Peru are also possible, but have no real importance as regards cereal imports into Bolivia.

FIGURE 3: MONTHLY CIF UNIT VALUE OF IMPORTED HARD YELLOW MAIZE, 1999-2011. MONTHS SHOWN ARE ONLY THOSE WITH IMPORTS ABOVE 100 MT.



Source: INE Foreign Trade Statistics.

FIGURE 4: INDEX NUMBERS OF WHEAT PRICES. CONSUMER PRICES: AVERAGE OF LA PAZ AND SANTA CRUZ PRICES FOR ORDINARY FRESH WHITE BREAD (PAN CORRIENTE) AND DRY SHORT NOODLES (FIDEO CORTO)



Source: Ministry of Agriculture (http://64.76.123.202/site/agricultura/precios_fob_-_exportaciones/02-series%20históricas/index.php).

attained in mid-2008, when import prices were at their peak. Consumer prices did not subsequently mirror import prices, neither the decrease in the price of imported wheat and flour (late 2008), nor the subsequent increase (2010-11).

What happened in Bolivia was that the initial percentage rise in import prices in 2007-2008 had only a lower percentage reflection on consumer prices for bread or pasta. After that, consumer prices remained practically stable in spite of a decline in import prices in late 2008, and a further surge in import prices in 2010-2011. These developments resulted from a combination of several factors, briefly examined in the next section.

The total impact can be analysed in two parts: first comparing the different course of the main imported commodity (wheat flour), computed in US dollars (CIF), and the domestic wholesale price of the same commodity, in local currency, and secondly comparing the relationship between the wholesale price of flour and the price of its major consumer goods (bread and pasta).[4] The chain of comparisons may be shown schematically as follows:

These phases in the chain of transmission of the international food price surge down to prices faced by Bolivian consumers will be examined now.

• Import cost to wholesale prices

In general terms, domestic wholesale prices of flour have tended to mirror flour import price movements, but in a dampened manner (Figure 5). The difference in relative trends (measured in price indexes with a common base period) reflects the combined impact of (a) the exchange rate and (b) domestic subsidies (to the domestic milling industry and to domestic transportation costs). Although

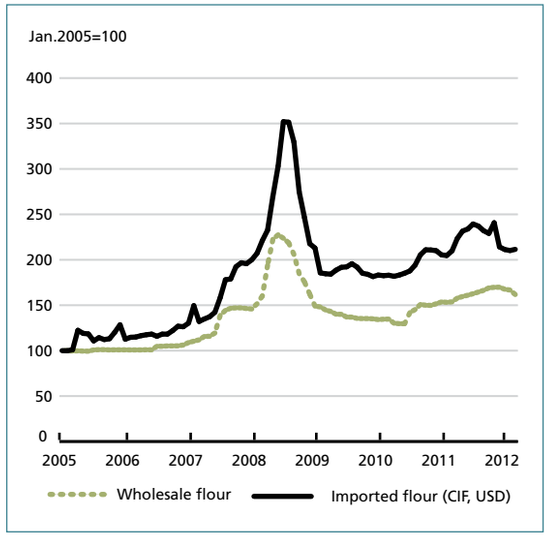
[4] Consumer prices in this analysis correspond to the low-cost types of bread and pasta most widely consumed in the country: ordinary bread (pan corriente) and short noodles (fideo corto).

import prices in 2009-2012 hovered around twice the 2005 level (index numbers in 2009-2012 oscillated around 200), domestic wholesale prices reflected only half that increase (index hovered at about 150). At their peak, import prices reached an index number of 352 while wholesale prices peaked much lower, at 227, relative to the baseline (January 2005=100).

• Wholesale to consumer prices

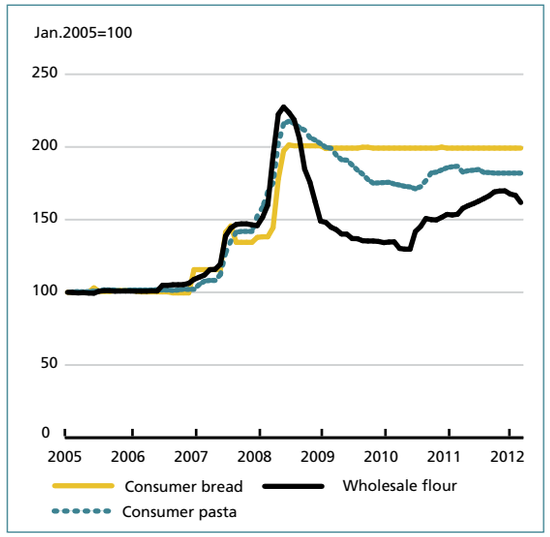
The second stage of this initial overview focuses on the correlation of changes in the wholesale price of flour and changes in the consumer prices for bread and pasta (Figure 6). It is easy to see that consumer prices for bread and pasta rose in 2007-2008 in nearly *the same proportion* as the wholesale price of flour, but then *remained at that level* in spite of the significant subsequent decrease in the price of flour. The

FIGURE 5: PRICE INDICES OF WHEAT FLOUR



Source: INE.

FIGURE 6: PRICE INDICES FOR THE WHOLESALE PRICE OF WHEAT FLOUR, AND THE CONSUMER PRICES OF BREAD AND PASTA, 2005-2012



Source: INE.

price of flour stayed well below its previous peak level for several years, even during the moderate increase of 2010-2011. It is also remarkable that in 2008-2009 pasta prices somewhat reflected the reduction in the price of wholesale flour, but decreased much less than flour itself. Even more notably, the consumer price of bread remained immovable for nearly four years in spite of movements in the international price of wheat and the domestic wholesale price of wheat flour, its main input. By early 2012, the price of bread was twice its 2005-2007 level, and that of pasta just slightly less, whereas the price of flour had only risen by about 50 percent.

This is particularly striking because flour represents only a fraction of the cost of production of both bread and pasta. One kilogram of the most popular fresh bread in Bolivia requires about 750g of flour (estimated from carbohydrate content as per FAO-LATINFOODS, 2009 and also Leung and Morales, 1961). At October 2011 prices, and taking the city of Santa Cruz as an example, one kilogram of common bread (*pan corriente*) had a consumer price of Bs16.50, whereas the required amount of flour (750g) cost bakers (wholesale) Bs3.45, or 20 percent of the retail price of bread. One kilogram of the most common pasta (dry short noodles, sold in bulk rather than packaged) had a consumer price of Bs7.41. The requirement of flour per kilogram of dry noodles is 810g, which cost at that time Bs3.50, or 47 percent of the retail price of noodles. In other words, a 100 percent increase in the wholesale price of flour would increase the costs of production by the equivalent of 20-22 percent of the retail price of bread and 47 percent of the retail price of dry pasta.

This suggests that a relatively *attenuated* impact of flour prices on bread or pasta prices should be expected, an expectation further reinforced by the fact that in May 2008 the government enacted a subsidy to the bakery industry (along with another subsidy to the milling industry). But in fact the opposite was observed. Consumer prices of bread and pasta increased more than expected, and then failed to drop when flour prices did.

After peaking in 2008 with a transient 100 percent increase over previous levels, the wholesale price of flour remained some 50 percent above its former (pre-surge) price. The prices of bread and pasta first doubled, that is, they increased by the same proportion as flour in spite of the limited share of flour cost in the price of bread or pasta, plus some extra government subsidies to the bakery industry enacted in May 2008. Then the consumer price of both products failed to decline in line with the cost of flour: they have stayed at about twice their pre-surge level, not moving much from 2008 to 2012.

The behaviour of consumer prices did not directly follow any government directives. There was no official price for bread and pasta during this period. In particular, there was no policy to keep bread prices stable from mid-2008 until early 2012. At most, there seems to have been a tacit agreement on the part of manufacturers not to raise the price of their products beyond the levels attained at mid-2008. This was apparently made possible by 'overshooting' the initial price increase, as well as the extra subsidies established in the wake of the price spike

In practice, data imply that bakers and noodle-makers enlarged their gross margin over the cost of flour (simply defined as the consumer price of bread and pasta minus the wholesale cost of flour) in early 2008. They achieved this margin enlargement by increasing their prices more than proportionally to the actual impact of flour price on their costs of production. They further enlarged their margin in late 2008 when the price of flour fell while noodles and bread prices failed to budge in a proportionate degree. This wider margin stayed in place through 2009, and allowed bakers and noodle-makers to withstand the second (but more moderate) surge in flour prices that occurred in 2010-2011 without further consumer price hikes. Part of this wider gross margin might have been explained by increases in other inputs, but that does not seem to be the case: the other main input in both cases is energy for

industrial processing and transportation, and these costs have been kept stable under heavy subsidies in Bolivia in recent years, as oil and gas are priced (for the domestic market) well below the international price for both, and especially below the price Bolivia gets for its natural gas exports. As reported by the National Statistics Institute (Instituto Nacional de Estadística – INE) in its index of prices received by manufacturers, prices received by oil refineries have remained entirely stable from 2005 until 2012. The cost of electricity is also subject to state control and has been kept generally stable in recent years. Therefore the increase in prices for bread and pasta widened the margin earned by bakers and noodle-makers and allowed them to keep their prices stable despite further oscillations in flour prices. This increased margin was not eroded through competition: it did not appear to encourage the more competitive bakers or noodle-makers to widen their market share by supplying the goods at lower prices.

Impact of government policies

The evolution of international, wholesale and consumer prices reviewed above for wheat and its products was heavily influenced not only by international prices, but as already mentioned, by domestic policies. These included currency appreciation, accentuated by monetary policy, reduction or elimination of import tariffs, and introduction of subsidies. The currency appreciated rapidly during 2007, with the exchange rate going from Bs8.00 to $1 in late 2006 to Bs7.00 to $1 by mid-2008. In November 2007, import tariffs for wheat, maize and other foodstuffs were reduced to zero. In May 2008 the government granted subsidies to the milling and bakery industries. The effect of these policies on wheat will be briefly examined.

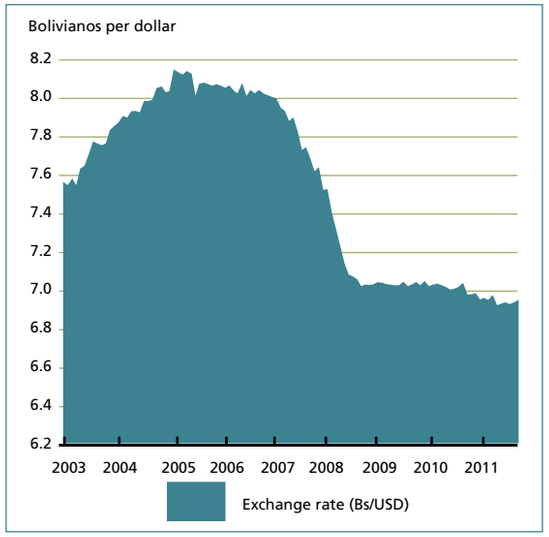
• Currency appreciation

The one policy process that actually reduced the impact of the price surge on Bolivian consumers was the *appreciation of the national currency*, in accordance with the general depreciation of the US dollar worldwide. This was mainly market-driven, but also permitted and even accelerated by Central Bank policy. It occurred quite rapidly in 2007-2008, and thus dampened the impact of the first surge in international prices. The exchange rate did not change much in 2008-2011, and therefore its effects on the second price surge in 2010 were practically non-existent (Figure 7).

The exchange rate of the US dollar against the *Boliviano* rose from about Bs7.50 per dollar in January 2003 to Bs8.10 in early 2005. It gently declined to Bs8.00 to the dollar by December 2006, and then rapidly fell during 2007 and into early 2008, reaching about Bs7.00 to the dollar by mid-2008 (at the high point of the first food price surge). It stayed at that level until early 2011, then slid slightly further, to about Bs6.94 from mid-2011 to early 2012.

The strong appreciation of the domestic currency during the very same period in which international food prices were surging

FIGURE 7: RATE OF EXCHANGE OF THE US DOLLAR, 2003-2011



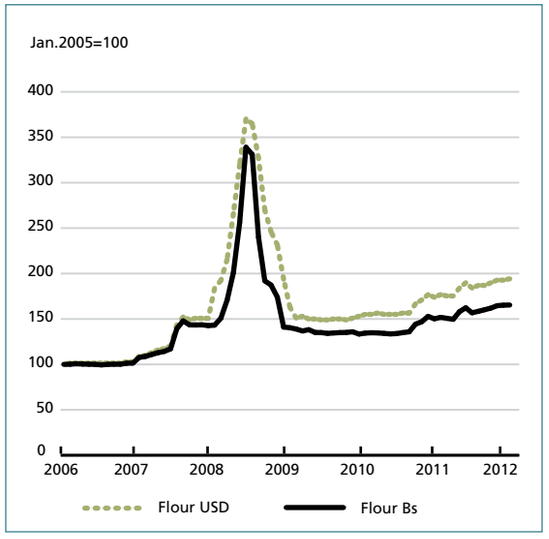
Source: INE.

in 2007-2008 caused international price increases to translate into smaller rises in domestic prices. The impact of the exchange rate on the transmission of international prices to the domestic market can be assessed by comparing changes in CIF unit values, expressed for imports in foreign and domestic currencies. This can be done more easily for wheat and flour, where imports are continuous, unlike maize, which is only imported occasionally, but the effect is similar for all traded products. Figure 8 uses flour to show that the effect of the exchange rate on the price series is noticeable in 2007, but widens in 2008 and continues through early 2012. In effect, the currency appreciation caused the price of imports in local currency to rise perceptibly less than they would have done without the currency appreciation. At January 2007, both indexes had risen by 40 percent relative to January 2005, thus the exchange rate had a neutral effect. However, by mid-2008, the index in dollars had reached a value of 380 while the index in local currency was at 338 (11 percent less). By January 2012, the index was 229 in dollars and 198 in local currency (13.5 percent less). The difference reflected in the figure is *only* due to the effect of movements in the exchange rate: both lines in the chart refer in fact to index numbers of *the same price*, only expressed in either dollars or national currency. Currency appreciation, thus, reduced the transmission of international price hikes to domestic food prices by about 13 percent.

• From import price to wholesale price

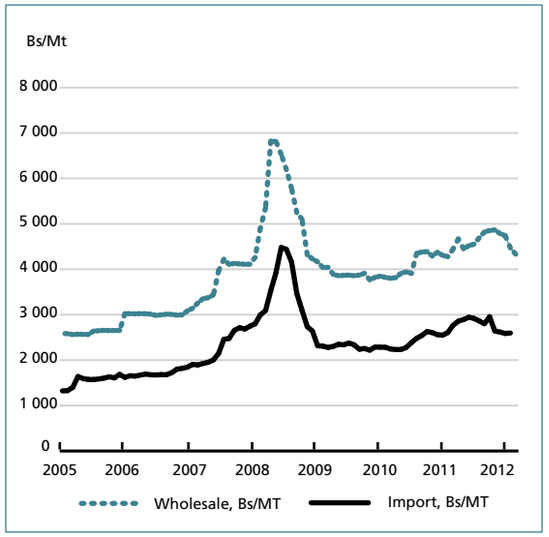
In addition to the impact of exchange rates, domestic prices were also affected by other factors. In the absence of such other influences, the wholesale price of flour in the domestic market should have varied in tune with border prices (i.e., the import price expressed in local currency), but those other factors, including government subsidies to the milling industry and elimination of import duties, caused the two to vary at a different pace (Figure 9).

FIGURE 8: INDEX OF IMPORT PRICES (CIF) OF WHEAT FLOUR, IN USD AND CONVERTED INTO LOCAL CURRENCY



Source: INE.

FIGURE 9: WHEAT FLOUR. CIF IMPORT PRICE IN LOCAL CURRENCY, AND DOMESTIC WHOLESALE PRICE



Source: INE.

Two aspects should be considered in this regard. First, the domestic wholesale price of flour was consistently higher than the import price valued in local currency, due

to domestic transportation and wholesale marketing costs. Second, wholesale prices peaked *before* import prices (Figure 9). Millers were probably raising wholesale prices in the early months of 2008, in expectation of further increases in import prices, but the subsidy to the milling industry enacted in May 2008 caused the wholesale price of flour to start falling, even before import prices reached their peak somewhat later (August-September 2008).

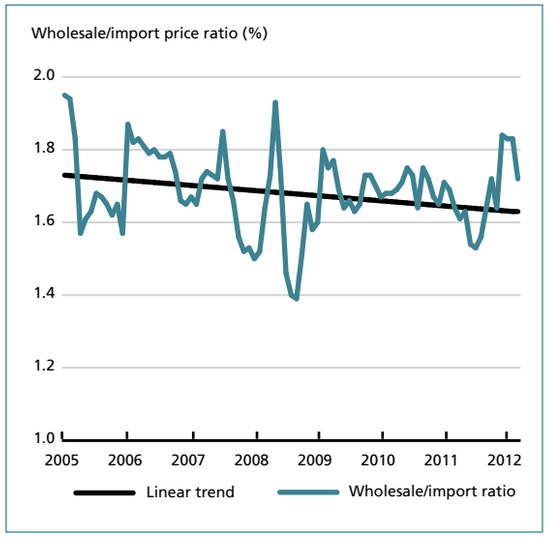
Import and wholesale prices did not move in sync due to various policies implemented in the time period examined, including the elimination of import duties and subsidies to the milling industry. The wholesale/import price ratio ranged between 1.6 and 1.8 in most months, with just a few brief departures from this range (Figure 10).

Taking January 2005 as a reference, the domestic wholesale price of flour increased consistently more than the border price of imported flour (calculated in local currency). The difference, however, was minimal until late 2007. At that time the government repealed custom duties for wheat products, which was reflected in the stability of wholesale prices during the second half of 2007 in spite of steadily climbing CIF import prices. Wholesale prices, however, increased again in early 2008, but their rise was halted by the government's subsidies to the milling industry enacted in May 2008. In the meantime, import prices kept rising until a peak in July, after which they began to decrease.

Domestic wholesale prices thus started declining even before import prices peaked later in 2008, because of the subsidies to the milling industry. However, the relative decline in wholesale prices from mid-2008 to early 2009 (about 38 percent) was lower than the parallel decline in import prices (50 percent).

From late 2008 until early 2010, domestic wholesale prices stabilized at a level about 50 percent higher than the base period, while

FIGURE 10: WHEAT FLOUR - RATIO OF DOMESTIC WHOLESALE PRICE TO CIF IMPORT PRICE IN LOCAL CURRENCY, 2005-2012

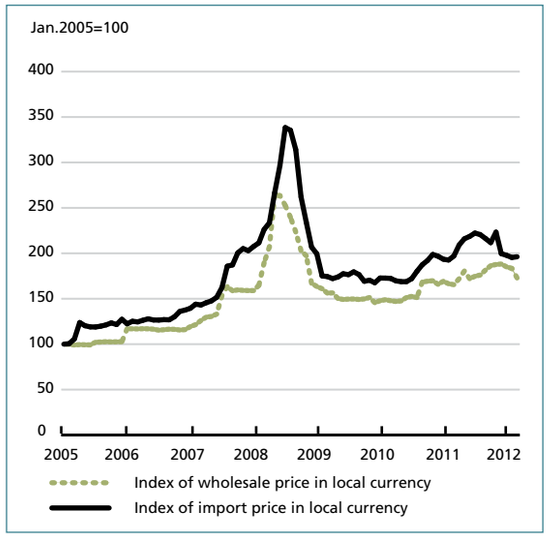


Source: INE.

imported flour had increased perceptibly more (about 75 percent above the initial price). In 2010-2011 prices increased again, but this time both did so in tandem, probably because no further policies were implemented during that period which may have influenced these prices. By the end of 2011, both indexes were very close to each other, at a level about twice the base period.

It can be concluded in this regard that government policies succeeded in somewhat dampening the effect of the first wave of increases on the imported price of wheat flour (expressed in domestic currency), in 2007-2008, but did not have much effect on the impact of the second wave of price rises in 2010-2011. This reinforces the pattern previously observed with regard to the exchange rate, which also had a significant effect on the first wave, but not on the second because of the stability of the exchange rate from mid-2008. After spending much of its policy ammunition in 2008 to dampen the transmission of international price hikes to domestic prices,

FIGURE 11: PRICE INDICES OF WHEAT FLOUR. INDICES OF IMPORT (CIF) PRICES EXPRESSED IN LOCAL CURRENCY, AND INDEX OF DOMESTIC WHOLESALE PRICES (ALSO IN LOCAL CURRENCY), 2005-2012



Source: INE.

the government was apparently unable to act again with the same force in the second food price surge in 2010-2011.

• From wholesale to consumer prices

It has already been shown (Figure 6) that consumer prices for bread and pasta failed to follow the movement of the wholesale price of flour. Consumer prices "overshot" in 2008 (they increased by roughly the same percentage as flour, whereas flour represents only a fraction of their costs), and then remained approximately at that level in spite of subsequent ups and downs in the price of flour. This price stability is particularly striking in the case of bread, the price of which has remained at *exactly* the same level from mid-2008 until the time of writing.

If the government wanted to stabilize the price of bread and pasta, it evidently succeeded, but the stabilization occurred at rather high prices. In practice, by increasing retail prices in 2008 to this new level, bakers and noodle-makers have provided themselves with a price cushion thick enough to withstand subsequent fluctuations in the price of flour (and other inputs) while at the same time widening their profit margin, all at the expense of consumers. The international price surge, mediated by domestic measures regarding custom duties, the exchange rate and subsidies, would have justified an increase of about 20 percent in the price of bread and 50 percent in the price of pasta, whereas both increased by about 100 percent. There is no systematic study of the reasons behind these trends. The most likely reason is a tacit agreement on the part of the processing industry to stabilize the consumer prices of these basic foods, which has been made possible by initially overshooting the impact of increased food import prices.[5]

As a summary of the effect of government policies it may be said that domestic price *volatility* was avoided after mid-2008, but the impact on the *level* of consumer prices was in

[5] Monopolistic price fixing or cartelization is not likely to be the reason behind these trends for the consumer prices of bread and pasta (wider margin and unmovable prices persisting for years). The milling industry in Bolivia is indeed concentrated (less than half a dozen firms control the market for making flour), but this is not enough, for five reasons: (1) most wheat imports are already in the form of flour, not grain to be milled, and not all imports are ordered by mills; some are directly imported by noodle factories and other manufacturers and traders; (2) the wholesale price of flour, made or sold by the concentrated milling industry, did show flexibility in response to international prices; whilst on the contrary (3) the bakery and noodle-making industries are not so concentrated as wheat mills, but dominated by a relatively large number of medium-sized, small and even micro enterprises, especially for fresh bread, which is mostly baked and sold in small bakeries (many of them household-based) across the country; moreover (4) dry-noodle-making, not much concentrated but dominated by medium-sized mechanized factories, is surely more concentrated than bakeries, but pasta prices showed more price flexibility (relative to the price of flour) than the widely dispersed production of fresh bread; in fact price flexibility varied in exactly the opposite direction than expected by the monopolistic explanation: it was maximum in the most concentrated sector (mills), intermediate in the mostly corporate but less concentrated pasta sector, and practically non-existent in the absolutely not concentrated sector of fresh bread bakers; finally (5) there are no entry barriers into these consumer industries, especially bakeries.

fact more severe than justified by increases in the prices of imported food.[6]

The case of maize

As shown before, maize is not a major import in Bolivia. The country is largely self-sufficient in both soft white maize for human consumption and hard yellow maize for animal feed. There had been only occasional deficits or surpluses of hard yellow maize, triggering small flows of imports or exports. There are also some small exports and imports of soft maize. In 2007-2008 there were some export and import flows of hard yellow maize, amounting to just a small percentage of total domestic utilization. Imports in 2008 were small and the price was not high (probably because purchases had been contracted somewhat before the international price surge). The average import price paid by Bolivian maize importers in 2008 (around $100 per tonne in CIF terms) was well below international prices at the time (about $140 on average in the Rosario cereal exchange of Argentina).

Policies regarding this product, however, were more complex and variable over time as compared with policies for wheat. Their effect was also complex, and not altogether in the direction originally desired. Since the product is only marginally traded, and most of the supply is domestically produced, the ultimate effect of government policies was mediated by the response of domestic producers of both hard yellow maize and chicken, since maize is used extensively for feeding and therefore maize prices affect chicken production directly.

The government of Bolivia, as indicated before, adopted several policies and measures to face the rise in international food prices. Some policies had a broad scope, for example, improving public support for smallholders or allowing the national currency to appreciate against the US dollar, while other policies were specific to particular crops, including hard yellow maize. The following table summarizes the main measures adopted during the period of international price hikes.

The main direct measures adopted by the government regarding the surge in international food prices that are relevant for maize pointed to reducing or eliminating customs duties on imported food, and also banning the exportation of various food products.

Through several decrees in late 2007 and early 2008 the government liberalized imports and restricted exports. In September 2007, maize exports were banned (though in practice this ban was only applied to the output of the next agricultural year, thus allowing by early 2008 some exports from the previous harvest). By a decree (No. 9339) in November 2007 the government temporarily reduced import duties for key foodstuffs (live animals and all meats, hard yellow maize, rice, sugar, vegetable oils, and wheat and wheat products) to zero; this temporary liberalization was later extended several times. By another decree (No. 29640, February 2008) the government forbade exports of various food products (live animals, bovine and poultry meat, and wheat and wheat products), and extended the already existing ban on hard yellow maize exportation. It also established a complex

[6] One important and intriguing question is why the majority of Bolivia's imports of wheat consist of flour, especially in recent times, even if the milling industry is subsidized and the import cost of grain is well below the import cost of flour. The answer seems to lie in the relative cost of domestic milling versus the price differential of imported flour versus imported grain. The domestic milling industry is apparently not competitive, even given the government subsidies. Using early 2010 prices, one tonne of imported flour cost $335, while one tonne of imported grain cost $260. The cost of making flour domestically can be seen as the cost of imported grain plus the cost of manufacturing grain into flour. Making one tonne of flour requires 1.4 tonnes of grain, costing (CIF) about $260x1.4=$366, plus processing costs, clearly much above the cost of imported flour ($335). The subsidy required to offset the difference would probably be much higher than the subsidy that the government actually grants or is willing to grant; thus importers mostly prefer importing flour than grain.

Period	Government policies and measures
2007-08	Currency appreciation (from 8.00 to 7.00 Bs/USD)
Sep-07	Export ban for maize and other products
Nov-07	Zero import tariff for wheat, maize, vegetable oil, rice, sugar, chicken meat
Feb-08	Export ban for several products (live animals, meat). Enhanced law enforcement and penalties to stop illegal exportation.
May-08	Subsidies to milling and bread industries (but not to balanced feed industry or poultry farms)
May-08	Export ban for meat, soybean products and vegetable oils
Oct-08	Maize export ban lifted. Lifting of ban for other products to occur gradually. Export ban for soy was never actually enforced.
Mar-09	Subsidy to small farmers for diesel fuel
Oct-09	$59 million for small farmers (infrastructure, other)
Feb-10	Export ban for maize, sorghum and sugar
Jan-11	Maize export ban lifted

system for detecting the illegal export of those products, subjecting the contraband merchandise to be confiscated and offenders to be tried and imprisoned under criminal law.

In May 2008 the export ban was extended to vegetable oils from soy and sunflower, and to meat products (including chicken), and export restrictions short of outright bans were applied to other vegetable oils. Banning soybean exportation was intended to create an incentive for soy growers to shift their crop schedules to the production of food crops, chiefly hard yellow maize. However, the ban on soy products was never actually enforced, probably because soybeans and their products (oil, cakes) are major Bolivian exports producing a steady flow of export revenue. Also, incentives were hardly enough in view of the very high cost of production of maize relative to the much lower cost of production of soybeans, and the high price soy was fetching in international markets (compared to the lower and more uncertain price to be obtained for maize in the domestic market). These considerations, reinforced by the soybean farmers, most likely influenced the government decision not to enforce the ban on soy exports.

In a November 2007 decree, the government also allocated USD 59 million through EMAPA[7], the State-owned enterprise for food production support () to be spent in various forms: $42 million to subsidize inputs for the production of staple foods including wheat, maize, *soybeans* and rice[8]; $1.6 million to support production and distribution of potato seed; $4.8 million in direct subsidies to smallholder producers of fresh corn, onions, potatoes and tomatoes (all products mainly grown in the Andean regions); finally, $10 million were allocated for livestock restocking credit at concessional rates of interest, and the State Bank for the Development of Production was told to prioritize credit for food production.

These production support measures did not yield the expected results on production or prices, at least not in the short term. Production in the Andes did not grow significantly in 2008-2009 or 2009-2010.[9]

[7] Empresa de Apoyo a la Producción de Alimentos (http://www.emapa.gob.bo) .

[8] Soybeans were also included as a beneficiary product in the decree, but their inclusion had no practical effects: inputs for soybeans were not provided or subsidized under this regime, and the vast majority of the money allocated by the decree was directed to smallholder producers, mostly in the Andean region, whilst soybeans are mostly a product of large and medium scale commercial agriculture in the Lowlands. Besides, high soybean prices made such subsidies unnecessary.

[9] Data on agricultural output by product and department

Production of maize outside Santa Cruz fell from 275 900 metric tonnes in 2008 to 261 000 metric tonnes in 2009 and to 253 900 metric tonnes in 2010 (most of the maize outside Santa Cruz is not hard yellow but soft white maize, though some hard yellow maize is grown on lowland parts of other departments). Total wheat production also showed no positive impact in the Andean region: total production increased from 199 000 metric tonnes in 2008 to 253 000 metric tonnes in 2009 (only to fall back slightly to 241 000 metric tonnes in 2010), but most of the increase came from commercial wheat growers in Santa Cruz, where wheat output increased from 141 700 metric tonnes in 2008 to 193 600 metric tonnes in 2009, declining to 180 400 metric tonnes in 2010. Wheat output in other (mostly Andean) departments during those three years increased slightly to 57 600, 60 200 and 61 500 metric tonnes (about 1 percent of total national output, and less than 5 percent of total wheat growth in those years). Potatoes had been growing in preceding years and continued to do so in 2008-2010, but instead of growing faster because of official support policies, growth relented: potato output had increased from 706 000 metric tonnes in 2001 to 935 860 metric tonnes in 2007 (at an annual rate of 4.11 percent), and kept growing to 975 420 in 2010 (at an annual rate of 2.09 percent, half the rate of the preceding years). Quinoa, an Andean indigenous crop that fetches high prices in foreign markets, also showed no significant impact: having hovered between 24 000 and 27 000 metric tonnes since 2001, it attained 28 200 in 2007 and 28 800 in 2008 (before the impact of support measures), increasing marginally to 29 800 in 2009 and 30 900 in 2010. It grew at an annual rate of 3.53 percent in 2001-2008 and practically at the same rate (3.56 percent) in 2008-2010, without any perceptible impact from the support measures established in 2008.

The main mechanism through which international maize prices ultimately affected Bolivia were related to the export ban on maize imposed by the government in 2008, and then successively lifted, re-imposed and lifted again in subsequent years. The export ban caused maize exports in 2008 to fall relative to the previous year (from 23 000 to 10 000 metric tonnes) but it also discouraged Lowlands yellow maize producers, who sharply reduced the area planted. The area planted fell from 332 837 hectares in 2008 to 229 967 hectares in 2009 Output fell from 858 567 metric tonnes in 2008 to 764 838 metric tonnes in 2009 and 701 683 metric tonnes in 2010. Some small part of the reduction in yellow maize production (possibly about 30 000 metric tonnes in 2010) may have been due to localized drought in marginal lowland areas, affecting about 20 000 hectares of relatively low-yield crops. The low productivity of the affected lands may explain why overall maize output decreased in a smaller proportion than planted area. The extent of the drought effect is doubtful. In any case, most of the reduction in output cannot be attributed to climatic factors.

The fall in maize output imposed a severe restriction on livestock sectors that use hard maize as feed (chiefly poultry, but also hog and dairy farms, and cattle fattening). It also triggered protests by maize growers. After these developments, the ban on maize exports was lifted in early 2009, and in fact maize exports (which had been halved in 2008 relative to 2007) tripled in 2009 from 10 000 to more than 30 000 metric tonnes. Given the small incidence of both imports and exports on the much larger size of domestic maize demand, both the ban and its removal had only a small impact on aggregate demand, of the order of 10 000 to 20 000 metric tonnes, but they had a more considerable effect on area planted and production (reducing output by about 150 000 metric tonnes) as maize farmers were uncertain about possible government measures during the next agricultural season.

The sharp fall in domestic production of hard yellow maize caused domestic maize prices to rise and imports to surge from low volumes in 2008 to more than 30 000 metric tonnes in 2009 and to an unprecedented 80 000 metric tonnes in 2010-2011. The ban on maize exports was re-imposed in February 2010, in view of the sharp rise in imports. Maize exports in 2010 thus dwindled to non-significant amounts, but production was low and imports soared (in spite of the ban on exports) in both 2010 and 2011. The maize export ban was repealed for a second time in January 2011 and has not been enacted since.

The reduction in maize area and output and subsequent large increase in imports at a time of high international prices contributed to the impact of the second wave of international price surges in 2010-2011, causing a rise in the domestic price of hard yellow maize and its main related food product, chicken.

In this phase, the domestic wholesale price of maize grew faster than the international price of maize. The Bolivian wholesale price of a tonne of maize in 2008 was $40 (or 35 percent) above the export price at the Rosario cereal exchange in Argentina, but the gap rose to $100 above the Rosario price in 2010 and (as the price reached $452 per tonne by early 2011) the gap reached about $180 (or 65 percent) relative to the $274 price that was obtained at the time at the Rosario exchange, and $200 (or 80 percent) relative to the $250 price at the Chicago exchange (Guachalla, 2012). In spite of the export ban, which was intended to cause domestic prices to fall relative to international levels, the net outcome was an increase in domestic prices and a widening gap between international and domestic wholesale prices, both triggered by falling domestic output.

The attempt to fight the rising costs of imported maize through an export ban did not work. The ban caused a reduction in exports and a sharp rise in imports, at a rate substantially above those registered in previous years and at the time of the highest prices. This in turn caused maize (and chicken) prices to rise in 2010-2011, as discussed below. It also reduced the incentives to farmers to plant the crop, triggering a fall in domestic production. The fact that the export ban was imposed, then lifted and subsequently re-imposed did little to assuage the farmers' preoccupation about further changes in the rules of the game.

- **Price ceilings and illegal trade**

Also in 2010, when the maize export ban was re-imposed and maize prices skyrocketed, maximum consumer prices for chicken and sugar were established and subsidies for wheat flour continued in force. According to industry specialists, both in Bolivia and neighbouring Peru, a steady flow of illegal exportation of chicken, sugar and wheat flour to Peru developed rapidly, to take advantage of cross-border

FIGURE 12: CONSUMER PRICE OF CHICKEN IN LA PAZ

Source: INE.

are taken from the website of the Ministry of Land and Rural Development (MDRYT), http://www.agrobolivia.gob.bo]'Estadísticas Agropecuarias'. Source is indicated as INE-MDRYT. See also MDRYT 2011.

price differentials. In particular, the cap on chicken retail prices imposed much strain on poultry farms, which already faced increased and volatile costs of feed (made mostly of three parts hard yellow maize and one part soybean cake, both selling at increasingly higher prices). This proved to be a strong incentive to sell the birds in the informal markets, mostly for illegal export. Something similar occurred with sugar and wheat flour. It is not possible to estimate the volume of this contraband trade, but by all accounts it appears to have been significant. Chicken, however, is hardly found at the official price in the retail market and is sold at higher prices in many places. The informal market premium is about 40-50 percent above the official price; the government's ability to control retail distribution (and informal border trade) is very limited.

The pre-surge chicken price level was about Bs10 per kilogram. When the market price reached about Bs14 in 2008, an official price cap of Bs10.50 per kilogram depressed the retail price in 2008 and 2009 to about that level (at least in the official figures), but the price repeatedly rebounded. Since mid-2010, the price surged again, reaching Bs16.50 per kilogram in La Paz by late 2011.

The retail price of chicken is the main channel through which the prices of hard yellow maize (used for feed) impact consumer food prices. Chicken has been subject to price controls, while its principal input (hard yellow maize) has been subject to export bans and other restrictions. This set of policies has been relatively ineffective, causing a decline in maize output, triggering a surge in maize imports at high prices, creating incentives for illegal exports of chicken to Peru, and failing to keep chicken market prices from surpassing the official level.

Concluding remarks

Since 2005, Bolivian agricultural policy has had a strong emphasis on food sovereignty, which tends to be interpreted as food self-sufficiency. This has been implemented through a set of interventionist policy measures. Policy responses to rising international food prices have also reflected domestic political factors: strong central government support came from the Andean regions while the Lowlands expressed fierce opposition.

During the 2007-2008 price surge, wheat-based products were initially strongly affected by rising international prices, but afterwards the domestic prices of wheat-related products remained comparatively more stable. Government policies succeeded in dampening the effect of the surge in import prices on the domestic *wholesale* price of wheat flour, but the consumer price of bread and pasta increased more than was justified by the higher cost of production caused by a higher wholesale flour price. In contrast, the impact of the second international price surge (2010-2011) has been felt especially in the maize-chicken value chain.

A major factor to dampen the impact of international prices was the appreciation of the Bolivian currency from late 2006 until early 2008. There was no further appreciation (or depreciation) of the currency in 2008-2010, and only a very slight appreciation (about 1 percent) in 2011, and thus exchange rates played no significant role in softening the impact of the second price surge. Currency appreciation reduced by about 13 percent the impact of import prices on the domestic wholesale price of flour. A subsidy to the milling industry also contributed to dampening the price increases, although most wheat imports in recent years were already in the form of flour.

Besides these policies directly addressing the price level, the government also provided strong financial support to Andean peasant

production and small or artisanal processing industries in the Highlands regions, with the hope of rising domestic production to thus improve the food security of Andean smallholders and also reduce demand for imports. Andean peasant production, however, was slow to respond to these incentives, or perhaps unable to do so due to constraints on natural resources (land and water).

In the case of maize, regulations affecting commercial maize and poultry farms (such as export bans and domestic price controls) caused commercial maize growers (large and small) to reduce the area planted with maize and to shift land use towards more easily exportable and profitable products, such as soybeans (the government, in fact, briefly banned soybean exports, but this policy was quickly abandoned). The imposition of price ceilings for chicken did not keep chicken prices low; on the contrary, they continued increasing while informal exports (primarily to Peru) surged to benefit from border price differentials. This occurred not only with chicken, but also with sugar and flour.

In 2011, the political climate governing agricultural policies had perceptibly changed, according to both governmental and private sector opinions gathered in the field, and the second ban on maize exports was lifted in February 2011. A more favourable disposition towards Lowlands commercial producers (both in the primary sector and agro-industry) became noticeable, but not in time to avoid the fall in maize output and a large increase in maize imports just as international prices reached their highest points.

This change in the policy climate also likely reflects a broader shift in political orientation toward the national dialogue. Even if many foreign trade restrictions and domestic market controls remain in force, dialogue with commercial farmers and agribusinesses has resumed. Several policies that have yielded negative results (such as the ban on maize exports) have been discontinued or given less priority for enforcement.

Bolivia is a complex society prone to internal conflicts and undergoing rapid economic and political change; the time elapsed since the country entered the current political landscape in 2005, or since the food price surge in 2008, is still too short. However, it is instructive to analyse the case of Bolivia as an example of activist or interventionist policies to reduce the impact of international price volatility, in contrast with the very different policies adopted in other countries of the region, such as Peru.

REFERENCES

EC. 2004. Disponibilidad nacional de alimentos, patrón de consumo y cambios tendenciales del sector agrope¬cuario. *In Comida propia, comida ajena. Alimentos en Bolivia – Disponibilidad y donaciones*. AIPE. La Paz.

FAO, WFP and IFAD. 2012. *The State of Food Insecurity in the World, 2012*. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition. Rome.

FAO and LATINFOODS. 2009. *Tabla de composición de alimentos de América Latina*. FAO Regional Office for Latin America and the Caribbean. Available online at: http://www.rlc.fao.org/es/conozca-fao/que-hace-fao/estadisticas/composicion-alimentos.

Leung, W.-T. W. and Flores, M. 1961. *Food Composition Table for Use in Latin America*. INCAP, Guatemala and NIH, Bethesda, MD.

MDRYT. 2011. *Boletín Estadístico Agrícola – Octubre 2011*. Ministerio de Desarrollo Rural y Tierras, La Paz.

Ormachea, E. S. 2009. *Soberanía y seguridad alimentaria en Bolivia: Políticas y Estado de Situación*. CE¬DLA, La Paz, Bolivia.

World Bank. World Development Indicators. Available at http://data.worldbank.org/data-catalog/world-development-indicators

Zeballos, H. H. 2011. Seguridad Alimentaria. *Coloquios Económicos* No. 22, Fundación Milenio, La Paz.

CHAPTER 4

BRAZIL

JOAQUIM BENTO DE SOUZA FERREIRA FILHO AND CARLOS EDUARDO DE FREITAS VIAN*

Introduction

During the past decade, the growth of developing economies like Brazil, China and India has been an important advance, bringing with it an attendant rapid increase in personal incomes and consumption. Another central feature of the recent evolution of the world economy, and linked to the growth of developing economies, has been the rapid increase in food prices since the beginning of the 2000s.

Rising food prices are, naturally, a great concern for most governments. Food price increases can negatively impact the well being of the developing world, which is largely composed of net food importing countries. Even Brazil, which is a net food exporter, still has a significant number of poor persons for whom the share of food in total expenditures is high.

The objective of this study is to analyse Brazil's policy response to the 2007–2008 food price swing, focusing on three products: maize, rice and wheat. As part of its policy set Brazil has been developing a system of safety nets, which has managed to cope with the recent food price spikes; this system will also be described.

It should be noted that Brazil is not a typical developing country because it is a large food exporter. Furthermore, it has the potential to increase its food supply, due to an ample supply of land and a well-structured agricultural research system. Nevertheless, its policies are of interest to other countries, and we will attempt to draw lessons for the future because it is widely anticipated that there will be international food price fluctuations in the years to come.

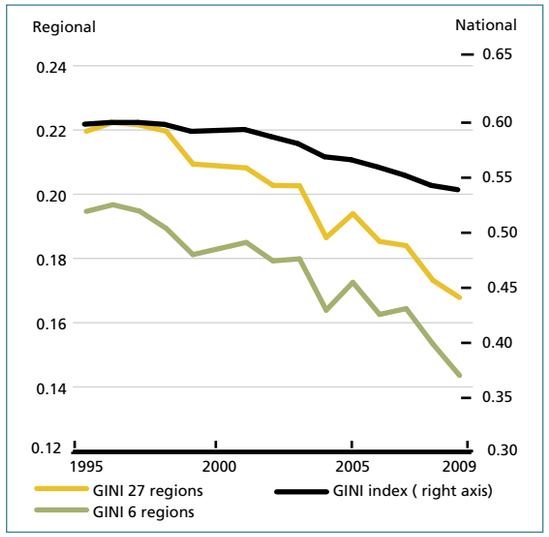
Inequality, poverty and food security in Brazil

One of the more noticeable aspects of economic development in Brazil during the past ten years has been the fall in poverty and inequality levels (although such levels are still high by any standard). Figure 1 shows the evolution of the Gini index in Brazil for personal income, as well as the Gini index calculated between regions inside the country[1]. As

* Professor, Escola Superior de Agricultura "Luiz de Queiroz", University of São Paulo. Department of Economics, Management and Sociology. Piracicaba, SP, Brazil. Email: jbsferre@usp.br and Professor, Escola Superior de Agricultura "Luiz de Queiroz", University of São Paulo. Department of Economics, Management and Sociology. Piracicaba, SP, Brazil. Email: cefvian@usp.br

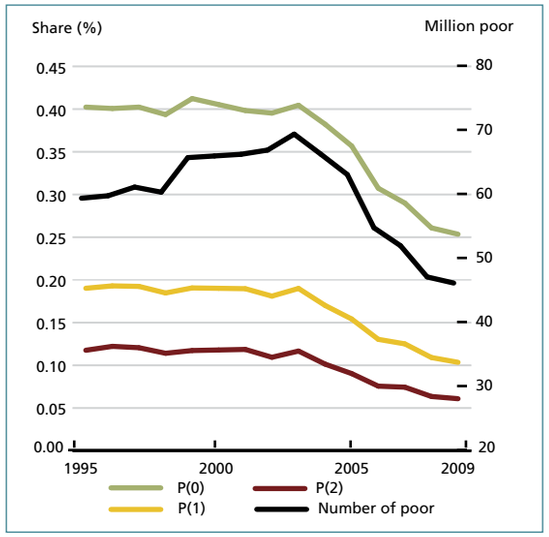
[1] The authors are grateful to Prof. Rodolfo Hoffmann, from the University of Campinas (Universidade Estadual de Campinas – UNICAMP) and the Luiz de Quieros

FIGURE 1: EVOLUTION OF GINI INDEX IN BRAZIL, NATIONAL AND BETWEEN REGIONS



Source: Hoffmann (2011) calculations.

FIGURE 2: POLICY EVOLUTION IN BRAZIL, 1995-2009



Source: Hoffmann (2011) calculations.

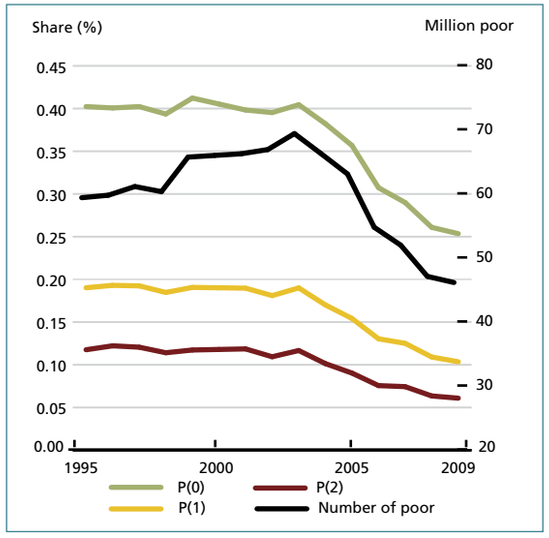
can be seen from the figure, the Gini index in Brazil fell steadily from a value of 0.60 in 1995 to a value of 0.54 in 2009. Regional income inequality inside Brazil fell faster than inequality across households. While the Gini index measured at the household level fell by about 11 percent during this time, the Gini index for regional incomes fell by about 36 percent when computed over 6 regions, and 31 percent when computed over 27 regions.

Along with inequality, the poverty situation is also improving in Brazil. It can be seen from Figure 2 that, using a poverty line of R$200 (constant 2009 currency terms), the number of poor has declined from about 59 million persons in 1995 to about 46 million in 2009, along with other poverty indicators (the Foster-Greer-Torbecke poverty indices, namely the headcount ratio (P0), the poverty gap (P1) and the dispersion of poverty (P2)). The share of poor persons in the total population (P0) fell from 40 percent in 1995 to 25 percent in 2009. The poverty gap fell from 0.19 to 0.10 in the same period, and the dispersion of poverty (the dispersion of income of those below the poverty line) also fell from 0.13 to 0.06. These indicators show that not only has the number of poor fallen, but also that the improvement has reached the very poorest people in the country.

Poverty figures are sensitive to the definition of the poverty line, but the abovementioned fall in poverty can be observed even with the use of different definitions. Brazil's Institute of Applied Economic Research (Instituto de Pesquisa Econômica Aplicada – IPEA, 2010), for example, also shows that the share of the Brazilian population living below the poverty line has been falling since 2003, and the movement has been particularly strong for lower poverty lines. Using a poverty line defined as 50 percent of the value of the Bolsa Família Programme (the poverty line for extreme poverty) at its inception in 2004 (R$100), the poverty headcount fell by 44 percent in 2009, compared to 1995.

Agricultural School (Escola Superior de Agricultura "Luiz de Quieroz" – ESALQ/USP), Brazil, for his invaluable support in the calculation of the inequality indices.

FIGURE 3: EVOLUTION OF PER CAPITA GDP IN BRAZIL (THOUSANDS OF CONSTANT 2009 REAIS)



Source: IPEADATA.

The observed decreases in poverty and inequality are related to two main factors in the Brazilian economy: a steady increase in per capita GDP and the direct income transfer policies that have increased markedly over the past decade. Figure 3 shows the evolution of per capita GDP in Brazil, from 2000 to 2009. As can be seen, there is a steady increase at the beginning of the period followed by a considerable acceleration from 2003 until 2008, the year of the world financial crisis.

It is important to note that per capita GDP increased in Brazil in 2007 and 2008. Indeed, Hoffmann (2005) and Hoffmann and Ney (2008) show evidence that economic growth during the past decade was responsible for a greater share of the fall in inequality than the transfer programmes[2]. Thus economic growth (due partially to higher commodity prices on international markets) made a key contribution to improvements in food security.

The Brazilian Household Survey (Pesquisa Nacional por Amostragem de Domicílios – PNAD) contained a special supplement in 2004 and 2009 that monitored the food security situation in the country. According to the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística – IBGE, 2010), based on the information from that survey, the proportion of Brazilian households that were food insecure to some degree fell from 34.9 percent in 2004 to 30.2 percent in 2009. The other 69.8 percent of the 58.6 million households in the country were classified as food secure in 2009.

The survey also showed that food insecurity has strong regional dimensions in Brazil, with 40.3 percent and 46.1 percent of households in the North and Northeast regions, respectively, being food insecure. Food insecurity was also higher in households with per capita income below half the minimum wage (55.0 percent), in households with persons younger than eighteen years old (37.2 percent), and among non-white persons (43.4 percent).

Broken down by degree of food insecurity, the share of households with less severe food insecurity (when there is concern with the availability of food in the future, or with its quality) was estimated at 18.7 percent in 2009 (18.0 percent in 2004). The share of households experiencing moderate food insecurity (when there is some shortage of food in quantitative terms) was 6.5 percent in 2009 (9.9 percent in 2004). The share of households experiencing severe food insecurity (defined as a situation of food deprivation) was 5 percent in 2009 (7.0 percent in 2004).

The proportion of food insecurity is also different between rural and urban areas. In 2009, while 6.2 percent and 4.6 percent of urban households had persons who were in a situation of moderate or severe

[2] Hoffmann and Ney (2008) show that increased labour earnings contributed more to the fall in the GINI index between 2001 and 2006 (57.6 percent) than the transfers from Bolsa Família and other government programmes, which, together with interest earnings, were responsible for 27.3 percent of the fall in the GINI index.

food insecurity, in rural areas those figures amounted to 8.6 percent and 7 percent, respectively. The decline from 2004 to 2009 in total food insecurity was more rapid in rural areas, however. It declined from 43.6 percent to 35.1 percent in rural areas, compared to a decline from 33.3 percent to 29.4 percent in urban areas (IBGE, 2010).

Overview of policy measures adopted in response to rising food prices

Food security programmes in Brazil have developed over time and have a complex set of institutional arrangements. Trade policies now play a minor role, with government food procurement and distribution and income transfers being much more important. Most of the programmes were designed long before the start of the food price crisis – thus, the agricultural price increases in 2007–2008 did not cause any particular policy adjustments apart from those already at work. The only two special measures adopted during the period of the price crisis were:

- the temporary elimination of the External Common Tariff (TEC) for wheat imported from outside Mercosur in 2008, due to the problems in the supply of wheat from Argentina; and
- a noticeable increase in the distribution of food bundles[3] in 2007 compared to 2006. The number distributed fell in 2008, but remained far above the 2006 level.

When discussing commodity-based policies, this paper will focus on maize, rice and wheat. Before discussing these policies, however, it is important to understand some basic facts about the market structure for each of these commodities in Brazil.

In terms of volume of production, maize is the most important product among those analysed in this paper. It is used mainly as feed for livestock, not for direct human consumption. Brazil is an exporter of maize, with an average of 10 percent of domestic production being exported over the period 2002–2008 (Table 1). Exports have been increasing over the past few years, rising from 2.9 million tonnes in 2002 to 6.5 million tonnes in 2008.

Rice is an important food staple in Brazil, frequently served with beans. After being a consistent net rice importer for many years, Brazil became self-sufficient in production during the past decade. At present, the importance of rice trade relative to production is very small.

Wheat is used to make flour and bread products. Most of the wheat for domestic consumption is imported. Although the magnitude varies from year to year, imports reached as high as 2.63 times the level of domestic production in 2006. The variations in trade are related to production variability in Brazil, where wheat is produced as a winter crop, with little irrigation and high production risk.

Trade policies and domestic price movements during the price crisis

Brazil is an important net food exporter, with wheat being the only food imported in significant amounts. Brazil does not impose tariffs on either exports or imports of agricultural products. Wheat is the only exception, in which case there is a differentiated import tax depending on the source. Because of the country's open trade policies, domestic prices are linked closely to international prices, which are not affected by Brazil because it is a small trader of those products[4]. This is true even in the case of rice,

[3] A food bundle is a package of basic food products (enough for one month). It normally includes beans, flour, rice, sugar and local products specific to certain regions in Brazil.

[4] Brazilian exports of maize in 2008 accounted for 8.5 percent of world maize exports (USDA, 2011).

TABLE 1: HARVESTED AREA, PRODUCTION AND TRADE FOR MAIZE, RICE AND WHEAT IN BRAZIL 2002-2008

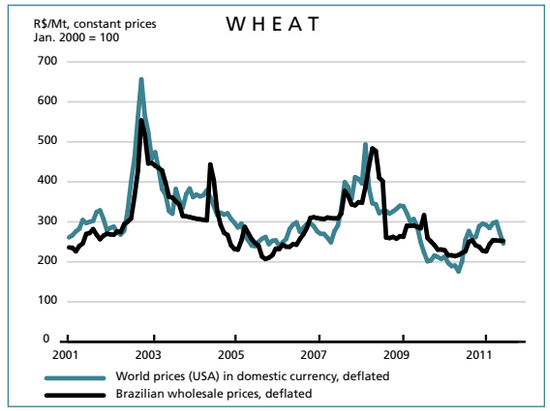
Year	Area (1 000 ha)			Production (1 000 tonnes)			Trade/production (share)		
	Maize	Rice	Wheat	Maize	Rice	Wheat	Maize *	Rice**	Wheat**
2002	11 751	3 146	2 105	35 933	10 457	3 106	0.08	0.021	2.12
2003	12 966	3 181	2 560	48 327	10 335	6 154	0.07	0.063	1.07
2004	12 411	3 733	2 807	41 787	13 277	5 819	0.12	0.016	0.83
2005	11 549	3 916	2 361	35 113	13 193	4 659	0.03	0.003	1.07
2006	12 613	2 971	1 560	42 661	11 527	2 485	0.09	0.003	2.63
2007	13 767	2 891	1 853	52 112	11 061	4 114	0.21	0.004	1.61
2008	14 445	2 851	2 364	58 933	12 061	6 027	0.11	0.004	1.00

(*) Gross Exports/Production. (**) Gross Imports/Production.
Note: Trade figures are for gross exports or imports. The use of net figures does not significantly change the results
Source: FAO (2012).

for which relatively little international trade takes place. In this case, the small trade flows are due to the approximate balance between production and consumption, and are not due to any trade barriers.

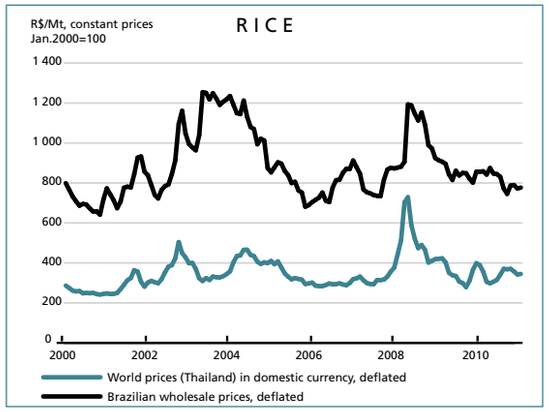
The following figures (4, 5 and 6) show the comparative evolution of domestic and world prices for maize, rice and wheat. They show that domestic prices in Brazil track international prices very closely. These graphs provide empirical support for the "law of one price," which holds that in the absence of restrictions on external trade, the domestic price of any tradable product must lie between the FOB export price and the CIF

FIGURE 5: WHEAT: BRAZILIAN WHOLESALE PRICES AND WORLD PRICES IN DOMESTIC CURRENCY, DEFLATED



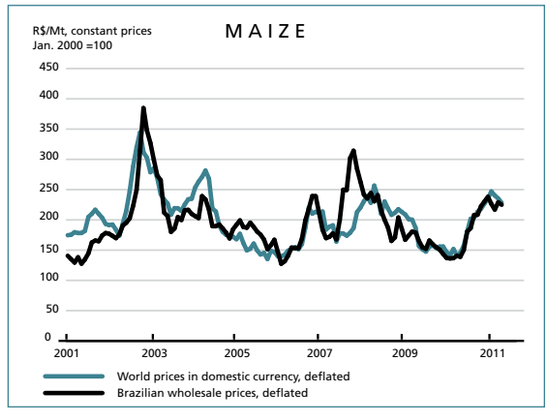
Source: FAO GIEWS Food Price Data and Analysis Tool.

FIGURE 4: RICE: BRAZILIAN WHOLESALE PRICES AND WORLD PRICES IN DOMESTIC CURRENCY, DEFLATED



Source: FAO GIEWS Food Price Data and Analysis Tool.

FIGURE 6:MAIZE: BRAZILIAN WHOLESALE PRICES AND WORLD PRICES IN DOMESTIC CURRENCY, DEFLATED



Source: FAO GIEWS Food Price Data and Analysis Tool.

import price, adjusted for internal marketing costs to bring the product to or from port.

The preceding figures showed the evolution of domestic and external prices, denominated in inflation-adjusted Brazilian reais (R$). These graphs hide the impact of exchange rate movements during the period, however. Between 2002 and 2008, the Brazilian currency appreciated in value by 37 percent. These exchange rate movements alleviated the domestic price increases of the products under analysis, providing a cushion against external price increases. For example, even though the domestic price of wheat increased rapidly after 2006, the increase would have been even more marked if the Brazilian real had not appreciated strongly at that time.

The international price increases had mixed welfare effects in Brazil. On the one hand, the price hikes raised producers' income and reduced the need to intervene to guarantee such income. On the other hand, the increases represented a threat to food security for the poorer groups in the country, especially since Brazil did not react to rising food prices with price controls (which, in any event, may not have worked). Rather, it let price increases on international markets be transmitted to the domestic economy, and minimized the effects on food security by increasing the distribution of food bundles to the population and expanding income transfer programmes. We now turn to an analysis of those responses.

Institutional and regulatory settings for implementing food security measures

The World Food Summit in 1996 inaugurated an international commitment regarding access to food, and Brazil was a pioneer in implementing food security policies in Latin America. It started to treat access to food and alleviation of hunger as a key state policy objective (Ortega and Almeida Filho, 2007). Civil society played a key role in organizing actions to increase the focus on food security, for example Herbert de Souza (Betinho) led the Citizen's Action against Misery, Hunger and for Life (Ação da Cidadania contra a Miséria, a Fome e pela Vida).

Brazil's Zero Hunger Programme (Fome Zero) gained prominence after 2002, with the election of President Luiz Inácio Lula da Silva. He created the Extraordinary Ministry to Fight Hunger (Ministério Extraordinário de Combate à Fome), which was later replaced by the Ministry of Social Development and Fight Against Hunger (Ministério de Desenvolvimento Social e Combate a Fome – MDS) and the Ministry of Agrarian Development (Ministério de Desenvolvimento Agrário – MDA). These ministries play a key role in Brazil's food security policy framework, which is based on three main pillars: stimulating food production, broad food supply policies and direct income transfer programmes.

The National Supply Company (Companhia Nacional de Abastecimento – CONAB) plays a key role in the first two of these pillars, and traces its origins back to 1943 with the creation of the Production Financing Company (Companhia de Financiamento da Produção – CFP). Historically, CONAB has been very important in the execution of the Minimum Price Guarantee Programme (Programa de Garantia de Preços Mínimos – PGPM) in Brazil, a policy to stabilize agricultural prices and guarantee rural incomes. After the opening up of the Brazilian economy to international trade and the consequent integration of the domestic price system with international market prices, new intervention instruments were created, which modernized and changed its scope of action. The most important of these instruments are described in CONAB (2007):

- **Federal Government Acquisition Programme (Aquisições do Governo Federal – AGF):** this is the traditional intervention mechanism that aims to guarantee a minimum price to rural producers, family producers and cooperatives through the direct purchase of farm products. Operations are undertaken when market prices fall below the minimum price for the current harvest season, which is fixed by law.

- **Options Contract (Contrato de Opções – CO):** this instrument was created after the trade opening of the Brazilian economy, and allows the government to selectively purchase products from particular regions and groups of producers through a commodity exchange. CONAB issues sales options to be settled if market prices fall below the minimum prices. Access to the contracts is through bids in an electronic system that integrates the commodity exchanges.

- **Product Flowing Premium (Premio de Escoamento de Produto – PEP):** is an economic subsidy to a particular segment of the trade chain, offered in a public auction, for acquisition of products at the reference value determined by the government. The auction is based on the difference between the minimum price determined by the government and the market price. The winner of the auction has the choice of promoting the flow of production from surplus regions to any of several deficit regions.

- **Product Flowing Value (Valor de Escoamento de Produto – VEP):** in this programme, an economic agent acquires the product in a public auction, and receives a subsidy after transferring the product to a specific deficit region that needs supplies. This modality is used when the government has stocks far from the areas of consumption, and needs to move the stocks to those regions.

- **Risk Premium for the Acquisition of Agricultural Product Originating in a Private Sales Option Contract (Prêmio de Risco para Aquisição de Produto Agricola Oriundo de Contrato Privado de Opção de Venda – PROP):** users of agricultural products (normally traders and vegetable processing companies) agree to acquire the product on a future date directly from producers or cooperatives at a fixed price, through the issuance of sales options in a private auction. It is similar to the CO and PEP modalities, except that the private sector issues the contract.

- **Equalizing Premium to Producers (Premio Equalizador Pago ao Produtor – PEPRO):** a subsidy paid to producers or cooperatives willing to sell their production for the difference between the Reference Value established by the government and the value of the Equalizing Premium bought at auction. Its operation is similar to the PEP, but the premium is paid directly to the rural producer. This instrument is used when market prices are below the minimum.

- **Public Auction Sales (Vendas em Leilões Públicos):** this intervention happens through public auctions in commodity exchanges and aims to complement domestic supply.

- **Counter Sales (Vendas em Balcão):** this modality aims to supply small producers, primarily of animal products, with inputs for their production from public stocks, in a regular manner and at prices similar to those in public auctions. The programme benefits producers who are not large enough to participate in public auctions.

At present, CONAB is deeply involved in Brazilian food security, acting through policies that span the mandates of several different ministries. Its institutional mission is to "contribute to the regularity of food supply and guarantee of income to rural producers by participating in the formulation and execution of agricultural and food supply policies" (CONAB, 2007). In this regard, it purchases food from small producers, supplies food and animal feed to small producers and retailers, distributes food bundles to endangered populations and supplies food programmes in public schools. Since CONAB is involved in both procurement and distribution, many of its actions are inter-related. For example, the products acquired from family producers are distributed to food-insecure households, and are also used to build stocks for future sales. In implementing CONAB's mandate, Brazil's federal government works in partnership with state and local governments as well as civil society organizations in the execution of food assistance policies and school food programmes.

CONAB's commodity purchases, sales and stocks during 2007–2008[5]

The Brazilian maize harvest increased about 21 percent in 2007 compared to 2006, forcing prices down in the first half of the year. This led to government interventions in the market through the AGF and PEP modalities – around 280 000 tonnes of maize were bought by CONAB during 2007. By the second half, however, prices were up following the announcement of problems in European harvests. The high world prices and the large Brazilian harvest then led to a strong increase in maize exports. After the increase in prices, purchases by the government stopped, and CONAB instead sold around 2.4 million tonnes of maize in the market.

Similar patterns were observed in the rice market in 2007. After a fall in prices at the beginning of the year, CONAB made purchases, mainly through options contracts (total purchases for 2007 were about 550 000 tonnes, made mostly in the first half). The market then reversed in the second half of the year, and as prices turned up, CONAB sold 110 000 tonnes of rice in 2007. Sales strongly increased in 2008 to 887 000 tonnes.

In the case of wheat, the price in early 2007 was already above the minimum price and no government intervention was necessary. Thus, CONAB did not buy wheat during 2007. The price remained strong until the second half of 2008, when the announcement of a large harvest in Brazil and some resumption of exports from Argentina started to push domestic prices down. CONAB decided to intervene, and purchased 230 000 tonnes of wheat toward the end of 2008 through the AGF modality.

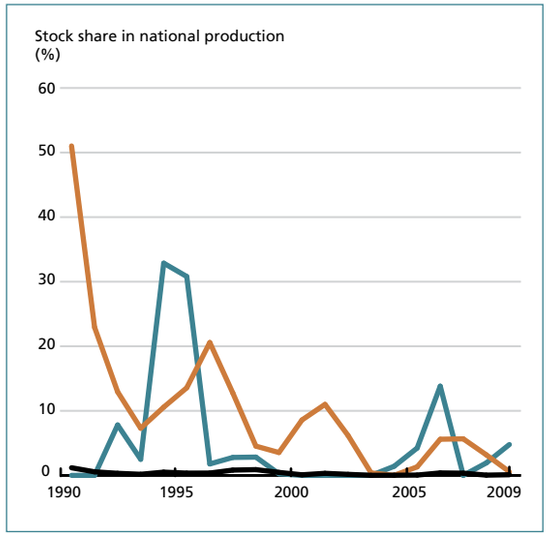
Overall, there was some stock accumulation of rice and wheat in 2006 and of rice in 2007 when prices were relatively low, but this was rapidly depleted in 2008 as a policy response to the price increases during that year.

Despite these interventions, the role of CONAB has evolved since the opening of the Brazilian economy in the 1990s. Currently, its primary function is to provide enough liquidity to agricultural trade at particular times and locations, and ensure minimum prices through financial mechanisms, given that international prices determine domestic prices in the absence of quantitative restrictions on trade.

The amount of product involved in the interventions is not very high when compared with total production. This is reflected in the level of stocks as a share of production (Figure 7). For rice, the ratio of stocks to production has declined substantially over the past 20 years, while for maize the share

[5] This description is based on CONAB (2008b).

FIGURE 7: SHARE OF PUBLIC STOCKS IN DOMESTIC PRODUCTION



Source: CONAB.

of public stocks in total production has always been very low. Rice stocks increased somewhat in 2006 and 2007 as a result of the aforementioned purchases, reaching around 6 percent of national production, but then the level decreased in 2008 and 2009. Wheat stocks also increased in 2006, when the monthly average level of stocks reached almost 14 percent of domestic production, but because wheat is imported, this is equivalent to just 4 percent of apparent domestic consumption.

These figures illustrate why public policy is not effective in terms of influencing domestic prices in Brazil. It is widely recognized that it is not possible to stabilize market prices in an open economy, and stock formation is determined by local and regional situations. Thus, the size of stocks held by CONAB is not big if compared to the total national market, but it is enough to intervene in particular markets and regions for limited periods of time, and to support the social policies of food distribution and stimulus to family agriculture.

Stimulating food production – the role of the Food Acquisition Programme

As mentioned earlier, one of the three key pillars of Brazilian food security policy is stimulating domestic food production, especially from family farms. Thus, in July 2003, the Food Acquisition Programme (Programa de Aquisição de Alimentos – PAA) was created, with the objective of stimulating family farm production by utilizing markets and a regional focus. Its purpose is to "guarantee access to food in the quantity and regularity necessary to populations in situations of food and nutritional insecurity" (MDA)[6]. It is managed by CONAB and linked to the MDS and MDA, the two ministries that provide resources for specific food acquisition (and distribution) programmes in Brazil. In terms of stimulating production, the PAA aims to support minimum prices for farmers.

The main group targeted by the PAA for assistance is family producers classified as such by the National Programme for the Strengthening of Family Agriculture (Programa Nacional de Fortalecimento da Agricultura Familiar – PRONAF). This group includes beneficiaries of the agrarian reform programme, indigenous communities, families affected by large public investments like dams for electricity generation, and other vulnerable families. From 2003 to 2005, the PAA received its funding from the MDS Poverty Eradication Fund (Fundo de Combate e Erradicação da Pobreza). Later, the MDA joined the programme, supplying funds to acquire products and build up stocks.

The PAA allows for the acquisition of food from small producers through a simplified (relative to that for normal food purchase programmes) process of bids, at prices compatible to those on regional markets. The purchased products are used in food programmes by social assistance institutions and distributed to households in conditions

[6] Available at http://www.mda.gov.br/

of food insecurity, as well as through food bundle distributions. There are five main modalities of purchase in the PAA[7]:

- **Direct Purchase from Family Agriculture (DP):** direct purchase of food from small producers at the minimum prices, for distribution or augmentation of public stocks. This modality is operated by CONAB through an agreement between MDA and MDS. The products are mainly used for food bundles. The products included in this modality are beans, Brazil nuts, cashew nuts, cassava flour, maize, powdered milk, rice, sorghum and wheat flour.

- **Local Direct Purchase with Simultaneous Donation (LDP):** this modality is managed by MDS through partnerships with local governments. Products are purchased from family farms and distributed through the local social assistance network. Included in this modality is the National School Food Programme (Programa Nacional de Alimentação Escolar – PNAE). The PNAE buys food from different sources; in certain localities it can purchase from family producers and directly donate to schools to be used for student meals[8].

- **Stock Formation (SF):** this modality aims to stabilize prices for family producers (as classified by PRONAF) and provide an instrument for them to generate value added. The programme is managed by CONAB, through agreement with MDA and MDS. Organizations of producers submit a proposal (which can include some primary processing of production) for storage and future sale to the regional CONAB office. The proposal must specify the product, the period for which stocks will be held, the prices and the producers to be included. Once the proposal is approved the producer's organization issues a financial instrument (**CPR-Estoque**) that must be settled within twelve months, and receives the equivalent financial resources at issuance. Funds for the programme are provided by both the MDA and the MDS. The contracts with funds from the MDA must be settled with physical products, while the contracts with funds from the MDS must be settled financially, including administrative costs and an interest rate of 3 percent per year.

- **PAA Milk:** this modality operates in the Northeast region and Minas Gerais state. It aims to increase milk production by small producers and milk consumption by families who are food insecure. The programme operates through commercial dairy companies, by agreement with the MDS.

- **Purchase and Simultaneous Donation (PSD):** this modality acquires food from small producers organized in groups or cooperatives, and donates it to institutions belonging to the Social Protection Network (Rede de Proteção e Promoção Social) that have programmes of food access. The programme is managed by CONAB, with resources from the MDS. A producers' organization submits a proposal to CONAB, and, if approved, issues a financial instrument (**CPR-Doação**) to be settled in the future. This modality allows for the acquisition of both "in natura" and processed food, and prioritizes the purchase of organic food products. A wide range of different types of food (about 200 in total) are included, many of which are only produced in a specific region. The programme has a strong regional focus, with food typically being distributed in the same region where it was produced.

[7] The following is based on information from the MDS, available at http://www.mds.gov.br/segurancaalimentar/alimentoseabastecimento/paa.

[8] A recent law was approved (Law 11,947) according to which 30 percent of the funds supplied from the National Fund for the Development of Education (Fundo Nacional de Desenvolvimento da Educação – FNDE) for the PNAE must be used to purchase food from family producers.

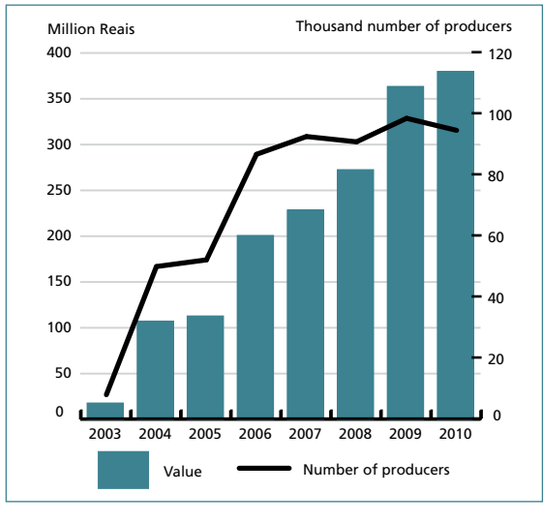
The extent to which each of the above modalities[9] is used in any particular year depends on circumstances. The total value allocated to the PAA, however, has been generally increasing since the programme's inception in 2003, both in terms of total value and the number of producers included (Figure 8). This trend, which has also been observed in the evolution of the Bolsa Família programme, will be discussed below.

In terms of the different PAA modalities, the PSD modality has been increasing in importance over time, and it is usually the most important modality (Figure 9). The share of the PSD modality increased in 2007 and 2008, returning again in 2009 to the previous 2006 share, only to increase again in 2010. This pattern is a result of the price increases in 2007, 2008 and 2010, and the consequent attempt to guarantee a supply of food to the most vulnerable households.

It is important to note the large share of programmes that use financial instruments (PSD with the CPR-Doação, and SF with CPR-Estoque), and account for the bulk of resources in most years. This reflects CONAB's present strategy of reducing the volume of products in storage through the use of more efficient and modern financial mechanisms to solve localized commercial problems, thereby avoiding the serious stock management problems that occurred in the past.

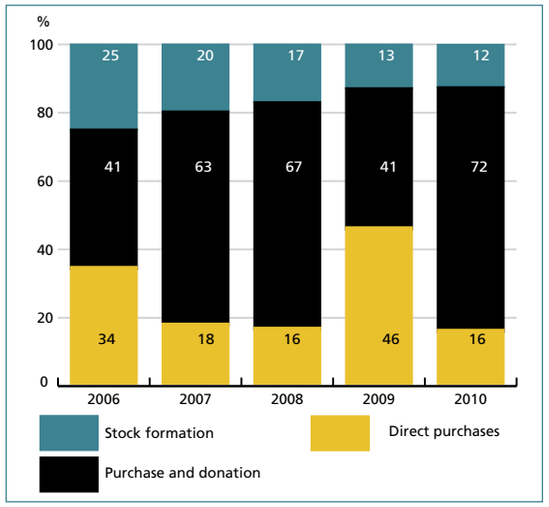
[9] The CONAB has another programme, PROHORT, (Programa Brasileiro de Modernização do Mercado Hortigranjeiro) that aims to help modernize vegetable markets. Its actions, however, are focused on market information instead of buying from farmers, and are not analysed here.

FIGURE 8: TOTAL DISBURSEMENT VALUE IN PAA AND NUMBER OF PRODUCERS ASSISTED



Source: CONAB.

FIGURE 9: EVOLUTION OF PAA MODALITIES OVER TIME



Source: CONAB.

Food supply policies

The second pillar of Brazil's food security policies relates to food supply. This pillar

was reflected in the annual message from the president of CONAB in 2007 (CONAB, 2007a). "If, on the one hand, the conditions in the market for primary products, especially the increase in world demand with consequent price increases above the historical trend, demanded less intervention from the public sector to sustain prices, on the other hand they demanded more attention on the supply side, to eliminate negative effects at the retail level." As a result, the number of food bundles distributed to the population increased from 1.2 million in 2006 to 2.2 million in 2007, an 83 percent increase. The number of small producers from whom production was purchased reached 98 840 households, involving 232 000 tonnes of various products.

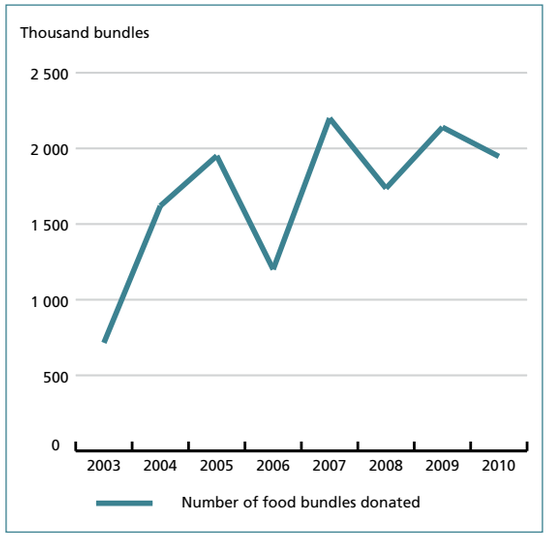
The CONAB 2008 Social Report (CONAB, 2008a) states that in 2008 the marketing policy focused more on financial contracts (options), which are more suitable for unstable markets. Around 175 000 tonnes of various food products were purchased from 92 158 small producers, and this food was used for 1.7 million food bundles (benefiting 645 000 households) and donations to about 19 600 social institutions.

The actions undertaken by CONAB in 2007 and 2008 had the goal of stabilizing the food supply for the poor in the face of rising prices, given that the need to support prices had disappeared by the second half of 2007 when international prices started to rise sharply. During 2008, the prices of the three products under analysis remained above minimum prices, reducing the need for acquisitions but increasing the need for purchases to meet social programme goals.

CONAB's distribution of food bundles aims to alleviate food needs for endangered populations. The most important recipients of the distribution programme are families camped in tents alongside roads and other open areas waiting for agrarian reform settlements. The share of this group in the total number of bundles was 93 percent in 2003, after which it decreased almost continuously until 2009, when it reached 46 percent. It then increased again in 2010 to 62 percent[10]. Other important beneficiaries include local communities of slave descendants (*quilombolas*), local fishing villages, communities affected by the construction of water reservoirs for electricity generation, and indigenous communities. International aid is also included in this modality.

The number of food bundles distributed by CONAB has increased over time (Figure 10). In terms of the number of recipients, 3.2 million persons received food bundles in 2004 and 1.8 million persons in 2007. Beginning in 2008, data collected was changed to reflect beneficiary households, thus 626 830 households received food bundles in 2008, 1 040 684 million households in 2009, and 446 363 households in 2010. As with the evolution of the PAA discussed earlier, the distribution of food bundles has been

FIGURE 10: NUMBER OF FOOD BUNDLES DISTRIBUTED BY CONAB



Source: CONAB.

[10] Disaggregated data are missing for 2006 and 2007.

increasing over time as part of the federal government's food security policies.

The number of food bundles distributed by CONAB also varies considerably between years. This is in part due to problems resulting from natural disasters. The increase in the number of food bundles distributed in 2007, for example, is linked to the drought that affected Northeast Brazil that year, mainly in the states of Bahia and Piaui (CONAB, 2007a). In this same year, food aid was also sent abroad to help countries affected by natural disasters, as was the case with Bolivia (flooding), Jamaica (hurricane) and Peru (earthquake).

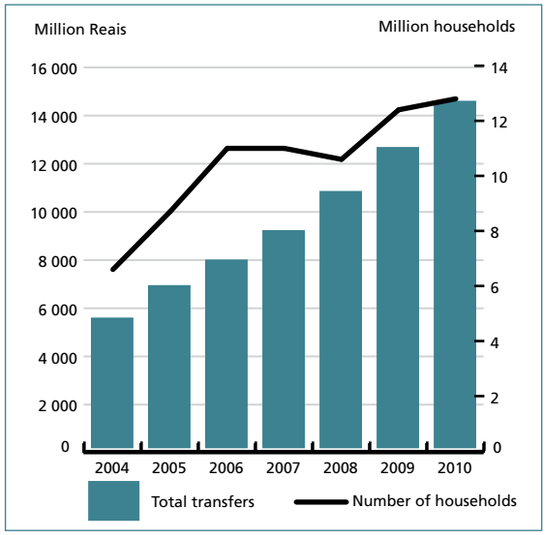
Social policies and welfare programmes, with a focus on Bolsa Família

The Bolsa Família Programme (BFP) was created in 2003, consolidating many different transfer programmes. As pointed out by Soares and Sátyro (2009), the creation of the BFP is a consequence of the social protection policies followed by Brazil over the past 40 years, especially after the 1988 Constitution. It is the main direct income transfer programme from the Brazilian government, and is targeted to poor and extremely poor households. Presently, the BFP assists approximately 12 million households in Brazil.

The BFP, like the other programmes discussed earlier, was in place long before the price hikes of 2007–2008. The funds allocated to the programme have increased steadily since its creation, reaching about R$14 billion in 2010 (Figure 11). The values transferred increased in 2007 and 2008, following the trend for the whole decade. In terms of the number of households assisted, this also increased consistently from 2004 (with a small reduction in 2008), reaching 12.7 million households in 2010.

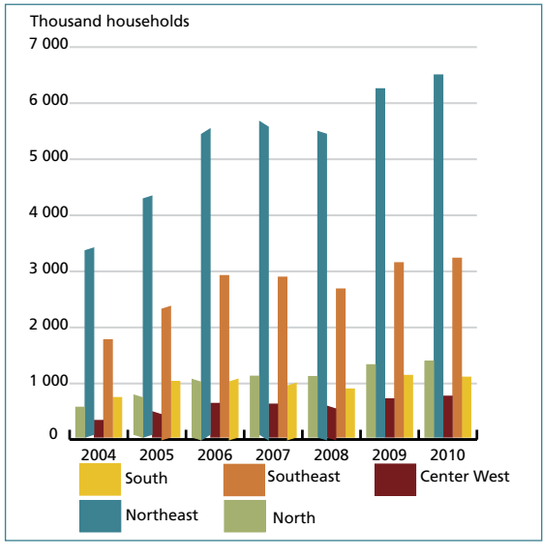
The distribution of BFP funds centres on the North and Northeast regions (Figure 12), where poverty is concentrated (Figure 13).

FIGURE 11: BOLSA FAMILIA PROGRAMME. TOTAL TRANSFERS AND NUMBER OF HOUSEHOLDS ASSISTED



Source: Ministério do Desenvolvimento Social e Combate à Fome.

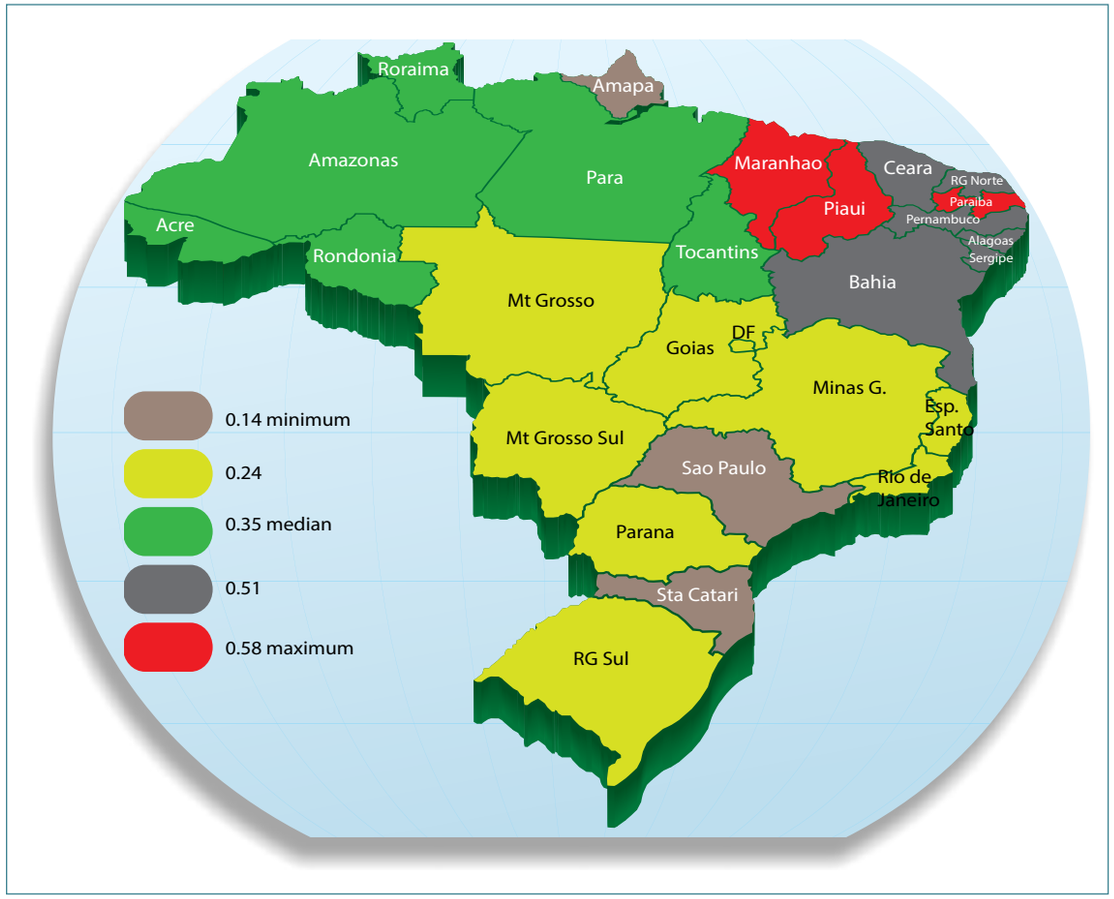
FIGURE 12: EVOLUTION OF THE NUMBER OF HOUSEHOLDS ASSISTED BY THE BOLSA FAMÍLIA PROGRAMME IN BRAZIL, BY REGION



Source: Ministério do Desenvolvimento Social e Combate à Fome.

The focus on the North and Northeast has increased over time. The number of households assisted in the Northeast region,

FIGURE 13: RELATIVE POVERTY IN THE BRAZILIAN REGIONS
(States are shaded according to the degree of relative poverty (or share of poor households in population)



Ferreira Fo and Horridge (2010).

in particular, increased from 3 320 000 to 6 454 000, almost doubling in the period. The number of households assisted in other regions also increased, but at a much slower rate. Notice, however, that even though relative poverty is lower in Southeast Brazil than in the Northeast or North, the share of the population living in the Southeast is much higher, which causes the share of BFP funds allocated to these regions to be higher than it otherwise would be. Rio de Janeiro and São Paulo, the most populous states in Brazil, are the largest beneficiaries in the Southeast region.

Thus, management of the BFP was not solely a policy reaction to higher food prices. Rather, it followed the trend that began earlier in the decade because of the Brazilian government's social policies. The amount of resources allocated to the programme increased in 2008, after the start of the world financial crisis, because the government opted to preserve that income transfer programme. Considering the price increases in the domestic market, however, and the size of the BFP, it was certainly an important instrument to counteract the negative effects of price hikes on poor consumers and foster their food security.

Expansion of rural credit

Rural credit in Brazil has two different broad modalities: rural credit for commercial agriculture, and credit to family agriculture, known as the PRONAF programme (the latter supplies credit at interest rates lower than the regular rates for general rural credit). The volume of credit allocated to both programmes has been increasing consistently since 2000 (Figure 14).

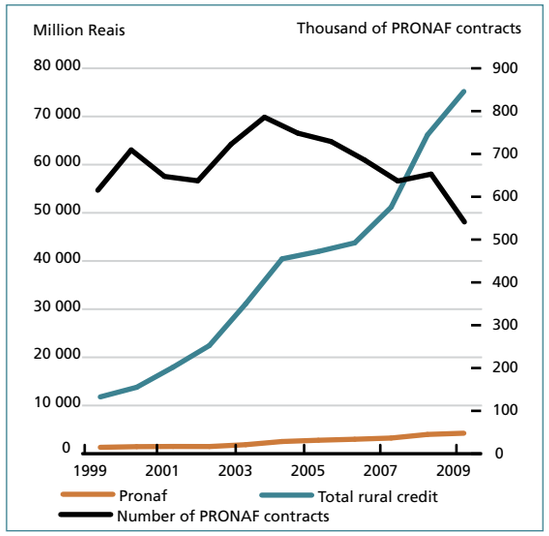
Total rural credit supply has strongly increased in recent years in Brazil, from about R$10 billion at the beginning of the decade to about R$75 billion in 2009.[11]. This was an important factor supporting the strong increase in Brazilian agricultural production during this time. Credit for family producers through PRONAF also increased significantly during the period, although at a much slower rate: while total credit increased 4.5 times in the period from 2000 until 2009, PRONAF credit increased just 1.9 times. It is also interesting to note that the number of contracts under PRONAF rose until 2004, but began falling thereafter. The total number of contracts under PRONAF peaked at 785 000 in 2004, declining after that to reach 541 000 contracts in 2010. Considering that the volume of credit increased, this means that the average value of each contract also increased.

In terms of the products considered in this paper, a much larger share of PRONAF credit is allocated to maize than to rice and wheat (Figure 15). This is primarily due to the larger area used for and the greater yield of maize production. It is also evident from the data that the amount of credit used for maize production has increased considerably faster than the credit used for rice or wheat production; this could be due to the more rapid expansion in the area used for maize production in recent years.

Finally, in 2008 a new investment credit programme for family agriculture was announced, the PRONAF More Food Programme (Mais Alimento – PRONAF-MA). This programme aims to increase investment

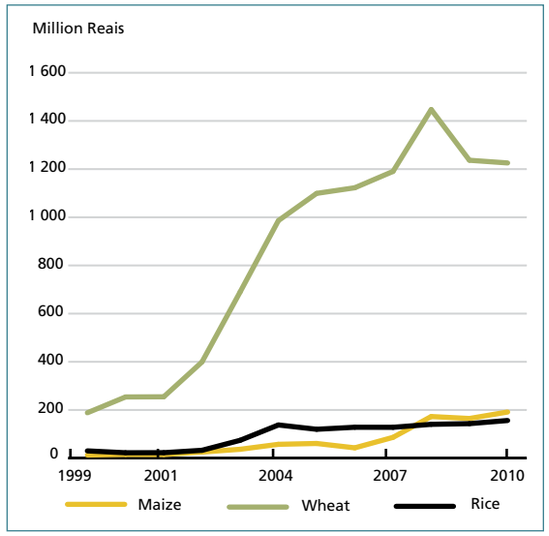
[11] This volume of credit refers just to credit for inputs, not investment.

FIGURE 14: RURAL CREDIT IN BRAZIL



Source: Anuário Estatístico do Crédito Rural (Banco Central do Brasil, various years).

FIGURE 15: EVOLUTION OF PRONAF, SELECTED PRODUCTS



Source: Anuário Estatístico do Crédito Rural (Banco Central do Brasil, various years).

in family agriculture, allowing small farms to modernize via the purchase of up-to-date machinery and equipment. Even though this programme was too new to have had an effect in 2007 and 2008, it constitutes an important development related to food security in Brazil.

Lessons and policy recommendations

The food security system in Brazil has developed over several decades. It gained new momentum early in the past decade as part of a deliberate government policy. All the programmes analysed here have evolved and expanded over time, as has the amount of resources allocated to them. This is a very important point to note because previous policy efforts gave Brazil the institutions and experience to rapidly respond to price increases. In fact, the response was nothing more than the normal implementation of policies that were already in place.

The institutional design supporting these policies is not trivial, and the reaction to the prices hikes would have certainly constituted a serious problem in a country with the social diversity and geographical dimensions of Brazil. Without such a pre-existing structure, the implementation of these policy measures (other than perhaps the simple distribution of food bundles) would simply not be feasible in a time span of two years. To quote an example, CONAB (2007b) states that the execution of the PAA presents complex operational problems, since it requires the relocation of staff to the targeted regions, an enormous effort to handle a huge amount of fiscal invoices, as well as the general bureaucracy involved. To solve these problems, special software to handle the invoices had to be developed, equipment designed, and the personnel necessary to operate it had to be hired and trained (PAANET, Conab (2007b).

Along the same lines, CONAB concentrated its intervention mechanisms in financial instruments, but it took time to develop and improve these so that they could serve effectively as its main operational instruments. These mechanisms minimize the serious problems of corruption, waste and general inefficiencies in the management of public stocks that were observed in the past when intervention happened mostly through physical stock purchases.

The present strategy is to use financial instruments to ease liquidity constraints when temporary problems occur in particular regions (normally the most distant ones, during the harvest season). Maintaining stock is done only to the extent necessary to provide supplies to the food programmes and alleviate short-term supply bottlenecks. As described above, CONAB intervention is not enough, and not intended, to isolate domestic food markets from international markets.

Thus, the main policy recommendation based on Brazil's experience is that faced with the difficulty of stabilizing food prices in an open economy regime, it is more effective to focus on transfers, either conditional (as is the case with BFP) or unconditional, targeted to the poorest and most endangered groups. Supply policies should also be used. In the case of the Brazilian experience, these constituted an important innovation: for small farmers, access to credit and income stabilization policies is at the same time supply and food security policies.

And finally, although not the main focus of this paper, the importance of general agricultural policies for food security should not be underestimated. As seen previously, the amount of rural credit in Brazil has expanded significantly in the past decade, supporting a strong increase in food production by small, medium and large producers. A strong agricultural research system has also been a key feature of Brazil's general food security policies.

Conclusions

In conclusion, Brazil has a complex and diversified food security system. The combination of different policy mechanisms (local intervention policies, price stabilization and supply policies as well as direct transfers) allows the public sector to choose among different instruments for different purposes. This flexibility is an important aspect of the Brazilian food security system, since it allows interventions to be directed to the most endangered groups in particular regions at a lower cost compared to what would be required to stabilize prices in domestic markets at a level below that set by international markets. Furthermore, the present intervention mechanisms avoid the serious economic distortions caused by other types of market interventions, as was the case with the export and price controls used in the past (and still used in many countries). However, choosing the most endangered groups and designing effective intervention mechanisms to protect them is not a trivial issue, and it requires methods and institutions that can only be developed over time. Starting early, instead of just reacting to a crisis, is crucial.

References

Banco Central do Brasil. *Anuário Estatístico do Crédito Rural*. Various years. Available at: http://www.bcb.gov.br/?RELRURAL

Companhia Nacional de Abastecimento – CONAB. 2007a. *Balanço Social 2007*. Brasília. 57p. Available at http://www.conab.gov.br/OlalaCMS/uploads/s/6ce8d1c49a80357c097b1541aaa5154a..pdf

Companhia Nacional de Abastecimento – CONAB. 2007b. *Relatório de Gestão 2007*. Brasília. 57p. Available at http://www.conab.gov.br/conteudos.php?a=23&t=1

Companhia Nacional de Abastecimento – CONAB. 2008a. Balanço Social 2008. Brasília. Available at http://www.conab.gov.br/OlalaCMS/uploads/s/6ce8d1c49a80357c097b1541aaa5154a..pdf

Companhia Nacional de Abastecimento – CONAB. 2008b. *Relatório de Gestão* 2008. Brasília. 57p. Available at http://www.conab.gov.br/conteudos.php?a=23&t=1

Ferreira, Fo, J.B.S., Horridge, M. 2010. Brazil. *In*: Anderson, K; Cockburn, J; Martin, W. *Agricultural Price Distortions, Inequality and Poverty*. Washington DC. The World Bank.

Instituto de Pesquisas Econômicas Aplicadas – IPEA. 2010. PNAD 2009 – Primeiras Análises: Distribuição de Renda entre 1995 e 2009. *Comunicados do Ipea* no. 63. October. 21p.

Instituto Brasileiro de Geografia e Estatística – IBGE. 2010. PNAD – Segurança Alimentar 2004/2009. Insegurança alimentar diminui, mas ainda atinge 30.2% dos domicílios brasileiros. *Comunicação Social, 26 de novembro de 2010*. Available at http://www.ibge.gov.br/home/presidencia/noticias/noticia_impressao.php?id_noticia=1763 (downloaded in March, 02, 2011).

Hoffman, R. 2005. As transferências não são a causa principal da redução da desigualdade. *Econômica*, v. 7(2).

Hoffman, R. & Ney, G.M. 2008. A recente queda na desigualdade de renda no Brasil: análise de dados da PNAD, do Censo Demográfico e das Contas Nacionais. *Econômica*, v. 10(1).

Hoffmann, R. 2011. Poverty and inequality data in Brazil. *Personal communication*.

Ortega, A. C. & Almeida Filho, N. 2007. *Desenvolvimento territorial, segurança alimentar e economia solidária*. Campinas, SP: Editora Alínea.

Soares, S & Sátyro, N. 2009. O Programa Bolsa Família: Desenho Institucional, Impactos e Possibilidades Futuras. IPEA. *Texto para Discussão no. 1414*. 37p.

USDA. *World Corn Trade.* Available at: http://www.fas.usda.gov/psdonline/psdgetreport.

CHAPTER 5

DOMINICAN REPUBLIC

NORBERT A. QUEZADA*, **

Introduction

Between 2007 and 2008 the international prices of petroleum and food products experienced sharp upswings, with food prices reaching their highest level in 30 years by mid-2008. During the crisis period, complaints about the increase in transportation and food costs prompted the government of the Dominican Republic to introduce mitigating measures and expand the reach of existing support programmes. By the end of 2008, prices had returned to pre-2007 levels.

The objective of this study is to draw lessons from the policy responses in the Dominican Republic to the 2007-2008 petroleum and food price swing that can be used to improve the future management of price spikes. Of particular interest are the measures taken during the price crisis to help the poor.

Poverty and food security in the Dominican Republic

Food security is defined as a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2012). This implies both the availability of food and access to it, among other dimensions. Practically speaking, a household is deemed food-secure when its occupants do not live in hunger and are not vulnerable to it in the near future. Poverty is a main cause of food insecurity – many poor people are not able to afford minimum nutrition requirements as well as other basic human needs that are important for food security, such as clean water, health care, education, clothing, and shelter.

Significant levels of poverty persist in the Dominican Republic in spite of per capita income growth. In 2007, the poverty headcount ratio at USD 2 a day in purchasing power parity (PPP) terms was 12.3 percent of the population, while at USD 1.25 a day (PPP) it was 4.4 percent of the population (World Bank, 2011). When measured against a national poverty line, the poverty headcount ratio is much higher, at 54 percent in rural areas and 45 percent in urban areas (World Bank, 2011). The national poverty lines refer to the cost of a normative food basket to obtain minimum dietary energy intake and the costs of basic non-food expenditures for the given reference group of the population; the extreme poverty line

* Independent researcher.

** The author is grateful for valuable information received in the Dominican Republic from Virgilio Ruiz of Solidaridad; José Achécar Chupani and Darío López of SIUBEN; Alejandro Hernández Paniagua of ADOFA; and Isabel Nova of UEPI.

refers to the costs to obtain the food basket only (World Bank and IDB, 2005). Nearly 14 percent of the population lives in extreme poverty (Attali, p. 10).

Availability of food is ample in the Dominican Republic. Thus, the food security of poor households can be better understood as the lack of funds to purchase necessary food items. Although food insecurity still exists, increases in household income have improved access to food. In the decade ending in 2009, GDP per capita increased by 70 percent in nominal terms and by 36 percent in real terms (World Bank, 2011). The percentage of undernourished people has declined from 30 percent in 1990-1992 to 15 percent in 2010-2012.

The Dominican poverty headcount and poverty rates are exacerbated due to significant illegal immigration. Immigrants from Haiti, the poorest country in the Western Hemisphere, informally enter the Dominican Republic looking for work in lower wage occupations, including as agricultural labourers. This migration is fueled by the fact that per capita GDP in the Dominican Republic is more than seven times that in Haiti (World Bank, 2011).

Institutional and regulatory setting for food security

The government has implemented both production and consumption measures to improve food security. Consumers have received in-kind assistance and cash transfers. Producers have received assistance through agricultural extension services (such as the technical assistance), subsidized credit, free inputs and services, low cost irrigation water, income transfers and protective trade policies.

Consumers

Traditionally, government food assistance to the poor has consisted of the delivery of free items (e.g., milk, school breakfasts) or reduced-price items (e.g., "popular market" sales). In recent years, assistance has also included cash transfers designated for food purchases, some of which are conditional on meeting certain requirements in education and health.

Government food security actions have become more organized in the past decade with the design of a poverty reduction strategy, creation of targeted programmes for the poor, and the establishment of specific budget allocations. These grants and programmes are delivered through several agencies (Box 1).

An initial effort in 2001 on social sector institutional reform (IDB, 2004, pp. 19, 60) led to the creation of a Social Policy Cabinet (Gabinete de Coordinación de Políticas Sociales – GCPS) that is headed by the vice president. The GCPS supervises direct cash transfers to poor families, free school breakfasts, and, beginning in 2005, several conditional assistance programmes under the current Solidaridad programme. It also is involved in several legacy programmes that manage traditional free food handouts, reduced-price food sales and provision of health and other services (e.g., medicines and roofing materials after adverse weather events). The cash transfer programme is modeled after Mexico's cash transfer programmes (initially known as Progresa, and later Oportunidades; Mexico, 1998).

Solidaridad comes closest to being an entitlement programme, but not all eligible households receive benefits. The programme includes income support for food purchases, payments attached to school attendance, and payments to defray the cost of cooking gas and electricity. During the oil and food price increases of 2007-2008, the cash transfer programme was expanded to more beneficiaries while the traditional in-kind handout and reduced-price sales actions were re-activated or expanded. The handouts are typically a basket of food items given by

Box 1: Social assistance agencies, Dominican Republic, 2010

Agency	Activities
Comedores Económicos	
(Economical Diners)	Created in 1942 to offer reduced-price meals. Recently active in distribution of reduced-price meal boxes.
Instituto de Estabilización de Precios (Price Stabilization Institute)	Created in 1969 to stabilize food prices through state procurement. Later involved in 'popular markets' and supermarkets to sell reduced-price food baskets.
Ministerio de Agricultura	
(Ministry of Agriculture)	In addition to policy matters, provides land plowing, planting materials, and cash rebates, among other support measures. Also sells reduced-price food items.
Plan Social de la Presidencia (President's Social Plan)	Created in 1989 to fight poverty through the distribution of free food baskets and small investments and donations.
Fondo para Iniciativas Comunitarias (Community Initiatives Fund)	Created in 1993 as a 'social investment fund' to finance projects of social impact, such as community centres, classrooms, clinics, and sports areas.
Comunidad Digna	
(Dignified Community)	Created in 1999 to provide assistance to poor persons and groups, such as utensils to street vendors, disabled persons, newborn baskets, and medicines.
Solidaridad	
(Solidarity)	Started in 2001, reorganized in 2005, provides direct cash transfers to needy families either tied to education goals or to support purchases of cooking gas and electricity.

Source: Author.

the government during presidential visits, Christmas, Epiphany (mainly toys), and Mother's Day, among other special events.

Producers

The government has maintained significant levels of support to agriculture, especially for staple crops such as rice and beans. The support is channelled through subsidized credit, agricultural extension services (such as technical assistance provided by the government at no cost to the producer), free delivery of some planting materials, free plowing, assistance to agrarian reform farmers through the Dominican Agrarian Institute (Instituto Agrario Dominicano – IAD), marketing support, and cash rebate payments for the adoption of modern technologies (under the Project to Support the Transition to Competitive Agriculture, Proyecto de Apoyo a la Transición Competitiva Agroalimentaria – PATCA). For the 2001-2003 periods, total farm producer support was estimated at 2.3 percent of GDP, higher than the average recorded in OECD countries. Support to rice production in 2003, from fiscal sources alone, represented around USD 68 per metric tonne of paddy; of this amount, two-thirds was based on the use of inputs and one-third on

the level of production (Quezada, 2006, pp. 0-11, 15). In addition to support financed through fiscal expenditures, producers also benefitted from price supports that kept domestic prices higher than international prices, due to tariff and quantitative restrictions. The import restrictions will gradually be reduced until they are eliminated in 2023 for members of the trade agreement with the United States and Central America.

In 2010, the Dominican Republic spent USD 195.5 million, or 2.3 percent of total fiscal expenditures, on the Ministry of Agriculture and related agencies. An additional USD 30.6 million was spent on irrigation. Service of the public debt accounted for 25 percent and treasury obligations (pensions) another 11 percent of total expenditures (Table 1).

The Uruguay Round of negotiations introduced import quotas at preferential tariffs and open imports at prohibitive tariffs. Those quotas were binding, as domestic demand exceeds domestic production at world prices. The 2004 regional free trade agreement with the United States and Central America (known as DR-CAFTA) introduced a transition to free trade, including (1) quotas at zero duty that grow over time; and (2) unrestricted imports at tariff rates that decrease to zero over a 20-year period. For rice, under DR-CAFTA, the 99 percent base tariff for unrestricted imports remains in place from 2004 until 2013; reductions of 8 percentage points will be made in each year from 2014 to 2018 and of 12 percentage points in each year from 2019 to 2023. Duty-free annual quotas open to the United States start at 8 560 metric tonnes for polished rice and 2 140 metric tonnes for brown rice, and grow at 7 percent per annum. For edible beans, the base tariff starts at 89 percent, and is being removed in 15 equal annual stages from 2004 to 2018. A duty free annual quota to the United States of 8 560 metric tonnes grows at 7 percent per annum, and a 20 percent base duty on an annual quota to Nicaragua of 1 800 metric tonnes was removed over the course of 4 years (Quezada, 2004, p. 26). A more recent agreement with the European Union opens the Dominican market to European goods, but it does not largely impact edible beans, maize or rice (EU, 2008).

TABLE 1: TOTAL GOVERNMENT EXPENDITURES, 2009-2010

	2009	2010
	USD	*Million*
Ministry of Agriculture	209.5	195.5
Irrigation	49.5	30.6
Public Debt	2 066.5	2 445.6
Treasury Obligations (Pensions)	912.9	1,088.8
Other	5 734.9	6 150.7
Total fiscal expenditures	8 973.7	9 911.5

Source: Dirección General de Presupuesto, "Ejecución," 2011a.

Policy measures adopted in response to rising food prices

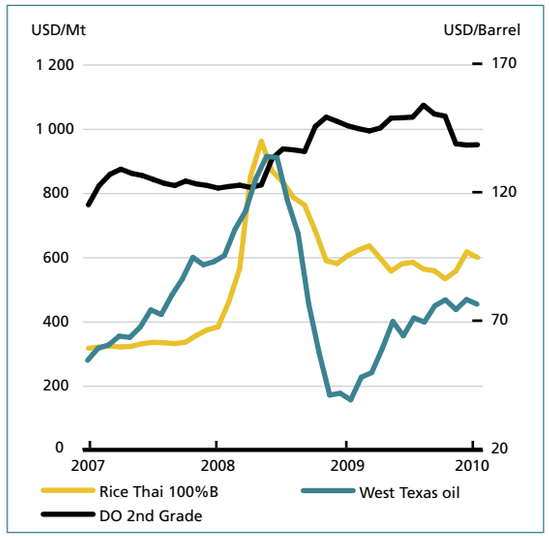
The domestic market for rice, beans and other importable goods has been separated from world markets, mainly through import permit requirements and quantitative restrictions. As a result, domestic prices of those goods are higher than international prices, which serve to stimulate domestic production and reduce trade. Furthermore, the transmission of international food price changes to domestic prices has been small. Because of that market separation and the cushioning effect of domestic grain stocks, domestic prices have been more stable than international prices.

International oil price fluctuations are transmitted much faster to the domestic market, as all oil is imported. Indeed, domestic prices in general follow the level and trends of world oil prices. The government controls the prices of gasoline and diesel fuel with a formula designed to ensure that they follow the international "import parity" price, and all service stations are required to sell at the prices announced weekly.

During 2007-2008, when the world prices of oil and food increased sharply, domestic rice prices remained above world prices in all but two months. The wholesale price of 2nd quality rice in Santo Domingo was largely above and more stable than the price of Thai 100B rice, a common measure of international prices (Figure 1); this remains largely true even if transport costs are added to arrive at an import parity price. The tripling of international rice prices from January 2007 to May 2008 led to just a small increase in domestic prices, and it was hardly a crisis for consumers. The doubling of the international price of oil during the same period did result in calls for compensatory measures, and the government was receptive due to the presidential elections that were to be held on 16 May 2008.

However, the domestic price of rice continued to rise after the international prices of both oil and rice peaked and declined in the second half of 2008 and into 2009.

FIGURE 1: RICE AND OIL PRICES, DO WHOLESALE AND INTERNATIONAL, 2007-2009



Source: FAO, 2011a: Thai prices (fob); 2011b: Wholesale prices. Federal Reserve Bank St. Louis, 2011: W. Texas oil.

This was a result of border measures, mainly import quotas and tariffs, and the producer price support scheme, which relies on cost of production estimates that tend not to decline.

Measures directed at consumption

At the onset of the increase in fuel prices in 2007, the government expanded its traditional food assistance given in the form of free and reduced-price food items (via the programmes and agencies mentioned in Box 1). Analysis of those activities is complicated due to the lack of timely published statistics. Adequate information is available for the Solidaridad targeted cash transfer programme, which was used to respond to rising oil and food prices.

The Dominican government operates the Solidaridad programme, which provides income transfers to poor families, conditional on their fulfilment of certain requirements in health and education. To target the assistance, a set of beneficiary criteria was defined and a census of needy families was created (known as the Unique Beneficiaries System, or Sistema Único de Beneficiarios – SIUBEN). A payments implementation office, the Social Subsidies Administrator, was also created (Administradora de Subsidios Sociales – ADESS). During 2007-2009, the Solidaridad programme grew substantially in terms of beneficiaries, expenses per beneficiary and total fiscal disbursements.

The first component of Solidaridad is Eating Comes First (Comer es Primero – CeP), which provides eligible families with a direct transfer deposited in a prepaid debit card issued to each beneficiary. (The initial programme issued checks instead.) The debit cards can be used to purchase foodstuffs at designated retailers. In 2007, the programme added the School Attendance Incentive (Incentivo a la Asistencia Escolar – ILAE), which provides a cash transfer per child attending school; it is addressed to the same eligible families and the subsidy

is also deposited to the debit card. In 2008, at the height of the price crisis, yet another component was added, the Gas Purchase Bonus (Bono para Compra de Gas – Bonogas), to subsidize the purchase of propane gas for cooking. Finally in 2009, the Electric Rate Subsidy (Subsidio a Tarifa Eléctrica – STE) was introduced to help eligible families pay their electricity bills.

The number of families receiving debit cards with the CeP component rose sharply from 200 000 in 2006 to 500 000 in 2009 (Figure 2). In 2010, two-thirds of the CeP eligible households actually received payments (Solidaridad, 2011, p. 4).

Perhaps the largest government response to the increase in oil and cooking gas prices was the Bonogas component that began in 2008. It benefited over 700 000 families, more than any other component.

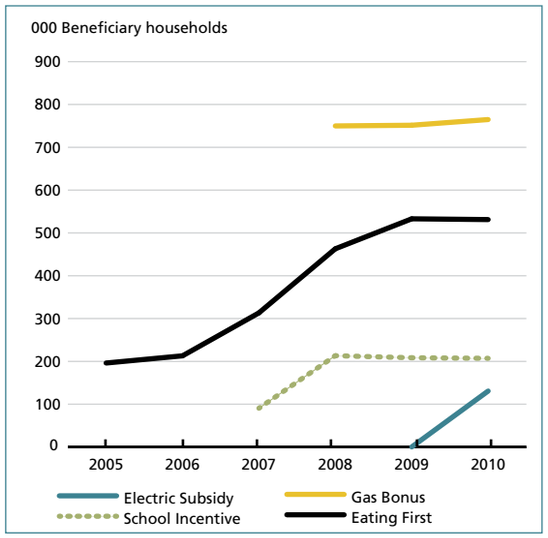
Solidaridad expenses soared from USD 19 million in 2005, or 0.3 percent of total government expenditures, to more than USD 186 million in 2009, or 2.1 percent of total expenditures (3.1 percent of current expenditures – see Table 2). Total Solidaridad expenses in 2009-2010 reached around 85 percent of total government expenses on the Ministry of Agriculture (Table 1). Total government expenditures also increased during this period, rising from 18.5 percent of GDP in 2005 to 21.6 percent of GDP in 2008, an election year, and then declining to 19.2 percent of GDP in 2009 and 2010 (Table 2).

Several factors contributed to the sharp increase in Solidaridad expenses. First, poor families began to ask for government relief because of rising transportation costs and food prices starting in 2007. Second, presidential elections were scheduled for May 2008. The president was running for re-election and was eager to respond through increased spending on direct subsidies such as the CeP component (in the end, he was re-elected to another four-year term). Third, the creation of targeted subsidies for cooking gas (2008) and electricity (2009) further added to the expenses. Traditionally, the government has subsidized cooking gas and electricity in a generalized form, through its control on imports of propane gas and petroleum, respectively. The resale price of propane gas was lower than its import cost for all uses (cooking and car fuel), and the controlled electricity rates included a subsidy (as transfers to the state utility) on the first few hundred kilowatts of consumption for all households. The rise in petroleum prices starting in 2007 led to an additional burden on households in spite of the subsidies, which prompted the launch of targeted subsidies for cooking gas and electricity, via additional Solidaridad components.

Eligible families can receive any or all of the four assistance components of Solidaridad. In addition to increasing the number of families found eligible to receive the prepaid debit card, Solidaridad also increased the amounts available to each recipient for the four components. The CeP component rose sharply from an average of USD 50 per family in 2006 to an average of USD 200 in 2009 (Figure 3).

For a family receiving all four Solidaridad components, the sum of annual benefits rose from an average of USD 50 per family in 2006 to USD 380 in 2009.

FIGURE 2: SOLIDARIDAD BENEFICIARY HOUSEHOLDS, 2005-2010



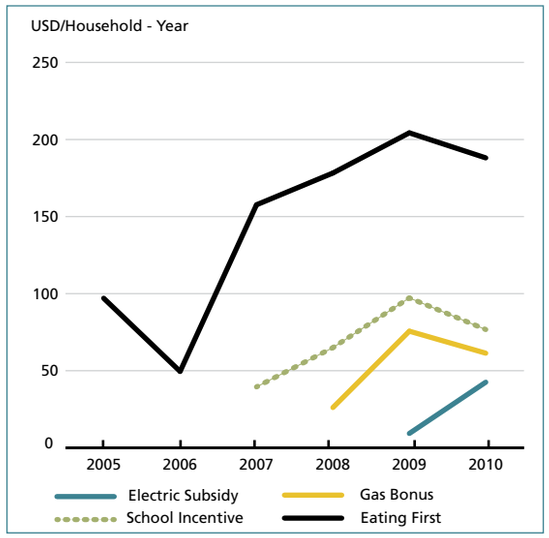
Source: Solidaridad, 2011, and tables provided to author

TABLE 2: SOLIDARIDAD AND TOTAL GOVERNMENT EXPENSES, 2005-2010

	2005	2006	2007	2008	2009	2010
	RD$ million					
Solidaridad Expenses	576	351	1 757	4 004	6 691	6 197
	USD million					
Total Expenses	6 236	6 888	8 245	9 856	8 974	9 912
Current expenses	3 862	4 395	5 238	6 468	6 078	6 577
Solidaridad Expenses	19	11	53	116	186	168
as part of:	%					
Total Expenses	0.3	0.2	0.6	1.2	2.1	1.7
Current Expenses	0.5	0.2	1.0	1.8	3.1	2.6
Total Expenses/ GDP	**18.5**	**19.3**	**20.0**	**21.6**	**19.2**	**19.2**

Note: Current expenses (salaries, services and supplies) refers to non-capital expenditures (e.g., for buildings, roads, and trucks).
Source: Solidaridad, 2011, and tables provided to author. Dirección General de Presupuesto, "Cuenta Ahorro," 2011b.

FIGURE 3: SOLIDARIDAD BENEFITS PER HOUSEHOLD, BY BENEFIT, 2005-2010



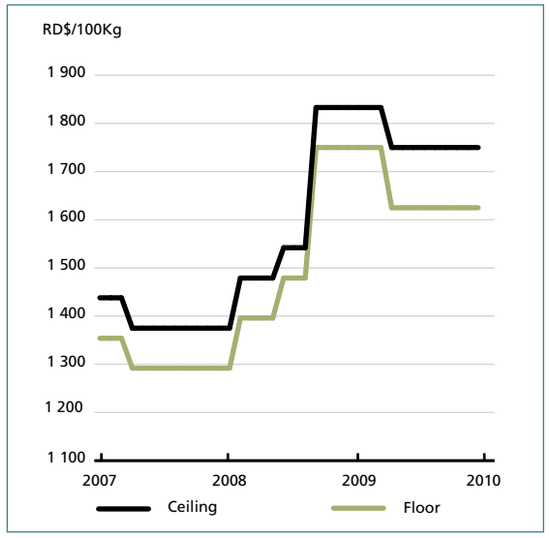
Source: Solidaridad, 2011, and tables provided to author

Measures directed at production

Since 1999, the government has operated a price support programme for rice farmers based on government-sponsored private procurement. The programme includes reimbursement of interest payments and warehousing expenses to millers who buy paddy from farmers at a price set within a specified band, with the paddy pledged as security for loans from private banks. Ownership of bonded rice and responsibility for loan service lies with the millers. Participating millers also commit to sell the polished rice at a price not above the equivalent of the band's top price. The programme is managed by the Bonded Loan Unit (Unidad Ejecutiva de Pignoraciones), a dedicated office of the Ministry of Agriculture, which authorizes payments to paddy buyers.

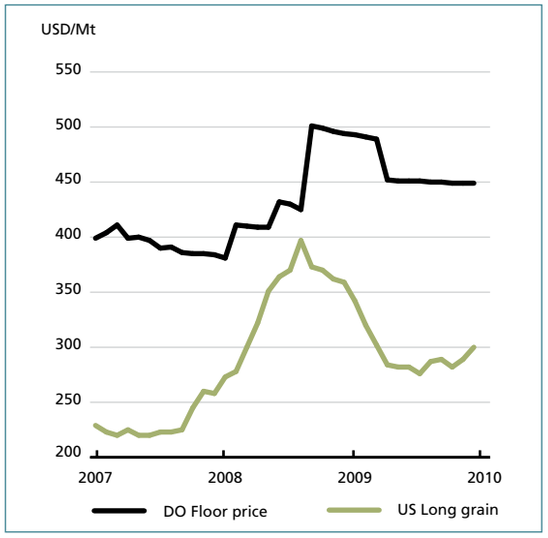
The price band is established by the Rice Commission (Comisión Nacional Arrocera – CONA), which is made up of rice farmers (including those of agrarian reform settlements), rice millers and government representatives. Price bands are generally established for the spring harvest, and sometimes for the fall harvest. Typically, a rice inventory is conducted before the spring harvest to assess the market situation, together with an estimate of production done by the Rice Department of the Ministry of Agriculture. Changes to the current price band can be initiated by any group of representatives. When fuel and input prices are rising, farmers present their cost of production estimates to ask for an increase to the price band. When costs of production are decreasing the government may propose a decrease in the price band. When reimbursement payments for loan expenses are in arrears, millers resist price increases that

FIGURE 4: PADDY RICE PRICE BAND, 2007-2009



Source: UEPI, M of A; ADOFA; and CONA resolutions

FIGURE 5: PADDY PRICE: DO FLOOR AND US FARM GATE, 2007-2009



Source: UEPI, M of A; ADOFA. USDA, 2011, Appendix Tables 15-16. Banco Central, 2011: exchange rates

carry larger cash outlays. At the beginning of 2007, the CONA approved a decrease in the price to be paid for a100 kg bag (a *fanega*) of dry, clean paddy (Figure 4). However, rising prices of fuels and inputs prompted the CONA to respond in 2008 by raising the paddy price three times: in February, May, and September (CONA, 2007, 2008). The last two increases took place after the presidential elections of 16 May. Once input costs declined, the CONA reduced paddy prices for the 2009 spring harvest to a band of RD$1 625-1 750 per 100 kg bag, about 10 percent higher than the band in 2006-2007.

Dominican rice policies have succeeded in separating the domestic rice market from prices in the United States, while partially responding to changes in input costs. Thus, Dominican paddy prices remained high even though US paddy prices declined after mid-2008 (Figure 5). In the United States, the major exporter of rice to the Dominican Republic, the farm gate paddy price for the 2009/10 marketing year was USD 284 per metric tonne (USDA, 2011, Appendix table 15), much lower than the USD 450 per metric tonne price declared in the Dominican Republic.

The bonded warehouse price support scheme is popular with both millers and farmers because it has been an effective tool to stabilize prices at relatively high levels (previous government procurement to support prices proved unreliable and had a higher fiscal cost). The scheme's budget grew rapidly, however, from USD 10.6 million in 2006 (Quezada, 2007, p. 34) to USD 26.6 million in 2008 (Digepres, 2011b). In addition, in order to relieve downward pressure on domestic prices, the government has subsidized rice exports at considerable expense. For example, in 2009, the government spent USD 15 million to subsidize the export of 26,000 tonnes of rice.

Paddy prices paid to farmers are appreciably higher than in other importing countries and significantly more than in exporting countries (FAO, 2010, Table E03). As the domestic rice market becomes progressively more open to imports under the DR-CAFTA agreement, there will be downward pressure on domestic prices as the import quota grows, because in-quota imports are less expensive than domestic rice. Furthermore, over-quota imports may become profitable when the base tariff starts to decline in 2014.

The situation will worsen as the rice sector moves toward free trade in 2024, and the lower prices will present a major challenge for government policy. Continuing to base the price band on production costs will increase government expenditures on price supports and export subsidies, and this may not be fiscally sustainable. To become competitive, and to survive under free trade, the price difference between Dominican and US paddy will have to decrease to an amount equal to the shipping and import costs of imported rice. The competitiveness of Dominican rice can be improved by transferring funds currently used for price supports, and other forms of support on production and input use, to farmer income support (a scenario contemplated in Quezada, 2007).

Implementation of the new policy measures

Most of the measures announced at the beginning and at the height of the price crisis were implemented; particularly those related to targeted food consumption (e.g., cash transfers via debit cards) and to production (e.g., price support). More generalized support measures, such as food plazas or popular markets, were implemented only in part, or were difficult to analyse owing to a lack of published reports. Some announced fuel economy measures, such as energy savings in public buildings and forbidding the use of official vehicles on weekends, were not implemented in full.

The measures that were adopted created a lasting gain for recipients of Solidaridad benefits, both in terms of the assistance per household and the number of households benefitted. The increase in international oil prices since 2007 and of grains since 2008, combined with the approaching presidential elections in May 2008, provided the initial impetus for the increase in support to poor households. As the crisis ended and oil and food prices declined, coupled with a growing budget deficit, benefits were reduced, but not by an amount commensurate to the reduction in oil and food prices.

Responding to the increased costs of imported fuels and inputs for rice production, the measures in favour of rice producers were largely implemented. It should be noted, however, that domestic rice prices were high in relation to world prices both before and after the price crisis. Other measures, such as low interest rate loans from the Agricultural Bank and free plowing of small farmer fields, are standard practices that are carried out every year.

Assessment of the effectiveness of the measures

The effectiveness of the measures adopted in response to rising prices was markedly different between those using targeting mechanisms and those based on handouts or reduced-price formats. The response through the Solidaridad debit card effectively protected eligible poor consumers via increases in the monetary amount per household and in the number of beneficiary households. The eligibility criteria, based on targeting of needy families, guaranteed the benefits were also targeted.

In contrast, food distribution through the various Ministry of Agriculture programmes were announced as being directed to poor families but anybody could access the lower prices offered there. These measures also incurred indirect costs in terms of personnel and operating expenses that are usually not accounted for. A study evaluating similar food sales during the financial crisis of 2003-2004

concluded that if benefits "were randomly allocated (say, a 'helicopter drop' allocation), the benefits to the poor would be much larger than under their current design" (IBRD, 2005, p. iii).

Lessons learned and policy recommendations

Food price downswings can be very damaging to food security by making agricultural production unprofitable. While consumers may benefit from sudden price drops, the increases in food imports may reduce national food security. International price upswings can provide justification for the implementation of populist measures, especially at election time. Some of these measures are implemented without sufficient regard for the effective use of public funds. Thus, food price volatility presents serious challenges for government policy.

While food price upswings can be beneficial to producers, they harm needy families that are not eligible to receive food assistance and represent a call to action on the part of the government. The Dominican government responded to the 2007-2008 price increase crisis by helping both producers and consumers. The government expanded the reach and level of assistance of existing policy instruments. Targeted measures seemed to be more effective than untargeted measures, although there are no available data on leakage in targeted programmes.

The Dominican rice price support mechanism and trade restrictions have resulted in paddy prices that are more stable than international rice prices, at levels substantially higher than the international price. But trade agreements will result in border protection on rice imports being reduced and eventually removed, which will tend to decrease farm level paddy prices; maintaining high prices through the bonded warehousing scheme and subsidized exports will become more and more expensive year after year as border measures are removed. Under free trade, which is scheduled to be reached in 2024, these expenditures will probably not be sustainable.

In this context, a forward-looking policy to allow domestic prices to decrease gradually, as import quotas grow and over-quota tariffs are reduced, might help domestic production to remain competitive during the transition to free trade. The main problem is that unit production costs are high, so that excess production cannot be profitably sold abroad. To protect the rice farmer's standard of living, the government can convert most of its price support measures to farm income support.

References

Attali, J. *et al*. 2010. *Informe de la Comisión Internacional para el Desarrollo Estratégico de la República Dominicana*, Noviembre 2010.

Banco Central. 2011. *Tasas de Cambio de Referencia del Mercado para Compra y Venta de Dólares Estadounidenses*. Available at http://www.bancentral.gov.do/tasas_cambio/TAC4014.pdf

CONA (Comisión Nacional Arrocera). 2008a. *Acta No. 05-2008*. 11 September.

CONA (Comisión Nacional Arrocera). 2008b. *Acta No. 02-2008*. 12 February.

CONA (Comisión Nacional Arrocera). 2007. *Acta No. 02-2007*. 26 April.

Digepres (Direccion General de Presupuesto). 2011b. *Cuenta Ahorro - Inversión – Financiamiento 2005-10, Ingreso Percibido y Gasto Devengado*.

EU. 2008. Economic Partnership Agreement between the CARIFORUM States, of the one part, and the European Community and its Member States, of the other part. *Official Journal of the European Union, L 289/I/3*, 30.10.2008.

FAO, WFP and IFAD. 2012. *The State of Food Insecurity in the World 2012. Economic growth is necessary but not sufficient to accelerate reduction of hungerand malnutrition*. Rome, FAO. Available at http://www.fao.org/publications/sofi/en/

FAO. 2010. *FAO Statistical Yearbook 2010*. Table E.3 Agricultural producer prices. Available at http://www.fao.org/economic/ess/ess-publications/ess-yearbook/ess-yearbook2010/yearbook2010-prices/en/

FAO. 2011a. *International Commodity Prices*. Available at http://www.fao.org/es/esc/prices/PricesServlet.jsp?lang=en

FAO. 2011b. *Food Price Data and Analysis Tool*, Global Information and Early Warning System (GIEWS). Available at http://www.fao.org/giews/pricetool2/

Federal Reserve Bank of St. Louis. 2011. *FRED2 database*, Exchange Rates: http://research.stlouisfed.org/fred2/series/EXUSEU?cid=95; oil: http://research.stlouisfed.org/fred2/series/OILPRICE

World Bank. *World Development Indicators*, Available at http://data.worldbank.org/data-catalog

World Bank and IDB. 2005. *Dominican Republic Poverty Assessment: Achieving More Pro-Poor Growth*. Report No. 32422-DO, June 30, 2005

IDB. 2004. *Programa de Apoyo a la Transformación del Sector Social*. Informe de Terminación de Proyecto DR-0140, Agosto 2004

Quezada, N. 2007. *Programa de Apoyos Directos Desconectados a Productores Agropecuarios – Propuesta Conceptual y Operativa*. Proyecto de Apoyo a la Transición Competitiva Agroalimentaria (PATCA). Diciembre 2007.

Quezada, N. 2006. *Estimado de Apoyos Agropecuarios en República Dominicana 2000-03*. Report submitted to the Inter-American Development Bank, April 2006.

Quezada, N. 2004. *Cuotas y Salvaguardias Agropecuarias del Acuerdo de Libre Comercio entre Estados Unidos, Centroamérica y República Dominicana*. Unpublished manuscript. December 2004.

Solidaridad. 2011. *Estadísticas Institucionales*. Vicepresidencia de la República Dominicana. Santo Domingo. December 2011.

USDA. 2011. *Rice Yearbook 2011*. Economic Research Service, Washington, DC, May. Available at http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1229

CHAPTER 6

ECUADOR

SARA A. WONG*

Introduction

The Ecuadorian government adopted a number of policy measures in response to rising food prices in 2007–2008. The goal of this study is to draw lessons from the government's response in order to better manage future food price spikes. The study describes the measures adopted in response to rising world food prices, stating the objectives of the announced policies, presenting graphs which outline the implementation of the measures over time and discussing the main implementation issues. The paper assesses the effectiveness of the measures, stressing whether the goals set were achieved and who the key beneficiaries were, and highlighting how the policy response helped improve the food security situation in Ecuador, focusing on policies for rice, maize and wheat, three of the most important food crops in Ecuador. Rice and wheat are the two most important sources of calories, while maize is widely planted and is a key input in the production of meat and other food products.

* Professor, Polytechnic University (ESPOL). Guayaquil, Ecuador. Thanks to Gustavo Anríquez and participants at the April 2012 FAO workshop and the 2012 IAAE meetings for valuable comments, and Ketty Rivera for diligent research assistance. The usual disclaimer applies; all remaining errors are mine.

Overview and classification of the policy measures

Ecuador is a small open economy with a population of around 14 million. The percentage of total employment by sector is 28.5 percent in agriculture, 18.8 percent in manufacturing, and 52.6 percent in services. Of those employed in rural areas, 69.3 percent work in agriculture (ECLAC, 2009). At the national level, the poverty rate was 42 percent and the extreme poverty rate was 18 percent in 2009 (ECLAC, 2009).

The measures adopted by the government during the 2007–2008 food price spike (and its aftermath) included a variety of policies that can be classified as follows:

Trade policies. These policies included a ban on exports for commodities in which Ecuador has a net exporter position, such as rice, and tariff breaks for commodities in which Ecuador has low domestic production and is clearly a net importer, such as wheat. In both cases the goal was to ensure food availability and access for the Ecuadorian population.

The government also reduced to zero the tariffs on agrochemical imports, as a policy to face increasing agricultural input prices (Ecuador imports agrochemicals). There were also tariff reductions for the import of capital goods for agriculture.

Price controls. The government implemented ceiling (maximum sales) prices and controls to stabilize prices. The food items included in this policy measure were: the so-called "popular bread," chicken, milk, oats, pasta, sugar, tuna and vegetable oils. The measure included a list of maximum sales prices for specific food items by industry and product name. These food products were those usually sold in supermarkets or convenience stores that target low to medium-low income level households. The measure also included a public-private agreement that would guarantee access to quality food products at affordable prices[1].

The government also established price controls to support both farmers and producers of manufactured foods. Support prices for rice and maize farmers were set, as well as for producers of wheat flour. The government also set a maximum sales price for wheat flour purchased by craft and industrial bakeries and other food industries. At the same time, it established a fund to pay wheat flour producers a price differential, which was in fact a subsidy to the milling industry.

The purpose of these reference prices and controls was again to ensure food access for the population, in particular those in the lowest income levels, through price stabilization.

Input subsidies. This set of policies was aimed at reducing the cost of production for farmers, thereby increasing the domestic food supply. These policies included subsidies to farmers for the purchase of fertilizers or other inputs ("Socio Siembra" Programme). Their objectives were to: (a) foster productivity in farms ("Unidades Productivas Agropecuarias", UPAs) and prevent a fall in production due to high prices of agricultural inputs (fertilizers, pest control chemicals, etc.), and (b) minimize the effects of the world food crisis on the domestic supply of food as well as on domestic inflation. The measures set out the mechanisms by which the subsidy to farmers for purchases of agricultural inputs were to be implemented. The Ministry of Agriculture was appointed to establish the list of agrochemicals that qualified for the subsidy. The original period of implementation was June to December 2008. A reform extended this to 31 May 2009.

The subsidy was implemented as a one-time fixed reimbursement of USD 80 per farm (on the presentation of the corresponding receipts). It also included a variable reimbursement of 5 percent on the difference between the total value of the receipts and the USD 80 fixed reimbursement, up to a maximum of USD 240 (per farm). As such, the subsidy can be viewed as a type of social protection policy, as there is no evidence that it affected the relative prices of inputs (which were still determined by the market). Further, above USD 80 per farm, it was only very slightly proportional to the amount of input use. Even if the farmers that claimed the subsidy received it, this measure should not have encouraged excessive input use.

An evaluation of the "Socio Siembra" Programme, conducted by the Ministry of Coordination and Social Development, estimated the operational cost of the programme at USD 1.45 million and the cost of the subsidy at USD 3.24 million. There were 54 134 registered producers and 40 180 beneficiaries bringing the operational cost per registered producer to USD 27, and the average subsidy paid to USD 81 (Bermudez, 2011).

A subsequent reform to this measure in September 2008 referred to the case when additional financing (over the USD 240) might be needed by a farmer for the purchase of fertilizers, pesticides or seeds (again, following the presentation of the corresponding receipts), in which case a farmer might have access to micro credit. The Banco Nacional de Fomento (BNF) was in charge of processing the micro credits. However, we could not find evidence on whether these loans were indeed made available to farmers, nor could we find evidence on the amount of micro credits effectively accessed by small farmers.

A temporary direct subsidy to farmers for the purchase of seeds was also enacted, but there is scant information about how this subsidy was implemented, if it was implemented at all.

Market interventions. The government purchased rice and maize through the BNF to support prices for rice and maize farmers. The government purchases of grains were stored in National Storage Unit ("Unidad Nacional de Almacenamiento", UNA) warehouses. Although we could not find evidence that rising world food prices were the rationale for implementing a national grain storage institution, such an institution was created in September 2007, and its first warehouse was opened in May 2008[2,3]. More details are provided in the rice and maize sections below.

Fiscal Policies. These included tax subsidies, such as income tax exemptions for the 2008–2009 period for food agri-businesses and agrochemical companies that re-invested their profits. This measure was part of the "Mandato 16," or agricultural mandate enacted by the new Constitutional Assembly in response to rising world food prices. To qualify for the tax exemption, producers and importers of agrochemicals were required to give discounts to micro and small farmers under terms and conditions established by the Ministry of Agriculture.

In addition, the value added tax (VAT) was reduced to zero for transfers and imports of goods for agricultural use. There were also consumer price subsidies as discussed in the section below about wheat and wheat flour.

Social Policies. Although we did not find evidence that social policies (or a specific social policy) were adopted to fend off any negative impacts of the 2007–2008 international food price increase, particularly on the poor, some social programmes have been adopted or expanded since 2007. In fact, some of these programmes have been cited as the government's policy response to the world economic crisis (see UNDP, 2010) and/or to local negative shocks, such as flooding in the coastal region in 2008 (Programa Mundial de Alimentos, 2008). These policies included targeted nutrition and conditional cash transfers. For example:

- School food and other nutrition programmes, such as Nourishing Development ("Nutriendo el Desarrollo"). The objective of this programme is to include micro and small milk producers in the supply chain for the government's food programmes, including: (i) School Nutrition Programme ("Programa de Alimentación Escolar", PAE) of the Ministry of Education, which provides breakfast and food to children attending public schools and benefits 1.38 million children according to government data; (ii) National Food and Nutrition Programme 2000 ("Programa Nacional de Alimentación y Nutrición 2000", PANN 2000), of the Ministry of Health, which targets 6 to 24 month-old babies, as well as pregnant and breastfeeding women; and (iii) the Ecuador Feed Yourself Programme ("Programa Aliméntate Ecuador") of the Ministry of Economic and Social Inclusion that benefits children between two and five years of age, adults over 65 and disabled people (of any age).

[1] Press news highlighted the timing of this measure. The maximum sales prices for basic food items happened when the government was campaigning for the approval of the newly written Constitution of its liking. See for instance Reuters (available at http://lta.reuters.com/article/businessNews/idLTAN2853901920080828, last accessed March 2011).

[2] We thank Miguel Serrano, a UNA officer, for this information.

[3] There were some government food commodity warehouses (e.g., Empresa Nacional de Almacenamiento y Comercialización, ENAC) in the 1970s and 1980s whose purpose was to help the government implement a policy of price controls on food items. This policy in general failed and the storage units were dismantled and/or abandoned in the 1990s (Tschirley and Riley, 1990; Calderón, 2011).

- Human Development Bond ("Bono de Desarrollo Humano", BDH) is an existing conditional cash transfer programme. The programme gives USD 35 per month to female heads of poor households (households in the two lowest income quintiles), who in exchange have to send their children to school and attend medical checkups. According to a report on the impacts of the 2008 floods in Ecuador, the government provided a subsidy for rice consumption to female beneficiaries of the BDH (Programa Mundial de Alimentos, p.38).

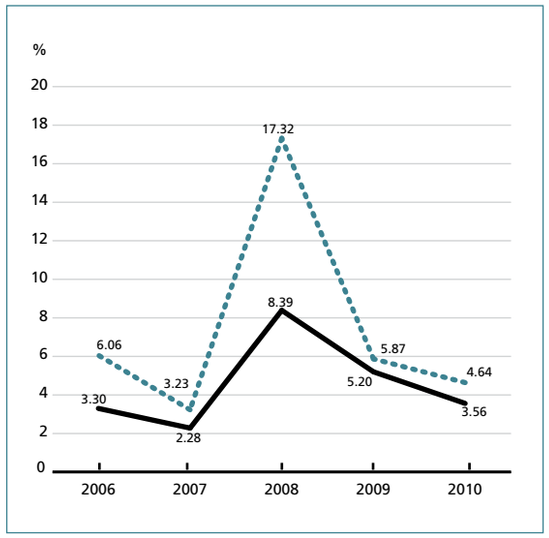
It is important to clarify that some of these social policies were the continuation of old policies, or new policies designed to support the agricultural sector and promote the development of food sovereignty (e.g., Nutriendo el Desarrollo) or improve the purchasing power of the poorest in Ecuador (e.g., BDH). That is, some of these policies were not responses to the food price spike. The main policy responses to high world food prices were trade policies, input subsidies to farmers, price controls (maximum sales prices), market interventions and fiscal policies as described above.

In general, the government responded to rising food prices in 2007–2008 to ensure price stabilization and food access, in particular for the poorest, in some cases by securing or increasing the food supply, lowering the cost of production or the price of imports, and in others, by trying to improve the purchasing power of Ecuadorians.

Notwithstanding these policy responses, in 2008, the rate of inflation for food reached a national average of 17.3 percent, and the total inflation rate was 8.4 percent[4]. In 2006 and 2007, the inflation rates for food were 6.1 percent and 3.2 percent, respectively (and the general inflation rate was 3.3 percent and 2.3 percent in those years). In the years following the international food price spike, the domestic inflation rate for food items fell to 5.9 percent in 2009 and 4.6 percent in 2010, while the general inflation rate dropped to 5.2 percent and 3.6 percent in the same years (Figure 1).

It is difficult to assess the extent to which the 2007–2008 policies actually helped to prevent an even greater increase in food prices. In addition to rising international food prices, in roughly December 2007–May 2008, Ecuador suffered floods that affected the coastal provinces and some provinces in the highlands (Bolívar), wiping out crops in some of these areas. A recent study reported that because of the floods, food prices in these provinces increased by 50 percent or more for key items in the Ecuadorian diet such as the following, listed in order of importance in the Ecuadorian diet: rice, plantains, potatoes, beans, noodles, oil and cassava (yuca). Despite rising food prices in Ecuador in 2008, the magnitude of the sudden 2007–2008 world food price spike observed in the FAO food price index was not replicated in Ecuador (Figure 2)[5].

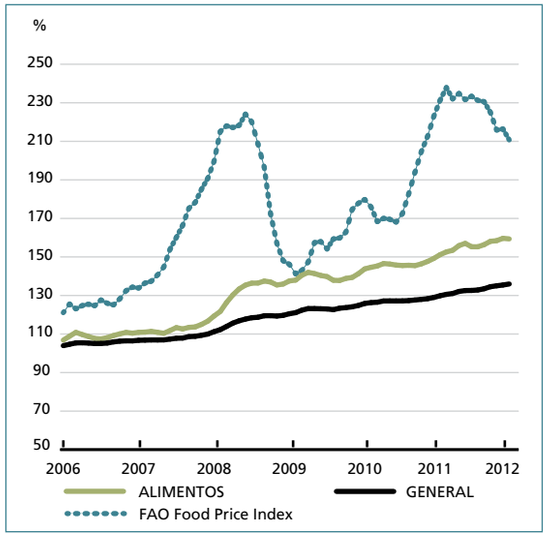
FIGURE 1: ECUADOR INFLATION RATE



Source: Own construction using Consumer Price Index (2004=100) from National Institute of Statistics and Census (INEC).

[4] Ecuador is a dollarized economy. Ecuador adopted the US dollar as its own currency (by law) in January 2000.

FIGURE 2: ECUADOR CONSUMER PRICE INDEX AND FAO FOOD PRICE INDEX, 2006-2011



Source: National Institute of Statistics and Census (INEC), Consumer Price Index: Historical data (2004=100). FAO Food Price Index (2002-2004=100).

Policy measures by selected commodities

Rice

Rice is the most widely planted crop in Ecuador, taking up a third of the area of annual crops in the country (MAGAP, 2009a). It is also a staple food in the diet of Ecuadorians across all regions (Programa Mundial de Alimentos, 2008, p.42), representing a fifth of the dietary energy supply (FAO, 2010).

There are two main rice harvest periods in Ecuador – the first from April to May and the second from July until November. According to the 2000 National Agricultural Census, there are approximately 76 000 productive units of rice and a total planted area of 344 000 hectares of rice. Of these units, 29 percent are less than 3 hectares and 45 percent are less than 5 hectares. Farms with between 100 and 200 hectares represent 1 percent of total farm units, as do those of over 200 hectares. The largest farms have the largest yields. Farms with over 200 hectares produce 4.1 metric tonnes (MT) per hectare. Farms with less than 5 hectares have a productivity of 3.6 MT per hectare. Most of the planted areas are located in two coastal provinces: Guayas and Los Ríos. Together they represent 83 percent of the planted area of rice (MAGAP, 2009a).

Over the last few years Ecuador has had a surplus of rice that has been exported to neighbouring Andean countries, in particular Colombia. However, there is no strong historical tradition of rice exports – they may or may not happen, depending on the level of domestic production, the price for the domestic producer vis-à-vis the export price, the supply in neighbouring countries and policy regulations at the northern and southern borders concerning rice trade (MAGAP, 2009a).

Main policies related to the rice sector, late 2007–end 2009

The government's rice policy response to rising international food prices was a combination of trade policies, price controls and public purchases. These policies aimed to guarantee food security and price stability.

The initial policy response was to ban rice exports. The first export ban took effect on 6 September 2007, before the large spike on international rice markets, and lasted until 4 December 2007. The ban was successively extended by several Acts, some

[5] In 2010–2011 the FAO food price index shows another world food price spike, which again, was not replicated in Ecuador (Figure 2). However, some food items did show a sizable price increase in Ecuador in 2011 (see maize and meats, and wheat flour and wheat-flour products in Figures 7 and 8, respectively). This study focuses on the 2007–2008 world food price spike.

for 90 days, others for 30 days. In June 2008, another MAGAP Act "temporarily" banned rice exports, but without stating the duration of the ban. Finally, an Executive Decree maintained the ban as a policy to regulate the domestic rice market by establishing a strategic reserve of rice. (The ban was eventually lifted in February 2010, as mentioned below.)

In addition to banning exports, the government authorized the BNF to import up to 40 000 MT of paddy rice. This policy was in response to the floods in early 2008 that affected the main rice producing areas in some coastal provinces.

The rice export ban put downward pressure on domestic prices and created incentives for smuggling. The government tried to establish mechanisms at the borders to avoid or reduce rice smuggling in the northernmost and southernmost provinces (the borders with Colombia and Peru, respectively), but these were not implemented until late 2008. Because of this downward pressure on prices (relative to free trade – real farm prices were roughly constant during this time), small farmers asked the government to set support prices and make rice purchases. If these were not possible, small farmers argued, exports of rice should be allowed. The government did establish support prices and engage in procurement, allowed exports of rice by-products for a short period in 2008, and eventually authorized and allowed rice exports from April 2009.

In the timeframe of the present analysis, mid-2007 to end-2009, the second policy related to rice was to authorize government purchases of paddy and/or milled rice (through the BNF). The first purchase was for up to 22 727 MT of milled rice, which represents approximately 3 percent of milled production (Table 1). This authorization took place in late February 2008, at the same time that the government decided to import rice to deal with the flooding that devastated some rice farms in late 2007-early 2008.

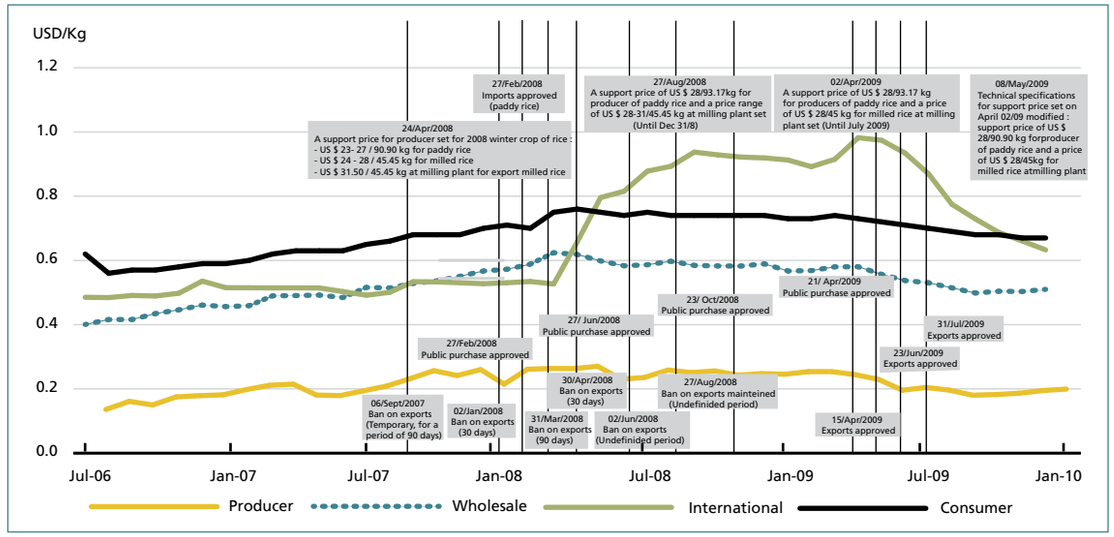
The government authorized the BNF to purchase an additional 40 000 MT of milled rice or its equivalent in paddy rice in July and November 2008. In April 2009, the government authorized the BNF to purchase milled rice (40 000 MT, degree 2) and paddy rice (22 500 MT). All purchase costs, plus any

TABLE 1: RICE, 2003-2009

Year	Paddy		Dry Paddy	Dry and clean paddy	Milled	Areas (has)	
	Production	Domestic supply [1]	Net food [2]	Net food [3]	Net food [4]	Planted	Harvested
	(metric tonnes)						
2003	1 384 715	1 384 682	1 068 186	908 113	640 743	343 240	332 837
2004	1 778 380	1 777 155	1 389 872	950 357	876 092	358 094	348 320
2005	1 471 064	1 471 064	1 128 788	1 109 508	678 899	380 254	365 044
2006	1 501 238	1 501 238	1 187 353	1 254 269	591 527	402 345	374 181
2007	1 734 135	1 734 135	1 372 563	1 134 633	771 790	385 872	355 002
2008	1 442 052	1 442 052	1 160 949	1 054 787	725 979	365 000	338 270
2009	1 579 406	1 579 406	1 276 185	1 098 516	798 982	380 345	361 328

Notes: (1) Equal to: production minus exports and plus imports. (2) Net food for dry paddy is calculated using the domestic supply minus the use of rice for seeds, waste and feed; and all this minus an extraction rate. The extraction rate used was: from 2003-2005 (17.4 percent), 2006, 2007, 2008 (15 percent) and 2009 (10 percent). (3) It is equivalent to rice production (dry and clean). (4) Net food for milled rice is calculated with an extraction rate of 63 percent multiplied by milled net food plus the gross food of milled rice (in turn equal to: domestic supply of milled rice minus its uses in seeds, waste and feed).
Sources: Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP), Food Balance Sheets 2003-2009. Data for dry and clean paddy net food and areas from "Sistema de Información Geográfica y Agropecuaria" (SIGAGRO), MAGAP.

FIGURE 3: MILLED AND PADDY RICE: REAL PRICES AND POLICIES, 2006-2009



Notes:
- Wholesale prices refer to milled rice, grade 2 (short grain).
- Consumer prices refer to "arroz flor".
- International prices refer to U.S. California Medium Rice Grain.
- The dates set refer to the date of policy implementation according to the publication of Registros Oficiales from the Republic of Ecuador.
- Nominal prices are deflated using the Ecuador CPI (2004=100).
- The policies depicted in the graph are described in more detail in Annex 1.

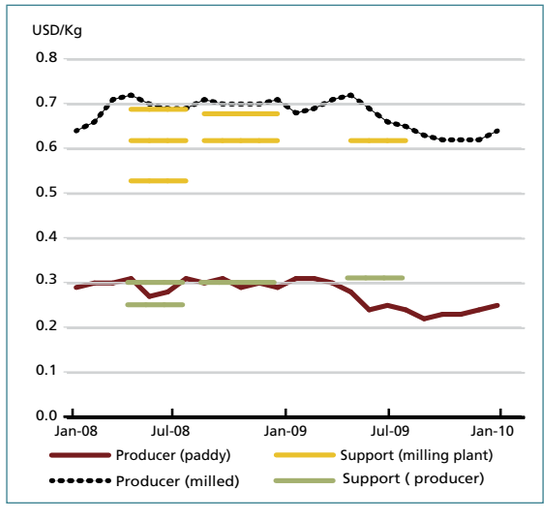
Source: Own construction based on data from FEDEAGRO, the Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP), GIEWS Food Price Data and Analysis Tool from FAO, Registros Oficiales (RO) from the Republic of Ecuador and the National Institute of Statistics and Census (INEC).

implicit subsidy created in the transaction, were to be covered by government budgetary funds. Although the stated goals of each purchase authorization varied, in general the purchases were made to guarantee food security and ensure price stability through the creation of a strategic food reserve. However, it is interesting to note that data from UNA show no public purchases of rice in 2008, despite the authorizations decreed by the government in that year.

During this period, the government established a series of reference prices, support or floor prices, that varied according to the quality of rice (for details see Figure 3).

At the farm level, these prices were generally in line with market prices, while at the milling level they were slightly below market levels (see Figure 4). The main objectives of these prices were to guarantee

FIGURE 4: NOMINAL RICE PRICES, 2008-2009



Source: Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP) and Registros Oficiales (RO) from the Republic of Ecuador.

food security and a "fair" price for all involved in the rice sector.

In July 2008, the government also set a sales price for milled rice at USD 25 per 100 pounds (45.45 kg), to be sold by the BNF. The Act suggests that the rice to be sold is the same rice that the BNF bought at USD 28 per 50 kg in February 2008, and that any price differential (between the purchase price and the set sales price plus any selling expenses incurred by the BNF) would be covered by the general state budget. The stated goal of this measure was to contribute to price stability.

The same week that the government set support prices in April 2009, it also gave MAGAP permission to export paddy, milled rice and rice by-products, provided it ensured the existence of a strategic food reserve of up to 40 000 MT. The rice surplus created and maintained through previous measures (support price and direct state purchases, without allowing exports) was finally allowed to be exported in mid–2009. On 23 June 2009, MAGAP authorized the BNF to export 100 000 MT of milled rice or its equivalent in paddy. According to the corresponding MAGAP Act, this rice had been purchased by the BNF from small and medium farmers and was stored at the UNA. On 31 July 2009, MAGAP authorized organizations, associations, cooperatives, and other groups of farmers legally constituted to export up to 100 000 MT of paddy and milled rice. This authorization was valid until 30 September 2009. Finally, MAGAP Act 068 of 26 February 2010 repealed MAGAP Act 091 of 2 June 2008 that temporally prohibited the exports of rice and its byproducts.

Assessment of the effectiveness of the measures related to rice

The main goal of the policy responses to the 2007–2008 international rice price increases – price stability for rice – seems to have been achieved. According to Figure 3, the international price of rice rose rapidly at the beginning of 2008, reached a peak by April 2009 and then fell (although at the end of 2009 it was at a higher level than in pre-crisis years). But domestic rice prices did not experience such extreme swings. Farmgate, wholesale and consumer prices of rice did increase in 2007 and at the beginning of 2008, but they reached a plateau in 2008 and early 2009 even when the international price of rice was still rising[6].

The export ban seems to have contributed to price stability by increasing the availability of domestic supply. Export records from the Central Bank of Ecuador show that, while there were consistent rice exports from January to September 2007, there were no exports of rice in the last quarter of 2007, in 2008, or in 2009 (except for April and December 2009, when some exports were indeed allowed; Table 2). These official records do not include any smuggling,[7] but the fact that domestic prices were stable at the same time that international prices (including those in Colombia, the main export market during this time) surged suggests that smuggling, if there was any, was not sufficient to arbitrage domestic and international prices. To the extent that smuggling did occur, it created rents for those involved. The obvious solution to eliminate smuggling was to allow rice exports, which the government finally did in 2009 after the international price surge was over (and after domestic production had started to recover).

[6] Notice that Figure 3 uses California medium grain prices as the reference price. The patterns of this price over time are somewhat different than those for Thai rice, in that California prices started rising later and continued to rise even after Thai prices had collapsed. Nevertheless, the conclusions of this section are the same regardless of which international price series is used. Also note that, generally speaking wholesale domestic prices are less than international prices, especially if wholesale prices in surplus regions are used (not shown in the figure).

[7] Press news reported rice smuggling and attempts to smuggle rice through the borders with Colombia and Peru (see, for instance, newspaper "Hoy" at http://www.hoy.com.ec/noticias-ecuador/menos-arroz-se-va-a-colombia-297218-297218.html, last accessed April 2011).

TABLE 2: MONTHLY EXPORTS OF AGRICULTURAL PRODUCTS, 2007-2010

Month/ Year	Paddy rice		Milled rice		Hard yellow maize		Wheat		Wheat flour	
	MT	*Thousand FOB USD*	*MT*	*Thousand FOB USD*	*MT*	*Thousand FOB USD*	*MT*	*Thousand FOB USD*	*MT*	*Thousand FOB USD*
Jan-07			5 931.59	2 461.02	536.51	80.07			2.74	5.71
Feb-07			2 622.49	1 087.65	113.53	17.03			1.16	5.18
Mar-07			1 582.93	661.51					8.53	9.27
Apr-07			16 463.90	6 834.68	1 237.37	203.77			7.37	9.37
May-07			30 218.43	12 939.49	2 519.11	377.86			10.61	10.80
Jun-07	0.77	1.59	22 787.71	9 507.18	5 142.05	819.19			1.25	1.55
Jul-07			6 413.28	18 489.31	6 745.47	1 123.99			7.19	3.99
Aug-07			5 610.07	2 414.24	413.56	76.70			3.52	4.75
Sep-07			1 917.84	850.93	4.38	6.74			85.93	28.30
Oct-07									86.05	23.18
Nov-07					2.03	1.36			7.82	4.20
Dec-07					0.63	0.54			0.05	2.56
Jan-08					0.69	0.36			6.40	7.65
Feb-08					524.96	100.02			7.75	10.20
Mar-08					273.17	72.84			46.05	22.83
Apr-08					4 761.88	1 064.82			126.45	53.91
May-08					6 387.86	1 455.40			4.13	10.79
Jun-08					2 266.15	622.86			5.55	11.01
Jul-08									3.66	7.35
Aug-08									3.87	7.65
Sep-08									20.62	20.13
Oct-08									2.50	5.14
Nov-08					694.89	199.65			22.57	21.09
Dec-08					3 472.51	961.45			9.02	16.88
Jan-09					206.34	56.84			7.78	11.95
Feb-09									7.64	10.29
Mar-09									16.15	31.03
Apr-09			5 013.41	3 331.66					2.45	11.62
May-09							0.95	0.36		
Jun-09					9 780.54	2 444.81				
Jul-09					7 987.08	2 094.84			6.91	13.94
Aug-09					3 957.70	1 062.88				
Sep-09					2 214.93	598.03			9.04	16.02
Oct-09					2 016.39	557.62			10.86	19.58
Nov-09					0.12	0.25			12.59	14.59
Dec-09			9.00	8.10					10.57	16.14

TABLE 2: MONTHLY EXPORTS OF AGRICULTURAL PRODUCTS, 2007-2010 (CONTINUED)

Month/ Year	Paddy rice		Milled rice		Hard yellow maize		Wheat		Wheat flour	
	MT	*Thousand FOB USD*	*MT*	*Thousand FOB USD*	*MT*	*Thousand FOB USD*	*MT*	*Thousand FOB USD*	*MT*	*Thousand FOB USD*
Jan-10									4.67	7.32
Feb-10									12.71	22.27
Mar-10									8.28	16.99
Apr-10	50.00	0.00	6.75	2.03			0.28	1.11	6.00	8.21
May-10			9.90	3.15					6.07	11.46
Jun-10	16.00	0.00			684.01	194.14			25.23	14.90
Jul-10					2 249.97	654.99			6.49	9.73
Aug-10					498.64	145.24			0.32	0.02
Sep-10			2.63	2.24					14.91	17.95

Sources: Central Bank of Ecuador (BCE) and website of Corporación de Promoción de Exportaciones e Inversiones (CORPEI).

The floor price policy adopted by the government and enforced through direct purchases of paddy rice (from farmers) or milled rice would have contributed to higher prices, and thus did not contribute to keeping domestic prices below international prices. Furthermore, in 2008, there were no recorded public purchases of rice (although there were some in 2009; see below). It is possible that domestic prices could have actually declined because of the export ban, but the large production shortfall in 2008 (paddy production fell 17 percent in 2008, reaching its lowest level since 2003, taking into account the flooding in 2008; Table 1) probably prevented such a decline.

What were the effects of the government policies? First, there was an opportunity cost in terms of foregone export revenue – farmers would have enjoyed higher prices if exports had not been banned. Consumers benefited from lower domestic prices than would have otherwise existed, although the magnitudes of consumer gains must have been less than the losses to producers because of the allocated efficiency losses incurred by not having domestic prices follow the trend of world prices. On the other hand, consumers, farmers, and milling companies all seem to have benefited from price stability.

Rice *producers* (mostly small farmers) and milling companies seem to have benefited from support prices. In addition, the initial ban on rice exports may have created rents that could have been appropriated by some groups, but such rents are difficult to estimate.

As for consumers, although rice prices did not increase in real terms from April 2008 to April 2009 (when most of the policies were in place), prices had already increased throughout 2006 and 2007, and by the end of 2009 rice prices were at a higher level than in pre-crisis years (Figure 3). Such price increases might have jeopardized the access of households, in particular the poorest households, to this staple food.

The government also had to absorb some costs, although due to lack of data the estimates are tentative. According to data from UNA, in 2009 the volume of paddy purchased was 58 316 MT, which assuming a transformation factor of 0.60, gives approximately 34 990 MT of milled rice. At a price of USD 616 per MT for milled rice, this amounts to expenditures of approximately USD 22 million. Eventually, the government should sell the rice stored at UNA facilities, which implies that part or all of the amount paid as direct purchases can be recovered, but we could not find data on any government revenue from selling rice stored at UNA. Since the government sales price might have been below the purchase price (see above), it is not clear how much revenue the government might have accrued.

The cost of milling (drying and cleaning) the paddy rice amounted to USD 462 000[8]. The storage cost of the rice purchased should also be accounted for, but we could not find data to estimate this cost. Nor could we find data to estimate the cost of subsidies on seeds in 2007–2009. An estimate of the subsidy for fertilizers ("urea") used in rice crops in 2010 equals USD 10 689 660 for 118 774 hectares of planted rice. We take this amount as an indicator of the subsidy in 2009. Summing up, just for rice the fiscal cost of public purchases and subsidies for fertilizers reached USD 33 million in 2009, although much of this should be recovered when the rice is sold.

Supply and demand responses

As noted earlier, there was a reduction of 17 percent in production (and domestic supply) of rice in 2008 (Table 1). The decrease in production can be explained by floods that destroyed crops in the 2007–2008 winter season, as already mentioned. The reduction in planted and harvested areas for 2007 (-4 percent and -5 percent, respectively) and 2008 (-5 percent for both planted and harvest areas) highlights the negative impact on production and net food availability of climate factors in Ecuador. It is therefore important to take into account such falls in production (due to climate factors) to explain the increase in the domestic price of rice, besides the contribution of rising international prices. In 2009, production and food availability had recovered.

Maize[9]

As with rice, there are thousands of small producers of maize. Of a total of almost 82 000 maize producers (more than for rice), 22 percent have less than 3 hectares, 34 percent less than 5 hectares and 52 percent less than 10 hectares. In 2000, the total planted area of maize was approximately 240 000 hectares, and it has been constantly growing (except in 2008, when it fell with respect to the previous year). By 2009, it had reached 279 261 hectares (Table 3)[10]. The largest planted areas are located in the provinces of Los Ríos (42 percent), Manabí (24 percent) and Guayas (21 percent), (MAGAP, 2009b).

Inputs such as fertilizers may constitute an important share in the total cost of production, depending on the degree to which the farm uses technology. Agrochemical inputs and fertilizers may represent on average 40 percent of total direct costs for crops produced with high levels of technology. For maize crops produced using some technology, the share of those inputs reaches only 23 percent (MAGAP, 2009b). Thus, the spike in the price of agrochemicals observed in 2008 affected some maize farms more than others.

Ecuador is not a traditional exporter of maize. Maize surpluses, if any, are usually small. Thus, when the local industry cannot absorb the total crop, the excess supply is exported most often to Colombia. Indeed, a large share of domestic maize utilization

[8] Data from UNA shows that in 2011 the "subsidy" for drying and cleaning paddy rice was USD 142 668.42. With 17 904.61 MT of paddy rice purchased in 2011, this cost amounts to USD 7.97 per MT of paddy rice. We assume that the same cost per MT applied in 2009.

[9] We refer to yellow hard corn.

[10] Data on areas for 2000 is from the National Agricultural Census (CNA, 2000); for other years, data is from the Survey of Areas and Agricultural Production (ESPAC).

TABLE 3: MAIZE (1), 2003-2009

Year	Production (dry)	Imports	Exports	Domestic Supply [2]	Gross food [3]	Production (dry and clean) [4]	Areas (has)	
							Planted	Harvested
2003	539 816	337 890	64 915	812 791	750 478	485 345	260 000	250 000
2004	732 111	457 711	38 291	1 151 530	1 017 953	387 750	255 000	235 000
2005	744 629	417 867	32 846	1 129 650	1 086 150	671 786	262 623	249 492
2006	683 039	483 321	39 035	1 127 325	1 088 554	591 585	277 546	249 449
2007	913 477	553 160	16 714	1 449 924	1 399 073	605 293	278 681	250 340
2008	774 879	327 953	18 382	1 084 450	1 041 117	787 129	250 306	250 095
2009	767 153	348 681	26 163	1 089 671	1 046 717	765 320	279 261	259 585

Notes: (1) Refers to hard and dry yellow maize. (2) Equal to: production minus exports and plus imports. (3) Calculated as domestic supply minus the use of maize for seeds, waste and feed. (4) It is equivalent to hard dry maize production (dry and clean).

Sources: Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP), Food Balance Sheets 2003-2009. Data for production and areas from "Sistema de Información Geográfica y Agropecuaria" (SIGAGRO), MAGAP.

comes from imports, as imports are much larger than exports (Table 2).

According to León and Yumbla (2010), about 80 percent of the demand for maize in Ecuador comes from the animal feed industry. The largest consumers of yellow corn are two business groups: the Ecuadorian Association of Animal Feed Producers (AFABA) and the National Food Processor Company (PRONACA). Between them, they use about 75 percent of the national crop. These two groups are also responsible for the largest imports of yellow corn – AFABA accounted for 39 percent of total yellow corn imports in 2009, while PRONACA had a share of 37 percent. Ecuador imports maize from Argentina, Brazil and the United States, among others.

Main policy responses related to the maize sector, 2007–2009

During the period under study (2007–2009), the government actively pursued a set of maize policies, including restrictions (sometimes a ban) on exports, a floor price for producers, direct state purchases, and import permits. Of this set of policies, the export ban adopted in 2007 was most clearly identified as a response to high world prices of maize. Some of the other policies had been in place before (e.g., floor prices, government purchases of maize, export permits). Most of the policies established for this sector in the period under analysis had as a rationale the "normal provision of inputs" (to the animal feed industry) and food security.

In response to the spike in international food prices in 2007, the government banned exports of maize for a 90-day period, from 10 August 2007 until 10 November 2007. A ban on maize exports is not difficult to enforce, because the domestic price of maize in Ecuador has historically been higher than the international price (see Figure 5).

In addition, the annual domestic production of maize has not been enough to cover the increasing demand for maize to produce animal feed, and imports have had to be allowed[11]. A contentious issue has been the timing of maize imports. Producers

[11] Yellow maize is one of the 13 marker commodities protected by the price-band mechanism of the Andean Community (SAFP, by its acronym in Spanish). The other commodities are: barley, milk, palm oil, pork, poultry, refined sugar, rice, soybeans, soy oil, unrefined sugar, wheat and white maize.

claim that the largest consumers of maize are allowed to bring in imports to trigger a free fall in domestic prices (León and Yumbla, 2010, p. 34).

Figure 5 shows producer prices, the international price, and CIF unit values of maize. As shown in the graph, only when domestic producer prices fall enough to be close to or below the international price are there no imports (usually around June–August of each year).

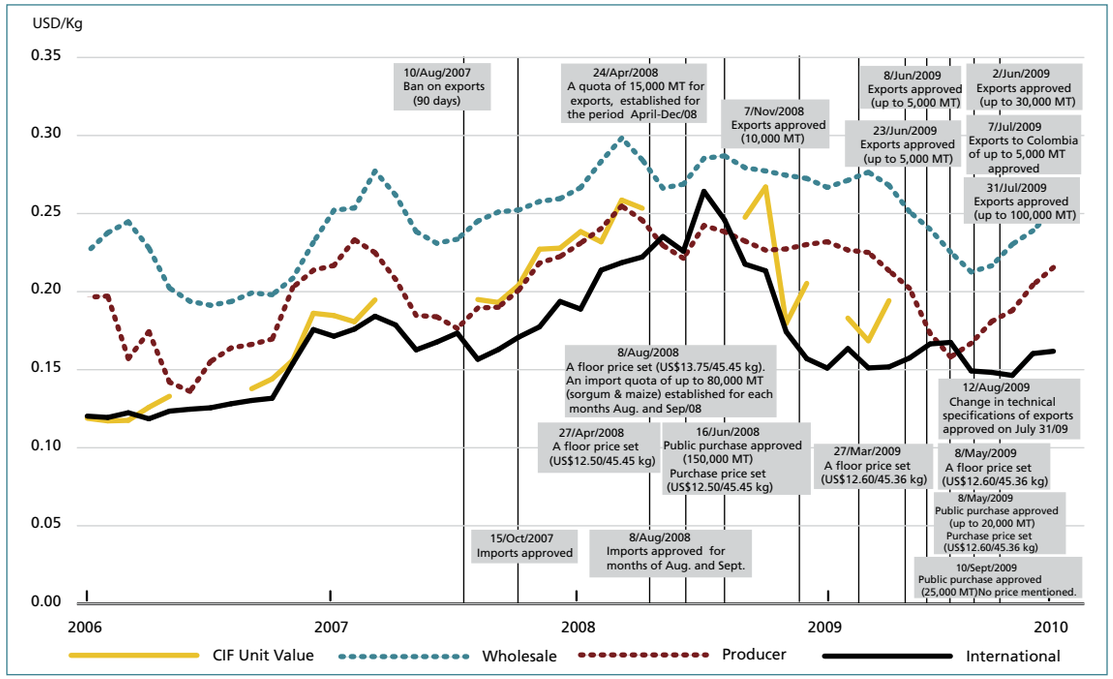
Other trade policies actively pursued by the government since 2007 include the establishment of both the volume of imports needed (in response to production deficits) and the volume of exports allowed. The latter can be seen as a complementary policy to government floor prices.

In late April 2008, the Ministry of Agriculture established a support price of USD 12.50 per quintal (1 qq is equivalent to 100 pounds or 45.45 kg) for the winter crop of maize[12,13], and the government later authorized the BNF to purchase 150 000 MT of maize from that crop. In addition, the government allowed 15 000 MT of maize

[12] A support price of USD 12.5 per quintal (100 pounds or 45.45 kg) is approximately equivalent to a price of 28 cents per kg.

[13] In the coastal areas of Ecuador, where most maize production takes place, winter is from December to May. The sale of the yellow maize winter crop happens around April-May of each year.

FIGURE 5: HARD DRY MAIZE: REAL PRICES AND POLICIES, 2006-2009



Notes:
International prices refer to yellow maize FOB Golf #2.
Wholesale and producer prices refer to hard dry maize.
The dates set refer to the date of policy implementation according to the publication of Registros Oficiales from the Republic of Ecuador.
Nominal prices are deflated using the Ecuador CPI (2004=100).
The policies depicted in the graph are described in more detail in Annex 2.

Source: Own construction based on data from FEDEAGRO, the Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP), Registros Oficiales (RO) from the Republic of Ecuador and the National Institute of Statistics and Census (INEC).

exports until the end of 2008. This volume was considered necessary to guarantee the support price while maintaining the normal provision of maize for the local animal feed industry. The Act establishing the support price also included a government commitment to buy the total national crop (to enforce the floor price), and for those that wanted to import maize, the need to request official authorization.

For the summer crop of 2008[14], the government set a floor price for maize producers of USD 13.75 per 45.45 kg, higher than for the winter crop. One of the main objectives of this policy, in addition to the usual ones, was to respond to the losses in maize production due to winter floods in 2008. The same act established a maximum import volume of 80 000 MT (including maize and sorghum) for both August and September 2008. The government also ratified its commitment to purchase all national production from the summer 2008 crop. By the end of 2008, the government had authorized the export of 10 000 MT of domestically produced maize to support the floor price for farmers.

In 2009, the government established the same floor price for both the 2009 winter and summer crops at USD 12.60 per 45.36 kg[15]. For the 2009 winter crop, the government set 15 April 2009 as the start date for maize purchases. It again ratified its commitment to buy all domestic production by the end of 2009. The government also authorized the UNA to open storage facilities for maize in the cities of Daule, Portoviejo, Quevedo, and Ventanas. Finally, the Ministry of Agriculture set 30 March 2009 as the latest arrival date for imports.

In 2009, government policies focused on exports and purchases of maize, as to be expected given the policy of support prices for maize producers. Twice in June, once in July, and once in August 2009, the Ministry of Agriculture authorized maize exports. The export quantities stated in the Ministerial acts vary: up to 5 000 MT in the June and July acts, and up to 100 000 MT in the August act. The beneficiaries of exports should be producers, producer associations and those associations that bought the production from farmers at the support price for 2009. In this regard, the government seems to operate a "buy high, sell low" policy, as international prices are below domestic prices (see Figure 5), and it is not clear that exports would occur under a free-trade policy. In any event, imports are much larger than exports every year (Table 3).

Finally, in October 2009, the government authorized the BNF to purchase 25 000 MT of maize with the goal of guaranteeing price stabilization. The government did not indicate the price of maize for this purchase.

Assessment of the effectiveness of the measures related to maize

The domestic price of maize increased sharply in 2007 and early 2008 (Figures 5 and 6), fell in early 2009. The magnitude of the domestic price fluctuations for maize was much greater than for rice. However, the striking swing in the international price of maize in 2008 seems to have been smoothed out – to some degree – by government policies (Figure 5). The relative stability in domestic prices during 2008 came at the cost of much higher domestic prices than were necessary, however – both real producer (farmgate) and wholesale prices of maize were maintained at a high level in 2008 and the first quarter of 2009, even though the international price of maize was already falling sharply (this benefited farmers, but harmed consumers). Furthermore, the domestic price eventually

[14] Summer on the coast of Ecuador runs from June to November and the sale of the summer crop usually takes place around October of each year.

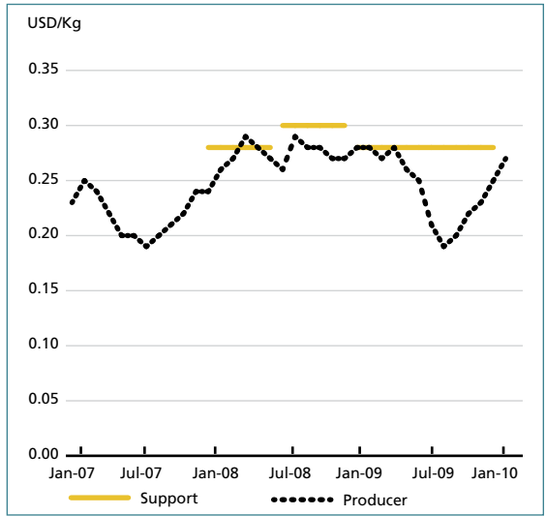
[15] The conversion factors between quintals and kilograms vary across sources – the difference is minor, however (45.45 kg per quintal versus 45.36 kg per quintal).

collapsed later in 2009 at a time when world prices were stable. Thus, the price plunge was not so much avoided as delayed.

In contrast to what we observed for rice, the maize floor price for producers (thousands of small farmers) has not been effective all the time (Figure 6). This difference is understandable. In contrast to rice, the domestic price of maize is higher than the international price, and the sector is usually in deficit, with imports needed to cover the difference between domestic demand and supply. In the 2008 winter crop, when the international price of maize was rising and its level was about the same as the domestic price, a support price was enforced (and there were no imports of maize in such months). However, in subsequent crops (April 2009, October 2009), when the international price of maize fell to about pre-crisis levels, the price received by maize producers was lower than the support price set by the government. During these months, imports did take place (see Table 4)[16].

Enforcement of support prices requires storage capacity and funding. Public purchases of maize totalled 43 520 MT in 2009, the first year for which there are data available at UNA. Assuming producers received the official support price of USD 12.60 per qq (USD 277.2 per MT), the amount paid for maize purchases in 2009 should have been USD 12 million[17]. In addition, drying maize (for storage) cost USD 335 110[18]. Another fiscal cost is the subsidy for fertilizers – USD 4 720 500 for an

FIGURE 6: NOMINAL HARD AND DRY YELLOW MAIZE PRICES, 2007-2009



Source: Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP) and Registros Oficiales from the Republic of Ecuador.

area of 78 675 hectares (in 2010, according to data from UNA). Assuming the same cost applied in 2009, the total fiscal cost for public maize purchases and the fertilizer subsidy was approximately USD 17 million.

Regarding the contribution of trade policies to price stabilization, supply of inputs and food security, the policy prohibiting exports seems to have been enforced. In the last quarter of 2007, there were practically no exports (according to the Central Bank of Ecuador (Table 2). From May to December 2008, maize exports fell more or less within the limits allowed (15 000 MT). Similarly, for 2009 the quantity of exports recorded by the Central Bank is within the limits allowed by the government (around 100 000 MT). At the same time, the policy that established the maximum quantity of imports from October 2007 to March 2008 was also enforced. In this period, Central Bank records show around 450 000 MT of imports, the maximum quantity permitted (Table 4).

The main beneficiaries of the policy response to rising international maize prices

[16] As opposed to the rice situation, it was established that the animal feed industry should directly purchase some maize from farmers. This industry is comprised of just a few firms, and this may have exerted some market influence with regard to these purchases. However, this is an issue beyond the scope of this study.

[17] Part of this cost should be recovered when the government sells the maize stored at UNA facilities.

[18] In 2011, the cost for drying maize amounted to USD 104 781.77. With 303 018.51 qq (13 773.57 MT) of maize purchased that year, the cost of drying maize was USD 0.35/qq (USD 7.61/MT) in 2011. We assume that the same cost applied in 2009.

TABLE 4: MONTHLY IMPORTS OF AGRICULTURAL PRODUCTS, 2007-2010

Month/ Year	Paddy rice			Milled rice			Hard yellow maize			Wheat			Wheat flour		
	MT	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*
Jan-07	8.00	8.48	8.60				79 223.72	13 028.80	15 618.88	50 999.58	9 948.83	12 315.04	22.00	7.83	9.62
Feb-07				9.05	7.18	9.04	72 918.49	11 548.88	14 075.75	50 429.01	9 504.29	11 688.75			
Mar-07	1.82	0.02	0.31	13.44	22.24	24.76	88 801.62	15 296.15	18 488.34	32 204.97	6 205.30	7 671.18	21.50	8.17	9.82
Apr-07				3.85	7.28	8.26				60 794.27	13 040.72	15 910.12			
May-07	11.00	28.12	28.28	0.20	2.10	2.17				40 140.59	7 792.17	9 832.73			
Jun-07										48 423.01	9 629.40	12 176.94	21.50	8.17	9.91
Jul-07				9.00	23.42	26.08				491.26	154.51	197.55	22.17	8.65	10.40
Aug-07				3.93	7.17	8.03	28 346.34	4 127.80	5 961.54	17 546.98	3 854.07	4 779.62			
Sep-07				5.66	7.81	9.01	44 497.63	6 625.13	9 334.63	51 613.83	13 141.83	15 987.61	21.67	9.95	11.88
Oct-07				3.31	2.80	3.68	95 156.05	15 538.67	21 148.91	36 750.01	10 875.01	13 250.89	0.12	0.10	0.13
Nov-07	0.69	1.76	1.97				88 215.33	15 390.57	21 912.25	43 236.96	13 408.65	16 508.01	23.43	11.41	13.90
Dec-07				29.38	32.70	37.66	56 001.27	9 899.23	14 032.46	34 985.48	11 180.68	14 033.92	22.93	17.50	19.77
Jan-08				1.82	2.29	2.44	95 020.69	18 292.80	25 200.14	48 056.43	16 687.93	20 763.82			
Feb-08	10.50	12.73	12.95	0.40	4.40	4.53	69 201.73	12 853.04	18 016.95	75 356.40	27 237.55	33 648.15	1 168.01	564.18	633.03
Mar-08	0.01	0.01	0.01				47 046.35	10 787.62	13 863.71	9 686.81	4 038.12	4 791.13	1 912.50	856.40	1 018.10
Apr-08							5 828.90	1 296.74	1 708.44	64 411.11	41 341.02	46 402.97	4 570.00	2 024.07	2 411.31
May-08	10.00	10.28	10.40	12.03	15.69	19.90				44 867.45	19 310.85	22 084.74	1 689.94	746.36	901.25
Jun-08				4.54	5.52	6.80				42 300.00	19 808.73	22 759.09	4 612.50	2 018.65	2 470.34
Jul-08				17.26	18.86	22.93				0.00	0.00	0.00	4 636.27	2 005.22	2 485.96
Aug-08	35.32	47.42	57.16	2.19	4.05	4.62				59 908.38	19 757.84	24 335.32	2 925.00	1 238.94	1 557.89
Sep-08				9.09	6.50	8.55	27 586.68	6 179.42	8 161.28	11 079.00	5 724.54	6 615.99	3 712.90	1 649.00	1 986.36
Oct-08				18.72	34.27	39.79	22 789.00	5 501.67	7 273.60	38 030.82	11 561.45	14 228.38	1 462.67	587.50	775.86
Nov-08	1 264.80	1 675.83	1 900.40	29.81	56.27	64.66	26 163.64	4 260.28	5 609.32	21 970.01	7 993.51	9 463.36	1 612.08	626.02	863.59
Dec-08				2.18	11.17	13.25	34 315.82	6 871.23	8 431.28	25 852.12	9 965.25	11 324.48	5 287.50	2 100.23	2 802.21

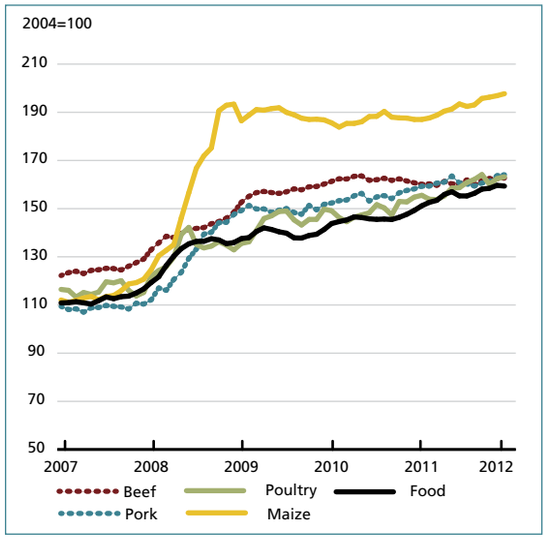
TABLE 4: MONTHLY IMPORTS OF AGRICULTURAL PRODUCTS, 2007-2010 (CONTINUED)

Month/ Year	Paddy rice			Milled rice			Hard yellow maize			Wheat			Wheat flour		
	MT	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*	*MT*	*000 FOB USD*	*000 CIF USD*
Jan-09	174.00	219.90	249.37	16.20	23.52	25.85				22 550.00	6 568.08	7 857.17	2 138.00	857.72	1 140.70
Feb-09	20.00	27.70	27.98	20.89	31.15	34.10	81 049.86	15 946.35	17 964.72	48 729.84	13 671.10	15 430.88	787.50	324.45	416.91
Mar-09							129 168.60	23 723.77	26 648.42	16 144.11	4 116.89	4 535.06	2 271.45	957.54	1 217.68
Apr-09				12.61	22.24	24.66	47 350.46	9 953.80	11 331.43	51 404.12	12 612.91	13 870.67	620.40	269.84	314.44
May-09										71 386.04	16 678.43	19 293.44			
Jun-09				8.71	20.97	23.95				57 433.56	15 525.96	17 030.06	0.05	0.95	0.97
Jul-09				18.90	27.17	29.57	3.00	0.87	0.90	82 273.19	20 360.11	23 089.41			
Aug-09										19 550.00	5 018.77	5 572.46			
Sep-09										26 950.00	6 989.43	7 724.64	141.45	53.33	62.84
Oct-09										60 851.57	14 243.73	16 076.03			
Nov-09				11.92	20.96	23.54				15 400.00	3 726.80	4 235.03			
Dec-09				16.00	21.85	23.73	91 109.41	17 609.06	21 094.42	16 805.75	4 285.95	4 844.07			
Jan-10							100 268.57	18 262.58	22 464.21	49 845.06	12 113.97	13 898.10			
Feb-10				14.41	23.96	25.35	152 343.65	27 887.47	34 609.27	58 359.73	14 479.68	16 554.63			
Mar-10										50 732.81	12 368.99	14 470.03	21.50	9.89	11.83
Apr-10										53 577.33	12 492.63	14 850.45			
May-10				18.94	23.42	26.12				79 498.98	17 691.17	21 260.72			
Jun-10				13.05	20.03	24.44				75 504.95	17 779.92	20 604.51	0.77	0.72	1.01
Jul-10				23.87	28.63	32.42				30 508.95	6 754.99	7 924.91			
Aug-10				4.22	8.72	9.53				14 804.71	3 242.13	3 781.92	44.05	17.32	20.74
Sep-10				30.97	35.80	41.92				24 607.98	5 594.31	6 555.70			

Source: Central Bank of Ecuador (BCE) and website of Corporación de Promoción de Exportaciones e Inversiones (CORPEI).

seem to be farmers (even those farmers who were not paid the support price, as domestic maize prices were substantially higher than world maize prices during 2007–2009). The main consumer of maize is the animal feed industry, but this industry was able to pass on the increased cost of inputs to the users of animal feed as the price of meats (especially pork and beef) increased more rapidly than for food in general in 2008 (Figure 7). The equity impact of this policy will depend on the relative poverty rates for maize farmers and meat consumers, and the shares of these items in their income and expenditures.

FIGURE 7: CONSUMER PRICE INDEX FOR MAIZE, MEATS AND FOOD, 2007-2011



Source: Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP) and Registros Oficiales from the Republic of Ecuador.

Supply and demand responses

As with rice, in 2008 there was a fall in maize production (-15 percent), domestic supply (-25 percent), and gross feed availability (-26 percent)[19]. The negative impact on production could in part be explained by the floods that affected key production areas in Ecuador; the planted area for maize fell 10 percent in 2008. Imports also fell in 2008 (by 41 percent), exacerbating the supply shortage (Table 3).

In 2009, there was a recovery. Planted area increased by 12 percent with respect to 2008, although the increase was more modest (0.2 percent) when compared with 2007, suggesting that much of the recovery was due to the lack of floods in 2009. Price supports may have provided some incentives, although they were not successfully defended at harvest time. Imports and exports also increased in 2009 over 2008 (6 percent and 42 percent, respectively). The availability of gross feed increased by 1 percent in 2009 (Table 3).

Wheat and wheat flour

In Ecuador, there are fewer producers of wheat (about 30 000) than of rice or maize. In 2000, the planted area of wheat totalled almost 22 000 hectares, a tenth of that planted for maize, and a fifteenth of the planted area of rice in Ecuador. At that time, almost 60 percent of the planted wheat area was cultivated on farms of less than 3 hectares, and only a little over 1 percent was planted on farms of more than 100 hectares. Ecuador has to import nearly all of the wheat needed for local industries (98 percent).

Main policies related to the wheat sector, 2007–2009

The government's main trade policy response to rising international wheat prices in 2008 was a tariff break to imports of wheat, hard wheat, wheat flour and semolina (a different type of wheat flour). Before the tariff break, applied rates were 5 or 10 percent for wheat, and 20 percent for wheat flour. From 7 September 2007, as per Executive Decree, the tariff was reduced to zero on these items for six months. These products would not be charged with tariffs under the Andean Community price band system (SAFP) either. The stated goals of this policy were to foster competition in the domestic wheat market and to stabilize prices.

The tariff break was extended to December 2008, to July 2009 and then again to June 2010. The Executive Decrees added that the tariff break could be extended for additional periods, but only for those milling companies that had participated in purchasing the national harvest. Other importers would be able to import wheat, but would need to pay all taxes and tariffs in place.

The government in late 2007 also adopted control prices, subsidies and public purchases. Thus, in September 2007, the government set a ceiling price for wheat flour sold to bakeries of USD 22.00 per 50 kg. To implement this measure, the BNF was designated to purchase directly from the domestic milling industry the wheat flour needed by bakeries (at a "sustainable" price of USD 25.50 per 50 kg, established in the same Executive Decree). The government would absorb the price differential in the national budget and with this, the government aimed to keep the prices of bread at the same level as in June 2007.

In July 2008, the government increased the price of domestic wheat flour to USD 35.00 per 50 kg, for flour whose final use would be to make bread, noodles, pastries, and other wheat flour food products. Another Executive Decree established a subsidy for wheat flour imported from Argentina. This wheat flour was to be sold domestically to small bakeries from 10 July 2008 to 9 January 2009 with a government subsidy of USD 10 per sack.

In December 2008, the government issued a new Executive Decree that maintained (as an "exceptional" measure) the price for domestic wheat flour at USD 35.00 per 50 kg. The rationale for the policy was food sovereignty (no response to high international wheat prices is mentioned in the decree). The decree also established that the government would absorb a price differential of USD 5.80 per sack of 50 kg, to be paid to the milling companies (continuing the subsidy). The goal of the policy was to ensure that bread, noodles, pastries, and other food were accessible to consumers.

Finally, the government, in agreement with the private sector, established maximum sales prices for several food items sold at popular markets (supermarkets or convenience stores directed to low or medium-low income households). These food items included wheat flour products such as bread, noodles, and pasta. For instance, given the importance of bread in the diet, the price of so-called "popular bread" was set at USD 0.10 per unit of 51 g[20].

Assessment of the effectiveness of the measures related to wheat and wheat flour

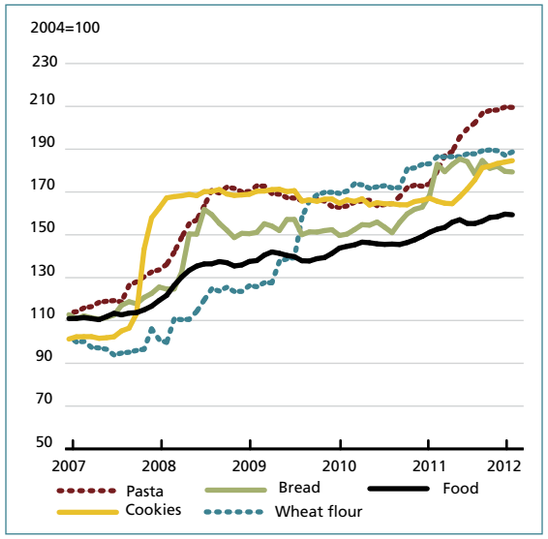
The goal of the policies adopted by the government in response to the 2007–2008 spikes in world wheat prices was to keep the prices of basic food items, such as bread and noodles, at pre-crisis levels. However, despite the subsidies and price controls, the consumer price index of bread, wheat flour, and other wheat products increased rapidly in Ecuador from mid-2007 to mid-2008 (Figure 8). The consumer price index has remained high since then, even though the world price of wheat fell after April 2008.

Figure 9 shows the evolution of real wheat prices for domestic producers, wholesalers and the world, as well as the implementation dates for the tariff breaks. As mentioned earlier, Ecuador produces very

[19] According to data from the food balance sheets; however, data from SIGAGRO shows an increase of 30 percent in the production of dry and clean maize (Table 3). The reason for the large discrepancy between the two sources is not clear.

[20] According to Bermudez (2011), 94 percent of the surveyed bakeries did charge the price set for "popular bread" (USD 0.10 per unit) – although the study does not provide details on how the survey was conducted. The study reports that there were cases of "popular" bread being sold at USD 0.10 but weighing under the specified 51 g per piece.

FIGURE 8: CPI FOR FOOD, WHEAT FLOUR, AND PRODUCTS DERIVED FROM WHEAT, 2007-2011

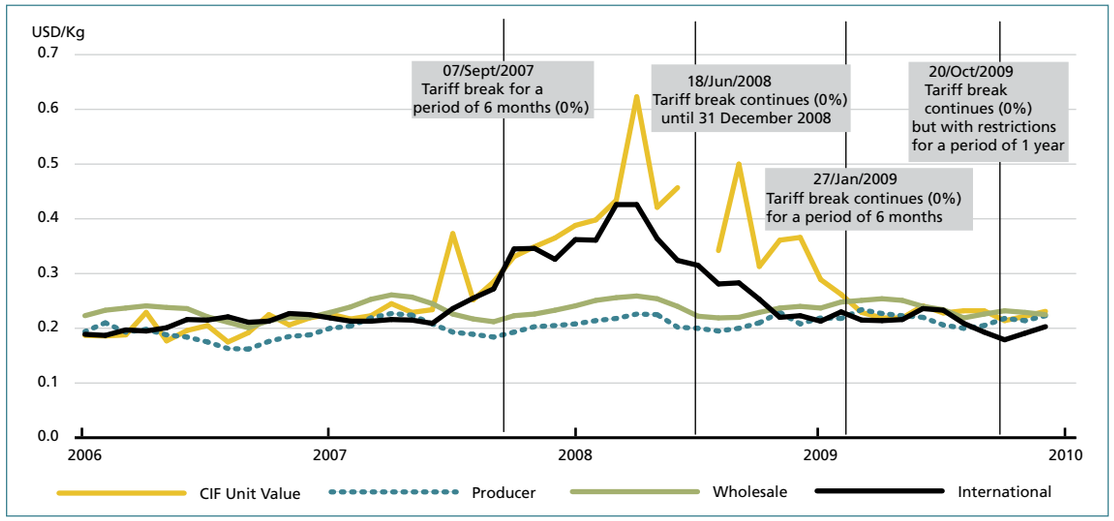


Source: National Institute of Statistics and Census (INEC), Consumer Price Index: Historical data.

low quantities of wheat, and nearly all of the wheat consumed in Ecuador is imported. Although the domestic price of wheat (for both producers and wholesalers) increased from mid-2006 to April 2007, and increased again from September 2007 to April 2008, it never experienced the sharp increase that international wheat prices did during the same time (although CIF unit values of wheat imports did shoot up in late 2007 and early 2008). Coupled with the fact that most wheat is imported, it is clear that the steep increase in the price of bread cannot be explained by developments in the *domestic wheat* market.

In contrast, in the domestic wheat flour market we observe a sharp increase in the consumer price of wheat flour from September 2007 to December 2007. This occurred despite a ceiling price for consumers of wheat flour, a "sustainable" price plus a

FIGURE 9: WHEAT: REAL PRICES AND POLICIES, 2006-2009

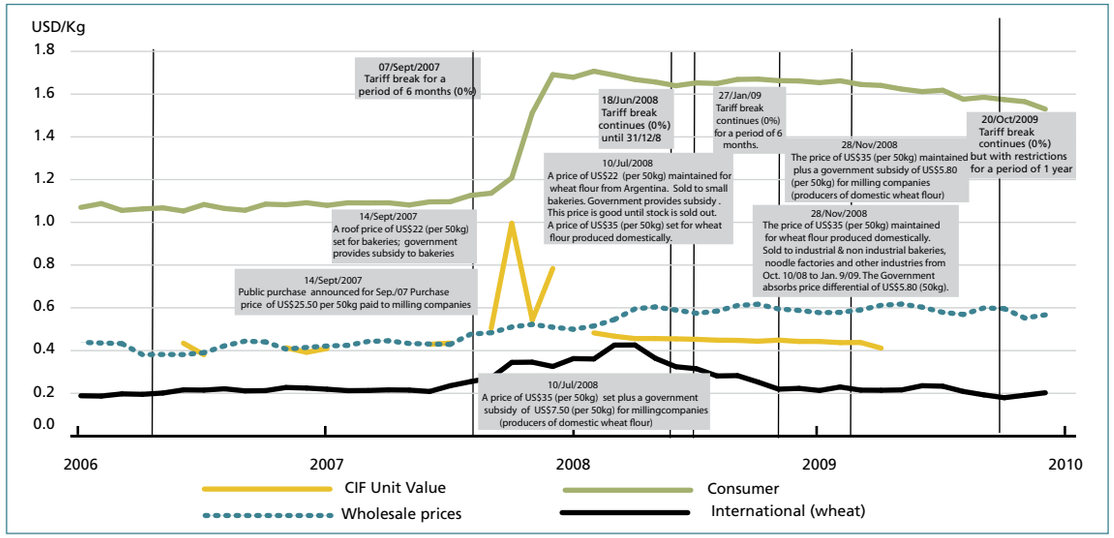


Notes:

- *International prices refer to FOB Gulf HW Ord. #2.*
- *CIF unit values were calculated using the total CIF value of wheat imports in USD divided by the total amount imported in kilograms.*
- *The dates set refer to the date of policy implementation according to the publication of Registros Oficiales from the Republic of Ecuador.*
- *Nominal prices are deflated using the Ecuador CPI (2004=100).*
- *The policies depicted in the graph are described in more detail in Annex 3.*

Source: Own construction based on data from FEDEAGRO, the Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP), Registros Oficiales (RO) from the Republic of Ecuador and the National Institute of Statistics and Census (INEC).

FIGURE 10: WHEAT FLOUR: REAL PRICES AND POLICIES, 2006-2009



Notes:

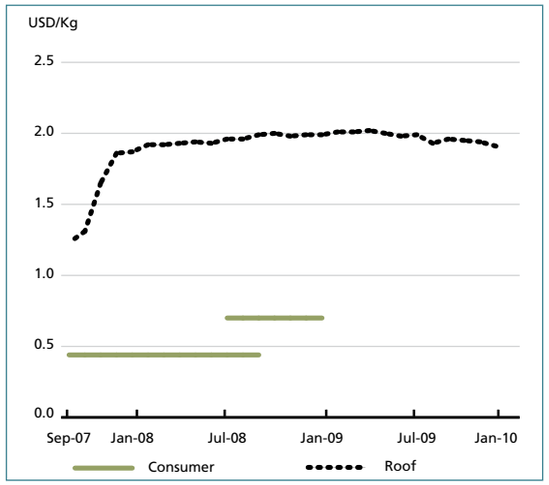
- *We assume that wholesale prices correspond to producer prices. According to the Decree 604-B published in RO 170, 14 September 2007, the distribution and marketing of wheat flour (directly to bakeries and other food industries) is done through the mechanisms and channels of industrial millers. As such, the data on wholesale prices that we received from MAGAP should correspond to the prices received by wheat-flour producers.*
- *International prices refer to wheat at FOB Gulf HW Ord. #2.*
- *CIF unit values were calculated using the total CIF value of wheat flour imports in USD divided by the total amount imported in kilograms.*
- *The dates set refer to the date of policy implementation according to the publication of Registros Oficiales from the Republic of Ecuador.*
- *Nominal prices are deflated using the Ecuador CPI (2004=100).*
- *The policies depicted in the graph are described in more detail in Annex 3.*

Source: Own construction based on data from FEDEAGRO, the Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP), Registros Oficiales (RO) from the Republic of Ecuador and the National Institute of Statistics and Census (INEC).

subsidy for producers of wheat flour, and government purchases of wheat flour from domestic milling companies. The increase in domestic wheat flour prices is mostly likely explained by the spike in CIF unit values of wheat and wheat flour imports observed in late 2007 and early 2008. The wheat flour price for consumers reached a much higher level than in pre-crisis years, and there is a wider gap between this consumer price and the wholesale and international prices (of wheat) than in pre-crisis years (Figure 10).

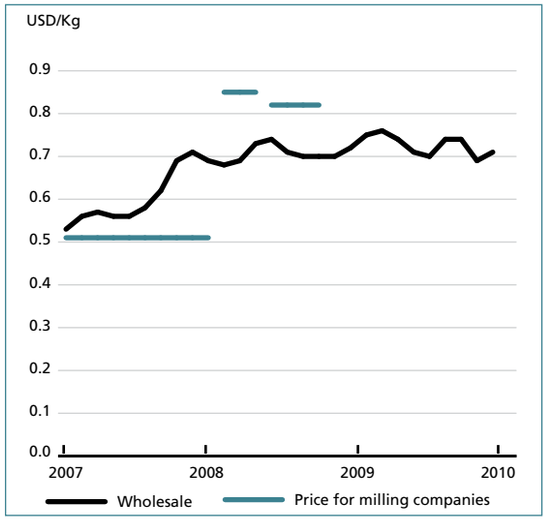
Figure 11 shows that the consumer price for wheat flour was well above the ceiling price established by the government for this commodity. In contrast, Figure 12 shows that the price received by milling companies (producers and/or importers of wheat flour) is close to or above the reference price for purchases of wheat flour (by the government)

FIGURE 11: NOMINAL WHEAT FLOUR PRICES, 2007-2009



Note: The ceiling price applies for consumers of wheat flour such as craft bakeries, industrial bakeries, etc.
Source: Ministry of Agriculture, Livestock, Aquaculture and Fisheries *of Ecuador (MAGAP) and Registros Oficiales (RO) from the Republic of Ecuador.*

FIGURE 12: NOMINAL WHEAT FLOUR PRICES, 2007-2009



Source: Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP) and Registros Oficiales from the Republic of Ecuador.

from milling companies. The reference price in this case seems to have worked. In fact, the domestic price of wheat flour did not fall after April 2008, even though international prices of wheat did (Figure 10).

Clearly, the beneficiaries of policies adopted in 2007 as a response to high wheat prices were the milling companies and some bakeries[21]. Consumers of wheat products (such as bread, cookies and pasta) seem to have borne the burden of high prices since 2007 (Figure 8). Another burden is the fiscal cost of the wheat flour subsidy. From September 2007 to April 2009 this subsidy is estimated to have cost approximately USD 55.6 million (Bermudez, 2011).

The tariff break on imports of wheat and wheat flour also imposed a fiscal cost. Using data from the Central Bank of Ecuador, from September 2007 to December 2009, there was a total of USD 416 million of wheat imports that would have paid a 10 percent tariff, and a total of USD 21 million of wheat flour imports that would have paid a 20 percent tariff[22]. Thus, the forgone tariff revenue was approximately USD 46 million in that period[23,24].

Supply and demand responses

As mentioned above, Ecuador has little domestic wheat production, and has to import most of the supplies needed for the milling industry. The tariff break seems to have provided incentives for an increase in wheat imports, as they rose 24 percent in volume terms in 2008, the largest increase in the previous five years (Table 5). Imports began to increase substantially in September 2007, as soon as the tariff break was enacted (Table 4). As a result, the domestic supply of unrefined wheat for food use increased by 15 percent.

It seems that the increased imports, along with the preferential price for wheat flour paid to domestic milling companies, had a positive impact on the domestic availability of wheat flour. According to the food balance sheet of Ecuador, after a fall of 34 percent in 2007, the availability of bakery products, noodles and other wheat products increased by 26 percent in 2008 (Table 6).

As with maize (and perhaps more clearly than in that case), support prices for wheat flour seem to have provided some incentives to farmers. In 2007, there was an increase in planted (15 percent) and harvested (16 percent) areas of wheat. In that year, production volume increased by 22 percent – by far the largest increase observed in domestic wheat production in the last six years (Table 5). Similarly, in 2009, there was an increase in planted (17 percent) and harvested (20 percent) areas of wheat, and again, production increased by a staggering 39 percent. Imports fell by 17 percent in 2009, and the domestic supply of wheat as well as the availability of unrefined wheat also fell by 16 percent.

[21] A study by the Ministry of Coordination and Social Development finds that the subsidy applied to wheat flour imported from Argentina benefited 8 046 small bakeries (see Bermudez, 2011, p. 302).

[22] Imports of wheat that would have paid 5 percent were negligible in September 2007 to April 2009.

[23] Considering only 2009, the forgone tariff revenue totaled approximately USD 14.6 million.

[24] The calculation in the text ignores the Andean Price Band Mechanism (SAFP by its acronym in Spanish). In effect, we assume that the CIF reference price was above the floor but below the ceiling of the price band.

TABLE 5: WHEAT, 2003-2009

Year	Production	Imports	Exports	Domestic Supply [1]	Unrefined wheat supply (food) [2]	Areas (has)	
						Planted	Harvested
				Metric tonnes			
2003	11 052	414 857		425 628	421 833	14 238	13 849
2004	10 214	416 830		427 044	422 155	13 118	12 684
2005	8 429	466 729		475 158	473 874	11 904	11 674
2006	7 577	554 081		474 784	471 220	9 811	9 747
2007	9 243	382 192		391 435	389 172	11 327	11 291
2008	8 144	475 108		449 662	447 397	11 370	10 908
2009	11 314	374 605	1	379 959	377 923	13 329	13 130

Notes: (1) Equal to: production minus exports and plus imports. (2) It is calculated using the domestic supply minus the use of wheat for seeds, waste and feed.
Sources: Ministry of Agriculture, Livestock, Aquaculture and Fisheries of Ecuador (MAGAP), Food Balance Sheets 2003-2009. Data for areas from "Sistema de Información Geográfica y Agropecuaria" (SIGAGRO), MAGAP.

Conclusions, lessons learned and policy recommendations

Ecuadorian food prices did not increase as much as they did on world markets during the global price crisis, despite serious floods that resulted in a negative shock to domestic production. Nevertheless, food price inflation reached 17.3 percent in 2008, the highest in any year since dollarization was adopted in 2000. These price increases contributed to a total inflation rate of 8.4 percent in 2008, also the highest rate since 2000.

The Ecuadorian government used a host of policy measures during the 2007–2008 spike in world food prices in order to stabilize domestic prices. Of this set of policies, trade policies stand out. There were bans on exports of rice and maize, and tariff breaks for wheat and wheat products.

Initially, the ban on rice exports faced problems with smuggling, and it had to be accompanied by support prices for farmers and government purchases. In the end, exports were allowed again. In contrast, the maize export ban was not as vulnerable to smuggling, which is not surprising given that Ecuador is not a regular net exporter of maize. However, a combination of support prices for maize farmers and government purchases was also adopted. The enforcement of the maize support price was difficult, as Ecuador is a net importer of this cereal. When the international price of maize increased, the support price was enforced. However, when the world price of maize declined, the support price for maize could not be enforced. In addition, for maize, exports seem to have followed a buy high, sell low policy. The resulting fiscal drain may imply sizable opportunity costs in terms of spending on education, health, infrastructure and public goods.

There follow two key policy lessons. First, in order to guarantee the domestic availability of food and stabilize prices, trade policies are a second-best solution, and if used alone may not achieve the intended objectives. Consumer and wholesale rice prices still increased substantially from September to December 2007, when the rice export ban was the only policy in place; there also appears to have been some amount of smuggling during this time. Despite any smuggling that may have occurred, small farmers blamed the export ban for the fall in farm gate prices in the last quarter of 2007. We observe that in 2008 the domestic prices of rice (farm gate, wholesale, and consumer) stabilized when there was an export ban and also a support price and government purchases. But it should be noted that this policy combination implied a cost in terms of net welfare losses for society[25]. Eventually, the government had to allow the rice surplus stored in government facilities to be exported[26].

Therefore, if the goal is to stabilize domestic prices and food supplies in the wake of a global food price spike, price and production policies should be used to tackle these issues directly. Given an export ban, support prices could be adopted at the outset, together with other policies needed to make the support price work, such as government purchases and the storage of surplus production (with the eventual export of the surplus)[27]. It is important to note that this should be a short-term policy.

It is also important to note that, given the market structure of the rice economy (tens of thousands of small farmers, a few hundred mills and millions of consumers), price supports for small farmers may not be effective.

There are two caveats regarding these price policies. First, significant fiscal costs may be entailed to finance the direct state purchases needed to defend the support prices, including the cost of storage and other transaction costs. Second, although intended to be short-lived, these measures, once in place, may be politically difficult to dismantle.

The second lesson related to the use of trade policy for price stabilization is that policy effectiveness will depend on the net trade position and the market structure of the sector concerned. A ban on exports will only be applicable if the commodity affected has a net export position (thus, a ban on maize exports was not really sensible). Moreover, even if such a policy is applicable, it may be difficult to enforce, depending on market structure (the initial ban on rice exports suffered from smuggling due to the thousands of producers and the fact that the natural export market of Ecuador is the neighbouring country of Colombia). Thus, strict controls are needed to enforce the ban.

Wheat provides another example, as tariff breaks for wheat and wheat products were not successful in stabilizing domestic prices – the prices of bread and other wheat products increased sharply and have stayed at high levels since the price spike occurred. Again, the market structure of the wheat flour sector offers clues as to why the policies failed. First, because imports account for nearly all of domestic consumption, and the initial level of tariffs before the price spike was low, eliminating those tariffs did not provide much cushion – a reduction of tariffs from 10 percent to zero cannot counteract a doubling of world market prices. Furthermore, domestic prices may not be determined competitively because the flour milling sector is dominated by a few companies (although more studies are needed to prove any collusion).

In the medium and long term, assuming that high international food prices continue, the best policies to guarantee food availability and stabilize prices are measures aimed at reducing production costs and increasing productivity. These measures should improve resilience to natural disasters and help with climate change adaptation. In 2007 and 2008, the government did adopt a set of policies directed at reducing food production costs and increasing food productivity. However, those measures (tariff breaks for imports of agricultural inputs, income tax breaks, subsidies for seeds and inputs) were temporary – no long-term programmes to foster production or productivity were adopted. Medium and long-term measures to face high international food prices should be part of Ecuador's policy agenda, given that international institutions suggest the increase in food prices is likely to persist in the medium term (e.g., World Bank, 2008).

The purely temporary adoption of measures to increase productivity is an example of a larger problem, namely that of policy consistency over time. As another example, the frequent change in trade policies (e.g., repeated extensions of export bans) makes it difficult for the private sector to operate effectively. Such an uncertain policy environment raises risks and increases trading costs, ultimately resulting in lower prices for farmers and higher prices for consumers.

Finally, Ecuador did not adopt any new social safety nets in response to the 2007–2008 global food price crisis. Social programmes such as school food programmes or conditional cash transfer programmes were already in place when the crisis hit, but there is no evidence that they were scaled up as a policy response. In the cases where some increases in cash transfers were given during the crisis, the rationale given was not the crisis but rather the floods that occurred at that time.

Ecuador still lacks food security institutions that function effectively. The enactment of several laws on this subject has not been able to provide a solid, stable institutional framework for food security (or food sovereignty, as stressed in Ecuadorian law). Indeed, food security laws are written and rewritten, and it has proven difficult to build strong institutions. The first food security law was enacted in 2006, but was then repealed in 2008. Currently, food security institutions are in the process of being built and rebuilt to suit changing public concerns. Furthermore, without the necessary funding, some already created institutions are struggling to survive and work to achieve the goals for which they were created (e.g., the Plurinational and Intercultural Conference on Food Sovereignty).

The global food crisis and the policy responses that it prompted have unveiled the pressing need for implementing a serious food security agenda. The experience of how the government handled the 2007–2008 crises, and the lessons that can be learned from it, should help shape those laws and institutions so as to be better prepared to face future food crises.

References

Bermudez, K. 2011. Los subsidios y el control de precios. La respuesta del Estado ante el alza de precios y las lecciones aprendidas. Chapter XIII in *Seguridad Alimentaria y Nutricional en el Ecuador. Construyendo la Soberanía Alimentaria*, Ministry of Coordination and Social Development.

Calderón, G. 2011. El Estado en el agro. Editorial note. *El Universo*. Available at http://unvrso.ec/0002BPR

[25] Note that production also declined in 2008 due to floods in the 2008 winter season (end of 2007 to middle of 2008). This decline may help to explain the increase in consumer prices, but it does not explain the fall in farm prices in May and June 2008.

[26] Ecuador still suffers from a shortage of storage capacity necessary for government purchases to effectively influence market prices.

[27] Recent studies stress the importance of reducing price volatility for fostering agricultural investment and production (e.g., FAO, 2011).

ECLAC. 2009. CEPALSTAT. *Statistics and Social Indicators*.

FAO, IFAD, IMF, OECD, UNCTAD, WFP, World Bank, WTO, IFPRI and UN HLTF. 2011. *Price Volatility in Food and Agricultural Markets: Policy Responses*. Inter-agency report. June 2011.

FAO. 2010. *Country Profile: Food Security Indicators, Ecuador*.

León, X., & Yumbla, M. R. 2010. *El Agronegocio en Ecuador: El caso del maíz, Quito, Ecuador*. Available at http://www.ibcperu.org/doc/isis/12645.pdf

MAGAP. 2009a. *Panorama Internacional*.

MAGAP. 2009b. *Panorama Mundial de Maíz Amarillo*.

Tschirley, D. & Riley, H. 1990. "The Agricultural Marketing System", in Whitaker, M. D., and D. Colyer eds., *Agriculture and Economic Survival: The Role of Agriculture in Ecuador's Development*. Westview Special Studies in Social, Political, and Economic Development.

UNDP. 2010. *Políticas Sociales en Respuesta al Impacto de la Crisis Internacional en América Latina*. Foro Virtual de los Ministerios Sociales de América Latina. Fondo España-PNUD.

World Bank. 2008. *Rising food prices: Policy options and World Bank response*. Background note for the Development Committee meeting. April, 2008.

ANNEX 1:

GOVERNMENT POLICIES FOR RICE BETWEEN 2007 AND 2009

90-day ban on exports in place 6 September 2007 via MAGAP Agreement 313 (RO 178, 26 September 2007). MAGAP cited concerns about food security and high world prices as a rationale for the adoption of this policy. The export ban on rice was extended for another 90 days on 2 January 2008 via MAGAP Agreement 002 (RO 259, 24 January 2008). The government again cited concerns about high rice prices in neighbouring countries, and a demand pressure that distorted domestic prices that could compromise the domestic supply of rice when extending the ban of rice exports.

On 31 March 2008 the government banned the export of rice for thirty days via MAGAP Agreement 044 (RO 331, 7 May 2008). This time the government blamed weather conditions for the delayed rice crop. The government extended the ban on 30 April 2008 for another 30 days with MAGAP Agreement 072 (RO 344, 23 May 2008).

On 2 June 2008 with agreement 091 (RO 364, 20 June 2008), the ban of exports was implemented again (except for the export of 20 000 MT of milled rice to Venezuela). This time, there was no set period for the export ban. The ban was maintained on 27 August 2008 with DE 1285 (Supplement of RO 422, 20 September 2008).

Exports allowed on 15 April 2009 with DE 1673 (RO 580, 29 April 2009) for surplus, once there are reserves in place to supply the domestic market.

On 23 June 2009 with MAGAP agreement 099 (RO 633, 14 July 2009), the exports of 100 000 MT of milled rice (or its equivalent in paddy) were approved. The rice was property of the BNF. This was supposed to be the rice purchased by the BNF from small and medium farmers, and stored away by UNA. On 31 July 2009 with MAGAP agreement 127 (RO 13, 27 August 2009), rice exports were approved until 30 September 2009.

Support price on 24 April 2008 with MAGAP agreement 069 (RO 343, 22 May 2008) the government set a support price range for producers. The prices were: USD 23 - USD 27/200 lbs (200 lbs = 90.90 kg) for paddy rice, USD 24 - USD 28/100 lbs (100 lbs = 45.45 kg) for milled rice, and USD 31.50/100 lbs at milling plants for export milled rice. Although no period of duration was established, it was mentioned in the Official Registry that the support price applied for the 2008 winter crop of rice.

On 27 August 2008 with DE 1285 (Supplement of RO 422, 10 September 2008), a support price of USD 28/205 lbs (205 lbs = 93.17 kg) for producers of paddy rice was set temporarily until 31 December 2008, and a price range of USD 28 - USD 31/100 lbs at milling plants for the same period.

On 2 April 2009 with MAGAP agreement 052 (RO 576, 23 April 2009), another support price of USD 28/205 lbs (205 lbs = 93.17 kg) for producers of paddy rice was set temporarily until 31 July 2009, and a price of

USD 28/45 kg for milled rice at milling plants, for the same period.

On 8 May 2009 MAGAP agreement 0071 (RO 602, 1 June 2009), modified the technical specifications for the support price set on 2 April 2009: support price of USD 28/200 lbs for producers of paddy rice and a price of USD 28/45 kg for milled rice at milling plants.

Public purchase approved on 27 February 2008 with MAGAP agreement 025 (RO 302, 26 March 2008), the government authorized the BNF to purchase up to 500 000 quintals (22 725 MT) of milled rice.
On 27 June 2008 with MAGAP agreement 107 (RO 385, 21 July 2008), the government approved the purchase of 40 000 MT of milled rice (or its paddy equivalent).
The government approved two more public purchases of 40 000 MT of milled rice on 23 October 2008 with MAGAP agreement 207 (RO 471, 20 November 2008), and on 21 April 2009 with MAGAP agreement 0058 (RO 602, 1 June 2009). On 23 October 2008 with MAGAP agreement 207 (RO 471, 20 November 2008), the purchase of 22 500 MT of paddy rice was approved.

Imports were approved on 27 February 2008 via MAGAP agreement 025 (RO 302, 26 March 2008), which allowed the BNF to import up to 40 000 MT of paddy rice.

ANNEX 2:

GOVERNMENT POLICIES FOR MAIZE BETWEEN 2007 AND 2009

Ban on exports started on 10 August 2007 with MAGAP agreement 273 (RO 155, 24 August 2007), and lasted for 90 days.

Exports approved. On 24 April 2008, with MAGAP agreement 068 (RO 343, 22 May 2008) the government establishes a volume of exports of up to 15 000 MT that can be exported from 24 April 2008 to 31 December 2008.

On 7 November 2008 with MAGAP agreement 219 (RO 493, 22 December 2008), the government authorized the export of 10 000 MT.

On 8 June 2009 with MAGAP agreement 088 (RO 633, 14 July 2009), the government authorized maize exports (up to 5 000 MT) for the entities that bought maize from producers at USD 12.60/qq (1 qq equals 45.36 kg or 100 lbs).

On 23 June 2009 with MAGAP agreement 100 (RO 633, 14 July 2009), the Government authorized maize exports (up to 5 000 MT) for the entities that bought maize from producers at USD 12.60/qq.

On 2 July 2009 with MAGAP agreement 110 (RO 645, 30 July 2009), the government authorized maize exports (up to 30 000 MT) for the entities that bought maize from producers at USD 12.60/qq. Some of this amount was approved to be exported to Venezuela and other destinations.

On 7 July 2009 with MAGAP agreement 113-A (RO 651, 7 August 2009), the government authorized exports (up to 5 000 MT), to Colombia for the entities that bought it from producers at USD 12.60/qq.

On 31 July 2009 with MAGAP agreement 127 and 12 August 2009, with MAGAP agreement 131 (RO 13, 27 August 2009), the government authorized exports (up to 100 000 MT).

These policies were valid for organizations, associations, cooperatives, unions and other collective agricultural producer bodies legally constituted before 20 September 2009.

Support prices set on 24 April 2008 with MAGAP agreement 068 (RO 343, 22 May 2008). The government set a floor price of USD 12.50/100 lbs (100 lbs = 45.45 kg) for the winter 2008 harvest at the seller's warehouse.

On 8 August 2008 with MAGAP agreement 132 (RO 416, 2 September 2008), the government set a floor price of USD 13.75/100 lbs for the summer 2008 harvest at the seller's warehouse.

On 27 March 2009 with MAGAP agreement 053 (RO 576, 23 April 2009), the government set a floor price of USD 12.60/45.36 kg for the winter 2009 harvest at the seller's warehouse.

On 8 May 2009 with MAGAP agreement 0072 (RO 602, 1 June 2009), the government set a floor price of USD 12.60/45.36 kg for the summer 2009 harvest at the seller's warehouse.

Public purchase approved on 16 June 2008 with MAGAP agreement 100 (RO 379, 11 July 2008), for a purchase of 150 000 MT. The government set a price for this purchase of about USD 12.50 (from the winter 2008 harvest) at the buyer's warehouse.

On 8 May 2009 with MAGAP agreement 0072 (RO 602, 1 June 2009), a purchase of up to 20 000 MT. The government set a price for this purchase of about USD 12.60/qq to the producer and at seller's warehouse.

On 10 September 2009 with MAGAP agreement 140 (RO 44, 12 October 2009), the government approved a purchase of 25 000 MT (no price is mentioned).

Imports approved. On 19 October 2007, with MAGAP agreement 344 (RO 194, 19 October 2007), the government established an import volume for the feed industry during a six-month period (15 October 2007 to 15 April 2008). The maximum date for import arrival in the country was 25 March 2008.

On 8 August 2008 with MAGAP agreement 132 (RO 416, 2 September 2008), imports were approved for a certain amount of hard yellow corn for animal feed industries during September 2008.

ANNEX 3:

GOVERNMENT POLICIES FOR WHEAT AND WHEAT PRODUCTS BETWEEN 2007 AND 2009

Tariff elimination

On 7 September 2007 with Executive Decree 587 (RO 165, 7 September 2007) for a six-month period. The zero tariff is applied to wheat and wheat products (wheat flour and other types of wheat and wheat flour). The government extended this policy for other periods as follows:

- On 18 June 2008 with Executive Decree 1151-A (RO 371, 3 July 2008) until 31 December 2008. The zero tariff is applied to wheat and wheat products (wheat flour).
- On 27 January 2009 with Decree 1543 (Supplement of RO 515, 27 January 2009) for a six-month period. The government maintained the zero tariff applied to wheat and wheat products (wheat flour).
- On 20 October 2009 with Decree 95 (RO 50, 20 October 2009), for one year starting from the expiration of Decree 1543 (Supplement of RO 515, 27 January 2009). The zero tariff was applied to wheat and wheat products (wheat flour).

Price controls

- On 14 September 2007 with Decree 604-B (Supplement of RO 170, 14 September 2007), the government set an "exceptional" price for wheat flour for baking that is sold to bakeries. The government absorbed the differential.
- On 10 July 2008 with Decree 1200 (RO 389, 25 July 2008), the government kept the price for wheat flour from Argentina used for craft baking. The government absorbed the price differential with regard to the import cost plus the cost of domestic marketing. The subsidy on purchases of Argentina wheat flour lasted until the stock was depleted.
- On 10 July 2008 with Decree 1200 (RO 389, 25 July 2008), the government set an "exceptional" price for wheat flour (produced in Ecuador), for the commercial production of bread, noodles, pasta and other products. The price was set for the following sectors: craft and industrial baking, noodles, and other food industries. The government absorbed the price differential of USD 7.50 per bag in relation to the sales price (which can be seen as a subsidy for the producers of wheat flour in Ecuador).
- On 28 November 2008 with Decree 1457 (RO 486, 11 December 2008), the government set an "exceptional" price for wheat flour (produced in Ecuador), for the commercial production of bread, noodles, pasta and other products. The price was set for the following sectors: craft and industrial baking, noodles, and other food industries. The government absorbed the price differential of USD 5.80 per bag in relation to the sales price from

10 October 2008 until 9 January 2009 (again a subsidy for the producers of wheat flour in Ecuador).

Public purchase approved on 14 September 2007 with act 604-B (Supplement of RO 170, 14 September 2007), for an equivalent volume of wheat flour for baking. The government set a price for this purchase and this policy was applied in September 2007, to ensure that bread was sold at the controlled consumer price levels.

CHAPTER 7

MEXICO

ISIDRO SOLOAGA *

Introduction

Mexico is considered an upper middle income country with a per capita GNI of USD 9 420 in 2011[1]. However, poverty levels remain high, particularly in rural, with 61 percent of the headcount ratio in 2010 in rural areas versus 51 percent at the national level[2]. Migration flows from rural to urban areas and from rural areas to the United States continue to be high.

Despite the substantial agricultural reforms undertaken in the 1980s and 1990s, the Mexican agricultural sector is largely unchanged. Production remains polarized with a large share of subsistence farmers (primarily in the production of beans and maize) and a smaller share of market-oriented producers. There is also a strong regional disparity, with the South characterized by subsistence agriculture and low levels of technology adoption, and the North with a greater share of commercial agriculture and more technologically advanced producers.

Nevertheless, there have been some important changes, including marked growth in trade with the Unites States and an increase in maize productivity, despite concerns over rising imports from the United States under the North American Free Trade Agreement (NAFTA). An increase in the production of fruits and vegetables has also been noted.

Although agriculture receives substantial amounts of government support, which in turn has contributed to increases in productivity and growth in agricultural production, in general these programmes do not target poverty reduction among agricultural producers. There is a substantial body of evidence that indicates that support to agriculture in Mexico has been regressive (Scott, 2010). By 2008, 10 percent of the biggest agricultural producers in Mexico were receiving between 50 percent and 80 percent of the country's agricultural subsidies. Ingreso Objetivo, a programme run by the Agricultural Commerce Support and Services (Apoyo y Servicios a la Comercialización Agropecuaria – ASERCA) is even more regressive: 10 percent of the top producers received 80 percent of total subsidies (Scott, 2010).

* Professor, Department of Economics, Universidad Iberoamericana Ciudad de México isidro.soloaga@ibero.mx
The author thanks the participants at a FAO-Chile seminar in November 2011 and at the IAEA Meetings in Foz do Iguazu in August 2013. Joana Mayorga provided superb assistance in preparing information for charts and figures used in this paper.

[1] World Development Indicators, The World Bank: http://databank.worldbank.org/ddp/home.do

[2] World Development Indicators, The World Bank: http://databank.worldbank.org/ddp/home.do

Production, consumption and trade of basic food products

Figures 1a, 1b, 1c and 1d present consumption, production and trade figures for the four main crops produced and consumed in Mexico: maize, wheat, rice and beans. It is worth mentioning that despite initial fears that NAFTA membership would result in the virtual disappearance of maize production in Mexico, maize production has actually increased.

The relative importance of imports in total grain consumption is shown in Figure 2. Of these four grains, rice, and to a lesser extent wheat, show a relatively high share of imports

FIGURE 1A: MAIZE: PRODUCTION, TRADE AND CONSUMPTION

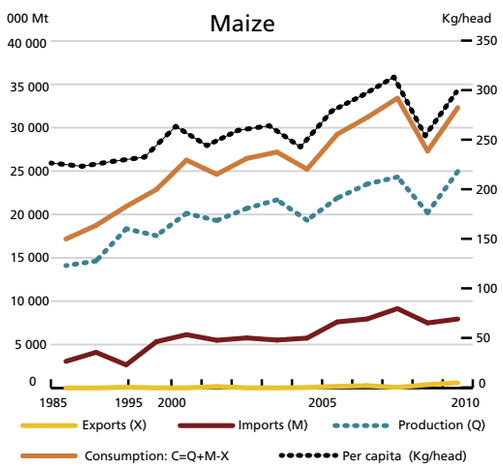


FIGURE 1B: WHEAT: PRODUCTION, TRADE AND CONSUMPTION

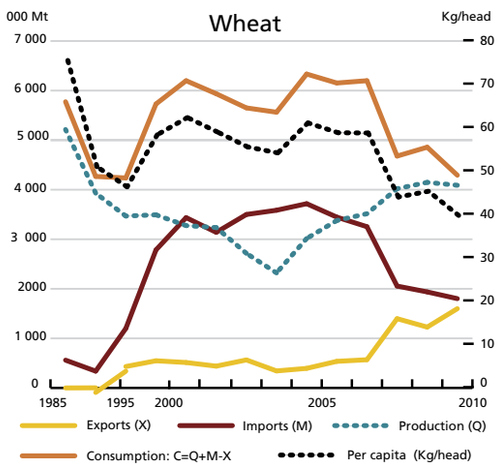


FIGURE 1C: RICE: PRODUCTION, TRADE AND CONSUMPTION

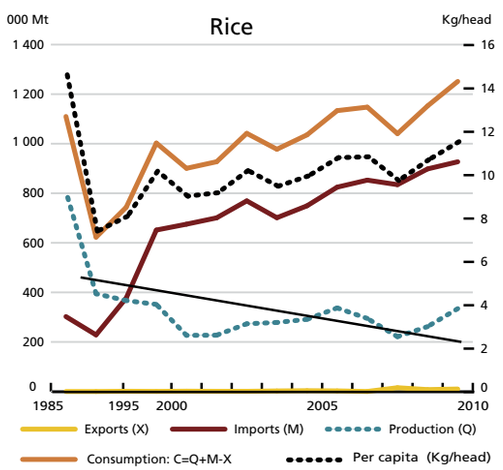
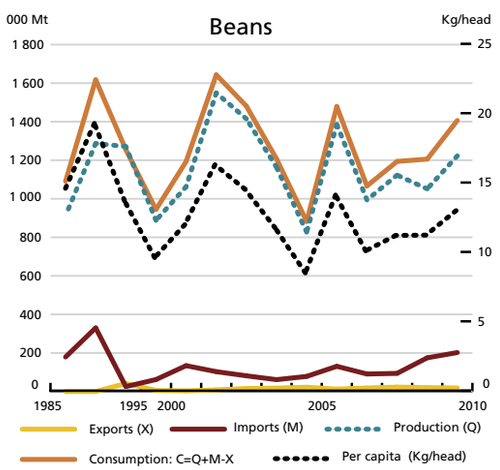
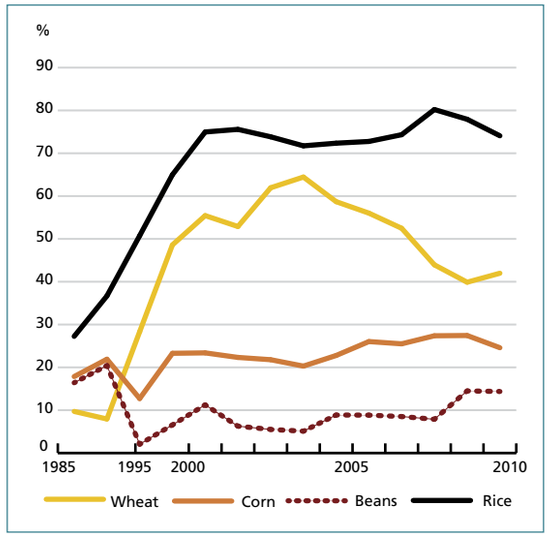


FIGURE 1D: BEANS: PRODUCTION, TRADE AND CONSUMPTION



Source: Own, based on Informe Presidencial, 2010.

FIGURE 2: IMPORTANCE OF IMPORTS IN GRAIN CONSUMPTION (IMPORTS/TOTAL CONSUMPTION)



Source: Own, based on Informe Presidencial, 2010.

in total consumption. The share of imported maize in domestic consumption fluctuated between 22 and 27 percent in the period from 2005 until 2010. In the case of wheat, the share of imports in total consumption decreased from 59 percent in 2005 to 42 percent in 2010. For rice, the percentage increased initially from 72 percent in 2005 to 80 percent in 2008, but then reverted to 74 percent in 2010. Finally, in the case of beans the share increased from 8-9 percent during 2005-2008 to 14 percent in 2009 and 2010.

Poverty and food security in Mexico

Recent developments in poverty levels

Poverty remains high in Mexico. Although poverty rates showed marked improvement from the peak recorded in 1996 (after Mexico's 1995 financial crisis) until 2006, poor economic developments from 2007 onwards have had negative effects on the various poverty rates. In 2008 about 18.4 percent of the population was below the so-called food poverty line[3] (Table 1), rising to 18.8 percent in 2010. Other national poverty indicators show a similar pattern.

Since 1992, rural poverty has been considerably higher than urban poverty (on average, about three times higher). Since the 1995 macroeconomic crisis, urban and rural poverty rates have followed similar trends, decreasing until 2006 and then increasing from 2008. The first spike in food poverty occurred in 1996 when it jumped to 37.4 percent from 21.2 percent in 1994. After decreasing from 1996 until 2006, the overall food poverty rate increased again, from 13.8 percent in 2006 to 18.8 percent in 2010.

Poverty levels are not evenly distributed and vary across the different regions of Mexico. Poverty levels are relatively low in the North and Pacific regions and in Mexico City, but are much higher in the South, particularly in the States of Chiapas, Guerrero, Oaxaca, Puebla and Veracruz.

Two main events have driven the recent rise in poverty levels in Mexico. The 2008-2009 economic downturn–that resulted in a GDP decrease of about 7 percent–negatively impacted wages and the ongoing global food crisis that began in 2006 (with a pause in 2010) has increased the cost of the basic food basket. While nominal incomes have been relatively steady since 2008, in real terms incomes have dropped considerably, especially when nominal incomes are deflated by the cost of the basic consumption basket that determines the poverty line.

Food security

A recent study by the National Council to Evaluate Social Development Policies (Consejo Nacional de Evaluación de la Política de

[3] See Annex I for the definition of the different poverty measurements in Mexico.

TABLE 1: RICE, 2003-2009

Year	Food poverty Total	Food poverty Urban	Food poverty Rural	Capabilities poverty Total	Capacity poverty Urban	Capacity poverty Rural	Patrimonial poverty Total	Patrimonial poverty Total	Patrimonial poverty Total
1992	21.4	13.0	34.0	29.7	20.1	44.1	53.1	44.3	66.5
1994	21.2	10.7	37.0	30.0	18.3	47.5	52.4	41.2	69.3
1996	37.4	27.0	53.5	46.9	36.8	62.6	69.0	61.5	80.7
1998	33.3	21.4	51.7	41.7	30.6	59.0	63.7	55.9	75.9
2000	24.1	12.5	42.4	31.8	20.2	49.9	53.6	43.7	69.2
2002	20.0	11.3	34.0	26.9	17.2	42.6	50.0	41.1	64.3
2004	17.4	11.0	28.0	24.7	17.8	36.2	47.2	41.1	57.4
2005	18.2	9.9	32.3	24.7	15.8	39.8	47.0	38.3	61.8
2006	13.8	7.5	24.1	20.7	13.6	32.2	42.7	35.6	54.1
2008	18.4	10.8	31.3	25.3	17.4	38.5	47.7	40.1	60.3
2010	18.8	12.6	29.3	26.7	20.0	37.8	51.3	45.5	60.8

Notes: Food poverty is defined as the inability to acquire a basic food basket. Capabilities poverty: Insufficiency of the disposable income to acquire the basic food basket and make the necessary expenses for health and education. Patrimony poverty: Insufficiency of the disposable income to acquire the food basket, as well as to make the necessary expenses in health, education, clothing, housing and transportation. See Annex I for more details on these poverty definitions.
Source: CONEVAL (2009).

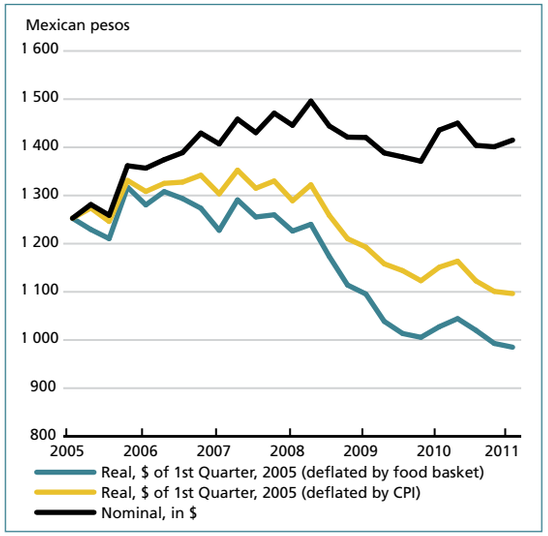
Desarrollo Social – CONEVAL, 2010) measures the number of people with insufficient access to food in Mexico. The concept of deprivation in access to food used by CONEVAL is based on what is set forth in FAO (2006) and considers access by individuals to adequate resources for acquiring appropriate foods for a nutritious diet.

The study shows that in 2008, 23.1 million people (21.6 percent of the total population), had insufficient access to food. Tabasco (34.5 percent), Guerrero (33.8 percent) and Michoacán (31.3 percent) registered the highest percentages.

Economic reforms and social protection programmes preceding the 2006-2008 food crisis

Since the mid 1980s, the Mexican economy in general and the agricultural sector in particular, has experienced important market-oriented reforms. A summary is provided in Table 2.

FIGURE 3: PER CAPITA LABOUR INCOME (NOMINAL AND REAL TERMS)



Source: CONEVAL, 2011.

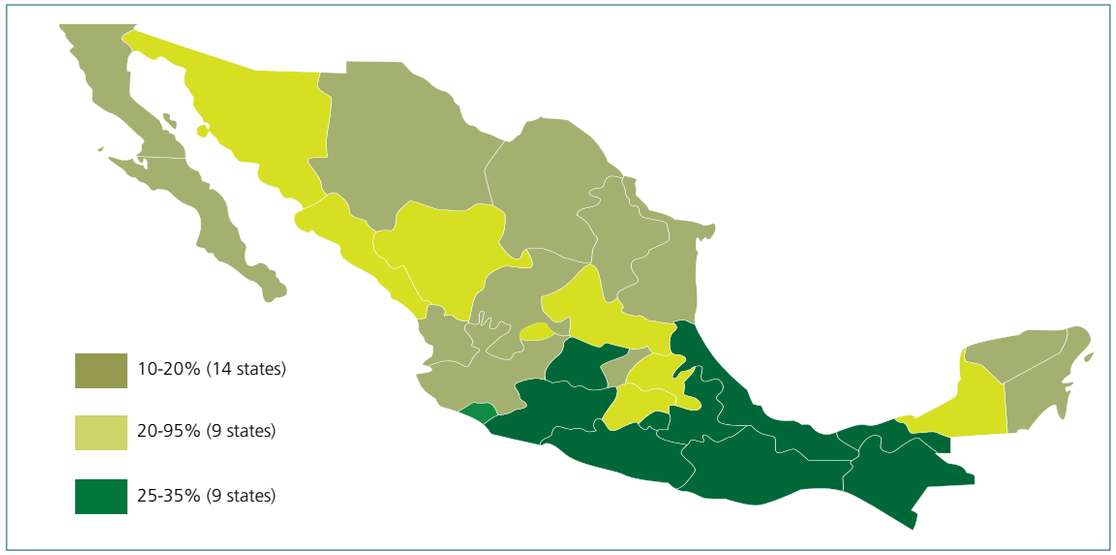
The market reforms were accompanied by an increase in social expenditures to combat poverty. However, as a share in the total budget, the expenditures for anti-

TABLE 2: MARKET-ORIENTED REFORMS IN MEXICO'S AGRICULTURAL SECTOR

Policy	Main policy changes	Year(s)
Mexico joins GATT and food import restrictions began to be reduced	• Substitution of import licensing by tariffs on agricultural goods (tariffs ranging from 0% to 20%)	1986-1994
Sale of State Food Enterprises	• Privatization of State Food Storage Facilities and State enterprises selling seeds and fertilizers at subsidized prices • Abolition of State enterprises selling coffee, sugar and tobacco	1988-1989
"Ejidal" Reform (property rights reform)	• End of agricultural land distribution to peasants • Liberalization of agricultural property rights	1992
Elimination of price supports to farmers producing food staples (in 1990 the State Trading Enterprise providing this subsidy was abolished)	• Domestic prices of staples determined taking into account international prices • Creation of ASERCA in 1991, a marketing support agency granting subsidies to commercial staple crop producers and buyers • Creation of PROCAMPO in 1994, a direct income transfer programme to all food staple producers	1989 to date
North American Free Trade Agreement (NAFTA)	• Prohibits the use of import licenses and applies tariff principles • "Free" trade in 15 years. Sensitive agricultural products were subject to Tariff Rate Quotas for a transitional period of up to 15 years • Interventions are allowed in the three countries for Ag. Subsidies, import restrictions on phyto-sanitary grounds and rules of origin and for packing	Jan 1994- Jan 2008

Source: Yunez-Naude, 2010.

FIGURE 4: FOOD INSECURITY IN MEXICO, % OF POPULATION



Source: CONEVAL 2010b.

TABLE 3A: ACCESS TO OPORTUNIDADES BY THE BOTTOM 1ST AND 2ND INCOME QUINTILES

	1st income quintile	2nd income quintile
	%	
Share of population with access to Oportunidades	63	80
Share of population without access to Oportunidades	37	20

Source: Yunez-Naude, 2010.

poverty programmes are still rather low at 12.5 percent of GDP in 2008-2009, compared to the average of 18.4 percent in Latin America and the Caribbean in 2008-09[4].

Mexico has only recently applied targeted anti-poverty programmes with broad coverage and documented positive impact (Skoufias, 2005). The main programme, *Oportunidades* (previously known as Progresa), was developed in 1997 and is a conditional cash transfer (CCT) programme. It reaches about 5.8 million households (plus an additional 0.7 million from the Food Support Programme, Progama de Apoyo Alimentario – PAL) and has a presence in all Mexican municipalities. In 2011, its budget was about Mex$7 billion,, some 0.5 percent of GDP.

A study by Scott (2008) analyses public spending on education, health and social security, energy and agricultural subsidies[5]. According to this study, of the nine programmes analysed, only four effectively target the poor, and only two (*Oportunidades* and the Temporary Work Programme – Programa de Empleo Temporal) allocate more than 50 percent of their transfers to the lowest income quintile. The rest are either neutral (Microregiones), or regressive, favouring middle-income groups over the poor (Liconsa, Vivienda, Crédito a la Palabra and Habitat, Scott, 2009). Targeted programmes account for less than 20 percent of what the government spends on all subsidies. Table 3a shows the coverage of the *Oportunidades* programme within the two lowest income quintiles.

As shown, the government has the capacity to reach 63 percent of the population in the first income quintile and 80 percent of the population in the second income quintile. This has been critical to the government's response to the food crisis, as it enabled a monthly transfer of an additional Mex$120 to each household in the *Oportunidades* and PAL programmes when food prices increased (see next section).

Unlike *Oportunidades* and PAL, agricultural sector programmes are not specifically designed to reach the poor. In fact, several studies have argued that Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación – SAGARPA)[6] programmes are characterized by their regressive nature. For example, according to Scott (2008), the richest 10 percent of producers (in terms of land endowment) receive 45 percent of all the transfers in the Procampo programme, 55 percent of the Rural Development Programme (Programa de Desarrollo Rural–Alianza para el Campo), 60 percent of energy and hydrological subsidies (proxy through the distribution of irrigated land), and 80 percent of Ingreso Objetivo[7].

[4] Source: "Panorama social de America Latina" (ECLAC, 2010).

[5] The total of these expenditures represented 60 percent of public spending, 10 percent of GDP and 15 percent of disposable household income in 2006.

[6] SAGARPA stands for Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, which is the Ministry for Agriculture, Livestock, Rural Development, Fisheries and Food http://www.sagarpa.gob.mx/English/Pages/Introduction.aspx

[7] See also Fox and Haight (2010) and Yunez-Naude (2010).

The study also shows that the poorest 50 percent of the rural population are excluded from non-targeted, input- or output-linked support programmes, because they are landless or have plots which are too small to be eligible for such programmes (except for a decoupled programme like Procampo).

Policy reactions to the 2006–2008 food price crisis

In 2008, the government of Mexico announced a series of measures in response to rising food prices. Three main goals were set: to facilitate supply and access to food at international prices; to encourage domestic food production and increase farm productivity; and to provide support to poor households' incomes. To achieve these goals, Mexico relied on both existing policies and programmes and new measures designed specifically to influence price formation in domestic value chains, in particular in the maize sector[8,9]. The main instruments utilized were cash transfers to poor households and state support for agriculture, agreements with producers and food industry on prices to consumers and the elimination of tariffs on a number of basic food products.

Expansion in cash transfers to compensate the vulnerable population

To enhance the incomes of poor consumers, Opportunidades was expanded to include

[8] http://www.oportunidades.gob.mx/Portal/wb/Web/did162008_26052008

[9] On 7 January 2009 the government launched a framework to deal with the impact of the international economic crisis. This new set of policies known as the National Agreement in Favour of Household Economies and Employment for Better Living (Acuerdo Nacional en Favor de la Economía Familiar y el Empleo para Vivir Mejor – ANFEFE) had five pillars (employment, household economics, competition in SME, infrastructure and transparency). Despite an announced 10 percent increment in supply credits for the rural sector, the plan did not contain any other measures for the agricultural sector (Presidencia de la República, 2009).

TABLE 3B: CASH TRANSFERS FROM OPORTUNIDADES (NON-RELATED TO SCHOOLING) IN MEXICAN PESOS PER MONTH

Period	Component of the Oportunidades programme				
	Food support (Apoyo Alimentario)	Support to the elderly (Adultos Mayores)	Support for energy expenses (Componente Energético)	Support "Vivir Mejor" (by household)	Support "Vivir Mejor" (by child)
Jan - Jun 2011	225	315	60	120	105
Jul - Dec 2010	220	305	60	120	100
Jan - Jun 2010	215	305	60	120	100
Jul - Dec 2009	210	295	55	120	0
Jan - Jun 2009	210	295	55	120	0
Jul - Dec 2008	195	275	55	120	0
Jan - Jun 2008	195	270	50	120	0
Jul - Dec 2007	185	260	50	0	0
Jan - Jun 2007	185	260	50	0	0
Jul - Dec 2006	180	250	0	0	0
Jan - Jun 2006	180	250	0	0	0
Figures for Jan-Jun 2011 as % of the monthly minimum wage	12.5	17.6	3.3	6.7	5.9

Source: SEDESOL, 2011.

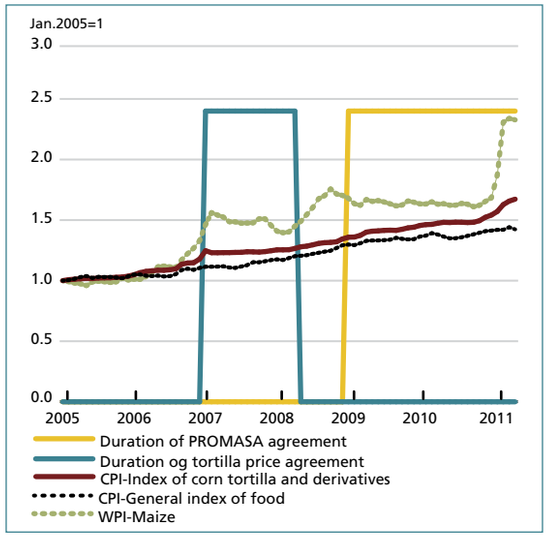
an additional subsidy to compensate for rising prices. Those households already enrolled in the programme were given an extra Mex$120 per month through a new programme known as Live Better (Vivir Mejor), bringing the average transfer up to Mex$655 from Mex$535 per month for a family of five (SEDESOL, 2008). The Live Better programme was expected to reach about 5.3 million households, equivalent to almost 26 million individuals. Beneficiaries of two food assistance programmes, Nutrition Programme for Marginalized Zones (Programa Alimentario para Zonas Marginadas – PAZM) and Nutrition Programme (Programa Alimentario – PAL) also distributed an additional Mex$120 per household to compensate for rising prices, bringing the PAZM average to Mex$365 per month from Mex$245 and the PAL average to Mex$302 per month from Mex$182.

Price agreements and state retail

Following the trend in international markets, domestic maize prices began rising quickly in mid-2006, this in turn impacted tortilla prices. In January 2007, the government established an agreement with the main flour producers and about 5 000 tortilla producers (which is a relatively small number given that there are more than 100 000 small-scale tortilla producers in the country). The agreement set a maximum retail price of Mex$8.5 per kg of tortilla. The agreement was renewed twice (in April and August 2007), although in August consumer prices in the agreement were increased to Mex$9.5 per kg. The agreement also established a maximum wholesale price for maize flour at Mex$5 per kg. The price paid for maize by the maize mills was set at Mex$3.5 per kg. Thus, all prices along the value chain were controlled by the agreement. The last agreement ended in April 2008.

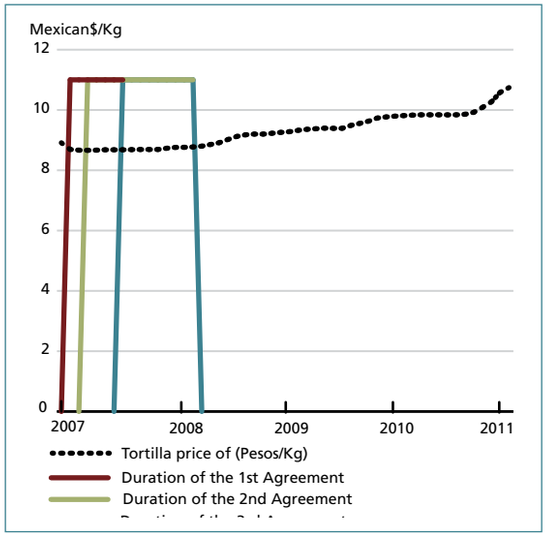
Figure 5a shows maize and tortilla price index levels for the Consumer Price Index (CPI) and the Wholesale Price Index (WPI) (base January 2005=1). The graph also shows the duration of the two main government interventions in these markets: the tortilla price agreement lasted from January 2007 to April 2008, and the support program to

FIGURE 5A: CPI AND WPI INDEXES FOR TORTILLA AND MAIZE



Source: Own, based on Banco de Mexico.

FIGURE 5B: TORTILLA PRICES (IN TORTILLERIAS)



Note: Tortillería is a store (or a station within another store or supermarket) that sells freshly made tortillas and corn-dough to make tortillas.
Source: Own, based on Informe Presidencial, 2010.

the maize-tortilla value chain (El Programa de Apoyo a la Industria Molinera y del Nixtamal – Promasa), in effect from January 2009 onwards.

From January 2007 until September 2011 the prices to consumers in Diconsa, the state-run network of retail shops in rural areas, were fixed at Mex$3.5 per kg of maize and Mex$5 per kg of maize flour. Diconsa is an important instrument that helps to even out basic food prices for the rural poor. Although market prices increased, Diconsa maintained the prices of corn flour and milk, for example, at the same level as in 2006. Diconsa also increased its strategic reserves of white maize produced domestically from 100 000 tonnes on average prior to 2007 to over 350 000 tonnes in 2008, maintaining the same level in 2009, in order to guarantee sufficient supply to marginalized areas.

Furthermore, in 2008 the government signed an agreement with food producers to freeze the retail price of 150 processed foods. The list includes beans, canned chilies, cooking oil, flour, preserves, sauces and some beverages. The agreement was implemented in June 2008 and kept until the end that year.

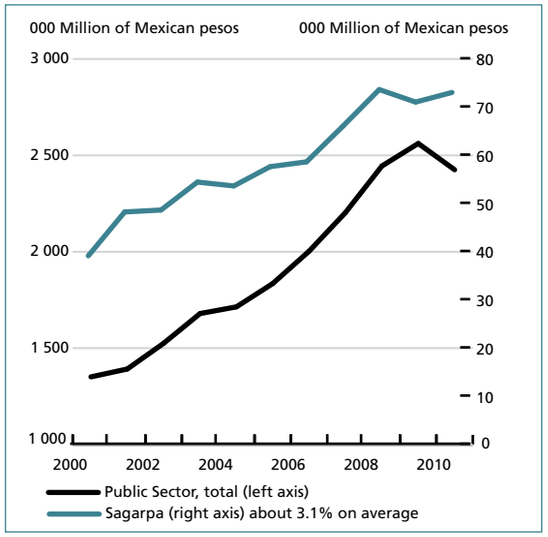
Government support to the agricultural sector

The tortilla and maize flour price agreements were complemented by a new government programme called Mi Tortilla[10] established in August 2007. By the end of 2008 the programme reached about 4 000 tortilla producers, providing funds for the acquisition of new machinery as well as technical assistance and training to introduce cost-saving practices. The total programme budget was Mex$350 million in 2007. By 2011 its annual budget had increased to Mex$500 million. In addition, a new programme (PROMASA) was established in 2009 to provide direct subsidies to corn dough producers: Mex$500 per tonne of dough for small firms and Mex$600 per tonne of dough for bigger producers, equivalent to approximately 10 percent of the sale price. The programme budget amounted to Mex$65 million between January and August 2009 and Mex$135 million September 2009 and June 2010). In the first half of 2011 the programme disbursed approximately Mex$227 million in subsidies.

The dual challenges of rising food prices and the global financial and economic crisis that started in the second half of 2008 had profound effects on the Mexican economy, causing the government to expand public expenditures, including subsidies to the agricultural sector managed by SAGARPA (Figure 6).

Table 4 analyses public expenditures in the agricultural sector by programme. It shows that the budget managed by the Ministry of Agriculture (SAGARPA) expanded from Mex$48.8 billion in 2006 to Mex$57.1 billion in 2007 and Mex$67.1 billion in

FIGURE 6: ANNUAL EXPENDITURES: PUBLIC SECTOR TOTAL AND SAGARPA, 2000-2010



Source: Own, based on Presidential Report, 2010 and Banco de México, 2010.

[10] The programme was named the National Programme to Modernize the Corn-Dough and Tortilla Industry (Programa Nacional de Modernización de la Industria de la Masa y la Tortilla).

TABLE 4: ANNUAL BUDGET IN MILLIONS OF MEXICAN PESOS. PUBLIC SECTOR (TOTAL) AND SAGARPA FROM 1995 TO 2010

Year	Annual budget in millions of Mexican pesos									
	Public Sector total	Agric. Sector total (SAGARPA)	Pro-campo	Alianza Contigo	Support to marketing (ASERCA)	Fishing sector	Incentive to rural finance (INFIDER)	Strategic Program for Food Security (PESA)	Credi-Fertiliz	Other
1995	290 424	15 128	5 864		807					
1996	403 450	19 653	6 800	1 203	642					
1997	528 124	21 262	7 533	1 575	2 163					
1998	600 583	22 286	8 492	1 914	1 991					
1999	711 228	21 062	9 372	2 497	1 699					
2000	855 286	24 714	10 379	2 656	3 050					8 629
2001	937 214	32 405	11 005	4 046	5 235	199				11 920
2002	1 078 861	34 299	11 851	6 438	4 440	411				11 159
2003	1 241 853	40 170	13 111	6 555	5 699	784				14 020
2004	1 326 952	41 456	13 812	7 059	5 549	313				14 722
2005	1 477 368	46 279	14 168	7 234	6 331	233				18 314
2006	1 671 175	48 779	15 025	6 270	7 119	235				20 130
2007	1 911 321	57 118	15 520	8 729	7 446	229		561		24 634
2008	2 229 155	67 061	14 198	14 405	9 143	573	2 571	1 100	82	24 988
2009	2 459 610	68 053	16 643	15 775	9 350	226	2 946	1 560	125	21 429
2010 *	2 425 553	72 924	14 929	12 416	10 499	191	4 858	1 750	N/A	28 281

Source: Author's calculations based on Presidential Report 2010 and Banco de México 2010.

2008, corresponding to an annual increase of 17 percent in both 2007 and 2008. Public expenditure for agriculture included support for irrigation expansion and improvement.

ASERCA[11] is the government agency responsible for supporting farmers' marketing activities. It is one of SAGARPA's main programmes and its budget has been increasing steadily since 2000. In 2008, the ASERCA budget rose by 22 percent relative to 2007. Recent changes to the programme include the switch from income support to subsidies to farmers to help them participate in the options market, reducing their exposure to price risks. Table 5 analyses the change in the composition of ASERCA's expenditures. It shows that the share allocated to providing incentives for participation in the options market doubled between 2007 and 2008.

As the table shows, there are different lines of support provided by ASERCA. The first one targets income (*Ingreso Objetivo),* which functions as a price support with an administered price that takes into account production and transportation costs as well as the international reference price. As international prices increased, this subsidy effectively disappeared.

Currently, the main share of ASERCA subsidies are incentives to farmers to participate in options markets. ASERCA underwrites the entire cost of the derivatives position seeking to protect sellers and buyers of agricultural goods at the moment that

[11] ASERCA stands for Apoyo y Servicios a la Comercialización Agropecuaria (Support and Services for Agricultural Trading) http://www.aserca.gob.mx

TABLE 5: ASERCA'S BUDGET FOR STRUCTURAL PROBLEMS AND SUPPORT TO TARGETED INCOME AND TRADING, IN MILLIONS OF MEXICAN PESOS IN JANUARY 2007

Item/year	2006	2007	2008	2009	2010
Targeted income (Ingreso Objetivo)	4 620.8	961.7	258.0	610.9	0.9
Market functioning (Ordenamiento de mercados)	1 606.5	3 857.7	2 794.0	2 031.7	3 249.9
Contract agriculture (Agricultura por contrato)	88.7	878.1	724.7	527.8	1 166.3
Subsidies for access to options markets (Cobertura)	936.0	2 253.5	5 536.0	5 712.4	6 576.0
TOTAL	7 163.3	7 073.0	8 587.9	8 355.0	9 826.8
Item, as % of total budget					
Targeted income (Ingreso Objetivo)	65	14	3	%	0
Martket functioning (Ordenamiento de mercados)	22	55	33	24	33
Contract agriculture (Agricultura por contrato)	1	12	8	6	12
Subsidies for access to options markets (Cobertura)	13	32	64	68	67
TOTAL	100	100	100	100	100

Source: Author's calculations based on Presidential Report 2010 and Banco de México 2010.

a transaction is made from future changes in prices. The programme also aims to counteract the short-term market power of buyers as opposed to farmers. The main products supported through this mechanism are maize, sorghum and wheat.

There has also been an expansion in lending to agriculture through the development banking entity Banca de Desarrollo: Credit to the rural sector increased by 4 percent in 2007 and by 21 percent in 2008, decreasing markedly thereafter. On the other hand, the share of lending to the rural sector in total decreased from 18 percent in 2006 to 12 percent in 2009 (see Table 6).

A special credit programme (*Credi-Fertiliza)* for smallholder farmers to purchase fertilizers was also created. The programme provides a loan of up to Mex$500 per hectare to finance the acquisition of fertilizers at discount prices. The budget was Mex$82 million in 2008 and Mex$125 million in 2009, reaching 63,000 smallholder producers. The programme was administered by FIRCO[12], which in addition to *Credi-Fertiliza* operates a large fertilizer programme with an annual budget of about Mex$1 billion. Moreover, a special credit line to purchase tractors and other machinery was expanded in May 2008.

Trade measures

On the trade policy side, the government sought to lower domestic prices and increase supplies by relaxing import restrictions. A set of provisions reducing or eliminating tariffs was introduced in May 2008. The provision eliminated import tariffs on basic food products such as white and yellow maize rice, sorghum, soy paste and wheat. A tariff-free quota of 100 000 tonnes was introduced for beans for imports from 1 July until 31 October of each year. The out-of-quota tariff for imports from outside NAFTA was 125 percent. At the same time the tariff for powdered milk was reduced from 125.1 percent to 63 percent and tariffs on some chemical inputs and fertilizers were eliminated.

In summary, starting in early 2007 the government implemented a number of measures to counteract the impact of rising food prices on the poor—at a time when the government was already heavily involved in the agricultural sector. The prices

[12] A parastatal enterprise that operates within SAGARPA to support agribusiness projects and provide technical assistance to farmers http://www.firco.gob.mx/firco/Paginas/Quienes-Somos.aspx

TABLE 6: DIRECT CREDIT OF BANCA DE DESARROLLO (MILLIONS OF MEXICAN PESOS AT MARCH 2011 (BY SECTOR 2006–2011))

Sector	2006	2007	2008	2009	March-2010	March-2011
Firms	98 220	115 401	163 175	200 064	184 894	213 835
**Nafin	63 447	84 317	112 902	152 630	141 649	166 393
**Bancomext	34 773	31 084	50 274	47 434	43 245	47 441
Infrastructure 1/	73 651	79 207	108 809	130 676	127 221	135 725
Housing 2/	156 611	150 507	174 031	263 919	259 313	230 681
Rural	71 733	74 304	89 916	84 282	79 691	78 853
**FIRA	56 636	56 480	70 201	65 918	62 034	62 545
**Financiera Rural	15 097	17 824	19 715	18 364	17 657	16 308
Other 3/	4 536	6 701	8 568	11 481	11 831	13 305
Total	404 750	426 119	544 500	690 423	662 950	672 397
Total w/out housing	248 140	275 612	370 469	426 504	403 637	441 716
****Memo items:**						
Rural/total, in %	18	17	17	12	12	12
Rural/Total w/out housing, in %	29	27	24	20	20	18
Rural, 2006 =100	100	104	125	117	111	110

Source: Author's calculations based on Presidential Report 2010 and Banco de México 2010.

of tortillas and maize flour, very important for food security in Mexico and at the same time most affected by rising international prices, received the most attention with the government signing price agreements with tortilla producers and marketers. The price agreements with producers and agro-industry and the outreach of the Diconsa network among poor consumers in rural areas also helped to soften the effects of the rising international prices of basic commodities on domestic markets.

Policy outcomes

Possible poverty effects

As indicated above, through the *Oportunidades* programme the government was able to reach at least 63 percent of the population in the bottom income quintile and 80 percent of the second to last income quintile. The additional Mex$120 per month allocated to these families was equivalent to 32.1 percent of the increment in the cost of the basic basket for a family of five between 2007 and 2006 in rural areas and to 23.1 percent of the increment that occurred in urban areas (see Table 7). This implies that at least for 2007, the transfer offset between a quarter and one third of the increase in the cost of the basic consumption basket for about 31.7 million people in poverty[13].

Although the importance of these measures for overall poverty reduction has probably been low[14], they almost certainly

[13] Considering that there are about 21.2 million in each population quintile, and that Oportunidades covers about 63 percent and 80 percent of the first two quintiles respectively, in addition to about 1.5 million people covered by PAL.

[14] A study by Valero-Gil and Valero (2008) finds that the increase in cash transfers to the extremely poor combined with the reduction of tariffs on milk and maize produced less than a two percentage point reduction in poverty rates.

TABLE 7: SHARE OF THE ADDITIONAL CASH TRANSFER OF MEX$120 AS % OF THE MINIMUM WELL-BEING LINE FOR A FAMILY OF FIVE

Year	Rural			Urban		
	The cost of minimum consumption basket, in $ per month (*)	Increase in the total cost relative to 2006	Share of the additional cash transfer in the total increase, %	The cost of minimum consumption basket, in $ per month (*)	Increase in the total cost relative to 2006	Share of the additional cash transfer in the total increase, %
2006	2 679			3 831		
2007	2 863	184		4 075	244	
2008	3 053	373	32.1	4 349	519	23.1
2009	3 368	689	17.4	4 761	930	12.9
2010	3 490	810	14.8	4 954	1 123	10.7

Source: Own, based on CONEVAL, 2011.

helped to contain the effect of high food prices on the budgets of the poor, especially when taking into account lower prices for basic food products (beans, maize flour and oil, among others) in the Diconsa retail chain. The Diconsa distribution network is important to maintaining food security because some poor households that do not receive cash transfers are still able to obtain food products at lower prices. The tortilla price agreement and the agreement on retail prices for processed food products have also benefited poor consumers independent of whether or not they received income support. The agreement with retail chains probably had a limited impact on food security, however, because the prices were fixed at June 2008 levels, when international prices were peaking, and also because the products covered by this agreement accounted for only 2 percent of the total food consumption basket.

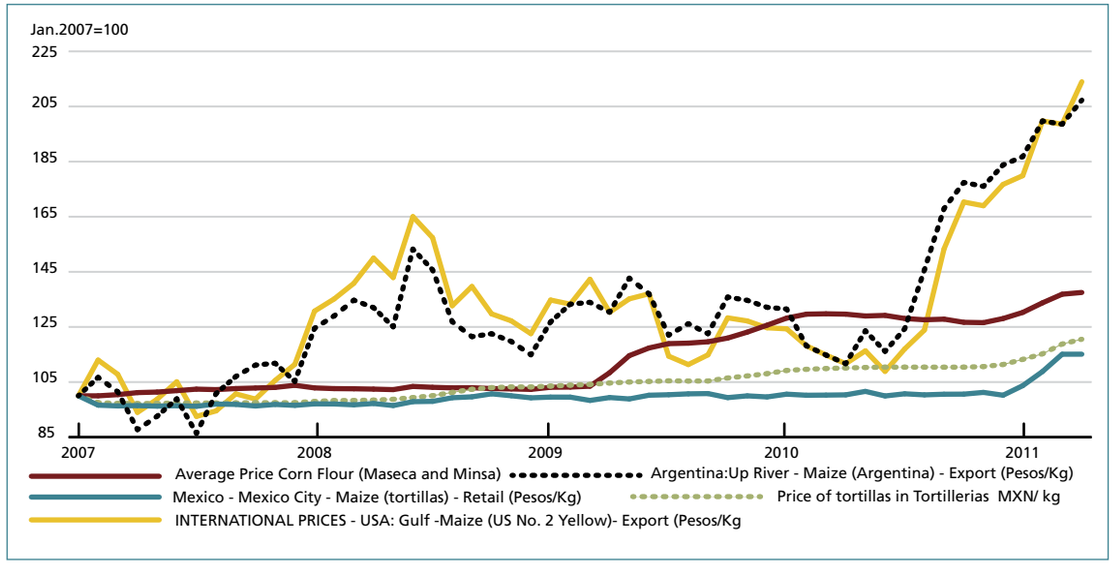
Although the budget allocated to agricultural programmes has increased, not all of them have benefitted poor producers. A study by the Wilson Center (Fox and Haight, 2010) reports that many programmes have benefitted relatively well-off producers. Since the subsidies are tied to either area or level of production, large farms received a greater share of the funds. Thus, these programmes do not target the rural poor. For example, the poorest producer decile receives only 0.1 percent of the total budget of *Ingreso Objetivo*, a similarly insignificant fraction of energy and irrigation subsidies, and only 2–3 percent of the total *Procampo* budget. On the other hand, producers in the top decile receive 42 percent of all *Procampo* funds, 55 percent of *Alianza PDR*, 60 percent of energy and irrigation subsidies, and 85 percent of *Ingreso Objetivo* (Scott, 2010).

The evolution of domestic prices

This section describes the evolution of the domestic and international prices of the main food products consumed in Mexico. Figure 7 shows the evolution of international prices (those of Argentina and the United States) for yellow maize and domestic retail prices for maize dough, maize flour and tortillas, all based on white maize[15]. The graph shows that the domestic prices of these products did not increase as much as international maize

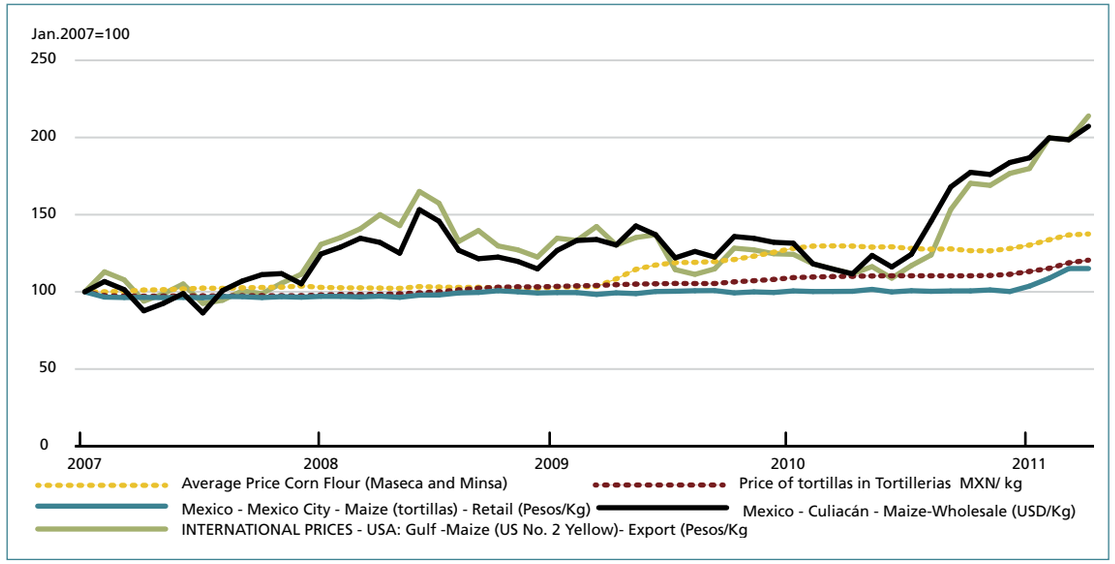
[15] Studies show that only about half of an increase in maize prices is transmitted to tortilla prices (INFP, 2010), indicating that part of the shock is absorbed by the production chain. Moreover, Barceinas and Yunez (2005) show that changes in the international price of agricultural commodities are transmitted to the Mexican market after about two years.

FIGURE 7: MAIZE FLOUR, MAIZE DOUGH AND TORTILLA PRICES FROM 2007-2011 IN MEXICAN PESOS



Source: FAOSTAT (FAO), and SNIIM Sistema Nacional de Información e Integración de Mercados (Secretaría de Economía), and Banxico.

FIGURE 8: WHOLESALE PRICES OF WHITE MAIZE RELATIVE TO INTERNATIONAL PRICES OF YELLOW MAIZE FROM 2000-2011 (NOMINAL PRICES) IN US DOLLARS



Source: Author's calculations, based on Sistema Nacional de Informacion e Integracion de Mercados and FAOSTAT (FAO).

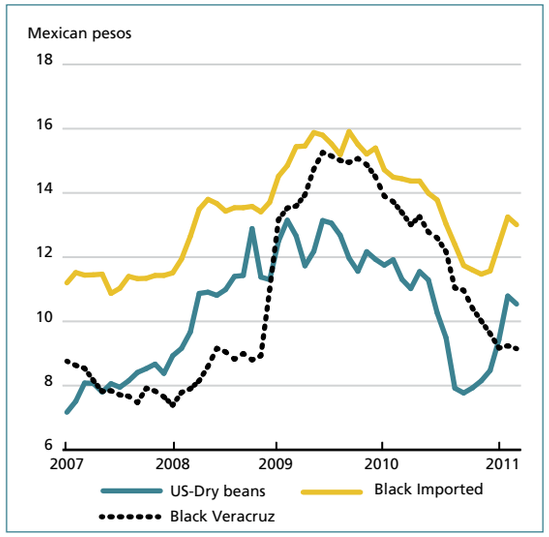
prices during 2007 and 2008. In addition, the retail price of maize started to increase substantially after April 2009, whereas the price of tortillas increased steadily over the whole period, but by a lot less.

Figure 8 shows that that the situation has been similar for the domestic prices of white maize.

The evolution of the domestic prices of beans and rice followed a similar pattern. As the international price of beans experienced steady growth during 2007 and 2008, the prices of domestically produced beans increased only slightly. The largest increases in Mexico were registered in the beginning of 2009 when international prices stabilized.

In the case of rice, domestic wholesale prices were actually declining from 2005 until the beginning of 2008; a price spike in the domestic market occurred in the second half of 2008, when international prices started to fall. Domestic prices continued to rise during 2009, implying that there is a substantial lag in the transmission of international price changes to domestic markets.

FIGURE 9: BEANS, LOCAL VS. INTERNATIONAL MARKETS JANUARY 2007



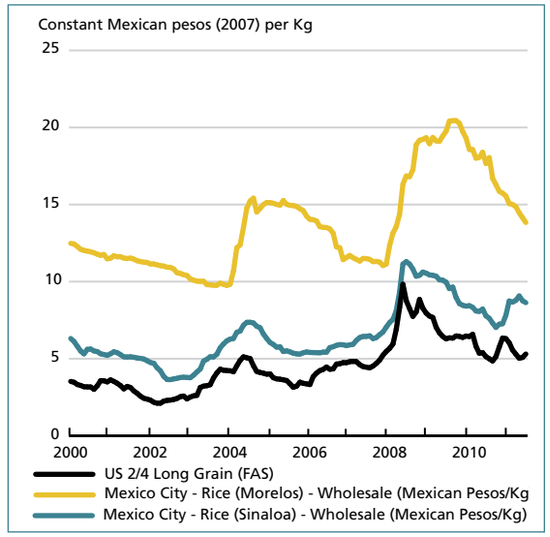
Source: Banxico, SIIM and Bean Markets News.

Conclusions and policy recommendations

The government response to the food-price crisis that started in 2006 had three goals: first, to facilitate supply and access to food at international prices which was achieved by eliminating tariffs on basic food products; second, to boost domestic food production and increase farm productivity; and third, to improve the purchasing power of the poor by providing support to poor households' incomes through cash transfers.

The direct impact of the government measures to improve the food security situation are difficult to assess given that in September 2008 additional measures were implemented to offset the negative effects of the international financial crisis. Following sluggish growth in the early 2000s, Mexico's GDP dropped by almost 7 percent in 2009, real wages declined and unemployment increased, contributing to the increase in poverty rates. As a consequence of rising food prices and poor economic performance, food poverty levels increased markedly in Mexico

FIGURE 10: RICE, INTERNATIONAL AND DOMESTIC WHOLESALE PRICES



Source: Author's calculations based on GIEWS (FAO), Infoarroz and Banco de Mexico data.

from 13.4 percent in 2006 to 18.4 percent in 2008, increasing slightly to 18.8 percent by 2010. It is difficult to assess how much of this deterioration is attributable to the rise in international food prices.

One of the main lessons that can be drawn from the policy reaction to the food crisis in Mexico is that a well functioning social protection system is needed to reach the poor population quickly when the economy is bearing the consequences of external shocks. In the case of Mexico, although the *Oportunidades* programme was not designed to respond to the needs of the poor associated with rising food prices, the existence of such a programme and the institutional arrangements in place helped address the problem, almost instantaneously reaching about three quarters of the most vulnerable population.

Additional policies targeting the main actors in the maize flour-dough-tortilla value chain were successful in maintaining relatively low tortilla prices, the main staple of the Mexican diet, for more than a year. Again, the implementation of this policy was facilitated by the strong presence of the state in the agricultural sector prior to the crisis, providing support though a number of agricultural programmes.

Measures to secure enough public reserves of maize for domestic consumption, in particular for the poor areas serviced by the Diconsa chain of stores were also instrumental in preventing a deterioration of the food security situation given high world prices and poor crop yields due to bad weather conditions.

References

ASERCA. 2010. *Informe Trimestestral*. September 2010.

Barceinas, F. & Yúnez-Naude, A. 2005. *TLCAN y cambio estructural en la agricultura mexicana*. Mimeo. El Colegio de México. Available at http://www.alde.es/encuentros/anteriores/viiieea/trabajos/b/pdf/barceinas.pdf

CONEVAL. 2009. Comunicado de prensa No. 006/09. July 2009.

CONEVAL. 2010. *Information Note released for the World Food Day*. October 2010. Available at http://www.coneval.gob.mx/rw/resource/coneval/home/Dia_mundial_de_la_alimentacionin.pdf

CONEVAL. 2011. *Tendencias Económicas y Sociales de Corto Plazo Resultados nacionales*. May 2011.

ECLAC. 2010. *Panorama Social de América Latina*. Santiago de Chile, 2010.

FAO. 2006. Food security. *Policy Brief. Issue 2*. June 2006.

Fox, J. & Haight, L. 2010 *Subsidizing inequality: Mexican Corn Policy since NAFTA*, Eds. Woodrow Wilson International Center for Scholars & CIDE. www.wilsoncenter.org/MexicanRuralDevelopment

Presidencia de la República. 2009. *Acuerdo Nacional en Favor de la Economía Familiar y el Empleo para Vivir Mejor*. 7 de enero de 2009. Available at http://www.presidencia.gob.mx/infografias/2009/enero/070109_economia_empleo/index.html

Presidencia de la República. 2009. *III Informe de Gobierno*.

Presidencia de la República. 2010. *IV Informe de Gobierno*. Available at http://www.informe.gob.mx/informe-de-gobierno/

Scott, J. 2008. Redistributive constraints under high inequality: The case of Mexico. *Volume 441 of CIDE. Documento de trabajo*. División de Economía. Centro de Investigación y Docencia Económicas (CIDE).

Scott, J. 2009. *10 puntos para entender el gasto en equidad en México: Consideraciones sobre la desigualdad y la exclusión*. Mexico Evalúa. Centro de análisis de políticas públicas.

Scott, J. 2010 Agricultural Subsidies in Mexico: Who Gets What? In J. Fox, and L. Haight, eds. Subsidizing inequality: Mexican Corn Policy since NAFTA. Woodrow Wilson International Center for Scholars & CIDE. Available at www.wilsoncenter.org/MexicanRuralDevelopment

SEDESOL. 2008. Discurso del Presidente Calderon.

SEDESOL. 2008. Apoyo Alimentario para Vivir Mejor. Available at http://www.cefp.gob.mx/foro/alimentos/foroalimentos2.pdf

SEDESOL. 2011. *Oportunidades, Histórico*. Available at http://www.oportunidades.gob.mx/Portal/wb/Web/historico

Secretaría de Economía. 2008. Decreto por el que se modifica la Tarifa de la Ley de los Impuestos Generales de Importación y de Exportación y el Decreto por el que se establecen diversos Programas de Promoción Sectorial. *Diario Oficial de la Federación*. 27 May, 2008. Available at http://dof.gob.mx/nota_detalle.php?codigo=5035565&fecha=27/05/2008

SECRETARIA DE ECONOMIA. 2009. Acuerdo por el que se dan a conocer los criterios de operación del Programa de Apoyo a la Industria Molinera de Nixtamal (PROMASA), en el marco de los lineamientos del Programa para Impulsar la Competitividad de los Sectores Industriales (PROIND). *Diario Oficial de la Federación, May 11,2009. Available at* http://dof.gob.mx/nota_detalle.php?codigo=5089892&fecha=11/05/2009

Skoufias, E. 2005. PROGRESA and its impacts on the welfare of rural households in Mexico. *Research Report 139*. International Food Policy Research Institute. Washington DC. Available at http://www.ifpri.org/sites/default/files/publications/rr139.pdf

USDA. 2011. *Bean Markets News*. Available at http://usda.mannlib.cornell.edu/usda/ams/LSWBEAN.pdf

Valero-Gil, J. & Valero, M. 2008. *The effects of rising food prices on poverty in Mexico Agricultural Economics* 39: 485-496.

Yunez-Naude, A. 2010. *Recent Developments in Mexico's Agricultural Policy*. Mimeo. Centro de Estudios Económicos de El Colegio de México.

World Bank. 2011. *World Development Indicators*.

ANNEX 1:

WHAT IS INCOME POVERTY?

A person is considered to be in an income poverty situation whenever his/her income is below the minimum amount necessary to satisfy his/her essential needs. This threshold is called the poverty line and is expressed based on the monetary value of a basic goods and services basket. According to the Poverty Measurement Methodology elaborated by the Technical Committee for Poverty Measurement, the income employed for this measurement is the Total Current Net Income Per Capita (INTPC) and the poverty thresholds are defined in three levels:

1. **Food poverty**: Incapability to acquire a basic food basket, even if the entire income available to the household were used just to buy said basket of goods.

2. **Capabilities poverty**: Insufficiency of the available income to acquire the food basket value and make the necessary expenses in education and health , even if the total household income were devoted solely to these purposes.

3. **Patrimony poverty**: Insufficiency of the available income to acquire the food basket, as well as to make the necessary expenses in clothing, education, health, housing and transportation, even if the entire household income were used exclusively for the acquisition of these goods and services.

CHAPTER 8

NICARAGUA

LUIS RIVERA*

Introduction

In Nicaragua, approximately 70 percent of all agricultural producers are poor, with low productivity and limited education (World Bank, 2008). Moreover, more than 50 percent of the income for poor households is generated by agricultural activities (INIDE, 2011). Grains, especially maize, constitute an important part of the Nicaraguan diet. Small producers account for the bulk of grain production, with a lesser share produced by medium and large-scale farms. Under these circumstances, rising food prices might affect poverty and income in several ways. The objective of this study is to analyse the policy response of the Nicaraguan government to the high food prices recorded during 2007-2008 and the effectiveness of the adopted measures in mitigating the impact on vulnerable populations, mainly poor farmers and consumers.

Characteristics of staple food markets in Nicaragua

The economic relevance of agriculture in Nicaragua has decreased in recent years. Currently, it represents less than 20 percent of national value added and 25 percent of formal employment. In the last two decades, the country experienced a shift in value added from basic grains production and traditional exports (beans, coffee, and sugar) to non-traditional agricultural goods (processed food, forestry products, fruits, roots, tubers and vegetables). These non-traditional exports have grown steadily mainly because of incentives and support policies and a long-term predictable exchange rate policy. Traditional crops, including basic grains, have received less state support. Nevertheless, staple food crops, that include grains and beans, still account for over half of total agricultural value-added in Nicaragua.

Evidence from Nicaragua suggests that agricultural markets are highly concentrated. In many supply chains, only a few companies control the market, both as buyers and sellers (De Franco and Arias, 2011). In the case of black beans, production and export is concentrated in eight companies that control 75 percent of the market. The rice market is also highly concentrated, with few medium and large rice farms and companies controlling production, milling and distribution. Moreover, just one company (AGRICORP) processes (mills) more than 50 percent of paddy rice produced domestically and controls 80 percent of rice imports. It is also the

* Universidad de Costa Rica, luis.riveravalerio@ucr.ac.cr
Valuable support from FAO-NI staff members and information from interviewees from government and private organizations is acknowledged.

TABLE 1: AGRICULTURAL VALUE-ADDED COMPOSITION

	2002	2003	2004	2005	2006	2007	2008	2009	2010
					%				
Cash crops	37	37	45	41	44	45	44	43	46
Coffee	20	18	23	18	22	20	22	21	22
Sugar cane	9	9	11	10	10	12	11	11	12
Bananas	1	1	1	1	1	1	1	1	1
Peanut	5	6	7	8	7	8	7	6	7
Soya beans	0	0	0	0	0	0	0	0	0
Sesame	1	1	1	2	2	2	2	2	2
Tobacco	1	1	2	2	2	2	2	2	2
Food crops	63	63	55	59	56	55	56	57	54
Rice	11	12	9	12	12	10	10	12	11
Beans	15	12	11	12	13	13	17	16	14
Maize	9	12	8	11	8	9	8	7	7
Sorghum	1	1	1	1	1	1	1	0	1
Other	27	27	25	23	22	24	21	22	21

Notes: Own elaboration with data from BCN.

largest distributor of rice at the wholesale level in Nicaragua (Tijerino, et al, 2008). However, there are important exceptions. In the case of red beans and maize, two products in which Nicaragua is self-sufficient, many micro and small producers and traders compete in the domestic market, and therefore the degree of concentration is lower than for other grains.

Growth, poverty and food security indicators

In real terms, per capita GDP in Nicaragua has been increasing during the last decade at an average of 2.2 percent; average GDP growth during this period has been 3.66 percent[1]. According to the World Bank (2008), Nicaragua's poverty elasticity with respect to growth (the response of poverty to changes in per capita income) has been a modest -0.4, compared to the regional average for Latin America of -0.9. In contrast, Nicaragua's elasticity for reducing extreme poverty has been much higher at -1.4. This means that Nicaragua will need GDP growth averaging 5.5 percent per year between 2005 and 2015 to reach its Millennium Development Goal (MDG) of halving extreme poverty between 1990 and 2015 (the stated goal is 9.7 percent).

Poverty in Nicaragua worsened from 2001 to 2005, with the share of the population below the national poverty line increasing from 45.8 percent to 48.3 percent; however, from 2005 to 2009 the ratio fell to 42.5 percent.

Food accounts for 60 percent of the cost of the total consumption basket in Nicaragua. In 2009, 57 percent of the food expenditure of extremely poor households was composed of beans, maize, milk and rice. Maize alone accounted for 18.6 percent of total food consumption for the extreme poor and 14 percent for the poor. Rice accounted for

[1] BNC (2011).

TABLE 2: TOP TEN FOOD PRODUCTS IN TOTAL FOOD EXPENDITURE OF THE POOR (PERCENTAGE OF TOTAL PER CAPITA FOOD EXPENDITURE IN 2009)

	2002	2003	2004	2005	2006	2007	2008
		Extreme poor		Poor		Country	
	Product	%	Cumulative	%	Cumulative	%	Cumulative
1	Maize	18.6	18.6	14	14	8.2	8.2
2	Milk	15.4	34	16	30	15.1	23.3
3	Rice	12.3	46.3	13.2	43.2	12.3	35.6
4	Beans	11	57.3	8.9	52.1	6.8	42.4
5	Plantains	10.9	68.2	9.6	61.7	9.0	51.4
6	Sugar	6.3	74.5	6.1	67.8	6.0	57.4
7	Sweet Bread	3.8	78.3	3.4	71.2	3.8	61.2
8	Eggs	2.8	81.1	3.1	74.3	3.1	64.3
9	Cooking Oil	2.4	83.5	2.6	76.9	2.6	66.9
10	Tortillas	2.1	85.6	3.7	80.6	5.6	72.5

Notes: Own elaboration with data from MAGFOR and MIFIC.

12.3 percent of total food consumption for the extreme poor. Ten products represent 86 percent of total food expenditure for extremely poor households (Table 2).

The Global Hunger Index (GHI) value for Nicaragua evolved from "alarming" in 1988-1992 to "moderate" in 2004-2009 (IFPRI et al, 2011)[2]. Compared to the 1988-1992 level, in 2010 the GHI indicator for Nicaragua was reduced by over 50 percent (Figure 1), from 23.4 to 10.0, making Nicaragua one of the countries with the largest improvement in 20 years. It also reduced the share of undernourished people from 50 percent in 1990-1992 to 19 percent in 2005-2007 (FAO, 2010). Despite this progress, and although Nicaragua performs better than expected given its level of income measured by GNI per capita, it still lags behind the average GHI for Latin America.

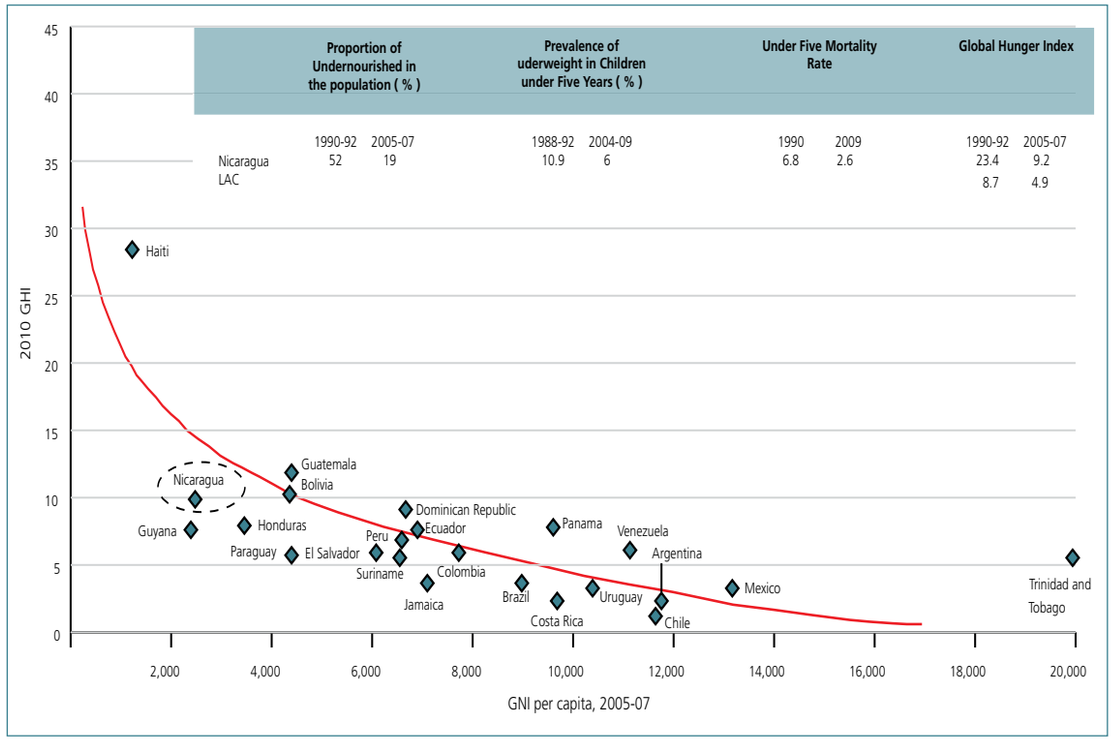
[2] The GHI combines three equally weighted indicators in one index number: (i) Undernourishment (the proportion of undernourished as a percentage of the population reflecting the share of the population with insufficient calorie intake); (ii) Child underweight: the proportion of children younger than five who are underweight (low weight for age reflecting wasting, stunted growth, or both), which is one indicator of child malnutrition; and (iii) Child mortality.

The nutritional status of children in Nicaragua has improved since 1998, though more efforts are needed to achieve better standards (INIDE, 2008a). Chronic malnutrition is a public health problem in Nicaragua, affecting 27.2 percent of children between 6 and 9 years of age. Greater levels of malnutrition are evident among children in rural as opposed to urban areas and the proportion of underweight children tends to be greater in rural areas.

Policy measures for food security

The policy measures adopted by the government in Nicaragua to mitigate the effects of rising food prices during 2007-2008 and the financial and economic crisis in 2009 formed an integral part of an overall prioritization of food security and rural development issues in national policy. The government implemented macroeconomic policies to control inflation and devaluation, reduce import tariffs on basic food and agricultural inputs, and create a so-called "fair price" system for agricultural markets. Policy

FIGURE 1: GLOBAL HUNGER INDEX (GHI) FOR NICARAGUA



Source: IFPRI et al (2011).

measures targeted increases in the production of basic food crops, support to consumption and better nutrition for poor households, expansion of credit and infrastructure services, and greater gender equality.

The institutional framework

The current institutional framework for food security in Nicaragua started to develop more than a decade ago. In 2000 and 2001 the National Policy for Food and Nutritional Security (PNSAN) and the corresponding Action Plan were formulated. In addition, a national commission (CONASAN, with relevant Ministries including Agriculture, Health and Education) and a technical committee (COTESAN) were established in order to implement the plan. A new law on "Food and Nutrition Sovereignty and Security"[3] was adopted in July 2009. The new National Policy for Food and Nutrition Sovereignty and Security (POLSSAN) has four central pillars: (i) availability: government commitment to guarantee the quantity and quality of the food supply for the country; (ii) equality and access: government focus on poorer households and women; (iii) consumption: promotion of healthy and safe food products for adequate nutrition; and (iv) biological benefit: environmental, genetic and immunological assurance, and health improvements.

The origins of POLSSAN can be traced to 2007 when the Ortega administration

[3] The Law defines food sovereignty as a people's right to determine and implement its own policies, and a condition for food security. In addition, cultural, gender and sustainability dimensions are incorporated into the operational concept of food security (La Gaceta, Diario Oficial, AÑO CXIII, Managua, 16 July 2009, No. 1333).

established food insecurity and poverty as one of the priorities of the National Human Development Plan (PNDH). The PNDH incorporates food security and sovereignty as a central pillar of Nicaragua's poverty eradication and development strategy, aligned with the achievement of the MDGs[4]. It also integrated PRORURAL, a rural development plan that started in 2005 and was restructured in 2009, with the participation of diverse working groups.

Thus, the policy response to the 2007-2008 international food crises can be seen as an adaptation of POLSSAN (a redirection and scaling-up of programmes). Rising food prices during 2007-2008 created a political environment that favoured the approval of POLSSAN in 2009. Moreover, the country's food security and sovereignty policy was influenced not only by the urgency to compensate the effects of high international food prices, but also as a response to agricultural underdevelopment and poverty as well.

Table 3 describes national food plan (PNA) goals, components and outcome indicators. Production and consumption growth (scale) and number of beneficiaries (scope) were the main indicators for measuring impact. Stabilizing food prices was considered a necessary condition to achieve those goals. Although controlling food inflation appeared to be a priority for the government, price indicators were not explicitly included in the PNA.

Policy response to high food prices in 2007-2008

In 2007-2008, the Nicaraguan government undertook measures to reduce domestic food prices and improve the supply of key

[4] The government prepared a revised version of PNDH in 2009, with policy adjustments to respond to the international economic and financial crisis. The leading role of food security and rural development policies was reaffirmed in the plan.

TABLE 3: NATIONAL FOOD PROGRAMME: MAIN CHARACTERISTICS

Goals	Components	Indicators
a) Growth of production yields of beneficiary households crops: maize, red beans, rice and sorghum.	a) Governance and capacity development for food security.	a) % growth of production of basic grains (maize, red beans, rice, sorghum) and livestock products (eggs, meat, milk, and poultry) by rural households.
b) 12 000 MT (260 900 QQ) of certified seeds distributed per agricultural cycle.	b) Strengthening of living means of vulnerable groups.	b) Number of beneficiary households.
c) More than 77 000 farmers receiving technical assistance and technology transfer per year.	c) Capitalization and capacity building of poor farmers.	c) % growth of consumption by beneficiary households.
d) Less than 1% non-acceptance rate of agricultural exports.	d) Associability.	
e) More than 2.9 million Ha of agriculture under phytosanitary control.	e) Production inputs.	
f) Basic grain storage capacity of 104 500 MT (2.3 million QQ).	f) Technology innovation.	
	g) Food safety for primary goods production.	
	h) Fair trade and access to markets.	

Source: MAGFOR (2009a).

agricultural products. Most measures were implemented during the second half of 2007 and first months of 2008 and were focused on macroeconomic policies implemented by the Central Bank (BCN), such as controlling for inflationary pressures, currency devaluation and increasing foreign exchange reserves. In addition, the Ministry of Industry and Commerce (MIFIC) managed food price variability in the domestic market by reducing import barriers on basic food products. MIFIC also monitored prices in coordination with private sector representatives in order to identify bottlenecks in the value chains of main food products and propose solutions to keep prices in check.

Poverty reduction programmes and productive infrastructure investments were prioritized. Macroeconomic stability and growth recovery was regarded as a necessary but not sufficient condition to improve living conditions in poor rural areas. Therefore, food safety and agricultural development policies were promoted to create new options for inclusive growth (Gobierno de Nicaragua, 2009). When international prices increased, the government also strengthened and expanded existing policies and programmes related to food security and poverty reduction. Main policy areas included incentives for food production, improved seed distribution, food price controls through government purchase and distribution mechanisms, extension activities and technical assistance, and credit for small farmers (Table 4).

Following the classification of policy actions to address rising food prices developed by FAO (2011), Annex 1 outlines the main measures implemented in Nicaragua to improve food security in the context of the 2007-2008 price spike and the 2009 global economic crisis, differentiating between trade measures and those that target consumers or producers. The main government food security programmes are described in more detail below.

TABLE 4: PROGRAMMES RELATED TO FOOD SECURITY

Programme	Budget 2008 (USD Million)	Agency	Target	Expected Beneficiaries
Food production programme (PPA) and productive food transfers (BPA)	13.23	MAGFOR	Households	12 000
Certified seed programme (PASC)	0.32	MAGFOR	Producers	106 200
Basic grain production support (FPGB)	2.56	IDR	Producers	45 140
Rural infrastructure (IR)	1.20	IDR	Producers	1 200
Micro credit programme (Programa "Usura Cero")	4.30	MIFIC	Individuals	4 823
Basic grains commercialization	21.19	ENABAS	Households	30 000
School gardens and school food programme	48.00	MEDE	Children	204 432
Rural development plan (PRORURAL)	15.01	MAGFOR, INTA, IDR, others	Producers	150 073

Source: MAGFOR (2009a).

- **Subsidies to smallholder farmers**

The food production programme (Programa Productivo Alimentario, PPA) aims to transform small farm production to strengthen food security and help solve hunger problems. It started in 2007 with a subsidy for poor households in the rural sector (Bono Productivo Alimentario, BPA). The BPA is an in-kind subsidy valued at between USD 600 and USD 1 500 per household and includes distribution of agricultural inputs, farm animals (chickens, cows, and pigs), vegetable and fruit seeds, as well as basic construction inputs (materials for cellars and fences, among others).

The BPA aims to improve the food security of poor rural households by improving own consumption of eggs; fruits (citrus, avocado, and mango); grains; milk; meat; and vegetables (tomato, onion, and chayote) that they produce. Over time, households should be able to produce a surplus that can be traded locally or even exported, to increase income and employment. The BPA is exclusively given to female farmers. The target established in 2007 was 75 000 households that would receive a transfer between 2007 and 2012, and the total cost of the progamme was USD 30 million. The original target was increased to 100 000 households to compensate for rising food and energy prices.

- **State-trading enterprise ENABAS**

The Nicaraguan basic food products company (Empresa Nacional de Alimentos Básicos, ENABAS) is a state enterprise that invests in grain storage infrastructure and facilities, as well as in vehicles and machinery. ENABAS is involved in the production, storage and distribution of basic grains (beans, maize, rice, and sorghum) in poor rural regions. In addition, the company acts as a market intermediary for basic food items like cooking oil, pasta, soybean products, sugar, and wheat flour. Its goal is to control food inflation through direct purchases of grains from small farmers and control prices paid by consumers. One of its functions is to promote greater competition in the value chain comprised of producers (including small farmers), wholesalers, retailers and consumers. ENABAS manages an alternative network of retail shops (mainly *pulperías*, small convenience stores). At the end of 2010, it operated 78 storage centres and more than 3 000 retail stores. During 2008-2012 the estimated ENABAS budget was USD 32 million (MAGFOR, 2008c). This included: a) storage infrastructure for one million QQ (46 000 MT) of basic grains (beans, maize, rice, sorghum); b) operations centres for wholesale management (local and export markets); c) a retailer distribution network; d) price regulation and food supply mechanisms in food insecurity zones; e) 1.2 million QQ (550 000 MT) of basic grains purchased from farmers and 150 000 QQ of contingency inventory (7 000 MT).

- **Food and Nutritional Security Programme**

The national programme of food and nutritional security (Programa de Seguridad Alimentaria y Nutricional, PSAN) started in 2008 as a strategic intervention tool to reduce poverty and the social vulnerability of poor households, as part of POLSSAN[5]. The core activity of PSAN is distribution of basic food crops (beans, maize, and rice) and fortified cereals. The total budget for 2008-2012 was estimated at USD 37 million (FAO, 2008). The PSAN targets subsistence farmers and rural households under extreme poverty, undernourished and vulnerable to climatic conditions such as droughts and floods). It also provides basic technical training and capacity building for natural resources

[5] PSAN was initiated as the World Food Program (WFP) chapter for Nicaragua.

management. In 2009 the programme distributed 3 257 MT of food among 68 956 beneficiaries in poor households and schools, equivalent to 15 million meals (MAGFOR-PMA, 2010). It also promoted better production practices and environmental sustainability of school gardens and small-scale "family gardens".

- **Seed distribution programme**

The seed distribution programme (Programa Agroalimentario de Semillas, PAS) started in 2008, complementing the mandates of PPA and ENABAS. The PAS aims to distribute high quality certified seeds for basic grains production (beans, maize, rice and sorghum) and other agricultural inputs like urea and cattle feed, in order to stimulate food production and increase the productivity of poor farmers. Beneficiaries are members of organized groups like cooperatives and other types of producer associations. The programme works in coordination with government financial organizations that provide concessional credit to small farmers at favourable conditions, with ENABAS for seeds storage and distribution, and INTA for technical training and capacity building for farmers. In 2009-2010 the programme had a budget of USD 19.2 million and included the following targets: a) production of basic grains with certified seeds in 193 956MZ (52 percent beans, 39 percent maize, 3 percent rice, and 6 percent sorghum); b) purchase and distribution of 112 800 QQ of certified seeds (71 percent beans, 18 percent maize, 7 percent rice and 4 percent sorghum); c) purchase and distribution of 204 845 QQ of fertilizers; and d) 67 485 credit operations (MAGFOR, 2008d).

- **Access to credit**

In addition to production and consumption support programmes, the government used various funding mechanisms to improve farmers' access to financial resources for productive activities, inputs and intermediate goods purchase, and technology adoption. Financial support was coordinated with other food security programmes, particularly the BPA and ENABAS operations.

Banco Produzcamos (Production Bank) is a state-managed bank that provides soft loans to micro, small and medium-sized farmers and entrepreneurs dedicated to agribusiness, agriculture, crafts, fisheries, forestry, industrial activities, trade and tourism. BP aims to promote food security and export production, with a participatory and gender equality approach. It is the only government organization responsible for receiving, managing and allocating funds from international lenders and donors for productive development. The bank operates as a second-tier financial institution that allocates financial resources through commercial banks and other financial organizations. In 2009 it was merged with two other financial institutions: Rural Credit Fund (Fondo de Crédito Rural, FCR) that provided credit for small producers and agricultural workers and Financiera Nicaraguense de Inversiones (FNI) that provided medium and long-term credit for investments in productive assets and loans for new crops development, work capital and exports financing (MAGFOR, 2008b).

Usura Cero is a micro credit programme for micro and small businesses that started in 2007 with the objective of promoting female workers and reducing barriers to formal sources of financing (mainly minimum income requirements and credit guarantees). The programme is implemented by MIFIC in coordination with other government programmes that contribute to the achievement of MDGs. Usura Cero is funded by the government and with resources from international donors or lenders.

TABLE 5: OUTCOME INDICATORS OF NATIONAL FOOD SECURITY PROGRAMMES

Indicator/Original Goal	2007	2008	2009	2010	2011
Production growth of basic grains (average)	-8.2%	-1.2%	19.8%	1.6%	10.4%
Growth of maize yield	-5.8%	-3.4%	17.4%	-7.2%	7.9%
Growth of beans yield	-4.6%	0.3%	14.2%	0.4%	2.6%
Growth of basic grains trade balance USD thousand	(9 248)	(31 805)	37 937	4 301	93 1
Growth of maize and beans area produced with certified and improved seeds (in MZ)	na	84 693	93 781	161 315	224.909
Number of farmers receiving technical assistance and technology transfer (at least 40% women)	62 896 (na)	54 449 (44% women)	60 609 (47% women)	32 213 (37% women)	35 796 (34% women)
Number of Ha under phytosanitary control (over 2 million)	900 000	2 100 954	2 096 475	1 576 164	na
Non-acceptance rate of agricultural exports lower than 1%	0.04%	0.2%	0.2%	0.1%	0.1%

Source: Own elaboration with data from MAGFOR official reports, various years.

Implementation of the policies and their effectiveness

The outcomes of the main food security programmes

In general, the policy response to rising international food prices in 2007-2008 is considered positive and effective by the authorities. Most PRORURAL operations were successfully completed, notwithstanding some implementation and management problems. The main obstacles were limited capacity of inter-organization coordination and budget constraints.

Looking at outcome indicators, the impact of food security programmes during 2007-2008 and beyond seems positive in terms of the policy objective to increase the production of basic grains (Table 5). Improvements in production, yields and the trade balance occurred mainly in 2009.

Table 6 shows the number of beneficiaries for each of the programmes discussed. It should be noted that it is not clear whether some producers can be recipients of several benefits. Clearly, there was important growth in the number of beneficiaries in both 2008 and 2009.

Although the exact outcomes and impacts of these programmes are not easily identifiable, below the main achievements of each programme are discussed.

- **ENABAS**

In 2009 ENABAS operated 2 700 small convenience stores (*pulperías*) across the country. It is estimated that on average, from 2007 until 2009 the prices in ENABAS retail outlets were 10 percent to 12 percent lower than market prices[6]. ENABAS stores sold 26 products in the Nicaraguan food basket, including grains (beans, maize, and rice), pasta, soybean oil, sugar, tomato sauce, and wheat powder as well as cleaning products, among others. The prices of beans, maize and rice are reported in Table 7.

[6] Official Web site, www.enabas.gob.ni, retrieved on 5 January 2012.

TABLE 6: FOOD SECURITY PROGRAMME BENEFICIARIES

Programme	2007	2008	2009	2010	2011
ENABAS	Producers: 40 000 Households: 100 000	Producers: 150 000 Households: 270 000	Producers: 50 000 Households: 215 000	Producers: na Households: 105 000	na
Productive Food Programme (PPA)	Households: 12 473 with BPA. Direct employment: 20 900	Households: 16 210 with BPA. Direct employment: 27 902	Households: 14 477 with BPA. Direct employment: 92 496	Households: 12 260 with BPA. Direct employment: n.a.	Households: 25 058 with BPA. Direct employment: n.a.
Seeds Programme (PAS)	Producers: 39 375 Part-time employment: 55 428	Producers: 147 865 Part-time employment: 144 010	Producers: 103 000 Part-time employment: n.a.	Producers: 150 000 Part-time employment: n.a.	Producers: 110 705 Part-time employment: n.a.
Rural Credit Fund (FCR)	Producers: 16 036 (21% women)	Producers: 28 936 (37% women)	Producers: 37 128 (37% women)	n.a.	n.a.
Rural Development Institute (IDR)	Producers: 1 700 Households: 19 135	Producers: 4 441	Producers: 9 463	n.a.	n.a.
Banco Produzcamos				n.a.	n.a.

Source: Own elaboration with data from MAGFOR official reports, various years.

TABLE 7: BASIC GRAINS CONSUMER PRICES: ENABAS AND MARKET AVERAGE (CÓRDOBAS PER POUND)

	February 09		Mid 2010	
	ENABAS	Market	ENABAS	Market
Rice 70/30	7	10.44	8	9.18
Rice 60/40	n.a.	n.a.	6.5	n.a.
Red Beans	10	11.44	7	9.15
Maize	3	4.7	3.5	4.25

Source: ENABAS (2010) and own estimation with data from INIDE.

The company reports that during the 2008-2009 seasons, its stores supplied 1.6 percent of the domestic rice market, 3.9 percent of the domestic red bean market and 1.1 percent of the domestic maize market (ENABAS, 2010). During the first six months of 2010, ENABAS sold 105 044 QQ of beans, 110 000 QQ of rice, and 40 000 QQ of maize. According to data from MAGFOR, these represent 4 percent of the national production of rice and beans and less than 1 percent of maize[7].

- **Subsidies to small farmers**

Between 2008 and 2010, the number of households that received a BPA subsidy

[7] Own estimation with data from MAGFOR (2011).

TABLE 8: VOLUME OF BASIC GRAINS MANAGED BY ENABAS, 2009

Month	Rice	Red Beans	Maize
January	20 974.1	3 608.8	3 278.3
February	22 422.1	2 682.1	5 556.6
March	35 164.5	5 836.3	12 237.9
April	28 391.3	2 862.1	9 810.4
May	19 894.9	2 232.9	5 859.0
June	20 493.3	2 041.3	6 627.6
July	15 224.1	1 699.1	4 858.7
August	10 577.0	1 109.6	5 346.7
September	10 460.3	5 644.5	3 702.7
October	10 314.9	3 928.7	763.8
November	9 605.4	7 058.4	563.5
December	10 942.7	5 487.0	3 494.7
Total Volume QQs	214 464.3	44 190.4	62 099.6
Value (Thousand Córdobas)	171 571.4	n.a.	27 944.8
% of National Market Volume	5.3	1.1	0.7

Source: ENABAS (2010) and own estimation with data from INIDE.

exceeded projections, but the share of beneficiaries fell significantly in 2011. Still, over the whole period, 92 percent of the original target was reached. During 2007, when prices registered high growth, the number of households that received assistance was much higher than planned (Figure 2).

MAGFOR (2009a) reported BPA results for June 2007 to December 2009 in terms of animals distributed to households (185 929 chickens, 30 565 cows, 2 771 goats, 23 840 pigs, 31 827 roosters, and 7 852 sheep) and production (11 739 QQ of beans, 211 158 chickens, 13 590 cows, 5.79 million eggs, 19 566 QQ of maize, 5.06 million kilograms of milk and 49 998 pigs). The total value of production is estimated at USD 34 million, or about USD 730 per beneficiary, with a 27 percent project return. In addition, household savings (deposited in communal funds) reached USD 895 000, about USD 19 per beneficiary. The average expenditure per family under BPA is shown in Figure 7. It was highest in 2007, countering the negative impact of high food prices, and decreased in the following years, dipping below the originally established minimum amount of USD 600 (Figure 3).

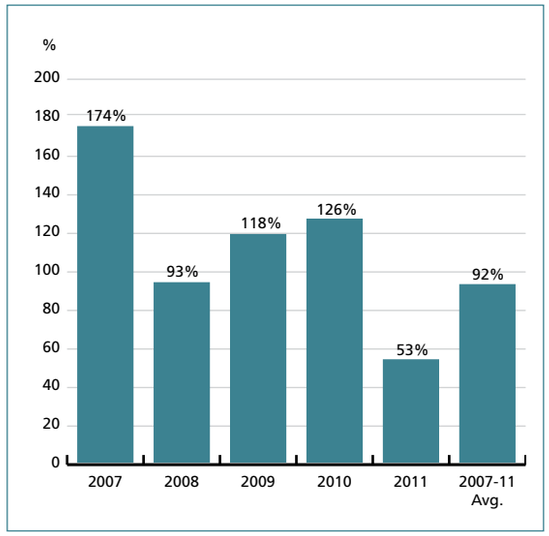
The target beneficiary population was expanded from 75 000 to 100 000 households after 2008, although it appears that the target has not been met (IEEPP, 2011).

- **Agricultural credit**

Credit to agriculture has been expanding during the last decade. Apart from 2009 when all credit contracted due to the economic crisis, agricultural credit has increased steadily since 2001, although as a share of total lending, agricultural credit decreased from 2001 to 2007, with only a slight increase after that (Figure 4).

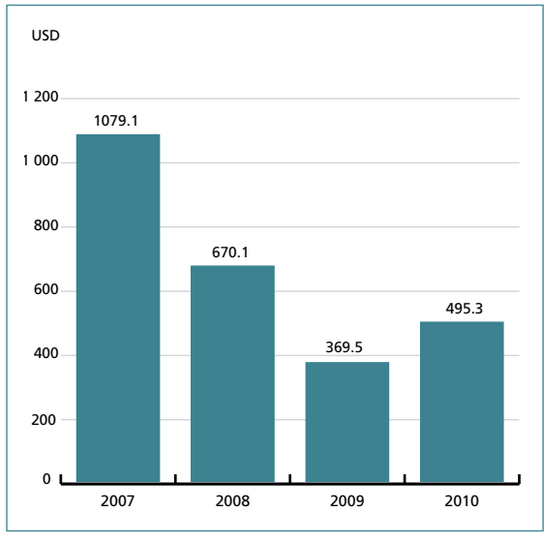
It should be noted that the bulk of agricultural lending is allocated to agricultural export activities and large-scale rice farms, reducing the participation of small farmers and also diverting credit from traditional agriculture toward the production of non-traditional agricultural products. This limits the sources of funding for the development of agricultural activities. Small-scale production of basic grains is considered more risky by commercial banks and the provision of credit to this segment is characterized by high

FIGURE 2: BONO PRODUCTIVO ALIMENTARIO: PERCENTAGE OF BENEFICIARIES COVERED PER YEAR (EFFECTIVE VS. PLANNED)



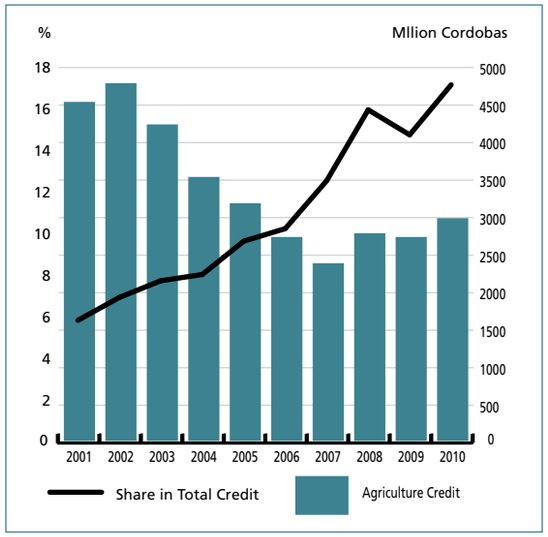
Source: Own elaboration with data from IEEPP (2011).

FIGURE 3: AVERAGE EXPENDITURE PER BENEFICIARY, BPA



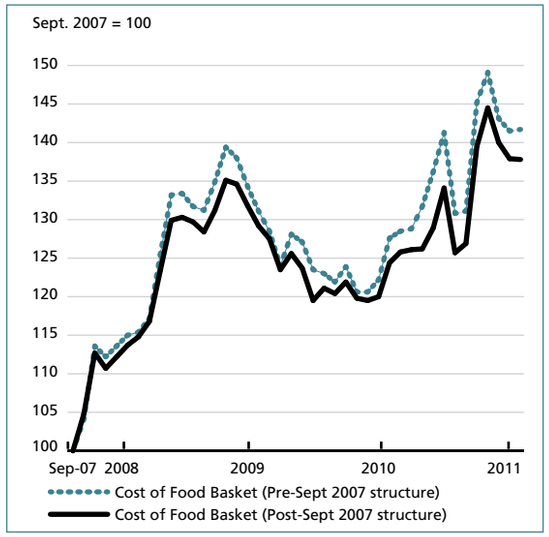
Source: Own elaboration with data from IEEPP (2011).

FIGURE 4: AGRICULTURE CREDIT



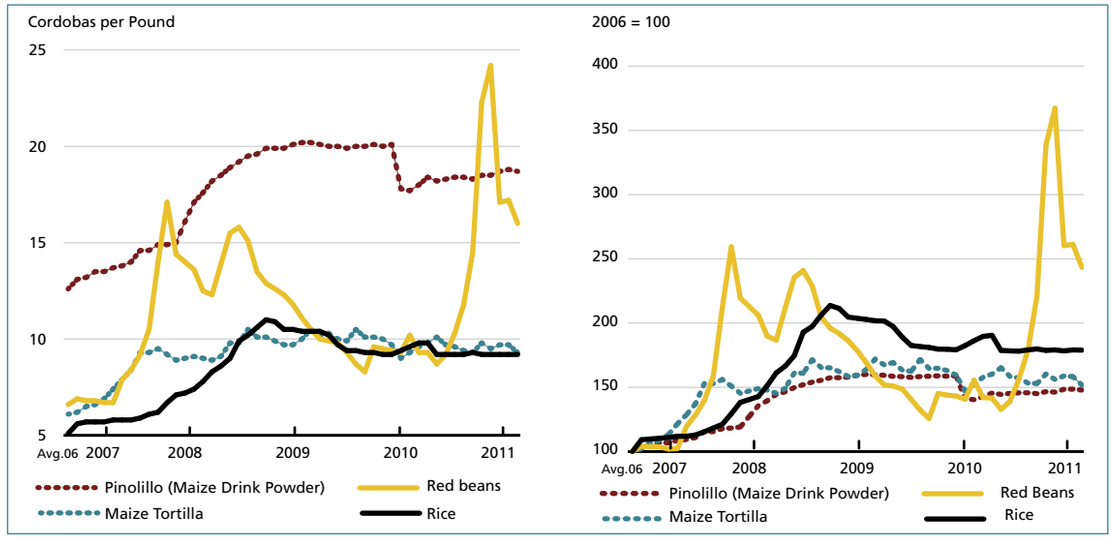
Source: Own elaboration with data from BCN.

FIGURE 5: CHANGE OF FOOD BASKET COST (OLD AND NEW STRUCTURE)



Source: Own elaboration with data from INIDE and BCN.

FIGURE 6: EVOLUTION OF RETAIL PRICES OF BASIC GRAINS (NATIONAL AVERAGE)



Source: Own elaboration with data from INIDE and BCN.

transaction costs and larger interest rate spreads (Rivas, 2008; MAGFOR, 2009b). The largest share of commercial credit for traditional crops accrues to rice.

Credit conditions from government organizations from 2007 to 2009 were more flexible, with below market interest rates. For instance, rural credit fund interest rates remained fixed in 2007-2008 (at 10 percent for short-term loans and 14 percent for long-term loans), with better conditions in terms of collateral and payment options. In 2007, the rural development institute negotiated with commercial banks to lower rates for specific productive activities, from 42 percent to 8 percent. Similar negotiations by the Nicaraguan Investment Finance company in 2007 helped reduce rates from 23 percent to 13 percent (MAGFOR, 2010b; MAGFOR-PMA, 2010; MAGFOR 2009b).

Consistent with the government's approach toward better credit conditions for basic grains producers, Banco Produzcamos offered relatively lower interest rates, with more favourable terms and a combination of credit lines and loans. However, long-term loans are not offered to basic grains producers.

The effect on food prices

A key outcome expected from the food policy actions was the stabilization of food prices. By September 2008, the cost of the basic food basket was 38 percent higher than the cost in September 2007 (Figure 5). Two factors drove this increase. First, the prices of main food products rose in response to international price increases. Second, the structure of the food basket was adapted to include additional goods and higher monthly quantities of consumption (in pounds) for basic grains and other items used in calculations.

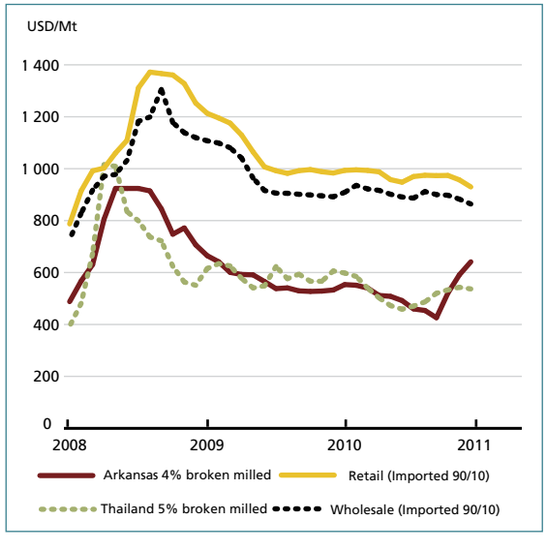
This adjustment in food basket quantities implied an automatic one-time upward increase in its cost and thus in food expenditure as compared to September 2007. However, as shown in Figure 10, the cost of the "old" and the "new" food basket followed a similar trend since 2007, reflecting higher prices. The expenditure stabilized in 2009 but did not return to September 2007 levels. Moreover, by the end of 2010 the cost of the basic food basket was 50 percent higher than in September 2007.

The increase in the cost of the food basket was driven by the growth of basic grain prices. The prices of rice and red beans more than doubled during 2008, while the prices of main maize products like tortillas and pinolillo grew by 50 percent. In the following years prices did not return to pre-2007 levels (Figure 6). Rice prices decreased slightly by the end of 2008, but remained 75 percent higher than in 2006. Red bean prices stabilized in 2008 as well. However, negative production shocks (droughts in particular) caused a pronounced peak at the end of 2010 (MAGFOR, 2011). The prices of maize-based products have grown since 2007.

The domestic prices of rice (both imported and nationally produced) peaked during the second half of 2008, a few months after the peak in international prices. Figures 7 and 8 depict prices for imported and domestic rice at the wholesale and retail levels, compared to international paddy rice and milled rice prices. Nicaraguan prices have been significantly higher than international prices, before and after the 2007 upswing. Upward adjustments at the beginning of 2008 made international and national prices converge, however, the reduction of international prices in the second half of 2008 did not affect national prices to the same degree. Since 2008, the domestic wholesale price of rice has declined, but at the end of 2010 it remained some 80 percent above international prices.

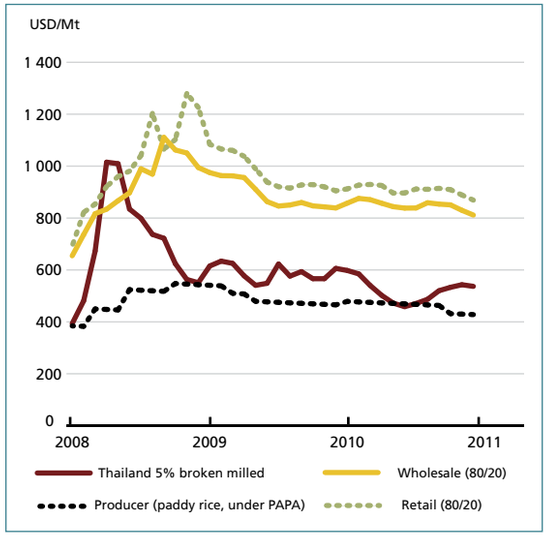
Dutoit et al (2009) indicate that rice producer prices in Nicaragua are cointegrated with the Thai and US markets. The domestic wholesale price adjusts almost immediately to changes in international prices. Transmission is not very strong for producer prices, however. This is partly explained by high import tariffs on rice. Furthermore, the price negotiation within the Support Programme for Rice Producers (Programa de Apoyo al Productor Arrocero, PAPA) prevents a better price transmission because of the establishment of minimum (floor) prices to producers. In addition to tariffs, logistics costs increase the price of imported rice significantly. Fernández et al (2011) estimate that 59 percent of final imported rice prices in Nicaragua are caused by in-country costs related to customs procedures, sanitary and phytosanitary

FIGURE 7: PRICES OF IMPORTED RICE: INTERNATIONAL, WHOLESALE AND RETAIL (90/10 QUALITY)



Source: Own elaboration with data from MAGFOR, MIFIC, and USDA Market News.

FIGURE 8: PRICES OF RICE: NATIONAL QUALITY 80/20 (WHOLESALE, RETAIL AND PRODUCER) COMPARED TO INTERNATIONAL PRICES



Source: Own elaboration with data from MAGFOR, MIFIC, and USDA Market News.

regulations, domestic transportation, port use, and other bottlenecks that should be addressed to lower prices for consumers.

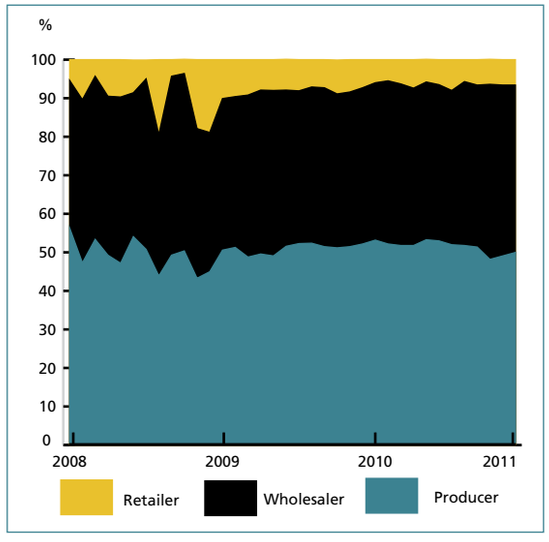
Furthermore, De Franco and Arias (2011) indicate that most differences between international and local prices in Nicaragua could also be explained by the oligopolistic structure of the domestic market with high levels of concentration in different segments of the value chain, resulting in higher prices to final consumers. The composition of the final price across the different components is described in Figure 9. It shows that the lowest share of the price accrues to retailers.

As indicated before, consumer prices on maize-based products stabilized after 2008 but remained higher than pre-2007 prices. Producer prices, as well as wholesale and retail prices, registered strong fluctuations from 2008. Prices decreased slightly in the first half of 2010 but continued growing in the second half of 2010 and beyond (Figure 10). Higher peaks were registered in Nicaraguan prices than in the prices of maize in Mexico and other Central American countries, but the prices have converged during 2010 (Figure 11). De Franco and Arias (2011) argue that maize price variations in Nicaragua could be explained by demand factors and market characteristics rather than by tariffs or other border measures.

The Nicaraguan maize market is more competitive than the rice market, because of the large number of small and medium scale farmers, wholesalers and retailers that compete in the domestic market. Maize prices have not increased as much as rice prices. Farmers obtain the highest share of the final price paid by consumers. Wholesale margins are rather small compared to rice, while retailers obtain on average 20 percent of the final price (Figure 12).

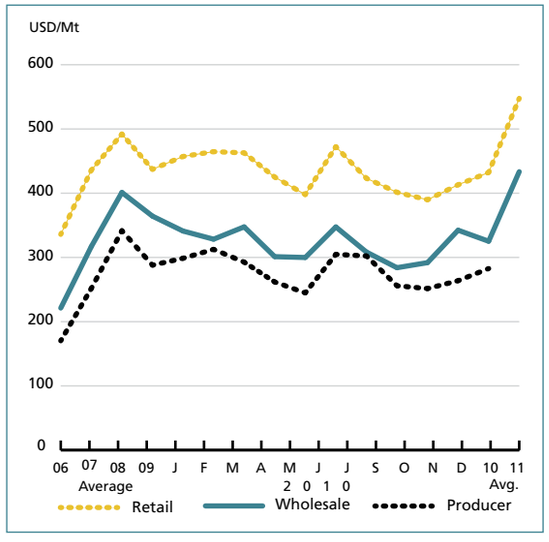
The market for red beans produced for local consumption is also characterized by a higher degree of competition than the rice market. As in the case of maize, numerous small producers and retailers participate in the value chain. In the case of black beans, an export product, only eight exporters account for 75 percent of all exports (Tijerino et al,

FIGURE 9: RICE PRICE MARGIN DISTRIBUTION



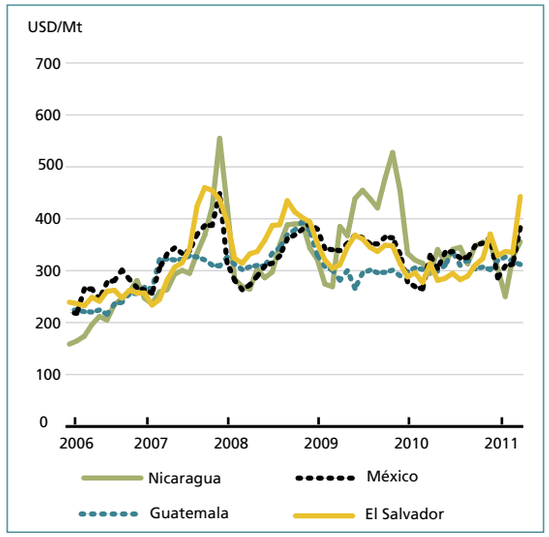
Source: Own elaboration with data from MAGFOR and MIFIC.

FIGURE 10: MAIZE PRICES (PRODUCER, WHOLESALE, RETAIL)



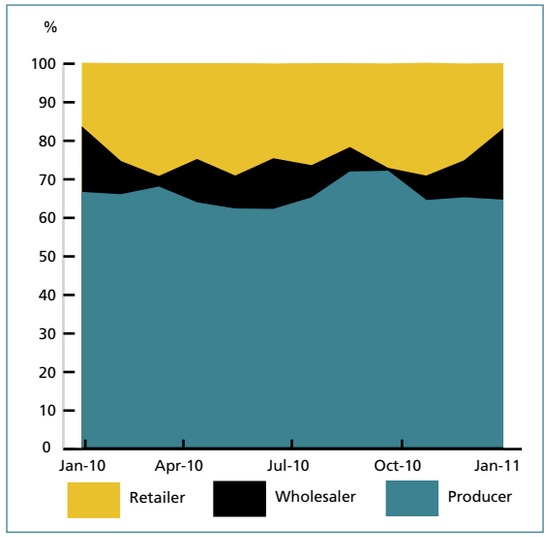
Source: Own elaboration with data from MAGFOR and MIFIC.

FIGURE 11: MAIZE PRICES (WHOLESALE, USD PER MT)



Source: Own elaboration with data from MERCANET-CNP.

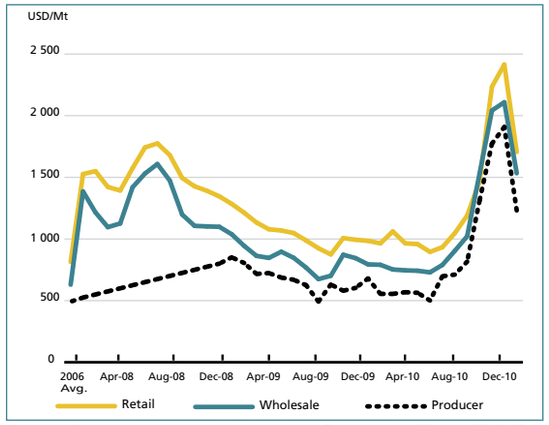
FIGURE 12: MAIZE PRICE MARGIN DISTRIBUTION



Source: Own elaboration with data from MAGFOR and MIFIC.

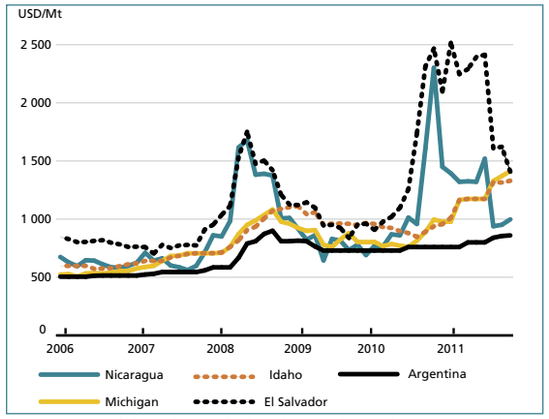
2008). In recent years, bean production has been affected by climatic events such as droughts and floods, which partly explain the high degree of price volatility and the peaks at the beginning of 2008 and at the end of 2010 (MAGFOR, 2010b). After growing significantly during 2008, all prices (producer, wholesale, and retail) stabilized during 2009 but increased again in 2010 (Figure 13). Compared to other countries, red bean wholesale prices in Nicaragua are higher. During the 2007 and 2010 peaks,

FIGURE 13: RED BEAN PRICES (PRODUCER, WHOLESALE, RETAIL)



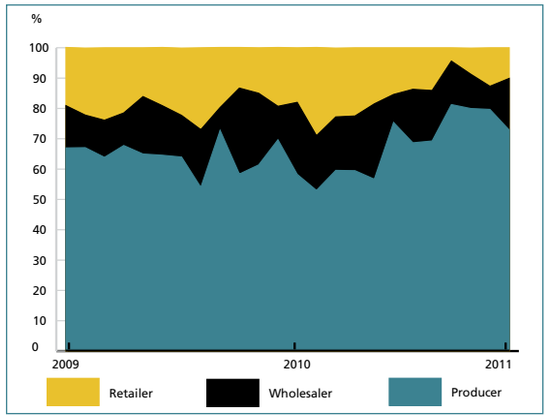
Source: Own elaboration with data from DGA and MERCANET-CNP.

FIGURE 14: RED BEAN PRICES (WHOLESALE)



Source: Own elaboration with data from DGA and MERCANET-CNP.

FIGURE 15: RED BEAN PRICE MARGIN DISTRIBUTION



Source: Own elaboration with data from MAGFOR and MIFIC.

national prices were almost double the level of international prices (Figure 14).

The greatest share of the final price of red beans accrues to producers, as in the case of maize. Wholesalers and retailers received smaller and almost equal shares of the final consumer price (Figure 15).

The evidence indicates that the domestic prices of the main staple foods (beans, maize and rice) did increase as a consequence of rising international prices and have remained at higher levels than prior to 2007. The policy measures targeting food security, most of which were implemented between 2007 and 2009, could have contributed to the stabilization of food prices in 2008. For instance, the operations of ENABAS in the domestic market could have helped reduce the prices of basic grains. The distribution of the final price across the different segments of the value chain indicates that Nicaraguan consumers are facing higher food prices, notwithstanding the potential impacts of government food policy interventions on the living conditions of specific groups or regions of the country.

The evolution of production

After an important expansion in 2005/06, the production of basic grains decreased significantly during the 2006/07 and 2007/08 harvest periods, but grew again in 2008/09. Rice production reached its highest level in a decade during 2009/10 and 2010/11 thanks to the expansion in planted areas and yield growth. Red bean and maize production increased in 2009/10 because of higher yields, while the planted area of all three crops did not expand significantly after 2007 (Figure 16).

This does not provide any reliable evidence with respect to whether or not policy changes have had an effect on the production of basic food products. Productivity growth was one of the main targets of government interventions in 2007 and afterwards,

FIGURE 16: BASIC GRAINS PRODUCTION CHANGE

Source: Own elaboration with data from BCN and MAGFOR.

especially of the seeds programmes (PAS), the PPA and credit incentives for productive improvements (new technology adoption and better agriculture practices). Basic grains production recovered from the 2007-2008 downturns and has been expanding since then, reflecting primarily the improvement in yields. Government subsidies and other agricultural programmes may have contributed to this recovery. On the other hand, higher producer prices may have provided incentives to farmers to increase production. In absolute terms, basic grains production has increased substantially since 2006/07 (Table 9).

Outcomes on poverty, income and consumption

Food security and rural development policies implemented in Nicaragua under PRORURAL focused on poverty reduction, income growth and higher consumption of poor households. All government programmes (ENABAS, PPA, rural credit funds) that supported productive development, income growth and food consumption were targeting improvements in the livelihood of the population and poverty reduction. Unfortunately, no thorough impact evaluation has been done for these food security programmes and the data to quantify the possible effects are scarce. However, the results of household surveys conducted in 2005 and 2009 help shed some light on the possible outcomes of the food security interventions that took place in response to high food prices.

Government household surveys demonstrate that poverty levels in Nicaragua decreased between 2005 and 2009. In addition, an independent organization conducted a poverty survey in 2010, confirming that poverty has decreased since 2005. It is estimated that extreme poverty was cut in half from 2005 to 2010 (Table 10). However, according to FIDEG (2011), poverty was slightly higher in 2010 than in 2009.

The purchasing power of Nicaraguan households improved between 2005 and 2009 as well. Per capita consumption and income increased in real terms, with higher growth rates experienced by rural, poor and extremely poor households (Table 11).

It is interesting to note than income from self-employment in agriculture has increased in the case of extremely poor households.

TABLE 9: BASIC GRAINS PRODUCTION (THOUSAND UNITS)

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11*
Rice (Gold)	105.6	137.2	125.9	98.0	102.1	105.8	122.6
Area (Mzs)	3 326.5	4 529.0	4 569.8	3 859.1	4 076.4	4 783.6	5 312.3
Production (QQ)	31.5	33.0	36.3	39.4	39.9	45.2	43.3
Yield (QQ/Mzs)							
Beans (Red)	332.2	387.6	336.4	332.1	343.0	356.5	338.2
Area (Mzs)	3 811.3	4 662.0	3 983.5	3 749.9	3 886.4	4 612.6	4 391.0
Production (QQ)	11.5	12.0	11.8	11.3	11.3	12.9	13.0
Yield (QQ/Mzs)							
Maize	463.5	568.3	492.2	506.7	456.7	479.8	508.7
Area (Mzs)	9 762.1	12 223.1	11 041.6	10 706.8	9 325.4	11 499.5	11 317.3
Production (QQ)	21.1	21.5	22.4	21.1	20.4	24.0	22.2
Yield (QQ/Mzs)							

* *Estimation* Mzs = Manzanas = 0.7 hectares; QQ = Quintales = 0.046 metric tonne.
Source: BCN and MAGFOR.

TABLE 10: POVERTY INDICATORS

	2005	2009	2010*
		%	
Poverty	48.3	42.5	44.5
Urban	30.9	26.8	28.9
Rural	70.3	63.3	62.8
Extreme Poverty	17.2	14.6	9.0
Urban	6.7	5.6	3.1
Rural	30.5	26.6	15.9

*Estimation with a different methodology.
Source: INIDE (2007a) and (2011), FIDEG (2011).

In 2009 a quarter of the income of these households was derived from own agricultural production. Data suggest an important shift of labour from other sectors to own agricultural production, by poor and especially extremely poor households (Table 12).

The productive subsidy programme (BPA), the seeds programme (PAS) and the credit instruments, all targeted an increase in agricultural production by poor households, and could have contributed to the expansion of income from own agricultural activity. In

TABLE 11: CHANGE IN PER CAPITA INCOME AND CONSUMPTION 2005-2009, CÓRDOBAS, 2005

	Per capita Income			Per capita Consumption		
	2005	2009	Growth	2005	2009	Growth
			%			%
National	12 797	13 746	7.4	10 094	11 346	12.4
Urban	16 546	17 358	4.9	12 940	14 151	9.4
Rural	8 058	8 965	11.3	6 497	7 636	17.5
Non Poor	19 318	19 115	-1.1	15 237	15 840	4.0
Poor	5 820	6 482	11.4	4 593	5 265	14.6
Extreme Poor	4 106	4 620	12.5	2 979	3 494	17.3

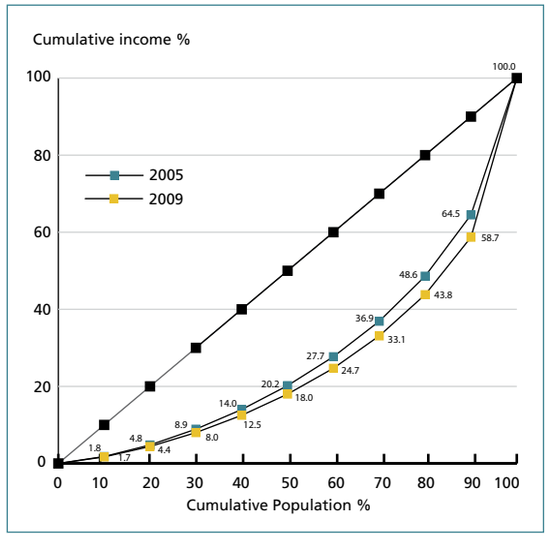
Source: own elaboration with data from INIDE (2007a) and INIDE (2011).

TABLE 12: CHANGE IN PER CAPITA INCOME AND CONSUMPTION 2005-2009, CÓRDOBAS, 2005

	2005			2009		
Source	Non Poor	Poor	Extreme Poor	Non Poor	Poor	Extreme Poor
			%			
Wage (Agriculture)	4.2	17.6	26.1	2.9	16.7	27.7
Wage (Other Sector)	38.7	24.2	16.5	38.7	27.0	15.7
Own Work (Agriculture)	21.9	11.4	7.0	7.9	19.8	25.0
Own Work (Other Sector)	8.1	23.4	28.2	24.5	16.5	11.5
Transfers						
Food at School	na	na	na	0.6	2.0	2.6
Food Donations	1.4	2.1	2.2	1.4	2.1	2.0
Remittances	7.1	4.3	3.2	5.7	3.6	3.2
Other Donations	0.0	0.1	0.1	0.0	0.1	0.4
Pensions	1.7	1.1	0.7	3.0	1.5	1.4
Other Transfers	1.4	5.1	6.4	1.5	0.8	0.4
Rents (own house)	14.2	9,9	9.2	12.8	9.6	9.4
Other Income	1.0	1.0	0.0	1.0	0.0	1.0
	100	100	100	100	100	100

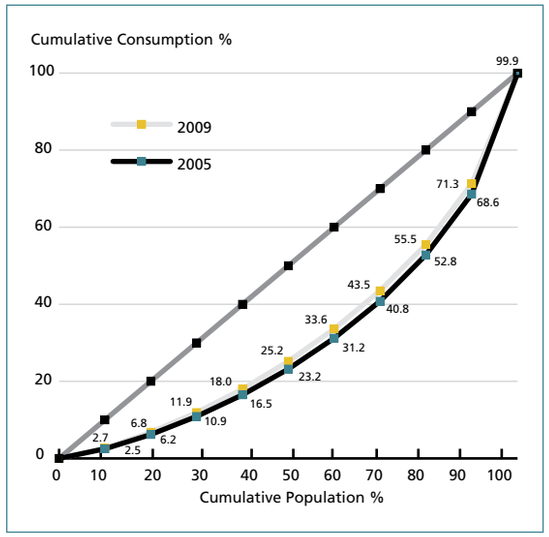
Source: Own elaboration with data from INIDE (2007a) and INIDE (2011).

FIGURE 17: LORENZ INCOME CURVE, 2005 AND 2009



Source: Adapted from INIDE (2011).

FIGURE 18: LORENZ CONSUMPTION CURVE, 2005 AND 2009



Source: Adapted from INIDE (2011).

the case of non-poor households, on the other hand, the share of income that can be attributed to agricultural production has declined.

In addition to income growth, income distribution improved between 2005 and 2009. The national Gini coefficient decreased from 0.51 to 0.46. The coefficient is similar for urban and rural populations (0.43 and 0.42, respectively), and in both cases inequality is lower than in 2005.

In Nicaragua, consumption distribution has been more unequal than income distribution for several years (INIDE, 2011). Household data indicate that consumption distribution improved between 2005 and 2009, as in the case of income distribution. Figure 18 depicts the Lorenz consumption curve for both years.

Trade developments

Another objective of PRORURAL and the policy measures that were put in place in response to rising food prices was the improvement of the basic grains trade balance, that is, the reduction of rice imports and the growth of black bean exports. Imports of rice grew by 80 percent in value terms (because of higher international prices) during 2008, although the imported volume remained almost the same as in previous years[8]. However, in 2009 and 2010 both rice import value and volume started to fall, mainly because of lower international prices and growing national production. The trade balance of rice remained negative in net terms but improved significantly after 2008. Black bean exports increased mainly because of higher international prices that almost doubled in 2008 and later remained at higher levels than before 2007. In volume terms, black bean exports grew at a lower rate, however.

The fluctuations in international food prices had an important impact on trade in basic food products. In the case of rice, growth of national production has substituted imports. Currently, 70 percent of the domestic market is supplied with local production, up

[8] Some 95 percent of rice imports to Nicaragua come from the United States.

from 60 percent in 2006 (MAGFOR, 2011 – Table 13).

Conclusions

Agricultural growth is a necessary condition for rural development and poverty reduction in Nicaragua given the importance of the sector as a source of income for a large share of poor households. Moreover, food is the most important expenditure category for the low-income population. Nicaraguan households are net consumers of beans, maize, rice and other grains. Many poor rural farmers are engaged in grains production, for trade or self-consumption. Hence, the impact of rising food prices on poverty and income depends on changes in consumption and production by households.

In the face of soaring international food prices, in 2007 the Nicaraguan government implemented a series of policy actions, some at the macroeconomic level and others focused on the agricultural sector. The government provided incentives for basic grains production and took action to improve nutrition levels among poor and vulnerable households. The polices that were already in place by 2007 were adjusted and expanded in response to rising food prices and the economic crisis of 2009. Food assistance programmes were implemented in parallel to enhance the distribution of seeds and inputs, in-kind transfers of livestock and productive assets, basic technology transfer, new skill and capacity development programmes, and government interventions in basic grains markets through purchase, storage and distribution operations; all of them supported with credit programmes. The main policy programmes (PPA, PAS, ENABAS, and Banco Produzcamos) were integrated under PRORURAL, which has been the backbone of government policies aimed at promoting fair food markets and reducing poverty.

As a general conclusion, it seems that food security policies in Nicaragua have mainly benefited producers, since production and trade of basic grains have grown as food prices have increased following the spike in international food prices. Food prices continued growing even as international prices stabilized in 2008. Household surveys provide some evidence that modest improvements in equality and poverty reduction took place between 2005 and 2009, particularly in rural areas, however whether or not the food security policies were the main drivers of these improvements remains an open question. A sound impact evaluation exercise is needed to identify the effects of food security policies on indicators related to prices, production and consumption of food, as well as poverty reduction. Additionally, identification and quantification of benefits to rural and urban households, and producers (poor small farmers and medium and large integrated basic grains producers) remains a future task.

In Nicaragua, like in many developing countries, agricultural trade protectionism and price interventions have been widely used to support agricultural producers. Both are generally considered in the literature to be ineffective as poverty reduction instruments and create market distortions. In historic perspective, protection of domestic markets has occurred as the result of actions by specific interest groups, usually large farmers or agri-businesses, and does not in general benefit small farmers and poor households. For instance, in the case of rice, the vertical integration of the market as well as price interventions have kept consumer prices high, reducing food security.

A more successful strategy could include the elimination of trade barriers and other market distortions, as well as strengthening competition within the agricultural sector. Social transfers and subsidies to small farmers are important in the short run, to mitigate the effects of negative production shocks

TABLE 13: CHANGE IN PER CAPITA INCOME AND CONSUMPTION 2005-2009, CÓRDOBAS, 2005

	2006	2007	2008	2009	2010
	Value: 000 USD				
	Exports				
Rice	69.8	953.1	2 666.1	3 208.7	3 785.9
Maize	189.5	1 574.0	1 252.5	288.5	666.2
Black Beans	36 684.1	39 971.9	79 841.9	61 244.4	59 365.8
	Imports				
Rice	47 789.1	57 920.8	91 438.3	54 044.2	50 320.5
Maize	1 223.0	596.9	449.4	3 285.1	1 121.2
Black Beans	2 306.0	2 408.7	5 187.6	2 230.2	3 739.2
	Balance				
Rice	(47 719.4)	(56 967.7)	(88 772.2)	(50 835.5)	(46 534.5)
Maize	(1 033.5)	977.1	803.1	(2 996.6)	(455.0)
Black Beans	34 378.0	37 563.2	74 654.3	59 014.2	55 626.6
	Volume: Thousand QQ				
	Exports				
Rice	11.3	66.5	104.1	95.8	155.8
Maize	48.3	136.4	111.8	24.1	57.6
Black Beans	1 191.9	1 174.2	1 274.8	1 374.1	1 213.2
	Imports				
Rice	2 691.4	2 600.1	2 684.1	1 882.2	1 969.2
Maize	118.6	19.9	8.2	205.9	64.6
Black Beans	58.4	58.5	123.8	49.2	89.9
	Balance				
Rice	(2 680.1)	(2 533.6)	(2 580.0)	(1 786.4)	(1 813.4)
Maize	(70.4)	116.5	103.6	(181.8)	(7.0)
Black Beans	1 133.5	1 115.7	1 151.0	1 324.9	1 123.4
	Price: USD per QQ				
	Exports				
Rice	6.2	14.3	25.6	33.5	24.3
Maize	3.9	11.5	11.2	12.0	11.6
Black Beans	30.8	34.0	62.6	44.6	48.9
	Imports				
Rice	17.8	22.3	34.1	28.7	25.6
Maize	10.3	30.0	54.8	16.0	17.4
Black Beans	39.5	41.2	41.9	45.3	41.6

QQ = Quintales = 0.046 metric tonne.
Source: Own elaboration with data from INIDE (2007a) and INIDE (2011).

or soaring international food or agricultural inputs prices, particularly for the most vulnerable households. In the medium and long run, however, productivity and income growth are the central issues to improve living conditions and enhance food security. In the case of small farmers, temporary incentives could help overcome productivity limitations. However, in the long run, farmers need productive development policies that include improvements in infrastructure (warehouses, rural roads, and distribution facilities), capacity building to develop skills, technology transfer (seeds improvement, pest management) and environmental management (precision agriculture, pesticides replacement). These types of support could provide coherent incentives to achieve higher farm productivity, sufficient production and lower prices for consumers.

References

Banco Central de Nicaragua. 2011. *Informe Anual* 2010. Gerencia de Estudios Económicos. Managua: Banco Central de Nicaragua.

CEPAL, FAO and IICA. 2011. Volatilidad de precios en los mercados agrícolas (2000-2010): implicaciones para América Latina y opciones de políticas. *Boletín CEPAL/FAO/IICA N°1*. Santiago de Chile.

De Franco, M. & Arias D. (2011) Are food markets in Central America integrated with international markets? An analysis of food price transmission in Honduras and Nicaragua. In López J. H. and Shankar R., eds. *Getting the Most Out of Free Trade Agreements in Central America*. Washington DC. The World Bank.

Dutoit, L., Hernández K. & Urrutia C. 2009. *Transmisión de precios para los mercados del maíz y arroz en América Latina*. CEPAL-Sida-France Coopération.

ENABAS. 2010. *Resumen de los principales logros durante el periodo: Enero – Junio 2010*. Managua. ENABAS.

FAO. 2008. *Evaluación de necesidades alimentarias y propuestas de respuesta para Nicaragua*. FAO report. Managua.

FAO. 2010. *Country Profile: Nicaragua*, FAO Statistics Division, October 2010.

FAO. 2011. *Guide for policy and programmatic actions at country level to address high food prices*. Guide developed in the context of FAO's Initiative on Soaring Food Prices (ISFP). Rome.

Fernández, R., Flórez, S., Estrázulas de Souza, F. & Vega, H. 2011. Supply chain analyses of exports and imports of agricultural products: Case studies of Costa Rica, Honduras, and Nicaragua. In López J. H. and Shankar R., eds. *Getting the most out of free trade agreements in Central America*. Washington DC. The World Bank.

FIDEG. 2011. *Encuesta de hogares para la medición de la pobreza en Nicaragua, FIDEG 2010. Principales aspectos metodológicos y resultados*. Managua.

Gobierno de Nicaragua. 2009. *Plan nacional de desarrollo humano actualizado 2009-2011*. Gobierno de Reconciliación y Unidad Nacional. Managua.

IEEPP. 2011. Hambre Cero: Avances y desafíos. *Tercer informe de evaluación del programa productivo agropecuario*. Instituto de estudios estratégicos y políticas públicas. Managua.

IFPRI. Concern Worldwide and Welthungerhilfe. 2011. *Global hunger index. The challenge of hunger: Taming price spikes and excessive food price volatility*. Bonn, Washington, DC and Dublin.

INIDE. 2007a. *Perfil y características de los pobres en Nicaragua 2005. Encuesta de hogares sobre medición de nivel de vida 2005*. Instituto Nacional de Información para el Desarrollo. Programa MECOVI. Managua.

INIDE. 2007b. *Anuario Estadístico 2006*. Managua.

INIDE. 2008a. *Nicaraguan demographic and health durvey*. National Statistics System. Managua: Ministry of Health.

INIDE. 2008b. *Anuario Estadístico 2007*. Managua.

INIDE. 2011. *Encuesta de hogares sobre medición del nivel de vida 2009. Principales resultados: Pobreza, consumo, ingreso*. Managua.

MAGFOR. 2008a. *Informe Sectorial 2008*. Managua.

MAGFOR. 2008b. *Informe anual agropecuario y forestal Nicaragua 2007*. Sistema de Evaluación, Seguimiento y Aprendizaje. Managua.

MAGFOR. 2008c. *Acopio y comercialización de productos básicos. Reactivación del parque agroindustrial de ENABAS e implementación de la red de comercio justo de los alimentos básicos en Nicaragua*. Managua.

MAGFOR. 2008d. *Subprograma de insumos básicos para la producción agrícola 2009-2010*. Dirección general de delegaciones y promoción de estrategias regionales. Managua.

MAGFOR. 2009a. *Política sectorial de seguridad y soberanía alimentaria y nutricional. Departamento de política de seguridad y soberanía alimentaria*. Managua.

MAGFOR. 2009b. *Plan sectorial PRORURAL incluyente 2010-2014*. Managua.

MAGFOR. 2010a. *Manual de las técnicas y los técnicos del programa productivo alimentario*. MAGFOR-PPA. Managua.

MAGFOR. 2010b. *Informe Sectorial 2009*. Managua.

MAGFOR. 2011. *Informe Anual Sectorial 2010*. Prorural Incluyente. Managua.

MAGFOR and WFP. 2010. *Programa de seguridad alimentaria y nutricional (PSAN)*. Managua.

Rivas, C. 2008. *El arroz en Nicaragua. Análisis y descripción*. Managua.

Rivera, L. & Rojas-Romagosa, H. 2010. *Human capital formation and the linkage between trade and poverty: the cases of Costa Rica and Nicaragua*. Final report for the project "Programa de Cooperación CEPAL - AECID 2008 - Políticas e Instrumentos para la Promoción del Crecimiento en América Latina y el Caribe". Santiago.

Robles, M. & Torero, M. 2010. Understanding the Impact of High Food Prices in Latin America. *Economia*, Vol. 10, N° 2. Journal of the Latin American and Caribbean Economic Association.

Tijerino, A., Vega, C. & Bone, J. 2008. *Cadenas Productivas. Granos Básicos*. Programa COMPAL, proyecto para Nicaragua. Ministerio de Fomento, Industria y Comercio. Managua.

World Bank. 2008. Nicaragua Poverty Assessment. *Report No. 39736-NI*, The World Bank, Central America Country Management Unit, Washington D.C.

ANNEX 1:

POLICY AND PROGRAMMATIC ACTIONS FOR FOOD PRICE STABILIZATION AND FOOD SECURITY IMPLEMENTED IN NICARAGUA

Policy or programmatic measure	Expected effects	Implemented in Nicaragua	Description/Policy
TRADE MEASURES			
Reduce import taxes on food items, agricultural inputs and equipment	Lower the price of the imported good Stimulate imports Negative effect on state budget revenue	Yes. During 2007-2008	Tariffs on main food products and agricultural inputs imported from third markets (outside Central America) were temporally reduced, from 10-15% to zero.
Tax breaks for importers	Same as above	No	
Financial support or loans to private sector to fund imports of food commodities	Same as above	No	
Reduce customs procedures and other formalities for food import (one-stop shop) with or without relaxation of regulations	Same as above	No	
Engage in forward contracts for food imports to secure food availability in medium term	Not effective in solving high price problem	No	
Reduced, banned or taxed exports of strategic food commodities	Reduce prices Medium- to long-term implications on producers Risk of smuggling and corrupt practices	No	
MEASURES IN FAVOUR OF CONSUMERS			
Tax Policies			
Reduce or remove Value Added Tax (VAT) and/or other taxes on food products	Lower the price of food Negative effect on state budget revenue	No	
Removal of road blocks and taxes	Facilitate flow of commodities Reduce price differential between producers and consumers Reduced income for local government/authorities	No	
Tax reduction on fuel for transport	Reduce price differential between producers and consumers Negative effect on state budget revenue	No	
Targeted income tax reduction	Increase of disposable income for target groups	No	

Policy or programmatic measure	Expected effects	Implemented in Nicaragua	Description/Policy
Market Management Policies			
Boosted food imports financed by balance of payments, import financing and budget support	Increase availability of food in the normal market channels Can undermine speculation	No	
Food aid in kind	Rapidly increase food availability to implement various lifesaving safety net modalities	Yes. Since 2007-2008	Through PSAN, monthly food supplies are distributed to poorer households in rural areas and school children in urban areas.
Requisition of private stocks (forced procurement)	Increase immediate availability of food to some extent Stock owners may hide stocks May make private sector reluctant to keep stocks in the future	No	
Progressive release of food kept in public food reserve	Can temporarily improve availability on markets Can help to put in place safety nets	No	
Price controls on key staple food products through regulation	All consumers benefit from stable and moderate prices Likely to impact negatively on producer prices; may produce less in the future Risk of black market	Yes. During 2007-2008	Price controls on food markets by the Ministry of Industry and Commerce (MIFIC). Temporary. Basic grains prices management (producer and consumer) by ENABAS purchase, storage and distribution activities.
Safety Nets			
Cash transfers or food vouchers	Beneficiaries have additional resources to purchase food Can contribute to maintaining diet quality Could have inflationary effects Vouchers could become a parallel currency Subject to leakages, embezzlement, corrupt practices and security risks Cost to budget	No	

Policy or programmatic measure	Expected effects	Implemented in Nicaragua	Description/Policy
Food distribution in kind	Beneficiaries have direct and free access to a certain quantity (ration) of food If food is purchased locally, it can stimulate production. In case of short supply, local purchases will have inflationary effect If food is brought in it could reduce local prices Could create new food habits subject to leakages, corrupt practices and security risks Cost to budget	Yes. Since 2007-2008	Through PSAN, monthly food supplies are distributed to poorer households. In coordination with BPA, local production is stimulated and rural income increased.
Universal food subsidy	Everyone has access to subsidized food Targeting possible by focusing on selected staple commodities Extremely costly with potentially serious macroeconomic consequences Risk of black market in case of rationing	Yes	ENABAS sets maximum prices of basic grains (beans, maize, rice and sorghum) in its retail distribution network.
Other Measures affecting Disposable Income			
Increasing salary in civil service and other benefits	Improved welfare of civil servants Risk of inflation	Yes	Wages for government workers and minimum wages were increased in 2008 and 2009. Minimum wage for agriculture workers was increased in 2008.
Credit facilities for consumers	Benefits better off groups	Yes	Credit with better conditions and lower interest rates by FCR, FNI and "Usura Cero" programmes. Since 2010 by Banco Produzcamos.
Reinforce capacity (training and equipment) in income generating activities through value addition on agricultural and food products	Stimulate economic growth Provide jobs and income- generating opportunities Meet demand of urban consumers	Yes	The BPA activities include training for productive activities and business management tools. The Programme for Rural Agribusiness offers since 2009 capacity building and technical assistance for small producers. Value added in agricultural production is promoted through better productive practices and enhanced product attributes (environmental management).
MEASURES IN FAVOUR OF PRODUCERS			
Market Management Measures			

Policy or programmatic measure	Expected effects	Implemented in Nicaragua	Description/Policy
National market information system (prices observatory)	Economic operators are better informed on opportunities existing in the market Limits market segmentation Farmers and small traders will be in a stronger position to negotiate prices Market problem areas can be identified	Yes, improved since 2007	Monthly and weekly reports of wholesale and retail prices of main food products and agricultural inputs (SIPMA of the Ministry of Agriculture, MAGFOR and MIFIC).
Value chain analysis and/or development workshops	Concerted decisions, actions and commitments by various economic operators and the government to improve the functioning and governance of the value chain, and develop mutual trust	Yes. Since 2008	PRORURAL develops various programmes that support the strengthening of agricultural value chains of dairy products, basic grains and cattle.
Negotiation of commercial margins with private sector	Contribute to fair distribution of value added along the chain	No	Rice producers affiliated with PAPA obtain minimum prices according to quality standards.
Make/facilitate contract farming arrangements	Provide a greater assurance of a market for farmers and thus remove some of the risk from farming Open possibilities for obtaining technical support and, on occasion, input supply on credit terms Contribute to enhanced investment	No	
Government re-engagement in marketing	Seek to undermine speculation by private traders	Yes. Since 2008	Through ENABAS basic grains (rice, corn, maize and sorghum) and other food products are purchased, storage and distributed in alternative networks, targeting small farmers and rural poor households.
Forced procurement	Black market Disincentive for production	No	
Minimum producer price for key staple food commodities	Stability and increased supply of the food commodity Reduced risk for farmers, which encourages them to grow the commodity and invest	Yes. Since 2009	Rice producers under PAPA receive minimum prices based on quality standards. Through ENABAS basic grains (rice, corn, maize, sorghum) producers are ensured a minimum price for their harvest.

Policy or programmatic measure	Expected effects	Implemented in Nicaragua	Description/Policy
Production Support Measures			
Immediate support to production in family gardens and irrigated areas	Rapid production of short cycle crops including vegetables in peri-urban areas and on irrigated land Supply of certain food items will be improved on some markets Prices of certain food items could be reduced on some markets If targeting is effective, this could contribute to improving the welfare of small poor farmers	Yes	The PSAN supports school and family gardens for self consumption and diet diversification. Surplus production can be traded and generate alternative income.
Input vouchers (seeds, fertilizer and tools) for vulnerable farmers	Vulnerable farmers can decide which inputs of seeds, fertilizer and tools they want to get It is cheaper to distribute input vouchers than to distribute food to the vulnerable Can improve the welfare of the poor	Yes	The PAS and BPA programmes distribute seeds and agricultural inputs to small farmers.
Pilot fertilizer and seed input credit schemes for small- scale farmers for the next cropping season	Benefits to small farmers are potentially large Availability of certain food items will be improved in households of the pilot areas and in nearby markets With good targeting, this can contribute to improve the welfare of small farmers	Yes	The BPA and financial programmes dedicated to rural development allocate credit for improved seeds production and use in basic grains farming, based on production cycles.
Input trade fairs	Vulnerable farmers are able to choose the inputs (i.e. seeds, fertilizer and tools) that they need Can strengthen the local seed system	No	
Direct Seed Distribution	Beneficiary farmers have access to inputs that allow them to produce food	Yes. Since 2007	The PAS distributes improved seeds among small producers for crops like beans and maize.
Measures to ensure availability of fertilizer	Allocation of government budget resources for a credit line for the private sector Organization of national or sub regional bulk procurement Creation of a risk-sharing fund to facilitate the issuance of letters of credit Fertilizer available on time in appropriate quantities and quality	Yes	FCR and FNI offered credit lines for fertilizer and other inputs purchase.

Policy or programmatic measure	Expected effects	Implemented in Nicaragua	Description/Policy
Universal (untargeted) subsidized fertilizers	If input markets function, subsidies will distort production decisions and encourage over-utilization If input markets are imperfect subsidies can increase economic efficiency Small farmers have easier access to fertilizer and can increase yields	No	
Removal of collateral requirements and the establishment of a government guarantee fund	Farmers, particularly small farmers, will have some access to credit for purchasing inputs and small equipment, and for engaging in rehabilitation of productive assets Increased production	Yes	After 2010, through "Banco Produzcamos" credit is available for small farmers, with better conditions compared to commercial banks.
Provide mechanical and financial support for increasing cropped area	Increase area cropped, production and food availability in the next season	Yes	Through "Banco Produzcamos," credit is available for small farmers, with better conditions compared to commercial banks.
Pilot scale farm power vouchers	Vulnerable farmers have access to farm power and equipment for preparing land, cultivation and transport of produce In case of limited availability of power services and equipment, voucher system can contribute to make them more expensive Improve the welfare of the poor	No	
Stop any subsidy or encouragement for animal production	Reduction in economically unsustainable animal production with the consequence of reduced supply of animal products and higher prices for these food products Increased availability of certain grains for human consumption	No	
Sustainable intensification of crop production systems	Systems-based approach to agricultural development and sustainable farming systems Local engagement with farmers in adaptive research Improved farmer livelihoods, and minimal environmental disruption associated with intensification	Yes. Since 2009	The PRORURAL policies for sustainable farming and productive development aim to modernize production systems and improve productivity.
Increase extension and advisory services on food production	More efficient use of fertilizer, taking into account its higher price	Yes	MAGFOR provides technical support on diverse areas through PRORURAL.
Low cost mechanical conservation agriculture	Improve soil structure and reduce the hard work of digging/plowing the fields Increase fertilizer efficiency	Yes	MAGFOR provides technical support on diverse areas through PRORURAL.

Policy or programmatic measure	Expected effects	Implemented in Nicaragua	Description/Policy
Integrated Pest Management (IPM)	More efficient production Reduced risks of pesticide induced pest outbreaks Less hazards for environment and public health due to reduced/minimized pesticide use	No	MAGFOR provides technical support on diverse areas.
Reduce post-harvest losses and promote longer shelf-life products	Reduced post-harvest losses Reduced cost of transportation Nutritious food immediately available in rural areas Profit through added-value goes to the rural poor Employment and income for non-farming rural dwellers	No	
Encourage the production of lesser processed cereals by processors	Better extraction rates and therefore greater availability (less loss of by products) Higher nutrition quality of the product	No	
Inform private sector on impact of increased prices on profitability of investments in agriculture and food chains	In the short term, identify accompanying measures that can increase investment in agriculture and food chains In the medium term, increased investment flows into the sector that will boost production, stabilize markets, increase the diversity of food products available on the market and create jobs	No	
Moratorium on construction licenses in cultivable lands	Limits expansion of construction on agricultural land Will create tension in urban areas as supply of housing will be reduced and may become more expensive Could create opportunities for rent seeking and corrupt practices	No	

Source: Author's compilation, following a classification by FAO's Initiative on Soaring Food Prices (FAO, 2011).

CHAPTER 9

PERU

HECTOR MALETTA AND LILIANA BALBI*

Introduction

This chapter analyses the implications of volatility in world cereal prices during 2007-2011 for Peru and the government's policy response. The key issue discussed is the mechanism of transmission of international cereal prices to domestic retail prices. Transmission is affected by government policies and macroeconomic variables including exchange rates, trade restrictions, domestic subsidies to agricultural and agro-industrial producers. The two major commodities analysed are wheat and hard yellow maize. The main consumer products considered are bread, pasta and poultry meat. (Poultry meat is the main product affected by the price of hard yellow maize, which is an important input in poultry production.)

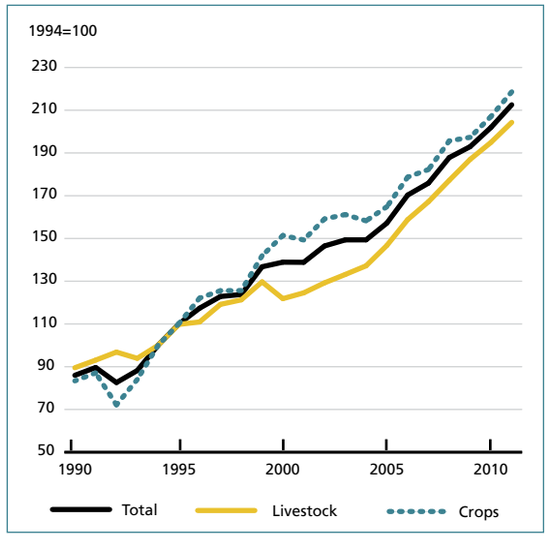
Peru has three main geographical regions: the Coast (a narrow desert strip along the Pacific coast), the Sierra or Highlands (the Andes mountain region, including High Plateaux and inter-Andean valleys) and the Selva or Forest. The complex and mountainous profile of the country makes for a variety of micro-climates and ecological zones within the three major regions. Commercial agriculture is mostly present along the Coast, while subsistence farming is widespread in the Highlands.

In 2011 the population of Peru was 29.4 million, of which 24.7 million or 83 percent were urban dwellers. Nearly one-half of the population lives along the Coast, with the majority (around 9 million) residing in the metropolitan area of Lima, about one-third lives in the Highlands, and the rest in the Selva.

Peru's GDP per capita in current US dollars at purchasing power parity (PPP) was $10 234 in 2011 (WDI). GDP registered high growth after overcoming the severe depression and hyperinflation of the 1987-1990 period. Economic reform and liberalization in the early 1990s helped to further this growth. Economic growth during the 2000s has benefitted from a steady flow of investment of both national and foreign origin, and steady growth and diversification in domestic demand as well as exports, which increased in both quantity and value. GDP grew by 73 percent in real terms from 2000 to 2010, and *per capita* GDP increased by 54 percent in the same period. Current macroeconomic policies have been relatively constant through several governments formed by different political parties and coalitions. For the most part, macroeconomic policy in Peru has been based on an open economy with strong links to the international economic

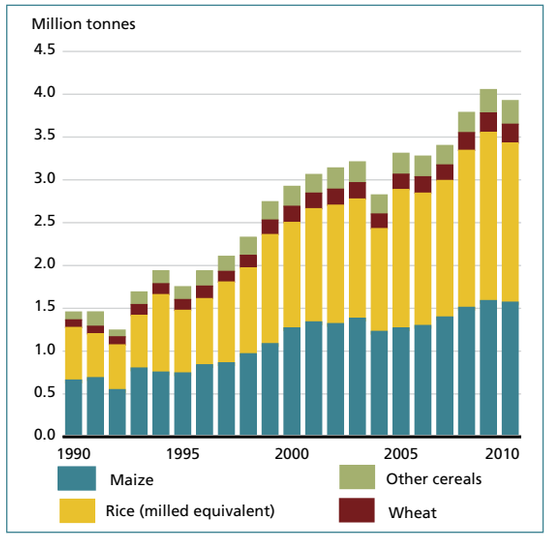
* Professor, Graduate School of Social Sciences, University of Buenos Aires, Argentina and Senior Economist, Trade and Markets Division, FAO, Rome, Italy.

FIGURE 1: PERU: INDEX OF AGRICULTURAL PRODUCTION (TOTAL, CROPS AND LIVESTOCK PRODUCTS)



Source: INEI..

FIGURE 2: PERU: CEREAL PRODUCTION IN MILLION TONNES, 1990-2010



Source: FAOSTAT.

system through the US-Peru Free Trade Agreement and other trade initiatives such as partnerships with countries that have access to the Pacific Ocean.

Agricultural production and cereal markets in Peru

Cereal supply and demand

The value of agricultural production (at constant prices) has more than doubled since 1990 in Peru. Growth has been faster for crops than for livestock (Figure 1).[1]

The same is true of *cereal* production (Figure 2), which has shown steady growth since 1990. Rice has had the fastest growth in output.

[1] Most statistical data in this chapter are taken from FAOSTAT (http://faostat.fao.org), and from the online information on agriculture and foreign trade provided by the Peruvian Institute of Statistics, INEI (http://www.inei.gob.pe), with some complementary information supplied by the Ministry of Agriculture (MINAG 2010a, 2010b, 2011).

Cereals constitute an important part of the Peruvian diet. According to the FAO Food Balance Sheet, in 2007 the daily dietary energy supply in Peru was 2 457 kilocalories per person. Of this amount, cereals accounted for 1 071 kilocalories per person, made up mostly of rice (516) and wheat (378). Foods of animal origin supply only 280 kilocalories per person and more than half of this amount comes from poultry meat, eggs and milk.

Per capita apparent consumption of cereals has recently been on the rise in Peru; the annual amount grew from 110 kilos per capita in 1990 to about 132 kilos per capita in 2010, as indicated in Table 1.

Peru produces most of the rice absorbed by domestic consumption, but relies heavily on imports for maize and wheat. Almost 90 percent of the wheat available for domestic consumption is imported. Peru imports wheat in the form of grain, which is then milled into flour by domestic mills. In the past, Peru imported significant quantities of rice. In the late 1990s imports accounted for (approximately) one-third of

TABLE 1: CEREAL APPARENT FOOD CONSUMPTION PER CAPITA, 1990-2010 (KG/YEAR PER PERSON)

	1990	1995	2000	2005	2010
Maize	25	25	21	18	17
Rice	41	35	42	48	57
Wheat	42	56	54	54	62
Other cereals*	2	6	6	6	6
All cereals*	110	122	123	126	132

* Excluding cereal used for making beer.
Source: FAOSTAT for 1990-2005. Estimate for 2010 based on official data (INEI and MINAG).

the total domestic rice supply, but imports have declined as domestic production has increased. Maize output has grown substantially, from 1.24 million tonnes in 2005 to 1.52 million tonnes in 2011. However, maize accounts for 42 percent of all cereal imports; about 80 percent of maize imports consist of hard yellow maize used to feed livestock (chiefly chicken but also pigs and milking cows).

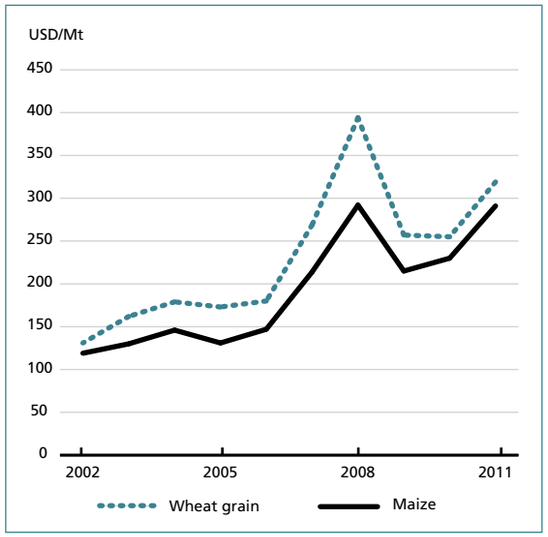
Between 2008 and 2011 the total output of maize, rice (in milled equivalent) and wheat averaged 3.6 million tonnes. Of the total, rice (milled equivalent) accounted for 52 percent and maize accounted for 42 percent. The country also produces approximately 200 000 tonnes of wheat per year and a similar amount of barley. Total cereal production peaked in 2009 at 4.0 million tonnes, and decreased slightly in 2010 and 2011, mainly as a result of the effects of adverse climatic conditions caused by the El Niño and La Niña phenomena. The volume of cereal imports did not change significantly during the period of increased international prices (2007-2011), although imports did grow slightly in 2010 and 2011 to make up for the reduction in domestic output (see Table 2).

TABLE 1: CEREAL APPARENT FOOD CONSUMPTION PER CAPITA, 1990-2010 (KG/YEAR PER PERSON)

	2005	2006	2007	2008	2009	2010	2011
Rice (000 tonnes)							
Output (paddy)	2 466	2 363	2 456	2 794	2 990	2 831	2 621
Output (milled equivalent)	1 645	1 576	1 638	1 864	1 994	1 888	1 748
Imports (milled equivalent)	127	44	80	147	92	95	206
Exports (milled equivalent)	0	0	0	18	48	2	2
Domestic supply (milled equivalent)	1 772	1 620	1 718	1 993	2 038	1 981	1 952
Maize (000 tonnes)							
Output	1 243	1 269	1 362	1 481	1 544	1 541	1 518
Imports	1 314	1 497	1 570	1 401	1 508	1 916	1 905
Exports	8	6	7	7	8	9	7
Domestic supply	2 549	2 760	2 925	2 875	3 044	3 448	3 416
Wheat (000 tonnes)							
Output (grain)	179	191	182	207	223	219	213
Imports (grain+flour, grain equivalent)	1 464	1 473	1 531	1 492	1 513	1 687	1 684
Exports (grain+flour, grain equivalent)	6	19	7	9	12	7	5
Domestic supply (grain equivalent)	1 637	1 645	1 706	1 690	1 724	1 899	1 892

Source: FAO (GIEWS) based on national statistics and FAO estimates.

FIGURE 3: FOB UNIT VALUES OF MAJOR CEREAL IMPORTS, 2002-2011



Source: INEI, and MINAG 2010b.

Food import prices, 2005-2011

As shown in Figure 3, the effective FOB price of Peruvian cereal imports of (wheat and maize) slightly increased from 2002 to 2006, and then followed international trends increasing significantly in 2007-2008. FOB prices fell moderately in 2009 to an intermediate value above pre-surge levels, but then resumed growth in 2010-2011. The second surge was (on yearly average terms) more moderate than in 2007-2008.

Monthly records from January 2006 to December 2011 are shown in Figure 4 (maize) and Figure 5 (wheat), in both FOB and CIF terms. These figures allow for an analysis of the CIF-FOB differential that reflects the varying costs of overseas transportation. This is important because a significant portion of the increased cost of imports in Peru was not due to the higher price of the cereals themselves, but to the surge in transportation costs (linked to oil prices, which peaked by early 2008).[2]

The CIF-FOB gap widened from about USD 30 per tonne in 2006 to peak values of approximately USD 77 for maize and USD 87 for wheat in the first half of 2008. The gap narrowed rapidly during the second half of 2008, reverting to its previous level; it has stayed around USD 30-$40 since the beginning of 2009. The relative importance of freight and insurance has fallen from about 18-30 percent of CIF price in 2006 to 10-12 percent in 2011 (the FOB price of imported wheat in March 2008 surged to a peak of USD 353, while CIF prices reached USD 440 at that time, as freight and insurance costs represented an additional 24 percent over the FOB price of wheat).

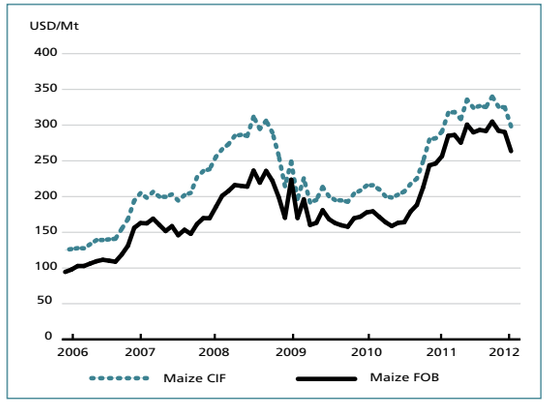
Prices paid by Peruvian importers of wheat and maize increased steadily from 2006 to the first half of 2008, and then decreased during 2009 and the first half of 2010. They rose again in the latter half of 2010 and the first three quarters of 2011, to decrease slightly in the final quarter of that year. Wheat CIF prices in 2009-2010 fell from about USD 440 in March 2008 to about USD 250 by early 2009, where they stayed during most of 2009 and early 2010, until rising again to reach about USD 350 by mid 2011. Maize CIF prices followed a similar path, falling from around USD 300 to about USD 200, and then surging back to a second peak of about USD 330 during 2011. The decrease in late 2011 was slightly more marked (and earlier) for maize than for wheat. A more detailed analysis of wheat and maize is provided in the following sections.

The case of wheat

Peru is largely dependent on imported wheat (almost 90 percent of the domestic supply is imported). Wheat imports in Peru are mostly in the form of *grain* (contrary to Bolivia, for example, where a predominant and increasing proportion is imported as flour). The following sections describe how variations in imported wheat grain (shown in Figure 3 and Figure 5) were transmitted to the domestic market for wheat flour, bread and pasta. This transmission was greatly influenced by Peru's policy frameworks, particularly by its monetary policy (*via* the exchange rate) and also by the limited impact of the cost of grain on wheat-product prices. In addition, the milling industry agreed to keep prices for the most common types of bread and pasta stable, absorbing the elevated cost of imports mainly on other products with higher income elasticity, such as packaged sliced bread, cookies and pastries.

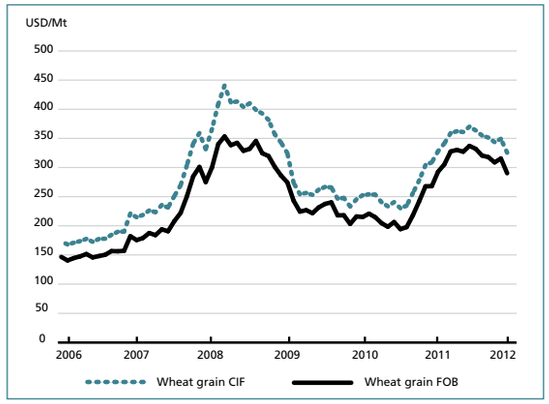
[2] This factor did not play a significant role in Bolivia because imports to Bolivia may follow different routes (from the Pacific, the Atlantic, Brazil, and/or Argentina). The CIF-FOB gap in Bolivia fluctuated widely, according to the source of imports and port of entry, albeit with a general trend toward a narrower gap in recent years.

FIGURE 4: MONTHLY AVERAGE FOB AND CIF UNIT VALUES OF MAIZE IMPORTS, 2006-2011



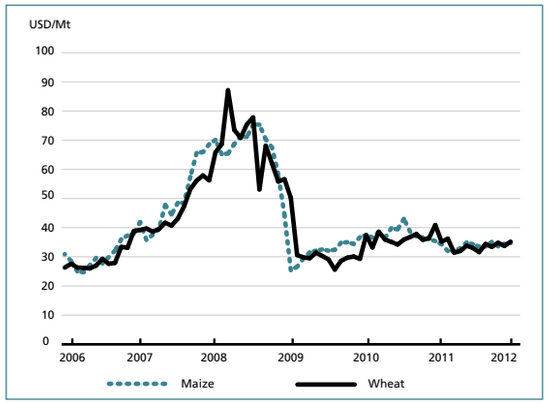
Source: INEI.

FIGURE 5: MONTHLY AVERAGE FOB AND CIF UNIT VALUES OF WHEAT GRAIN IMPORTS, 2006-2011



Source: INEI.

FIGURE 6: CIF-FOB PRICE DIFFERENTIAL FOR WHEAT AND MAIZE, MONTHLY AVERAGE 2006-2011



Source: INEI.

- **Policy response**

When prices surged in early 2008, the government, out of concern for the possible impact on the most vulnerable groups, allocated certain amounts of staple foods for emergency aid, and mobilized some Army units to distribute that food to specific 'hot spots', especially in Lima. About 100 000 families (some 3-4 percent of the population of greater Lima) were reportedly reached by that short-lived operation of food distribution.

No further direct measures were applied in 2009-2011. Food-related measures enacted in 2010 and 2011 were centred on other aspects altogether, such as food safety protocols, genetically modified crops and agricultural bio-security, as shown in the table overleaf.

The reduction of tariffs on food imports in 2007 and the elimination of a surtax on agricultural products imports in 2008 were measures that had already been scheduled as part of the implementation of various liberalization policies, especially the US-Peru Free Trade Agreement (FTA), and were general rather than sectorial (that is, they were not particularly focused on food prices). As permitted by provisions in the FTA, a small

Period	Government policies and measures
2002-2007	Background monetary appreciation: The value of the US dollar declined from S/ 3.62 in August 2002 to S/ 3.15 by August 2007.
Sep-07	Appreciation accelerates: From S/ 3.15 per US dollar in August 2007 to S/ 2.80 in May 2008.
Abr-08	Emergency food distribution to 100 000 families in Lima
May-08	Currency depreciation, from S/ 2.80 in May 2008 to S/ 3.24 in February 2009
Oct-08	Wheat and flour import tariff liberalization (from 25 percent to zero) and agricultural im-ports surtax eliminated, as foreseen in US-Peru Free Trade Agreement
Oct-08	Transfer of USD 16 million in debt burden alleviation for smallholder farmers
Apr-08	Export ban for sugar; credit line for importing sugar
Feb-09	US-Peru Free Trade Agreement officially in force. Signed in 2006, ratified by both legislatures in 2007, implementation laws and decrees issued during 2008
Feb-09	Monetary appreciation resumes to reach S/ 2.67:USD 1 by March 2012
Apr-11	Regulation approved for genetically modified crops
Apr-11	Protocols approved for agricultural bio-security and food safety

The Peruvian currency is the Sol (pluralSoles), which is sometimes abbreviated as S/.

degree of protection to the milling industry is still in force, to be gradually reduced and eliminated over the span of a decade The Peru-US FTA foresees gradual reductions in those and other tariffs and subsidies that were not immediately eliminated at the time of FTA implementation, but all are expected to reach zero in ten years (i.e. by 2018) for bilateral US-Peru trade.[3]

Trade liberalization opened the US market for Peruvian products, but there was also fear that Peruvian farmers could suffer from exposure to cheap imports from the US. As a matter of fact, there was no negative development in domestic agricultural production, even for the most 'sensitive' products such as avian and bovine meat, hard yellow maize, milk, rice, sugar, wheat and others. Indeed all those products *increased* their output from 2005 to 2010, that is, from before the FTA until after its implementation. And they grew quite vigorously. Rice and poultry output increased in that period at an *annual* rate of nearly 9 percent, sugar cane at a yearly 7 percent, milk at 6 percent per year, wheat and hard yellow maize at 5 percent per year, and the output of bovine meat (which cannot be caused to increase at short notice except by stress liquidation of stocks, which is not the case) grew at an annual rate of 3.3 percent. At the same time agricultural exports greatly expanded, especially non-traditional exports such as fruits and vegetables. Similarly, some new export products such as artichokes or wines also showed surprising growth, albeit from a low base.

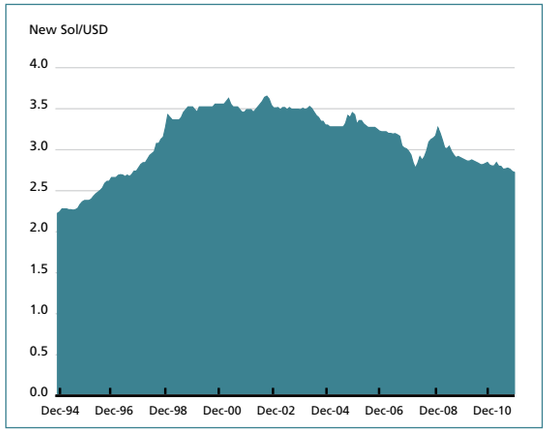
[3] One policy indirectly affecting food prices was the Compensation Fund attenuating the impact of fuel price rises, and thus benefitting transportation, industrial processing, and mechanized agriculture. However, its actual impact on food prices, agricultural production and food consumption may have been quite limited.

- ## Currency appreciation

As in the case of Bolivia, an *appreciation of the national currency* relative to the US dollar attenuated the impact of rising import prices on domestic prices. The exchange rate of the Peruvian currency against the US dollar varied in a less abrupt manner than it did in Bolivia. The Peruvian New Sol (or Sol for short) had depreciated from S/ 2.20:USD 1 in January 1995 to about S/ 3.50:USD 1 in 1999, where it remained until January 2004. The currency then began to appreciate—well before the food price surge—and continued until the end of 2010 when the rate was about S/ 2.65:USD 1 (with a brief episode in the opposite direction during 2008), as seen in Figure 7. This caused domestic prices in national currency to rise far less than they did in dollar terms, as shown in Figure 8, Figure 9 and Figure 10. Taking January 2006 as the basis of the index (100), the wholesale price of wheat grain *expressed in dollars* increased by 80 percent, to an index value of about 180 in 2008, and even more in 2011, but the same wholesale price *in domestic currency* increased much less (on the order of 50 percent instead of 80 percent). It was also lower in 2011 than it had been in 2008 (Figure 8). Likewise with the retail prices of flour and bread: flour rose by 60 percent in dollars but by just 27 percent in domestic currency; retail bread prices increased by 65 percent in dollars but by just 31 percent in national money.

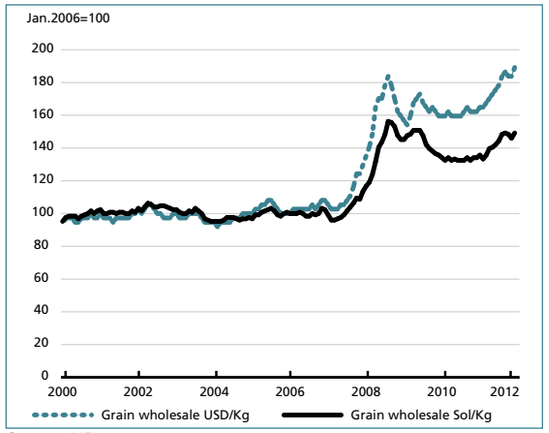
On average, the currency appreciation halved the rise in the domestic price of imported food (using wheat grain as an

FIGURE 7: FOREIGN EXCHANGE RATE JANUARY 1995-DECEMBER 2011



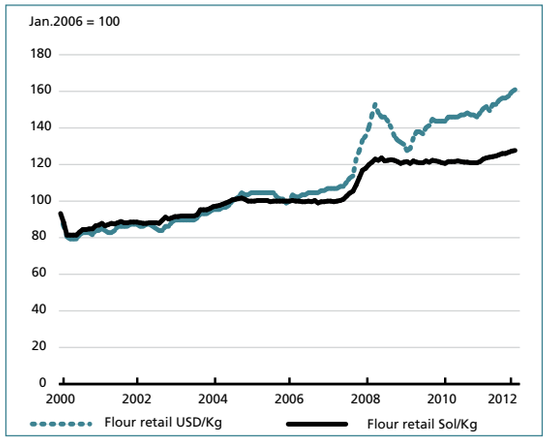
Source: INEI.

FIGURE 8: INDEX OF THE DOMESTIC WHOLESALE PRICE OF WHEAT GRAIN, IN FOREIGN AND DOMESTIC CURRENCY, 2000-2011



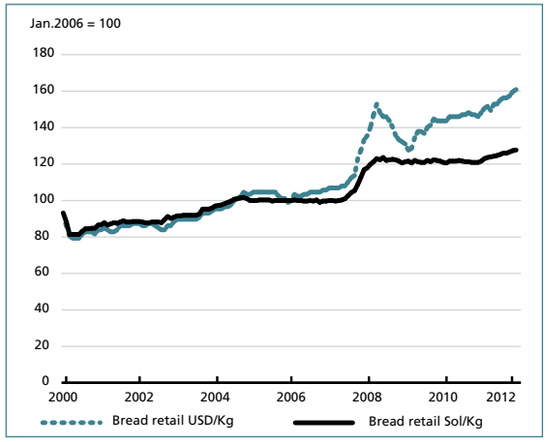
Source: INEI.

FIGURE 9: INDEX OF DOMESTIC RETAIL PRICE INDEX OF WHEAT FLOUR, EXPRESSED IN DOMESTIC AND FOREIGN CURRENCY, 2000-2011



Source: INEI.

FIGURE 10: INDEX OF THE RETAIL PRICE OF WHEAT BREAD, EXPRESSED IN DOMESTIC AND FOREIGN CURRENCY, 2000-2011



Source: INEI.

example because it is the predominant staple food import). Notice also (Figure 9 and Figure 10) that the retail prices of bread and flour in domestic currency were relatively stable through 2008-2010, with only a small rise in 2011, despite the much larger increase of their US dollar price and the volatility of international prices, particularly during the surges of 2007-2008 and 2010-2011. The short period of Sol depreciation in late 2008 and the beginning of 2009, and the subsequent resumption of appreciation until the end of 2011 allowed Peru to use the exchange rate to stabilize the retail price of wheat flour and bread in 2010-2011.

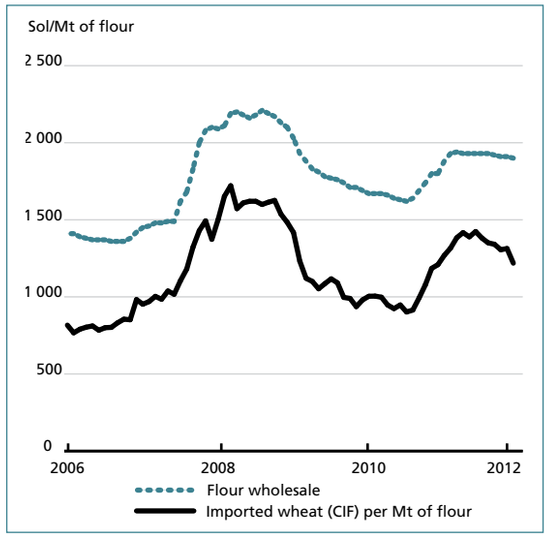
Figure 8, Figure 9 and Figure 10 reflect the pure effect of the exchange rate, independent of other factors. These figures suggest that, in the absence of currency appreciation against the US dollar, domestic prices would have risen much more than they did, i.e. they would have more closely reflected increases in the dollar-denominated price of imported wheat. To have a more detailed view of the impact of policies and other variables on the transmission of import prices to the domestic market, the next sections examine the main links in the wheat value chain, from the import cost of grain to the retail price of the derived consumer products.

- **From import cost of grain to wholesale price of flour**

In addition to the direct impact of the exchange rate, other factors (such as the elimination of import tariffs and the remaining subsidy to the milling industry) influenced the impact of grain import prices on the domestic wholesale price of wheat flour. Figure 11 shows the course of the wholesale price of flour, compared with the cost of the amount of wheat grain required to make one tonne of flour (assumed to be 1.4 metric tonnes of grain at a 72 percent extraction rate), both expressed in domestic currency, from 2005 to 2011.[4] The general conclusion from Figure 11

[4] Estimated from FAO-LATINFOODS 2009, and Leung and Flores 1961.

FIGURE 11: WHOLESALE PRICE OF WHEAT FLOUR, AND CIF COST OF IMPORTED WHEAT AS REQUIRED PER MT OF FLOUR, BOTH IN LOCAL CURRENCY (SOL/MT OF FLOUR)



Source: INEI.

is that the wholesale price of flour moved in line with the cost of imported grain in domestic currency. The difference between the two series reflects the domestic cost of processing wheat grain into wheat flour.

It is appropriate to distinguish two periods: from the start of the steep rise in import prices (June 2007) to the enactment of tariff reductions (October 2008) and from there to May 2009 and the subsequent decline in prices. The first of these periods is shown in Table 3.

During the steep rise in food prices of 2007-2008, the CIF cost of imported grain increased (in dollars) by 64.95 percent. The cost in local currency increased less (59.88 percent) due to contemporaneous currency appreciation, and the wholesale price of flour increased even less (45.64 percent).[5]

[5] Government officers report that some voluntary restraint was applied by the milling and bakery industries at the time of passing its increased grain costs to their customers downstream. Information about this restraint on the part of the milling industry is reported by the industry itself (personal communication, interview with Mr Alejandro Daly, of the millers' trade association).

TABLE 3: CHANGE IN THE GRAIN COST AND WHOLESALE PRICE OF FLOUR, JUNE 2007-OCTOBER 2008

	June 2007	October 2008	Difference	% change
CIF cost of one tonne of wheat (USD /MT)	231.39	381.68	150.29	64.95
CIF cost of one tonne of wheat in local currency (Sol/MT)	732.30	1 170.80	438.50	59.88
CIF cost of required wheat (1.4 MT) per MT flour (Sol/MT)	1 017.00	1 626.10	609.10	59.89
Wholesale price of flour (Sol/MT)	1 490.00	2170.00	680.00	45.64

Source: INEI.

In absolute terms, whilst the required amount of wheat (to make one tonne of flour) increased by S/ 609.10, one tonne of flour increased only slightly more (S/ 680.00): the small difference may be attributable to general domestic inflation affecting other costs within the milling industry. Disregarding that small discrepancy, it can be said that the increased cost of grain was fully transmitted to the price of flour.

In October 2008 import tariffs on wheat were eliminated. The regular tariff and a surtax established in the 1990s were both cancelled, meaning that 25 percent of the combined tax on imported wheat disappeared. The combined effect of lower export prices and zero tariffs led the CIF cost of wheat to fall by 33.6 percent from October 2008 to May 2009[6] and slightly more (35.2 percent) in local currency. However, while the CIF cost of the imported wheat requirement (1.4 metric tonnes of grain to make 1 metric tonne of flour), expressed in local currency, fell by S/ 573.40, the wholesale price of flour fell by only 17.6 percent (S/ 360). The reasons for this limited transmission are unclear; it might be that the milling industry was hesitant to reduce the price of flour because of uncertainty about the future price of wheat. Table 4 shows price changes clearly.

Subsequently, in 2010-2011 the price of flour rose to about 1 950 Sol/metric tonne, in parallel with the price of imported wheat, and remained at that level until end-2011, not responding immediately to the slight reduction in grain prices in late 2011. This may indicate some caution on the part of millers, causing their response to be slower.

Overall, however, changes in the wholesale price of flour have reflected movements in the cost of imported grain in local currency. The end result was an increase in the wholesale price of flour, from S/1 490 per metric tonne in June 2007 to a new level of about S/1 900 per metric tonne in the second half of 2011, a net increase of about 30 percent, for a similar net increase of 30 percent in imported grain prices (which passed from S/1 017 per metric tonne in June 2007 to about S/1 320 per metric tonne in late 2011). For its part, the CIF price of imported grain in dollars had increased by 50 percent during the same period. The main source of the difference

[6] Wheat import prices were falling in FOB terms, but even more so in CIF terms due to the contemporaneous decline in the cost of freight and insurance per tonne of grain: see Figure 5 and Figure 6.

TABLE 4: CHANGE IN THE IMPORT COST OF GRAIN AND WHOLESALE PRICE OF FLOUR, OCTOBER 2008-MAY 2009

	October 2008	May 2009	Difference	% change
CIF cost of one tonne of wheat (USD /MT)	381.68	253.08	-128.60	-33.6
CIF cost of one tonne of wheat in local currency (Sol/MT)	1 170.80	757.90	-412.90	-35.2
CIF cost of required wheat (1.4 MT) per MT flour (Sol/MT)	1 626.10	1 052.70	-573.40	-35.2
Wholesale price of flour (Sol/MT)	2 170.00	1 810.00	-360.00	-16.6

Source: INEI.

was currency appreciation, which attenuated the impact of the rise in international prices, with a supplementary contribution from tariff reductions. Thus, monetary and trade policies clearly reduced the impact of international prices on the wholesale price of flour, from 50 percent to 30 percent. It remains to be examined what happened with the corresponding consumer products.

- **From the wholesale price of flour to the retail prices of bread and pasta**

To examine the impacts of food import prices one further step along the value chain, the retail prices of bread and pasta are compared to the wholesale price of the *required amounts of flour*, expressed in local currency units per kilogram of bread or pasta.[7, 8]

In Peru, as in many other countries, the cost of wheat grain is only a fraction of the final retail price of major wheat products such as bread or pasta. This fact is even more evident in Peru because wheat is mainly imported as grain, and not as flour. One kilogram of bread was sold (as of December 2011) at USD 2.31; the flour required to make one kilogram of bread (about 750 grams) had a wholesale cost of USD 0.50, and the imported grain required to make 750 grams of flour (about one kilogram of grain) had a CIF import cost of about USD 0.36, representing about 16 percent of the final retail price of bread.[9]

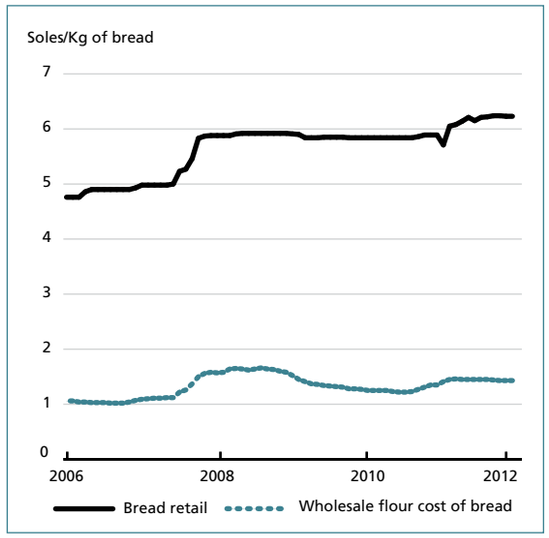
The share represented by wholesale flour costs in the retail price of bread is much lower than in the case of pasta. In both

[7] The actual kind of dry noodles (sold in bulk) that was used in the Peruvian Consumer Price Index (CPI) was changed in January 2009, producing an artificial price jump between December 2008 and January 2009. To avoid this artificial jump both series were joined at the point of commodity change. Noodle prices shown for 2006-2011 thus refer to the kind of noodles that were included in the CPI basket until 2008.

[8] As mentioned before, food composition tables for Latin America estimate that one kilogram of common fresh white bread requires about 750 grams of flour, while making one kilogram of dry noodles takes about 810 grams of flour. The difference between the two requirements is mostly due to the lower water content of dry noodles relative to fresh bread.

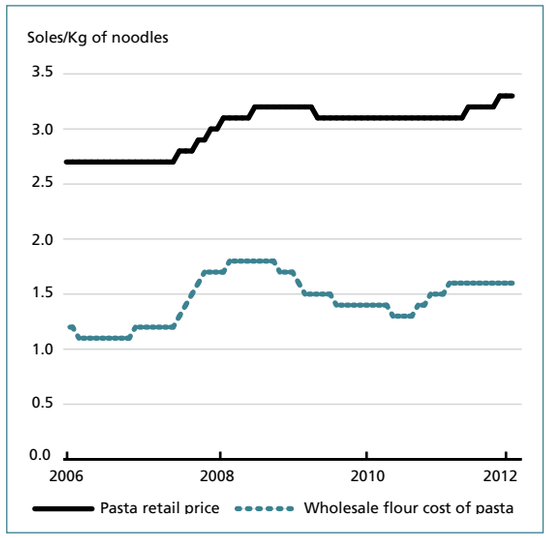
[9] Wheat requirements per kilogram of flour, and flour per kilogram of bread, estimated on the basis of FAO and LATINFOODS (2009) and also Leung and Flores (1961).

FIGURE 12: RETAIL PRICE OF BREAD AND WHOLESALE COST OF THE FLOUR REQUIRED JANUARY 2006 TO DECEMBER 2011



Source: INEI.

FIGURE 13: RETAIL PRICE OF DRY NOODLES AND WHOLESALE PRICE OF THE FLOUR REQUIRED JANUARY 2006 TO DECEMBER 2011



Source: INEI.

cases, consumer prices move in agreement with flour costs but to a lesser proportion, reflecting the limited fraction of the retail price represented by the cost of flour. For instance, when the wholesale price of flour increased by about 80 percent in 2007 and early 2008, the price of bread increased by about 20 percent, and the price of noodles by about 65 percent. The relative impact was greater in the case of pasta, taking into account the greater weight of flour in the cost of pasta. However, when the whole period is considered from 2007 to 2011, the actual percentage changes in bread and pasta prices are similar. During the second wave of price increases, in 2010-2011, both pasta and bread remained relatively stable, with only limited increases.

There were neither maximum prices nor formal agreements with the bakery industry, to keep bread and pasta prices stable, but there was, apparently, a sort of voluntary restraint (or tacit agreement) on the part of that industry to keep the price of staple wheat products relatively stable. There was a differential pass-through, as bakers charged most of the increased costs on non-staple products such as sliced bread, specialty fresh breads, pastries and cookies, while keeping a more stable price for bread and dry noodles. Regrettably, this is not easy to prove statistically because official price data do not include the price of the various non-staple wheat products, but informal data collected in the field indicate larger increases in specialty breads, pastries, cookies and other such products.

In conclusion, considering the whole period of price hikes (from June 2007 to late 2011), a net 50 percent increase in the dollar price of imported wheat was reflected in a 30 percent increase in the wholesale price of flour, and ultimately increases in retail prices of 25 percent for bread and 20 percent for pasta. All in all, domestic policies plus some unforced restraint on the part of industry halved the impact of the international price surges for staple wheat-based food products.

The case of maize

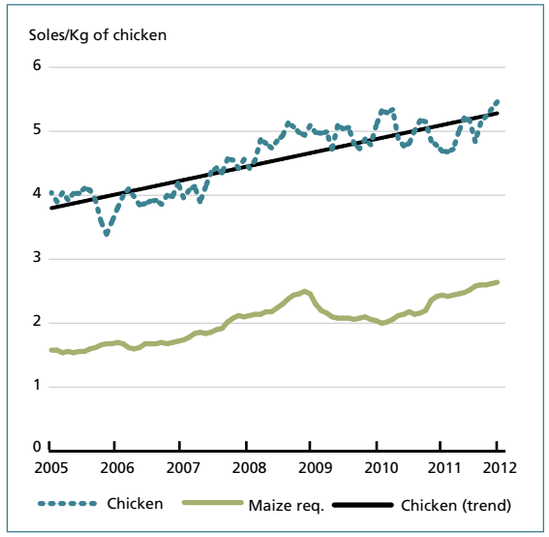
Peru imports about one-half of its domestic supply of maize of all kinds, and an even higher proportion of hard yellow maize used for animal (especially poultry) feed. The import price of maize is shown in Figure 3 and Figure 4. The impact on the price of the main food item (poultry meat) reflects also the increase in other components of chicken feed (especially oilseed meal), most of which are imported. The most usual composition of these balanced meals is about three-quarters maize and one-quarter oilseed, plus some minor ingredients such as minerals. The gross conversion rate from feed to poultry meat is about 2.0, meaning that two kilograms of feed are required to produce one kilogram of chicken meat (referred to as "eviscerated chicken," the form in which poultry meat is sold in the market).[10]

The impact of the exchange rate on the cost of imported maize followed a pattern similar to the one already assessed for the case of wheat: currency appreciation caused the cost of imported cereal to rise significantly less in local currency than in dollars. Additionally, the domestic wholesale price of hard yellow maize is also influenced by domestic maize production, which makes up a significant part of domestic supply. The present section examines the impact of the wholesale price of hard yellow maize on the retail price of chicken.

The dollar cost of imported maize (Figure 4) rose from USD 125 per tonne in January 2006 to USD 306 per tonne in September 2008; it fell to about USD 200 per tonne for most of 2009 and early 2010; then rose again to reach about USD 340 in late 2011. In summary, from January 2006

[10] The actual cost of chicken feed requirements (2 kilograms of feed per 1 kilogram of meat) may have risen even more than the price of maize, since about 30 percent of most feed is made of oilseed cakes, the price of which rose more than maize up to mid-2008. Unfortunately, there are no similar data series for the wholesale prices of cakes or balanced chicken feed.

FIGURE 14: RETAIL PRICE OF CHICKEN (EVISCERATED) AND COST OF MAIZE REQUIREMENTS, 2005-2011



Source: INEI. Feed requirements are assumed to be two kg of maize per kg of eviscerated chicken (the actual feed contains also oilseed cakes and other ingredients).

to January 2012 it rose by about 70 percent. However, the domestic wholesale price of maize rose by 53 percent, significantly less than the dollar cost of imported maize, mostly due to currency appreciation. The price of a kilogram of chicken rose slowly and steadily from about S/ 6 in 2006 to about S/ 7 in 2011 with no major fluctuations throughout the period other than minor monthly variations (Figure 14).

Comparison of policies and outcomes in Peru and Bolivia

Both Peru and Bolivia had some success in stabilizing staple food prices after the waves of rising international food prices in the late 2000s. They did so with very different policies and varied degrees of success. Both countries resorted to reduction or elimination of import tariffs, but Bolivia relied on more interventionist policies such as restrictions or bans on exports, price controls, and subsidies to domestic industry and farmers. Both countries attenuated the impact through currency appreciation, but it was used in Bolivia during the first price surge only (2007-2008) while in Peru monetary policy was used in a more nuanced way: the Sol appreciated during the 2007-2008 surge (up to mid-2008), then transiently depreciated when food prices were falling (in the second half of 2008 and early 2009), and appreciation resumed in time to face the second wave of food price rises in 2010-2011. In both countries, currency appreciation was not a response to food price rises, but a consequence of other factors, such as the worldwide weakening of the US dollar relative to other currencies, and domestic macroeconomic policies that maintained monetary stability while benefitting from favourable terms of trade. Both Bolivia and Peru are exporters of raw materials such as metals, natural gas, and some agricultural commodities (soybeans in the case of Bolivia, various other products in the case of Peru), all of which increased their price in the 2000s.

However, in the case of Bolivia most of the appreciation happened quite rapidly during 2008, with a stable exchange rate afterwards; thus the 2008 price hike was indeed dampened by exchange rate movement, but not so the second surge in 2010-2011. The currency of Peru, instead, appreciated in a more gradual manner from 2006 to mid-2008, then it temporarily depreciated during the second half of 2008 and the beginning of 2009, to stabilize afterwards with just a slight appreciation in 2011. The exchange rate in Peru thus exhibited more flexibility and offered the possibility of attenuating the rising food prices in recent years, whereas in Bolivia it only played a role in the first phase of the price surge.

Peru avoided special interventions in markets, applying only programmed tariff reductions (and surtax elimination) according to the prior schedule of liberalization mandated by its international trade agreements and general policy approach. The small Peruvian subsidy to the milling industry, bound to survive for some years under the US-Peru FTA, was not modified during the period of international food price rises.

In both countries, but especially in Peru, overall inflation is low and real wages have been increasing. However, an analysis of the impact of food price increases over the well-being and access to food of vulnerable groups, or any resulting change in their nutritional status, is beyond the scope of this paper. It is also arguably too soon to tell, especially because detailed information on food consumption and nutrition *after the price rise* is not as yet available.

Both countries exhibit an agricultural (and overall) trade surplus, which was maintained throughout the 2000s. Both suffered the increased price of food imports, but also benefited from higher export prices of agricultural and non-agricultural export commodities. In fact, *agricultural* trade surpluses increased in both countries during the first food price hike of 2007-2008. In the second surge (2010-2011), however, the two countries experienced opposite developments: Peru's agricultural trade surplus expanded further, but the Bolivian surplus (affected by the reduction of maize production and the surge in maize imports) narrowed significantly.

Higher international prices of agricultural products act in favour of growth in domestic production. Both Peru and Bolivia have a positive agricultural trade balance, and that balance become larger as a result of higher prices in the late 2000s. Their food imports became more expensive, but so did their farm (and farm-related) exports. Extra revenue from agricultural exports, of course, would not automatically be funnelled to the household budget of the poor, and official policies may help in that regard. However, imposing extra taxes on exports (or export revenue) in order to capture the extra export revenue may be counter-productive since it may dampen incentives for exporters. This apparently happened in Bolivia with maize producers, who sharply curtailed the area planted and reduced production in the wake of export bans and other similar measures (including a price cap for the principal consumer product of maize, i.e. chicken). No such development occurred in Peru.

Prices of bread, pasta and chicken rose more sharply than the corresponding imports in the case of Bolivia than in the case of Peru. Price controls and domestic subsidies to food industries that were applied in Bolivia are likely to have motivated informal exports to neighbouring countries and reduced the domestic supply of products at the official price, creating a black market for these products. However, these measures may dampen the immediate impact of international prices, at least to a certain extent and in the short term. In the case of Peru, with no such bans or price caps, the percentage increase in the price of the relevant consumer products was much more limited, and below the percentage increase in the price of the corresponding imported cereal, without motivating illegal exports or any form of black market.

In both countries, the CIF cost of imported food commodities represents a very limited share of the retail price of final consumer goods like bread, pasta or chicken. This factor greatly reduces the proportional impact of any given rise in import prices upon the cost of food for consumers. This may be different in other countries where the final product undergoes a less costly phase of processing and marketing.

The experiences of Bolivia and Peru illustrate different policy approaches. However, both countries have healthy agricultural exports while importing a large share of their staple food (mainly wheat in both countries, and in the case of Peru also relatively large amounts of maize and vegetable oils); the surge in food prices also meant a surge in export revenue, since it was accompanied by higher prices of non-agricultural commodities exported by both countries, such as natural gas and minerals.

Concluding remarks

As a net result of monetary appreciation, trade liberalization and some voluntary restraint on the part of industry, consumers suffered only a moderate impact from the increased prices of imported wheat and maize. Consumer prices for bread and pasta increased by about half the percentage increase in the dollar cost of imported wheat grain, whilst the consumer price of chicken meat increased by less than half the percentage increase in the dollar cost of imported maize. The price increases occurred in a period in which domestic output and total domestic utilisation of wheat and maize also increased.

The Peruvian case illustrates the kind of policy responses to international price hikes that avoid export restrictions and price controls, in the context of an open economy. Since starting economic reforms in the early 1990s, and especially since 2000, the country has known several successive governments, but all of them have adhered to the tenets of a free market economy. Peru is growing vigorously, with a steady flow of foreign and domestic investment, and opening its economy to the world, most notably through the US-Peru FTA, as well as trade pacts with other regional bodies such as the European Union and the Asia-Pacific Economic Cooperation area, and a generally low tariff. A consistent monetary policy with flexible exchange rates attenuated the impact of international price hikes; the economy (and its exports) rose strongly even during a long period of currency appreciation, due to increasing competitiveness. Agricultural trade has a positive balance and domestic agricultural production has continued to grow, even in products like wheat, maize and soy, which were all regarded as 'sensitive' in relation to the US-Peru FTA and other policies of economic openness.

References

FAO-LATINFOODS. 2009. *Tabla de composición de alimentos de América Latina*. FAO Regional Office for Latin America and the Caribbean. Available at http://www.rlc.fao.org/es/conozca-fao/que-hace-fao/estadisticas/composicion-alimentos.

Leung, W.-T. W. & Flores, M. 1961. *Food Composition Table for Use in Latin America*. INCAP, Guatemala and NIH, Bethesda, MD.

MINAG. 2010a. *Dinámica Agropecuaria 1997-2009*. Lima.

MINAG. 2010b. *Comercio exterior agrario*. Lima.

MINAG. 2011. *Dinámica Agropecuaria 2001-2010.* Lima.

CHAPTER 10

CONCLUSIONS

DAVID DAWE AND EKATERINA KRIVONOS*

Summary of policy measures adopted to counteract high food prices

As the country chapters show, governments in Latin America applied an array of policy measures in reaction to skyrocketing food prices, attempting either to contain the pass-through of world prices to consumers or to mitigate the negative consequences of high food prices through transfers and food distribution. Market interventions to influence domestic prices ranged from border measures to direct state purchasing and distributing of staple foods, primarily cereals. At the same time, the vast majority of the countries in the region reinforced programmes to stimulate production, typically by providing farmers with inputs, access to credit and technical assistance. Some countries counteracted the negative implications of the price spikes by expanding safety nets to compensate for the loss of consumers' purchasing power, usually by building upon existing policies and programmes. Other mitigation strategies included the development of local markets and rural infrastructure to improve the flow of food products from farms to cities, encouraging the diversification of consumption to include traditional and locally produced products, supporting agricultural research and development and strengthening extension services.

Policy makers preferred border measures because they were a quick way to contain the negative effects of global price increases on domestic consumers. These focused on the reduction or elimination of import tariffs and the imposition of export restrictions on some key products. Both types of measures were intended to boost domestic food supplies. Moreover, export taxes on agricultural products also had the potential to boost fiscal revenues, especially for those countries where agriculture accounts for a large share of export revenues. The choice of trade policy instrument varied substantially among the countries analysed in this book, depending not only on the alternatives available to each country, but also on the overall political setting and the country's stance with respect to trade openness.

The trade measures were typically concentrated in products that weighed most in the basic consumption basket and therefore constituted key products in terms of food security. The measures were also determined by the country's dependence on revenues in the agricultural sector and the composition of its imports and exports.

* Helpful comments from David Hallam and Jamie Morrison are gratefully acknowledged. Any errors are the responsibility of the authors.

TABLE 1: SUMMARY OF POLICY RESPONSES TO HIGH FOOD PRICES DURING 2007-2009, BY COUNTRY

Country	Cereal import dependency ratio in 2007*	Changes in trade and market policies	Changes in other policies
	%		
Argentina	0.3	Increase in export taxes and quantitative export restrictions; target prices	Price subsidies to producers and millers
Bolivia	22.3	Export ban and tariff elimination	Subsidies to producers and millers
Brazil	14.7	Temporary tariff reduction; minimum guaranteed prices to producers; release of public cereal stocks	Expansion in social protection and access to farm credit; minimum guaranteed prices to producers
Dominican Republic	76.8	Agreements with private sector on prices to consumers	Expansion in social protection; subsidized prices to consumers; seed distribution and expansion in farm credit
Ecuador	38.6	Export ban; tariff reduction; import subsidy; administered prices and state purchasing	Producer price support; agricultural input subsidies
Mexico	36.5	Tariff reduction and agreements with private sector on prices to consumers	Expansion in social protection and sales of subsidized food through state food retail network
Nicaragua	37.9	Tariff elimination; price controls and state purchasing	Subsidized agricultural inputs and expansion in access to farm credit
Peru	50.0	Tariff reduction	Food distribution to poor households; expansion in farm credit and rural infrastructure

* Share of imports in total cereal supplies: Cereal imports/(cereal production+cereal import-cereal export).
Source: Country chapters, FAO-GIEWS (http://www.fao.org/giews/pricetool/) and World Trade Organization.

The main features of trade policies implemented during 2007-2009

Countries that depend heavily on imports to satisfy the domestic demand for cereals, including Bolivia, Ecuador, Mexico, and Nicaragua tended to lower or eliminate import tariffs on most important food products at one point or another. This also happened in other import-dependent countries not analysed in the book (El Salvador, Guatemala and Honduras, among others). A notable exception was the Dominican Republic, which already had zero tariffs on key importable staples such as maize and wheat, but maintained high tariffs on products largely supplied by domestic producers, such as poultry and rice.

Some of the countries also introduced export restrictions on a number of products, including those that are not exported on a large scale, as in the case of Bolivian maize and wheat and Ecuadorian maize. In these cases, export restrictions did not have any sizable effects on either domestic or export markets. However, in instances where a country is a major exporter of a commodity, as in the case of wheat in Argentina, export restrictions seemed to have pivotal implications, not only for domestic producers, but also for importing countries and global supplies.

In general terms the countries analysed in this book can be divided into two groups: those where governments intervened heavily in the market to influence domestic prices, usually through a combination of export restrictions and price controls (Argentina, Bolivia, Ecuador and Nicaragua); and those that relied primarily on social policies (food distribution and increases in social transfers) to protect poor consumers (Brazil, Dominican Republic, Mexico and Peru). In the first category, some governments accompanied border measures with a renewed state involvement in food purchasing, marketing and distribution, as in the case of Ecuador and Nicaragua. In the second category, the countries did not resort to trade measures, except for isolated cases of tariff reductions.

The ability of these policies to soften the impact of high international food prices on consumers was mixed. Observed price changes of the main staple foods, analysed in Chapter 1, do not provide any clear indications on which policies were most successful. Price increases affected both net food importing and net food exporting countries; thus, there was no clear relationship between the degree of self-sufficiency and the evolution of domestic food prices. The reason why it is very difficult to determine the effects of policy measures on food prices is that there were many other factors at play that could have affected the interaction between domestic and international prices. For example, local conditions, such as the weather and market structure, can play a key role in the formation of consumer prices, especially when the market is primarily supplied by local producers.

Other factors include the dynamics of exchange rates and the cost structure of the final good that is purchased by consumers. The appreciation of some Latin American currencies during 2007 and 2008 against the US dollar played a major role in dampening the impact of international prices on domestic prices. Thus, between 2006 and 2008 Bolivia's currency appreciated by 10.7 percent against the US dollar, whereas the currencies of Brazil and Peru appreciated by 18.6 percent and 12.0 percent, respectively. As a result, in some countries the retail prices of staples such as bread and flour in national currency increased far less than international prices during the same period. For example, as the chapter on Peru explains, between January 2006 and June 2008, when world prices of wheat reached their peak, the retail prices of wheat flour in Peru increased by 46 percent in dollar terms, but only 23.6 percent in Peruvian Soles. The domestic prices of both white and yellow maize followed a similar pattern.

It is important to keep in mind that the cost of raw inputs represents a small share of the final retail price of heavily processed consumer goods such as bread and pasta. The cost share of wheat flour in the price of bread in both Argentina and Bolivia has been evaluated at 20 percent[1]. The growth in the costs of other inputs such as rent and labour used in the production of bread and other wheat-based products could have had a stronger effect on final prices than the policies implemented to keep wheat prices low. Thus, the degree of processing strongly influences the effectiveness of measures that target the reduction of commodity prices as a tool for improving food security.

Given these difficulties in the interpretation of the observed changes in domestic food prices, policy lessons and recommendations are best drawn on a country by country basis. However, some general considerations with regard to the implemented policy measures

[1] Moreover, in Argentina, the cost of wheat accounts for approximately 48 percent of mill costs. Therefore, the incidence of wheat in the cost of bread production is approximately 10 percent. See the Argentina and Bolivia country chapters.

can be made. We consider here some of outcomes of the most commonly used trade measures in Latin America and the lessons that can be drawn from them.

Reduction or elimination of import barriers

The majority of countries in Latin America have lowered import barriers on key food products at one point or another since 2006. This step helped to contain the upward movement of some domestic prices, although to a varying degree, depending on the cost share of the imported product in the final good (as in the case of wheat) as well as the competitive behaviour of importers, processors and retailers. Overall the reduction of import barriers probably had a limited impact since the majority of countries already had low import tariffs on many food items as a result of multilateral, regional and bilateral trade negotiations. Among the most recent FTAs is the CAFTA-DR agreement, which grants the United States access to markets in Central America and the Dominican Republic for a variety of agricultural and food products. On the other hand, high import tariffs and quotas were kept on products considered sensitive for the domestic economy, including dairy, rice and poultry (in the case of Central American countries and the Dominican Republic). Therefore, the elimination of tariffs was by no means the principal instrument to secure lower prices.

Introducing export restrictions

In the short run, exporting countries may have incentives to impose export restrictions to ensure sufficient domestic supplies. The governments that introduced export bans or quantitative restrictions argued that diverting exports to the domestic market would ease the pressure on prices to consumers. The evidence does not support this claim. Certainly, in the case of Brazil, which did not constrain exports, the retail price of wheat flour more than doubled between January 2006 and June 2008. But equally high changes were registered in the same period in Argentina, which imposed an export ban and increased export taxes on wheat. Bolivia, which also relied on export restrictions, witnessed dramatic increases in the prices of wheat and wheat-based food products as well. In fact, Argentina and Bolivia are among the countries where the retail prices of bread, pasta and wheat flour registered the highest growth in Latin America. Therefore, based on Latin American experience, export restrictions are not an effective tool for keeping consumer prices in check.

Overall, the long-term effectiveness of quantitative restrictions is debatable, even though in some situations they can provide temporary relief as an emergency measure. Not only can they be undermined by illicit trade (as reported in Bolivia and Ecuador, for example), but export controls also weaken the supply response. For example, as the chapter on Argentina shows, there was a sharp decline in the area planted with wheat as farmers shifted towards maize and soybeans, which were more profitable. Maize and soybeans were also subject to high export taxes, but were not subject to erratic management, such as in the case of wheat export quotas. In Ecuador, rice growers had to be supported with minimum prices in order to produce in the presence of an export ban.

Apart from the effects on domestic producers and consumers, export restrictions, when introduced by several countries in the same period, can have severe global implications. Most analyses show that by diminishing global supplies, trade restrictions can make world markets more volatile, causing additional upward pressure on prices (Martin and Anderson, 2012; Bouët and Laborde Debucquet, 2010). An abrupt break in exports particularly affects traditional trading partners that are forced to look for new suppliers at short notice to satisfy their demand.

Under certain conditions, export taxes can be used to stabilize prices (Gouel and Jean, 2012). In general, taxes are preferable to quantitative constraints as an export limiting instrument, because they can constitute an important and easily managed source of government revenues and do not generate rent-seeking behaviour. In practical terms, the administration of taxes tends to be more transparent and predictable than quantitative restrictions, making them more easily acceptable to farmers.

Protecting domestic producers from external competition

Another strategy that has been applied in some countries for strategic food products, such as rice, has been to protect domestic producers from foreign competition. One such case is the Dominican Republic where the long-established rice policy almost completely insulates the domestic market from import competition through a combination of price supports to producers and high import barriers. This policy kept the domestic price of rice artificially high for many years. As a result, when international food prices soared, the domestic rice price changed very little. Retail rice prices grew only 14 percent from January 2006 to June 2008; in the same period, international prices roughly tripled.

Similarly, in Nicaragua, rice prices did not increase as much as world prices, partly due to high tariffs on rice imports and the pricing system under the Support Programme for Rice Producers (Programa de Apoyo al Productor Arrocero), which establishes relatively high minimum prices to producers. The MFN tariffs on rice were kept at 60 percent during the whole period, while tariffs on beans, wheat flour and vegetable oils were eliminated in 2008. As mentioned earlier, Ecuador also supported rice farmers with subsidies as a way to provide income support after exports were prohibited.

This approach is very different from the path taken by the other countries analysed, since it relied on generating long-term incentives for farmers to produce rice, rather than temporarily boosting domestic supplies through changes in border measures. It is a policy that certainly introduced a significant level of stability to domestic markets and has been successful in practically eliminating the fluctuation in domestic prices despite rapid increases in world prices. However, this stability usually comes at a high fiscal cost and significantly higher consumer prices (relative to both domestic prices in other countries and world prices) when international prices are below their peaks. Moreover, in both the Dominican Republic and Ecuador, price support to producers led to an accumulation of large rice stocks which cannot be sold easily at the high administered price, either domestically or abroad.

Establishing price controls

State involvement in price formation at the consumer level took two main alternative forms. First, there were time-bound price agreements with the food industry and retailers, as in the cases of the Dominican Republic and Mexico. Second, there were caps on retail prices (as in the cases of Argentina, Bolivia and Ecuador), typically coupled with subsidies to food processors, such as millers and bakeries. As the country chapters demonstrate, the maximum prices were rarely observed, as the governments lacked an effective control mechanism to ensure compliance. As a result, the main beneficiaries of the subsidy appeared to be the wholesalers and the food industry.

In cases where price controls were introduced without any supporting mechanism such as a subsidy or import

protection, producers had to bear the full cost of a lower retail price, at a time when input costs (especially feed for poultry) were on the rise. For example, the cap on chicken retail prices in Bolivia imposed a severe strain on poultry farms, which were facing the high cost of yellow maize and soybean cake used for feed. A similar situation was observed in the cases of sugar and wheat flour. As a result, producers started selling in the informal market, and the flow of illicit exports of these items to neighbouring Peru seemed to increase, drawn by the price differential. Thus, price controls contributed to uncertainty in domestic supplies in a situation already marked by fluctuating world prices and shifting border measures.

Social protection as an alternative to price stabilization

Overall, one can argue that targeted subsidies to the poor, as opposed to attempts to manipulate domestic food prices, could be a more effective measure to alleviate the burden of rising food prices for the vulnerable population. Targeted subsidies do not distort markets as much as price stabilization and are more effective in terms of government expenditure than subsidies that lead to lower food prices for the entire population. Many Latin American countries have successfully scaled up their social programmes to at least partially compensate poor consumers for food price increases.

Thus, Mexico's reaction to high food prices focused on expanding existing safety nets for poor consumers. The main social programmes (Oportunidades and Programa de Empleo Temporal) were instrumental in reaching the poorest inhabitants of Mexico, as the additional cash transfers between 2006 and 2008 corresponded to about one-third of the increase in the cost of the food basket in rural areas. The Brazilian government also relied on social transfers to deal with the erosion of purchasing power, coupled with a complex system in support of family farming. This strategy has produced positive results, lowering poverty rates and improving food security despite the significant increases in food prices during some periods. Moreover, the Brazilian agricultural sector has greatly benefitted from the expansion in access to credit, research and development and generally non-distortive agricultural policies. As a result, the agricultural sector, including smallholder farmers, has thrived, enabling Brazil to become a major supplier of food products at the global level.

A policy measure worth considering is payouts to poor consumers to compensate for the increase in the cost of the basic food basket, activated when food prices reach a certain predetermined level. Such an option was implemented in Chile in the form of a once a year cash transfer to the poorest 40 percent of families to compensate for food price increases. This strategy is likely to be less distortive and easy to implement in a transparent and predictable manner.

Policies often have undesirable side-effects

As discussed earlier, the majority of the countries applied a set of policies to counteract rising food prices, adopting either several measures at once or introducing them sequentially. The countries that took a more interventionist approach to manage food prices were often faced with the need to alleviate the undesired effects of one policy by introducing a whole new measure.

For example, in many cases export restrictions had to be accompanied by other measures such as minimum producer prices and government purchases, contributing to further market distortions and imposing substantial fiscal burdens. Ecuador is a case in point. The ban on rice exports was first introduced in September 2007 and later

extended several times. The prohibition of rice exports in the context of rising world prices was hard to enforce and reports of illicit exports followed. In response, the government tried to establish mechanisms at the border to prevent rice smuggling in neighbouring Colombia and Peru, including the distribution of quotas of rice to each border province. Given the lowering of the domestic price produced by the export ban, smallholder farmers demanded guarantee prices from the government to cover their costs. In response, the government established support prices and eventually lifted the rice export ban. Moreover, the government began purchasing rice directly from farmers, paying them a set minimum price and using the purchased rice to develop a strategic food reserve. This led to the accumulation of stocks that required public investments in storage facilities and the need to dispose of the growing inventory.

Moreover, the Ecuadorian government, through agreements with supermarkets, introduced maximum consumer prices on some products, including bread, milk, oils, pasta, poultry, sugar, tuna and vegetable oats, effectively imposing a price band. The price band was supported by government subsidies with growing government expenditure as a consequence.

Policy predictability matters

In Ecuador, just as in Argentina and Bolivia, export restrictions were initially temporary but were later extended, making it difficult for producers to make informed production and marketing decisions. This contributed to an uncertain policy environment, reducing farmers' incentives and ultimately leading to diversification away from the crops affected by frequent policy changes.

As noted earlier, the unpredictability and lack of transparency of quantitative restrictions led Argentinean farmers to shift away from wheat towards maize and soybeans. Maize in Bolivia provides another example of the problems arising from inconsistent export restrictions, as the government imposed an export ban for several months, rescinded it, and then re-imposed it again before eventually dropping it. This uncertainty seems to have caused Bolivian maize farmers to actually reduce area planted at a time of high international prices.

In general, farmers have to deal with a high level of uncertainty due to the weather and market price fluctuations. Unpredictable policies can augment this uncertainty, further reducing production incentives.

Concluding remarks

Price stabilization in the traditional sense, through direct state interventions in the market, has proven to be rather costly and difficult to manage, with often adverse outcomes for agricultural producers. Trade policy can be used to temporarily offset shocks to food prices, however it does not, by itself, guarantee low prices to consumers due to the difficulties in execution and often ambiguous effects on agricultural production, as discussed above. The experience in Latin America shows that any new measure that can be expected to significantly alter the dynamics of domestic supply and demand should consider the short-term and long-term effects on producers, consumers and the fiscal accounts. The cost-effectiveness of trade measures should be assessed in relation to other, possibly less distortive policy options that could achieve the same food security outcomes.

In the longer run, to minimize the risks of unexpected movements in food prices and to guarantee sufficient access to food, global food production needs to be strengthened. Possible policy actions to boost food production at the country level include research and development to increase

productivity in a sustainable manner and enhance resilience to risks associated with climate variability. Development of modern risk management tools, promoting greater competitiveness in the marketing channel, improved infrastructure, expansion of rural credit and better extension services are equally important. Moreover, since food insecurity is largely driven by poverty, more attention needs to be paid to developing safety nets and economic and labour market policies to improve income-generating opportunities for the poor.

References

Bouët, A. & Laborde Debucquet, D. 2010. Economics of Export Taxation in a Context of Food Crisis: A Theoretical and CGE Approach Contribution. IFPRI Discussion Paper 00994. June 2010.

FAO. 2011. *Safeguarding food security in volatile global markets*. Adam Prakash, ed. Rome.

FAO. 2013a. FAOStat. Available at http://faostat.fao.org/?lang=en

FAO. 2013b. GIEWS Price tool. Available at http://www.fao.org/giews/pricetool/

FAO. ECLAC and IICA. 2012. Respuestas de los países de América Latina y el Caribe al alza de la volatilidad de precios de los alimentos y opciones de colaboración." *Boletín CEPAL/FAO/IICA* no. 1. Available at http://www.rlc.fao.org/fileadmin/content/events/conferencia_regional/cepal_fao_iica_es.pdf

FAO, IFAD, IMF, OECD, UNCTAD, WFP, World Bank, WTO, IFPRI and UN HLTF. 2011. *Price Volatility in Food and Agricultural Markets: Policy Responses*. Inter-agency report. June 2011.

FAO, WFP and IFAD. 2012. *The State of Food Insecurity in the World* 2012. *Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition*. Rome, FAO.

Gouel, C. & Jean, S. 2012. Optimal Food Price Stabilization in a Small Open Developing Country, *Policy Research Working Paper 5943*. The World Bank.

Martin, W. & Anderson, K. 2012. Export restrictions and price insulation during commodity price booms. *American Journal of Agricultural Economics*, 94(1).

International food prices rose sharply between 2007 and 2008, followed by a further spike in 2010–11, and in the following years prices remained well above the level of the previous decade. Persistently high and volatile food prices have eroded the purchasing power of poor households and increased the food import bill of many developing countries.

Despite adequate supplies of basic foods in Latin America and the Caribbean, access to food remains limited for a large share of the low-income population in the region, and food security remains a challenge. The increases in prices of basic food crops, such as maize, rice, and wheat, have placed food security atop the political agenda in many countries. This has prompted a number of policy responses to counter the negative effects of high international prices on poverty and hunger. Governments attempted either to contain the pass-through of world prices to consumers or to mitigate the negative consequences of the high prices for households through cash transfers and food distribution. Different types of interventions were put in place, ranging from trade policy measures to purchasing and distribution of staple foods, cereals in particular, by the state. Among trade policy instruments, export restrictions and the elimination of import tariffs have been most commonly applied. At the same time, the vast majority of countries in the region have reinforced programmes to support production, typically by providing farmers with inputs, access to credit and technical assistance.

This publication presents evidence with regard to the effectiveness of policies and programmes introduced in response to rising food prices in eight selected countries in the region: Argentina, Bolivia, Brazil, the Dominican Republic, Ecuador, Mexico, Nicaragua and Peru. The case studies provide insights into the economic and policy environment at the time of the first price spike of 2007–08, analyse the measures that were introduced in response and discuss the evidence regarding the impacts on food security. As such they provide lessons learned in terms of the effectiveness of the different measures in achieving the intended food security goals and the challenges encountered in their implementation. The findings contribute to the debate on appropriate policy responses to future price shocks, and draw attention to the complexity and importance of the ex-ante analysis of possible effects.

I3909E/1/06.14