DAI
Shaping a more livable world.

cirad
AGRICULTURAL RESEARCH FOR DEVELOPMENT

Food Reserves

Working Paper #2

March 2019

Food Security and the Formation of Agricultural Grain Stocks in Brazil

Walter Belik
Altivo R. A. de Almeida Cunha

Study funded by the European Commission,
Directorate-General for Development and Cooperation, Unit C1

DAI Europe Ltd.

3rd Floor Block C
Westside,
London Road,
Apsley
HP3 9TD
United Kingdom

Tel: +44 (0) 1442 202 400
Fax: +44 (0) 207 420 8601
www.dai-europe.com

About this working paper

This working paper is one of the products of a study conducted by DAI at the request of the European Commission as part of the advisory service ASiST managed by the unit in charge of rural development, food security and nutrition (C1) within the Directorate General for International Cooperation and Development (DEVCO).

The study has aimed at clarifying the potential role of food reserves in enhancing food and nutrition security in developing countries, and at making recommendations on how to use food reserves (in complement to other tools), taking into account the specificities on the context and the constraints of World Trade Organization (WTO) disciplines.

The study was conducted based on i) an extensive review of the existing literature (both theoretical and empirical) and ii) 10 case studies analysing national or regional experiences in Africa, Asia and South America.

All the products of the study (including other working papers, a compilation of case study summaries, and a synthesis report) are available at: https://europa.eu/capacity4dev/hunger-foodsecurity-nutrition/discussions/how-can-food-reserves-best-enhance-food-and-nutrition-security-developing-countries.

Acknowledgements

Franck Galtier (CIRAD) coordinated the overall study. This working paper was written by Walter Belik (Institute of Economics, Unicamp, Brazil and Altivo R. A. de Almeida Cunha (consultant, FAO). It benefited from the review of Franck Galtier, Ralph Cummings (consultant, ex IFPRI), Kalanidhi Subbarao (consultant, ex World Bank), and Steve Wiggins (Overseas Development Institute).

Contents

List of Figures

List of Tables

List of Abbreviations and Acronyms

AGF	Acquisitions of the Federal Government
CDDS	Direct Purchase with Simultaneous Donation
CIBRAZEN	Cia. Brasileira de Armazenamento
CONAB	National Company of Food Supply
EGF	Federal Government Loans
FOB	Free on Board
FNDE	National Fund for Educational Development
PAA	Food Acquisition Programme
PEP	Premium for Product Outflow
PGPM	Minimum Price Guarantee Policy
PLE	Stock Release Price instrument
PNAE	National School Feeding Programme
PPAIS	Paulista Programme of Social Interest Agriculture
PRONAF	National Programme to strength the Family Farms
MERCOSUR	Southern Common Market
UNDP	United Nations Development Programme

1. Background: Institutional Evolution of Brazilian Agricultural Policies

Brazil has a long tradition of agricultural policies. Brazil has utilised public procurement programmes and maintained buffer stocks since the Convention of Taubaté (1906), by which the state held coffee purchases from large landowners to regulate international prices. In the "Estado Novo" period (1937-1945) various public institutions were created, whose aim was to promote and regulate the sugar, mate and pine markets. These policies were intended to foster regional elites with price stabilization programmes. In 1943, President Getúlio Vargas' government created a production financing company, the Cia. de Financiamento da Produção, with the aim of building regulatory stocks of grains and other products, complemented by the creation of a storage company, the Cia. Brasileira de Armazenamento (CIBRAZEN) in 1962 in order to build and manage public warehouses for food and ensure price stability.

From the mid-twentieth century, Brazil has created support mechanisms for the production, marketing of agricultural stocks heavily influenced by the US model of the Commodity Credit Corporation. These policies are still in force, aiming to regulate domestic prices by placing public stocks purchased through a system of minimum prices. The most common marketing instruments are direct purchases from the federal government (AGF) and public loans to finance private stocks, with a purchase option by the federal government (EGF).

The key element in this policy is the annual establishment of minimum purchase prices for agricultural products by the Government. These prices serve as a reference for the purchase of produce which is below the established limits, and for the release of produce through sale when prices are high. Essentially, its goals are anti-cyclical policies to reduce large price swings in times of harvest and between harvests.

In the 1980s and 1990s, this policy served as a strong incentive for opening domestic agricultural frontiers by establishing minimum Free on Board (FoB) prices, which became profitable for producers from more distant areas and without adequate outflow infrastructure.

Economically liberalising, the Brazilian government in the 1990s established clear policy rules for intervention in regulating stocks, while exchanges rate appreciated and import barriers were reduced. To avoid arbitrary decisions regarding the placement of public stocks in the market, in 1991 the government created the Stock Release Price instrument (PLE) which becomes effective with the Minimum Price as a ceiling and a floor for authorities' action, establishing a system of "passive intervention" (Delgado, 2005: 2) with very low pressure on market prices. The government also sought to encourage private action in the management of public stocks through an increasing emphasis on market price guarantees, without the need to purchase stocks.

From the 1990s, a series of financial innovations led Brazilian agricultural policy to adopt hedge mechanisms and futures markets for price stabilization through instruments seeking to stimulate the build-up of private stocks and commodity exchanges.

The main budgetary instrument for stock build-up is the Option Market. This instrument allows the Federal Government to selectively acquire products, choosing the region and the type of product they want to buy from farmers and cooperatives that are registered producers in accredited Commodity Exchanges.

In selling mode, the beneficiary has the right - but not the obligation - to sell their product to the Government at a future date, at a previously fixed price. The Put Option Agreement is released when the market price is below the minimum price and the government is interested in signalling the future price for the market, guaranteeing income to producers and stimulating production to meet domestic consumption. Access to the contract is through auctions, where all accredited Commodity Exchanges (of cereals, goods and/or futures) are simultaneously connected.

These policies aim to regulate domestic prices by placing public stocks purchased through the minimum price system. Since its inception, there has not been any restriction on the participation of small producers (latterly including family farmers) in the build-up of stocks.

Box 1 shows the dynamics of the main types of stock buildup policy instruments in Brazil.

Box 1 Brazil: Key Instruments of the Stock Build-up Policy

Minimum prices: fixed by Decree annually for each crop and implemented through instruments designed to operationalise the PGPM. The government action starts when the market price is below the minimum in production regions. On the other hand, every product purchased by the government should return to the market in due course and with the purchase prices consistent with the normal market. Products covered by the policy are: cotton, rice, beans, corn, soybean, cassava, milk, coffee, winter cereals (oats, canola, barley, wheat, triticale), garlic, peanuts, rubber, carnauba, Brazil nuts, cashews, sunflower, silk cocoon, guaraná, jute-mauve, castor beans, sisal and sorghum.

Acquisitions of the Federal Government (AGF): allows the government to guarantee a minimum price to farmers, family farmers and / or their cooperative, through direct acquisition, i.e., the direct purchase and payment in cash, of product as part of the agenda of PGPM. This operation is performed when the market price is below the minimum price set for the current crop, subject to the transfer, by the National Treasury, of the resources for the operationalisation of the acquisition.

Put Option Agreement: created with the liberalisation of the Brazilian economy, enables the Federal Government to acquire products selectively, i.e., choosing the region and the type of product they want to buy, benefiting farmers and cooperatives of registered producers in an accredited Stock Exchange, and who are not in default with the Company. It covers all products defined by the PGPM, and contracts are issued by decision of the government authorities, depending on the market conditions of each product. It aims to protect the producer / cooperative against the risks of falling prices, since the contract is (preferably) released within the period of harvest and maturity is in its off season. It also aims to improve the implementation of official policies of support and regulation of agricultural prices in the domestic market, becoming an alternative instrument to PGPM, at harvest time. Occurring in selling mode, it gives the beneficiary the right - but not the obligation - to sell their product to the Government at a future date, at a previously fixed price. The Put Option Agreement is released when the market price is below the minimum price and the government is interested in signalling the future price for the market, guaranteeing income to producers and stimulating production to meet domestic consumption. Access to the contract is through auctions, where all accredited Stock Exchanges (of cereal, goods and / or futures) are simultaneously connected.

Premium for Product Outflow (PEP): enables the government to guarantee a minimum price to the producer or cooperative without the need to purchase the product. It consists of a specifically defined grant to the market

sector. Advanced warning is issued by the Federal Government of the public auction for the purchase of products at a guaranteed reference value. This reference value is later used by the bidder which undertakes to promote the outflow for consumption regions previously established, according to the conditions laid down in Regulation and specific Warnings. Through the auctions the payment of the difference between the minimum price and the market price is done, decomposed from the import parity price to the federal unit of production. This instrument can be used to supplement the supply of deficit areas from private stocks.

Risk Premium for Agricultural Product Purchase coming from Put Option Private Agreement: an economic subsidy granted at public auction to the consumer segment (traders or processing industries, for example) that is willing to acquire a certain product at a later date, directly from producers and / or their cooperatives, at the fixed price established by the government, by means of the launch, in private auction, of a Put Option Agreement. It works similarly to the Put Option Agreement and to the PEP; however, the agreements are launched by the private sector.

Equalizer Premium Paid to Producer (PEPRO): an economic subsidy granted to farmers and / or their cooperative that is willing to sell their product for the difference between the Reference Value set by the Federal Government and the value of the equalizer premium auctioned. Similar to PEP, it ensures the producer a price level, which can either be the minimum or another set (reference) price - the main difference is that the premium is paid directly to the farmers. This instrument, launched when the market price is below the Minimum Price, is operationalized through the accredited Stock Exchanges. As with PEP, it exempts the government from purchasing the product, allowing the outflow to the consuming regions to complement supply.

Counter Sales: implemented in 1991 to support and stimulate small rural production, especially of domestic livestock, aims to ensure in a continuous and systematic way, the regular supply of raw materials, through the provision of official stocks at market prices compatible with those obtained in public auctions.

Source: CONAB

2. General characteristics of the Brazilian agricultural performance

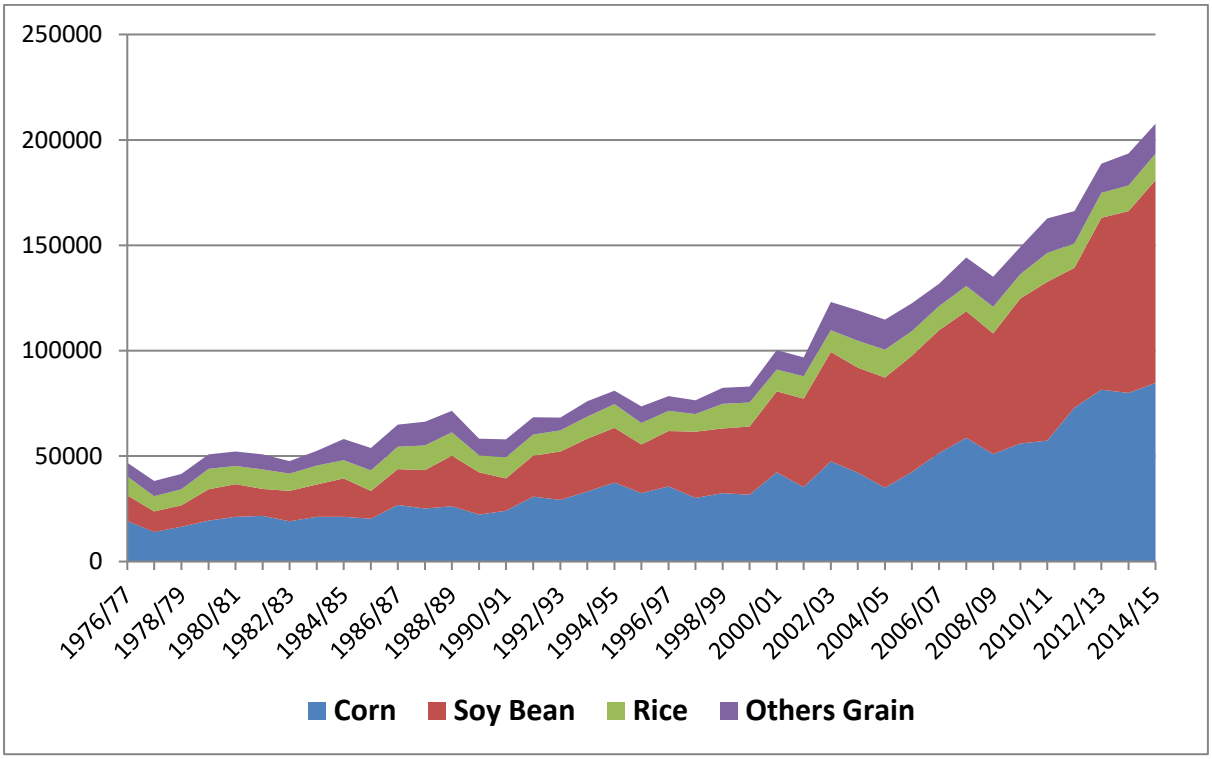
A successful agricultural research agenda focussing on adapted varieties and management of savannah (cerrado), and institutional mechanisms to support agriculture through agricultural policies, have contributed to the growth of Brazilian agricultural production. Although they have been selective in terms of beneficiaries, they succeeded in structuring an agricultural model of large-scale export-oriented grain production. From the early phase of modernisation of Brazilian agriculture (1960) until the late 1970s agricultural production, production of grains (cereals and oilseeds) was practically stationary at 50 million tonnes. At the end of 1990s, due to the stabilisation of the economy after hyperinflation and trade liberalization, this production quickly reached 100 million tonnes. After 10 years, production again doubled to 200 million tonnes.

The most important factor associated with the growth of Brazilian agricultural production is undoubtedly the stimulus given by the foreign market. In view of the "primarisation" movement observed throughout the Brazilian economy, agriculture was no different. From the 2000s, most of the grain production has been directed to the foreign market without processing. Many causes can be associated with this phenomenon, for example, the Brazilian tax structure, the Trading Companies strategy and even the obsolescence of national park processors, but the result has led to an increasingly important part of grain production exported *in natura* moments after harvesting.

The "primarisation" movement changed the flow and production logistics. Its displaced flow paths (roads and railways) and warehouses used by the processing industry, and redirected this once

important part of production (depending on the crop and market conditions) directly to the ports, which started to obey a new geography dictated by external markets.

Figure 1 Evolution of Brazilian grain production, 1976-2016 in tonnes

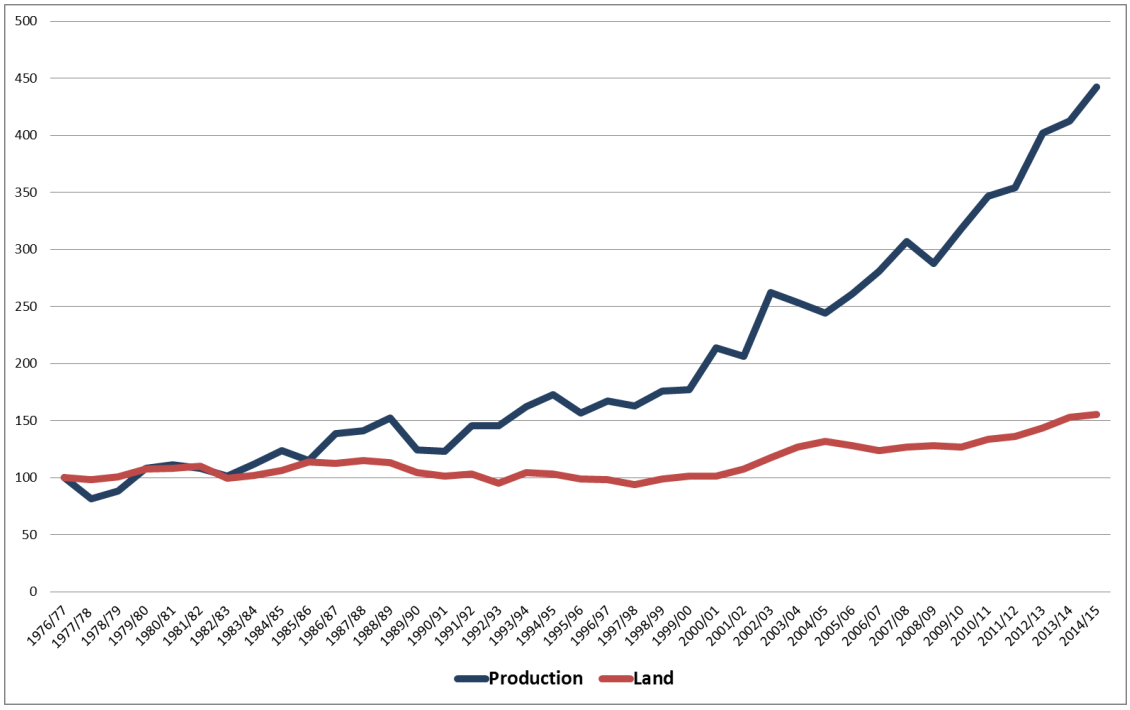


Source: CONAB Database, 2016

Another important factor that explains this extraordinary production growth is gains in productivity. The expansion of grain areas in Brazil towards the Midwest and North took place from the 1970s based on a technology package adapted to the savanna (cerrado) conditions. The correction of acid soils and the use of seeds adapted to the climate and altitude allowed the production of soybeans, cotton and corn to surpass the traditional areas of the South and Southeast in a few years, resulted in record earnings.

Figure 2 shows the detachment of the area and production curves observed in grain production. In new regions, production growth reflects the incorporation of this technology package and the practice of intensification of land use by planting an extra crop (known as “safrinha”) in the fallow period or off season.

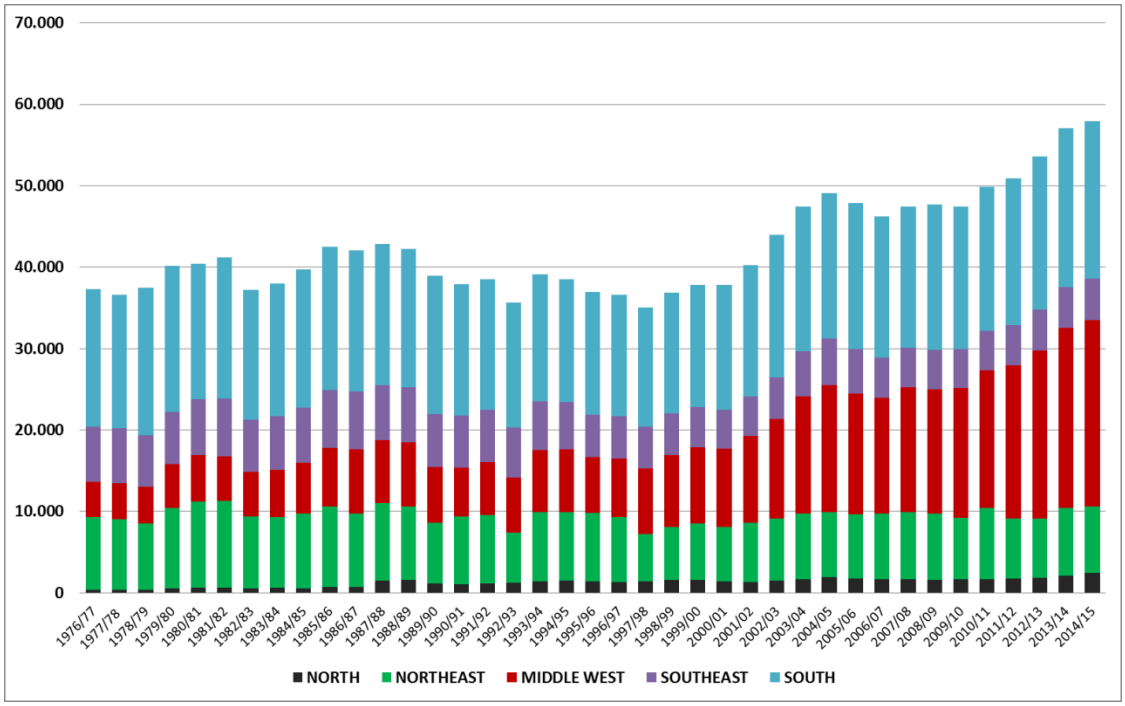
Figure 2 Evolution of grain production and land cultivated index in Brazil, 1976/77(=100) to 2014/15



Source: CONAB Database. 2016

The growth of the cultivated area in the Midwest is the main explanatory factor for the huge expansion in the use of land for agricultural activities in the last 40 years. This region made use of 4 million ha in the late 1970s, reaching 23 million ha in the last two years. Currently, the Midwest is the main productive pole of agriculture in Brazil, accounting for 40% of the cultivated area, which implies a renewed discussion on the logistics and storage of this production for subsequent export or domestic consumption. The growth of cultivated areas in the north was also explosive, experiencing an eightfold increase in this period, but as it is a smaller footprint, the result cannot be considered as extraordinary. The Southeast, however, lost acreage, mainly in S. Paulo due to the expansion of urban areas and the crisis experienced by some strategic products for the state, such as sugarcane and citrus (see Figure 3).

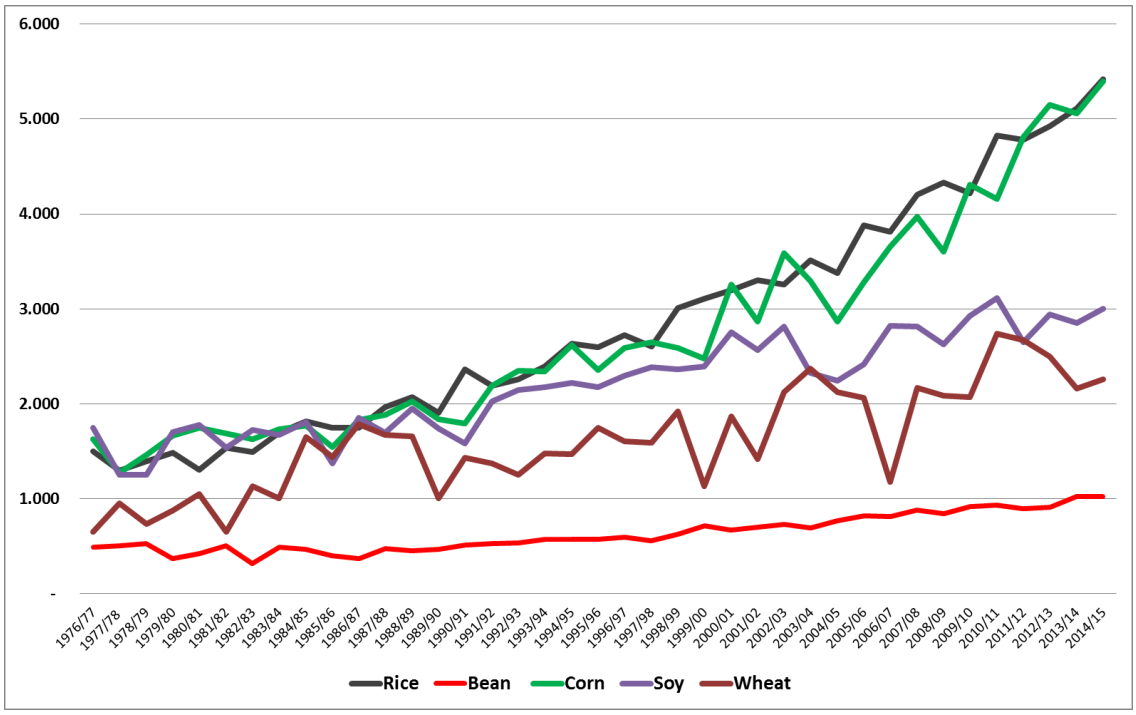
Figure 3 Land cultivated (million ha) by major regions, Brazil 1976/77 to 2014/15



Source: CONAB Database. 2016

Figure 4 shows the productivity evolution of different grain crops in Brazil. This figure highlights what the Brazilian average productivity figures cannot detect: bean and soybean productivity has nearly doubled while rice, corn and wheat experienced threefold growth in a period of 40 years.

Figure 4 Grain yields (kg/ha) of main crops, Brazil 1976/77 to 2014/15



Source: CONAB Database. 2016

The grain storage system in Brazil still suffers from some distortions due to low private sector investment and low public capacity for action. According to a recent survey by CONAB, the government agency responsible for developing food supply policies, there were 17,538 storage units with static capacity of 145 million tonnes (83% in silos for bulk storage) in Brazil in 2012. There was an increase of more than 67% of static storage capacity between 2007 and 2012, but still, agricultural production increased at a higher rate than the storage capacity.

The ratio between agricultural production and static capacity generates the rotation rate of these stocks, which in Brazil is still low. It is estimated that a 1.5 rotation rate could be comfortably administered. Maia et al. (2013) show that in 2012 (the last year to be researched) the index was at 1.17, reaching its worst mark in 2003 at 1.35. They found that the biggest storage problem is not the static capacity, but the concentration of the same in the first semester (harvest period of major summer crops) and its geographic distribution in relation to need. The government, directly or through its companies, holds only 5% of static capacity, while 73% is in the hands of private agents and 22% with cooperatives. Considering the government's performance and that of agents that have contracts with the government, it is estimated that 42% of the static capacity is occupied by public use.

Unlike other countries with large agricultural production, only 13% of the static capacity was in farms in 2011, while 35% was in rural areas, 45% in urban areas and 6% in port areas. Regarding geographical distribution, static capacity is low and risky in the new agricultural border area and high in the southern states of Brazil and São Paulo. Grain production has grown dramatically in the region known as MAPITOBA, a polygon formed by the borders of the states of Maranhão, Piauí, Tocantins and Western Bahia. In this region the soil and weather conditions are exceptional and the land, after correction, has high yields.

The warehouses located in the new regions are basically modern grain silos whose operating costs are lower. However, in general, it is estimated that storage costs are not high in Brazil. Overall storage costs in 2013, including administrative costs, were approximately 5% of the price of soybeans and corn (see calculations of Maia et al, 2013).

3. Family Farming and the Build-up of Food Public Stocks

One of the most notable innovations in public policy for food security in Brazil, is the use of government food purchases as active stimuli for local production through defined regions of production and food distribution. In particular, this policy created credit lines for stock build-up aimed at family farming through the Food Acquisition Programme (PAA). “Family farmers” are legally defined based on property parameters and agricultural work.

The PAA, implemented in 2004, created a new system for government procurement of foodstuffs, expressly supporting the purchase of products from family farmers. This programme expanded its objectives, covering the supply of foodstuffs for the National School Feeding Programme, encouraging other federal entities (states and municipalities) to adhere to the same procedures similar to PAA.

PAA spending can be divided into two types: food assistance and interventions to stabilize prices. The first case refers to PAA modes focused on donations for social programmes and school feeding. The second case relates to procedures aimed at structuring the market through build-up of public stocks that may or may not be donated in the future.

In its ten years of operation, the PAA has prioritised the procedures for public procurement with simultaneous donations and other donation programs without build-up of stocks, representing 86% of programme resources in 2014. This programme therefore did not constitute a significant change for the build-up of government stocks from the products of family farming.

The Government Procurement programme to support family farming in Brazil is composed of several sub-programmes, with different institutional and budgetary linkages, including executing agencies in the Federation spheres (federal, state and municipal agencies).

The main mode is the Direct Purchase with Simultaneous Donation (CDDS). Most of the budget resources refer to federal operations, operationalised by the National Company of Food Supply (CONAB), which is federally administrated. For the year 2012 it represented 82% of CDDS resources, estimated at U$ 314.4 million (R$ 654 million). The other forms of CDDS are municipally administered, which represented just over 9% of the operations with a disbursement of around U$ 28.7 million (R$ 59.6 million); and state-administered, with a disbursement of U$ 26.4 million (R$ 55 million), equivalent to 8% of the resources.

Table 1 Food Acquisition Programme (PAA): Modalities and Characteristics (2013)

Modality	Budget Resource	Management	beneficiaries	Purchase Limits/Year	Purchase Products
Direct Purchase with Simultaneous Donation - CDDS	MDS [1]	Conab [3] Municipality Programs State Programs	Producers Rural Cooperatives	**R$ 4,500.00 (~U$1,685)** **R$ 4,800.00 (~U$1,800)**	Fresh prodcts Several agriculture Products Extraction products
Direct Purchase for Stocks	MDS and MDA [2]	Conab [3]	Producers /Rural Cooperatives	**R$ 8,000.00 (~U$3,000)**	Grains and no perecible products
Public Adquisition of Milk (PAA-Leite)	MDS [1]	Northeast States	Producers /Rural Cooperatives	**R$ 9,000.00 (~U$3,3700**	Milk

Source: MDA Database

[1] MDS : Ministry of Social Development (MDS)

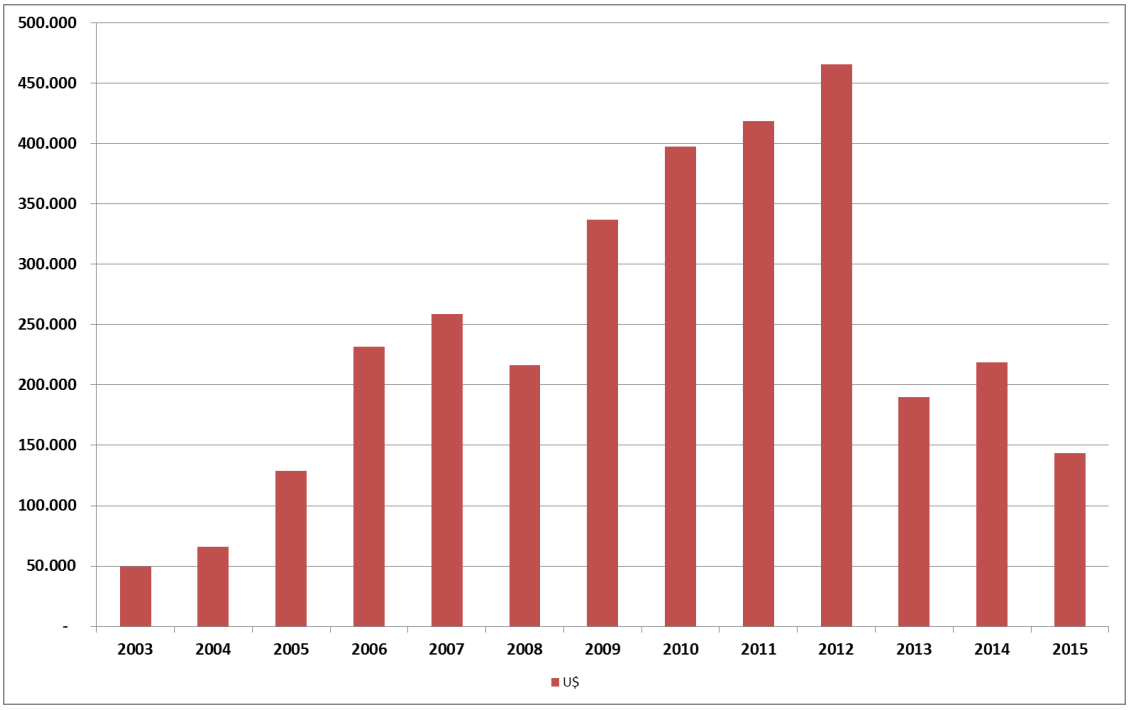
[2] MDA: Ministry of Agrarian Development

[3] Conab: National Company of Food Supply

An important institutional innovation occurred in 2009: the law establishing the commitment of public authorities (municipal, state and federal) to allocate 30% of federal funds for the purchase of foodstuffs for the National School Feeding Programme from Family Farmers.

Since 2004, with the establishment of the PAA, family farming now has a unique government programme of purchases spurred by demand for the composition of public stocks and for donation to institutions and schools. The number of people served each year reached 22.5 million. The volume of funds has grown rapidly until 2012 dropping dramatically after that due to budgetary problems, as can be seen in Figure 5.

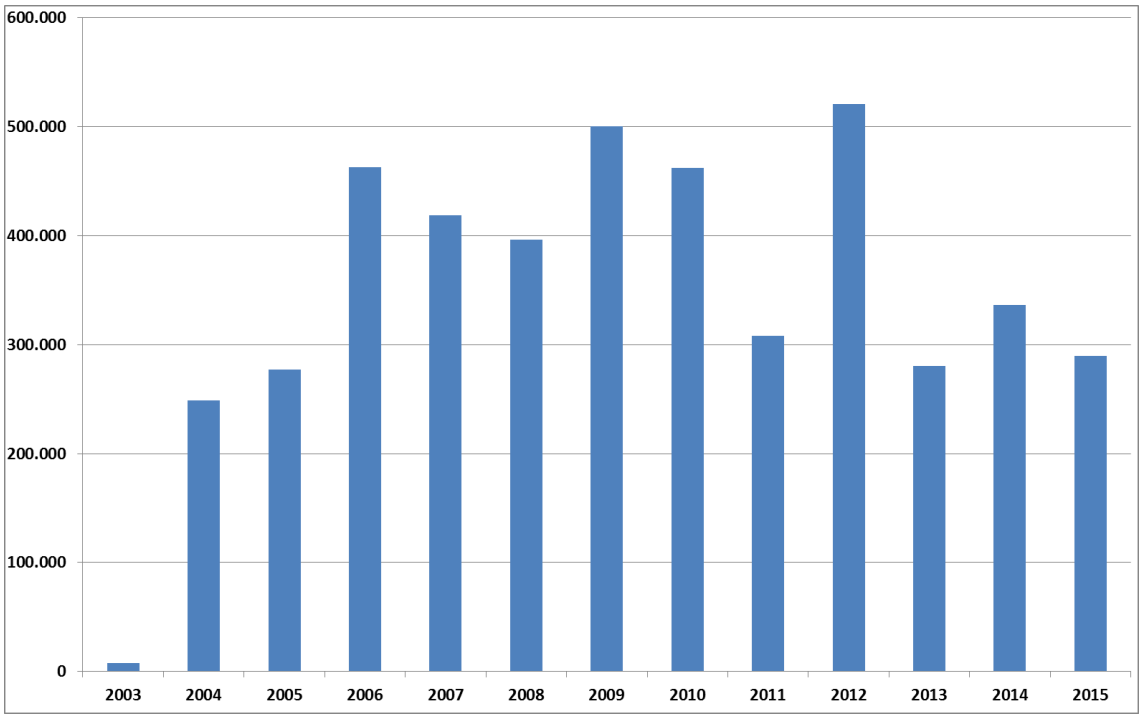
Figure 5 Allocated Resources in the Food Acquisition Programme (PAA), 2003-2015 (U$)



Source: MDA Database

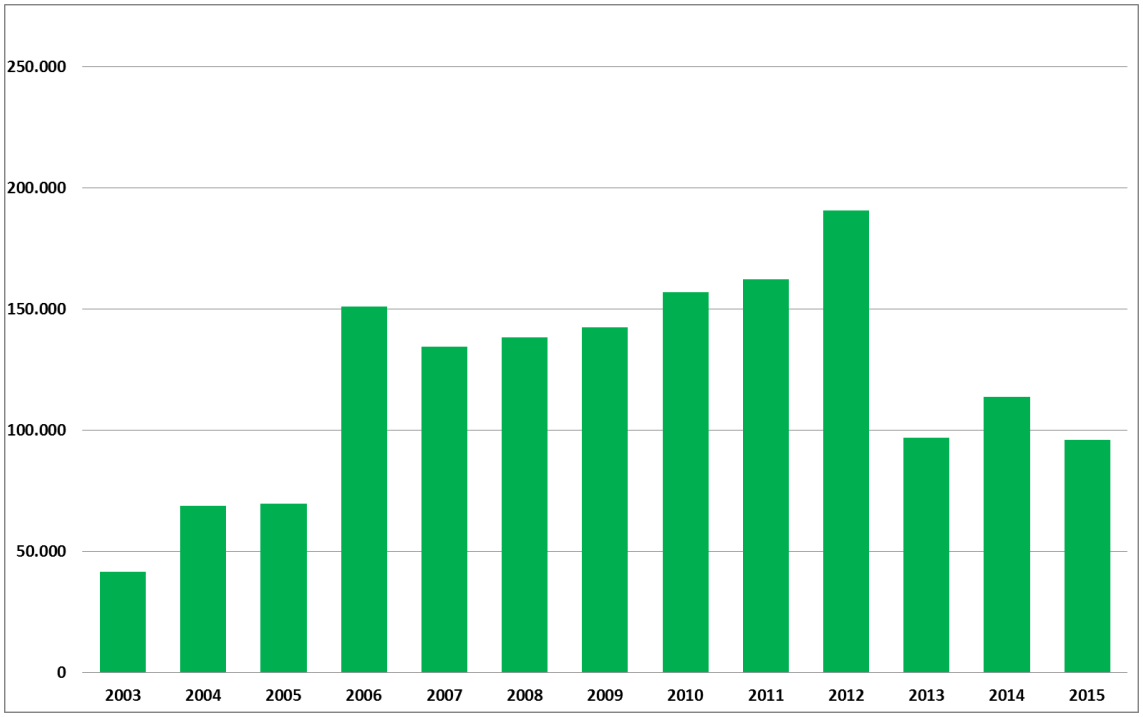
The volume of purchased products increased significantly by 2012, except for 2011, and from that had cuts due to budgetary restrictions. This reduction movement was reflected in the number of family farmers involved in the supply of these products, as can be seen in Figures 6 and 7:

Figure 6 Purchased products (million tonnes) per year by PAA, 2003 to 2015



Source: MDA Database

Figure 7 Number of producers participating in PAA, 2003 to 2015

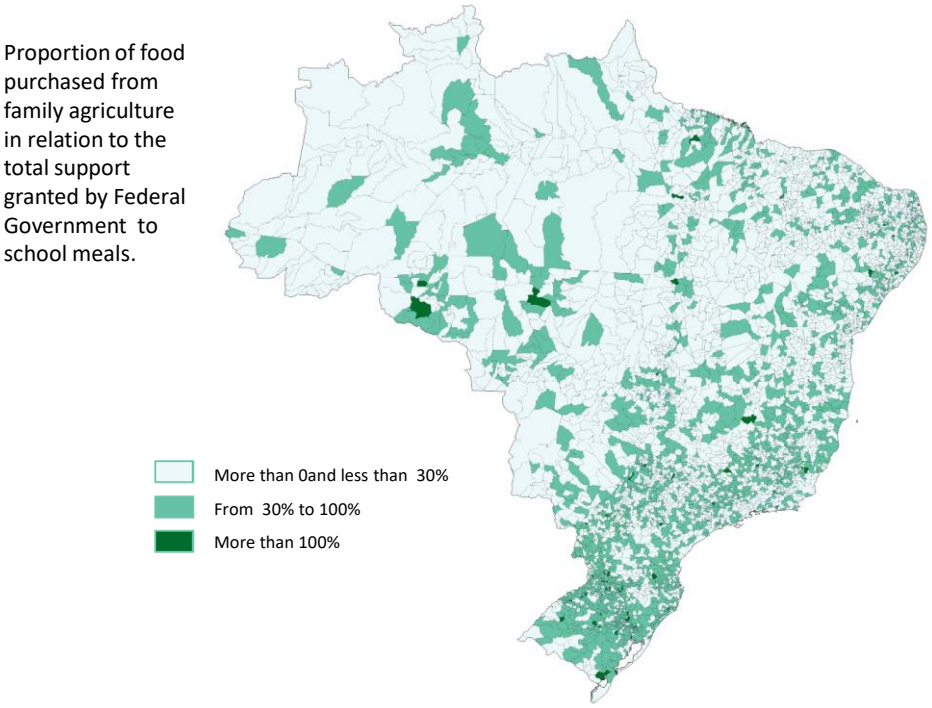


Source: MDA Database

According to the typology built by UNDP (2013), PAA spending can be divided into two types: food assistance; and interventions to stabilise prices. In the first case, the study considered the terms of PAA that focus on donations to social programmes and school feeding. The second case considered the procedures aimed at structuring the market through the build-up of public stocks that may or may not be donated in the future. Over its ten years PAA's operation has changed, favouring purchases with simultaneous donations and other donation programmes which now account for 86% of the PAA's resources at the expense of structuring markets. Thus, even though from the producer's point of view the type of government intervention makes no difference, there was effectively no change in agricultural policy orientation in government stock build-up activity aimed at favouring family farming.

In 2009 Federal Law 11,947 established that the government should allocated 30% of federal funds designated to the purchase of food to Family Farming (PAA). The share of direct purchases of family farming in the National School Feeding Programme (PNAE), in turn, represents only a potential amount of Federal Government expenditure, as the executive units (municipalities and state governments) may not fully meet their quotas. The National Fund for Educational Development (FNDE), the supervisory body of the Ministry of Education, states that municipalities that do not comply with accountability requirements may have the transfer of funds for school feeding suspended or rescheduled. Data collected by FNDE in 2011, referring to the rendering of accounts of the 2010 municipalities (one year after the enactment of the law) shows that there were few municipalities that were buying products from family farms, and much fewer who were fulfilling the proportion of 30% determined by law. Map 1 shows the consolidated transfer of funds data and the amounts spent on, or committed to, purchases from family farms.

Figure 8 FNDE Resource Transfer used for Direct Purchase by Municipalities in 2014



Source: MEC – FNDE

As noted in Figure 8, a significant number of Brazilian municipalities did not meet the legal requirement to use at least 30% of FNDE transfer for the purchase of products from family farming. The municipalities with greater populations and more economically developed, located in Southern and South-eastern Brazil, generally purchased a greater proportion of food from family farms.

The study which the map is based on uses 2014 data and a budget of approximately U$ 411.7 million (R$ 1.1 billion) distributed among 5,493 Brazilian municipalities, of which 4,229 bought products from family farming and 2,168 bought above 30% of the overall amount of federal funding. Due to the large amount of foodstuff needed and the almost non-existence of a large family farming sector around, the programme has found it difficult to access the State's capitals and metropolitan areas (CORÁ, BELIK (orgs), 2012).

Despite the efforts of some municipalities, family farming purchases have focused on the municipalities of greater agricultural presence and those where family farming already played an important role in supplying the population and public institutions. In other words, the National School Feeding Programme (PNAE) likely has had much less of an impact than that indicated by the FNDE data.

The scope of both PAA and the PNAE is limited, despite their tendency for growth. On the demand side of the PNAE (the use of public resources for free food supply), the programme serves 42.2 million public school students, promoting social protection and food and nutrition security for a vulnerable part of the population. However, on the supply side, few of the 4.1 million Brazilian farmers have access to these marketing programmes. Even though the federal government aims to spread its resources among the largest possible number of suppliers, the range is still very low.

As at 2013, the PAA set a limit of approx. U$2,785 (R$ 6,500) per family unit/year when the programme is accessed through supplying organizations (cooperatives, producer associations, etc.). For beneficiaries in the register of extreme poverty (CADUNICO), the limit rises to approx. U$ 3,425 (R$ 8,000) per family unit/year, which is the same in the case of direct purchase. In the case of the individual farmer, the PAA also makes the purchase, but the limit is approx. U$ 2,355/year (R$ 5,500) and approx. U$ 1,715/year (R$ 4,000) for the purchase of milk. The PNAE works with slightly higher purchase values, reaching U$8,565 per family unit/year (R$ 20,000).

Filling the PAA budget in 2014 would therefore require about 180,000 farmers, while the PNAE would require 55,000 producers at best projections, without considering that the same producer could provide for both programmes at the same time. This amount to be spent on purchases of family farming could therefore meet only somewhere around 5% of family farmers based on the 2006 Agricultural Census.

Given the initial success of the PAA and Family Farming purchases of PNAE, the federal government extended the programme to supply other programmes related to Food Safety and for use in public institutions such as hospitals, federal schools, prisons, etc. The example was followed by some states of the federation, such as São Paulo State, whose Paulista Programme of Social Interest Agriculture has grown rapidly since its launch in 2013.

In the ten years since its inception, the Brazilian Agricultural Policy targeted at family farming evolved from a budget of ~U$785 million (R$ 2.6 billion) in 2002/2003, to ~U$16.7 billion (R$ 39 billion) in the 2013/2014 crop, including public financing and acquisitions for stock build-up, and for use in school feeding and other public sector beneficiaries.

4. Performance of the Agricultural Policy in Brazil and the Build-up of Stocks

The practice of public intervention in the agricultural sector in Brazil analysed from the two main instruments of agricultural policy, the Rural Credit Policy and Minimum Price Guarantee Policy (PGPM), have well-defined temporal characteristics (ALMEIDA, 2014).

The period of spending expansion and stock build-up, from 1962 to 1979, is marked by a growing intervention of investment in agriculture. From the mid-1960s, PGPM offered changes to deal with the problems of domestic food supply, prioritising products such as rice and corn which are important for the food supply of the country. The decade 1980-1990 was marked by an unstable macroeconomic scenario, the fiscal and foreign exchange crisis and inflationary escalation, ending in the hyperinflationary crisis that lasted until stabilisation in 1994. The resources for stock build-up then fell sharply. In the early 1990s, the amount of rural credit represented only 22.9% of the 1979 year of credit (ALMEIDA, 2014).

In the 1980s, the proportion of public spending on agriculture in relation to the total expenditure of the Union averaged 5.6%. In the following decade, the average accounted for only 2.2%. Since 1987, spending on agriculture (including Rural Credit and PGPM) was reduced as a direct consequence of

the reduction in resources for rural credit, supply and for specific products, such as wheat, sugar and fuel alcohol.

Due to the reduction of the financial volume for the agricultural sector, rural credit policy in the period 1990/99 decreased by approximately 84%, while the PGPM decreased by around 43%. After a brief rise in spending on PGPM between 1992 and 1995, from that period on the share of PGPM spending compared to spending on agriculture has declined significantly with the introduction of new agricultural policy mechanisms.

By the end of the 1980s, a strong State role in agricultural marketing prevailed in Brazil. Regarding the EGF, a record volume of loans occurred in 1982, when the state-owned company acquired 14.9 million tonnes of produce, equivalent to 29% of the national grain production that year. In 1987, AGF reached its peak, with 12.8 million tonnes of grain withdrawn from the market, equivalent to 20% of the national production.

The 1990s were marked by a process of trade liberalisation, which influenced the redesign of sectoral policies, especially in agriculture, such as the PGPM. From the stabilisation of the Brazilian currency, the so called "Plano Real" from 1994, commercial liberalisation was coordinated with macroeconomic policies to contain possible domestic price increases by lowering barriers to imports.

With the reduction of barriers to imports and currency appreciation, imports of agricultural products, previously limited to protect the domestic market, were significantly affected during the 1990s. There were significant purchases in the foreign market of major food products, including through PGPM. From 1988-98, imports of the two most important products supported by PGPM, rice and corn, increased in volume by 791% and 10,566.7%, respectively.

Prices received by producers of major grains supported by PGPM exhibited a declining trend during the 1990s. The products that faced the biggest falls were those whose production was focused directly to supply the domestic market, such as corn and rice. From 1990-99, the price received by the producers of these two products declined by 34% and 65%, respectively (CAMPOS, FERNANDES FILHO, 1998).

In a trade liberalisation scenario, the PGPM proved unable to raise prices for producers as it would attract imports by the private sector, as indeed happened with imports of corn, which rose from 0.59 million tonnes in 1991 to 1.75 million tonnes in 2000, an increase of 195% (ALMEIDA, 2014). The market for major crops supported by PGPM, such as rice and corn, gradually integrated with external markets, so that Southern Common Market (MERCOSUR) countries accounted on average for 89% of Brazilian imports in the 1990s to the 2000s, designed to meet both domestic consumption and for the build-up of regular stocks of corn.

The trade liberalisation process, as well as providing greater commercial narrowing of Brazilian products in the international market, as seen in the case of corn and rice, modified the dynamics of the pricing of these products, so that the setting of domestic prices was also subject to world prices (ALMEIDA, 2014). Besides the grains that make up the staple diet of the population (rice, beans, wheat and soybeans), greater reliance was placed on wheat. Rice had a very high volume of imports until the

middle of the last decade (see Table 2) due to exchange rate appreciation and misguided sectoral policies, but this situation was reversed later. Beans are a special case among Brazilian staple foods because it is an essentially domestic product with low technification (i.e. it is labour intensive). Bean prices increase significantly in times of scarcity, accompanied by speculation and instability, since there are no beans with the characteristics of those consumed in Brazil in the international market. The rejection rate of imported beans from China, India or Colombia is high.

Brazil's rate of wheat consumption, combined with limits on domestic production due to environmental factors, has consistently required that domestic production be supplemented by imported wheat. However, domestic production has grown in recent decades. In the mid-1980s, for example, due to exchange restrictions and government stimuli, domestic wheat production comprised 80% of the total consumed domestically. Today domestic production accounts for approximately 50% of domestic consumption.

However, significant changes have occurred in the national productive system over the years. Embrapa (Brazilian state-owned company of rural technology) research efforts in tropical wheat cultivation resulted in the development of seeds appropriate for the savanna (cerrado) climate. Currently, the regions of the Planalto Central with mild weather and no wind are threatening the supremacy of Southern states as large producers. The Cerrado region can produce up to two wheat crops - irrigated and rainfed - in a year. This change in the geography of production also brings important changes regarding logistics and storage.

Traditionally, warehouses and flour mills were located in the regions near the landing ports of the imported product or the producing regions. It is not common to carry wheat *in natura* great distances by road in Brazil. Argentina, which until recently was Brazil's main supplier, exports its wheat *in natura* or flour at reduced costs (due to production costs, low freight costs and preferential rates) even to the Northeast, leaving national produce at a disadvantage. Argentine wheat reaches the ports of Fortaleza and Recife at cheaper prices than the domestic product. However, due to internal problems in Argentina, currently the largest supplier of wheat to Brazil is the United States, with approximately 25% of the market.

The imported product, mainly from the US or Canada, is of high quality with few impurities and low moisture content, which allows a good yield with few losses. In contrast, the domestic product is of lower quality and is used for lower value purposes such as the production of biscuits and animal feed. However, due to high international produce prices and the recent embargo on Russia, even lower quality Brazilian produce is finding a good market internally and in other developing countries.

Table 2 illustrates the Trade Balance of the main agricultural products in the last 15 years.

Table 2 Brazilian Agricultural trade 2001-2015 (tonnes)

Year	Transaction	Rice	Corn	Wheat	Soy (grain)	Soybean meal	Animal Feed	Other Cereals	Fruits	Vegetables
	Export	22.109	5.625.701	245	15.655.792	11.270.734	1.074.814	84.160	658.951	136.269
2001	Import	775.629	622.052	7.011.798	849.575	218.871	77.218	255.815	879.865	560.749
	Balance	**-753.520**	**5.003.649**	**-7.011.553**	**14.806.218**	**11.051.864**	**997.596**	**-171.655**	**-220.914**	**-424.481**
	Export	30.194	2.739.766	107	15.961.443	12.517.419	136.400	10.462	749.862	136.483
2002	Import	639.322	342.201	6.562.524	1.045.204	367.633	84.753	153.891	256.431	577.702
	Balance	**-609.128**	**2.397.565**	**-6.562.416**	**14.916.239**	**12.149.786**	**51.647**	**-143.429**	**493.431**	**-441.219**
	Export	19.779	3.561.801	49.909	19.881.261	13.602.548	58.978	302.357	903.001	133.728
2003	Import	1.293.489	796.162	6.611.926	1.189.229	305.515	89.453	258.496	198.126	646.219
	Balance	**-1.273.709**	**2.765.639**	**-6.562.017**	**18.692.033**	**13.297.033**	**-30.476**	**43.861**	**704.875**	**-512.491**
	Export	36.806	5.018.604	1.320.473	19.237.367	14.485.795	92.906	134.436	954.877	111.013
2004	Import	926.644	328.757	4.847.852	348.312	187.883	96.374	186.723	210.783	709.439
	Balance	**-889.837**	**4.689.847**	**-3.527.378**	**18.889.055**	**14.297.913**	**-3.468**	**-52.287**	**744.094**	**-598.425**
	Export	272.483	1.058.393	156.158	22.429.207	14.423.116	94.403	24.064	935.533	96.904
2005	Import	532.350	595.739	4.988.125	367.748	188.726	89.154	239.793	287.968	726.448
	Balance	**-259.867**	**462.655**	**-4.831.966**	**22.061.459**	**14.234.391**	**5.249**	**-215.729**	**647.565**	**-629.544**
	Export	290.346	3.924.552	651.366	24.949.585	12.333.678	103.173	307	913.534	81.355
2006	Import	652.758	956.040	6.531.178	48.857	152.427	103.226	204.540	346.178	714.560
	Balance	**-362.412**	**2.968.512**	**-5.879.812**	**24.900.728**	**12.181.251**	**-52**	**-204.233**	**567.356**	**-633.205**
	Export	201.406	10.914.634	102.835	23.721.481	12.477.203	126.742	225.462	1.047.583	176.244
2007	Import	720.222	1.095.266	6.638.010	97.920	101.223	107.238	248.450	352.824	731.210
	Balance	**-518.815**	**9.819.368**	**-6.535.174**	**23.623.560**	**12.375.980**	**19.504**	**-22.988**	**694.759**	**-554.966**
	Export	517.922	6.370.665	640.808	24.492.629	12.288.707	133.573	37.118	1.001.445	195.322
2008	Import	443.771	767.003	6.033.578	96.028	117.323	115.067	277.941	338.804	930.243
	Balance	**74.152**	**5.603.662**	**-5.392.770**	**24.396.601**	**12.171.385**	**18.506**	**-240.823**	**662.641**	**-734.921**
	Export	602.001	7.765.370	384.210	28.547.886	12.253.169	101.610	7.724	885.987	328.946
2009	Import	670.733	1.132.895	5.445.894	98.227	43.401	97.530	461.577	402.749	826.544
	Balance	**-68.731**	**6.632.474**	**-5.061.685**	**28.449.659**	**12.209.768**	**4.080**	**-453.853**	**483.238**	**-497.598**
	Export	430.429	10.792.581	1.316.834	29.064.451	13.668.639	141.282	4.047	839.518	233.387
2010	Import	781.870	459.428	6.323.206	116.644	39.475	117.163	299.814	480.789	1.166.057
	Balance	**-351.441**	**10.333.153**	**-5.006.372**	**28.947.807**	**13.629.165**	**24.119**	**-295.767**	**358.729**	**-932.670**
	Export	1.350.852	9.459.471	2.347.335	32.973.107	14.355.230	148.914	6.440	748.988	91.366
2011	Import	619.237	655.896	5.740.451	40.940	24.805	117.543	328.544	620.770	1.121.554
	Balance	**731.615**	**8.803.576**	**-3.393.116**	**32.932.166**	**14.330.425**	**31.372**	**-322.104**	**128.218**	**-1.030.188**
	Export	1.152.390	19.775.331	2.404.563	32.909.804	14.289.064	160.303	2.346	765.329	84.424
2012	Import	737.407	829.589	6.580.434	267.958	5.019	116.995	237.023	599.280	1.187.326
	Balance	**414.983**	**18.945.742**	**-4.175.871**	**32.641.846**	**14.284.045**	**43.308**	**-234.677**	**166.049**	**-1.102.902**
	Export	917.859	26.610.206	1.187.731	42.792.703	13.333.589	188.350	37.956	777.987	85.324
2013	Import	753.337	907.875	7.273.279	282.429	3.879	128.752	374.579	591.796	1.424.372
	Balance	**164.522**	**25.702.331**	**-6.085.548**	**42.510.274**	**13.329.710**	**59.598**	**-336.623**	**186.191**	**-1.339.048**
	Export	914.755	20.638.756	276.800	45.688.848	13.716.461	193.343	23.074	733.720	116.797
2014	Import	620.563	771.322	5.782.822	578.677	994	133.989	423.113	607.537	1.104.259
	Balance	**294.192**	**19.867.434**	**-5.506.022**	**45.110.171**	**13.715.467**	**59.354**	**-400.039**	**126.182**	**-987.462**
	Export	961.473	28.902.801	1.778.711	54.322.601	14.826.738	170.692	64.150	854.806	194.425
2015	Import	372.567	369.575	5.170.437	323.084	1.141	125.563	462.831	519.585	1.164.142
	Balance	**588.906**	**28.533.226**	**-3.391.726**	**53.999.517**	**14.825.597**	**45.129**	**-398.681**	**335.221**	**-969.716**

Source: Agrostat/Ministry of Agriculture of Brazil

Since 2005, a series of institutional changes have occurred following the new government orientation that took office in 2003. Federal government intervention through the CONAB started to play a more regulatory than interventionist role. New tools for marketing support, such as the Risk Premium for the Acquisition of Agricultural Product Coming from the Put Option Private Agreement (future market mechanism), the Premium Equaliser Paid to Producer, and the Premium for Equalisation of the Reference Value of Soybean Grains gradually transformed the private sector as a key agent in support of PGPM.

5. Recent trends in grain stock build-up in Brazil

The build-up of public grain stock in Brazil is strong in corn, rice and more inconsistently in wheat. However, the importance of this stock build-up has decreased gradually over the past 35 years.

The intervention of the Federal Government through CONAB in the increase of public stocks in the period started to occur at specific times, reaching two peaks in the crop years 2006/07 and 2010/11, but well below the level of the 1990s.

Table 3 Position of AGF public stocks of main crops (million tonnes) 2003/04 to 2011/12

Year	Cotton	Rice	Bean	Corn	Wheat	Soy
2003/2004	11.130	1.320	0	50.309	0	0
2004/2005	76	1.867	11.715	127.155	137.997	0
2005/2006	4.558	501.991	1.277	735.569	491.762	0
2006/2007	4.945	648.930	3.766	2.417.044	0	5.674
2007/2008	1.571	585.748	322	686.347	0	73
2008/2009	1.571	144.385	5	288.948	226.075	38
2011/2012	37	463.269	78.320	494.495	616.419	38

Source: Almeida (2014)

These two peaks of stock build-up are not due to a deliberate decision by CONAB to restart accumulating large audiences via AGF, but because of the need to intervene regarding specific crops such as corn, rice and wheat. In the case of corn, in the crop years 2006/07 and 2010/11 the physical volume of public stocks reached 2.417 million tonnes and 1.195 million tonnes, due to the low market price during these periods.

Stock build-up during that period of PGPM is therefore based on a short-term decision, in contrast with the initial long-term focus of the policy on maintaining farmers' income. From this perspective, the Federal government began to use its main company (CONAB) more as a regulatory agency, increasing the build-up of public stock only in critical agricultural situations, and working in places where the private sector was not interested buying the produce.

As evidenced by the figures showing the evolution of stocks for corn, rice and beans in recent years, there has been a remarkable decrease in this public policy action in the last five years.

In the case of corn, there is a predominance of stock accumulated by the AGF traditional system in the early 2000s, followed by a clear preference for the use of options markets from 2003-2005. Accumulation of stocks via AGF again predominates in the pre-food crisis period (2006 and 2007), but at the peak of the crisis (2008) public stocks are practically zero. In the next phase there is a large accumulation of stocks in the two modes, reaching a total of 5 million tonnes in 2010 (almost 5% of domestic consumption) under the pressure of swine breeders and poultry producers. Finally, between the years 2013 and 2015 the government reduces its purchases and operation through the market and instead emphasises use of PAA, which reaches 200,000 tons as Figure 10 shows (although this figure is only 15% of total stock). The PRONAF (National Programme to Strengthen Family Farms) programme is the modality which supports family agriculture.

Figure 9 Brazil's public stock of corn by modality 2001-2015

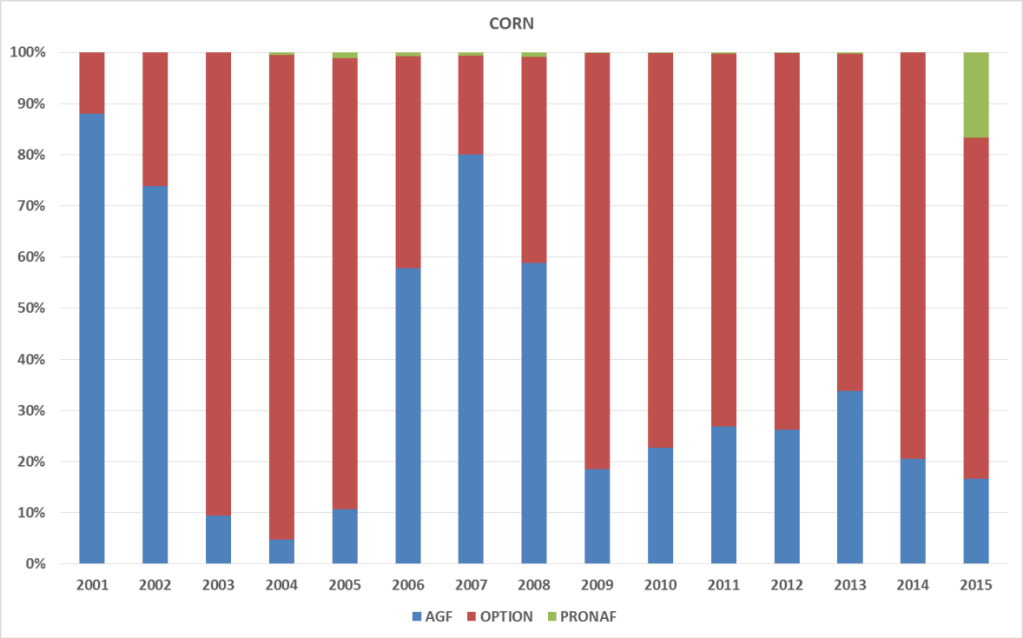
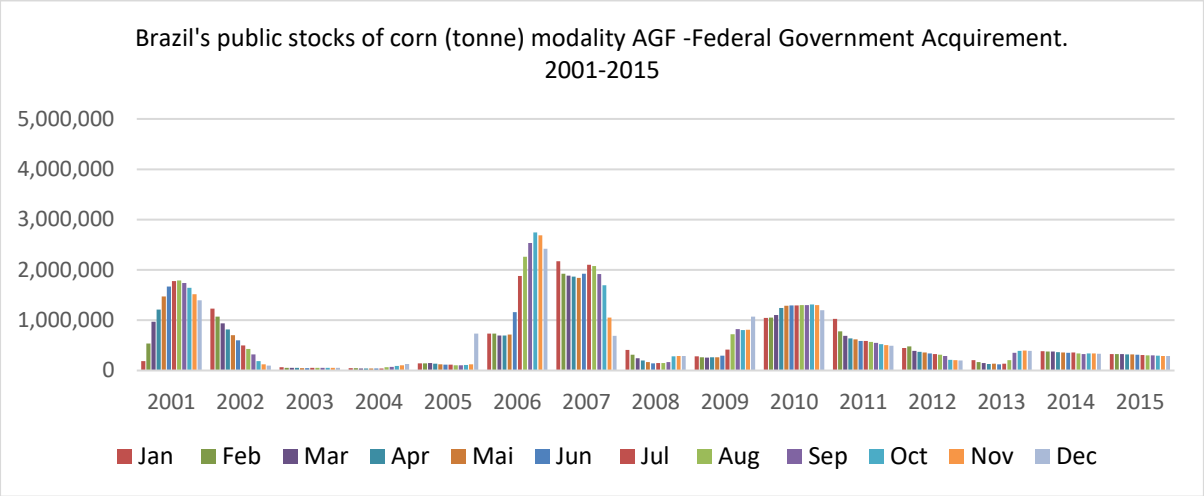
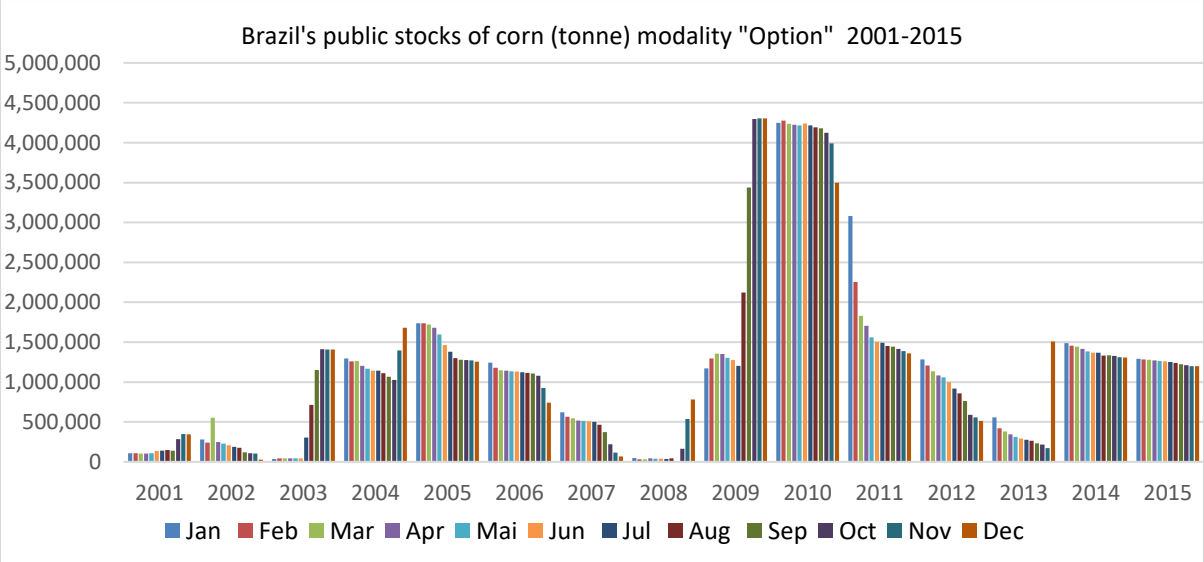
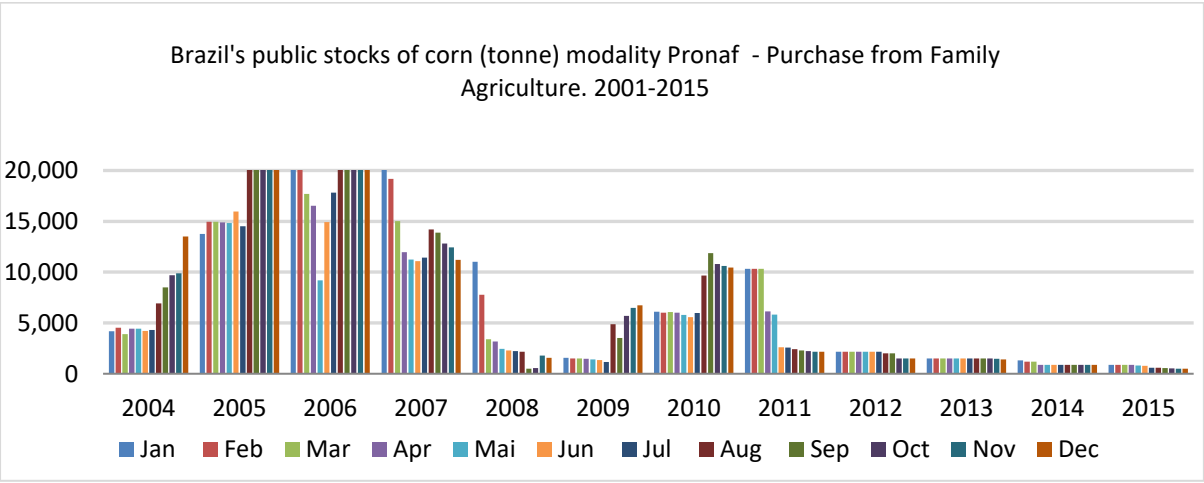


Figure 10 Public stocks of corn (tonnes) modalities "AGF" (Federal Government Acquirement), "Option" and "PRONAF", 2001-2015







Source: CONAB database

In the case of rice, concern regarding stock build-up has always been wider considering that this product is consumed directly. Thus, stocks controlled by the government (via AGF and via Option) accumulated somewhere around 2 million tonnes in 2001 and 2002, which represented 25% of

domestic rice consumption. However, over the last 15 years, the product backed by the government was reduced to near zero between 2003 and 2005. It then returned to represent something around 1.8 million tonnes from 2010 on, although at this point the government chose to act through the option agreement. Figures 10 and 11 illustrate this movement.

Figure 11 Brazil's public stock of rice by modality 2001-2015

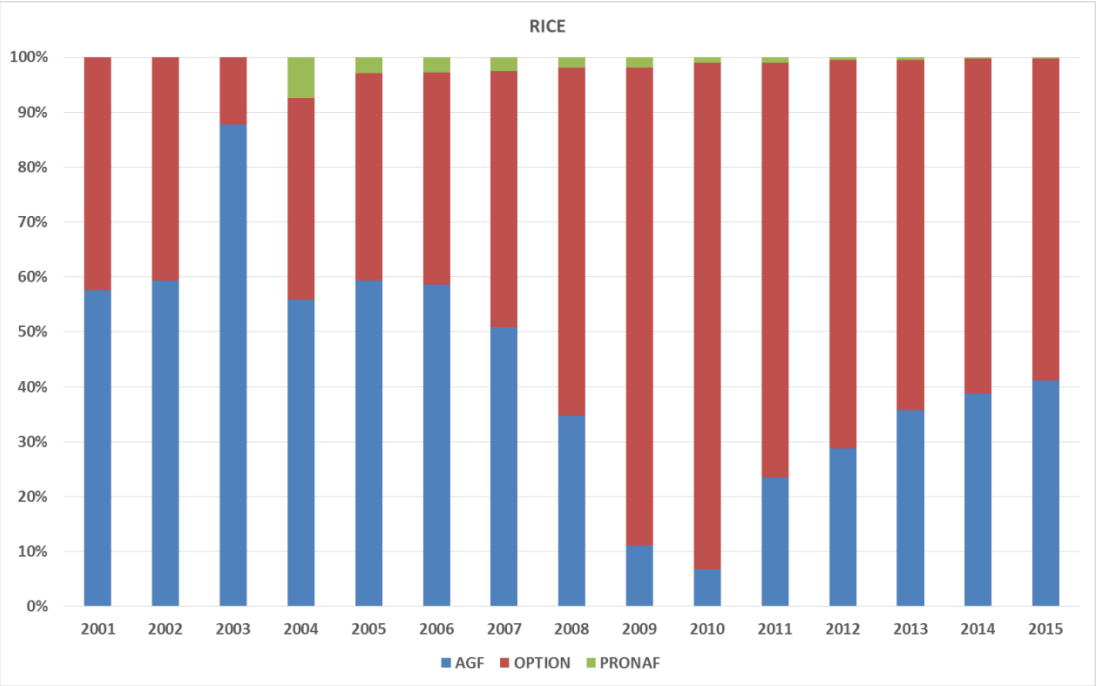
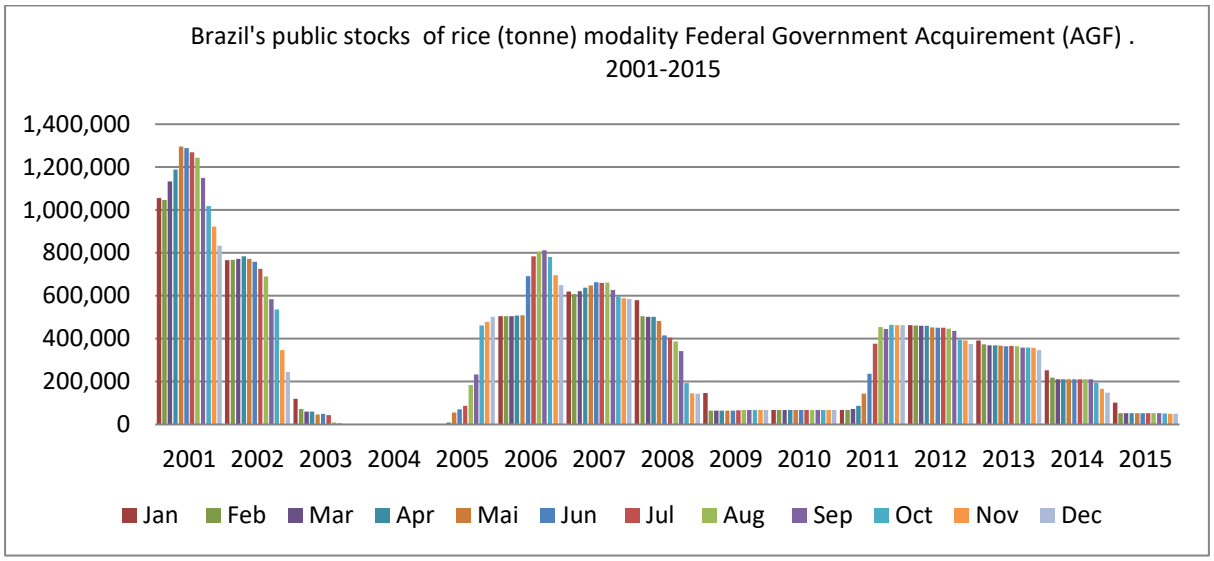
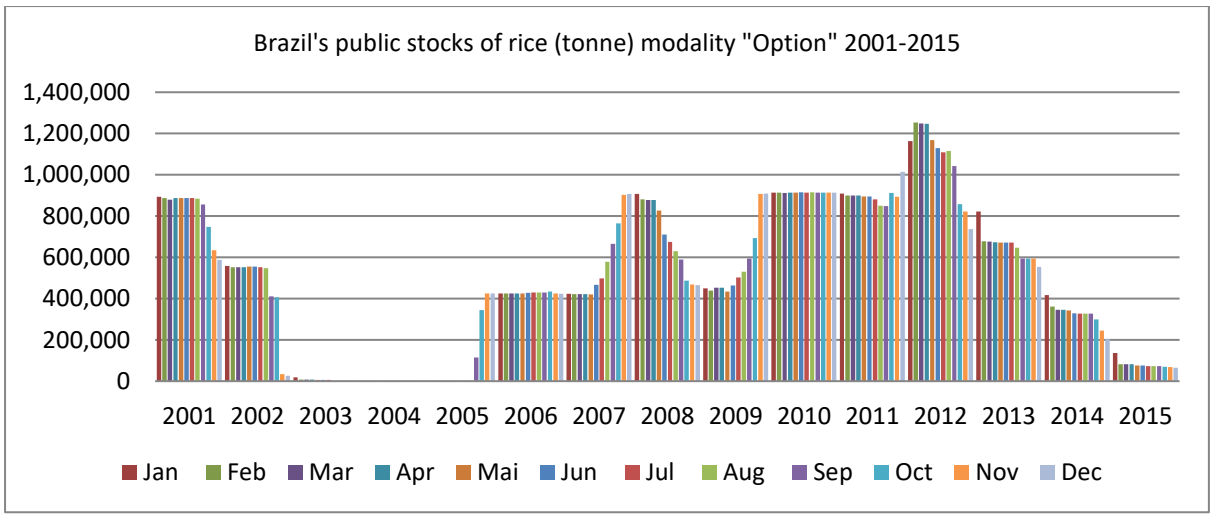
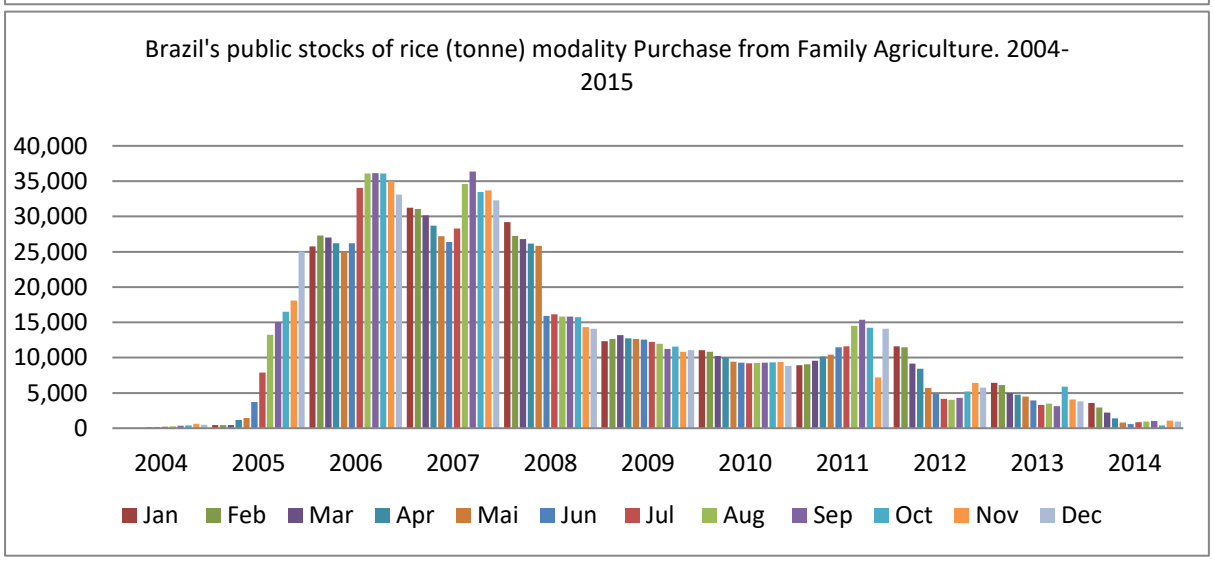


Figure 12 Public stocks of rice (tonnes) modalities "AGF" (Federal Government Acquirement), "Option" and "PRONAF", 2001-2015





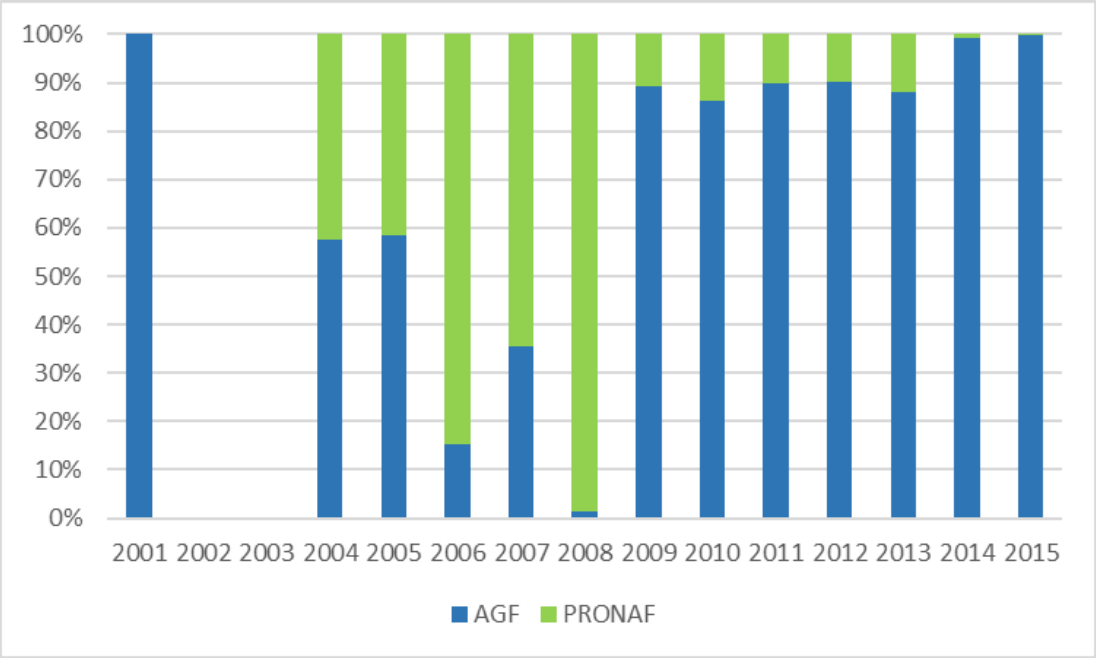


Source: CONAB database

In the case of beans, a staple in the Brazilian diet, the government has not acted in the build-up of stocks. The main mode is the AGF and there is no operation via the options market. In some years, including the 2008 crisis, government stocks were virtually empty. Soon after, there was a move to accumulate stocks, but these never surpassed 5% of the domestic consumption of the product, which shows a great weakness in the price control operation (Figure 12).

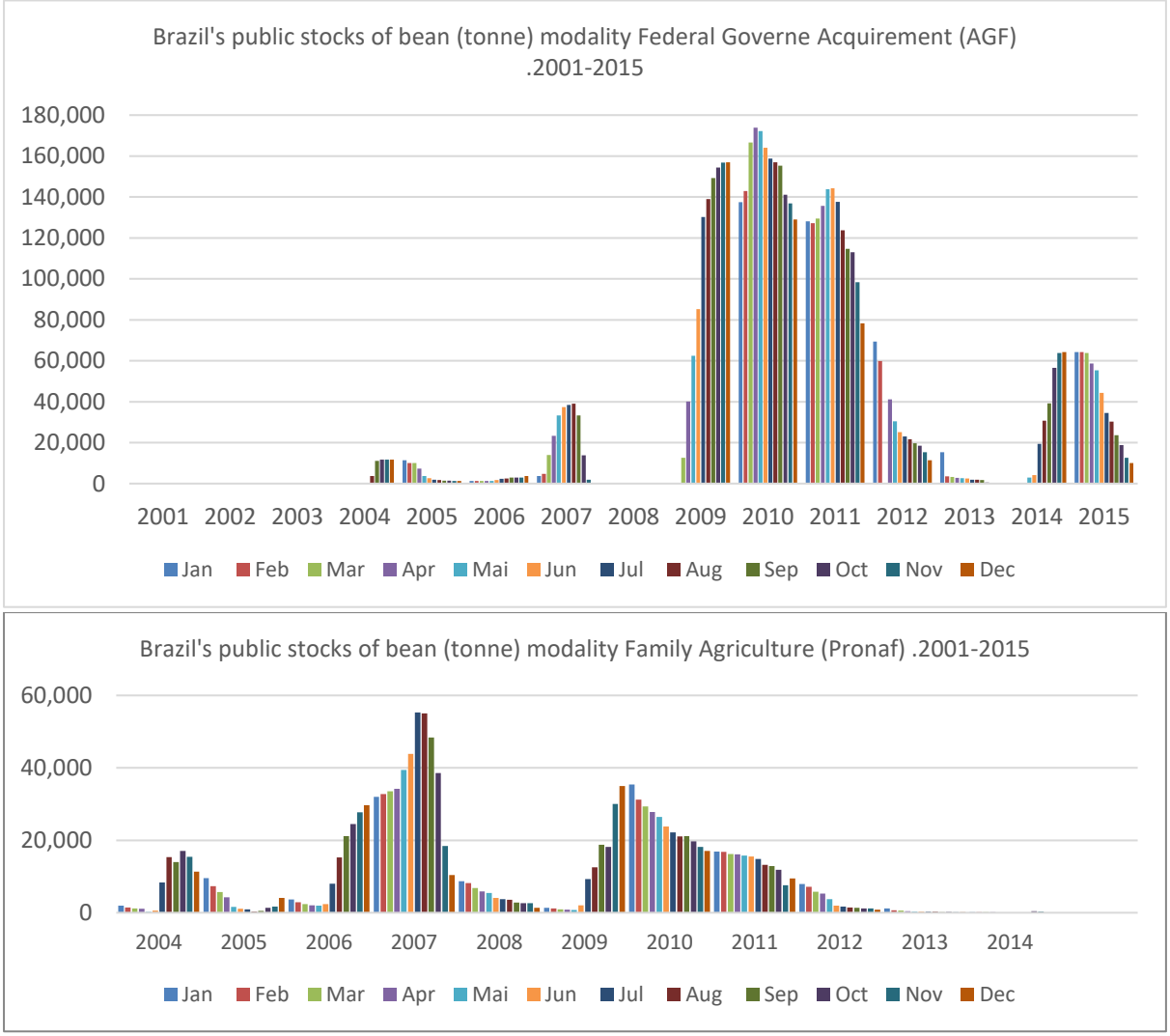
Regarding government procurement of beans via PAA, we observe a very small presence. During the 2008 crisis stocks formed by PAA were tiny, and after the year 2013 they disappeared (Figure 13).

Figure 13 Brazil's public stock of beans by modality 2001-2015



Source: CONAB database

Figure 14 Public stocks of beans (tonne) modalities "AGF" (Federal Government Acquirement), and "PRONAF", 2001-2015

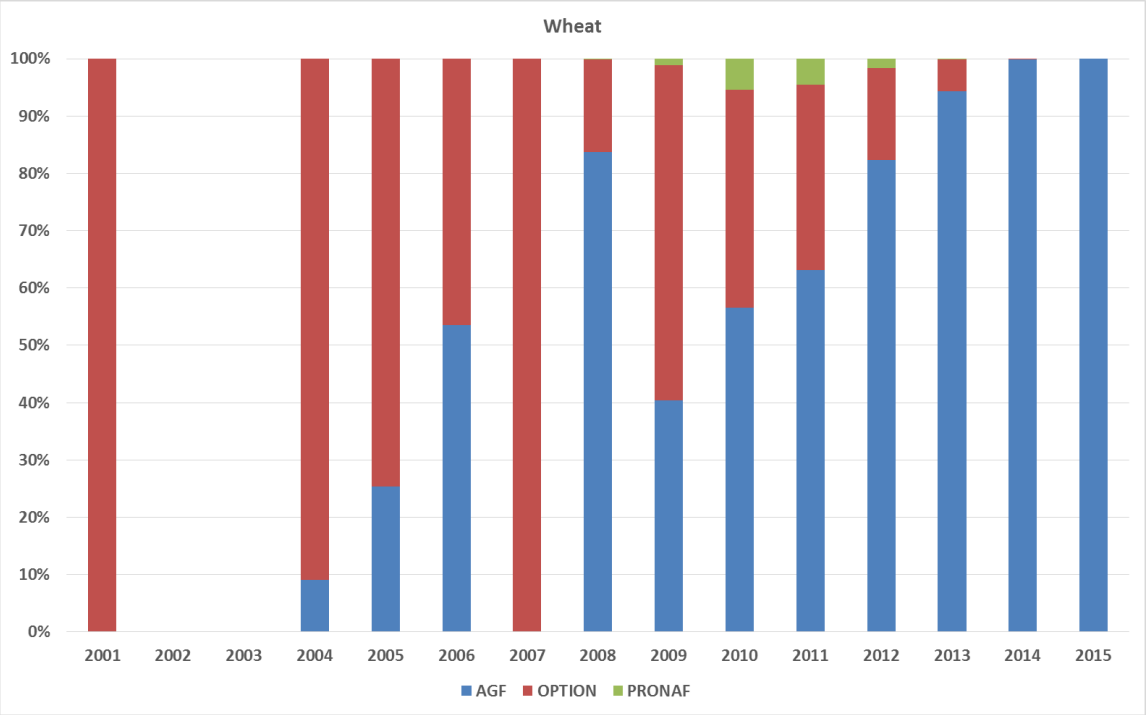


Source: CONAB database

An important aspect of the price policy to consider in the build-up of stocks is that the PAA has contributed very little to the increased volume of stocks. In the 2010/11 crop year, the stocks of the three most important products of the PAA (rice, beans and corn) were only 25,741 tonnes - well below the stock position of PGPM via AGF of 3,409,684 tonnes for the same products.

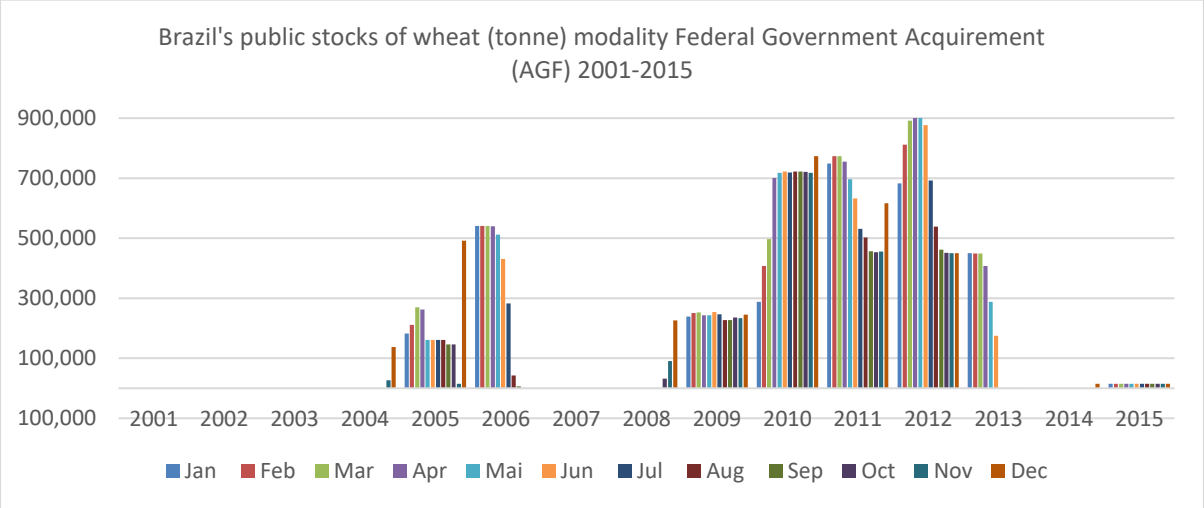
Finally, it is important to make some observations on the build-up of wheat stocks. This product is not demanded directly by the consumer, and the AGF can influence the carrying costs charged by the mills. The consumer's absence puts the power to directly influence prices in the hands of the industrial classes. It is therefore observed through Figures 16 and 17 that government presence in stock build-up was very weak throughout the previous decade, assuming some importance only between 2010 and 2012 when it reached approximately 5-7% of domestic consumption. In addition, wheat stocks through the PAA are very low and may even be disregarded.

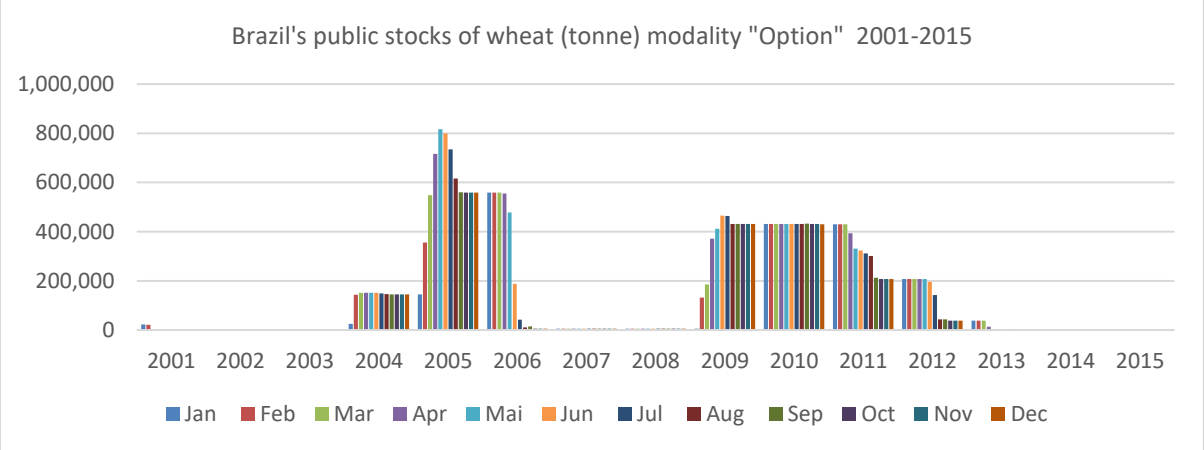
Figure 15 Brazil's public stock of wheat by modality 2001-2015

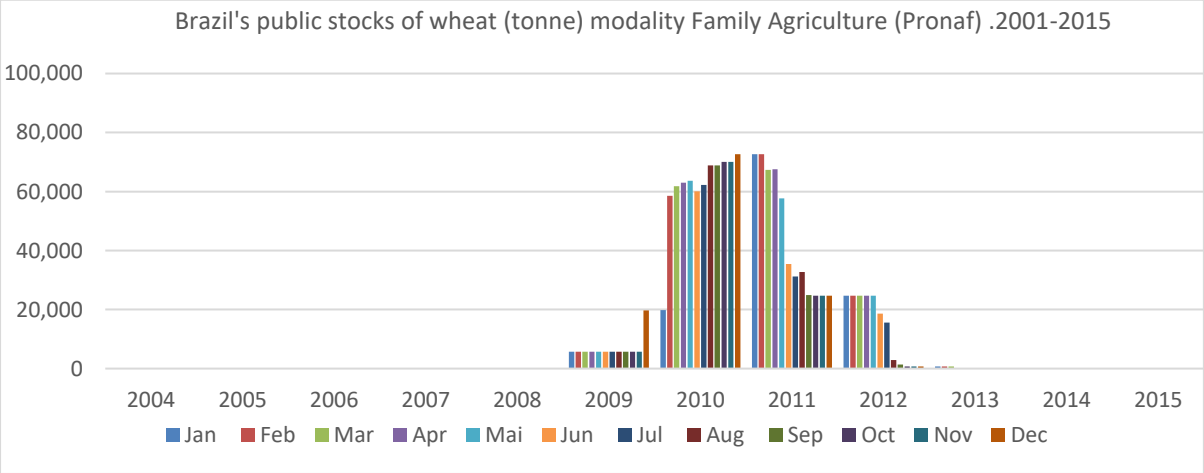


Source: CONAB database

Figure 16 Public stocks of wheat (tonne) modalities "AGF" (Federal Government Acquirement), "Option", and "PRONAF", 2001-2015







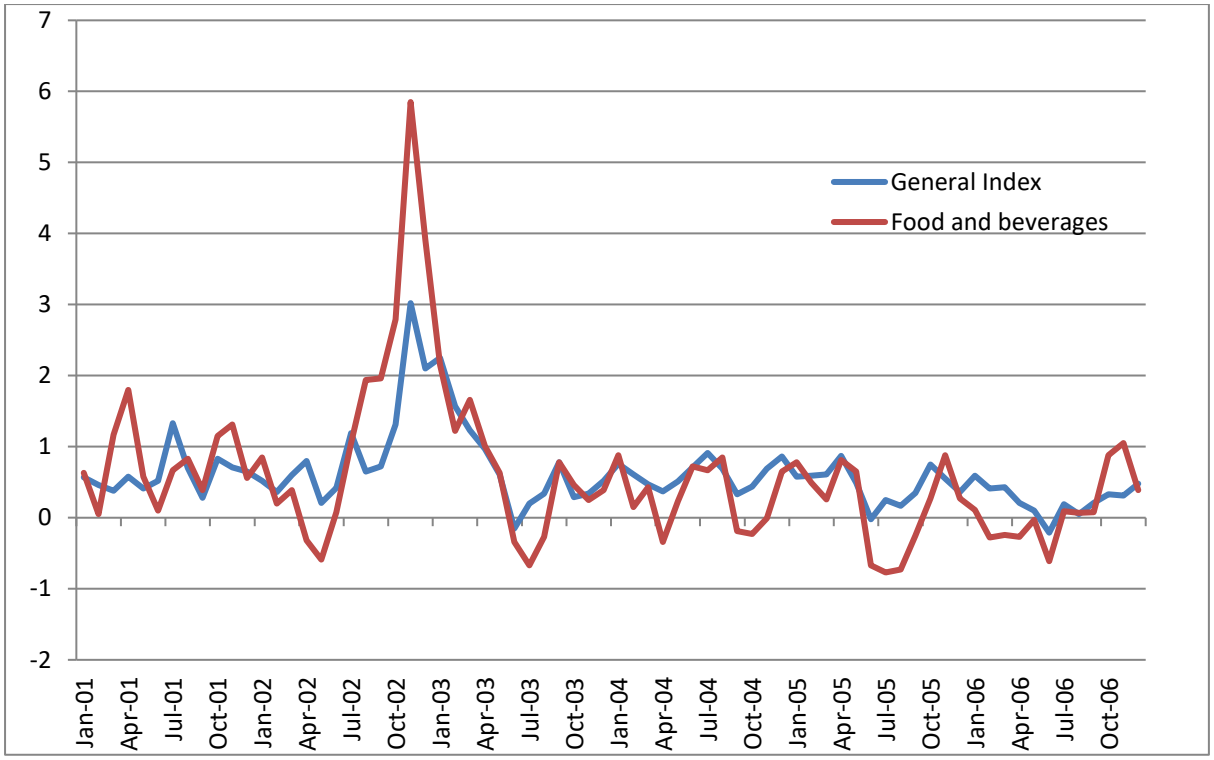
Source: CONAB database

6. Food prices to consumers in the last decade

The impact of international prices on food prices in Brazil can be seen in the effects of the food price crisis. The behaviour of prices vis-à-vis the general food price index in Brazil indicates two distinct temporary patterns in the 2000s.

The first period runs from 2000 to 2006. Except for an atypical movement, marked by expectations regarding the political situation in 2002, the period can be described as a "peaceful lagoon", with small fluctuations in quarterly prices, and high correlation between food price and general price indices.

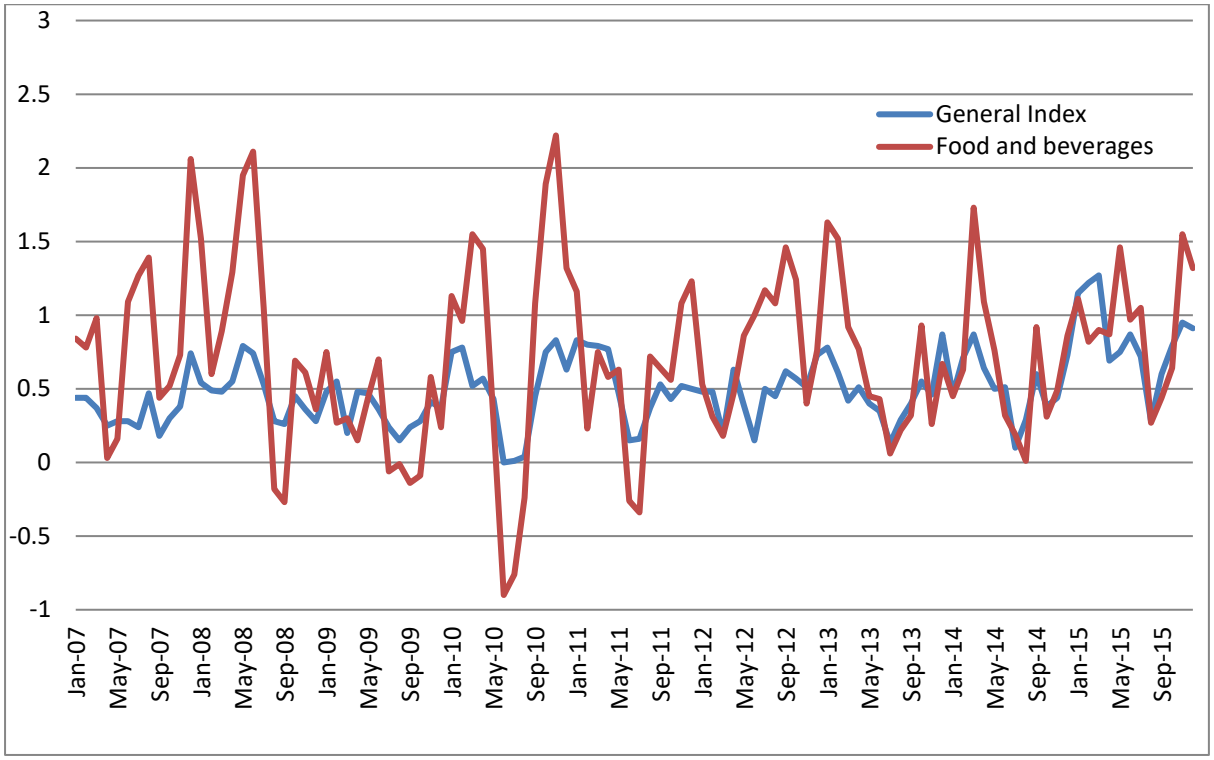
Figure 17 Evolution of general index prices and food and beverage index prices. Brazil, 2001-2006



Source: IBGE DATABASE

From 2007 to 2013, Brazil began to experience significant instability in food prices relative to general prices. The increase in inflation rates in the country from 2013 is accompanied by food prices, but with less variation than that seen from 2007-2013.

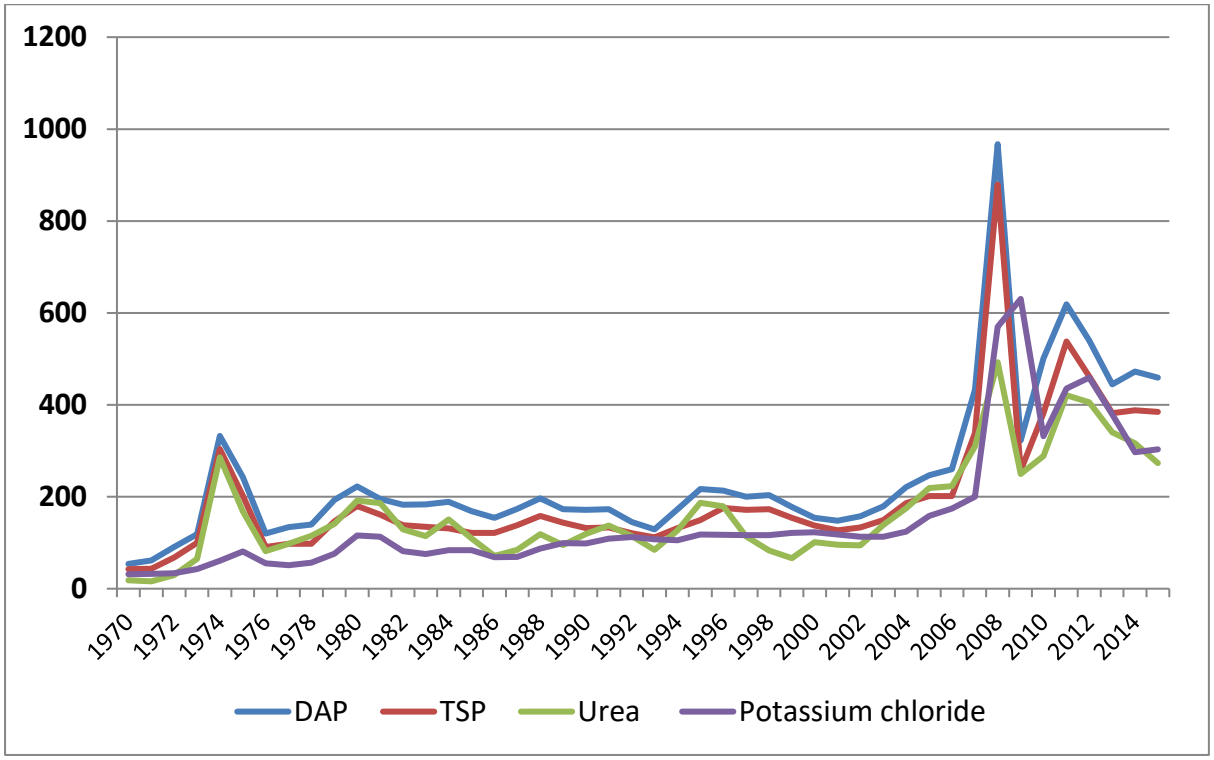
Figure 18 Evolution of general index prices and food and beverage index prices. Brazil, 2007-2015



Source: IBGE DATABASE

The international price of inputs rocketed from the beginning of the decade. Prices of many products that are not directed to the external market (and therefore are not influenced by international prices, as there is no opportunity cost) may have increased not because of demand but due to these cost increases. The figure below illustrates the increase in the price of the main input of Brazilian agriculture: agrochemical fertiliser, which soared from 2004 and peaked in 2009. Fertiliser now costs more than four times the price observed at the beginning of the decade.

Figure 19 Average fertiliser prices in Brazil, 1970-2015



Source: World Bank Database

Table 4 below shows the massive deterioration of terms of trade for five products in relation to fertiliser. The highest point of the increase in costs occurred in 2008 for soybeans, wheat and corn. For beans, the worst situation occurred in 2009 and for rice, in 2011. The deterioration in the relationship remained high and, except in the case of soy beans, it returned to the beginning of the levels of the 2000 decade.

Table 4 Exchange Ratio for the purchase of 1 tonne of fertiliser in Brazil, 2000-2015

Year	Exchange Ratio for the purchase of 1 ton of fertilizer				
	Irrigated Rice (Pack 50kg)	Bean (Pack 60kg)	Corn (Pack 60kg)	Soy (Pack 60kg)	Wheat (Pack 60kg)
2000	30,6	14,7	40,2	25,4	33
2001	30	10,6	57,8	23,4	31,7
2002	26,5	9,4	38,1	17,6	23,6
2003	21,9	11,6	50,3	19,8	28,6
2004	27	15,8	57,1	22,7	35,8
2005	38,5	11,4	57,3	27,7	41,5
2006	28,1	17	59,8	26,7	34
2007	30,7	14,4	50,7	25,6	21,2
2008	41,4	13,8	87,4	38,6	52,2
2009	39	16,8	67,5	25,7	41,3
2010	29,9	12,1	64,7	25,4	39,3
2011	51	16,1	52,6	27,1	46,5
2012	41,8	9,7	53,6	22,6	45,8
2013	33,1	8,7	64,8	22,2	30,2
2014	31,3	17,7	62,6	20,9	35,2
2015	38,8	12,8	72,1	23,5	45,1

Source: CONAB Database

We can separate the impact of the public policy of intervention in the market, via regulatory stocks, into two types: the impact in terms of social costs and impact in budget terms. The first is the cost imposed on society by supporting a higher price than the market price. This can occur through consumer subsidies or buying surpluses from farmers. The budgetary impact is calculated from the government's outlay for the acquisition of agricultural product or the cost of the implicit subsidy in the operation of the stocks through the market.

Given the change in government intervention model, the presence of interventions like the AGF were reduced in 1990 and 2000 and increased again only after the fall of international prices in 2010 and 2011, with rice and corn representing 90% of the government purchases between 1990-2007. To the extent that the Brazilian economy was opening up to the foreign market, the minimum prices by the government approached the international prices with the weakening of the PGPM.

Analysing the behaviour of these two products (rice and corn) since 1987, Schwantes (2015) estimated the social and budgetary costs. This calculation considered the functioning of the various mechanisms of stock policy (payment of insurance costs and production displacement) and the volume of product involved in government negotiations for these two products. In all cases analysed there was a huge reduction in the cost of intervention. For rice, the initial social cost with the purchase of surplus represented 23.5% of the value of production in 1986/87, 14.5% in 1995/96, and 0% from the year 2000. The cost of the subsidy in social terms was zero or practically negligible over all years, except for the year 1995/96 when it reached 11.9% of the production value. The expenses in budgetary terms for rice fell from 21.9% of production to almost zero in the 1990s, where it remains to date. In the case of corn, the situation was very similar, emphasising however that the participation of intervention

budget costs can be considered negligible except for the year 1996/97, where it represented 7.9% of the cost of production.

Overall government interventions, directly or through the market, had a very low weight in the set of price stabilisation policies in Brazil. According to Schwantes (2015) the action of pressure groups made the government buy the product when the minimum price was below the market price but, contradictorily, the government bought also when the minimum price was below the market price to remove the product of certain regions, preventing the market price from falling too much.

7. Food Consumption Indicators

Food consumption in Brazil has been growing steadily due to increasing incomes. The phenomenon of urbanization and demographic changes in a context of trade liberalisation and globalisation have transformed Brazilian eating habits toward a diet with more processed foods and more food away from home. In higher income classes there was a change favouring the consumption of more fruits, vegetables and fresh foods consistent with what happens in countries with higher incomes.

These changes in the eating habits of the Brazilian population are reflected in the growth of obesity and the incidence of chronic diseases such as hypertension and diabetes - a common phenomenon in the societies of the American continent. By the end of the 1970s the main nutritional problem in Brazil was undernutrition, but by the end of the next decade the prevalence of obesity became a problem to be addressed by public policy. The large national research on nutrition conducted nationally as a module of the Pesquisa de Orçamentos Familiares (Household Budget Survey) (last held in 2008-09) indicated the existence of obesity in 5.7 million children (5-9 years), 6.8 million adolescents (10-19 years) and 61.5 million adults over 20 years old.

When the first national research on nutrition was held in 1974-75 malnutrition was present in 8% of adult men and 12% in adult women. These percentages were higher than the obesity rate: 3% and 8%, respectively. Just over 30 years later, in the 2008-09 research, undernutrition rates had reduced to 2% and 4% for adult men and adult women, and obesity rates had soared to 12% and 17% respectively.

The household spending on food aligns exactly to the shape of the Engel curve, so that the poorest families have to use 32% of their income on food consumption, and the highest-income families (above 30 minimum monthly wages, or approximately USD 6,000 monthly per capita) spend less than 9% on food. The increase in incomes of the poor and the support of social feeding programmes have allowed this social layer to spend less proportionately on food, but at the same time, directed their spending to other types of food. In this 30-year interval, the per capita consumption of cereals and vegetables fell from 57.8 to 31.4 kg / year, fruits observed a drop of 38.4 to 32.9 kg / year, while drinks and infusions increased from 4.6 to 59.5 kg / year and prepared foods from 1.6 to 4.4 kg / year.

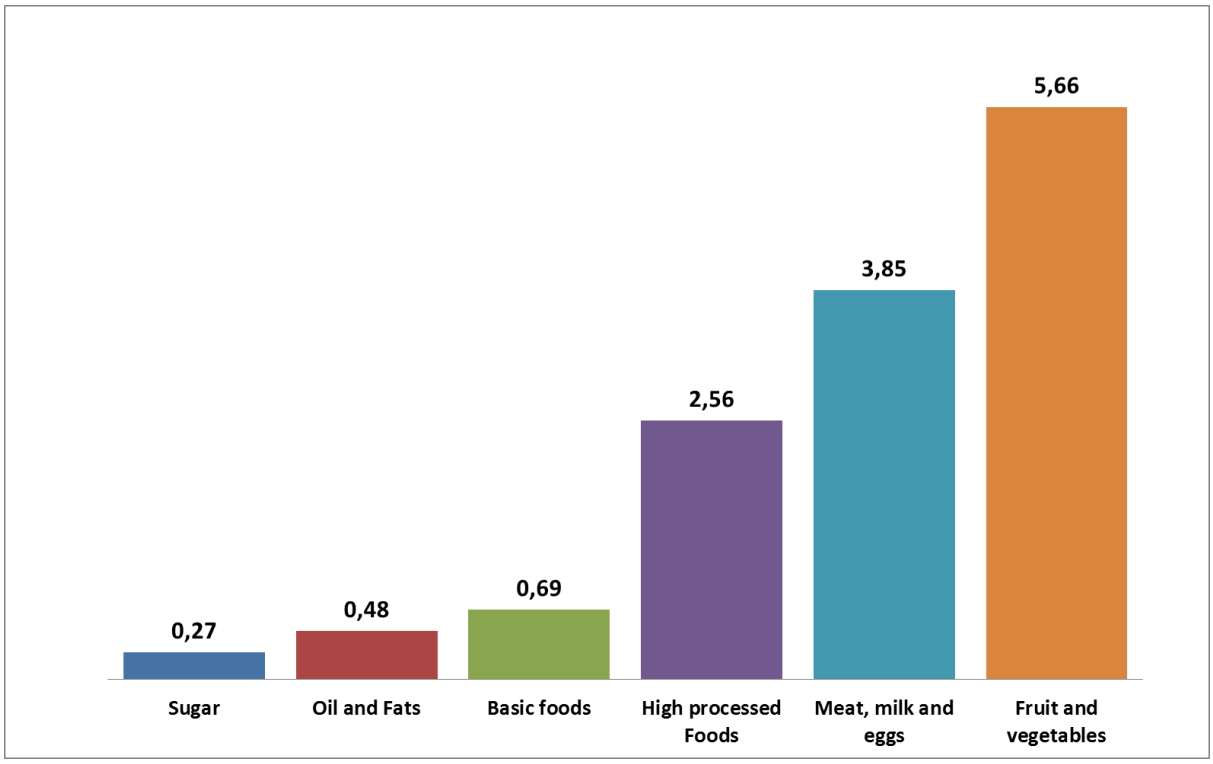
By calculating the availability of food in Brazil through its apparent consumption, it is possible to present data on an annual basis. Table 5 presents this information for a homogeneous group of products in selected years.

Table 5 Food Supply (kg/capita/year), Brazil

Product	1970	1990	2000	2005	2008	2009	2010	2011	2012
Beans	20,70	13,41	16,41	15,35	16,36	16,30	16,27	16,40	15,34
Bovine Meat	17,75	27,51	34,87	36,15	37,41	37,41	38,69	39,07	39,32
Maize	22,06	21,66	15,60	22,45	25,10	25,01	24,38	24,31	27,55
Meat, Other	0,03	0,05	0,04	0,02	0,07	0,07	0,10	0,10	0,11
Rice (Milled equivalent)	38,72	40,69	38,24	39,25	33,26	34,57	33,53	34,16	31,76
Soybeans	0,02	2,06	2,43	3,20	3,36	3,14	3,64	3,78	3,67
Wheat	36,02	43,55	43,75	51,77	53,63	53,41	53,88	53,46	52,29
Poultry Meat	3,94	14,14	29,59	27,54	36,57	35,04	37,74	40,63	40,84

Increased consumption of processed foods is linked not only to increased income and changing habits, but also to relative prices and the growing share of supermarkets as the place for the purchase of food prepared in the home. Figure 20 presents this scenario, taking as a basis the prices charged in Brazilian currency to the consumer at the time of the last budget survey of 2008/09.

Figure 20 Cost (R$/1,000 Kcal) of selected food groups. Brazil, 2008/2009



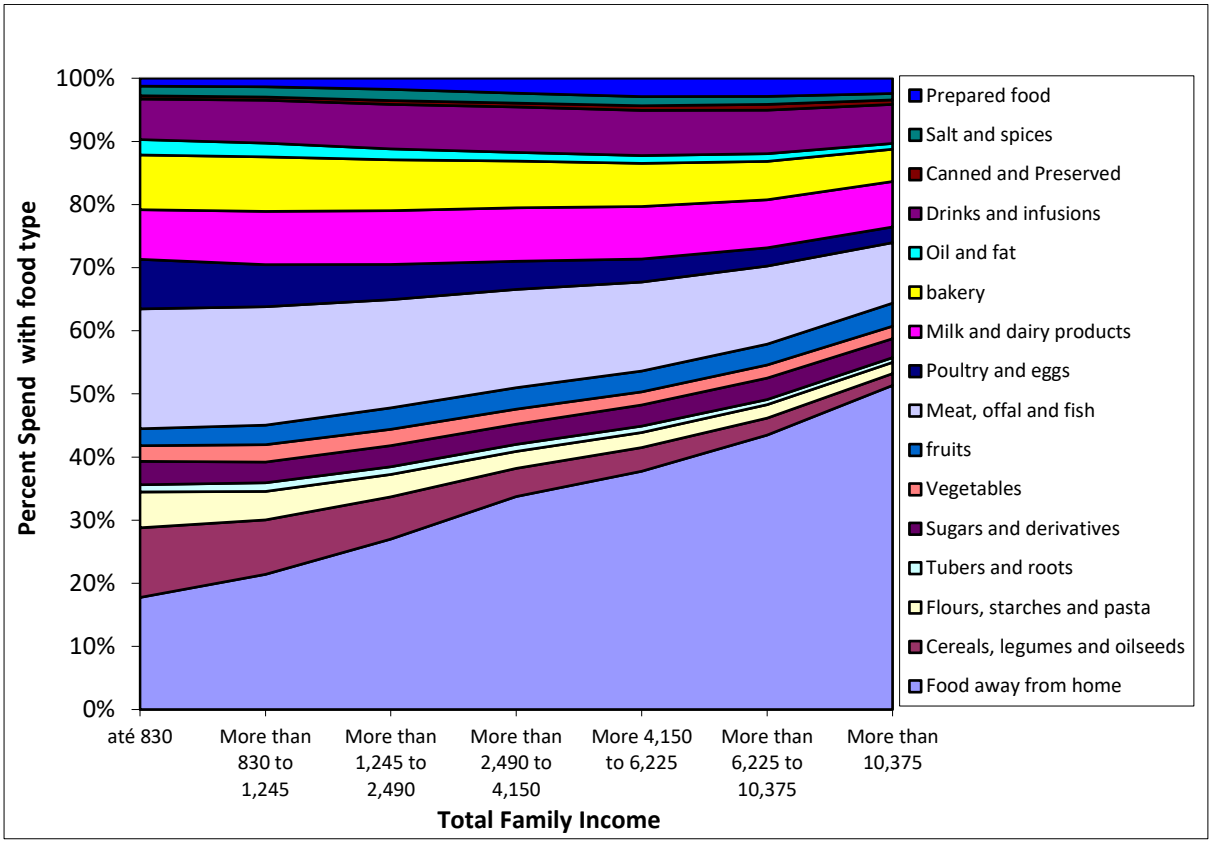
Source: Ricardo and Claro (2012)

Figure 21 below shows the distribution of food consumption by income class (measured in terms of minimum wages in Brazilian currency) in 2008/09. The consumption scale is 1 to 12.5 minimum wages of household income per capita. Emphasis should be given to the increased consumption of food away from home for the higher income classes and the increase in consumption of fresh food (fruit and vegetables) proportional to income growth.

Brazil is a major producer of food and, although exports have an important role, domestic agriculture ensures domestic supply. With the stability of the economy and income growth observed in recent

decades, a significant portion of the population has started to spend proportionately less on food in relation to their income, but that does not guarantee a better quality of food consumed. These distortions are reflected in the dramatic increase in the obesity rate and the incidence of non-degenerative chronic diseases. Even with the sharp rise in food prices observed since 2008, discussed below, the impact on domestic consumption did not significantly reduce household access.

Figure 21 Distribution of average family spend on food, by total income class, Brazil 2008/2009



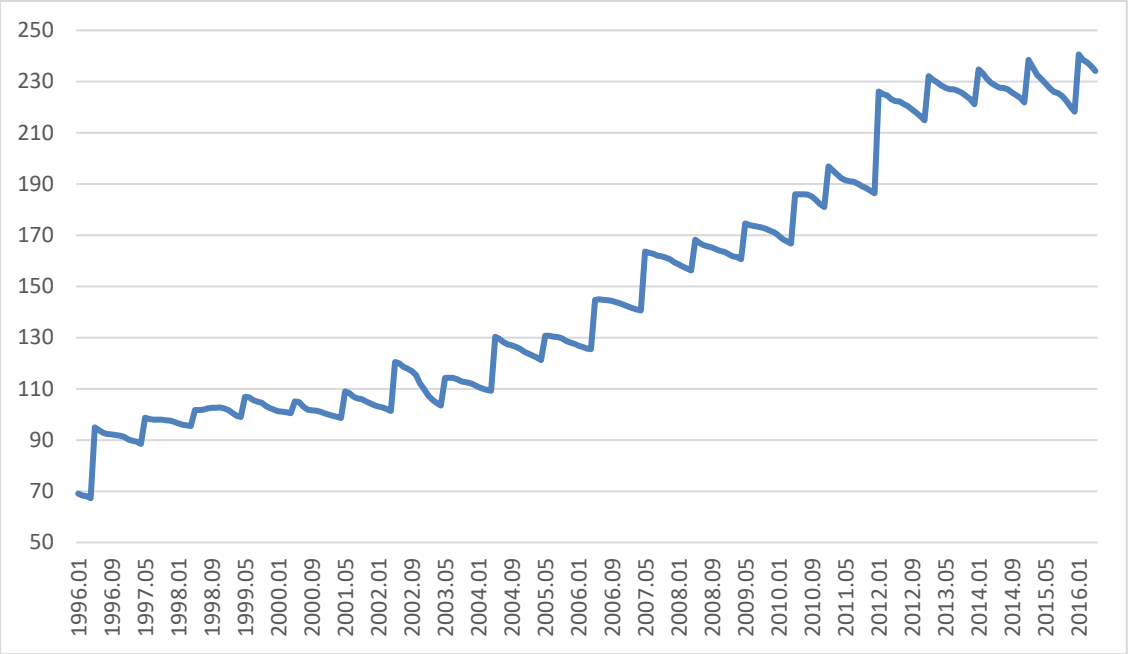
8. Conditional Cash Transfer Policy – "Bolsa Família" as food access policy

The "Fome Zero" or Zero Hunger programmes were implemented quickly, which allowed some indicators of vulnerability to be rapidly reversed in Brazil. There was a significant reduction in the level of poverty in relative terms and in the concentration of income (measured by Gini coefficient). The explanation for such changes can be found not only in concentrated efforts in terms of social politics, but also from the measures in the economic policies which had a direct impact on the level of economic growth, generating more jobs, increasing salaries and leading to a virtuous cycle of prosperity.

The original Fome Zero Project anticipated the need to promote growth and increase incomes. In terms of macroeconomy, Brazil experienced accelerated growth from 2002-12: annual income per inhabitant rose from USD 3,760 to USD 11,082 (Brazil National Accounts). However, aside from the statistical illusion promoted by the depreciated dollar during the present decade, we can observe an explosive growth in the minimum wage in real values.

As observed in Figure 22, over the past decade the government has promoted the rescue of the minimum wage by implementing raises in real values, which gave workers more purchase power.

Figure 22 Evolution of the Minimum Wage in real values 1996-2016, Brazil (base= Jan. 1976)



Source: IBGE (deflationed by IPCA)

The minimum wage doubled from 2000-11, and because this is the base for different categories of workers, the raise benefited the base of the population. In addition, in a period of low inflation, in contrast to the 1980s and 1990s, the fluctuations and the loss of purchase power between the dates of adjustment was also reduced, raising the consumption rate among the low-income classes and transforming into a development virtuous circle.

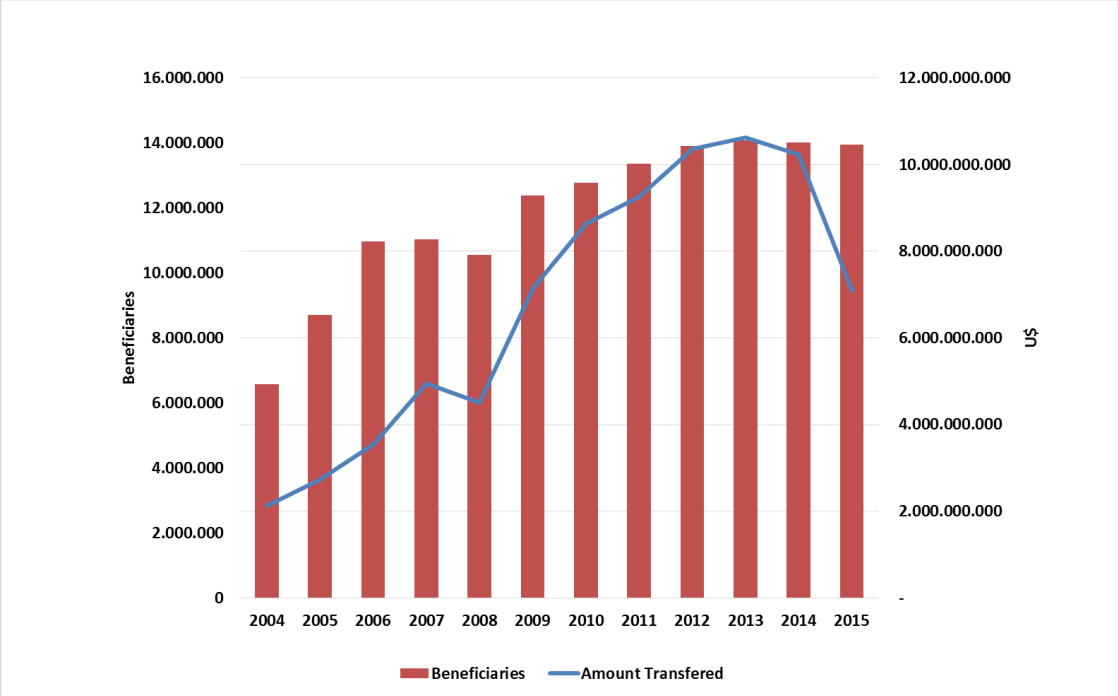
The unemployment rates during the period confirm the increase in demand. A comparative study between the years 2002 and 2011 shows that unemployment rate dropped from 12.6% to 6.0%. Not even the international financial crisis which started in 2008 reduced the general tendency of falling unemployment rates, although the unemployment rate did oscillate upward at that time.

In addition to the increased number of jobs offered in the last decade, there was also an increase in the number of formalised workers. In 2001, only 45.5% of workers were registered professionally, with both employer and employees collecting taxes directly from their main occupation. In 2011, the proportion increased to 59.2% due to increased demand for workers in the market.

Another factor that has contributed to increased consumption and income for families was the Bolsa Família Programme (a component of Fome Zero). This project is the result of the combination of all other cash transfer projects at the federal level. At the end of 2002, Bolsa Família started off with more than three million families granted benefits. At the end of 2009, the project accomplished the goal of establishing a presence in all 5,564 municipalities of Brazil, generating a wide system of coverage in partnership with local powers.

In 2011, with the new administration, the project was improved with an active search for families that would supposedly be living in conditions of misery and had not been enrolled in the programme. As a result, by the end of that year, a new record of 13.3 million families were participating in the program.

Figure 23 Bolsa Família beneficiaries and total amount of transfers

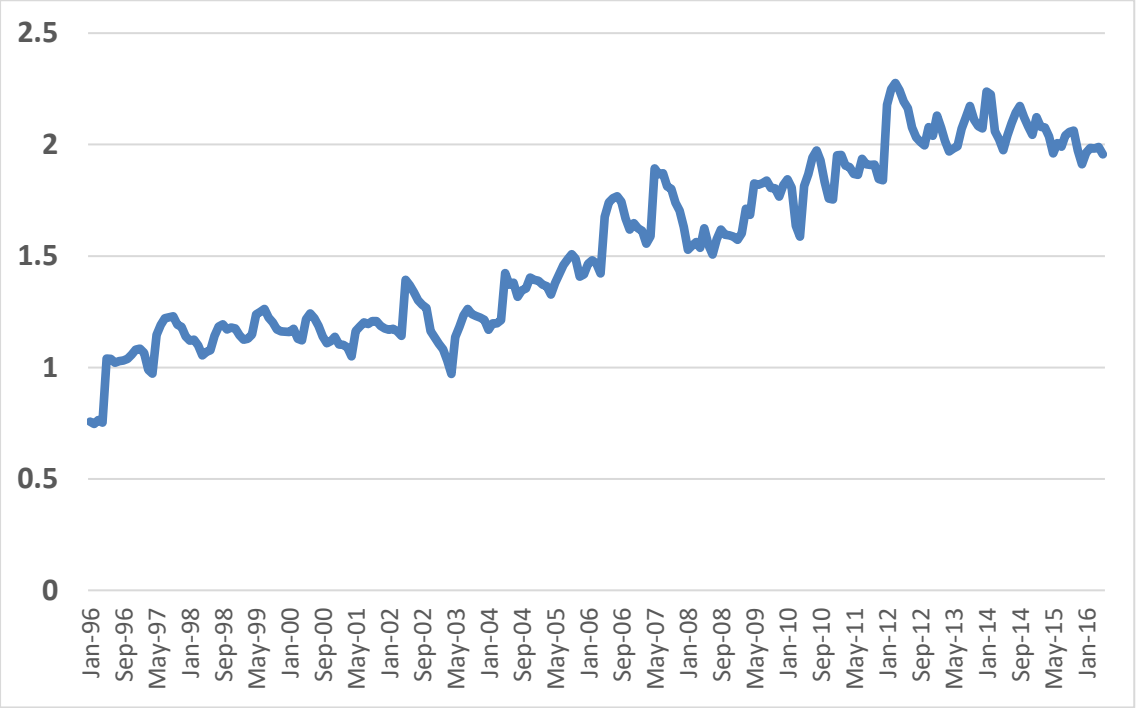


Source: MDS database

The combination of economic development and combating poverty through conditional cash transfer programmes and productive inclusion has enabled improvement in the purchasing power of the population. Studies developed by IBGE demonstrate that there was a reduction in the level of poverty according to relative criteria and an increase in the power of consumption.

Figure 24 shows that in 2001, the minimum wage was sufficient to purchase 1.37 food baskets in the city of São Paulo. At the beginning of 2012, the purchasing capacity of the minimum wage rose to 2.24 food baskets.

Figure 24 Basic official food basket purchased with minimum wage in Brazil, 1996-2015



Source: DIEESE database

Considering that there was a raise in the minimum wage and that the dimension of poverty is measured in terms of the minimum wage (and taking population growth into consideration), we conclude that the number of families now below the poverty line has increased.

According to studies by Dedecca et. al. (2012), considering the amount equivalent to half of the real minimum wage per capita as the bottom line, the number of families now below the poverty line has increased from 13,043,345 in 2001 to 15,812,850 in 2011.

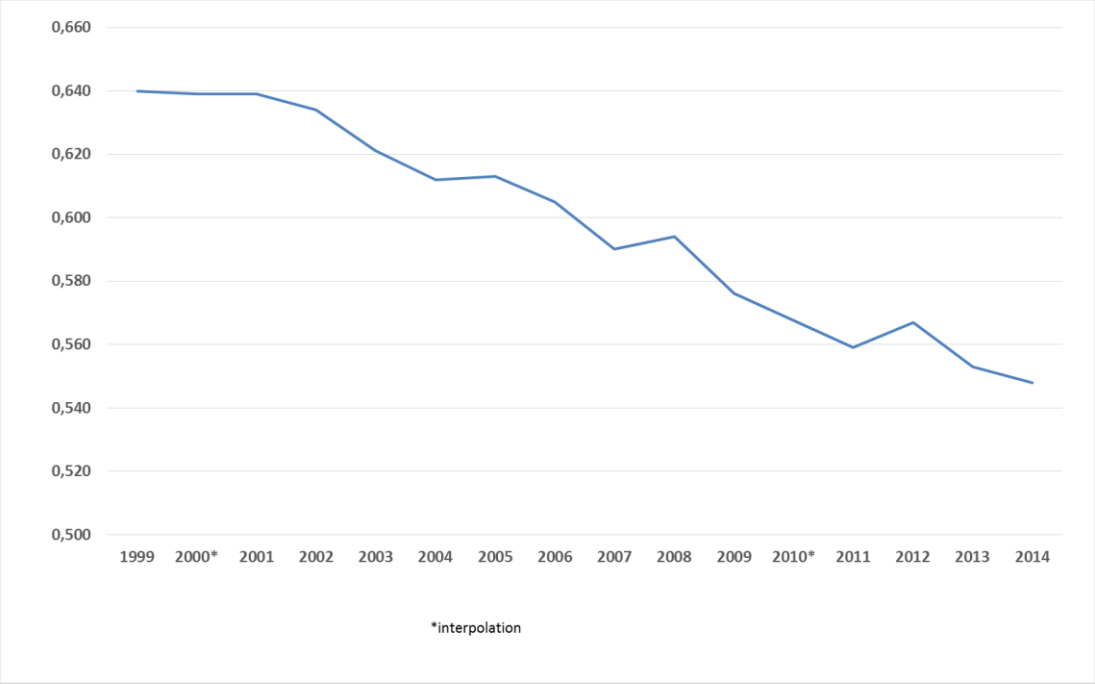
However, considering a poverty line of BRL 70,00 per capita in real terms, the same measure adopted recently for the planning of the "Brasil sem Miséria" project, which represents a figure very close to the estimate of USD 1.25 per capita per day, we conclude that the number of families in extreme poverty conditions has dropped. In that case, the total number of families has reduced from 4,900,116 to 3,689,571 between 2001 and 2009 (Brazilian Institute of Geography and Statistics, IBGE).

Another important indicator was the reduction of wealth concentration, especially because significant changes had not yet been observed in relation to this indicator in the last decades. In fact, on the contrary, with the hyperinflation in the 1980s and early 1990s, the concentration of income and wealth was aggravated in Brazil. Figure 24 shows a clear trajectory leading to less concentration in labour income. The information about wealth concentration in general does not point to an acute reduction, although the tendency is maintained.

According to preliminary calculations provided by Dedecca (2012), the Gini Index for all levels of income declined from 0.594 to 0.546 between 2001 and 2009. The concentration of total income among the poorest 10% rose from 0.4% to 0.6%, while the concentration of total income among the

richest 10% was reduced from 42.7% to 38.9%. The following diagram presents the evolution of the Gini Index by 2014.

Figure 25 Gini Index of real income of all work undertaken by employed citizens who are at least 10 years old



Source: CEPAL Databases

9. Conclusions

Brazil's experience shows that agricultural policy has acted via market intervention, although the authorities have not conducted an active policy in this direction in the last two decades. There are no direct mechanisms of granting subsidies to specific producers, as this policy has not been used since the liberalisation of Brazil's markets in the early 1990s.

During this period market intervention also decreased, either because the high inflation of the early 1990s could not be fought with intervention in the markets, or because later during the two Cardoso governments (1995-2002) and the two Lula governments (2003-2010) volume stocks accumulated by CONAB would not allow for greater intervention. In practice, the government food stocks build-up policy was driven to sustain the prices of producers and not to reduce the prices charged by wholesalers or by suppliers of food raw materials.

From 2003 guidelines were also introduced establishing procedures for the formation of commodity stocks starting from purchases from family farming and aiming the donation to social institutions or school feeding. Despite the impact generated by this policy on the income of producers, trading volume has not been sufficient to affect prices.

Regarding the formation of prices for agricultural products on the domestic market, the stock management policy did not allow the government to handle a higher level of intervention. Similarly,

this power of intervention is not available to any agent of the private sector, given the dispersion of production and storage system.

In Brazil, the network of public warehouses is very limited, and the major part of it is leased to the private sector. Analysing the Brazilian regulatory stocks, it appears that in recent decades the mode option has grown, overcoming the physical stocks held by the government. As Brazil is a major producer, crises due to availability problems are rare. Comparison of domestic prices with international ones shows that there is no necessary and direct adhesion between the external price changes and what happens domestically. The transmission of the recent rise in international prices showed that it was completed due to internal intercession as tax exemptions and moves in the exchange rate.

From the point of view of better management of agricultural policies, it would be better to have a combination of public stocks, private and financial options. This would give greater agility to the government and greater transparency regarding the trends for the producer.

Regarding the use of public food stocks for social purposes, Brazil has the Bolsa Família programme that serves 44 million people (14 million households) in a cash transfer system. There is no guarantee that these resources are being used to purchase food, but surveys conducted by the Ministry of Social Development and NGOs show that more than 80% goes to food consumption, consistent with the income elasticity of that range of consumers. The operation of the Bolsa Família programme over the past 10 years has shown that the use of debit cards spread, reducing transaction costs. Previous experiences demonstrate that the distribution of food baskets was not efficient and suffered several deviations, increasing their costs which ultimately paralysed them (LAVINAS & VARSANO 1997), in addition to logistical problems. The beginning of the “Zero Hunger” (Fome Zero) Programme with the enthusiastic flood of donations showed how difficult it is to manage the logistics of food *in natura*.

Currently, the Bolsa Família programme is considered an example and inspiration for other programs in Latin America. At the beginning of this decade the Economic Commission for Latin America and the Caribbean had implemented similar programmes in 18 countries in the region that benefitted more than 25 million households, or 19% of the Latin American and Caribbean population at a cost around 0.4% of the regional GDP (CECCHINI, MADARIAGA, 2011: 7).

Alongside the conditional cash transfer programmes, distributing through programmes such as PNAE and PAA proved optimal solutions. This is a solution with low focusing error which acts synergistically with education and health programmes, enhancing the results of food security for the medium and long term. This architecture of the cash transfer programmes has enhanced their sustainability despite political and economic fluctuations in Brazil.

In the past the large network of philanthropic institutions accredited to provided social assistance was very much needed because government didn’t have an efficient and centralized system. Nowadays this role is played by PAA but, apart from the supply and logistics problems, there were problems with the quality of food donation. As the programme promotes a rotation in public stocks, naturally the food which is donated is always the oldest one in the public warehouses. Sometimes, the donated food was of poor quality (old and contaminated) and always was not enough to meet demand.

The social policy developments in Brazil have shown that the so-called institutional market is being amplified since the purchase programmes are being managed by federal and state facilities such as universities, prisons and hospitals far beyond the traditional donations to philanthropic institutions. In this sense more food stocks, in physical terms, are going to be demanded. On the other hand, programmes to provide individual food donations *in natura* are rejected, except in cases of public calamity. Attention then turns to the issue of institutional purchase programmes, and in this case Brazil does need more stocks in good condition.

References

ABREU, M.P.; MEDEIROS, M.C.; WERNECK, R.L.F. Formação de preços de *commodities*: padrões de vinculações dos preços internos aos externos. Rio de Janeiro: PUCRJ, 2003. 51p. (Texto para discussão, 474). Disponível em: <www.economia.puc- rio.br/mpabreu/pdf/TD474.pdf>. Acesso em: 12 jul. 2011.

ALMEIDA, ANDRÉ MARTINS DE A. Política de Garantia de Preços Mínimos – PGPM e a atuação da Companhia Nacional de Abastecimento – CONAB no período após a abertura comercial: mudança institucional e novos instrumentos / André Martins de Almeida. Piracicaba, 2014. 206 p: il.

ANDRADE, L. A.; REIS, J. M. L. A política de garantia de preços mínimos e os programas sociais de abastecimento. Revista de Política Agrícola, Brasília, v. 2, n. 3, p. 15-17, 1993.

BELIK, WALTER. O Financiamento da Agropecuária Brasileira no Período Recente. Texto para Discussão (IPEA. Brasília)., v.1, p.1 - 62, 2015.

_____ and Luiz Fernando de Oriani. O financiamento da produção agrícola na década de 90: Ajustamento e crise In: Políticas públicas e Agricultura: Estado e desenvolvimento rural no Brasil do final do século XX.1 ed. Porto Alegre : UFRGS, 2001, v.1, p. 95-120.

_____and CUNHA, ALTIVO R.A. DE ALMEIDA. Abastecimento no Brasil: o desafio de alimentar as cidades e promover o Desenvolvimento Rural. Políticas públicas de desenvolvimento rural no Brasil / Organizadores Catia Grisa e Sergio Schneider. – Porto Alegre: Editora da UFRGS, 2015.

_____and ROSA DE SOUZA, L R (2009) Algumas Reflexões sobre os Programas de Alimentação Escolar na América Latina. Planejamento e Políticas Públicas IPEA no. 33 jul/dez 2009, pp103-122.

BEZERRA, ILANA NOGUEIRA; SOUZA, AMANDA DE MOURA; PEREIRA, ROSANGELA ALVES SICHIERI, ROSELY. Consumption of foods away from home in Brazil. Rev Saúde Pública 2013;47(1)

CECCHINI, Simone and MADARIAGA, Aldo. Programas de transferencias condicionadas: Balance de la experiencia reciente en América Latina y el Caribe. Santiago del Chile, CEPAL / UN, 2011

BRASIL. Indicadores da Agropecuária / Companhia Nacional de Abastecimento. Brasília, Ano XXV, n. 4, abr. 2016, p. 01-116

CUNHA, ALTIVO R.A. DE ALMEIDA. Documento técnico contendo a avaliação da contribuição de programas de compras governamentais para a inserção comercial dos produtos da agricultura familiar no Brasil, com destaque para os produtos hortifrutícolas. FAO/UTF/BRA/083/BRA - "Nova Organização produtiva e social da agricultura familiar brasileira – uma necessidade", Brasília, julho de 2013

DEDECCA, C. S. et al. A Questão Social na Primeira Década do Século XXI: Conquistas e Desafios In: Avaliação de políticas públicas: reflexões acadêmicas sobre o desenvolvimento social e o combate à fome.1 ed. Brasília : MDS, 2014, v.3, p. 90-117

DELGADO, GUILHERME C, CONCEIÇÃO. Políticas de preços agrícolas e de estoques de alimentos. Revista de Política Agrícola. Ano XIV – Nº 3 – Jul./Ago./Set. 2005

FGV / CNA Fundação Getúlio Vargas, Instituto Brasileiro de Economia e Confederação da Agricultura e Pecuária do Brasil (2010) Quem produz o que no campo: quanto e onde II. Brasília, 2010

LAVINAS, L.; VARSANO, R. Programas de Garantia de Renda Mínima e Ação Coordenada de Combate à Pobreza. IPEA, Texto para Discussão no. 534, 1997.

MINISTÉRIO DO DESENVOLVIMENTO AGRÁRIO. Secretaria da Agricultura Familiar; Instituto Via Pública Projeto Nutre SP: análise da inclusão da agricultura familiar na alimentação escolar no estado de São Paulo./Maria Amélia Jundurian Corá; Walter Belik , organizadores --São Paulo: Instituto Via Pública, 2012.

RICARDO, Camila Z.; CLARO, Rafael Moreira. Custo da alimentação e densidade energética da dieta no Brasil, 2008-2009. Cad Saude Publica; 28(12): 2349-2361, dez. 2012.

SCHWANTES, FERNANDA. Política de garantia de preços mínimos no Brasil – uma avaliação dos custos sociais e orçamentários para arroz e milho no período de 1987 a 2013. Tese Doutorado. Escola Superior de Agricultura "Luiz de Queiroz". Universidade de São Paulo. Piracicaba. 2015139 p. : il.

MAIA, GUILHERME BAPTISTA DA SILVA MAIA ARTHUR DE REZENDE PINTO CRISTIANE YAIKA TAKAOKA MARQUES DANIELLE DIDIER LYRA FÁBIO BRENER ROITMAN. Panorama da armazenagem de produtos agrícolas no Brasil. Revista do BNDES 40, dezembro 2013.

MALUF, RENATO S. E SPERANZA, JULIANA S. Volatilidade dos preços internacionais e inflação de alimentos no Brasil: fatores determinantes e repercussões na segurança alimentar e nutricional. Brasília, DF: MDS; Secretaria Nacional de Segurança Alimentar e Nutricional, 2013. 148 p.

NOGUEIRA JR., S.; TSUNECHIRO, A. Produção agrícola e infraestrutura de armazenagem no Brasil. Informações Econômicas, v. 35, n. 2, p. 7-18, fev. 2005

SOUZA, AMANDA DE M; PEREIRA, ROSANGELA A; YOKOOI LEVY EDNA M RENATA B; SICHIERI, ROSELY. Most consumed foods in Brazil: National Dietary Survey 2008-2009. Rev Saúde Pública 2013;47(1 Supl)

YUBA, TANIA YUKA; SARTI, FLÁVIA MORI; CAMPINO, ANTONIO CARLOS COELHO; CARMO HERON CARLOS ESVAEL DO. Evolution of the relative prices of food groups between 1939 and 2010 in the city of Sao Paulo, Southeastern Brazil. Rev Saúde Pública 2013; 47(3):1-10.

Databases accessed

http://faostat.fao.org
http://www.conab.gov.br/
http://seriesestatisticas.ibge.gov.br/
http://www.sidra.ibge.gov.br/
https://www.dieese.org.br/icv/
http://aplicacoes.mds.gov.br/sagi-data/
www.ipeadata.gov.br