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**Brazil: Shadow WTO Agricultural Domestic
Support Notifications**

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INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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CONFERENCE PROGRAM

Improving WTO Transparency: Shadow Domestic Support Notifications

Measurement Issues and Analysis for Eight Countries—
European Union, United States, Japan, Norway, Brazil, China, India, and the Philippines
<http://www.ifpri.org/events/conferences/2008/20080314.asp>

Friday, March 14, 2008

- 9:00–10:00 An Overview of WTO Domestic Support Notifications
David Orden
Discussion Opener: Lars Brink
- 10:00–11:10 European Union
Tim Josling and Alan Swinbank
Discussion Opener: Erling Vårdal
- Coffee Break
- 11:30–12:40 United States
David Blandford and David Orden
Discussion Opener: Munisamy Gopinath
- Lunch
- 1:30–3:30 Brazil
André Nassar and Diego Ures
China
Fuzhi Cheng
Discussion Opener (both papers): Caesar Cororaton
- Afternoon Break
- 3:45–5:45 India
Munisamy Gopinath
Philippines
Caesar Cororaton
Discussion Opener (both papers): Yoshihisa Godo

Saturday, March 15

- 9:00–11:00 Japan
Yoshihisa Godo
Norway
Erling Vårdal
Discussion Opener (both papers): André Nassar
- 11:15–12:30 Wrap Up

ABSTRACT

This paper is devoted to better understanding of the Brazilian agricultural national policies towards domestic support and implications related to WTO rules. Domestic support has taken central stage in the last years and in light of a global economic crisis will play an even greater role in international trade politics. The paper focuses on Brazil and lays out the different domestic support policies used by the government. It is divided into five distinct parts for better comprehension. These parts are as follow: a synopsis of policies and recent studies; replication of official WTO support notifications; construction of consistent shadow notification; comparison and discussion of shadow notifications in relation to the WTO rules; and projected notifications through 2018. Also ethanol policies and the WTO rules were carefully analysed in order to better understand the Brazilian domestic support.

Through this paper the reader will be able to have a better understanding of Brazilian agricultural domestic support policies with respect to WTO rules—a topic not well evaluated in the academic arena up to this time. A lot of scientific work has been done in the field of domestic support, but little has been done to better understand domestic support policies of specific countries in light of the WTO legal system.

Keywords: Brazil's agricultural support, WTO Doha Round, notifications of domestic support, WTO compliance

ABBREVIATIONS AND ACRONYMS

AGF	Federal Government Acquisitions
AMS	Aggregate Measurement of Support
AoA	Agreement on Agriculture
BACEN	Brazilian Central Bank
BNDES	National Development Bank
CIDE	Contribution to Intervention in the Economic Dominion
COA	Contract Option Acquisitions
CONAB	National Food Supply Company
DSB	Dispute Settlement Body
EGF	Federal Government Loans
EGF-COV	Federal Government Loans with a Sell Option
IBGE	Brazilian Institute of Geography and Statistics
ICMS	State Tax
INCRA	National Institute for Colonization and Agrarian Reform
IPI	Tax on Industrialized Products
MAPA	Ministry of Agriculture and Livestock
MDA	Ministry of Agrarian Development
MODERAGRO	Programme for the Modernization of Agriculture and the Conservation of Natural Resources
MODERFROTA	Programa de Modernização da Frota de Tratores Agrícolas e Implementos Associados e Colheitadeiras
MODERINFRA	Incentives Programme for Irrigation and Storage
MPS	Market Price Support
OECD	Organisation for Economic Co-operation and Development
OTDS	Overall Trade-Distorting Support
PEP	Premium to Commercial Buyers
PEPRO	Equalization Premium to Farmers
PESA	Financial Assets Rehabilitation Program
PGPM	Policy of Guaranteed Minimum Prices
PROCERA	Special Credit Programme for Agrarian Reform
PRODEAGRO	Agri-business Development Programme
PRODECOOP	Cooperative Development Programme for the Enhancement of Agricultural Value Added
PRODEFRUTA	Fruit Industry Development Programme
PROGER	Programme of Rural Employment and Income Generation
PROLEITE	Milk Production Mechanization and Transportation Incentive Programme
PRONAF	National Program for the Strengthening of Family Farming
PROP	Premium to Commercial Buyers under a Private Sell Option Contract
PROPFLORA	Programme of Commercial Planting and Recovery Forest
SELIC	Government Reference Interest Rate (short term)
SNCR	National System of Rural Credit
TJLP	Long-term Market Rate
WTO	World Trade Organization

1. INTRODUCTION

Trade-distorting domestic subsidies for agricultural products are among the most contentious issues in the Doha Development Round. It would not be a stretch to affirm that disciplining domestic support has become the most important shared offensive interest among developing countries; it has acted as the glue that keeps the G-20 an active coalition in the World Trade Organization (WTO) negotiations. Although there is a consensus that domestic support disciplines must be strengthened by the Doha Round, the concrete meaning in terms of cuts, caps, commitments, and allocation of subsidies in the boxes remains controversial. The topic is broader than simply the Doha Round because it also involves other spheres of the WTO, like the Dispute Settlement Body (DSB) and the functioning of the Agriculture Committee. The topic is evolving and embracing new perspectives. The most important is, no doubt, the subsidies for agricultural-based biofuels.

This paper deals with subsidies granted to the Brazilian agricultural sector. The agricultural sector is like no other sector of the Brazilian economy. It is at the heart of political attention because farm productivity from the 20th century and on has hugely increased due to technological modernization. Brazil has grown, in only a few years, to become among the top agricultural exporters in light of its increases in output. Consequently, trade liberalization has become an issue of central importance for the sustainability of Brazilian agriculture, and domestic subsidies together with market access are at the root of the problem.

In recent years, Brazil has appeared as a major player in the issue of strengthening the disciplines for trade-distorting domestic subsidies in the Doha Round and in the WTO legal system. Brazil has led two very important disputes against trade-distorting subsidies: cotton and sugar cases. Brazil is also in the heart of the Total Aggregate Measurement of Support (AMS) case that has been in course in the WTO DSB.

The Organization for Economic Co-operation and Development (OECD) producer support equivalent shows that Brazil is a big agricultural producer with low levels of subsidies when compared with other developing countries. Among China, Russia, South Africa, and Ukraine, non-OECD members that have been monitored by the OECD, Brazil is at the bottom in terms of the percentage of producer support equivalent.

The country has decided to be transparent, opening all information related to its agricultural policy: Different from other developing countries, Brazil updated its WTO domestic support notifications to 2004, and its policies since 2005 have been submitted to the OECD for evaluation. Stronger disciplines and tougher commitments, along with transparency, are of central interest for Brazil in the multilateral negotiations. The process of updating the notifications and projecting government support to the agricultural sector presented in this paper indicates that most information regarding agricultural policies expenditures is publicly available at Brazilian government websites, with the exception of subsidies related to debt rescheduling programs. As discussed in the paper, those programs were the most difficult to be interpreted and trace in terms of data and methodologies used by the government to prepare the notifications.

This paper will focus on Brazilian agricultural policy with respect to programs that could be considered supported by the government and distortive to trade. The analysis of current domestic support programs with trade-distorting effects, as understood within the WTO legal system and more specifically the Agreement on Agriculture (Agreement), will be studied in detail. Policy instruments will be linked to agricultural support programs as well as descriptions of how the amount of corresponding subsidy is calculated and where it is notified in the WTO documents. Moreover, a series of projections with respect to product-specific subsidies are extrapolated up to 2018.

The main objective of this paper is to provide reliable information with respect to Brazil, offering a better understanding of current subsidies in light of the Doha Round. Brazilian notifications, however, are not freed from questioning, and this paper will discuss alternative approaches to measures taken by the federal government. Alternative approaches will not change the conclusion that Brazilian subsidies

still remain low in relation to the agricultural output or even on a product-specific basis. They show that Brazil is in a comfortable position to accept stronger disciplines, even the ones applied in developed countries.

There remains an unresolved question related to the WTO disciplines for domestic support: How will biofuels subsidies be treated within the WTO? Although agricultural-based biofuels production is increasing at rapid rates in the United States, European Union, and Brazil, it is still not clear how to classify ethanol and biodiesel policies within the WTO context. Some countries are notifying certain policies except the two big ones, which are tax exemptions/tax credits and blending mandates. However, so far, none of the member countries has decided to notify these policies in the WTO as domestic agricultural support. This paper provides a brief discussion on the ethanol policies in place in Brazil and a few alternatives that could be used for notifying biofuels policies in the WTO.

2. SYNOPSIS OF POLICIES AND RECENT STUDIES

With regard to the rural sector, Brazilian policies are organized in two general policy frameworks: agricultural policy and agrarian policy (Chaddad and Jank 2006). The agrarian policy comprises programs related to agrarian reform and land settlement projects. Budgetary expenses with agrarian reform programs are notified as general services in the green box. Agrarian policies will not be discussed in this paper, not only because they are notified in the green box, but also because commercial and family farmers do not benefit by such policies.

Agricultural policy in Brazil benefits two groups: commercial farmers and family farmers. The classification and division of these two groups was developed based on the 1996 Agricultural Census. This dissection is also visible in government structure: Ministry of Agriculture and Livestock (MAPA) manages the policies for commercial farmers, and the Ministry of Agrarian Development (MDA) manages programs for agrarian reform and policies for family farming (Damico and Nassar 2007). However, policies can be implemented by the same government agency. That is the case with income support programs, which are implemented by the National Food Supply Company (CONAB). In addition, the nature of the policies is also very similar: They are strongly based on providing credit lines with reduced interest rates, for both commercial and family farmers.

Policy framework-wise, the division between the beneficiary groups becomes clear in the preferential credit policies: Credit programs for family farmers are established in the National Program for the Strengthening of Family Farming (PRONAF), which offers favorable conditions for credit availability and lower interest rates when compared with programs for commercial farmers (MAPA 2007 and MDA 2007).

The Brazilian federal government follows five main agricultural policy strategies, as follows (Damico and Nassar 2007): (1) production, marketing, and investment credit for commercial farmers; (2) income support programs for commercial and family farmers; (3) rural development and family farming; (4) debt management programs for commercial and family farmers; and (5) rural insurance for commercial farmers.

With the exception of the rural insurance program, Brazilian agricultural policy is based on two main tools: rural credit generally available for all farmers with preferential interest rates, and income support programs for specific commodities. Debt rescheduling programs are, in essence, based on the preferential credit. Rural insurance is a relatively new strategy, begun by the federal government in 2005. Currently, this program is still very small in terms of production coverage and its availability to producers.

2.1. Production, Marketing, and Investment Credit Programs

The rationale behind the preferential credit policies in Brazil is related to high interest rates that have prevailed in the country and to the fact that agriculture production is a risky economic activity. Credit policy is directed to the farming community directly via government sourcing or indirectly through financial institutions. The federal government requires that banks keep a total of 25 percent of deposits available for farming credit. Moreover, rural savings, the National Development Bank (BNDES) and the Workers Support Fund complement the remaining source of funding for agricultural credit¹.

In order to implement credit policies based on preferential interest rates, the government has developed the National System of Rural Credit (SNCR). The SNCR has adopted many changes since its creation in the late 1960s. The basic principle of the system, however, remains the same: to organize various sources of funding that are devoted to rural credit and to allocate funds among several agencies that are responsible for lending the resources. The allocation is made according to the different credit

¹ Data on amount of preferential credit available to producers as well as explanations about the sources of funds can be obtained in the Rural Credit Yearbook published by the Brazilian Central Bank. This paper used data from 1999 to 2007 yearbooks (BACEN, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006 and 2007).

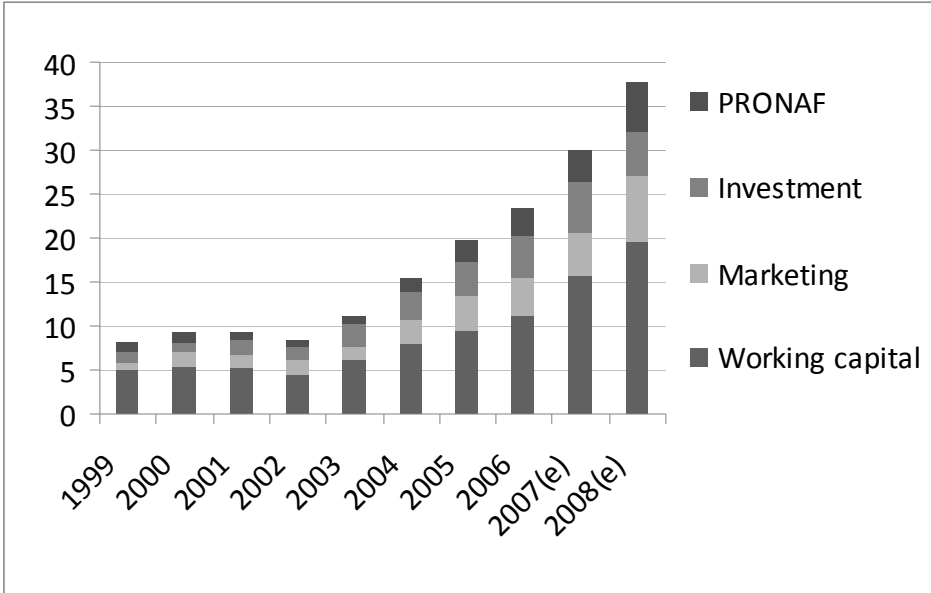
programs defined by the federal government. There are four credit programs in place (OECD 2005): (1) working capital credit², (2) marketing credit, (3) investment credit for commercial farmers, and (4) PRONAF for family farmers. Working capital credit and marketing loans, also known as EGF (federal government loans), are both short-term credit. The first provides credit to cover cropping activities (acquisition of seeds and fertilizers) and variable costs associated with production. Marketing loans are oriented to provide capital for after-harvesting activities, such as storage. Investment credit is focused on medium-term loans for capital goods acquisitions. PRONAF is a set of policies based on working capital and investment credit and is discussed separately in section 2.3 below.

Preferential credit policies have been in place in Brazil since the 1970s. Those policies were the main instruments used by the government to stimulate the expansion of agricultural production. When they began, these policies pursued two main objectives: to guarantee food security, and to promote the occupation of the Brazilian territory with agricultural production. During the 1970s and 1980s, real interest rates were negative, and there was no restriction on the availability of credit.

The purpose of these credit policies has changed since the beginning of the 1990s. As a consequence of the balance-of-payments crisis and hyperinflation, preferential credit policies, especially for working capital and marketing, have lost importance as a mechanism to increase production. Moreover, the amount of available credit decreased in real terms during that period. It was only in 2003 that the amount of credit began to grow once again, reaching, in 2008, the levels of the late 1980s (Figure 1).

In the case of production and marketing credit for commercial farmers, two elements of current policies are worth mentioning. First, loans are limited per farmer. For example, a soybean producer is limited to a Brazilian Real (R\$) 300,000/year loan. Second, increasingly a portion of the shares of the total available credit is subjected to market interest rates rather than preferential interest rates. For example, preferential interest rate, or the controlled interest rate, is 6.75 percent a year in the 2007–2008 crop season, but this rate is only for three-fourths of the total available credit, the other one-fourth having no controlled interest rates. Free interest rates operations represented 30 percent of the 2007 balance of credit operations. In the middle of the 1990s, that share was of 23 percent.

Figure 1. Working capital, marketing, and investment credit: Amount of funds available (in US\$ billions)

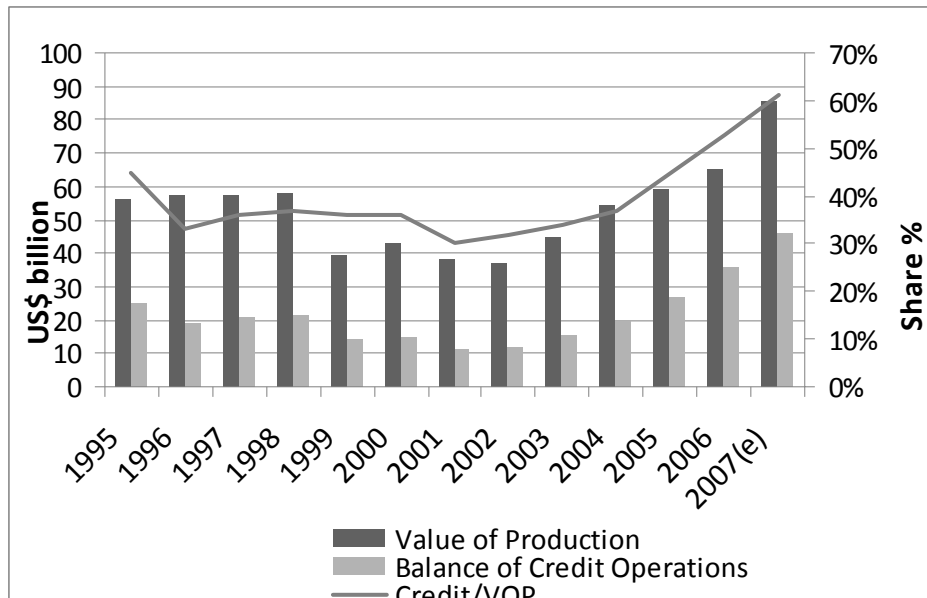


Source: BACEN; MAPA (2007) and MDA (2007). Note: (e) denotes an estimate.

² In this section we will refer to *production credit* and *working capital credit* as synonyms.

The 1990s have proved that availability of credit is a constraint in the performance of the Brazilian agricultural production. Figure 2 shows that credit availability and agricultural output measured by the value of production follow the same trend. Although the paper does not address the issue of the causality between availability of credit and production performance, it is clear that in the period between 1995 to 2007 the value of production has decreased following a decrease in available credit for the same years. Interesting to note is that total production is increasingly financed by credit programs in Brazil. The reduction of the credit share on total output from 1995 to 2001 is explained not only by the low availability of resources for credit, as shown in Figure 1, but also by the high level of credit default that prevents farmers from getting new loans. Among other factors, the balance of credit started to grow again in 2003 as a response to the debt rescheduling program.

Figure 2. Balance of credit operations and total value of production (in US\$ billions)

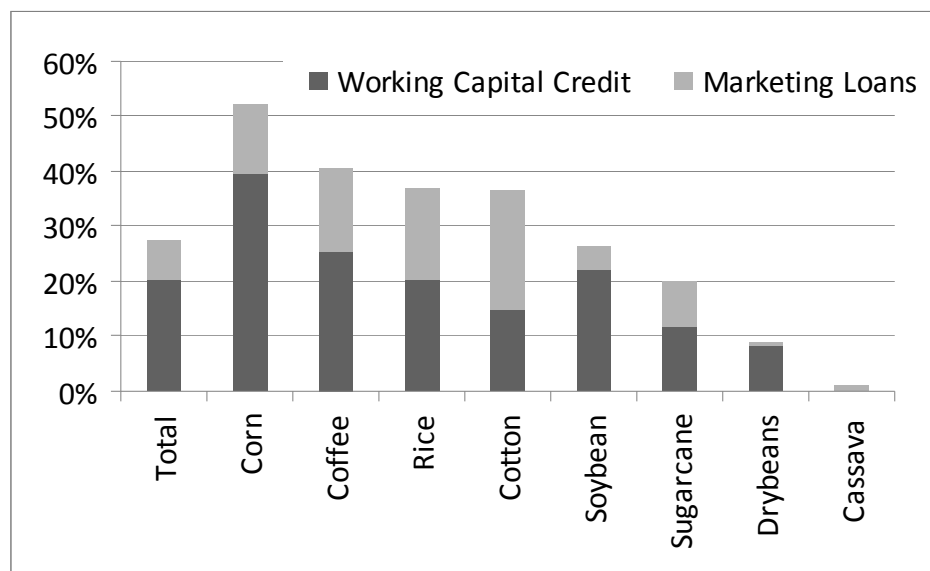


Sources: IBGE and BACEN. Note: Balance of credit operations on December 31; (e) denotes an estimate.

Working capital and marketing credit function under similar procedures and interest rates. The difference is that working capital loans are taken before the cropping season and are used to buy inputs for planting. The loan period is around nine months and is paid when the production is sold. Marketing loans are normally six months long and are used to finance product storage. Both are subjected to limits on a per-producer basis as mentioned before. Both credit modalities are notified to the WTO as product-specific support because the producer has to specify the product for which the credit will be used. However, the distribution of resources among products is not predefined and depends on demand from producers.

It is important to comprehend that the amount of capital for planting and marketing activities channeled to the agricultural production through the SNCR represents only a portion of the total demand for credit in the agricultural sector. The official credit is less than 40 percent in relation to the value of production, with the exception of corn (Figure 3). Credit for planting is below 25 percent of the value of production, again with the exception of corn. This explains why grains production in Brazil, especially soybeans and cotton, is dependent on private credit supplied by trading companies and inputs from producers. Private credit, however, is not subsidized, unlike the credit available through government funding.

Figure 3. Share of SNCR working capital credit and marketing loans compared to value of production (average 2005–2007)



Sources: IBGE and BACEN. Note: Balance of credit operations on December 31.

Investment credit composes a more complex structure, as there are many programs with different objectives. The largest program among the line of programs provided by the BNDES is the MODERFROTA (Programa de Modernização da Frota de Tratores Agrícolas e Implementos Associados e Colheitadeiras). It is aimed at providing investment credit to medium- and large-scale producers to renovate equipment such as tractors and other agricultural machinery. There are, however, seven other specific credit line programs provided by the BNDES: Incentives Programme for Irrigation and Storage (MODERINFRA), Cooperative Development Programme for the Enhancement of Agricultural Value Added (PRODECOOP), Programme for the Modernization of Agriculture and the Conservation of Natural Resources (MODERAGRO), Agri-business Development Programme (PRODEAGRO), Fruit Industry Development Programme (PRODEFRUTA), Milk Production Mechanization and Transportation Incentive Programme (PROLEITE), and the Programme of Commercial Planting and Recovery Forest (PROPFLOA).

In the case of the MODERFROTA, the equivalent measurement of support is estimated by observing the difference between the interest rate charged to borrowers (at 7.5 percent to middle-income producers and 9.5 percent to larger producers) from the BNDES and the equivalent long-term market rate (the TJLP rate). The MODERINFRA is a program designed to assist farmers in improving the structure of farm production by investing in proper irrigation. This program is independent from other credit programs, and by taking this loan farmers are not limited from getting other types of loans. The MODERINFRA funds projects up to R\$1,000,000 per farmer or cooperative.

Another line of credit is offered to agricultural cooperatives and is intended to allow for gains in efficiency through a series of steps. The PRODECOOP finances machinery and equipment as well as studies and projects design to improve production within the region. The government provides a preferential credit rate of 6.75 percent for up to 90 percent of the project. The cooperative is allowed a three-year grace period (with no interest paid) and 144 months for repayment in the case of non working capital credit and 24 months for repayment in the case of working capital credit.

Credit for quality improvement in the areas of apiculture, floriculture, and aquaculture was offered through the PRODEAGRO. The credit line was up to R\$150,000 at an 8.75 percent interest rate. The borrower was allowed a 24-month grace period (with no interest paid) and a 60-month repayment

period. The PRODEGRO was substituted by the MODERAGRO program. Its main goals include the PRODEAGRO areas plus credit for pasture conservation and soil recovery through funds of up to R\$250,000 per farm and R\$750,000 per collectives undertakings. Similar to the most BNDES programs, interest rates are made available at 6.75 percent per year, which already includes a 3 percent compensation to the financial institution. The borrower is also allowed a 36-month grace period (with no interest paid) and a 96-month repayment period.

The BNDES, through PRODEFRUTA, provides a special line of credit to improve efficiency in the fruit industry. The PRODEFRUTA provides total coverage of improvement projects at the same 8.75 percent interest rate as other BNDES programs. A 5 percent compensation to the finance institution is included, and the borrower has a grace period of 36 months to avoid paying interest. The loan is to be paid within 60 months.

The milk industry is benefited by a special line of credit for storage installation and related costs. The PROLEITE makes available credit lines of up to R\$80,000 in projects per producer at an 8.75 percent interest rate (which includes a 3 percent compensation to the financial institution). Repayment is to be done within a 60-month period, which includes a 24-month grace period.

The final BNDES-specific program is directed at environmental conservation. The PROPFLORA allows for credit lines of up to R\$150,000 (up to 35 percent of the total cost) designated for tree-planting projects. Repayment is to be done within 12 years at an 8.75 percent interest rate (including financial compensation of 3 percent to the lending agency), with a 96-month grace period.

The MODERFRUTA as well as all seven other programs from the BNDES are considered, by the Brazilian government, to be “development programs.” As such, they are notified to the WTO under Article 6.2 on its schedule under table DS:2. They are exempt from reduction commitments, according to the principle in Article 6.2 of the Agreement, which states that “investment subsidies which are generally available to agriculture in developing country Members and agricultural input subsidies generally available to low-income or resource-poor producers in developing country Members shall be exempt from domestic support reduction commitments.”

2.2. Income Support Programs

There are two groups of income support programs: (1) instruments under which the product ends up in the government stocks (AGF - Federal Government Acquisitions and COA - Contract Options Acquisitions) and (2) instruments that aim to facilitate the distribution of the product through market channels and are based on price equalization premium (PEP - Premium to Commercial Buyers, PROP - Premium to Commercial Buyers Under a Private Sell Option Contract, and PEPRO - Equalization Premium to Farmers).

Income support programs are inherited from the Policy of Guaranteed Minimum Prices (PGPM), and were widely used by the federal government during the 1970s and 1980s to intervene in the market by controlling prices and stimulating production throughout stocks management (OECD 2005). Two instruments were used by the government: AGF and federal government loans (EGF). Through the first mechanism, the government purchases agricultural products at prices higher than the market prices (CONAB 2008a). In the past, the government used intervention stocks to regulate the market supply. If prices were high, then the government would sell stocks. The second mechanism of the PGPM, the EGF, is a federal government loan that provides short-term preferential credit to agricultural producers and cooperatives, allowing them to withhold the sale of a product for a certain period in anticipation of a higher market price. The EGF is, therefore, a marketing loan with subsidized interest rates. Prior to 1996, EGF operated as an AGF: Borrowers could choose to give up the pledged product and in turn repay the loan (i.e., the EGF with a sell option, or EGF-COV).

Due to this policy, the federal government accumulated large stocks of products such as wheat, rice, corn, and dry beans during some crop seasons. This policy became unsustainable after the Brazilian policy shift toward market opening and was reformed in the early 1990s. AGFs are still in place, but the objective to use acquisitions as a mechanism to control prices is no longer applicable. Since 2004, the

AGF is used mainly for purchasing from family producers. Clearly, the current AGF system indicates a change in Brazilian agricultural policy: The objective of promoting food security has been shifted to promoting income support for family producers (Chaddad and Jank 2006; CONAB 2008c).

The use of federal government purchases as a mechanism to sustain prices for producers is still utilized in some specific seasons and specific crops. One example is the Government Sell-Option Contracts (CONAB 2008a, 2008b). Options contracts are auctioned at the start of the crop season. The mechanism guarantees the holder a future sale at a fixed “execution” price. If the holder decides to exercise the option, which tends to occur when the market price is below the execution price, then the government may buy back or transfer its obligation to purchase the product before its option contract expires through a recourse process, or transfer its purchasing rights to private agents. Once the government decides to buy back the contract, the farmer delivers the production under the contract to the government and receives the execution price. That type of operation has been used often for rice in 2005, 2006, and 2007. Both AGFs and options contracts are notified using the WTO’s market price support (MPS) methodology.

Since Brazilian agricultural policy reform in the early 1990s, new income support programs were put in place. There are two aspects to these programs: a reference price for the farmer and an equalization premium that is sold for private agents (wholesale buyers or producers) in auctions. The government sets the amount of product that will be available in the auction. This means that the equalization premium programs are not generally available for the whole production and are targeted to least-developed regions, where the price at the farm level tends to be lower, disadvantaged by transportation costs. There are three main modalities (CONAB 2008d, 2008e, 2008f):

1. PEP is granted to wholesale buyers as long as it pays for the producer a reference price. The equalization premium, which is the subsidy, is obtained in a public auction and the maximum value is fixed by the government. PEP targets stored production.
2. PROP works like PEP, but the delivery of the product will take place in the future. It is a mechanism to guarantee a future price, and it works as a hedge mechanism for the farmer.
3. PEPRO is an equalization premium granted to a producer through a public auction. The government sets the reference price and sells the premium in an auction. The equalization premium, which is the subsidy, is in general lower than the difference between the market price and the reference price.

Table 1 presents the amount of production benefited by income support programs in comparison with the total production. The following comments are noteworthy:

1. Higher prices in 2008 have interrupted the upward trend in the use of those mechanisms observed from 2005 to 2007. Income support programs were used in 2008 only for cotton and for an inconsequential amount of maize.
2. The amount of production benefited by support varies according to the crop season. This is due to the fact that income support programs are operated by CONAB after the harvesting season. There is no predefined rule for the implementation of the instruments and, with the exception of PEPRO, the decision of the government in terms of types of instruments and parameters (reference price, equalization premium, etc.) to be used depends on the situation of prices during the marketing period (March to December).
3. AGF/COA (Contract Option Acquisition) instruments are relevant only for rice. Although only AGF is a government procurement program, COA also works like one because the producer may opt to execute the contract against the government, and by doing that, the government shall receive the physical product. In both instruments, therefore, the government withdraws production from the market, potentially shifting prices upward and subsidizing the whole stored production.
4. The equalization premium instruments only promote the reallocation of production in the country. Aside from that, government expenditures per product unit (not shown in Table 1)

are much higher in AGF/COA than in equalization premium. A potential problem of the last program is when the benefited production is exported. In this case, the equalization premium can act as an indirect export subvention. That is the case of cotton.

Table 1. Income support program benefited shares of production (thousand tons)

	2004/05	2005/06	2006/07	2007/08		2004/05	2005/06	2006/07	2007/08
Cotton					Cassava				
Production	1,299	1,038	1,524	1,603	Production	25,872	26,639	26,921	26,599
AGF/COA	5	0	1	0	AGF/COA	0	0	0	0
Equalization Premium	470	464	729	1,024	Equalization Premium	76	189	0	0
Rice					Soybeans				
Production	13,227	11,722	11,316	12,057	Production	52,305	55,027	58,392	60,017
AGF/COA	917	308	920	0	AGF/COA	0	15	0	0
Equalization Premium	328	699	158	0	Equalization Premium	0	11,953	5,354	0
Edible beans					Wheat				
Production	3,044	3,471	3,340	3,521	Production	5,846	4,873	2,234	3,824
AGF/COA	0	3	36	0	AGF/COA	483	32	0	0
Equalization Premium	0	0	125	0	Equalization Premium	1,345	240	0	0
Maize					Coffee				
Production	34,977	42,515	51,370	58,610	Production	2,356	1,977	2,551	2,024
AGF/COA	637	2,224	273	0	AGF/COA	0	0	0	0
Equalization Premium	874	5,586	4,936	165	Equalization Premium	0	0	300	0

Source: CONAB. Note: AGF (Federal Government Acquisition); COA (Contract Option Acquisition).

2.3. Rural Development and Family Farming Support

With the creation of the Ministry of Agrarian Development in middle of the 1990s, the government started to channel funds from the SNCR to family farmers through PRONAF. PRONAF is a set of programs based on credit with preferential interest rates (MDA 2007). This program is gaining relevance in the SNCR, not only in terms of amount of resources available for credit, but also in terms of subsidization level, which is considerably higher than the credit for commercial farmers. Despite the fact that PRONAF is basically a credit program, we classify it as a different policy strategy because it targets farmers with low income and with poor available resources. PRONAF's main objective is to provide the necessary financial means for low-income farmers and agrarian reform settlers to remain in rural areas.

Additionally, the PRONAF is composed of a complex structure that is intended to assist small agricultural producers that are not classified under the general credit lines. Moreover, the PRONAF provides both working capital credit and investment credit through its line of programs. Furthermore, it is interesting to note that credit provided to family farmers through PRONAF is at even more preferential (lower) rates than credit provided to commercial farmers through the general credit line.

The amounts of resources for PRONAF credit lines are rising over time, and investment programs are gaining more relevance. In 2000, PRONAF loans totaled US\$1 billion, 86 percent for working capital credit and 14 percent for investment. For the 2007–2008 crop season it is estimated that US\$5.8 billion will be available for loans, 50 percent designated for investment programs.

PRONAF beneficiaries are divided into five different groups (A, B, C, D, and E). The classification depends on the size of the farm, the number of people employed, production, and the income of the farmer (MDA 2008);

1. Group A: agrarian reform settlers (investment and working capital)
2. Group B: small subsistence farmers who are eligible for micro credit (income support program)
3. Group C: increasing degree of commercial production; however, intensive use of family labor (60 percent of income has to come from agriculture)
4. Group D: also signs of commercial production with use of family labor plus some additional contracted labor (70 percent of income has to come from agriculture)
5. Group E: same as for Group D; however, at least 80 percent of income has to come from agriculture

PRONAF credit lines, modalities (working capital or investment), and interest rates are defined according to the beneficiary group. Table 2 shows the annual and fixed interest rates that were set for the 2007–2008 crop season.

Table 2. Interest rates of PRONAF credit modalities

Group	Modality	
	Working capital	Investment
Group A	n.a.	0.5%
Group B	n.a.	0.5%
Group C	3.0%	2.0%
Group D	3.0%	2.0%
Group E	5.5%	5.5%

Source: MDA, 2007.

Note: n.a.: not available.

2.4. Debt Management Programs

The credit-based agricultural policy that predominates in Brazil is not exempt from complications. Its major complication is how to manage the level of indebtedness of the rural sector. Although credit programs are conducted with preferential interest rates, producers are not always able to repay their loans for several reasons, resulting in increasing levels of indebtedness in the rural sector. Some reasons are crop frustration due to poor weather conditions or emergence of new diseases (e.g., the soybean rust in 2005), overinvestment on production capacity with immobilization of capital on land and machinery, and income loss due to high transportation costs or to changes in the macroeconomic policy (Brazilian Real overvaluation or inflation control).

Debt management became an objective of Brazilian agricultural policy when the government decided to renegotiate the overdue rural credit, intending to allow producers to continue taking new loans and rolling over the old ones. The three most important arrangements were the rural debt securitization (November 1995 and April 2002), the financial assets rehabilitation program (PESA, February 1998) and the renegotiation of family farming programs (PRONAF, PROCERA, and PROGER). In September of 2008, through the federal law 11,775 (September 17, 2008), the government took another step with the debt rescheduling program. Not only the remaining non-paid debts already included in the three previous arrangements were renegotiated, but also new unpaid debts obtained after the implementation of these arrangements were also included in this new renegotiation. The new debt renegotiation process is, in

concept, different from the others: The program is based on incentives to farmers to pay the debts with rebates and discounts on the interest rate. The new policy is more of a debt liquidation and regularization—for the unpaid renegotiated debts covered by the previous programs—than a rescheduling program, as previous programs were.

It is not of relevance for this paper to discuss in further depth the reasons the rescheduling programs were created. What is relevant is that all main credit modalities were, since 1995, benefited by rescheduling conditions. At the end of 2002, the base period used by the government for the calculation of the subsidy equivalent of the rescheduling program as notified in the WTO, the balance of overdue credit totaled R\$29.2 billion, more than 50 percent of which was associated with securitization and PESA.

The general principle of rescheduling programs is to prolong the period of payment with interest rates that lower than the original interest rate. The burden for the Brazilian government lies in the difference between the renegotiated interest rate and the cost of the money associated with the original loan as distributed in the original scheduled period compared to the repayment as it has been renegotiated over the new period. The amount of subsidy depends on the present value of the overdue debt, the payment schedule (24 years for the securitization program and 20 years for the PESA), and the difference in interest rates.

Although the securitization has been in place since the end of 1995, the government began notifying the rescheduling programs in 1999. The main motivation for the government to notify the rescheduling schemes was that, for the first time, the OECD assessed the Brazilian agricultural policy and calculated the Brazilian producer support equivalent (OECD 2005). In order to supply the best information regarding the rescheduling schemes to the OECD, the government gathered data that were located in different ministries and banks and, by doing so, was able to notify the information when the notifications from 1998 to 2003 were released.

Many factors worked together to result in the recent announcement of law number 11,775: the expansion of lending since 2002; the income and price problems that the agricultural sector faced from 2004 to 2006; a push by the agricultural lobby for a new debt renegotiation, including the renegotiation of the debts already renegotiated under the securitization and PESA schemes; and the renegotiation of the new loans (both working capital and investment credit) acquired from 2002 to 2006.

According to the Ministry of Finance, by August of 2007, the balance overdue was R\$87.8 billion. This amount is distributed as follows: R\$27.4 billion under renegotiation programs; R\$10.5 billion under new working capital credit; R\$17.3 billion under new investment and marketing credit; R\$12 billion under constitutional funds that were not subjected to rescheduling programs; and R\$7.1 billion under execution by the Brazilian treasury and that were originated from rescheduled debt not paid (MF 2008 and 2008a). It is necessary to add also R\$13.4 billion of overdue credit originated from programs to family farming.

This amount of credit was subjected to negotiation among the government, the congress, and producer (commercial and family) lobbying organizations. The objective of the new program is to stimulate farmers to liquidate its debts using economic incentives such as rebates on future payments and discounts on interest rates for anticipation of the payments. Depending on the level of engagement by farmers under this new regulation, it will eventually replace the old programs. The specific conditions of each debt modality in terms of payment schedule, interest rates, and debt balance makes the calculation of subsidies a hard task for nongovernment officials. Regarding this matter, this paper will not present any calculation regarding the new debt liquidation and compliance programs.

Debt rescheduling and management programs play an important role in the Brazilian agricultural policy at the moment. Such a role is played due to poor credit policies in the past that resulted in massive national default. Debt rescheduling programs are becoming the most important source of subsidies for Brazilian producers, both for commercial and family farming.

2.5. Rural Insurance

Although not explored in great detail here, we have reason to believe that rural insurance is a new strategy taking place in the Brazilian agricultural policy. There is a common perception among policymakers and producers that the country must develop a comprehensive national insurance policy to reduce the risks associated with climate, plagues, and diseases that negatively affect crop yields and, consequently, farmers' incomes. This insurance policy is seen as the solution to avoid problems with indebtedness in the future, not allowing the likes of the defaults observed in 2004–2006. The current program is, however, still very small and irrelevant in terms of the total agricultural production.

The new rural insurance program was created in 2005 and introduced in 2006 by the federal government. The program is still in its initial phase, and as for the moment, benefits are relatively small (MAPA). The amount of collateral paid in (partly by the producer, however, the majority was paid by the government) is small, and consequently, it covers only a small portion of the production. In addition, there is a limit (up to R\$32,000) to the amount a producer can insure production, limiting even further the scope of the program.

Given that the last Brazilian notification is dated from 2004, and the new rural insurance program started in 2005, there is no information about it in the WTO. This paper presents the estimated subventions of the insurance program, based on information gathered from the MAPA website. Due to its infancy, small scale, and therefore, no trade-distorting effect, this topic will not be explored in further detail.

2.6. Brief Description of Green Box Subsidies

General services such as research, training, advisory, inspection, marketing and promotion, and infrastructure services are provided by the government with no or very little trade-distorting effects. Both food aid programs and public stockholding programs are directed toward consumers only and are therefore not trade distorting. Moreover, the new insurance program, as described in section 2.5, is still under development and, up to the time of writing this paper, amounted to insignificant levels.

Policies related to agrarian reform are managed by the National Institute for Colonization and Agrarian Reform (INCRA) and supervised by the MDA.

INCRA's programs vary from infrastructure development to initial credit. Agrarian reform programs are protected under Annex II of the WTO's Agreement on Agriculture and are exempt from reduction commitments. Furthermore, green box subsidies, due to their minimal trade-distorting effects, will not be discussed any further.

3. REPLICATION OF OFFICIAL WTO SUPPORT NOTIFICATIONS

This section discusses the methodologies used by the Brazilian government in order to calculate its subsidies, as well as the data presented in the notifications. The period of analysis of this section and the one that follows includes the following: the Brazilian notifications to the WTO to date (which are from 1995 to 2004), an estimation calculated by the authors (which goes from 2005 to 2007), and a forecast for 2008. Methodologies are discussed according to the main programs presented in former sections.

3.1. Methodologies Used by the Brazilian Government

3.1.1. Credit Subsidies

The first line of domestic support programs calculated in this paper is what Brazil notifies under credit subsidies. Credit subsidies are simply gathered by analyzing the market-based interest rate, subtracting the preferential rate available under the subsidy, and multiplying by the amount borrowed from the SNCR.

Although the methodology is the same for all credit subsidies, there are differences in the calculation of production and marketing credit for commercial farmers, production for family farmers, and investment credit. In the case of working capital and marketing for commercial farmers, calculations are product-specific. There is no breakdown by product in the case of production credit for family farming.

Investments credit subsidies are calculated according to the specific conditions of each program. The total subsidy, as presented in WTO table DS:2 (Article 6.2), is the sum of the per-program subsidies. There is no distinction between commercial and family farming in the case of investments credit. However, this distinction can be made by separating and classifying the programs according to the beneficiary group.

For credit subsidies, the same method as the one used by the federal government was used to calculate estimates for the period of 2005 to 2007 and to forecast 2008. The market base interest rate is defined as the short-term government reference interest rate, which is the SELIC rate. Moreover, the preferential interest rate varies from program to program. The family programs (PRONAF) offer preferential interest rates that are lower than the ones provided to commercial farming, as shown above. Regardless of specific levels, it is important to bear in mind the fact that the government makes a clear distinction between family farming and commercial farming, and this is represented in the type/amount of support. As mentioned earlier, but worth stressing here as well, such distinctions are a new trend in the Brazilian agricultural policy. The political focus seems to be moving toward a more developmental basis, focusing on the low-income and small farms and their means for surviving.

The methodology used by the government is not equivalent to the value of government expenditures. It is a methodology based on an opportunity cost approach. This means that the lower the market interest rate in Brazil, the lower the subsidy for a given subsidized interest rate. One should also note that after many years of keeping the preferential interest rate fixed, for the 2007–2008 crop season, the government reduced the rate.

Moreover, the methodology used in this paper to calculate production and marketing subsidies has one difference from the methodology used by the government. Given that the government has access to loans on a monthly basis, the subsidy is calculated by the month and summed up to annual data, as reported in the notifications. Data on loans released by the Brazilian Central Bank, which are the ones available for the authors, are annually based. Therefore, in order to have accurate projections for the years not yet notified, past years were recalculated using the annual data available and the results were compared with the notified data. Although the results were not equal to the government's notifications, they followed the same trends.

Given that projections from 2005 to 2008 were based on annual data, the annual relative variation calculated according to the author's methodology were applied on the notified value, having 2004, the last notified year, as basis, therefore estimating the unofficial notifications for those years.

In the case of investments, credit data by program is also not available to the public. Therefore, calculations were made based on an average interest rate applied over the total annual investment loans. Results for past years were also used to check whether the procedure works.

3.1.2. Income Support Programs

As far as methodology goes for income support programs, the same line as the one used by official government notifications to the WTO was followed. Because up-to-date information was available from government reports, they were used to construct the subsidy values for the unofficial notifications. The amount of subsidies in the case of equalization premium programs is the government expenditure with the programs. In the case of AFG and COA, the MPS methodology was applied.

For MPS, the eligible production for the calculation is the amount procured by the government. Alternatively, the MPS would be calculated using the whole production. In this case, the aggregate measurement of support (AMS) commitment should also be recalculated, given that the notified commitments are based on the eligible production.

3.1.3. Value of Production

The value of production was an integral part of this study in terms of evaluating Brazil's compliance with the WTO rules. Up to the year 2007, value of production data were available in government reports (IBGE, Brazilian Institute of Geography and Statistics) and therefore were used. However, data were not available for the following years, and estimates were made using production values and market price trends, as discussed further when projections are presented in Section 6.

3.1.4. Debt Rescheduling Program

Certainly the calculation of the subsidies associated with the debt rescheduling program is the most complex task of this project. Even if the Brazilian government makes available information regarding the stock of debt, as done by the Ministry of Finance in 2008, information on interest rates of the original loan are quite difficult to be obtained. Even the mechanics of the calculations used by the government for the notified subsidies are not clear because the government has not published any document explaining the methodology used. It is important to note that the Debt Liquidation and Compliance Program announced in 2008 was not subjected to quantitative evaluation in this paper due to the lack of information available.

According to explanations gathered in interviews with technical government officials, plus a confidential document dated 2004 that puts in systematic terms all the information used in the government to prepare the notifications, the amount of subsidy is the total cost of the program for the government. The total cost is calculated comparing the original interest rate of the loans and the renegotiated interest rate under the rescheduling program. Given that under the rescheduling program debts are rolled over time, future scheduled payments were brought to a base date (December 2002). The present value of the sum of payments was calculated and in turn compared with the stock of debt at the same date. This calculation had to be done in each program because interest rates and scheduled periods were different among programs. The difference between the stock of debt at a certain date and the present value of payments is the total amount of subsidy. This total was, then, divided by the lifetime of the schedule period, according to the specifications of each program, in equal annual statements. The annual statements were summed up, differentiating family farming programs from other programs.

Annual statements were, therefore, calculated for the year 2002. The debt rescheduling program, however, has been notified since 1999. In both cases notifications prior and after 2002 were adjusted for inflation using the IGP-DI. From 1999 to 2001 annual inflation was discounted and for 2003 and 2004 the

amount of subsidy was inflated. After adjusting for inflation the total was converted to U.S. dollars using the appropriate exchange rate.

According to government officials, from 1999 to 2002, the government was able to calculate the amount of subsidy evaluating the balance between payments and installments. For the years 2003 and 2004, by the time the notifications were made, the government had not had available data on payments hence the option used was to assume that 100 percent of the payments were performed.

In order to double-check the methodology using unpublished and unofficial information gathered from government officials, calculations of the subsidy equivalent for 2002 were done and compared with the 2002 number presented in the notification. According to authors' calculations, the subsidy in that year amounted to R\$1.86 billion and the notified value was R\$1.66 billion (US\$570 million, converted using 2.92 R\$/US\$ exchange rate). Although the results are not exactly the same, they are close. Given that payments were brought back to present value, year 2002, calculations for equivalent subsidy for 2002 value were based on the notification.

3.1.5. Distribution of Programs in the Notification

Table 3 provides an insight to how the Brazilian domestic support is divided, under which WTO DS table it is notified, and a small description of how each subsidy was calculated.

Table 3. Structure of Brazil's WTO notifications

Policy Strategies	Program/Policy Instrument	Where Notified	How Subsidy Is Calculated
I. Working Capital and Investment Credit Subsidies (for commercial farmers)	Production and marketing credit (product specific)	DS:7	Interest rates differential (market cost versus controlled interest rate)
	Production and marketing credit (non-product specific)	DS:9	Interest rates differential (market cost versus controlled interest rate)
	Investment credit	DS:2	Interest rates differential
II. Income Support Programs	Contract option acquisition and federal government acquisition	DS:5	Government expenditures with purchases with minimum prices
	Minimum support program	DS:5	MPS (price differential)
	Equalization premium programs (PEP/PEPRO/PROP)	DS:7	Government covering price differential between reference price and market price
III. Rural Development and Family Farming Support	Production and investment credit to family farmers	DS:2	Interest rates differential
	Debt rescheduling programs (family farmers)	DS:2	Interest rate differential (debt market cost versus cost supported by the government)
	Agrarian reform programs	DS:1	Government expenditures
IV. Debt Rescheduling and Management	Debt rescheduling programs (commercial farmers)	DS:9	Interest rate differential (debt market cost versus cost supported by the government)
V. Rural Insurance	Old insurance program	DS:1	Government expenditures
	New insurance program (from 2005)	DS:7	Government expenditures to equalize premium costs

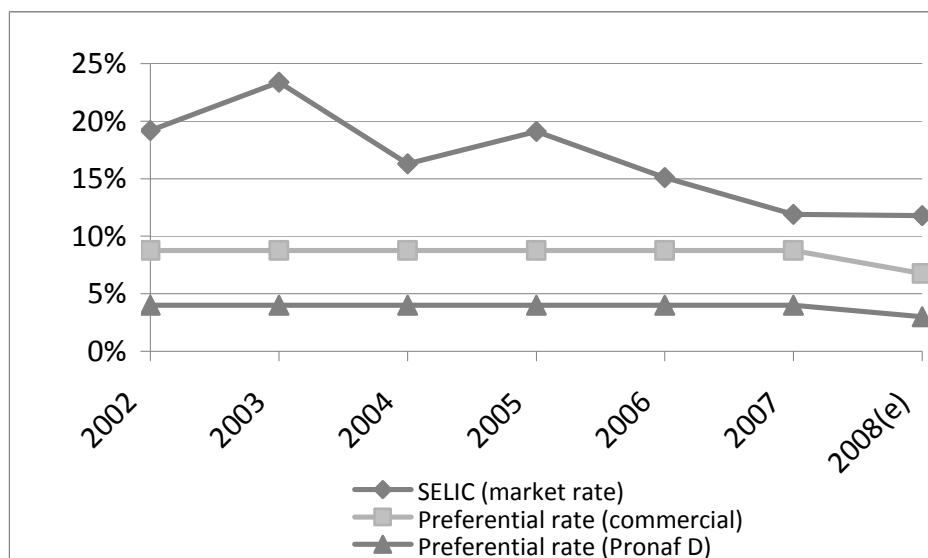
Source: Authors' input.

3.2. Description of Brazilian Notifications

The total domestic support provided by the Brazilian government can be observed in Table 4, with production and marketing credit subsidies detailed in Table 5 and Article 6.2 subsidies in Table 6. The data from Table 4 was gathered from the Brazilian notifications to the WTO up the year 2004. The values for 2005–2008 are authors’ estimates and forecast of unofficial “shadow” notifications (discussed in further depth in the next section). The level of AMS commitment gradually declined according to the agreement reached in the Uruguay Round negotiations and was kept at the 2004 level for the estimates and forecasts presented in Table 4. Total AMS support after *de minimis* was above the Uruguay Round commitment only in 1995 after an adjustment by the authors to an apparent omission in the official notification. Product specific *de minimis* showed no consistent pattern apart from the fact that throughout the notified years it increased, reaching the highest level in 1999 (US\$409 million). Moreover, support for products under Article 6.2 showed substantial levels in notified years and even greater levels since 2005, which shows the importance of domestic support programs that fall under this exemption to developing countries. Nevertheless, this support is still within the allowed guidelines. Lastly, non-product-specific *de minimis* presented drastic increases, from US\$18.4 million in 1995 to US\$1.07 billion in 2003.

Moving on to production and marketing credit, one should note how interest rates move across time (the market interest rate and the preferential interest rate subsidized by the government). For this reason a graph of interest rate pattern (Figure 4) is presented along with the values for production and marketing credit subsidies (Table 5). Figure 4 shows interest rates for the production and marketing credit programs plotted along with the market interest rate. It is important to mention that product specific production and marketing credits are notified in the AMS Commitment if total product specific subsidies exceed the *de minimis* provision. Non-product-specific production and marketing credits, on the other hand, are one of the programs notified in NPS *de minimis*. Table 5 brings the total of PS and NPS production and marketing credit subsidies without identifying, in the case of PS subsidies, if they were notified in the AMS or if they were below *de minimis*. The objective of this table is to illustrate the effect of the variations in the SELIC rate in the production and marketing credit subsidies, given that they are a large component of the total subsidies.

Figure 4. Comparison between market-based interest rate and interest rate for production and marketing credit

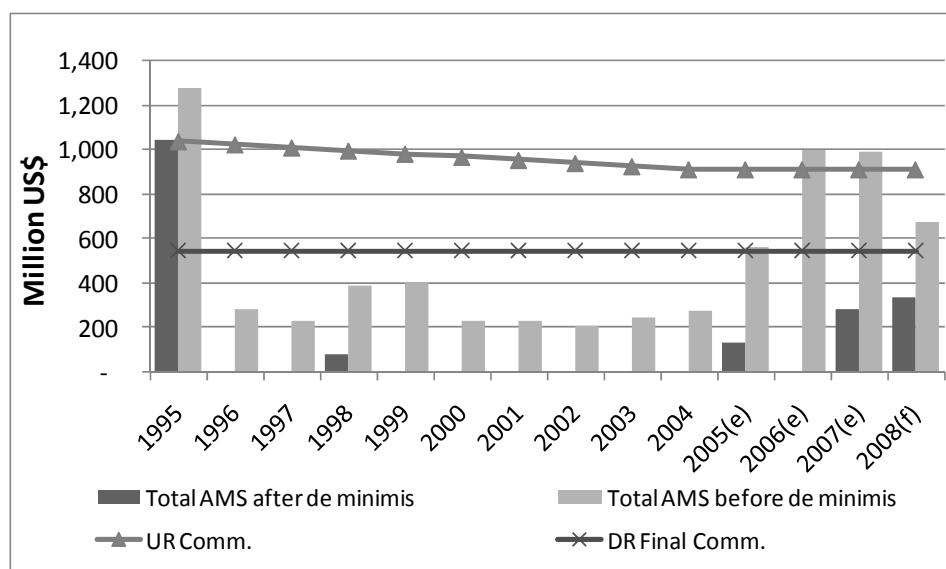


Source: BACEN and MAPA.

The AMS given by the Brazilian government has for the most part remained unchanged. Figure 5 illustrates the pattern. Total applied AMS (after *de minimis*) has remained well below the allowed level according to Uruguay Round commitments. Even total AMS before *de minimis* has gone above allowed Uruguay Round levels for AMS *after de minimis* in only 3 out of 14 years: 1995, 2006(e) and 2007(e).

It is worth to remind that Brazil is one of the few developing countries with a Total AMS commitment. Although it is not relevant nowadays, because Brazil has abolished all kinds of subsidies contingent to exports, Brazil has also commitments for export subsidies. The reason Brazil has a Total AMS commitment is because the combination of two policies that were in place at the Uruguay Round base period (1986-88): production and marketing credit at preferential rates and market price support for products with high tariffs at the time, such as wheat and cotton. Although a Total AMS Commitment of US\$ 912.1 million is tiny compared to the production value of the Brazilian agriculture (around 1 percent), there is no doubt that it grants Brazil with more space than for other developing countries that have product specific subsidies bound by the *de minimis* clause.

Figure 5. Total applied AMS before and after *de minimis* (in US\$ millions)



Source: Brazil's notifications to the WTO.

Brazil makes plentiful use of its developing status, and this is clear when one observes the use of Article 6.2 of the Agreement. The so-called development box is offered as a special and differential treatment to countries in need of such action. Brazil uses Article 6.2 to notify debt rescheduling and production credit (family farming only), as well as investment credit (for both family and commercial farming), as noted above.

At this point, the Brazilian government's behavior with respect to the use of investment credit under development programs should be stressed. It is clear that when applied toward family farming, investment credit reported under Article 6.2 makes sense. However, the Brazilian government makes no distinction in this case between commercial and family farming. Amounts for both programs are placed under Article 6.2 of the agreement.

Table 7 shows the main programs notified as non product specific. Two of them are production and marketing programs for a group of products (animal breeding, seeds, and packaging). Both are calculated using a differential interest rate methodology as used for all production and marketing credits. The last and the most important are subsidies associated to debt rescheduling programs. It is clear that subsidies are growing over time, as a consequence of the changes and the creation of new rescheduling programs.

Table 4. Total support (in US\$ thousands)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005(e)	2006(e)	2007(e)	2008(f)
AMS Commitment	1,039,126	1,025,012	1,010,899	996,786	982,672	968,559	954,445	940,332	926,219	912,105	912,105	912,105	912,105	912,105
Total AMS (after <i>de minimis</i>)	1,043,226	0	0	82,820	0	0	0	0	0	0	132,122	0	289,720	339,181
PS <i>de minimis</i>	235,297	283,473	236,709	304,981	409,064	230,446	235,768	211,831	249,548	278,626	335,861	957,570	671,328	247,769
Article 6.2	358,872	269,293	280,721	372,901	155,985	309,668	331,546	392,763	494,511	394,312	769,793	628,841	357,258	657,863
NPS <i>de minimis</i>	18,442	79,812	70,136	105,229	837,926	822,554	739,896	803,487	1,069,079	850,661	1,104,921	1,150,709	1,260,791	1,579,371

Source: Brazilian notifications to the WTO (1995 – 2004) and authors' estimates (e) and forecasts (f). Note: PS is product specific; NPS is non product specific.

Table 5. Production and marketing credit subsidies (in US\$ thousands)

Period	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005(e)	2006(e)	2007(e)	2008(f)
Product Specific	139,771	240,739	185,476	256,583	379,406	147,468	139,505	157,577	234,194	218,228	325,750	211,612	145,043	329,985
Non Product Specific	18,442	79,812	70,136	105,229	248,502	179,954	187,676	246,761	494,862	171,687	279,027	191,361	104,314	209,571

Source: Brazilian notifications to the WTO (1995 – 2004) and authors' estimates (e) and forecasts (f).

Table 6. Article 6.2 development programs (in US\$ thousands)

Period	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005(e)	2006(e)	2007(e)	2008(f)
Production Credit (family)	196,467	84,006	98,580	157,136	12,518	105,373	92,409	95,770	117,816	97,586	165,089	144,517	121,466	219,770
Investment Credit (all)	162,405	185,287	182,142	215,765	129,337	188,890	225,898	283,647	362,929	280,448	584,905	461,324	208,067	405,254
Debt Rescheduling (family)	0	0	0	0	14,131	15,405	13,239	13,347	13,766	16,277	19,800	22,999	27,725	32,839

Source: Brazil's notifications to the WTO (1995 – 2004) and authors' estimates (e) and forecasts (f).

Table 7. Non-product-specific subsidies (US\$ thousands)

Period	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005(e)	2006(e)	2007(e)	2008(f)
Production credit (includes animal breeding)	13,181	78,246	60,709	98,555	241,932	176,029	182,957	241,827	485,580	162,308	266,675	181,243	103,148	199,625
Marketing credit (seeds and packaging)	5,261	1,566	9,428	6,674	6,570	3,925	4,720	4,934	9,282	9,379	12,352	10,117	1,166	9,946
Debt rescheduling programmes	-	-	-	-	589,424	642,601	552,220	556,726	574,217	678,974	825,894	959,349	1,156,477	1,369,800
Total	18,442	79,812	70,136	105,229	837,926	822,554	739,896	803,487	1,069,079	850,661	1,104,921	1,150,709	1,260,791	1,579,371

Source: Brazil's notifications to the WTO (1995 – 2004) and authors' estimates (e) and forecasts (f).

4. CONSTRUCTION OF CONSISTENT SHADOW NOTIFICATION

Moving forward to calculate Brazil's shadow notifications for recent years, it is important to stress the methodology of how calculations were taken. First of all, the same format as presented in the notifications by the Brazilian government was kept. In other words, calculations follow the flow of the notification tables (DS:1, DS:2, and so on) as they represent the respective boxes (green, blue, and amber boxes). Moreover, constant consultations with government officials from MAPA provided immense insights into how calculations and therefore the notifications were made. Such information was necessary in order to understand the complex system of government support and how it is organized and presented to the international trade community.

Furthermore, all calculations and assumptions were made based on widely accessible online information that can be found in various official government institutions' databases. No confidential information, and for that matter, no detailed, inaccessible information was used (the government has access to monthly, weekly, and in some cases daily information that was not accessible for this publication), with the exception of some unpublished data regarding the debt rescheduling program.

Once again, focus was diverged away from green box subsidies that are not substantial in terms of domestic support by the Brazilian government. Hence, the spotlight was given to the examination of AMS, for both product-specific and non-product-specific support, as well as checking conformity with *de minimis* limitations and paying attention to benefits granted under Article 6.2 of the Agreement.

For table DS:2, Article 6.2 of the notifications, a review and update were made for production credit, investment credit, and debt rescheduling program designed for low-income producers. The aggregate value of these programs comes through as total support for programs under Article 6.2. Production credit was calculated with numbers provided by the BACEN database of available funds for the PRONAF programs. Numbers were made available up to the year 2007. This calculation involved all product-specific as well as non-product-specific programs. Programs were calculated in local currency and then converted into U.S. dollars in relation to the same year (for each year the exchange rate average was calculated based on monthly rates provided by BACEN). Whenever data was not available and/or was confidential for only government use, adjustments were made. This is also true for calculations involving investment programs and debt rescheduling programs, where a delta rate of change was extracted from previous years and used as the "rate of change" for the estimated years.

Moreover, for calculations to find out the *de minimis* for a specific product, a standard method similar to the one developed for credit, investment, and debt rescheduling programs was used. Adjustments were necessary in order to calculate the data for products where data were not available. For instance, in the case of grape and garlic, the price of the product³ was not available; hence, calculations were made using the last published year of the price and adjusting for further years as necessary by converting into the respective year's exchange rate.⁴ Adjustments were only made when there was no official government data available. For the years when the government reported the value of production, this data was used as input for further computations.

Another domestic support program that receives considerable attention from the government is investment programs. Investment support programs were calculated by adding the amounts given to each particular program. Data was gathered from the BACEN balance sheet database, which is provided on a yearly basis. For investment programs, just as for shorter-term credit programs, domestic support is measured by focusing on the preferential interest rate made available to each producer for each particular support program. That is important to understand since in calculations for this paper an adjustment was

³ In this paper, the authors used the relationship between price and production in order to calculate the value of production for each good and then the result compared to the support amount made available for each product in order to find out the per cent of support in comparison to the value of production.

⁴ Production data was collected from the Brazilian Institute for Geography and Statistics (IBGE) from its annual rural census.

necessary in order to make a distinction between investment programs made available to poor and/or small farmers and the investment credit made available to commercial producers.

In a study such as this it is only normal that a few results come out a bit different from what the government officially reports. Once again, one should take into consideration the different data available to the public and the far more specific data available to government officials. However, one significant difference was found during the course of this study. Though the government shows numbers that have so far fallen within the allowed AMS, this paper's calculations show that in the year 1995 domestic support programs actually surpassed the allowed AMS ceiling by US\$4,191,000, as shown in Section 3.

4.1. Shadow Notifications for Aggregated Support

Table 8 simplifies the results gathered by providing an overview of the Brazilian notifications since 1999 as well as the updated shadow notification information through 2008. One important trend and of importance to Brazil is the fact that the total support (All AMS + Article 6.2 in Table 8) over total production value has in recent years seen a falling trend (from 6 percent in 2006 to 3 percent in 2008). That indeed shows room for growth within domestic support and the ability to remain within the allowed levels of support in the proposed modalities for the Doha Round. Moreover, as previously mentioned, Table 8 shows the pattern of increase spending in non-product-specific AMS from US\$837.9 million in 1999 to US\$1.579 billion in 2008.

Table 8. Summary of the notifications main values

Measure Type	Monetary Value of the Measure (in US\$ thousands)									
	1999	2000	2001	2002	2003	2004	2005(e)	2006(e)	2007(e)	2008(f)
Product-specific AMS (including <i>de minimis</i>)	409,064	230,446	235,768	211,831	249,548	278,626	467,983	957,570	961,048	586,950
1) Market Price Support	0	0	0	0	9,863	16,040	14,333	11,917	83,509	0
2) Non-exempt Direct Payments	15,517	45,108	45,221	47,460	0	0	0	0	0	0
3) Other Non-exempt Product- specific Support	<u>393,546</u>	<u>185,338</u>	<u>190,547</u>	<u>164,371</u>	<u>239,685</u>	<u>262,586</u>	<u>453,650</u>	<u>945,654</u>	<u>877,539</u>	<u>586,950</u>
- <i>Production and Marketing Credit</i>	378,063	146,205	138,321	155,209	233,511	217,223	231,181	164,206	115,007	236,820
- <i>Equalization Premium</i>	4,282	31,240	52,226	9,036	0	45,363	222,200	771,000	740,700	322,581
- <i>Contract Option Reacquisition</i>	11,202	7,893	0	126	6,174	0	0	0	0	0
- <i>Rural Insurance</i>	0	0	0	0	0	0	268	10,448	21,832	27,549
Non-product-specific AMS	837,926	822,554	739,896	803,487	1,069,079	850,661	1,104,921	1,150,709	1,260,791	1,579,371
Article 6.2	155,985	309,668	331,546	392,763	494,511	394,312	769,793	628,841	357,258	657,863
PS AMS + Article 6.2	565,049	540,114	567,313	604,594	744,059	672,938	1,237,776	1,586,411	1,318,306	1,244,813
Total Support (all AMS + Article 6.2)	1,812,038	1,593,114	1,542,977	1,619,912	2,062,686	1,802,225	2,810,680	3,694,691	3,540,144	2,824,184
Total Production Value (TPV)	39,724,830	42,909,741	38,409,231	37,276,617	44,940,270	54,419,430	59,350,698	65,361,282	85,766,428	105,943,399
Total as percent of TPV	5%	4%	4%	4%	5%	3%	5%	6%	4%	3%

Source: Brazil's notifications to the WTO and authors' estimates (e) and forecast (f). PS is product specific.

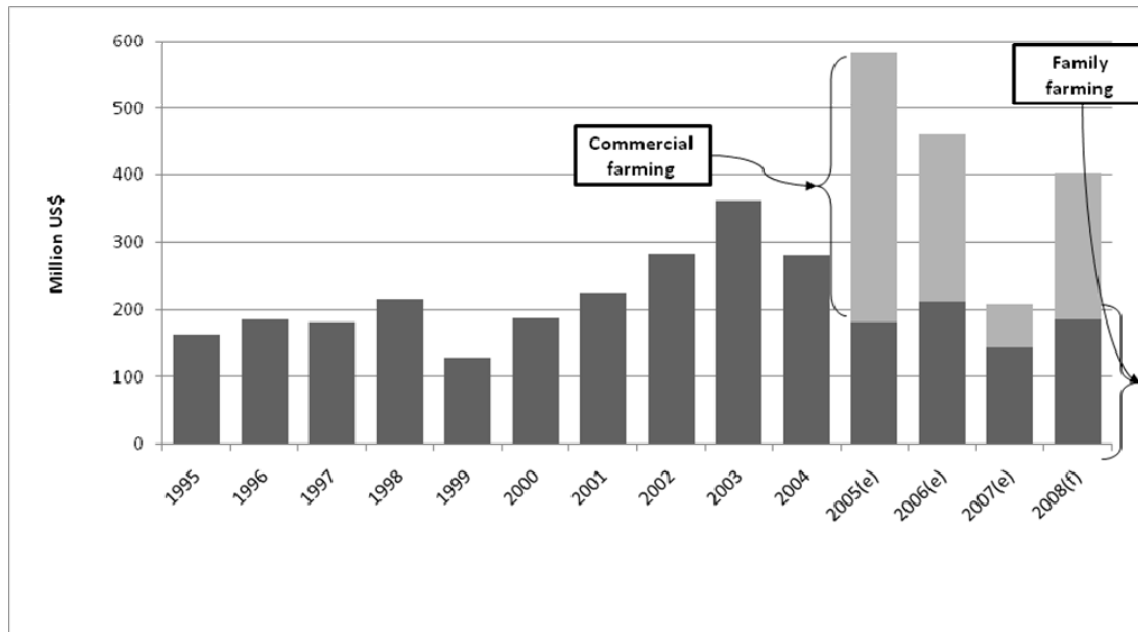
Subsidies of the production and marketing credit programs were shown in Table 5 and also in Table 8. The notified years do not seem to present any particular pattern. It is clear, however, that both product-specific and non-product-specific values given to production and marketing programs have remained relatively level throughout the 14 years of available data.

When looking at production and marketing values for recent years (2005–2008) one has to bear in mind the interest rate figure presented earlier in the text, where it is shown that the preferential interest rate given by the government has varied in the extent to which it is below the market interest rate, hence affecting subsidy levels.

Moreover, the total AMS support presented in Figure 5 (and Tables 5 and 8) shows that the AMS has increased in recent years. Such increase is consequence of two main factors: (1) the cost of income support programs (equalization premiums, as shown in Table 8) has increased, and (2) the Brazilian Real has increased in value over the U.S. dollar, which resulted in additional increases, visible in Figure 5 for the Total Applied AMS before and after *de minimis*.

Brazil’s investment in development programs has increased over the last couple years. Such programs receive special attention from the government because they are allowed under the WTO rules with no ceiling on the amount of subsidies. However, as mentioned above, Brazil includes investment programs to commercial farming among its development programs. Figure 6 demonstrates the amount that is destined to go to commercial farming and the amount that goes to family farming in investment credit programs.

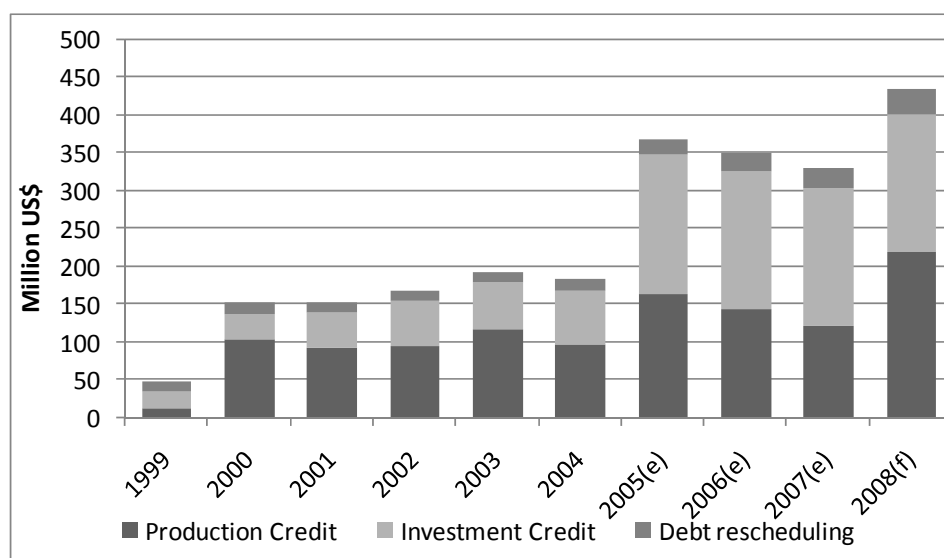
Figure 6. Investment credit subsidy (in US\$ millions)



Source: Authors’ own calculations.

Brazil’s overall spending on subsidy programs for family farming presents an interesting trend. It is increasing over the years and gaining more importance in the general policy decision making. Figure 7 for PRONAF total subsidies shows this trend over the years with data gathered from Brazil’s notifications to the WTO as well as estimated calculations for the period from 2005 to 2007 and a forecast for 2008. From Figure 7 a few conclusions can be drawn: The large share of funds destined to production and investment credit programs throughout the years indicates its importance to national agricultural policy, and the sharp increase of spending in debt rescheduling poses a level of uncertainty due to its questionable status within current WTO regulation.

Figure 7. PRONAF total subsidies (in US\$ millions)



Source: Brazil's notifications to the WTO and authors' calculations.

4.2. Official and Shadow Notifications for Product-Specific Support

As far as product-specific analysis goes, this paper focused on a few product of importance for Brazilian agriculture: cotton, rice, maize, wheat, soybeans, sugarcane, coffee, and dry beans.

The data gathered from the Brazilian notifications to the WTO and summarized by product in Table 9 allows us to conclude that domestic support for cotton went over the allowed *de minimis* of 10 percent of the value of production to 11.5 percent in 1998. Furthermore, from the analysis based on government data sources for the estimates and forecasts, the results shown in Table 9 demonstrates that the last three years (2006–2008) were either at the level of *de minimis* or higher (10, 14.3, and 13.7 percent, respectively).

It is equally clear that the amount of domestic support given by the government to rice producers is higher than the *de minimis*, at the 18.9 percent level for 1995 and similarly for maize, which in 1995 saw levels of domestic support reach 11.8 percent. However, for both rice and maize the levels of domestic support have fallen in recent years to rates comfortably below the *de minimis* threshold. Additionally, for soybeans, sugarcane, coffee, and beans, the Brazilian government has provided domestic support within levels that do not even come close to the allowed level of *de minimis*.

Along with the situation observed for cotton, wheat has seen throughout the years levels of support that goes beyond the *de minimis* 10 percent. Within the time period of 10 years (from 1995 to 2005) three years saw levels above 10 percent (66.8 percent for 1995, 10.1 percent for 1998, and 25.5 percent for 2005).

Furthermore, in light of the current Doha Round negotiations, it is interesting to analyze what would be the case if the allowed level of *de minimis* was 6 percent and not the current 10 percent for developing countries. If such scenario is played out, one would observe that the situation would be more drastic for the group of important products for Brazil. As for cotton, out of the 14 years of available data (including estimates and forecasts), Brazil would have gone to levels higher than the allowed *de minimis* in 8 years (1995, 1998, 1999–2001, and 2006–2008, as shown in Table 9). Wheat would also see levels above the allowed *de minimis* for 7 out of the 14 years available (1995, 1996–1998, 2004–2006, and 2008). Other products such as rice and maize also observed high levels of domestic support in early years (for 1995, 18.9 and 11.8 percent, respectively).

Table 9. Product-specific support (in US\$ millions) and share of the value of production

		95	96	97	98	99	00	01	02	03	04	05(e)	06(e)	07(e)	08(f)
COTTON	Prod. & Mark. Credit	12,586	12,710	10,278	19,325	23,830	16,175	19,676	18,695	18,074	15,676	18,049	12,523	9,781	20,897
	Inc. Sup. Programs	43,428	41	6	36,099	11,251	39,133	32,430	9,036	-	11,751	84,900	117,255	279,914	317,948
	AMS/VP	8.9%	3.0%	2.4%	11.5%	7.1%	7.9%	6.6%	5.0%	2.1%	1.5%	4.1%	10.0%	14.3%	13.7%
RICE	Prod. & Mark. Credit	14,839	34,009	19,058	26,409	49,716	16,984	13,268	14,144	18,349	20,154	29,228	19,060	12,810	30,612
	Inc. Sup. Programs	391,755	12,718	2,677	1,497	-	-	-	126	-	-	16,430	47,435	87,015	-
	AMS/VP	18.9%	2.7%	1.2%	1.4%	2.9%	1.2%	1.0%	1.1%	1.0%	0.8%	2.2%	3.4%	4.3%	1.1%
MAIZE	Prod. & Mark. Credit	26,915	73,112	47,232	45,110	82,556	36,867	36,538	39,086	61,180	57,320	91,547	57,746	39,082	93,331
	Inc. Sup. Programs	440,649	-	41,248	2,774	4,233	-	19,796	-	6,174	14,050	27,400	194,300	124,100	4,633
	AMS/VP	11.8%	1.9%	2.5%	1.4%	3.3%	1.1%	2.1%	1.3%	1.5%	1.8%	3.1%	5.5%	2.1%	1.0%
WHEAT	Prod. & Mark. Credit	10,677	10,073	14,503	10,300	8,326	7,425	10,325	13,470	22,933	18,663	24,919	16,492	12,476	26,985
	Inc. Sup. Programs	158,392	30,558	11,434	17,096	-	-	-	-	9,863	35,602	107,203	22,080	-	-
	AMS/VP	66.8%	8.2%	8.3%	10.1%	1.5%	1.1%	2.8%	2.8%	4.1%	7.6%	25.5%	8.4%	1.3%	2.4%
SOYBEAN	Prod. & Mark. Credit	40,158	59,327	44,650	87,336	133,950	38,481	33,146	44,752	78,203	64,342	93,525	46,902	29,961	91,993
	Inc. Sup. Programs	104,680	-	-	-	-	-	-	-	-	-	-	397,576	219,800	-
	AMS/VP	3.7%	1.2%	0.7%	1.6%	3.3%	0.8%	0.5%	0.8%	0.8%	0.6%	1.0%	5.2%	1.9%	0.7%
SUGAR CANE	Prod. & Mark. Credit	26,226	19,420	16,090	13,877	20,343	3,732	3,421	4,022	7,498	5,719	11,612	14,244	11,558	14,693
	Prod. Cost Equal. Credit Ethanol Storage	-	-	-	75,272	15,517	45,108	45,221	47,460	-	-	-	-	-	-
	AMS/VP	0.6%	0.4%	0.3%	1.7%	1.3%	1.3%	1.3%	1.3%	0.3%	0.5%	0.4%	0.2%	0.2%	0.2%
COFFEE	Prod. & Mark. Credit	2,102	11,380	9,724	33,535	33,166	14,366	11,665	8,385	11,043	8,370	22,877	26,822	19,064	25,938
	Inc. Sup. Programs	-	-	-	-	-	-	-	-	-	-	-	-	97,600	-
	AMS/VP	0.1%	0.4%	0.3%	1.0%	1.3%	0.6%	1.0%	0.5%	0.8%	0.3%	0.7%	0.6%	3.0%	0.5%
BEAN	Prod. & Mark. Credit	2,978	8,568	4,914	6,699	13,348	3,466	2,357	3,118	4,621	3,907	7,491	5,917	2,205	7,686
	Inc. Sup. Programs	-	-	-	-	-	-	-	-	-	-	-	-	13,729	-
	AMS/VP	0.2%	0.7%	0.4%	0.4%	1.3%	0.4%	0.3%	0.3%	0.4%	0.4%	0.5%	0.4%	0.8%	0.3%

Source: Brazil's notifications to the WTO and authors' calculations. Note: VP, value of production.

5. COMPARISON AND DISCUSSION OF SHADOW NOTIFICATIONS IN RELATION TO THE WTO RULES

The previous two sections presented Brazil's domestic support notifications for years through 2004, subsidies estimates for 2005 to 2007, and the forecast for 2008 for the policies as notified in the past by the Brazilian government. This section discusses alternative routes that could be used to build the notifications by reinterpreting the allocation of programs in the boxes, assuming WTO rules as if Brazil were considered a developed country, and setting new commitments resulting from a possible conclusion of the Doha Round.

Before discussing alternative notifications, the low subsidization level of Brazilian policies for agriculture allows the country great flexibility to comply with the WTO rules. According to the results discussed previously, Brazil has for the most part fallen within its product-specific and non-product-specific *de minimis*. In only a few cases was AMS after *de minimis* positive, and that was for cotton and wheat. The reason subsidies for cotton and wheat have in some years exceeded the level of allowed *de minimis* is the income support programs. The situation of cotton in 2006 to 2008 illustrates: In those years, the government decided to increase the share of the total production benefited by income support, leading to an increase in the level of subsidies. The devaluation of the dollar also contributed to an increase in the level of subsidies. The same conclusion would be reached assuming 6 percent value of production as a new level for product-specific *de minimis*. Cotton and wheat would be the only commodities to exceed this threshold.

The following notification alternatives and WTO rules shall be considered for Brazil.

5.1. Reallocate Investment Subsidies Notified under Article 6.2 to *De Minimis*

The reason the government has notified investment subsidies under Article 6.2 is that these are generally available for the agricultural sector, as specified in the Article 6.2 provisions. However, for the sake of consistency, given that the government decided to separate subsidies for commercial and family farmers, the same option should be undertaken for investment subsidies. In terms of meeting the commitments, however, shifting investment subsidies to non-product-specific *de minimis* would not make any difference.

A healthy discussion could be made of the methodology applied to the calculations of investment subsidies. The government has opted to calculate interest rate equalization by comparing the investment program interest rate with the SELIC rate, which is the short-term market-based interest rate and, therefore, is higher than the long-run interest rate. The calculated amount of investment subsidies is, therefore, intentionally overstated by the government. Given that the methodology used by the government already gives room for Brazil to remain under the non-product-specific *de minimis*, there would be no reason to recalculate the investment subsidies using the long-term interest rate.

5.2. Recalculate the Notifications, Applying Developed Country Rules to Brazil

In this scenario, Brazil would not be allowed to use Article 6.2, and *de minimis* threshold would be 5 percent of the value of production, rather than 10 percent. The Article 6.2 subsidies would be added to the non-product-specific *de minimis* and compared with the 5 percent *de minimis* threshold. AMS after *de minimis* would also be recalculated, taking into account the new threshold. The results are presented in Table 10. Even in the case of reducing the *de minimis* threshold, Brazil would be in the position to comply with its AMS commitment. Given that amounts in the non-product-specific *de minimis* and in Article 6.2 are well below the 5 percent *de minimis* threshold, Brazil would find no difficulties in staying within the boundaries established by the WTO.

Table 10. Alternatives subsidy measurement scenarios (in US\$ millions)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005(e)	2006(e)	2007(e)	2008(f)
Current WTO Rules and Brazil as a Developed Country														
AMS Commitment	1,039	1,025	1,011	997	983	969	954	940	926	912	912	912	912	912
AMS after 10% De Minimis	1,043	0	0	83	0	0	0	0	0	0	132	0	290	339
AMS after 5% De Minimis	1,099	41	33	87	35	55	52	0	0	54	132	875	290	339
NPS DM+Article 6.2	377	349	351	478	994	1,132	1,071	1,196	1,564	1,245	1,875	1,780	1,618	2,237
NPS DM+Article 6.2/ Value of Production	0.7%	0.6%	0.6%	0.8%	2.5%	2.6%	2.8%	3.2%	3.5%	2.3%	3.2%	2.7%	1.9%	2.1%
Doha Round Commitments and Brazil as a Developing Country														
AMS Commitment	638	638	638	638	638	638	638	638	638	638	638	638	638	638
AMS after 6% De Minimis	1,099	41	33	87	35	55	52	0	0	54	132	168	290	339

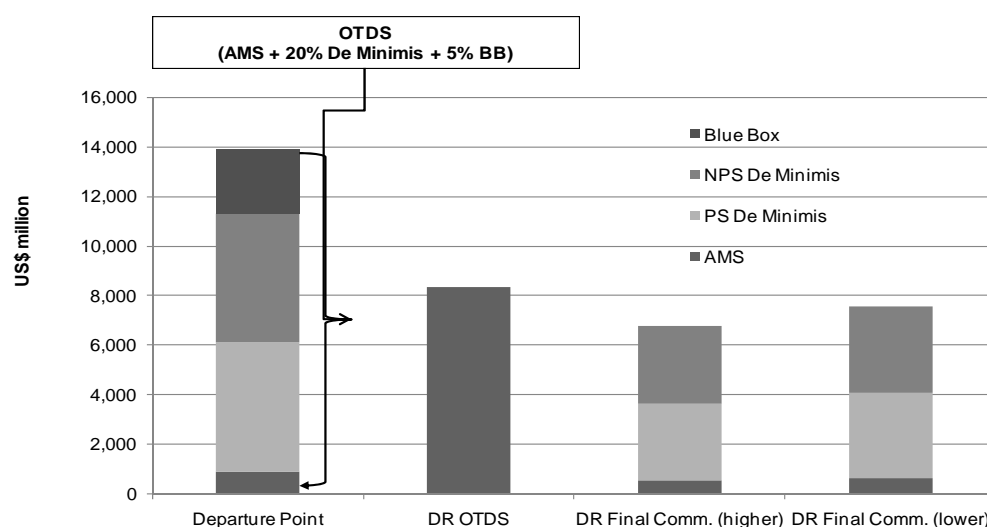
Source: Brazil's notifications to the WTO and authors' calculations. Note: NPS is non product specific.

5.3. Recalculate the Notifications Assuming New Doha Round Commitments

According to the Draft Modalities papers in negotiation in 2008 in the context of the Doha Round, new commitments for developing countries would be reduced by 30 percent of total AMS and 40 percent of *de minimis* which would reach a new threshold of 6 percent of the value of production. In this scenario, also presented in Table 10, AMS after *de minimis*, with exception of 1995, would be below the new commitment of US\$638 million.⁵ The new *de minimis* threshold would also not be a constraint for non-product-specific *de minimis* even if article 6.2 subsidies were included.

For the Doha Round results, it is important to assess the role of the overall trade-distorting support (OTDS) as a mechanism to impose additional disciplines over the individual cuts (AMS and *de minimis*). In the case of Brazil, the separate cuts have more constraint effect than the reduction in the OTDS (Figure 8). This conclusion is due to the fact that Brazil has no blue box policies and will not create this type of policy even with the creation of the new blue box.

Figure 8. Doha Round results: OTDS, AMS, and *de minimis* (in US\$ millions)



Notes: DR Final Commitment (higher): 40 percent cut in AMS and *de minimis* reduced to 6 percent of value of production. DR Final Commitment (lower): 30 percent cut in AMS and *de minimis* reduced to 6.7 percent. OTDS, overall trade-distorting support; BB, blue box; DR, Doha Round; PS, product specific; NPS, non-product specific.

5.4. Recalculate MPS using total production rather than government procurement

Although paragraph 8 of Annex 3 of the Agreement is very clear regarding the use of eligible production, not necessarily the whole production, in the calculation of MPS, there has been some discussion of the economic implications of the legal provisions on this subject. The idea is that the eligible production or the quantity available for government procurement, once withdrawn from the market, may impact domestic prices, benefiting the whole production or at least the production that will be marketed after the government intervention.

As discussed in Section 2, government procurement policies in Brazil are implemented through two mechanisms: AGF and COA. As presented in Table 1, from 2004 to 2008, AGF was almost negligible in terms of purchased volumes. COA, however, was important mainly for rice. The market

⁵ As mentioned in previous sections, we have reached different calculations for the AMS in 1995 when compared with the notifications. For reasons that are unknown to the authors, wheat subsidies were not included in the AMS after *de minimis*. According to our calculations, wheat total subsidies in 1995 have exceeded the *de minimis* level and should have been included in the total AMS.

situation for rice in Brazil in 2004–2005 and 2006–2007 confirms that although the COA benefits are only a share of the total production, the program is able to affect prices. Government procurement for the 2004–2005 and 2006–2007 farming seasons was 7 percent and 8 percent, respectively, of the total production (Table 1), and in both seasons prices responded positively to government intervention. However, higher prices did not necessarily benefit the whole production of rice. Two reasons explain this: (1) Government procurement in both years took place during the marketing season and it is very difficult to capture the share of the production that was already sold by the time the intervention started. (2) Government procurement in Brazil does occur as direct purchases but through a put option system (COA). The producer buys a put option, which gives him the right to sell the production to the government at a certain future date at a fixed price. With this put option, the producer tends to keep the contracted production in storages during the lifetime of the option (six months in general), and consequently, prices will tend to rise. That also depends on the market situation; for example, if prices increase above the level of the put option execution price, then producers may sell the production in advance, and give up the option. This system of options contracts, which is the predominant mechanism used by the government to procure product, may affect the future prices within the crop season but may not affect prices of future seasons.

A key distinction between the Brazilian MPS and the ones applied in developed countries, which are based on border protection and therefore affect the whole production, is that AGF and COA are after-harvesting policies. Before planting, the producer is informed of the level of minimum prices, which is the reference price for the implementation of policies; however, the amount of production enrolled in the program is defined by the government in the marketing period of the season. Despite the fact that minimum prices are established in the regulations, there is no provision regarding volumes of government procurement. The way the COA is operated, therefore, minimizes distorting signals that the program may send for producers in terms of stimulating overproduction.

5.5. Alternative Approaches to Notify the Debt Rescheduling Programs

The level of indebtedness and the capacity of farmers to honor the payment of loans have been major constraints for the performance of Brazilian agriculture. In order to eliminate these constraints, the government promoted a renegotiation of the debts with conditions of interest rate and payment period favorable in relation to the conditions offered at the original loans. As discussed earlier in the paper, many programs were renegotiated during 1995 and 1998. The majority of the renegotiated debts were acquired during the 1980s and early 1990s.

The equivalent level of subsidies for the debt rescheduling program was calculated comparing the cost of the original loan with the cost of the rescheduled loan. Given that the negotiated payment period for each program was different, the methodology used included measuring the subsidization as the difference of the present value (December 2002 as a basis) of the original and rescheduled loans.⁶ The level of subsidization calculated for 2002 was divided by the lifetime of the rescheduled loan, and then notified yearly. The annual value was corrected for inflation and the corresponding exchange rates. Therefore, it is our view that the methodology used by the government falls within the guidelines of the WTO rules. By 2002, the balance of debts under renegotiation was valued at R\$29.2 billion (US\$10 billion), which corresponded to 84 percent of the total balance of debts.

⁶ With the exception of the work done by OECD (2005), there is no public document available explaining the methodologies used by the different government agencies involved in the calculation of the subsidy component of the debt rescheduling programs. The lack of information, however, is more due to the complexity associated with putting together all credit programs in place in Brazil, which involves not only official banks such as Banco do Brasil and BNDES but also private banks, than lack of transparency from the government. All information presented in this paper was collected through interviews with technical professionals involved with the topic. Although the authors were able to gather from personal interviews and contacts almost all information needed to update data up to 2008, we are of the view that the government should make the effort to be transparent in disclosing information on the debit renegotiation programs. Those programs are becoming increasingly important, especially with the new program put in place in September of 2008, which further justifies increasing levels of transparency.

The implementation of the rescheduling program has shown that many farmers were not capable of continuing to make all annual payments, and that only part of the rescheduled loans had been liquidated. Due to the fact that a share of the annual installments had not been paid by farmers, the government promoted changes in the debt rescheduling policies, prolonging the length of the loans and reducing interest rates. This consequently leads to a higher level of subsidization. Notifications from 1999 to 2002 were able to capture those changes. However, 2003 and 2004 notifications assumed zero default on the annual payments. In other words, the subsidy associated to unpaid debts in the debt rescheduling programs is captured only when a new program is launched. This is a consequence of the methodology adopted by government which measures the level of subsidization through the interest rate differential. That methodology is not capturing the benefits for producers that were not able to pay the annual installments.

An alternative way to capture the subsidy equivalent related to unpaid installments is to associate them to an opportunity cost. The unpaid amount has an opportunity cost that is appropriated by the in debt producers. The value of this opportunity cost could be added up in the notified value, according to the amount of unpaid installments. Unfortunately, the government does not make available to the public the records of the balance of payments already paid.

As discussed earlier, the main objective of the rescheduling program was to allow farmers to recover financial solvency and maintain their access to credit in order to finance working capital and marketing costs. The production expansion of early 2000 followed the increasing availability of credit observed in the same period. Additionally, in this period the government created some credit programs for investments, leading farmers to increase the level of indebtedness even further. The balance of credit in 2007 was nearly double that of 2002: In 2002 it was 32 percent of the value of production, and it reached 61 percent in 2007.

Farmers' income, however, has not had the expected performance and solvency of producers, in particular for the state of Mato Grosso, is compromised. Thus, the farm sector and the government negotiated the 2008 new rural debt management policy of the Debt Liquidation and Compliance Program.

Total debt balance under negotiation is estimated to be in R\$74.4 billion (US\$38.2 billion). The equivalent subsidization will depend on the parameters negotiated under the new rescheduling program. Sources from the government have indicated that the additional subsidies, at 2007 value, would be around R\$10 billion (US\$5.7 billion). Assuming a lifetime of the rescheduled debt of 15 years, this amount would imply, at 2007 value, US\$380 million in addition to the notified value in 2008 (US\$1.4 billion).

Given the different nature of the recent released Debt Liquidation and Compliance Program in comparison with the earlier debt rescheduling program, new methodologies must be developed in order to update the notifications from 2008 onward. An update is also necessary to evaluate the impact of unpaid payments from 2004 in the subsidy component of the debt rescheduling program. In other words, estimations presented in this paper until 2008 are underestimated because the unpaid payments are not included in the calculations.

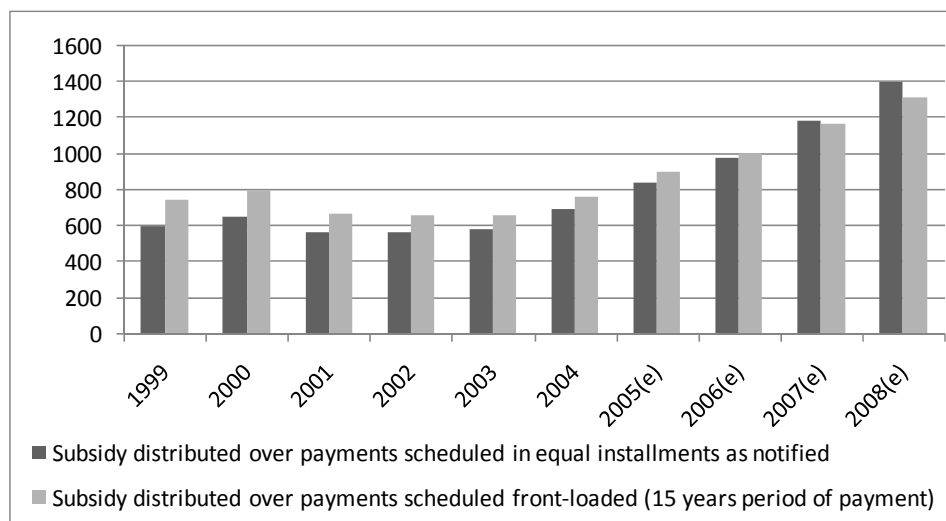
To search for alternative ways to replicate the notifications of the debt rescheduling program, as well as suggest improvement in the methodology for the future notifications that will take account the 2008 Debt Liquidation and Compliance Program, two possibilities can be explored:

1. The first is the idea pursued and later abandoned by the OECD, which was to calculate the Brazilian producer support equivalent, assuming that 100 percent of the subsidy should be notified in one installment. That option would put Brazil in a delicate position because the present value of the subsidy in 2002 would come up to US\$9.5 billion, which is much greater than the US\$3.7 billion non-product-specific *de minimis* threshold.
2. A second possibility is to recalculate the annual payments, assuming a schedule that follows a financial cash flow similar to a mortgage loan. With this methodology, interest is front-loaded, while the principal is divided equally in the schedule of payments, increasing the initial payments and reducing the final payments.

To examine option 2 for the past debt renegotiations, the notified values were recalculated from 1999 to 2008, assuming a 15-year payment period. From the total of 15 payments, which is equivalent to principal payments of 6.67 percent per payment in equal installments, the first payment moved up to 8.5 percent out of 100 percent of the total payments and the last payment moved down to 4.5 percent. As can be seen in Figure 9, the calculation based on distribution of the subsidy component over time using front-loaded interest payments shows results very similar to the methodology used in the notifications. The short-term period of payments, 15 years, explains why results are so similar.

Even when one assumes that the government is using the best methodology available to notify the debt rescheduling program, the economic impacts of this program are not captured by the notifications. It is clear that Brazilian farmers respond with increased production when the solvency problem is solved. A new rescheduling program will, therefore, stimulate new investments and push production up. Brazilian policymakers should pay more attention to this evidence when negotiating the new rescheduling program in order to avoid an adverse consequence: stimulating farmers to act as risk takers and to overinvest in agricultural production. This is essentially a domestic policy consideration as long as Brazil is within its WTO commitment in terms of the debt rescheduling program.

Figure 9. Debt rescheduling program: Distribution of the subsidy component over time (in US\$ millions)



Source: Brazil's notifications to the WTO; interviews with technical people from the federal government, and authors' calculations.

5.6. The Use of Budgetary Outlays Rather Than the Opportunity Cost Approach

Credit subsidies are notified using the opportunity cost approach: Preferential interest rates are compared with market interest rates in order to calculate subsidy levels. For a few sources of funding, the preferential rate is even lower than the cost of the resource, and the government uses budgetary resources to make up the difference (in Brazil, this operation is called interest rate equalization). This is the case of a few PRONAF credit modalities. In addition, the government also may cover BACEN's fixed costs to operate PRONAF contracts. Although this is not a direct subsidy to the farmer, it also accounts as a budgetary expense. In the case of PRONAF, therefore, an alternative methodology is to notify budgetary expenses rather than the interest rate differential. In 2006, for example, the estimated notified value was US\$357.1 million (production and investment credit), and it would be US\$499 million under the budgetary expense approach. Although the subsidy increases, given that PRONAF is notified under Article 6.2 a change in the methodology would not affect Brazil's WTO compliance.

6. PROJECTED NOTIFICATIONS THROUGH 2018

Notified data from 1995 to 2004 and estimated and forecast data up to 2008 show that there are two groups of programs that should be monitored in future notifications: income support programs and debt management programs. With respect to the latter, and due to reasons discussed in Section 2.5, this paper does not provide any projections, despite the fact that with the creation of the debt liquidation and compliance program, Brazil will use more space for these subsidies within its non-product-specific *de minimis*. The largest share of the non-product-specific *de minimis* used was 2.3 percent of the production value in 2003, out of a threshold of 10 percent. Even without explicit projections, we can expect that the new debt management policies will fit within the non-product-specific *de minimis*. Projections analyzed in this section will therefore be focused on product-specific income support programs.

From the set of products subjected to income support programs presented in Table 9, cotton, rice, maize, and wheat were subjected to amber box subsidies higher than the *de minimis* clause at least once from 1995 to 2008. Although for rice and maize the *de minimis* was breached only once, for cotton and wheat this happened three times. Assuming a 6 percent of production value *de minimis*, cotton and wheat went over their ceilings by 8 and 7 times, respectively. The higher relevance of income support policies for cotton and wheat, relative to other products, can also be observed in Table 1: In 2008, 64 percent of cotton production was subject to equalization premium mechanisms.

As can be seen, cotton is a special case among the crops granted with product-specific support mechanisms. The increasing support for cotton is explained by different reasons. The continuous overvaluation of the Brazilian currency since 2004 has reduced the competitiveness of the Brazilian cotton production facing domestic prices determined by world prices. The level of competitiveness is also strongly affected by transportation costs. There are two main cotton-producing regions in Brazil: the state of Mato Grosso in the midwest cerrados, and the state of Bahia in the northeast cerrados. Together they are responsible for 80 percent of the total production. Both regions are not endowed with good transportation infrastructure, forcing prices to be lower and costs higher. In the medium-run, with the extension of the South-North Railway under the federal government's growth acceleration program (PAC—Programa de Aceleração do Crescimento), transportation costs in Bahia should drop, benefiting producers. The perspective for Mato Grosso, however, is not as promising. In the short-run, the devaluation of the Real with the 2008 world financial crisis will certainly help the producers, although the financial crisis itself will be detrimental to cotton demand.

The projected notification results for 2009–2018 are presented in Table 11. The two main product-specific programs were projected: credit for cropping activities and marketing loans; and income support programs, assuming that only equalization premium instruments will be used in the future.

The production and marketing credit subsidy was calculated assuming that in the future the proportion between the equivalent subsidy for credit and the value of production will be constant. An average from 2005 to 2008 was calculated, and that was extrapolated for future years. Value of production was calculated using the production and prices contained in the FAPRI's 2008 Outlook (FAPRI 2008).

Given that FAPRI's 2008 Outlook has production for Brazil but does not have Brazilian prices, available prices were used as a reference to calculate domestic prices in Brazil. The basic assumption is that domestic prices will follow the same trend of world prices, using exchange rates also collected from FAPRI's 2008 Outlook. The following prices were used: Cotlook A Index for cotton, and U.S. FOB Gulf Ports for rice, corn, and wheat. Given that FAPRI's 2008 Outlook prices are given in real terms, minimum prices in Brazil were kept constant at the 2008 nominal level. The unitary subsidy is calculated by the difference between the estimated domestic price based on world prices and the minimum price supported by the government, when the latter is above the former.

As discussed, the decision of the amount of production to be subjected to the equalization premium program is ex-post (after the harvest) and varies according to the year and to the objectives of the government in terms of income support. It was assumed fixed for the projection period at the same

amount as the highest share between the benefited volume and the production observed from 2005 to 2008. The shares used are 64 percent for cotton, 10 for rice, 20 for corn and 20 for wheat.

Projections indicated that the total support for cotton and wheat will fluctuate around 4 to 6 percent of the projected value of production. With a product-specific *de minimis* of 10 percent of production value, it is not expected that cotton and wheat will breach above the allowed ceiling. However, if the *de minimis* is reduced to 6 percent, cotton would go above the allowed ceiling six times from 2009 to 2018.

Table 11. Projections of product-specific support for most sensitive commodities (in US\$ millions)

		09	10	11	12	13	14	15	16	17	18
COTTON	Prod. & Mark. Credit	18,394	18,669	19,184	19,537	19,638	19,600	19,683	19,818	19,912	20,197
	Inc. Sup. Programs	77,906	95,670	97,655	116,344	141,339	153,947	148,509	138,423	137,127	141,368
	AMS/VP	3.9%	4.6%	4.6%	5.2%	6.2%	6.7%	6.4%	6.0%	5.9%	6.0%
RICE	Prod. & Mark. Credit	36,550	36,210	35,267	35,297	35,317	34,785	34,042	33,373	32,667	32,847
	Inc. Sup. Programs	-	-	-	-	-	-	-	-	-	-
	AMS/VP	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
MAIZE	Prod. & Mark. Credit	158,983	150,948	141,929	139,524	138,767	138,313	135,509	133,048	128,978	127,111
	Inc. Sup. Programs	-	-	23,351	7,875	-	-	-	-	-	-
	AMS/VP	1.3%	1.3%	1.5%	1.4%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
WHEAT	Prod. & Mark. Credit	20,079	17,290	16,085	15,761	15,481	15,298	14,980	14,668	14,310	14,154
	Inc. Sup. Programs	19,186	18,205	17,749	15,917	14,501	11,978	10,749	9,554	8,757	8,136
	AMS/VP	5.7%	5.9%	6.1%	5.8%	5.6%	5.2%	5.0%	4.8%	4.7%	4.6%

Source: Authors' calculations.

7. ETHANOL POLICIES AND THE WTO RULES

The recognition that biofuels policies have contributed to the rise in agricultural commodities prices observed during 2007 and 2008 is encouraging the debate concerning the distortive effects of these policies. If biofuels policies induce distortions on the world market of agricultural products, why not fit them in the WTO framework disciplines? Why not notify them as any other agricultural domestic support? Although these questions seem to be rational and logical, answers are not that straightforward. New questions arise regarding the idea of notifying biofuels domestic policies: (1) Are they targeted for agricultural products? (2) Who is the final beneficiary: farmers, blenders, consumers? (3) Are they available only for the domestically produced biofuels? (4) Given that biofuels trade is not liberalized, are domestic policies discriminatory against imported biofuels? (5) What policies should be notified: tax credits/tax exemption and blending mandates?

These questions are relevant. From an economic perspective, biofuels policies have real impacts on the world market of agricultural products, and as a consequence, they should be subjected to multilateral disciplines. However, from a legal perspective, the idea of notifying them in the WTO Agreement on Agriculture framework can be refuted with different arguments. For example, one could argue that biofuels policies are not mainly distorting the biofuels market, but instead the agricultural commodities market.

The two most important biofuels policies that are source of distortions are tax exemption/tax credit and mandates. Following de Gorter and Just (2008) arguments, in a presence of a blending mandate, tax credit policies become a source of subsidy. One approach would be to focus on the mandate itself as a policy affecting prices. An alternative would be to notify the revenue forgone by the government with tax credit/exemption policies. This approach, however, has some limitations. The tax exemption for ethanol in Brazil is around US\$0.40 per gallon (R\$0.18 per liter). However, in 2007 it was US\$0.62 per gallon (R\$0.28 per liter). The comparison of per-unit values would show that Brazil is subsidizing the sugarcane ethanol industry more than the United States is the corn ethanol industry. This was true in 2007 because the federal tax credit in the United States was US\$0.51 per gallon. If we change the perspective of the economic impacts of both policies on the world price of agricultural commodities, it is hard to say that Brazil is distorting the world market to the same extent as the United States. Besides that, ethanol is a gasoline additive in the United States and, as a fuel, a gasoline competitor in Brazil. The nature of the policies is very similar, but its economic impacts are not.

A second problem of tax credit/exemption policies is that although they are not necessarily discriminatory against imported biofuels, under the presence of border protection, they are. If there would be no tariffs blocking the ethanol trade, ethanol from different origins would be enjoying similar benefits in countries that adopted tax credit policies. Although a free market would not resolve the issue of subsidizing oil consumption (de Gorter and Just 2008), at least the allocation of biofuel production among regions would be more efficient.

A second possible methodology for ethanol policies would be through the MPS calculations. With tax credits, we can expect higher prices of ethanol, which could be converted into the price of the agricultural feedstock and compared with world reference prices. The advantage of using this methodology is that it might also include border protection effects. The MPS method should be assessed in conjunction with the revenue-forgone methodology, in order to avoid doubly counting the subsidies.

Overview of Brazilian Policies for Ethanol

This section is focused only on ethanol policies because, although the biodiesel market has been stimulated by a set of policies very similar to those that apply to ethanol, biodiesel consumption is very small in Brazil compared with ethanol consumption.

Brazilian policies for ethanol comprise the following instruments:

1. Twenty to 25 percent mandatory blend of anhydrous ethanol in gasoline A (pure gasoline). The gasoline blended with ethanol and sold at the pump is called gasoline C. Gasoline A is

supplied by Petrobras (Brazilian oil company) to distributors (oil companies like Shell, Esso/Exxon, etc.), which in turn will blend the ethanol and distribute the gasoline C to gas stations.

2. Tax exemption of Contribution to Intervention in the Economic Dominion (CIDE). The CIDE fee is set at R\$0.18/liter (~US\$0.09/liter). Both anhydrous and hydrous ethanol (E100 ethanol) are exempted. If it had to be paid, CIDE on ethanol would be collected by millers. On gasoline A, CIDE is collected by Petrobras before it is sold to distributors.
3. Differential levy on the state tax (ICMS). In some states, like Sao Paulo, the ICMS fee for hydrous ethanol (12 percent) is lower than for gasoline (25 percent). However, given that ICMS is collected by gas stations, anhydrous ethanol is taxed by 25 percent as gasoline C. In other states, however, the ICMS fee is the same for gasoline and hydrous ethanol.
4. Subsidized credit for ethanol storage (preferential rates). This program had been notified in the last two notifications and classified as a sugarcane subsidy.
5. Vehicles: partial exemption of the IPI (tax on industrialized products) on flex-fuel cars as follows:
 - a. Below 1-liter engines: 7 percent fee on gasoline, E100 and flex-fuel cars
 - b. Between 1- and 2-liter engines: 13 percent fee on gasoline cars and 11 percent on E100 and flex-fuel cars
 - c. Above 2-liter engines: 25 percent fee on gasoline cars and 18 percent fee on E100 and flex-fuel cars

With regard to policies that are oriented to stimulate ethanol consumption and to grant competitiveness for ethanol in relation to gasoline, mandate and tax exemption of CIDE are the two most important.

The mandate in Brazil is binding the consumption of anhydrous ethanol, which follows the consumption of gasoline. However, the consumption growth of ethanol in Brazil is taking place with hydrous ethanol. For the 2007–2008 season, it is expected that the Center-South region will produce 19.3 billion liters of ethanol: 7.2 billion liters of anhydrous and 12.1 billion liters of hydrous. With the expansion of flex-fuel car sales in Brazil since 2003, when the first model was launched, the anhydrous market has been stable, while the hydrous market is growing very fast. The mandate in Brazil, therefore, has a very different role from the mandate in the United States or in the European countries in terms of subsidizing the production of ethanol.

A second distinction concerns price levels. Contrary to the situation in the United States and Europe, ethanol prices in Brazil are lower than gasoline prices (see Table 12). Even if ethanol was not exempt from CIDE, prices would still be lower. The CIDE exemption, therefore, is not necessarily acting as a consumption stimulator but as mechanism to guarantee higher margins to the millers. Additionally, given that hydrous ethanol is a competitor of gasoline and its consumption is increasing much faster than gasoline, the CIDE exemption is not subsidizing gasoline consumption as would be the case of anhydrous ethanol.

This particular situation in Brazil makes it even more difficult to find a common methodology to notify biofuels subsidies in the WTO for agricultural products.

Table 12. Prices of gasoline A, anhydrous ethanol, and hydrous ethanol (R\$/liter)

	2002	2003	2004	2005	2006	2007
Gasoline A	0.99	1.24	1.30	1.45	1.54	1.54
Anhydrous Ethanol	0.62	0.81	0.70	0.87	1.03	0.83
Hydrous Ethanol	0.54	0.69	0.60	0.77	0.93	0.74

Source: CEPEA.

Notes:

1. Including contributions for the Social Integration Program (PIS) and for the Financing of Social Security (COFINS) and excluding Tax on Goods and Services (ICMS). Ethanol is exempt from R\$0.18/liter of CIDE.
2. Gasoline A: Petrobras selling price to the distributors. Source: Agencia Nacional de Petroleo (ANP).
3. Anhydrous and hydrous ethanol: average state of Sao Paulo millers selling prices

8. CONCLUSIONS

Brazil is presenting itself as being in a comfortable position with respect to domestic support in the Doha Round negotiations, and our analysis confirms this position. Doha Round outcomes in terms of creating or strengthening domestic support disciplines will not be a constraint for the execution of the Brazilian agricultural policy. Even in the most restrictive scenario, assuming Brazil as a developed country, Brazil would still have enough room for maneuver by using non-product-specific and product-specific *de minimis* to notify its programs. In the case of Brazil, *de minimis* policies are binding compared to the OTDS of a possible Doha agreement. Due to the high level of overhang, even in the product-specific *de minimis*, a 40 percent reduction will not oblige Brazil to make deep changes in its programs.

Nevertheless, Brazil must be careful with income support programs. They have been responsible for product-specific support exceeding the *de minimis* levels. Income support programs, however, can be controlled by the government in order to fit them into allowed levels of *de minimis*.

The debt management programs, although they do not raise concerns with respect to how to notify them, are capable of influencing farmers' decisions in the medium to long run. They are becoming more sophisticated, with different sets of programs and specific objectives, and their relevance on the domestic support notifications will increase in the future. They have a risk aversion reduction effect and may lead farmers to overinvest in agricultural production. Although the debt rescheduling program is not product specific and is decoupled from the current production, the successive renegotiations have indicated to farmers that they do not need to be risk averse in getting credit because debts will be renegotiated at some point in the future. This effect is similar to the update effect of the U.S. direct payments. In Brazil's case, the certainty about the future renegotiation is leading farmers to high levels of indebtedness. There are no empirical studies assessing this hypothesis, but the release of 2006 agricultural census data will help us to evaluate the consequences of the debt relief policy.

In the process of negotiating the recent debt liquidation and compliance law, the government decided to be more transparent in releasing data on the level of indebtedness, but lack of transparency remains a problem to be tackled. This lack of transparency is not so much with respect to methodology used for measuring subsidy components, but with respect to making data on rescheduling and management programs publicly available.

As for biofuels, there is no doubt that disciplines are needed at the multilateral level. New rules are necessary to guarantee that policies oriented to create demand for biofuels will not jeopardize world agricultural markets. WTO rules, however, must be improved in order to capture the specific situations of biofuels, which are not the same as other agricultural commodities.

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