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Brazil
Agricultural Sector Review: Policies and Prospects

(In Two Volumes) Volume I: Main Report

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Country Operations Division
Brazil Department
Latin American and the Caribbean Region

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CURRENCY EQUIVALENTS
(As of July 16, 1990)

Currency Unit	=	Brazilian Cruzeiro (Cr$)
US$1.00	=	Cr$66

WEIGHTS AND MEASURES

1 meter (m)	=	3.28 feet
1 kilometer (km)	=	0.62 miles
1 hectare (ha)	=	10,000 m^2 = 2.47 acres
1 square kilometer (km^2)	=	100 hectares = 0.386 sq. miles
1 cubic meter (m^3)	=	1.31 cubic yards or 264.2 US gallons
1 kilogram (kg)	=	2.2 pounds
1 ton	=	1,000 kg - 2,205 pounds

FISCAL YEAR

Government of Brazil	=	January 1 to December 31

DEFINITIONS OF MACRO REGIONS

North

Rondonia, Acre, Amazonas, Roraima, Pará and Amapa

Northeast

Mananhão, Piauí, Ceará, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Fernando de Noronha, Sergipe and Bahia

Southeast

Minas Gerais, Espírito Santo, Rio de Janeiro, Guanabara, São Paulo

South

Paraná, Santa Catarina and Rio Grande do Sul

Center-West

Mato Grosso do Sul, Mato Grosso, Goiás and Distrito Federal

Note: For state and regional boundaries see Map IBRD 20444R.

GLOSSARY OF ACRONYMS

AGF	Aquisições do Governo Federal Federal Government Acquisition (Minimum Price Program)
CACEX	Carteira do Comércio Exterior Foreign Trade Portfolio (Bank of Brazil)
CFP	Comissão Financiamento da Produção Commission for Production Financing
CIBRAZEM	Companhia Brasileira da Armazenagem Brazilian Storage Company (Federal)
CNP	Conselho Nacional de Petróleo National Petroleum Council
COBAL	Companhia Brasileira de Alimentos Brazilian Food Company
CODEVASF	Compania do Desenvolvimento do Vale do São Francisco São Francisco Development Company
CONCEX	Conselho Nacional de Comércio Externo National Council for External Commerce
CTRIN	Comissão de Compra de Trigo Nacional National Wheat Buying Commission
DNOCS	Departamento Nacional de Obras Contra Secas National Department for Anti-Drought Works
DNOS	Departamento Nacional de Obras de Saneamento National Department of Sanitation
EGF	Empréstimo do Governo Federal Federal Government Loans (Minimum Price Program)
EMBRAER	Empresa Brasileira da Aeronáutica Brazilian Aeronautical Enterprise
EMBRAPA	Empresa Brasileira de Pesquisas Agropecuárias Brazilian Enterprise for Agriculture and Livestock Research
EMBRATER	Empresa Brasileira de Assistência Técnica e Extenão Rural Brazilian Enterprise for Technical Assistance and Rural Extension
FGV	Fundação Getúlio Vargas Foundation Getúlio Vargas Foundation
FINAM	Fundo de Investimento do Amazônia Amazon Investment Fund
FINOR	Fundo de Investimento do Nordeste Northeast Fund

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FISET	Fundo de Investimento Sectoriais Sectoral Investment Fund
FUNCAFE	Fundo do Café Coffee Price Stabilization Fund
IAA	Instituto do Açúcar e do Álcool Institute of Sugar and Alcohol
IBC	Instituto Brasileiro do Café Brazilian Coffee Institute
IBGE	Instituto Brasileiro de Geografia e Estatística Brazilian Institute of Geography and Statistics
ICM	Imposto Sobre Operaçoes Relativas e Circulação de Mercadorias Tax on the Circulation of Goods
INAN	Instituto Nacional de Alimentação e Nutrição National Food and Nutrition Institute
INCRA	Instituto Nacional de Colonização e Reforma Agrária National Institute of Colonization and Agrarian Reform
IPC	Indicador de Preção Consumo Consumer Price Index
MIC	Ministério da Indústria e Comércio Ministry of Industry and Commerce
MINAGRI	Ministério da Agricultura Ministry of Agriculture
MINTER	Ministério do Interior Ministry of Interior
MIRAD	Ministério da Reforma e do Desenvolvimento Agrário Minimum Price Program
PROÁLCOOL	Programa Nacional de Álcool National Alcohol Program
PROINE	Programa de Irrigação para o Nordeste Northeast Irrigation Program
PRONI	Programa Nacional de Irrigação Nation Irrigation Program (Outside the Northeast)
SENAR	National Service for Rural Apprenticeship
SUNAB	Superintendência Nacional de Abastecimento National Superintendency of Supply

BRAZIL

AGRICULTURAL SECTOR REVIEW: POLICIES AND PROSPECTS

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FOREWORD

1. Since the final draft of this report was completed in mid-1989, a new government has been elected to power. The new Government has introduced many major reforms throughout the economy. In the agricultural sector, a number of important policy and institutional changes affecting the agricultural sector have been made. Many of these changes are consistent with, and along the lines recommended in the report.

2. In the area of marketing and storage (paras. 3.03-3.08 and 4.37-4.40), the Commission for Production Financing (CFP), the Brazilian Federal Storage Company (CIBRAZEM) and the Brazilian Food Company (COBAL) are being merged into a single National Supply Company (CNA), linked to the Department of Supply and Prices of the Ministry of Economy, Planning and Finance. In addition, CIBRAZEM has already reduced its staff and is in the process of selling off most of its warehouse capacity, retaining some facilities for the purpose of holding what it regards as "strategic" stocks. COBAL has similarly reduced its operations and made even more dramatic cuts in staff. CFP continues to operate as it has before, but reduced budgetary allocations since mid-1989 have forced CFP to offer very low (well below market) minimum prices, resulting in continually declining CFP purchases.

3. With the collapse of the International Coffee Agreement in July 1989, Brazil temporarily retained the Brazilian Coffee Institute (IBC) (para. 3.19) to buy and sell stocks in order to regulate the domestic market. Under the new Government, IBC was dissolved and all controls and fees have been removed. The coffee market in Brazil is now totally free. It remains to be seen what the Government will do with the large stocks of coffee that have been accumulated.

4. In the case of sugar (paras. 3.11, 3.12 and 4.44), just before leaving office, the previous Government removed the export monopoly status of the Institute of Sugar and Alcohol (IAA). Subsequently, the new Government abolished the IAA, effectively removing the Government from any direct participation in domestic marketing. However, sugar exports have continued to be controlled by trade bans and quotas, and all prices in the industry have remained under the control of the Government.

5. On the trade front (paras. 3.18 and 4.48-4.52), since the issuance of CONCEX Resolution 155 of May 4, 1988, which removes all quantitative trade restrictions on cotton fiber, rice, maize, and soy products, Brazil has continued to exercise control over these and other agricultural exports and imports through the administration of its licensing system. The new Government has announced several steps it is taking to reduce the discretionary nature of the licensing process. Also, the variable tariff system for maize and rice imports (as provided for under Resolution 155) has yet to be tested since the international prices for these products have not been below the domestic target prices and Brazil has not had to import these products. Furthermore, the Brazilian tariff authority (CPA) still maintains fixed tariffs for these and other agricultural products. Tariffs on some agricultural products (cotton lint, sisal, jute and ramie) have already been removed, while other reductions are being studied. For most agricultural inputs, the tariffs have been reduced.

6. Under the new Government, the agricultural income tax (paras. 3.31-3.34 and 4.25) has been reformed. Rates have been raised and various deductions and exemptions removed, making effective rates roughly comparable to those in other sectors. However, under the new tax law, agricultural producers can still receive a tax exemption by holding their income in bank deposits used for the financing of rural activities. The Government has also suspended all fiscal incentives associated with promoting development in the Amazon (FINAM) and the Northeast (FINOR), but, at the same time, under the Constitution, a new credit fund has been established to finance (at less than market interest rates) investments in the North, Northeast, and Center-West regions.

7. In the area of rural credit (paras. 3.20-3.27 and 4.21-4.23), the Government has continued to contract the supply of funds provided from its own resources. At present, it is Government policy to restrict rural credit drawn from Government resources, to small producers. In the past, the bulk of official rural credit went to large producers. The compulsory application system remains in place and is currently the major source of official rural credit. At present, official rural credit, either from the Government's own resources or up to 60% of compulsory applications, has an interest rate ceiling of 12%. The agricultural sector has responded to the contraction of official rural credit with a much higher degree of self and direct financing from suppliers and marketing agents.

8. In the macroeconomic sphere, the most potentially significant development for the agricultural sector is the change in exchange rate policy. Historically, Brazil's overvalued exchange rate has been a major source of implicit taxation of agricultural production (paras. 3.43 and 4.12). Under the new Government, the foreign exchange regime has changed from a crawling peg to a managed float, which the Government maintains through its net purchases of foreign exchange in the market. This rate applies to all trade transactions. It remains to be seen whether, and to what extent, this policy will reduce the persistent overvaluation of the domestic currency. There is still a free parallel market rate and a so-called "tourist" rate, both of which exceed the trading rate.

9. Finally, a number of organizational changes have taken place within the Ministry of Agriculture. First, the Ministry of Agrarian Reform has been formally merged with the Ministry of Agriculture, creating the new Ministry of Agriculture and Agrarian Reform. To advise the Minister, a National Council on Agriculture (CONAGRI), comprising technical specialists from the public and private sectors, has been created. With regard to the technical support services provided by the Ministry, the Animal Health Department is in the process of being reorganized. The Federal Government's Extension Service (EMBRATER) has been abolished after being closed temporarily and then reinstated by the Congress during the previous administration. At the present time, the proposal is for its coordinating function to be transferred to a department within the National Agricultural Research Company (EMBRAPA). As already noted, the agency responsible for administering the Government's Minimum Price Program (CFP) and the Federal Government's Storage Company (CIBRAZEM), both formerly of the Ministry of Agriculture, are being merged with COBAL in the Ministry of Economy, Planning and Finance.

ABSTRACT

1. Since the end of World War II up until the macroeconomic crisis of the last several years, the Brazilian economy has undergone major structural change. Agriculture's share in output, employment, and trade has declined sharply, while industry's relative importance has increased. In addition, Brazil has gone from being a largely agrarian society to being a predominately urban one. This transformation occurred in a context of exceptionally rapid and sustained overall economic and sectoral growth that has benefitted a relatively small proportion of the total population. Also, regional income disparities have increased. Within the agricultural sector, output growth has come almost entirely from area expansion as opposed to productivity increases (only in recent years have yields begun to increase), the concentration of land holdings has increased, capital has been increasingly substituted for labor and the proportion of wage and temporary labor has increased as tenancy, family and self-employment have declined. Among the regions, the differences in farm income have increased, particularly between the Northeast and the rest of the country.

2. The study identifies and analyzes a number of principal causes that lie behind this performance, including: demographic factors; the abundance of land; technological innovation; the low educational attainment levels of the agricultural population; changes in international trade; and government policy interventions, including investments. Government policies have been particularly important in shaping the rate and pattern of growth and structural change. Through various policies, the agricultural sector has been implicitly taxed, with export crops registering higher rates of implicit taxation than food crops. The one exception is wheat, which has been heavily subsidized by the Government. In addition, the inputs which the agricultural sector uses have been heavily protected, thereby further implicitly taxing agriculture. For most of the crops studied, the indirect, economy-wide interventions (non-agricultural trade restrictions, exchange rate policy, etc.) have been relatively more, or as, important as the direct, sector-specific interventions (price policies, agricultural trade controls, agriculture-specific taxes, etc.). For wheat and cotton, the direct interventions have tended to be more important.

3. Partially offsetting this discrimination against agriculture, are the various subsidies that the Government has provided: subsidized credit, the wheat subsidy, tax shelters and fiscal incentives, and the minimum price program. These programs have mainly benefitted large producers, thereby widening individual and regional income differentials, while introducing further distortions in factor, product and credit markets.

4. The same policies that have led to serious resource allocation distortions in the overall economy, have also exacerbated the disadvantages of the less well-endowed and more agriculturally-dependent regions, such as the Northeast. This is because the general policy bias which discriminates against agriculture, adversely affects those regions with a relatively large agricultural sector (such as the Northeast) more that it does those regions with a relatively small agricultural sector. Also, the protection of agricultural inputs has taxed the less industrialized regions more than the industrialized regions, where these inputs are produced, resulting in a net transfer of income from the poorer to the more developed areas of the country. Consequently, the removal of such policy distortions should be an integral part of any rural development strategy.

5. In Government expenditures, the highest priority has been assigned to rural credit and other subsidy programs. Some public services, infrastructure and investment in human capital, notably rural primary education which is particularly important for the agricultural sector and its long-term growth, have been neglected.

6 During the coming decade, the agricultural sector is expected to face a number of major challenges. While the reform process has already begun, the analysis shows that by adopting further liberalization measures, not only does the performance of the economy improve, but it also leads to a substantially more equitable distributional outcome as well. Another challenge that the agricultural sector is likely to face in the 1990s is the further deceleration in the expansion of the agricultural frontier. Most agricultural growth is expected to come from productivity increases and more intensive use of existing farm land, rather than from area expansion. While this is expected to have overall beneficial efficiency, equity and environmental effects, it is also expected to put greater pressure on existing farm land. Agricultural labor force problems are also expected to persist. The analysis shows that even on the more efficient growth path, a large number of agricultural laborers with relatively low productivity are likely to remain in the Northeast. Finally, recent political developments are also expected to play a major role in the evolution of the sector in the coming decade. Greater decentralization of decision making is expected to give rural Brazil or agricultural interests more political representation than it has had in the past.

7. To address the issues facing the sector, a number of policy recommendations are made. In the area of rural credit and taxes, the report recommends accelerating the contraction of official credit, liberalizing rural saving deposit rates, removing entry restrictions for banks, abolishing fiscal incentives, revising the income tax code to ensure that agricultural income does not escape taxation, and eliminating the present discrimination, under the ICM tax, against agricultural exports which are taxed while industrial exports are exempt. The recommended domestic pricing and marketing policy reforms include: discontinuing the commodity stock purchase program (AGF); selling off the federal and state storage companies to the private sector; phasing out the Government's stock financing program (EGF); discontinuing the wheat subsidy scheme; and dismantling the plethora of price and production controls in the sugar industry. In the area of trade, the report recommends freeing all agricultural export trade from the vagaries of intermittent quantitative controls; discontinuing the Government's monopoly control of wheat imports and sugar exports; and removing or substantially lowering the tariffs on agricultural inputs. With regard to land policy, in addition to discontinuing the various fiscal and credit subsidies that have contributed to the land concentration process, the report recommends continuing efforts to establish title security in priority areas. Improving and strengthening the enforcement of the land tax is also recommended. On the Government expenditure side, the report makes numerous recommendations to eliminate the various untargeted subsidy programs, to withdraw from directly participating in operations that compete with or replace the private sector and, instead, to focus efforts on those regulatory functions, support services and infrastructure that facilitate the efficient operation of the private sector. Special emphasis is given to investment in research, human capital through basic education, job training, improved nutrition and physical infrastructure, especially rural roads. Finally, to improve the quality of policy advice, the report recommends the establishment of a Policy Group within the Ministry of Agriculture, reporting directly to the Minister.

PREFACE

1. The last comprehensive Bank review of Brazil's agricultural sector was undertaken about ten years ago.[1] It reviewed the sector's performance and the Government's agricultural policies over the preceding two decades. Since then, a few subsector studies (pricing policy, storage, sugar and irrigation) have been carried out, but no comprehensive, up-to-date reports on the entire agricultural sector currently exists.

2. Lacking this longer term, coherent overview of the agricultural sector and how it fits into the national economy has made it increasingly difficult to rank investment priorities or evaluate alternative development strategies for the sector. This Agricultural Sector Review is intended, in part, to address this problem. More specifically, the main objectives are: (i) to serve as a principal source of sectoral information; (ii) to identify gaps in sectoral knowledge needed to formulate a relevant sector work and investment program; (iii) to establish a common frame of reference around which to organize and focus a sectoral dialogue between the Bank and the Government; and (iv) to provide a comprehensive, long-term overview of the sector, which cannot be obtained through project work, to guide both the Government and the Bank in formulating a sectoral development strategy, particularly over the medium term.

3. At the same time, the report is intended to be updated at regular intervals, and should therefore be viewed not as a discrete exercise but rather as a series or process. To achieve a report design that allows for relatively easy and economical updates, special emphasis in this report has been placed on collecting and constructing the basic primary data sets from reliable and relatively easily accessible public sources. Too often in past sector work, another author's analysis of basic primary data has been used. Although the analysis may be of a high professional standard and scrupulously documented in a scholarly manner, the problem arises if one wants to replicate, modify or update the analysis and the primary data is not presented.

4. Fortunately, in the case of Brazilian agriculture, it is possible to obtain most basic primary data from reliable public sources. Some of the most important of these sources include: the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatistica -- IBGE); the Getulio Vargas Foundation (Fundacao Getulio Vargas, FGV), the Institute of Economic and Social Planning (Instituto de Planejamento Economico e Social -- IPEA); and the Company for Production Financing (Compania de Financiamento da Producão -- CFP). These sources have been used extensively in this report. Thus, with few exceptions, the analyses in this report are based on the primary data sets used here. This data base is now on file on Lotus 1-2-3 in the Brazil Agriculture Division. Arrangements are being made to ensure that the database is maintained continuously and that frequent updates can be handled relatively easily at reasonable cost.

1/ A Review of Agricultural Policies in Brazil (Grey Cover), September 11, 1981, Report No. 3305-BR. This report was later issued in Red Cover. The field work for this report was carried out in 1979.

5. To further contribute to ease in updating, the analyses have been made as replicable and transparent as possible. These criteria have weighed very heavily in the choice of analytical methods. Also, the reliability of the data, when this warrants mention, and the data and analytical gaps that need further work are discussed to facilitate the work of future analysts.

6. In developing a sectoral overview or framework, that could be used to assess how particular events and policy interventions are likely to affect the long-term performance of the agricultural sector, it was necessary to focus on a number of basic structural relationships, both between agriculture and the rest of the economy and within the sector. Some of the most important of these relationships include: agriculture's share in total output, employment and external trade; the domestic terms of trade between agriculture and industry; factor use and substitutability; land holdings and farm size; technology transfer; and human resource development. These areas, particularly the relationships between agriculture and the national economy, have received scant attention in previous sector work.

7. In order to understand how the above relationships and factors are likely to evolve in the foreseeable future under a variety of different plausible scenarios, it was necessary to analyze these relationships in the past. For the analysis of the long-term structural relationships between agriculture and the rest of the economy, a fairly long time span -- from 1950 to the present (a period of almost 40 years) was chosen. However, detailed quantitative analysis, particularly of policies, has been limited to the last two decades from 1970 through 1987/88, with emphasis on the 1980s -- the period not covered by the earlier sector report.

8. The report is divided into two volumes. Volume One, the main report, includes an executive summary and five chapters. Supplementary and technical material are provided in annexes in Volume Two.

9. The contributors to the report include: Martin Staab (Bank Staff and principal author), Nelson Aguilera (Consultant), Barry Ames (Consultant), Pamela Cox (Bank Staff), Howard Gautheir (Consultant), Douglas Graham (Consultant), Simon Hocombe (FAO), Donald Holsinger (Bank Staff), Ralph Lattimore (Consultant), Mauro Lopes (Consultant), Dennis Mahar (Bank Staff), Raymond Noronha (Bank Staff), Rene Ruivivar (Bank Staff) and G. Edward Schuh (Consultant). Monica Huppi and Joseph Newman provided research and statistical support. In addition, working papers were prepared by: Luiz Augusto de Queiroz de Ablas, Basilia Maria Baptista Aguirre, Alivinio de Almeida, Paulo F. C. de Araujo, Carlos Jose Caetano Baca, Joao Barbosa (Recife World Bank Office), Geraldo S. de C. Barros, Ana Maria Castelo, Guilherme Dias, Jose Juliano de Carvalho Filho, Richard Lacroix, Gervasio Castro de Rezende (IPEA), Ricardo Shirota, Caro T. Yamaguishi and Claudio Alfonso Vierra. UNDP helped finance many of the consultants. Also, there are numerous persons, both in and outside government, who voluntarily assisted the team and without whose help it would not have been possible to produce this report. We feel particularly obliged to mention the kind assistance and help received from IBGE, FGV, IPEA, including its library staff in Rio and Brasilia, and EMBRAPA.

EXECUTIVE SUMMARY

A. Purpose

1. This agricultural sector report:

(i) serves as a basic reference document for the sector;

(ii) establishes a common frame of reference around which to organize and focus a sectoral dialogue between the Bank and the Government;

(iii) provides a comprehensive overview of the sector to guide both the Government and the Bank in formulating a viable sector development assistance strategy, particularly over the medium term; and

(iv) identifies gaps in sectoral knowledge needed to formulate a relevant sector work program.

B. Sector Reference Document

2. The report furnishes a much needed database for the sector, which is fairly complete with the exception of a few areas identified in the report. Some of the data are not available in any other source. Furthermore, this database is totally computerized, making retrieval of information and adjustments relatively easy to accomplish.

3. In addition, a uniform national system for classifying the country's agricultural resources has been established for this review. Although these resources, with the exception of the areas in the North, have been inventoried at different times and in varying degrees of detail (including using satellite imagery), a national classification system has never existed before.

C. The Framework

4. The report also establishes a framework within which to analyze sectoral performance and assess its likely evolution in the near future. This framework, also expressed in model form, consists of the long-term relationships between agriculture and the rest of the economy and those relationships that are internal to the agricultural sector.

5. With regard to the first set of relationships, the study shows that Brazil, over the last 40 years, has experienced major structural change that has literally transformed the nature of the Brazilian economy; agriculture's share in output, employment and trade have declined sharply, while industry's shares have correspondingly increased. Across the country's five greater regions (North, Northeast, Southeast, South and Center-West), the same general patterns are observed, although the rate of structural change has varied considerably. These changes, until the 1980s, took place in a context of rapid and sustained overall economic and

sectoral growth that few countries have been able to duplicate. At the same time, only a small proportion of the total population actually benefited from this growth and structural change. For the vast majority, welfare did not improve significantly.

6. The report also shows that within the agricultural sector, output grew, exports became more diversified, the land frontier expanded, the concentration of land holdings increased, capital was increasingly substituted for labor and the proportion of wage and temporary labor increased as tenancy, family and self-employment declined. Among the regions, the skewness in the distribution of farm income increased, particularly between the Northeast and the rest of the country.

7. In analyzing this record, the report identifies four principal causal factors: (i) domestic resources, including population growth and frontier development; (ii) technology and human capital; (iii) international trade; and (iv) government policies which have affected all of the above.

1. Domestic Resources

8. Brazil's large and expanding population played a major role in the growth and transformation process that took place. Equally important from an economic point of view were the changes that occurred in the spatial or geographic distribution of the population. It is estimated that since the end of World War II, about 35 million people (roughly equivalent to the current population of Argentina) migrated from rural to urban areas. This massive migration was induced to a large degree by policies which protected industry and discriminated against the rural/agricultural sector. By 1970 Brazil had already shifted from being a largely rural society to an urban one.

9. These demographic changes had a profound impact on the economy. First, the large and rapidly expanding urban population created a large market for the domestic consumer goods manufacturing sector. This allowed some domestic industries to achieve significant economies of scale which made Brazil's import-substitution, industrialization strategy less costly than it otherwise would have been. Second, as the rate of growth of the population began to decline (from 3% in the late 1950s to 2.5% in the 1980s), along with the absolute decline in the rural population, labor became considerably more scarce in the rural areas (with the exception of the Northeast), bidding up rural wages and further encouraging less labor-absorbing, more capital-intensive and more land-extensive production techniques.

10. The other domestic resource that played a major role in the growth and transformation process during this period was the ample supply of land made possible through the expansion of the land frontier. This evolutionary process, first moving through Paraná and western Sao Paulo in the early 1950s, to the Center-West in the late 1950s and 1960s, and finally into the Amazon basin in the early 1970s, conditioned and shaped many dimensions of Brazilian society. Until recently, almost all of the growth in agricultural output could be attributed to area expansion as opposed to yield increases. Much of the land expansion that has occurred was encouraged by generous fiscal subsidies.

11. Recent evidence, however, indicates that the supply of unclaimed agricultural land with economic potential is rapidly diminishing. This fact, combined with the Government's recent initiatives to withdraw part of the various fiscal incentives that have, to an important extent, fueled this expansion, suggest that the growth of the land frontier may be coming to a close. Agricultural growth in the future is expected to come increasingly from more land-intensive production methods.

2. Technology and Human Capital

12. With regard to technology, recent investments in agricultural research have already begun to pay off handsomely, initially by enabling soybeans to be grown on acidic soils in the cerrado (savanna) areas of the Center-West and, more recently in the 1980s, by introducing new, higher yielding seed varieties for a number of important food and traditional export crops.

13. However, other forms of investment in human capital which are of particular importance to the agricultural sector and its long-term growth, notably rural primary education, have been seriously neglected. Of the total rural population, 94% have had not more than four years of formal education and more than half have not had any schooling at all. Under these conditions, it is unrealistic to expect any policy intervention, aimed at permanently raising living standards in rural areas, to be effective without at the same time raising educational attainment levels. These low levels appear to be one of the major factors in explaining the persistence of inter-sectoral and regional income disparities over the last forty years despite remarkably high overall and sectoral rates of growth.

3. International Trade

14. Throughout the postwar period, international trade -- or more specifically, exports -- played a major role in the growth process in the agricultural sector. A series of commodity price booms, initially in coffee and later in soybeans, helped stimulate agricultural production. In fact, most of the growth that did occur in the agricultural sector was related to this export performance. In contrast, in the industrial sector during the early part of the postwar period, exports played a relatively minor role, with the bulk of production geared to the domestic market.

15. However, beginning in the 1970s, industrial exports, including processed agricultural products, increased in relative importance while agriculture's share declined. The increase in the relative importance of processed agricultural products was induced to a large extent by trade policies that, from time to time, imposed trade bans and quotas on the export of raw materials, forcing producers to sell their products to the local processing industries at prices often below those in the world market. This implicit taxation, in effect, transferred income from farmers to agricultural processors.

16. As industrial and processed agricultural exports increased in relative importance, so did the proportion of total exports in the national product, rising from 7.9% of GDP in 1970 to 11.3% in 1987. Thus, increasingly Brazil's economy and its sectoral composition have come to be influenced by the dynamics of international trade.

4. Policy

17. As already alluded to, Government policies have had a major impact on the growth and transformation process in the Brazilian economy. Probably the most important policy action was the decision in the postwar era to embark on a comprehensive import-substitution, industrialization strategy, aimed at implanting a consumer durable goods industry in the country as soon as possible. This strategy has been pursued quite vigorously over most of the period through a variety of policy measures, including a persistently overvalued currency, highly restrictive protectionist trade policies on almost all finished manufactured goods, and, from time to time, outright bans and quotas on agricultural exports.

18. The results from the analysis of nominal rates of protection of agricultural products from 1970 to 1988 indicate: (i) heavy implicit taxation of agricultural export/industrial crops (such as cotton and soybeans) across all regions over the entire period; (ii) medium rates of implicit taxation of food crops (such as maize and rice) throughout the regions in the early 1970s, tapering off to low levels of implicit taxation thereafter; and (iii) significant levels of protection of wheat over the period. There is also some significant regional variation; for example, cotton has been more heavily implicitly taxed in the Northeast than in the Southeast.

19. With respect to the nominal rate of protection of agricultural inputs, the results indicate that, with the exception of tractors, the domestic producers of agricultural inputs have been heavily protected, which is an indirect implicit tax on agriculture. In general, the rates of protection have been higher in the North, Northeast and Center-West regions, owing largely to their distance from the centers of industrial (input) production in the South and Southeast. The net effect has been a larger than necessary (as given by international trade possibilities) transfer of income from the poorer to the more industrial regions of the country.

20. The results from the calculation of effective rates of protection, indicate that all crops (with the exception of wheat which has been protected) have been significantly implicitly taxed in all regions over the entire period. While there has been some diminution of implicit taxation of food crops over the period, there has been little, if any, variation in the implicit taxation of export crops.

21. For most of the crops studied, the indirect, economy-wide interventions (non-agricultural trade restrictions, exchange rate policy, etc.) have been relatively more, or as important as the direct, sector-specific interventions (price policies, agricultural trade controls, agriculture-specific taxes, etc.). In the case of most of the food crops and sugarcane in the Northeast, the indirect interventions tend to be relatively more important. This is also the case for the export crop -- soybeans, due in large part to this crop's reliance on inputs which are heavily protected. For wheat and cotton (the other export crop analyzed), the direct interventions tend to be more important, owing mainly, in the case of wheat, to administered producer prices, and, in the case of cotton, to the frequent direct restrictions imposed on exports of this raw material

in order to ensure domestic supplies to the local industry. For irrigated rice in the South and sugarcane in the South/Southeast both types of intervention are about equally important.

22. Presumably to compensate agricultural producers for the above-mentioned policies which discriminated against agriculture and to promote domestic agricultural input supply industries, subsidized rural credit was introduced. In addition, fiscal subsidies (tax credits, shelters, etc.) were given to encourage producers to open up new tracts of land in the country's expanding land frontier. The report shows that these policies introduced further distortions in factor and credit markets and only served to widen individual and regional income differentials.

23. The principal recipients of these subsidies have been the large and wealthy producers. These subsidies have encouraged highly capital-intensive, land-extensive undertakings. This has accelerated the land concentration process, leading to larger average sized farm units, biased production methods in favor of labor-displacing mechanization, promoted the more capital-intensive export/industrial crops over food crops and contributed to significant rural-to-urban migration.

24. The net effect of the above mix of subsidies and implicit taxation is crop and producer specific. Small- to medium-sized producers, particularly of export crops, (which are the most heavily implicitly taxed) who have limited access to credit subsidies, but experience the full impact of implicit taxation, bear the highest net negative impact. Larger producers who have had substantial access to highly subsidized credit, clearly offset their implicit taxation to a degree. There are various gradations in-between as well as for those producers of both domestic food crops and export crops. The joint sequential production of winter wheat (which is protected) and summer soybeans (which is implicitly taxed) can, to some extent, leverage the net benefits. The clearest conclusion that can be drawn from this complex mosaic of direct subsidies and implicit taxes is that direct subsidies, on the scale practiced in the past from the mid-1970s through the early 1980s were inefficient and inequitable in the extreme as a means to offset other distortions (trade and exchange rate controls) that discriminated against agriculture.

D. Policy Recommendations

25. To address the issues raised by the foregoing analysis, the report makes a number of policy recommendations. These are summarized below and grouped under the following main headings: (i) credit and fiscal subsidies; (ii) domestic pricing and marketing policies; (iii) trade policies; (iv) land policies; and (v) government expenditure policies.

1. Credit and Fiscal Subsidies

26. The report recommends that present Government efforts to reduce the supply of subsidized rural credit should be accelerated, and, as soon as possible, eliminated. This should be accompanied by the abolition of compulsory applications of sight and rural savings deposits. In addition, savings deposit rates should be freed to allow banks the scope to mobilize savings. Furthermore, banking and regulatory reforms are needed, principally to remove market entry restrictions.

27. The report also recommends that the income tax code should be modified to eliminate those provisions which effectively ensure that almost all agricultural income escapes taxation and which encourage the uneconomic holding of agricultural land as a tax shelter as well as investments in uneconomic rural enterprises.

2. Domestic Pricing and Marketing Policies

28. The Government's commodity stock purchase program (AGF) has been largely ineffective, and, if anything, has contributed to market instability and uncertainty. Consequently, the report recommends that it should be discontinued. Concomitant with this action, CFP (the implementing agency) would cease to sell stocks on the open market as it would no longer have stocks to sell. At the same time, the Government's stock financing program (EGF) should be progressively phased out and commercial financing encouraged. The report also recommends that the federal and state governments should begin to divest themselves of public storage companies and instead focus on improving licensing and inspection practices and procedures.

29. The wheat subsidy program imposes a heavy fiscal burden on the Government, leads to a misallocation of resources and has a highly regressive distributional impact due to the fact that the primary beneficiaries (producers, processors and consumers of wheat) are in the higher income brackets. The report recommends that the program should be discontinued and that the Government implementing agency (CITRIN) should be dissolved. To address the problem of improving the diet of poor people, better targeted food support programs would be a much more effective and less costly alternative.

30. Sugar marketing controls result in major inefficiencies and opportunities for cheating and tax avoidance. They have also led to a growing black market for sugar and alcohol. As a first step towards the full liberalization of marketing, the report recommends that the Sugar and Alcohol Institute (IAA), which controls prices and intervenes directly in marketing by buying all mill and distillery products in the Northeast and by serving as the country's monopoly exporter of sugar, should be dissolved.

3. Trade Policies

31. Agricultural and non-agricultural trade policies have considerably adversely affected agricultural performance through the distortionary impact these policies have had on agricultural product and input prices. Brazil needs to free all agricultural export trade from the vagaries of intermittent quantitative controls. As already noted above, the report recommends the removal of the Government's monopoly control of wheat imports and sugar exports, freeing up trade in these commodities.

32. With respect to non-agricultural trade restrictions, the report finds that there is little, if any, justification for continuing the high tariffs on such industrial products as agricultural chemicals, fertilizer and farm machinery. Such tariffs should either be removed or substantially lowered.

33. The report also recommends that the ICM tax should be changed to eliminate the present discrimination against primary agricultural exports which are taxed while industrial exports are exempt. In general the ICM tax needs to be reformed to make it as neutral as possible with respect to its impact on resource allocation.

4. Land Policies

34. The report finds that the highly skewed distribution of landholdings in Brazil is maintained and fostered by the ineffective administration of the country's land tenure laws and the uncertainty this generates, which tends to work against the relatively less educated small landholder. Compounding this problem are the various fiscal and credit subsidies that have encouraged the relatively wealthy to acquire agricultural land. Consequently, there are a number of actions which should be taken to promote a more equitable distribution of land holdings, and, at the same time, a more efficient use of the nation's land resources. First, the fiscal and credit subsidies that have contributed to the land concentration process should be discontinued. Second, continued efforts are needed to establish title security for land holding. To accomplish this, the report recommends that priority areas in the country should be delineated, within which all existing titles would be verified and revalidated. This would do much to improve the administration of existing land tenure laws. In addition, the report recommends that the land tax (ITR) should be reformed to take into account not just the use of land, but the type of use and, perhaps, most important, that the tax needs to be strictly enforced in all parts of the country.

5. Government Expenditure Policies

35. Government expenditures in agriculture over the last decade reveal that highest priority has been assigned to providing rural credit and other subsidy programs, followed by support to the Ministry of Agriculture (including its various specialized agencies) and to the Ministry of Industry and Commerce, which includes the coffee and sugar institutes. The report recommends that these priorities should change, reflecting a changed role for Government. The Government needs to eliminate the various untargeted subsidy programs, withdraw from directly participating in operations that compete with or replace the private sector and, instead, focus efforts on those regulatory functions and truly "public good" support services and infrastructure that facilitate the efficient operation of the private sector.

36. In particular, the emphasis should shift to areas such as research and extension (in those areas where there is clearly no private sector alternative), inspection, grading, licensing, market information, job training, basic education, resource conservation activities, regulations, monitoring and enforcement and public infrastructure, such as conservation works, off-farm irrigation facilities, telecommunications, power, and road transport. The report makes specific recommendations for some of the most important of these expenditures in terms of their impact on agriculture. Particular emphasis is given to investment in human capital through basic education, job training and improved nutrition and in physical infrastructure -- especially roads. Even under an austere budget program

these expenditures, or at least a large part of them, could very likely be made if other uneconomic expenditures were eliminated.

D. The Institutional Framework for Policy Making

37. Although there are many highly qualified economists in the Government, there is at present no group dedicated exclusively to assessing the merits of the different policies and actions which affect agriculture and to advising the Government accordingly. Had such a group existed, perhaps the present policy bias favoring import substitution and discriminating against agriculture would not have persisted for as long as it has. The report recommends setting up an Economic or Policy Staff Group within the Ministry of Agriculture, attached to the Minister. This group, which could consist of about ten to twelve economists (agricultural and general), would do the staff work needed to examine policy alternatives, follow developments in the domestic and international economy and assess the functioning of existing policies. To do this work, the group will need to maintain a consistent and reliable data base for the agricultural sector.

E. The Future Evolution of the Sector

38. This sector review also takes a forward look at the agricultural sector. To assist with this work, a simulation model is used to test the impact of various policy changes on the structure and performance of the sector over the coming decade.

39. At the national level, agriculture's shares in GDP and the labor force are expected to remain fairly stable over the next decade in contrast to the dramatic changes of the postwar period. The various policy changes that were tested tend to affect these parameters only marginally. This relative stability is not surprising in view of the fact that, in the case of some of these parameters (agriculture's share in GDP), Brazil has already reached levels close to that of an industrialized, developed country. In the trade sector, agricultural trade liberalization has the effect of essentially maintaining agriculture's share in total exports and offsetting the steep downward trend that is projected for this parameter on the basis of current trade policy.

40. The total cultivated land area is projected to increase by only about 1.3% per annum over the next decade, and most of this increase is expected to come from bringing existing farmland into cultivation, as opposed to the expansion of the land frontier. In addition, the trend indicates continued substitution of capital for labor. However, with the further reduction of credit and fiscal subsidies -- one of the policy changes that was tested --labor's share in the total costs of production (i.e. the wage bill) is maintained and land's share declines. Thus, under this scenario, the substitution which occurs is largely that of capital for land, rather than capital for labor, resulting in a more equitable distribution of total agricultural income.

41. Across the regions, some significant changes are projected, particularly in the agricultural labor force. In the Northeast, a large absolute decrease in the agricultural labor force is projected. The Northeast's share in the total agricultural labor force is also projected

to decrease significantly, while this share is projected to increase in the Center-West and Southeast regions and remain fairly constant in the South. Comprehensive trade and exchange rate liberalization, with its overall growth-enhancing effects, tends to reduce the agricultural labor force in all regions.

42. The projected large absolute decline in the agricultural labor force in the Northeast, which would be further reduced by the liberalization measures, is a significant and encouraging result in view of the present large pool of low productivity agricultural labor in this region. It also highlights the importance of general reform measures in the process of combating poverty, through the impact such measures have on facilitating the transfer of labor out of low productivity agricultural employment to higher productivity jobs in the rest of the economy. Nevertheless, a large and disproportionate share (in relation to output) of the agricultural labor force is projected to remain in the Northeast, suggesting the need for additional direct measures to deal with this problem.

43. Further significant changes at the regional level are projected in the stock of cultivated land area. In the Northeast and Southeast, significant increases are projected, but this is expected to come mainly from bringing existing farmland into cultivation rather than from expansion of the frontier, as new unclaimed land in these regions, for the most part, does not exist. In the North, cultivated land area is also projected to increase. This is the only region where the additional land is expected to come from expansion of the frontier. In the Center-West, where most of the land expansion of the last several decades has taken place, the projected annual rate of growth of cultivated land is relatively small (0.9%).

44. The projections also clearly reveal the important positive impact of various liberalization measures on the overall performance of the economy as well as that of the agricultural sector. Agricultural exports and imports are highly sensitive to changes in export and import prices that result from trade liberalization. The gains from trade liberalization for Brazil would be even greater if its trading partners were to increase access to their domestic markets. Furthermore, the trade-off between the expansion of agricultural export and domestic agricultural production is visible. The strong growth-enhancing effect of reducing the cost of imported agricultural inputs, through the removal of trade barriers, is also evident, particularly in the production of food crops.

F. Future Sector Work Priorities

45. In this overall review of the agricultural sector, some important gaps in knowledge needed to guide both the Government and the Bank in the formulation and implementation of a sectoral development and assistance strategy have been identified. These gaps are mainly in the areas of livestock, natural resource management, regional income accounts, intersectoral investment analysis and the labor absorptive capacity of the non-agricultural sector. These are areas where work needs to be initiated. Also, further analysis is needed on various subjects, where work has already been started. These include: (i) work on public expenditures in agriculture, particularly to take into account the budget process; (ii) analysis of sector institutions, including those at the state, regional and

local levels; and (iii) analysis of crop budgets by agronomic zone to identify areas where agricultural potential does and does not exist, particularly in the Northeast, in order to guide public investment decisions.

G. Challenges in the 1990s

46. Brazil will face a number of important challenges over the coming decade.

47. First, there is the need to ensure that the gains obtained from partial liberalization (the reduction of fiscal and credit subsidies and some agricultural trade reform) in the 1980s are not lost. The trend scenario for the future has built into it these more recent liberalization initiatives, induced to some degree by fiscal pressures. Just maintaining this more liberalized growth path in the future will require the vigilance of policy makers.

48. However, much more can and should be accomplished. The simulation analysis demonstrates that by adopting further liberalization measures this would result in an improvement in the performance of the economy overall and the agricultural sector in particular, relative to what is likely to happen if present trends continue. It would also lead to a substantially more equitable and, therefore, more socially acceptable course for the future. The fact that these distributional improvements can be achieved by pursuing a more economically efficient growth strategy is something that has not been given the attention it should in Brazil. It suggests that programs for poverty alleviation in rural areas need to be complemented by a national policy framework that does not discriminate against agriculture. To achieve this growth path, policy makers would need to resist the pressures of various interest groups that have benefited from the distortionary policies of the past. With liberalization and a greater dependence on free markets, the focus of public policy will need to shift towards establishing the conditions for competitive markets.

49. Another challenge which the Brazilian economy and the agricultural sector in particular will face during the coming decade is the general closing of the agricultural frontier, in the sense that agricultural production growth is expected to come mainly from productivity increases and more intensive use of existing farmland rather than from area expansion as has been the case for most of the postwar period. Ending the subsidized approach to agricultural growth through frontier expansion is expected to lead to the attainment of an agricultural growth path that is more economically efficient, regionally balanced, socially stable, and environmentally less damaging, particularly in the more ecologically fragile areas of the country. At the same time, this will put greater pressure on existing cultivated and unutilized farm land.

50. In this future setting of more land-intensive agricultural development, investments in areas such as agricultural research and extension, land resource management and irrigation are likely to take on greater importance. The Government's role in this regard should be that of facilitating an expansion of private sector activities through the provision of complementary support services and infrastructure.

51. Notwithstanding the above, settlement of the Amazon region is expected to continue, albeit at a slower pace than before. Strong demographic and social forces will continue to drive this process in the 1990s with or without fiscal or other incentives. This will present a major challenge to the federal and local governments concerned. It is imperative that the settlers face the real costs with uneconomic subsidies removed, and that the appropriate land use and environmental regulations are clearly established, monitored and enforced.

52. As already alluded to, the large size of the agricultural labor force in the Northeast will continue to pose a serious challenge to policy makers in 1990s. While there is still considerable room to increase the productivity of the agricultural labor force in the region, the sheer size of this labor force in relation to output indicates that a major focus of policy will need to be on facilitating the transfer of surplus labor to other sectors. Increased government efforts at all levels will need to be directed at removing the distortions and barriers that restrict occupational and geographic mobility of the labor force. One major barrier is the high rate of illiteracy among the rural population. Hence, formal education, at least in the long term, can play a major role not only in raising agricultural productivity, but in also facilitating the transfer of labor out of agriculture. In addition, measures which improve the dissemination of employment information and relieve the burden of transport can have an immediate effect. Another way in which such transfers can be facilitated is through informal job training for the general skills and discipline required of the industrial/commercial labor force. Needless to say, this is a difficult task and an area where a long-term concerted commitment is needed.

53. With regard to the poorer areas of the country, like the Northeast, the development strategy implied by the analysis carried out is one which emphasizes (i) the removal of policy distortions that discriminate against agriculture generally; (ii) much greater investment in rural education; (iii) the use of direct interventions in agriculture (research, extension, infrastructure) in selected areas of clearly established significant economic potential; and (iii) public investment in job training to facilitate the transfer of labor from low productivity agriculture to higher productivity employment.

54. Recent political developments are also likely to play a major role in affecting the evolution of the sector in the coming decade. The transition to a democratic government and the decentralization of power from the federal to the state and local governments as envisaged in the new constitution suggest that the political environment in which economic policies will be made is likely to be quite different in the 1990s from what it has been in the past. In particular, the federal executive branch can be expected to be considerably less powerful, while the power of Congress and the local government's increases. With this decentralization of power, it is possible that rural Brazil or agriculture's interests will become more heavily represented. However, since large farmers are likely to dominate whatever coalitions are formed, there is the risk that Government policy could move in the opposite direction of protecting and subsidizing agriculture as it has in many developed countries. This would be unfortunate.

55. Finally, unless there is success on the stabilization front to reduce the fiscal deficit and control inflation, the tendency will be to resort to ad hoc trade controls and an overvalued exchange rate, which maintain the distortions penalizing agriculture. In this sense, successful relaxation of the policies that have discriminated against agriculture depends on a credible stabilization effort for the economy as a whole.

SUMÁRIO EXECUTIVO

A. Objetivo

1. O presente relatório sobre o setor da agricultura:

(i) serve de documento básico de referência para o setor;
(ii) estabelece um quadro de referência comum para organizar e definir um diálogo setorial entre o Banco e o Governo;
(iii) oferece uma visão setorial ampla e geral, como orientação para que o Governo e o Banco formulem uma estratégia viável de assistência para o desenvolvimento do setor, principalmente a médio prazo; e
(iv) identifica lacunas no conhecimento setorial que é necessário para formular um programa de trabalho relevante para o setor.

B. Documento de referência setorial

2. O relatório proporciona uma base de dados de que o setor muito necessita. Como resultado dessa compilação, a base de dados para o setor revela-se agora bastante completa, exceto por certas áreas identificadas neste relatório. Alguns dos dados não são encontrados em nenhuma outra fonte. Ademais, esta base de dados está totalmente informatizada, o que torna relativamente fácil o acesso e a sua modificação.

3. Além disso, foi estabelecido, para esta revisão, um sistema nacional uniforme de classificação dos recursos agrícolas do país. Embora tais recursos, exceto pelas áreas do Norte, tenham sido inventariados em diferentes momentos e com diferentes graus de detalhe (incluindo o uso de imagens por satélite), o fato é que antes não existia qualquer sistema nacional de classificação.

C. Quadro de referência

4. O relatório também estabelece um quadro de referência para a análise do desempenho setorial e aferir a sua provável evolução em futuro próximo. Este quadro, também expresso na forma de modelo, consite do relacionamento a longo prazo da agricultura com a economia como um todo, e dos relacionamentos internos no setor da agricultura.

5. No tocante à primeira série de relacionamentos, o estudo mostra que, nos últimos 40 anos, o Brasil passou por uma importante modificação estrutural que literalmente transformou a natureza da economia brasileira; a participação da agricultura na produção, no emprego e no comércio caiu acentuadamente, ao passo que a participação da indústria aumentou com idêntica intensidade. Nas cinco grandes regiões em que se divide o país (Norte, Nordeste, Sudeste, Sul e Centro-Oeste) observam-se os mesmos padrões gerais, embora o ritmo da mudança estrutural haja variado consideravelemnte. Até os anos 80, essas mudanças ocorreram num contexto de crescimento econômico e setorial que poucos países conseguiram igualar. Ao mesmo tempo, somente uma pequena percentagem da população total realmente se beneficiou desse crescimento e dessa mudança estrutural. Para a grande maioria, as condições de vida não melhoraram significativamente.

6. Este relatório também mostra que, no setor agrícola, a produção cresceu, as exportações se diversificaram, a fronteira agrícola se expandiu, a propriedade concentrou-se, o capital substituiu cada vez mais a mão-de-obra e a proporção do trabalho temporário e assalariado aumentou, à medida que diminuíam a parceria e o arrendamento de terra e o emprego familiar. Entre as regiões, a assimetria da distribuição da renda agrícola acentuou-se, principalmente entre o Nordeste e o resto do país.

7. Ao analisar este desempenho, o relatório identifica quatro fatores causais principais: (i) os recursos internos, incluindo o crescimento poopulacional e a expansão das fronteiras; (ii) a tecnologia e o capital humano; (iii) o comércio internacional; e (iv) as políticas oficiais, que afetaram todos os fatores acima mencionados.

2. Recursos internos

8. A grande e crescente população do Brasil desempenhou importante papel no processo de crescimento e transformação que ocorreu. Igualmente importantes, do ponto de vista econômico, foram as alterações ocorridas na distribuição espacial ou geográfica da população. Calcula-se que, desde o fim da II Guerra Mundial, cerca de 35 milhões de pessoas (o equivalente aproximado da população atual da Argentina) migraram das áreas rurais para as urbanas. Essa maciça migração rural-urbana foi induzida em grande parte por políticas que favoreciam a indústria em detrimento ao setor rural e agrícola. Em 1970, a sociedade brasileira já passara de predominantemente rural para urbana.

9. Essas alterações demográficas exerceram profundo efeito sobre a economia. Primeiro, a grande e crescente população urbana criou um amplo mercado para o setor da manufatura nacional de bens de consumo. Isso habilitou certas indústrias nacionais a obter significativas economias de escala, o que tornou a estratégia brasileira de substituição de importações e industrialização menos dispendiosa do que teria sido em outras condições. Segundo, essas alterações demográficas afetaram a economia por meio do mercado de trabalho. Na medida em que o índice de crescimento populacional começou a declinar (de 3% no fim da década de 50 para 2,5% nos anos 80), e paralelamente com o declínio absoluto da população rural, a mão-de-obra nas áreas rurais tornou-se consideravelmente mais escassa (exceto nc Nordeste), encarecendo os salários rurais e fomentando adicionalmente as técnicas de produção com menor absorção de mão-de-obra, o uso mais intensivo de capital e aproveitamento mais extensivo da terra.

10. Outro recurso interno que desempenhou importante papel no processo de crescimento e transformação durante esse período foi o da ampla oferta de terras, possibilitada pela expansão da fronteira agrícola. Este processo evolucionário, iniciado através do Paraná e do oeste de São Paulo no começo dos anos 50, deslocando-se a seguir para o Centro-Oeste nos anos 60, e finalmente entrando na região amazônica no começo dos anos 70, condicionou e moldou muitas dimensões da sociedade brasileira. Até recentemente, pode-se atribuir quase todo o crescimento da produção agrícola à expansão de área, em contraposição a incrementos de produtividade. Grande parte dessa expansão foi incentivada por generosos subsídios fiscais.

11. Recentes evidências, porém, indicam que a oferta de terras agrícolas devolutas com potencial econômico diminui rapidamente. Combinado com recentes medidas do Governo no sentido de suspender em parte os incentivos fiscais, que muito contribuíram para tal expansão, este fato sugere que o crescimento da fronteira terrestre talvez esteja prestes a terminar. Para o futuro, espera-se que o crescimento da agricultura se origine cada vez mais da aplicação de métodos de produção mediante o uso intensivo da terra.

2. Tecnologia e capital humano

12. No que se refere a tecnologia, recentes investimentos em pesquisa agrícola já começaram a produzir consideráveis resultandos, incialmente ao possibilitarem o plantio de soja nos solos acídos dos cerrados do Centro-Oeste e, mais recentemente, nos anos 80, ao introduzirem variedades de sementes de melhor rendimento para diversas e importantes culturas de alimentos e de exportação tradicional.

13. Contudo, outras formas de investimento em capital humano particularmente importantes para o setor agrícola e o seu desenvolvimento a longo prazo, notadamente o ensino primário rural, têm sido seriamente negligenciadas. Da população rural total, 94% só têm, no máximo, quatro anos de educação formal, e mais de 50% sequer chegaram a frequentar uma escola. Nessas condições, é difícil de imaginar qualquer intervenção política de melhoria permanente do padrão de vida em áreas rurais, sem que primeiro sejam incrementados os níveis de formação educacional. As disparidades regionais e inter-setoriais de renda que têm persistido nos últimos 40 anos em face de taxas notavelmente altas de crescimento global e setorial podem ser atribuídas em grande parte a este viés na distribuição do avanço educacional.

3. Comércio internacional

14. Durante o período de pós-guerra, o comércio internacional ou, mais especificamente, as exportações desempenharam importante papel no processo de crescimento do setor agrícola. Sucessivos booms nos preços de produtos primários - inicialmente o café, e depois a soja - ajudaram a estimular a produção agrícola. De fato, a maior parte do crescimento ocorrido no setor agrícola relacionou-se com este desempenho das exportações. Em contraste, as exportações do setor industrial durante a primeira parte do período de pós-guerra desempenharam papel relativamente secundário, com o grosso da produção destinado ao mercado interno.

15. A partir da década de 70, entretanto, melhorou a importância relativa das exportações industriais, nestas incluídas os produtos agrícolas processados, ao passo que a participação da agricultura nas exportações diminuiu. O aumento da importância relativa dos produtos agrícolas processados foi induzido em grande parte pelas políticas de comércio, que impunham, de tempos em tempos, proibições e quotas de exportação de matérias-primas, forçando os produtores a vender às indústrias locais de processamento, a preços muitas vezes inferiores aos do mercado mundial. O efeito dessa tributação implícita foi de transferir a renda dos agricultores para os processadores de produtos agrícolas.

16. À medida em que aumentava a importância das exportações industriais e de produtos agrícolas processados, também aumentava a proporção das exportações totais no produto nacional: de 7,9% do PIB em 1970 pra 11,3% em 1987. Assim, a economia brasileira e a sua composição setorial passaram a ser influenciadas cada vez mais pela dinâmica do comércio internacional.

4. Políticas Governamentais

17. Como já foi mencionado, as políticas do Governo exerceram importante efeito sobre o processo de crescimento e transformação da economia brasileira. A ação de política mais importante foi, provavelmente, a decisão tomada pelo Brasil no sentido de adotar, depois da guerra, uma estratégia abrangente de substituição de importações e industrialização que visava implantar no país, com a maior rapidez possível, uma indústria de bens de consumo duráveis. Essa estratégia tem sido vigorosamente mantida durante quase todo o período por meio de uma série de medidas, que incluem uma persistente supervalorização da moeda, políticas de comércio protecionistas e altamente restritivas em relação a quase todos os bens manufaturados acabados e, de tempos em tempos, a proibição total e a imposição de quotas no caso da exportação de produtos agrícolas.

18. Os resultados da análise das taxas nominais de proteção de produtos agrícolas de 1970 a 1988 indicam: (i) uma forte tributação implícita de culturas exportáveis/industrializáveis (tais como o algodão e a soja) em todas as regiões e durante todo o período; (ii) taxas médias de tributação implícita de produtos alimentares (tais como o milho e o arroz) em todas as regiões, no começo dos anos 70, reduzindo-se depois a níveis baixos de tributração implícita; (iii) significativos níveis de proteção do trigo durante o período. Também há certas variações regionais importantes. Por exemplo: no Nordeste a tributação implícita do algodão é maior do que no Sudeste.

19. Quanto à taxa nominal de proteção dos insumos agrícolas, indicam os resultados que, exceto pelos tratores, os produtores nacionais de insumos agrícolas têm sido fortemente protegidos, o que representa uma tributação implícita indireta da agricultura. Em geral, as taxas de proteção têm sido maiores no Norte, no Nordeste e no Centro-Oeste, devido principalmente à distância que separa essas regiões do centros de produção industrial (de insumos) no Sul e no Sudeste. O efeito líquido tem sido uma transferência de renda maior do que a necessária (medida pelas possibilidades de comércio internacional), das regiões mais pobres para as mais industrializadas do país.

20. Os resultados do cálculo das taxas efetivas de proteção indicam que todas as culturas (exceto a do trigo, que é protegida), em todas as regiões, foram objeto de significativa tributação implícita durante todo o período. Embora a tributação implícita das culturas alimentares tenha registrado certa diminuição durante o período, a variação da tributação implícita das culturas de exportação, quando existiu, foi muito pequena.

21. Para a maioria das culturas analisadas, as intervenções econômicas gerais indiretas (restrições ao comércio não-agrícola, política cambial, etc.) têm sido de importância maior ou igual quando comparados às

intervenções específicas diretas no setor (políticas de preços, controle do comércio de produtos agrícolas, impostos específicos sobre a agricultura, etc.). No caso da maioria das culturas de alimentos e da cana-de-açúcar no Nordeste, as intervenções indiretas tendem a ser relativamente mais importantes. O mesmo ocorre com um produto de exportação - a soja - devido em grande parte ao fato de o seu cultivo depender de insumos altamente protegidos. Quanto ao trigo e o algodão (os outros produtos de exportação analisados), as intervenções diretas tendem a ser mais importantes, devido principalmente, no caso do trigo, ao controle dos preços ao produtor e, no caso do algodão, às restrições diretas frequentemente impostas às exportações desta matéria-prima, a fim de garantir o fornecimento interno à indústria local. Para o arroz irrigado, no Sul, e a cana-de-açúcar, no sul/Sudeste, os dois tipos de intervenção são igualmente importantes.

22. Presumivelmente para compensar os produtores agrícolas pela aplicação de políticas que, como as mencionadas acima, discriminavam a agricultura, e para promover a indústria nacional fornecedora de insumos agrícolas, introduziu-se o crédito rural subsidiado. Além disso, estenderam-se subsídios fiscais (isenções e créditos tributários, etc.) para incentivar os produtores a abrir novas terras ao cultivo, dentro do processo de expansão das fronteiras agrícolas do país. O relatório mostra que tais políticas distorceram adicionalmente os mercados de fatores de produção, e só serviram para ampliar as disparidades individuais e regionais em matéria de renda.

23. Os beneficiários principais desses subsídios foram os produtores maiores e mais abastados. Os subsídios estimularam os empreendimentos com uso altamente intensivo de capital e extensivo da terra. Isso acelerou o processo de concentração de terras, culminando com a formação de unidades agrícolas de tamanho médio maior, fez com que os métodos de produção tendessem para a mecanização que prescinde de mão-de-obra, promovessem as culturas exportáveis/industrializáveis de uso mais intensivo de capital em detrimento das culturas alimentares, e contribuisse para uma significativa migração rural-urbana.

24. O efeito líquido dessa combinação de subsídios e impostos implícitos é específico por cultura e tipo de produtor. O pequeno e médio produtor, principalmente nas culturas de exportação (sobre as quais recai o maior peso da tributação implícita), com limitado acesso aos subsídios de crédito, mas sentindo todo o impacto da tributação implícita, sofre o maior efeito líquido negativo. O produtor maior, com substancial acesso a crédito altamente subsidiado, tem a sua tributação implícita claramente compensada. Há, de entremeio, diferentes gradações, também para os que se dedicam a culturas tanto de alimentos como de produtos de exportação. Até certo ponto, a produção sequencial conjunta de trigo do inverno (que é protegida) e de soja do verão (que é implicitamente tributada) pode nivelar os benefícios líquidos. A conclusão mais clara capaz de ser extraída deste complexo mosaico de subsídios diretos e impostos implícitos é de que os subsídios diretos, na escala praticada de meados dos anos 70 até o começo dos anos 80, foram extremamente ineficientes e iníquos como instrumento de compensação de outras distorções (preço, comércio e controles de câmbio) prejudiciais à agricultura.

D. Recomendações em matéria de políticas

25. A fim de dar tratamento às questões suscitadas pela mencionada análise, o relatório formula uma série de recomendações em matéria de políticas, resumidas a seguir e agrupadas sob os seguintes títulos principais: (i) subsídios fiscais e de crédito; (ii) políticas nacionais de preços e comercialização; (iii) políticas de comércio; (iv) políticas de uso da tera; e (v) políticas de despesa pública.

1. Subsídios fiscais e de crédito

26. O relatório recomenda que o Governo acelere os seus esforços no sentido de reduzir a oferta de crédito rural subsidiado, de modo a chegar, no quanto antes, à sua eliminação. Acompanharia esta medida a revogação das aplicações compulsórias de depósitos à vista e de poupança rural. Também cumpriria liberar as taxas de depósito de poupança para dotar os bancos do alcance apropriado para mobilizar poupanças. Além disso, é necessária uma reforma bancária e de regulamentos, principalmente para remover restrições ao ingresso no mercado.

27. O relatório também recomenda que a Legislaçãao sobre Impostos de Renda seja emendada a fim de eliminar as disposições que efetivamente garantem a imunidade fiscal de quase toda a renda agrícola e promovem a posse não-econômica de terras agrícolas como escuda contra o fisco, assim como o investimento em empresas rurais não-econômicas.

2. Políticas nacionais de preços e comercialização

28. O programa de aquisição de estoques de produtos agrícolas do Governo (AGF) não tem sido eficiente e, se é que serviu para algo, foi para gerar instabilidade e incertezas no mercado. O relatório recomenda, assim, a sua eliminação. Simultaneamente com esta medida, a CFP (que é a entidade executora) deixaria de vender no mercado aberto, já que não teria mais estoques a vender. Ao mesmo tempo, o programa de financiamento oficial de estoques (EGF) seria progressivamente eliminado, estimulando-se o seu financiamento comercial. O relatório também recomenda que os governos federal e estaduais comecem a desfazer-se das empresas públicas de armazenagem e, em substituição, concentrem os seus esforços na melhoria das práticas e dos procedimentos de inspeção e concessão de licenças.

29. O programa de subsídio do trigo impõe ao Governo um pesado ônus fiscal, resulta em má alocação de recursos e exerce impacto distributivo altamente regressivo pelo fato de os beneficiários principais (produtores, processadores e consumidores de trigo) se classificarem nas alíquotas mais altas de renda. O relatório recomenda a eliminação do programa e a disolução do órgão oficial (CITRIN) encarregado da sua implementação. Para tratar o problema de melhorar a qualidade do dieta, programas de suplementação alimentícia alvejando os mais necessitados seriam muito mais eficientes e menos dispendiosos.

30. Os controles da comercialização do açúcar resultam em importantes ineficiências e criam oportunidades para burlar e contornar o fisco. Além disso, deram margem a um crescente mercado negro do açúcar e do álcool. Como passo inicial à completa liberalização do mercado, o relatório recomenda a eliminação do Instituto do Açúcar e do Álcool (IAA), que

controla os preços e intervém diretamente no mercado comprando toda a produção de usinas e refinarias do Nordeste, e atuando como monopólio exportador nacional de açúcar.

3. Políticas de comércio

31. As políticas de comércio agrícola e não-agrícola têm exercido consideráveis efeitos adversos sobre o desempenho da agricultura, dado o seu impacto sobre os preços de produtos e insumos agrícolas. O Brasil necessita libertar todo o seu comércio externo das extravagâncias de controles quantitativos intermitentes nos produtos agrícolas. Como já se observou, o relatório recomenda a remoção do monopólio governamental de controle das importações de trigo e das exportações de açúcar, liberando o comércio destes produtos.

32. No tocante às restrições ao comércio não-agrícola, o relatório conclui que, quando muito, é mínima a justificativa para o prosseguimento da aplicação das elevadas tarifas que incidem sobre certos produtos industriais como os químicos, os fertilizantes e a maquinaria agrícola. Essas tarifas devem ser eliminadas ou substancialmente reduzidas.

33. O relatório também recomenda uma reforma do ICM a fim de eliminar a discriminação que pesa atualmente sobre as exportações de produtos agrícolas primários, que são tributadas, ao passo que as exportações industriais não o são. Em geral, cumpre reformar o ICM para neutralizar o máximo possível o seu impacto sobre a alocação de recursos.

4. Políticas de uso da terra

34. O relatório conclui que a distribuição altamente assimétrica das propriedades rurais no Brasil é mantida e fomentada por um sistema legal de posse da terra que, dadas a ineficácia que caracteriza a sua administração, bem como as incertezas assim geradas, tende a prejudicar o pequeno ocupante menos educado. Agravam o problema os diversos subsídios fiscais e de crédito, que levaram os relativamente mais abastados a adquirir terras agrícolas. Em consequência, o relatório recomenda a adoção de diversas medidas para promover uma distribuição mais equitativa das propriedades e, ao mesmo tempo, um uso mais eficiente dos recursos de terra do país. Em primeiro lugar, deveriam ser eliminados os subsídios fiscais e de crédito que contribuíram para o processo de concentração de terras. Em segundo lugar, cumpre envidar esforços contínuos para estabelecer um sistema seguro de titulação. Para tanto, o relatório recomenda a delimitação de áreas prioritárias no país, em cujo processo todas as escrituras seriam verificadas e revalidadas. Isto muito contribuiria para melhorar a administração das leis de posse hoje existentes. O relatório recomenda também a modificação do ITR, de modo a levar em conta não apenas o uso da terra como também o tipo de uso e, talvez ainda mais importante, a estrita aplicação deste imposto em todas as regiões do país.

5. Políticas de despesa pública

35. As despesas do Governo no setor da agricultura durante a última década revelam que a prioridade mais alta foi atribuída ao crédito rural e a outros programas de subsídio, seguindo-se o apoio ao Ministério da Agricultura (e seus diversos órgãos especializados) e ao Ministério da

Indústria e Comércio, neste incluídos o Instituto Brasileiro do Café e o Instituto do Açúcar e do Álcool. O relatório recomenda a modificação dessas prioridades, de modo a refletir os diferentes papéis que cabe ao Governo desempenhar. O Governo deve eliminar os diversos programas de subsídio sem destinatário específico, eximir-se de participar diretamente de operações que concorrem como setor privado ou o substituem e, em vez disso, concentrar os seus esforços nas funções reguladoras e na infra-estrutura e nos serviços realmente "bens públicos" que facilitam a eficiente operação do setor privado.

36. Em particular, cumpre fazer com que a ênfase passe a recair sobre áreas tais como: pesquisa e extensão (onde não existia uma clara alternativa privada), inspeção, classificação, concessão de licenças, informação de mercado, preparação para o trabalho, educação básica, conservação de recursos, regulamentação, fiscalização e aplicação de leis e obras de infra-estrutura pública, tais como de conservação, fontes de irrigação fora da fazenda, telecomunicações, energia e transporte rodoviário. O relatório formula recomendações especiais em relação a algumas das despesas mais importantes em termos de impacto sobre a agricultura. Ênfase especial é atribuída ao investimento em capital humano na forma de educação básica, treinamento para o trabalho e melhoria da nutrição, e à infra-estrutura física - principalmente as estradas. Mesmo sob um austero programa orçamentário, seria possível efetuar despesas como estas, ou pelo menos parte delas, no caso de serem eliminadas outras despesas supérfluas e economicamente ineficientes.

D. O quadro institucional da formulação de políticas

37. Não obstante a presença de economistas altamente qualificados no governo, no momento, não existe um grupo exclusivamente dedicado à formulação das pertinentes recomendações. Se tal grupo existisse, talvez o viés das políticas atuais, expresso por um favorecimento da substituição de importações e uma discriminação contra a agricultura, não estaria persistindo por tanto tempo. Para dotar o Governo dessa capacidade, o relatório recomenda a criação, no âmbito do Ministério da Agricultura, de um grupo técnico econômico ou de políticas, subordinado ao Ministro. Formado por dez ou doze economistas (agrícolas e gerais), o grupo executaria as tarefas técnicas necessárias para o exame de políticas alternativas, acompanharia a evolução da economia nacional e internacional e avaliaria a funcionalidade das políticas vigentes. Para a execução de tal trabalho, o grupo terá que criar e manter um banco de dados confiáveis sobre o setor agrícola.

E. A futura evolução do setor

38. Esta análise setorial também se projeta para o futuro do setor da agricultura. A projeção é apoiada em um modelo de simulação, para testar o impacto de diferentes modificações de políticas sobre a estrutura e o desempenho do setor durante a próxima década.

39. A nível nacional, a expectativa é de que a participação da agricultura no PIB e na força de trabalho permaneça estável na próxima década, em contraste com as acentuadas flutuações experimentadas no período pós-guerra. As diversas modificações de políticas que foram testadas tendem a afetar estes parâmetros apenas marginalmente. Esta relativa

estabilidade não chega a surpreender, dado o fato de que, no caso de alguns desses parâmetros (a participação da agricultura no PIB), o Brasil já atingiu níveis próximos aos de um país desenvolvido e industrializado. No setor do comércio, a liberalização do comércio agrícola exerce o efeito de manter, em essência, a participação do setor nas exportações totais e de compensar a acentuada tendência de decréscimo que se projeta para este parâmetro, com base nas atuais políticas de comércio.

40. Segundo as projeções, a área cultivada total aumentará apenas 1.3% ao ano durante a próxima década, e a maior parte deste aumento deverá ser gerada pelo aproveitamento de terras já utilizadas, em contraste com a expansão da fronteira agrícola. Além disso, a tendência indica uma contínua substituição de mão-de-obra por capital. Contudo, com uma redução adicional dos subsídios fiscais e de crédito - uma das modificações de políticas que foram testadas - a participação da mão-de-obra no custo total de produção (ou seja, a conta salarial) se mantém, e a participação da terra diminui. Neste cenário, portanto, a substituição que ocorre é, em grande parte, a de terra por capital, mais do que de mão-de-obra por capital, resultando numa distribuição mais equitativa da renda agrícola total.

41. Através das regiões, projetam-se algumas mudanças significativas, principalmente na força de trabalho agrícola. Para o Nordeste projeta-se um acentuado decréscimo absoluto dessa força de trabalho. A participação da força de trabalho agrícola total deverá baixar significativamente no Nordeste, aumentar no Centro-Oeste e no Sudeste e permanecer aproximadamente constante no Sul. Uma liberalização ampla comercial e cambial, com seus efeitos gerais de estímulo ao crescimento, tende a reduzir proporcionalmente a força de trabalho agrícola em todas as regiões.

42. O acentuado decréscimo absoluto da força de trabalho agrícola que é projetado para o Nordeste, e que se acentuaria ainda mais com as medidas de liberalização, é um resultado importante e animador, tendo em vista a grande oferta atual de trabalho agrícola de baixa produtividade naquela região. Também é de destacar a importância das medidas de reforma geral no processo de combate à probreza, dado o seu efeito facilitador da transferência de mão-de-obra agrícola de baixa produtividade para empregos de produtividade mais alta no resto da economia. Não obstante, projeta-se que continuará a existir no Nordeste uma participação grande e desproporcional (em relação à produção) de força de trabalho agrícola, o que sugere a necessidade de medidas adicionais diretas para tratar desse problema.

43. Ao nível regional, projetam-se significativas alterações adicionais no inventário de terras cultivadas. No Nordeste e no Sudeste, estas áreas aumentarão significativamente, esperando-se porém que isto ocorra mais em função do aproveitamento de terras já cultiváveis do que da expansão da fronteira, por não existirem nessas regiões novas reservas de terras devolutas. No Norte, a área cultivada também deverá crescer. Esta é a única região em que o aumento da área agrícola deverá ser gerado pela expansão da fronteira. No Centro-Oeste, onde ocorreram, nas últimas décadas, as maiores expansões de área, o índice de crescimento anual da área cultivada é relativamente pequeno (0,9%).

44. As projeções também revelam claramente o importante impacto positivo de diferentes medidas de liberalização sobre o desempenho geral da economia e do setor agrícola. As exportações e importações agrícolas são altamente sensíveis a alterações de preços de exportação e importação resultantes da liberalização do comércio. Os benefícios desta liberalização seriam ainda maiores se os seus parceiros abrissem para um maior acesso aos seus mercados internos. Também é visível a compensação entre a expansão das exportações agrícolas e da produção agrícola interna. Igualmente evidente é o forte efeito estimulante exercido pela redução do custo de insumos agrícolas importados, mediante a remoção de barreiras comerciais, principalmente na produção de alimentos.

F. Futuras prioridades de ação setorial

45. Nesta análise geral do setor da agricultura, identificaram-se importantes lacunas nas informações que o Governo e o Banco necessitam para formular e implementar uma estratégia de desenvolvimento e assistência setorial. Tais lacunas existem principalmente nas áreas da pecuária, da gestão de recursos naturais, das contas de renda regional, da análise de investimentos setoriais e da capacidade de absorção de mão-de-obra do setor agrícola. São nessas áreas que cumpre redobrar o esforço. Cumpriria também efetuar análises adicionais sobre diversos aspectos em relação aos quais já se começou a agir, ou seja: (i) o exame da despesa pública em agricultura, particularmente para levar em conta o processo orçamentário; (ii) a análise de instituições do setor, incluídas as estaduais, regionais e locais; e (iii) a análise dos orçamentos de cultivos por zonas agronômicas, para identificar áreas em que existe maior ou menor aptidão agrícola, principalmente no Nordeste, a fim de orientar decisões de investimento público.

G. Os desafios dos anos 90

46. O Brasil enfrentará numerosos e importantes desafios na próxima década.

47. Em primeiro lugar, é necessário assegurar que os avanços possibilitados pela liberalização parcial (a redução dos subsídios fiscais e de crédito e certo grau de reforma do comércio agrícola) na década dos anos 80 não sejam perdidos. Essas iniciativas mais recentes de liberalização, induzidas até certo ponto por pressões fiscais, são intrínsicas ao cenário de tendências para o futuro. A simples manutenção deste rumo de crescimento mais liberalizado requererá vigilância de parte dos formuladores de políticas.

48. Todavia, é possível e necessário fazer muito mais. A análise de simulação demonstra que a adoção de medidas adicionais de liberalização resultaria num melhor desempenho da economia em geral e do setor da agricultura em particular, em relação ao que provavelmente aconteceria se as tendências atuais não mudassem. As novas medidas também permitiriam optar por um rumo substancialmente mais equitativo e, portanto, socialmente mais aceitável. O fato de ser possível concretizar essas melhorias de distribuição por meio de uma estratégia de crescimento economicamente mais eficiente é algo que não tem despertado a atenção que merece no Brasil. Sugere este fato que um programa de alívio da pobreza em áreas rurais deve se apoiar numa estrutura de políticas nacionais que não prejudicam a

agricultura. Para chegar a esse caminho de crescimento, os responsáveis pela adoção de políticas teriam de resistir às pressões dos diferentes grupos que se beneficiaram das políticas distorcionárias do passado. Com a liberalização e uma dependência maior em mercados livres, o enfoque da política terá de mudar no sentido de criar condições para mercados competitivos.

49. Outro desafio que a economia brasileira e o setor agrícola em particular enfrentarão na próxima década é o do fechamento geral da fronteira agrícola, no sentido de que o crescimento da produção do setor deverá advir principalente de incrementos de produtividade e do uso mais intensivo das terras existentes, e não da expansão da área agrícola, tal como ocorreu durante a maior parte do período de pós-guerra. Espera-se que o abandono da utilização de subsídios para induzir o crescimento da agricultura através da ampliação da sua fronteira agrícola resulte num caminho de crescimento economicamente mais eficiente, regionalmente mais equilibrado, socialmente mais estável e ecologicamente menos prejudicial, principalmente nos ambientes mais frágeis do país. Este novo rumo aumentará, simultaneamente, as pressões sobre as terras agrícolas existentes, tanto as cultivadas como as não utilizadas.

50. Neste futuro cenário de desenvolvimento agrícola com uso mais intensivo da terra, os investimentos em áreas tais como pesquisa e extensão, o manejo racional de recursos de terras e irrigação provavelmente se revestirão de maior importância. Nesse sentido, o papel do Governo deve consistir em facilitar uma expansão das atividades do setor privado mediante a provisão de serviços de apoio complementar e de infra-estrutura.

51. No Norte, não obstante, a colonicação da região amazônica deverá continuar, embora a ritmo mais lento do que antes. Poderosas forças demográficas e sociais continuarão a impulsionar este processo durante os anos 90, com ou sem incentivos fiscais ou de outra ordem. Para o governo federal, e para os respectivos governos estaduais e locais, isto representará um importante desafio. É imperativo que os novos colonos enfrentem os custos reais resultantes da remoção de subsídios antieconômicos, e que sejam claramente estabelecidas, vigiadas e aplicadas, normas ambientais e do uso apropriado da terra.

52. Como já se mencionou, as grandes dimensões da força de trabalho agrícola no Nordeste continuarão a representar um importante desafio para os formuladores de políticas na década de 90. Embora existam consideráveis possibilidades de incremento à produtividade da força de trabalho agrícola na região, a simples dimensão da mesma, relativamente à produção, é indicativa da necessidade de que as políticas focalizem processos capazes de facilitar a transferência do excesso de mão-de-obra para outros setores. Todos os níveis de governo terão de aumentar os seus esforços no sentido de remover os obstáculos e as distorções que restringem a mobilidade ocupacional e geográfica da força de trabalho. Importante obstáculo é dado pelo alto índice de analfabetismo da população rural. Por isso, a educação formal - pelo menos a longo prazo - pode desempenhar importante papel como fator de incremento da produtividade agrícola e, ainda, para facilitar a transferência de mão-de-obra para outros setores que não o agrícola. Além disso, a adoção de medidas que melhorem a divulgação de oportunidades de emprego e reduzam o ônus do transporte também pode exercer um efeito imediato. Outra forma de facilitar essas tansferências consiste em prover

treinamento informal nas aptidões gerais e nas disciplinas requeridas pelos empregos industriais e comerciais. É claro que a tarefa é difícil, e que esta área de atividade exige um empenho concertado e a longo prazo.

53. Quanto às áreas mais pobres do país, como o Nordeste, a estratégia de desenvolvimento implícita aos resultados da análise realizada dá ênfase ao seguinte: (i) a remoção das distorções de políticas discriminatórias da agricultura em geral; (ii) um investimento muito maior em educação rural; (iii) o uso de intervenções diretas (pesquisa, extrensão e infra-estrutura) em certas áreas agrícolas com potencial econômico nitidamente estabelecido; e (iv) investimento público em treinamento para o trabalho, a fim de facilitar a transferência de mão-de-obra agrícola de baixa produtividade para empregos de produtividade maior.

54. É provável que recentes eventos políticos também desempenhem um importante papel na evolução do setor na próxima década. A transição para um governo democrático e a descentralização de poder do governo Federal para os governos estaduais e municipais tal como é previsto na nova Constituição Federal sugerem a probalidade de que o ambiente em que serão formuladas as políticas econômicas muito diferirá, nos anos 90, do que existia no passado. Pode-se esperar, em particular, que o Executivo Federal seja menos poderoso, e que o poder do Congresso e dos governos estaduais e municipais aumente. Com essa descentralização de poder é possível que a representação do Brasil rural ou dos interesses da agricultura seja mais sólida. Mas, por ser possível que os grandes produtores dominem qualquer coalizão que venha a ser formada, existe o risco de que as políticas oficiais tendam para uma direção oposta, protegendo e subsidiando a agricultura, como ocorreu em muitos países desenvolvidos. Isto seria lamentável.

55. Para concluir, a menos que, na frente de estabilização, se consiga reduzir o déficit fiscal e controlar a inflação, haverá a tendência de recorrer a controles de comércio ad hoc e à sobrevalorização do câmbio, que mantêm as distorções que castigam a agricultura. Nesse sentido, o êxito do esforço dirigido à eliminação de políticas que são prejudiciais à agricultura depende de um esforço fidedigno de estabilização da economia em seu conjunto.

I. AGRICULTURE IN THE NATIONAL ECONOMY

A. Introduction

1.01 This chapter covers the basic structural relationships that exist between the agricultural sector and the national economy, with a view to providing the overall economy-wide framework within which to analyze how the agricultural sector is likely to evolve in the foreseeable future. For purposes of analysis, three basic structural relationships are examined: (i) the sectoral composition of output, or more specifically, agriculture's share of total output; (ii) agriculture's share or use of the factors of production (land, labor and capital); and (iii) agriculture in the external trade sector, including agriculture's share of world trade. The regional dimensions to these relationships, where applicable and when the data permit, are also analyzed.

1.02 First, a brief historical account of structural change in the Brazilian economy, in terms of the above relationships, is presented. This is followed by an analysis of the causes of structural change, particularly as it relates to the agricultural sector. However, before turning to these sections, it is worthwhile to review the general experience with regard to the role of agriculture in the structural transformation of national economies.

B. Agriculture and Structural Transformation: General Experience

1.03 Kuznets and others have shown that the long-term economic growth of nations is associated with major changes in economic structure.[1] Although the pace of this structural transformation may differ among countries, the overall patterns tend to be similar. The agricultural sector, in particular, plays a number of critical and changing roles during the process of structural transformation. At very early stages of development, agriculture generally provides for almost all of a country's domestic requirements for food and fiber, and (when other non-agricultural primary exports are lacking) foreign exchange needed for purchases of imported consumer and capital goods. The agricultural sector tends at this point to account for a relatively large proportion of national product. The predominance of traditional, low-productivity agriculture at early stages of development also normally requires that a relatively large proportion of the total labor force be retained in rural areas. In today's low-income developing countries, agriculture typically accounts for about 30% of GDP and 70% of the labor force.[2] This rural labor force normally produces not only agricultural commodities, but also petty manufactures and services.

1/ Simon Kuznets, Economic Growth of Nations, (Cambridge, Mass.: Harvard, 1971);
Bruce F. Johnston and P. Kilby, Agriculture and Structural Transformation, (London: Oxford, 1975).

2/ World Bank, World Development Report, (Washington, D. C., 1988).

1.04 Historically, the key factor leading to a more modern economic structure has been the emergence of specialization. Through this process, numerous non-agricultural tasks formerly performed by rural households (e.g., making clothing, construction, energy production and distribution, and food processing) gradually become absorbed by specialized firms in towns and cities. The rising per capita incomes resulting from this specialization, moreover, normally lead to more than proportionate increases in demand for non-agricultural goods (Engel's Law).

1.05 Another factor on the demand side that contributes to specialization and is capable of promoting a more modern economic structure is world market demand for local products (export demand). At the same time, rising living standards in the home market create a demand for imported goods and services. Trade allows for the possibility of a country developing a high degree of specialization in the production of some goods and a lower degree of specialization in others. The relative importance of world trade in contributing to a more modern economic structure has varied among countries, depending on a country's resources, products and technology vis-a-vis the rest of the world as well as trade policies, both at home and abroad.

1.06 In addition to these demand factors, labor tends to supply its services where it can obtain the highest possible return. In the long run, the opportunity of employees to realize higher returns has tended to be strongly dependent on their ability to acquire skills and training (human capital development).

1.07 Historically, the above changes in demand and supply have combined to draw people out of agriculture into industry. At this stage, the agricultural sector is also likely to provide a large part of the capital needed to finance incipient industrial development. This period of transition (which may last for decades or even centuries depending on country-specific conditions) is characterized by falling shares of agriculture and rising shares of industry, in both output and employment. In theory, the structure of an economy stabilizes when returns to the factors of production are equal across all the sectors. In today's developed industrialized countries, agriculture's share of output and employment seems to have stabilized at about 3-7 percent.[3] Let us now turn to the Brazilian case.

C. Agriculture and Structural Change in Brazil

1. Sectoral Shares in Total Output

1.08 Until the end of World War II, the Brazilian economy remained overwhelmingly traditional and agrarian in structure. National economic growth was almost entirely based on increases in agricultural production, concentrated in a few key commodities, and geared largely to the foreign

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3/ World Bank, World Development Report (Washington, D.C., 1988).

sector.[4] During this earlier period, the sheer size of the rural population, coupled with high overall population growth rates, allowed for only minor changes in the structure of the Brazilian economy. By 1950, agriculture still accounted for about a fourth of the country's total output of goods and services and about 60% of the total labor force (Tables A.1.3 and A.1.23) -- a structure not unlike that in the vast majority of low income developing countries today.

1.09 However, in the second half of this century, Brazil's economy underwent major structural change which literally transformed its character. Between 1950 and 1980, the total economy grew at the exceptionally high average annual rate of 7.1%. Few countries have been able to achieve and sustain growth rates of this magnitude over such a long period of time. The agricultural sector also performed extremely well, posting an average annual growth rate of about 4.4% over the same period which was almost twice the rate of population growth. However, in contrast to the prewar years, agriculture ceased to be the economy's leading sector. Throughout the period, the outputs of both the industrial and service sectors increased at much faster rates (8.5 and 7.0%, respectively) than that of agriculture, causing the latter's share in GDP to decline from about 25% in 1950 to 10.0% in 1980. The sectoral growth rates over this period are summarized in Table 1.1.

Table 1.1: Sectoral Growth Rates (1950-1980)
(Annual Averages, %)

Period	Agriculture	Industry	Services	Total
1950-60	4.5	9.0	6.1	6.7
1960-70	4.0	6.0	5.1	5.3
1970-80	4.2	8.9	8.7	8.2
1950-80	4.4	8.5	7.0	7.1

Source: Table A.1.7

1.10 The broad momentum of structural change evolving steadily throughout the postwar era, came to an abrupt halt in the 1980s. Economic growth, which had been taken for granted for so long, slowed, reflecting a sharp decline in industrial output and stagnant growth in agriculture. Consequently, agriculture's share in national output remained virtually constant, while industry's share declined. Partial recovery since 1984 has brought with it little, if any, structural change in the composition of output. The evolution of this change from 1950 to 1987 is summarized in Table 1.2.

4/ Indeed, Brazil's earlier economic history has been frequently portrayed in terms of boom and bust cycles based on production and export of such commodities as tropical woods and spices, sugar, rubber and coffee. For a good account of the economic history of this period see: Annibal V. Villela and W. Suzigan, Government Policy and the Economic Growth of Brazil, 1889-1945, (Rio de Janeiro: IPEA/INPES, 1977).

Table 1.2: Sectoral Shares of Output: 1950 - 1987
(%)

Year	Agriculture	Industry	Services	Total
1950	24	24	52	100
1960	18	32	50	100
1970	12	36	52	100
1980	10	38	52	100
1985	10	35	55	100
1987	10	n.a.	n.a.	100

Source: Table A.1.3

1.11 Across the country's five greater regions (North, Northeast, Southeast, South and Center-West) shown in Map IBRD 20444R, the rate of structural change has varied considerably (Table A.1.12) but the pattern has been strikingly similar (Table A.1.9).[5] Although some regions have grown faster than others, agriculture's share in total output has uniformly declined in all the regions while the shares for industry and services have correspondingly increased. These trends reflect the fact that in all the regions, as in the country as a whole, over this period, 1950-80, the industrial and service sectors grew at much faster rates than agriculture. The Southeast appears to have completed the final stage in the transition to a completely modern economic structure; agriculture's share in total output in this region has fallen from 21% in 1949 to 5.6% in 1980. In the Center-West (considered the country's agricultural frontier), while agriculture's share in total regional output has also declined (from 40% in 1949 to 21% in 1980), this sectoral share (21%) remains the largest among all the regions. In the Northeast, the country's poorest region, as measured by per capita income (Table A.1.20) as well as other indicators, agriculture's share in this region's GDP, as in the other regions, declined dramatically from 37% in 1949 to 16% in 1980.

1.12 In terms of regional shares in sectoral income, the Northeast's relative position has remained largely unchanged over the entire period, with its shares of total agricultural, industrial and service sector income holding constant at around 19%, 9-10% and 12-13%, respectively. The main shifts in sectoral income have been between the Southeast (its shares have declined in all three sectors, particularly in agriculture) and the South and Center-West regions (whose shares have increased in all three sectors).

1.13 Regional shares in total national income reveal that the relative economic importance of the regions, although not their ranking, has changed over the last several decades (Table. A.1.10). The most important region -- the Southeast -- experienced a relative decline from 67% in 1949 to 62% in 1980, whereas during this same period the Center-West region increased in relative importance from 1.7 to 5.5%. Both the South and North

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5/ Regional GDP accounts (Table A.1.8), on which this analysis is based, were prepared by FGV for benchmark census years from 1949 to 1980. Since the responsibility for preparing national income accounts was transferred to IBGE, no new regional income accounts have been produced.

experienced very small increases (from 15 to 17% and from 1.7 to 3.1%, respectively), while the Northeast declined slightly in relative importance from 14 to 12%.

1.14 With respect to per capita income, the changes are more pronounced (Table A.1.20). In 1949, per capita income in the Northeast was about one-third what it was in the Southeast -- the country's most economically developed region. By 1980, this figure had fallen to about 28%. Data on per capita agricultural income (using rural population as the deflator) are also revealing (Table A.1.20). In 1949, the Northeast's per capita agricultural income was roughly equal to that in both the North and the Center-West regions. By 1980, however, it was only a fraction of what it was in the North (65%) and Center-West (24%). In the Center-West, real per capita agricultural income increased so rapidly (6.4% per annum on average) that by 1980 it had attained the largest absolute level in the country -- Cr$57,602 compared to Cr$50,822 in the South and Cr$48,047 in the Southeast (Table A.1.21).

2. Agriculture's Use of the Factors of Production

(a) Labor

1.15 The structural changes in the labor force since the end of World War II have been even more dramatic than those in the composition of production. Throughout this period, excluding the early 1980s, agriculture's share in total employment has fallen precipitously, from about 60% in 1950 to 25% in 1987 (Table A.1.23). Despite this reduction, however, agriculture's present share of 25% still represents a very large proportion of the total labor force. The changes in sectoral employment shares are summarized in Table 1.3.

Table 1.3: Sectoral Shares of Employment: 1950-1987
(%)

Year	Agriculture	Industry	Services	Total
1950	60	14	26	100
1960	54	13	33	100
1970	44	18	38	100
1980	29	25	46	100
1985	29	22	49	100
1987	25	24	51	100

Source: Table A.1.23

1.16 Almost all the new permanent jobs created during this period were outside the agricultural sector. Based on the Demographic Census (DC), agricultural employment grew only 1.8% per annum on average during the 1950s and then remained virtually constant throughout the 1960s and 1970s

Table A.1.24).[6] In the 1980s, agricultural employment rose only modestly (1.6%). In contrast, industrial and service sector employment expanded rapidly (4.8 and 5.3%, respectively), during the entire period (Table A.1.24).

1.17 However, while the level of permanent agricultural employment has changed very little in the last forty years, agricultural output (as discussed in para. 1.09) has grown substantially, reflecting very large increases in average labor productivity. Over this period, agricultural labor productivity increased at the average annual rate of 3.4%, compared to 2.1% in the industrial sector and 1.1% in services (Table A.1.30). Notwithstanding this growth, however, average labor productivity in agriculture in 1987 was still only about 43% of the national average. The changes in real labor productivity are summarized in Table 1.4.

Table 1.4: Real Labor Productivity (Gross Output Per Worker) and Growth Rates by Sector: 1950-1987
(Constant 1980 Prices)

	Agriculture (Cz$000)	Avg.Annual Growth Rate (%)	Industry (Cz$000)	Avg.Annual Growth Rate (%)	Services (Cz$000)	Avg.Annual Growth Rate (%)	Total (Cz$000)	Avg.Annual Growth Rate (%)
1950	32		172		183		91	
		2.5		6.9		1.0		3.8
1960	41		334		202		132	
		3.7		0.8		1.8		3.3
1970	59		363		241		182	
		5.1		1.8		3.0		4.8
1980	97		434		323		285	
		2.0		-2.0		-2.1		-1.3
1987	112		377		278		260	

Source: Table A.1.30

1.18 Within the regions, the changes in the sectoral structure of employment have followed a similar pattern (Table A.1.27), although the

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6/ Another source of data for agricultural employment is the Agricultural Census (AC). The AC differs from the Demographic Census (DC) in several important respects: (i) the AC uses a much wider definition of the labor force, including persons of all ages who are employed in any type of agricultural activity at the time of the census regardless of the duration (the DC excludes all persons under 10 years of age and includes only those persons who list agriculture as their principal or habitual occupation); and (ii) the AC and DC are conducted at different times, the DC in September at a relatively slack time for agricultural employment and the AC in December at a relatively busy time. For the analysis of sectoral shares of employment the DC was chosen mainly because it also provides a consistent and comparable series on employment in the other sectors, in addition to recording mostly permanent employment. However, both censuses provide useful information. In other analysis, the AC and the DC are used together (paras. 2.25-2.31) to shed light on the behavior of the rural labor market.

rate of change has varied (Table A.1.29). In all regions agriculture's share in employment has declined, reflecting little or no growth in agricultural employment and the fairly rapid rise in employment in the industrial and service sectors. In the Southeast during the 1960s and 1970s and, in the South, during the 1970s, permanent agricultural employment actually fell in absolute terms. By 1987, all regions had substantially smaller shares of their labor force employed in agriculture, with the Southeast having the smallest at 14%, and the Northeast, the largest at 39%.

1.19 In terms of regional shares in sectoral employment (Table A.1.28), the pattern is similar to income (para. 1.12). The Northeast's relative position in all three sectors remained fairly constant (40-42%, 16%, and 22% of total agricultural, industrial and service sector employment, respectively) over the whole period, while the principal shifts took place between the Southeast (its employment shares in all sectors declined) and the South and Center-West (whose shares in all sectors correspondingly increased). However, most of these shifts occurred before 1970 (para. 2.29) whereas the shifts in industrial and service sector employment between these regions continued throughout the 1970s and 1980s.

(b) Land

1.20 Prior to World War II, there was a gradual intensification of the existing general patterns of land use, mostly along the coast and in the interior of the southern and southeastern regions. In the second half of this century, land use patterns changed markedly. The most striking changes which occurred during this period are: the growth of residential and industrial land use in and around the country's large urban centers, leading to progressively larger metropolitan areas; and (ii) the expansion of the land frontier in agriculture which has taken place mainly in the Center-West but also in the North.

1.21 From 1950 to 1985, the proportion of the country's total territory (845.6 million ha) accounted for by farmland increased from 27% to 44.5% (Table A.1.33). Farm land grew at an average annual rate of 1.3%. Most of this growth occurred during the 1970s. The changes are summarized in Table 1.5.

Table 1.5: Agriculture and the Total Land Resource: 1950-1985

Year	Total Territory (ha million)	Total Farm Area (ha million)	Total Farm Area/ Total Territory (%)	Interval	Growth of Farm Land (%)
1950	846	232	28	1950/60	0.7
1960	846	250	30	1960/70	1.6
1970	846	294	35	1970/75	1.9
1975	846	324	38	1975/80	2.7
1980	846	370	44	1980/85	0.4
1985	846	376	44	1950/85	1.3

Source: Table A.1.33

1.22 The regions in which this growth of agricultural land primarily took place in order of importance are: the Center-West, the North and the Northeast. The Center-West clearly led this development. Between 1950 and 1985 agricultural farm land in the Center-West expanded at an average annual rate of 2.2%. In the North, the rate of growth was 1.8%.[7] In both regions, there has been a leveling-off of this growth in the 1980s. Agricultural land expansion has virtually ceased (0.3% growth) in the Center-West and considerably slowed (1.1%) in the North. In fact, it is estimated that today in the Center-West almost 80% of the usable agricultural land is occupied with farm establishments (Table A.2.30). In the South, Southeast and in several states in the Northeast the area covered by farm establishments already exceeds the estimated total area of usable agricultural land. Only in the North (and in a few states in the Northeast) is there a substantial proportion of unoccupied potential agricultural land (of varying quality). In the North though, only a small fraction of this land could be considered economic to develop at present.

(c) Capital

1.23 Unfortunately, the Brazilian National Income Accounts do not provide information on the breakdown of investment by sector. A consistent investment series which can be used to analyze and compare the productivity of capital across sectors does not exist. Not surprisingly, therefore, research on this subject is nil.

1.24 In general, investment as a percentage of GDP increased progressively from 14% in 1950 to 24% in 1980. However, with the recent slowdown in the economy, investment as a percentage of GDP has been falling, reaching 19.6% in 1987. Across the sectors one can only infer what has been happening based on partial information.

1.25 One piece of partial information that throws light on the relative degree of capital intensity across sectors is the growth of real agricultural labor productivity. Evidence shows that the agricultural sector recorded much higher levels of real output per worker than either the industrial or service sectors throughout this period (para. 1.17). This particularly stands out in the agricultural frontier regions of the Center-West and the North but is also apparent in the Southeast (Table A.1.31). In the 1970s, the rate of growth of labor productivity in the agricultural sector was almost three times higher than in the industrial sector. Although both sectors have recorded substantially lower rates in the low-growth 1980s, the agricultural sector still shows a higher growth rate of labor productivity; indeed the industrial sector growth rate for 1980-85 was actually negative (Table A.1.30).

1.26 These findings are consistent with other indicators showing a rapid growth in the capital-labor ratio in agriculture, underscoring the shift to a very capital-intensive and land-extensive (mechanization) technology up to

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7/ These period averages, however, disguise considerable intra-period variations. During the 1970s, the expansion of farm land in the Center-West and North regions grew at the average annual rates of 3.5 and 6.3% , respectively (Table A.1.33).

the early 1980s (paras. 2.41-2.45).[8] Rapid rates of rural to urban migration reinforced these tendencies. The industrial sector, on the other hand, became relatively more labor-absorptive in the 1970s compared with previous decades. In conclusion, partial evidence would suggest a greater degree of capital-intensive investment in agriculture with respect to industry from the 1960s onwards and a greater degree of capital-intensive investment in agriculture in the 1970s compared to the 1960s.

3. Agriculture in the Trade Sector

1.27 Throughout the postwar period, agriculture continued to make an important contribution to Brazil's foreign exchange earnings, but by the early 1980s it no longer dominated the country's trade balance as it had before World War II. Agricultural exports increased in nominal terms from US$1.5 billion in 1951 to more than US$10.0 billion in the 1980s (Table A.1.38). The share of agriculture in total exports, however, declined from nearly 90% on average in the 1950s to around 40% in the 1980s, due to an even more rapid growth of industrial exports (Table A.1.34).

1.28 With regard to agricultural imports (including direct imports of fertilizer, agricultural chemicals and agricultural machinery) the data show that these increased slightly more rapidly than exports, rising from US$473 million in 1971 to US$2.4 billion in 1987.[9] As a percentage of total imports, agriculture's share remained fairly stable (15-16%) (Table A.1.35).

1.29 The agricultural trade balance or net foreign exchange earnings generated by the agricultural sector (agricultural exports less agricultural imports) rose steadily from US$1.6 billion in 1971 to US$7.4 billion in 1987, peaking at US$8.8 billion in 1984 (Table A.1.36). Though an impressive performance, agriculture's relative contribution to the country's overall trade balance has been gradually declining, reflecting the increased relative importance of non-agricultural trade. The agricultural sector's share of total exports, imports, and the trade balance are summarized in Table 1.6.

Table 1.6: Agriculture's Share of Total Trade
(%)

Year	(1) Agricultural Exports/ Total Exports	(2) Agricultural Imports/ Total Imports	(3) Agricultural Trade Balance/ Total Trade Balance
1951	88	--	--
1960	87	--	--
1971	71	15	470
1980	49	14	230
1987	43	16	100

Source: Tables A.1.34; A.1.35; A.1.36

8/ Throughout the report, the terms land-intensive and land-extensive are used. The former, unless otherwise specified, is defined as using a given stock of land more intensively (i.e., increasing other inputs in relation to land), whereas the latter refers to using more land.

9/ Due to the difficulty of obtaining a time series based on a consistent definition, CACEX prepared this series for the report.

1.30 With respect to world trade, Brazil has had the good fortune to produce many agricultural products for which world trade has increased substantially. Over the last twenty years, world trade in cocoa, coffee, beef, non-coniferous sawnwood, soybean products, orange juice, and grains has grown rapidly. World trade growth has been slower in sugar, rubber, tobacco and cotton.

1.31 During the last twenty years, there has been little change in Brazil's world market share in cocoa (15-18%), sugar (8%), wheat (import share -- 5%) and sawnwood (3%). Brazil's share of the world market has fallen significantly for cotton (from 9 to 2%) and risen appreciably for soybean products (from 5 to 27%) and tobacco (from 5 to 13%). There has been a spectacular rise in Brazil's market share for orange juice, which has exceeded 80% in recent years.

D. Causes of Change

1.32 The above account indicates that the structural transformation that took place in the Brazilian economy during the second half of this century generally followed patterns observed in other countries during the course of their economic development. In Brazil's case, those structural changes occurred in a context of rapid and sustained overall economic and sectoral growth that has benefited a relatively small proportion of the total population. In the 1980s, the process of structural transformation came to a halt and the rapid expansion of the frontier slowed perceptibly.

1.33 In analyzing this pattern of growth and structural change, four basic causes emerge: (i) domestic resources, including population growth, frontier development and mineral exploration; (ii) technology (broadly defined) and human capital; (iii) international trade; and (iv) government policies which affect all of the above. All of these factors have played a role to a greater or lesser extent at varying times throughout the postwar era.

1.34 However, before turning to this analysis, it should be mentioned that some of the changes in Brazil's economic structure that took place in the postwar period, are closely linked to earlier developments. Particularly important in this respect is the fact that Brazil's road system more than doubled (from 121,800 to 258,400 kilometers) during the 1930s.[10] This substantially lowered transport costs and greatly improved ex-farm prices. It also expanded the size of the effective market for domestically produced agricultural commodities. These transport investments also permitted reductions in the prices of domestically produced manufactured goods offered to the farm population. In addition, infrastructure investments (e.g., railways, power stations) intended to serve the coffee subsector (mostly in the state of Sao Paulo) also improved the physical environment for industry; they increased the demand for locally produced tools and spare parts as well. Moreover, the immigrant

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10/ Nathaniel H. Leff, Underdevelopment and Development in Brazil Vol. 1: Economic Structure and Change, 1822-1947, (London: Allen & Unwin, 1982).

labor brought to work in the coffee estates (many of whom were later absorbed by the cotton industry) provided a lucrative market for cheap consumer goods.[11] The above factors provided a strong stimulus to the country's nascent industrial sector, thus setting the stage for the rapid changes in Brazil's economic structure which were to occur in the postwar years.

1. Domestic Resources

1.35 Brazil's large population as well as its spatial distribution have played a major role in the growth and transformation process that has taken place over the last forty years. From the high point of the late 1950s, when population growth was 3% per year, population growth began to decline slowly to 2.5% per year by the early 1980s (Table A.1.15). During this same period, dramatic changes occurred in the spatial or geographic distribution of the population. Demographers estimate that the number of people migrating from rural to urban areas in the postwar years totalled around 35 million, larger than the current population of Argentina. This rural to urban migration was induced to a large extent by policies (paras. 1.47-1.50) that protected and stimulated the urban industrial sector (a pull factor), while discriminating against rural agriculture (a push factor).[12] The bulk of this migration took place during the 1970s when, as a result, Brazil's rural population decreased in absolute terms (from 41 million in 1970 to 38.6 million in 1980) for the first time in the country's history. Brazil had become a predominately urban society (Table A.1.16). By 1980, the urban/rural shares of the total population were the complete opposite (68% and 32%, respectively) of what they were in 1950 (36% and 64%).

1.36 These demographic changes had a major effect on the rate and pattern of growth. First, the large and rapidly expanding urban population created a large market for domestically produced manufactured consumer goods. This allowed some domestic industries (e.g. the automotive and related farm machinery industry) to achieve significant economies of scale, making Brazil's highly protectionist strategy (paras. 1.47 and 1.48) less costly than it otherwise would have been. Brazil clearly enjoys this big country advantage.

1.37 The second way in which population changes have affected the pattern of growth is through the labor market. During the 1950s and 1960s the rate of growth of new entrants to the labor market continued to increase. However, by the 1970s, the slowdown in population growth that had been occurring since the late 1950s, began to affect the supply of labor. Labor markets generally tightened during this period until the recession years of the early 1980s. In rural areas, which had also experienced an absolute decline in population, labor became considerably

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11/ Werner Baer, The Brazilian Economy (New York: Praeger, 1983).

12/ Legislation in the South and Southeast that adversely affected tenancy and the fiscal and rural credit subsidies (paras. 1.40 and 1.51), which encouraged land consolidation and more capital-intensive production methods, also served to push labor off the farm.

more scarce with the exception of the Northeast where there is still a large supply of excess labor. As rural wages generally rose (Table A.2.24), this induced further substitutions of capital for labor in agricultural production.

1.38 The other domestic resource factor that has played a major role in the structural transformation process is the expansion of the land frontier. This evolutionary process, first moving through Parana in the immediate postwar decade, then into the Center-West in the late 1950s and 1960s, and finally into the Amazon basin beginning in the early 1970s, conditioned and shaped many dimensions of the Brazilian economy and society.

1.39 In all likelihood, despite the rapid structural change that did occur in the Brazilian economy during this period, the frontier probably allowed the agricultural sector to account for a larger share of the national product than would otherwise have occurred. It clearly promoted the largest sustained continental-sized migration in the developing world and contributed substantially to the growth of export crops.

1.40 At the same time, the expansion of the land frontier, which has been stimulated by generous fiscal and credit subsidies, has been largely a highly mechanized, capital-using, labor-displacing process. This is largely due to the fact that the main crop that has accompanied this expansion has been soybeans which has these capital-intensive, labor-displacing characteristics. The general effect has been to reduce employment opportunities in agriculture. In addition, the principal owners of the new settlements on the frontier have comprised a relatively small number of large farmers, leading to higher degrees of land concentration (para. 2.35). More recently, the expansion of the frontier has led to the penetration of the last major rainforest in the world, creating environmental and social problems which are major challenges for the 1990s.

1.41 On balance, it would appear that frontier expansion in Brazil has benefited only a very small proportion of the total population. However, recent evidence on the declining availability of unclaimed potential agricultural land (para. 1.22), combined with the Government's recent initiatives to reduce the fiscal and credit incentives that have, to an important extent, fueled this expansion, suggest that the growth of the land frontier may be coming to a close.

2. Technology and Human Capital

1.42 Over most of the last 40 years, the rate of technological innovation in industry has been slow and has not played a significant role in the growth and transformation process. Some would attribute this to protectionist trade policies that have insulated industry from international competition and exposure to new technologies. Until relatively recently, the absence of technological progress was also characteristic of agriculture. Both agricultural research and extension were largely neglected, with the exception of these programs in the State of Sao Paulo. However, in the 1970s, Brazil began investing heavily in

agricultural research through EMBRAPA, the national research organization. Within a few years, new seed varieties and technical packages for soybeans became available, allowing this crop to be grown on the acidic soils of the cerrado (Savanna) in the Center-West region. A second wave of seed technology emerged in the mid-1980s that gave sustained high yields of cotton, wheat, rice and, to a lesser extent, beans and maize, especially for states in the South and the Southeast -- the old frontier. This technological factor appears to have played a key role in shaping the pattern of agricultural growth during the last two decades. It is interesting to note that during the recession years of the early 1980s and again during 1987 and 1988, when the economy slowed perceptibly, agriculture performed better than either the industrial or service sectors -- a reversal of the historical pattern. Technological innovation appears to provide at least part of the explanation.

1.43 However, other forms of investment in human capital which are of particular importance to the agricultural sector and its long-term growth, notably rural primary education, have been seriously neglected over the entire period. Of the total rural population in 1980, 94% has had not more than four years of formal education and more than half have not had any schooling at all (Table A.1.39). Illiteracy rates tend to reinforce this bleak picture. In the Northeast, 53% of all rural males and 47% of all rural females five years and older were illiterate in 1985 (Table A.1.41).

1.44 Under these conditions, it is unrealistic to expect any policy intervention, aimed at permanently raising living standards in rural areas, to be effective without at the same time raising educational attainment levels. These extremely low levels appear to be one of the major factors in explaining the persistence of inter-sectoral and regional income disparities over the last 40 years despite remarkably high overall and sectoral rates of growth.

3. International Trade

1.45 During the early part of the postwar period, international trade, or more specifically exports, played a relatively small role in the growth process insofar as industry was concerned in contrast to its much larger role in the agricultural sector. As already noted (para. 1.27) the bulk of Brazil's exports during this earlier period was accounted for by the agricultural sector. In the agricultural sector, exports played an important causal role in this sector's relative performance compared with the other sectors over the the entire postwar period. In fact, most of the growth that did occur in the agricultural sector was related to export performance, initially coffee, followed by soybeans and citrus products (para. 2.04).

1.46 However, beginning in the 1970s Brazil's total and agricultural exports, became increasingly diversified. Industrial exports, including processed agricultural products, increased in relative importance, while agriculture's share declined (para. 1.27). This has been accompanied by a general increase in the relative importance of exports in the total domestic product (from 7.9% in 1970 to 11.3% in 1987). Thus, increasingly, Brazil's economy and its sectoral composition, have come to be influenced

by the dynamics of international trade. This has become particularly apparent in the 1980s. In the early 1980s the slowdown in the economy was caused, in part, by the decline in world prices of Brazil's primary products and the substantial weakening of foreign markets for manufactured exports brought on by a world recession. When the world economy moved out of this recession, manufactured exports (including processed agricultural products) led the way to the partial recovery of the Brazilian economy through 1986.

4. Policy

1.47 Policy has played a major role in the structural transformation of the Brazilian economy, not only through its influence on many of the exogenous factors noted above, but in its own right as well. Probably, the most important action in this regard was Brazil's decision in the early postwar period to embark on a comprehensive import-substitution, industrialization strategy, aimed at implanting a consumer durable goods industry in the country as soon as possible. This strategy has been pursued quite vigorously through a variety of policy measures. Most noteworthy of these has been the prevalence of an over-valued currency. In fact, an over-valued currency has been a hallmark of Brazil's economic policy throughout the postwar period, with the exception of a few brief intervals, such as around 1970. Given that agriculture is a tradeable sector, where exports far outweigh imports, this policy has constituted serious discrimination against agriculture.

1.48 The manufacturing sector has been protected against this discriminatory policy by means of highly restrictive protectionist policies. Almost all finished manufactured goods are either subject to extremely high import tariffs or prohibited from importation completely, not to mention the difficulties of obtaining the necessary import licences and foreign exchange. In general, this protection has resulted in agriculture being implicitly taxed through the higher than necessary prices it pays for domestically produced industrial goods. Furthermore, manufacturing industries have been permitted to import raw materials and selected intermediate capital goods duty free, in addition to being able to purchase these inputs at the overvalued (hence, subsidized) official exchange rate.

1.49 With the above discrimination of agriculture, the relative price of food, an important wage good, has been kept lower than it would otherwise have been. This policy has benefitted urban industrial workers and consumers at the expense of the rural agricultural population.

1.50 The discrimination against agriculture has not been limited to the above policies. In addition, trade restrictions (including outright bans and quotas) have, from time to time, been imposed on agricultural commodities (maize, soybeans, cotton, etc.) to keep supplies dammed up in the domestic market until domestic demands have been met.

1.51 Within this policy environment, the industrial sector has flourished, producing for a relatively large domestic market. The same policies that have stimulated industrial production, have implicitly taxed

agriculture and served as a disincentive to agricultural production generally throughout the country.

1.52 For a brief interlude between 1964 (when the military government came to power), and 1974 'the time of the first oil shock), some shift in policy did occur. The new government moved to stimulate exports and to loosen controls on imports to some degree, while still maintaining the basic import-substitution, industrialization strategy. Also to promote a more rapid modernization of agricultural production and presumably to compensate agricultural producers for the other policies which discriminated against agriculture, subsidized rural credit was introduced, with its attendant distortionary effects throughout the financial sector. In addition, a significant attempt was made to reform trade policies, especially through tariff reform (1967) and by lowering the real value of the cruzeiro through periodic mini devaluations. These policies were reasonably successful, and, by the beginning of the 1970s, the domestic terms of trade had begun to shift in favor of agriculture (Table A.1.37) even though the implicit taxation of agriculture was not entirely removed (paras. 4.03-4.12).[13]

1.53 In addition, during this period the Government began investing heavily in new infrastructure. New penetration roads were built in previously inaccessible areas. Although motivated largely by security concerns, these investments opened up a whole new agricultural frontier in the Center-West, initially for the production of traditional food crops, to be followed in later years by non-traditional exports (mainly soybeans) once the technology became available.

1.54 In these years, the rate of growth and structural change accelerated as Brazil opened up its economy (more than at any other time in its postwar history) and began investing heavily in transport infrastructure. However, with the first oil shock of 1974, Brazil's brief small experiment with trade liberalization came to an abrupt end. Policy makers began to look inward once again and revitalized their import-substitution, industrialization policies. The Second National Development Plan (1975-79) included large public investments in pulp and paper, petrochemicals, fertilizers, steel and non-ferrous metals, with the objective of reaching or approaching self- sufficiency by the end of the decade. In 1974, the Government also announced the POLONORDESTE program, aimed at raising the productivity and incomes of small farmers in the Northeast through integrated rural development projects.[14] During this period, Brazil also embarked on an extensive program to substitute sugarcane-derived alcohol for imported gasoline (PROÁLCOOL).

13/ The shift in the domestic terms of trade in favor of agriculture during this period was buoyed in large part by higher commodity prices, particularly in the world market. The exception to this was in the Northeast where the terms of trade moved against agriculture in favor of industry.

14/ The Bank supported this program through a series of ten rural development projects in eight states in the Northeast.

1.55 In the current decade of the 1980s, while the same general policies of protecting industry and implicitly taxing agriculture have remained in place, the fiscal crisis has caused the Government to reduce some explicit subsidies. The rural credit subsidy has been reduced as have the explicit subsidies for the alcohol program and manufactured exports. In addition, elaborate national plans, promoting selected sectoral programs, have been conspicuously absent, as short-term stabilization issues have dominated the policy agenda. While a few new programs have been initiated, they have received limited political and financial support, in part because of the focus on short-term stabilization.[15] In May 1988, the National Council for Foreign Trade (CONEX) introduced new measures aimed at partially liberalizing trade in cotton, rice, maize and soybeans (para. 3.18). It remains to be seen what impact this will have.

1.56 As noted (paras. 1.10 and 1.15), most of the parameters of structural change have remained either constant (e.g. agriculture's share in total output and employment) or reversed direction (e.g. industry's share in total output and employment) in the 1980s. These results largely reflect the fact that economic growth, which had been taken for granted for so long, came to a halt during the early 1980s, as industrial output declined sharply and agriculture stagnated. The partial economic recovery from 1984 through 1986 had very little, if any, effect on economic structure. While a number of factors, including a global recession, combined to produce the slow growth profile of the 1980s, certainly the highly inflationary fiscal and monetary policies of the 1970s that continued into the 1980s played a major role.

15/ One of the few exceptions was the Northwest Region Integrated Development Program (POLONOROESTE), which was introduced in 1980 and aimed at absorbing in a more orderly, less environmentally damaging and more sustainable manner, the large number of settlers migrating to this region. For the most part, these goals have not been achieved. See Dennis J. Mahar, Government Policies and Deforestation in Brazil's Amazon Region (Washington, D.C., World Bank: 1989). In the agricultural sector, other initiatives included: Projeto Nordeste in 1985 (a fifteen-year multi-sectoral development program for the Northeast); the National Irrigation Program in 1986 and the National Land Reform Program (PNRA).

II. STRUCTURE AND PERFORMANCE WITHIN THE AGRICULTURAL SECTOR

A. Introduction

2.01 This chapter covers developments within the agriculture sector. Seven basic areas are examined, both at the national and regional level. These include: (i) agricultural production, including area and yields; (ii) farm income; (iii) the structure of agricultural employment; (iv) agricultural land use, tenure and distribution; (v) factor proportions in agricultural production; (vi) the composition of agricultural investment; and (vii) the structure of agricultural exports and imports.

B. Production, Land Area and Yields

1. Crops

2.02 Twelve major crops account for 98% of the total crop area and more than 90% of the total value of crop production. Seven are primarily export/industrial crops -- cocoa, coffee, cotton, oranges, soybeans, sugarcane and tobacco -- and five are important domestic food crops -- beans, cassava, maize, rice and wheat. Tables C.2.1 through C.2.72 summarize the changes in area, production and yield by region and state for these twelve crops during 1965-89. The crop data is further aggregated into three categories: grains, total food crops and export/industrial crops (Tables A.2.1-A.2.3). The changes at the national level by crop for selected years are summarized in Table 2.1.

Table 2.1 Index of Crop Area, Production and Yields: 1965-1989

(Base Year 1965 = 100)

	Area					Production					Yield				
Crops	1965	1970	1975	1980	1989[a]	1965	1970	1975	1980	1989[a]/	1965	1970	1975	1980	1989[a]/
EXPORT/ INDUSTRIAL															
Cocoa	100	92	94	100	137	100	123	175	198	232	100	133	187	198	170
Coffee	100	65	60	66	82	100	41	69	58	54	100	108	118	138	69
Cotton	100	107	97	92	37	100	98	88	84	90	100	92	91	91	243
Oranges	100	134	268	383	584	100	136	277	478	788	100	101	103	125	135
Soybeans	100	305	1349	2032	2837	100	288	1891	2897	4603	100	94	140	143	162
Sugar	100	101	115	153	240	100	105	121	196	343	100	104	104	128	143
Tobacco	100	90	93	116	106	100	98	115	163	180	100	110	124	141	170
FOOD															
Beans	100	106	127	140	157	100	97	100	85	100	100	91	79	61	64
Cassava	100	119	125	131	118	100	118	105	94	96	100	99	84	72	82
Maize	100	112	124	131	147	100	117	135	168	219	100	104	109	129	149
Rice	100	108	115	135	114	100	100	103	129	146	100	92	89	95	128
Wheat	100	247	382	407	453 [b]/	100	315	305	462	982 [b]/	100	127	80	113	216 [b]/

a/ Estimate

b/ Figure for 1988.

Source: Tables C.2.5, C.2.11, C.2.17, C.2.23, C.2.29, C.2.35, C.2.41, C.2.47, C.2.53, C.2.59, C.2.65, C.2.71

2.03 Throughout the 1950s and early 1960s, as urban markets expanded, the area under food crops and the production of food increased. This changed in the late 1960s and 1970s when world commodity booms (especially for soybeans), along with subsidized rural credit and fiscal incentives, promoted the expansion of export crops.

2.04 From 1965 to 1980, production growth came almost entirely from the non-traditional export crops, such as soybeans and oranges (Table A.2.4). In the case of soybeans, this growth was made possible by the efforts of EMBRAPA, the national agricultural research organization, which developed new seed varieties that allowed this crop to grow on the acidic soils of the Center-West region, thus enabling Brazil to take advantage of the boom in export commodity prices. Oranges, or more specifically orange juice concentrate, which has become a major export for Brazil, represents a very successful marketing effort by the Brazilian private sector. Sugarcane production also expanded during this period, stimulated in large part by the subsidies provided under the National Alcohol Program -- PROÁLCOOL (para. 3.12). Growth in these three crops was due almost solely to the expansion of area as opposed to increases in yields (Table A.2.5).

2.05 At the same time, food crop production -- with the exception of wheat, which was and still is subsidized (para. 3.09) and maize, which grew only moderately -- either declined or stagnated depending on the crop (Table A.2.4). Total food production as a proportion of total crop production declined precipitously from 36% in 1965 to 25% in 1980 (Table A.2.6). Per capita food production also fell (Table A.2.8).

2.06 Not all export/industrial crops fared well during this period. Traditional export/industrial crops, such as coffee and cotton and, to a lesser extent, cocoa, performed rather poorly. In part, this was due to less favorable world prices. However, in the case of coffee and cotton, the decline in production is also attributable to a set of discriminatory trade practices (i.e., intermittent export quotas and embargoes) that forced producers to sell in domestic markets at prices below those in the world market (para. 3.13). As a result, many producers of cotton and coffee shifted into the more remunerative production of soybeans, citrus and sugarcane.

2.07 Geographically, the regions most affected by these shifts were the Center-West, the Southeast and the South. The North and Northeast regions were largely unaffected. In the Center-West, almost all of the land opened up for soybean production was formerly either pasture or virgin land. In contrast, in the more heavily cultivated Southeast and South, the expansion of soybean production required corresponding reductions in the areas under other crops -- either food crops or other traditional export crops (e.g., coffee). These substitutions brought with them other effects, including the displacement of labor as the more capital-intensive soybean crop replaced other more labor-intensive crops. Increasingly, food crop production in these areas was displaced to more marginal lands in the states of Parana, Sao Paulo and Minas Gerais. The spatial distribution of grain production in 1989 is shown in Map IBRD 21676R.

2.08 However, in the 1980s some major changes appear to be occurring. In spite of declines -- or only modest increases -- in hectarage, the major domestic food crops, with the exception of cassava, showed important increases in production. These increases in output are largely due to increased yields (Table A.2.9).

2.09 The most significant increases in yields have occurred in wheat cultivation. More than 85% of the annual rate of growth in production is attributable to yield increases. Rice, principally irrigated rice, has had an annual rate of growth in physical output of about 3% even though the cultivated acreage has actually declined. Maize production has also increased by about 3% annually, with yields accounting for 43% of the growth in output. There also has been a significant increase in the output of edible beans, although this is due entirely to area expansion.

2.10 The general improvement in yields is due in large part to the development and production of improved seed varieties. EMBRAPA has played a major role in developing these varieties. Since 1980, the use of improved seed in wheat, rice and maize production has grown significantly.[1]

2.11 Progress has also been made in the 1980s on developing improved varieties for the traditional export/industrial crops such as coffee and cotton. Improved varieties of coffee, developed by the Sao Paulo Agronomic Institute, produced a sharp upswing in yields that offset the decline in area. Similarly in cotton, despite continuous declines in area, production has increased due to dramatic increases in yields, particularly in the traditional cotton growing states of the Northeast.

2.12 Also noteworthy is the fact that in the 1980s the Northeast has begun to experience a pattern of crop substitution similar to that which occurred earlier in the South and Southeast regions (Tables A.2.6-A.2.7). While the annual rate of growth of output of food crops in the Northeast has been extremely low (less than 1%), the output of export/industrial crops from this region has increased at an annual rate of 6% (Table A.2.10). The latter is due to increases in soybean production (more than half of which is due to yield increases) and to the expansion of the area under sugarcane (Table A.2.11). In Bahia, the expansion in soybean cultivation has come at the expense of area under food crops, but rice, maize and beans production have increased due to higher yields associated with the use of improved seed varieties (Table A.2.12). These developments suggest that land-saving and yield-increasing technologies are beginning to shape an alternative path of agricultural development alongside the established mechanized land-using, labor-displacing technology that operates on larger scale establishments.

1/ Improved seed production for wheat has increased by over 100% since 1980. It is used by 90-100% of the cultivators in the major wheat growing regions of the South, Southeast and Center-West. Production of improved seed varieties in rice has increased by over 30% in this decade and accounts for more than 50% of cultivation in the Southeast and 70% of the cultivation in Rio Grande do Sul. Since 1980, there has been a 13% increase in the production of improved seed varieties for maize, with a rate of utilization between 70 and 80% in the South and Southeast (Annex 7).

2. Livestock

2.13 The lack of consistent and reliable statistics on livestock production noted in the last Agricultural Sector Review continues to persist even after the completion by the Ministry of Agriculture (MINAGRI) in 1988 of a preliminary livestock subsector review. Although no statistics on the breakdown of agricultural GDP by crops and livestock exist, the informed judgement of Brazilian experts is that currently livestock production probably accounts for about 20 to 25% of agricultural GDP. Statistics on the stock of cattle, pigs and poultry by region from 1950 through 1985, as obtained from the Agricultural Census, are presented in Table A.2.13. The national figures are summarized in Table 2.2.

Table 2.2: National Stocks of Cattle, Pigs and Poultry: 1950-1985

Year	Livestock Numbers (000 Head)		
	Cattle	Pigs	Poultry
1950	44,562	22,998	73,675
1960	55,841	25,359	130,886
1970	78.562	31,524	213,622
1975	101,673	35,152	286,810
1980	118,086	32,629	413,180
1985	127,643	30,067	429,732

Source: Table A.2.13

2.14 From an economic point of view, the cattle herd is clearly the most important. It has grown by about 5.0% per annum over the period 1950-1985 (Table A.2.13). Most of this growth has taken place in the Center-West and North regions since 1970 and, in the South and Southeast prior to 1975. In the Northeast, over the whole period, the size of the cattle herd has remained relatively stable.

2.15 Commercial off-take rates (the ratio of annual commercial slaughterings to herd size) for the national herd remained fairly constant up to 1960 at about 13% (Table A.2.14). Since then, commercial off-take rates have fallen to just above 8% in 1985. This decline is believed to be due partly to Government policies that have, from time to time, banned beef exports to keep domestic prices down. Although data on non-commercial (i.e., non-inspected) slaughterings are not available, evidence suggests that this number has been increasing, at least partially offsetting the reduction in commercial off-take rates.

2.16 Milk production was essentially stagnant during the mid-1960s to early 1970s and then resumed growth. It leveled off in the late 70s and since then it has been growing at the very slow average rate of 0.4% per annum (Table A.2.15). Controlled retail prices are believed to be a

principal contributing factor. Over one-half of the output is produced in the Southeast.

2.17 The country's stock of pigs continued to increase up to 1975, but since then the stock has been decreasing. In 1985, it reached the level of the late 1960s. This phenomenon is largely explained by the rising cost of feed for pigs relative to cattle and poultry, and the increasing popularity of beef and chicken relative to pork in the average Brazilian diet.

2.18 The poultry stock has continued to rise throughout the country, with the exception of the Southeast where it has declined temporarily to compensate for some overproduction in the early 1980s. In general, production has been driven by the stimulus of export demand. In poultry, like orange juice, Brazil has succeeded in breaking into new export markets.

C. Farm Income

2.19 Data on farm income are not collected by the Agricultural Census. For the time being, at least, trends in the growth and magnitude of farm income can be inferred from trends in the growth of real sectoral output and the number of farm establishments.

2.20 Nationally, the agricultural sector registered real growth rates of roughly 4% per year through the 1960s and 1970s and 2.8% for the period 1980-1987 (Table A.1.7). The 1980s are marked by an initial period (1980-83) of deceleration (2.1% growth), followed by a small recovery (3.5% growth between 1984 and 1987). These growth rates are summarized in Table 2.3.

Table 2.3 Growth Rates of Real Agricultural GDP: 1950-1987
(%, Annual Averages)

1950-1960	1960-1970	1970-1980	1980-1983	1984-1987	1980-1987
4.5	4.0	4.2	2.1	3.6	2.8

Source: Table A.1.7

2.21 Among the regions, growth of agricultural product (and by implication, income) has varied considerably (Table A.1.11). This diversity in the growth of agricultural income became particularly pronounced during the latter half of the 1970s due to the sharp increase in growth in the frontier regions of the Center West and North (12 and 11.5%, respectively), the modest growth in the Southeast (6.7%) and Northeast (4.7%), and the low growth in the South (0.9%). Comparable data is not available on a regional basis for the 1980s. It should be noted as well that these annual averages hide substantial year-to-year fluctuations. Short-term windfalls and losses of farm income are clearly a part of these trends even for regions recording high growth. However, there is no reason to believe that the major trends and profiles outlined above do not reflect the long-term trends of agricultural production and income at the farm level.

2.22 With respect to the total number of farm establishments in Brazil, the trend has been clearly upward, rising from approximately 2 million in 1950 to 5.8 million in 1985 -- an average annual growth of 3.0% (Table A.2.16). Most of this growth is accounted for by the growth of very small farms of less than 10 ha in the Northeast, of intermediate size farms (between 50 and 100 ha) in the North, and of large farms (above 100 ha) in the Center-West (Table A.2.17).

2.23 Average farm income, obtained by relating the total number of farms to total income, showed a slight decline in real terms during the 1950s. This figure remained virtually constant during the 1960s, experienced significant growth (4.0%) for the first time during the 1970s and then leveled off to about 1.5% growth during the 1980s (Table A.2.18). The derivation of these estimates are summarized in Table 2.4.

Table 2.4 Average Real Farm Income: 1950-1985

Year	(1) Real Agricultural GDP (Cz$000 at 1980 Prices)	(2) Number of Farm Establishments (000)	(3) Average Real Farm Income (Cz$000 at 1980 Prices) (1) / (2)	(4) Annual Growth of Average Real Farm Income (%)
1950	328,032	2,065	158.9	
				-0.5
1960	504,370	3,338	151.1	
				0.4
1970	774,985	4,924	157.4	
				4.1
1975	961,236	4,993	192.5	
				4.4
1980	1,232,100	5,160	238.8	
				1.6
1985	1,500,203	5,835	257.1	

Source: (1) Table A.1.11; (2) Table A.2.18

2.24 These national averages disguise considerable variation among the regions (Tables A.2.17 and A.2.18). In the Northeast and North during the 1970s, real average farm income grew at less than 1% per annum, compared to 4% for the nation as a whole, while the Center-West experienced growth rates of over 6% and the Southeast and South -- 3% and 2.4%, respectively. The general trend which emerges is increasing skewness in the distribution of farm income among the regions. Moreover, there are considerable variations within some regions (the Northeast), reflecting the concentration of farm income within these areas.

D. Structure of Agricultural Employment

2.25 As discussed (para. 1.16), the total number of permanent jobs in the agricultural sector has remained fairly constant over most of the second half of this century, although during the early 1980s there has been a small increase. However, the composition or structure of agricultural employment has changed quite dramatically in a number of important respects.

2.26 First, there has been a significant rise in the relative importance of wage labor and a relative decline in traditional sharecropping, tenancy and family employment since the 1970s. This is summarized in Table 2.5.

Table 2.5: Structure of Agricultural Employment: 1960-1986
(%)

Year	Wage Earner	Self-employed, Employers, Tenants Unpaid Family Workers and Others
1960	26	74
1970	25	75
1980	38	62
1985	39	61

Source: 1950-1980: Table A.2.20; 1986: Table A.2.23

2.27 Second, there has been an increase in the relative importance of temporary employment. The Agricultural Census (AC), which differentiates between permanent and temporary wage labor, shows that most (approximately 56%) of the increase in wage employment that was recorded for the 1970s was of the temporary kind -- so temporary in fact that the Demographic Census (DC) did not even count it as agricultural employment.[2]

2.28 At the regional level, the developments are even more striking. In the Northeast, the proportion of wage agricultural employment to total agricultural employment increased from 22% in 1970 to 36% in 1986, while the proportion of persons classified as employers, self-employed and unpaid family workers, correspondingly declined from 78% to 64%. At the same time, according to the AC (Table A.2.21), as much as 79% of the increase in wage employment for the Northeast during this period was classified as temporary. In a region which accounts for 42% of the national agricultural labor force, these developments tend to be reflected in the national averages. Other regions exhibited similar -- and in some cases -- more dramatic changes. In the Center-West, wage employment as a proportion of total employment increased from 22% in 1970 to 48% in 1986.

2/ For an explanation of the differences between the DC and the AC, see Footnote 6, p. 6.

2.29 In terms of the distribution of the agricultural labor force among the regions (as measured by the DC), there has been little relative change since 1970 (Table A.2.20). Before that, the changes mainly involved a reduction in the relative importance of the Southeast, a corresponding increase in the relative importance of the South and a subsequent increase in the relative importance of the Center-West. These changes reflect the initial migration of agricultural labor from the Southeast to the South as coffee moved further south, followed by a movement of agricultural labor to the Center-West, as this frontier was initially opened to food crops. Since 1970, the regional shares of total agricultural employment have remained fairly constant, indicating that the expansion of soybean production, mostly in the Center-West, has had little impact on the distribution of the agricultural labor force. Since 1950, the Northeast's share in total agricultural employment has remained unchanged at its relatively high level of 40 to 42%, while its share in total agricultural income has also remained fairly constant at about 19%. The fact that the Northeast accounts for a relatively large proportion of the total agricultural labor force and, at the same time, a relatively small proportion of agricultural income, is a reflection of this region's relatively low rate of agricultural labor productivity (Table A.1.31), and is at the heart of the rural poverty issue in the Northeast.

2.30 As one would expect during a period of rising wage employment in agriculture, real agricultural wages also increased throughout the 1970s for all categories of workers (both permanent and temporary) (Table A.2.25). These trends also reflect to a large degree the increased demand for labor in the non-agricultural sector, which led to a tightening of labor markets generally (except in the Northeast), rural outmigration and a rise in real wages for those who remained in the agricultural sector. In the early 1980s, real wages tended to show some erosion as the slowdown in the economy (particularly in the urban industrial sector) reduced the demand for labor and caused some labor to return to rural areas, increasing the supply of agricultural labor and lowering agricultural wages. With partial economic recovery in the subsequent years, real agricultural wages began to increase.

2.31 The above changes in the structure of the agricultural labor force have been caused by a number of factors, the most important being: the expansion of the land frontier which has been a largely capital-using, labor-displacing process (para. 2.44); credit and fiscal subsidies that have also had this effect on factor proportions but which, in addition, have promoted land concentration through the consolidation of smaller farms (paras. 4.15 and 4.18); and changes in tenancy laws in the South and Southeast that have caused many landowners to cancel tenancy contracts, forcing tenants to seek wage employment. All of these factors have contributed to the industrialization of the rural labor force or what some Brazilian writers have called "proletarianization." Furthermore, the increase in the relative importance of temporary employment has increased the instability of agricultural employment. Both changes have important social as well as economic implications.

E. Agricultural Land Use, Tenure and Distribution

2.32 As Brazil's land frontier expanded (paras. 1.21-1.22), particularly after 1970, the process of land concentration within the expanding stock of available agricultural land also increased. This is summarized in Table 2.6.

TABLE 2.6: DISTRIBUTION OF FARMS AND TOTAL FARM AREA BY FARM SIZE: 1950-1985

FARM SIZE	FARMS (%)						TOTAL FARM AREA (%)					
(ha)	1950	1960	1970	1975	1980	1985	1950	1960	1970	1975	1980	1985
0 - 10	34.4	44.8	51.3	52.1	50.3	52.9	1.3	2.4	3.1	2.8	2.4	2.7
10 - 20	16.7	16.4	15.6	14.7	14.9	14.0	2.1	3.1	3.6	3.2	2.9	3.0
20 - 50	23.6	20.2	16.7	16.3	16.5	15.6	6.6	9.3	8.6	7.8	7.2	7.5
50 - 100	10.6	8.2	6.9	7.1	7.6	7.5	6.6	7.6	8.1	7.6	7.5	8.0
100 - 1000	13.0	9.4	8.4	8.9	9.5	8.9	32.5	34.4	37.0	35.8	34.8	35.0
Above 1000	1.6	1.0	0.7	0.9	0.9	0.9	50.9	44.1	39.5	42.8	45.1	43.8
TOTAL a/ (000)	2,065	3,338	4,924	4,993	5,160	5,835	232,211	249,862	294,145	323,898	364,854	376,287

a/ Includes undeclared
Source: IBGE, Censos Agropecuarios

2.33 The data indicate that before 1970 there was actually some reduction in the degree of land concentration. In 1950, the number of farm establishments with more than 1,000 ha (about 7.6% of the total number of farms at this time) accounted for about 51% of the total farm area in the country. By 1970, this figure had fallen to about 40%. However, after 1970, the land concentration process intensified. By 1980, the number of large farm establishments with more than 1,000 ha accounted for about 45% of the country's total farm area. The comparable figure for 1985, is 44%, which indicates that the process of land consolidation, at least at the upper end of the size distribution, may have stabilized.[3]

2.34 GINI coefficients, measuring the relationship between the size distribution of farms and total farm area by region from 1960 to 1985 are presented in Table 2.7.

3/ The AC for 1985 is still only a synopsis and the results are preliminary.

Table 2.7: Gini Coefficients for the Size Distribution of the Number of Farms and Farm Area by Region: 1970-1985

Regions	1960	1970	1975	1980	1985
North	0.944	0.839	0.868	0.835	0.800
Northeast	0.846	0.855	0.863	0.862	0.870
Southeast	0.771	0.761	0.762	0.771	0.774
South	0.727	0.727	0.735	0.745	0.753
Center-West	0.845	0.856	0.856	0.845	0.841
Brazil	0.842	0.844	0.855	0.857	0.858

Source: R. Hoffman, Evolucão da Desigualdade da Distribuicão da Posse da Terra no Brasil no Periodo 1960/80, (Rev. Reforma Agraria 12(6), Nov./Dez. 1982).

_____, A Distribuicao da Posse da Terra no Brasil, em 1980 e 1987 Revista da Associacão Brasileira de Reforma Agraria (ABA, Ano 17, No. 2, Agosto/Nov. 1987).

2.35 Among the regions, land concentration, as measured by these GINI coefficients, has continuously declined in the North, remained fairly constant in the Center-West and increased in the more established areas of the Northeast, Southeast and South. However, equally -- if not more significant -- than these regional variations over time are the high absolute values for all these coefficients -- at present, ranging from approximately 0.75-0.77 in the South and Southeast, 0.80 in the North, 0.84 in the Center-West, to a high of 0.87 in the Northeast.

2.36 Agricultural land prices generally increased in real terms during 1970-87 with the exception of 1983 and 1987 (Table A.2.28). Land prices for all categories of land (cultivated, pasture, field and forest) generally moved together, with prices for cultivated land uniformly higher (from 50 to 100%) than those recorded for the other three land categories.

2.37 A number of factors have contributed to the rise in land prices and the overall increased concentration of land holding. From 1973, land became an increasingly valuable asset to hold as inflation increased. Inflationary expectations were further fueled by the commodity boom of the mid-1970s, which added to the attraction of holding more land. Moreover, tax loopholes and other fiscal incentives, which continue today, made agriculture a tax shelter and further stimulated the demand for land (paras. 3.31-3.34). Finally, the easy availability of cheap rural credit at substantially negative real rates of interest (para. 3.25) indirectly facilitated land purchases, thereby adding to the growing demand for land. It also made the holding of agricultural land attractive just from the standpoint of collecting the rent transfers associated with these subsidies. All of these factors increased the incentive to hold agricultural land, particularly for Brazilians in the upper income brackets who could benefit from tax and credit subsidies. The net effect was to increase land concentration and raise the price of land above what it would otherwise have been. Furthermore, the increased price of land made its purchase increasingly difficult for the majority of the population. These high land prices are

also partly responsible for the migration of poor people to the frontier areas in the North in search of unclaimed land.[4]

2.38 With regard to land tenure, there have also been some significant changes. As discussed (para. 2.26), the proportion of wage agricultural employment to total agricultural employment has been increasing, while the proportion of sharecropping, tenancy and family employment has been declining. These labor market developments represent significant tenurial changes in labor's relationship to the land. In general terms, the rural population has become increasingly alienated from the land.

2.39 Agricultural land use has also changed significantly over the last several decades (Tables A.2.29 and A.2.30). In 1950, 15% of the utilized farm land in the country was under crops, 84% in pasture and the remaining 1.0% under planted trees. By 1980, the corresponding figures were 22%, 76% and 2%, respectively. The changes were even more dramatic in the South, where the proportion of utilized farmland devoted to crops more than doubled over this period (from 19 to 39%), and, in the Center-West, where the proportion of utilized farm land under crops went from an insignificant 1.7% in 1950 to 9% in 1980. Almost all of the new land brought under cultivation in the Center-West represented the substitution of crop land for pasture as extensive livestock development was pushed further north.

2.40 Utilized farmland, as a proportion of total farm area, increased only slightly over the period -- from 55% in 1950 to 62% in 1980, indicating that the intensity of land use increased, but not much. However, at the regional level there were some significant variations. In the Northeast, the proportion of utilized farm land to total farm land increased the most -- from 39% in 1950 to 54% in 1980; in the North, it increased from 12% to 23%; in the South, from 66% to 77%; in the Southeast, from 69% to 79%; and, in the Center-West, the proportion actually declined, from 68% to 65%. These results are generally consistent with previous empirical research in Brazil which has shown that land intensity as defined by the above ratio) varies inversely with farm size; i.e., smaller farms use the available land more intensively.[5] Thus, in the Northeast, which has the largest proportion of small farms, land intensity is relatively high, and in the Center-West, which has the largest proportion of large farms, land intensity is relatively low.

F. Factor Proportions in Agricultural Production

2.41 Factor proportions in agriculture have changed dramatically during the last several decades and strongly reflect a labor-saving, capital-using technology, namely, mechanization (Table A.2.31). The use of tractors per ha of cultivated land doubled from 1960 to 1970, then tripled from 1970 to

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4/ Hans Binswanger, Brazilian Policies that Encourage Deforestation in the Amazon. (Environment Department Working Paper No. 16. Washington, D.C., 1989).

5/ William R. Cline, Economic Consequences of a Land Reform in Brazil, (Amsterdam: North-Holland Publishing Co., 1970).

1980. This increase was fairly uniform across all regions for both decades. In contrast, during the 1980s, this indicator of mechanization only increased 20%, reflecting the sharp decline in agricultural income and investment during the recession years of the early 1980s.

2.42 Additional indicators reinforce the same factor proportion profile. Tractors per persons employed more than doubled (2.3 times) from 1960 to 1970, almost tripled (2.7 times) from 1970 to 1980, but increased only 8% from 1980 to 1985. Shifting the focus to persons employed per ha, this measure of labor intensity or absorption declined about 5% from 1960 to 1970; from 1970 to 1980, however, this indicator declined 17%, or three times the drop recorded in the previous decade. This trend appears to have stopped during the recession years of the early 1980s. From 1980 to 1985 there was actually a slight rise of 3% in this measure, reflecting the decline in investment in labor-displacing tractors and machinery and a reverse migration of labor from urban to rural areas during this period of high urban unemployment. As the supply of rural labor increased in the early 1980s, real agricultural wages declined (Table A.2.25). The key indicators of factor proportions at the national level for selected years are summarized in Table 2.8.

Table 2.8 Agricultural Factor Proportions: 1950-1985

Year	Tractors Per 1000 Ha of Cultivated Land	Tractors Per 1000 Persons Employed		Persons Employed Per 1000 Ha. of Cultivated Land	
		Ag.Census	Dem.Census	Ag.Census	Dem.Census
1950	0.44	0.36	0.81	576	543
1960	2.16	3.97	4.94	544	432
1970	4.88	9.43	12.67	518	385
1980	11.10	25.76	43.06	431	257
1985	12.45	28.02	--	444	--

Source: Table A.2.31

2.43 In regional terms, the Center-West recorded the highest level of labor displacement from 1970 to 1980, with a 46% decline in employed labor per unit of land. This was followed by declines in the North (35%), the South (20%), the Southeast (13%) and, also the Northeast (10%), the region least affected by labor-displacing technology.

2.44 The changes in the 1980s have, at least temporarily, brought this intense period of labor displacement to a halt. All regions (except the Center-West) from 1980 to 1985 recorded either no significant change or substantial increases in labor absorption (especially the Northeast with a 9% rise). Only the Center-West continued on its previous labor- displacing path of technological change, recording a modest decline of 9% in labor per ha (Table A.2.31). This occurred in the face of declining real wages in agriculture during this period (Table A.2.25), attesting to the strength of the mechanization process in the production of soybeans which has led the expansion of the frontier in general and the development of the Center-West region in particular.

2.45 Finally, production indicators on tractors indicate that domestic sales of wheel tractors increased from 14,000 units in 1970 to 51,000 units in 1980. This was followed by a decline of sales to 22,000 units in 1983, then a sharp rise to 46,000 units in 1986 (Table A.2.32). This recent recovery suggests that the halt in labor displacing mechanization of the early 1980s may be only temporary in nature -- a result of macroeconomic stagnation and decline. Therefore, once the economy shows signs of recovery, the agricultural resource endowment, land size distribution and policy bias on relative prices which favor more capital intensive development, could resuscitate the labor displacing technologies of the past unless policy changes are introduced to shift the path of technological change.

G. Composition of Agricultural Investment

2.46 The composition of agricultural investment has changed markedly over the last couple of decades (Table A.2.33).[6] This structure at the national level is summarized in Table 2.9.

Table 2.9 The Composition of Agricultural Investment: 1970-1980

(%)

Year	Land Acquisitions	Houses	Installations	New Pastures and Seedlings	Breeding Stocks and Draft Power	Machines and Instruments	Vehicles	Total
1970	19.8	9.8	19.2	9.0	17.0	14.3	10.8	100
1975	16.4	8.6	19.1	10.1	15.6	19.8	8.4	100
1980	15.6	8.1	12.5	18.8	30.6	9.2	5.1	100

Source: Table A.2.33

2.47 In interpreting the above figures, it is important to recognize the problematical nature of attaching value to breeding stock and draft animals in census surveys. Nevertheless the sharp relative increase in this category appears to reflect an important trend during the 1970s, even if the precise estimates may be open to some question. Most of this relative increase occurred from 1975 to 1980, coinciding with the peak of the soybean boom, the rapid growth of livestock activities in the frontier regions of the Center West and the North (induced to a large extent by fiscal incentives), and the growth of citrus plantings in Sao Paulo and Minas Gerais and coffee in frost-free Minas Gerais and Mato Grosso.

6/ It should be noted that these sectoral investment figures are obtained from the Agricultural Census and are not derived from, nor necessarily consistent with, the national income accounts. As noted (para. 1.23), the National Income Accounts do not provide information on the sectoral breakdown of investment.

2.48 For example, in 1970, farm machinery, vehicles and tractors accounted for 22% of total agricultural farm investment in the Southeast, 35% in the South, and 18% in the Center-West. By 1980 the share of these items in total farm investment had dropped roughly by half in all three regions -- 12%, 21%, and 13%, respectively -- indicating a relative decline in this indicator of mechanization, at the same time there was a rise in the relative shares of breeding stock and draft animals and permanent crop investments (Table A.2.33). Thus, the major thrust in investment in mechanized technology launched in the 1960s, appears to have peaked by the mid-1970s. While still continuing, it has been overtaken in relative terms by investments in breeding stock, draft animals and permanent crops.

2.49 In terms of regional shares in sectoral investment, the Southeast recorded the largest share (39% in 1970 and 40% in 1980), followed by the South, the Center West, the Northeast and the North. Over this decade, the North and the Northeast (similar to the Southeast) maintained their relative shares of total sectoral investment at roughly the same level (2-2.5% for the North and 12.5-14.0% for the Northeast). The large regional shifts occurred between the South (dropping from 36% of total farm investment in 1970 to 23% in 1980) and the Center West (increasing its relative share from 10% in 1970 to 21% in 1980). This rising investment in the Center West was associated with a rise in the relative shares of breeding stock and draft animals (from 24% in 1970 to 32% in 1980) and to seedlings for permanent crops (from less than 1% in 1970 to 18% in 1980).

H. The Structure of Agricultural Exports and Imports

2.50 Over the last several decades, the structure of agricultural exports has changed in two important respects. First, agricultural exports have become considerably more diversified. This change is largely due to the precipitous decline in the relative importance of coffee (from 68% in the early 1950s to 25% in the 1980s), and the even greater rise in the relative importance of soybean products, (from 3% to 24% of total agricultural exports) during the same period (Table 2.35). The changes in the composition of agricultural exports are summarized in Table 2.10.

TABLE 2.10: COMPOSITION OF AGRICULTURAL EXPORTS: 1951-1985

(% of total agricultural exports)

PRODUCTS	1951	1960	1970	1980	1985
Raw sugar	--	4.8	6.2	6.4	1.7
Raw cotton	13.4	4.1	7.5	--	0.8
Raw coffee	68.0	64.5	45.8	25.3	24.6
Beef	0.1	0.3	3.4	0.2	2.7
Cashewnuts	--	--	0.4	0.7	1.1
Soymeal	--	--	2.1	14.8	12.2
Tobacco	1.2	1.7	1.5	2.5	4.5
Soybeans	0.3	--	1.3	4.0	7.9
Frozen poultry	--	--	--	2.1	2.5
Crystalized sugar	--	0.5	--	3.2	0.3
Cocoa butter	0.5	2.2	1.4	1.6	2.1
Soy oil	--	--	--	4.2	3.4
Refined sugar	--	--	--	3.5	1.7
Processed coffee	--	--	2.2	2.9	2.7
Orange juice	--	--	0.7	3.5	7.8

Source: Table A.2.35.

2.51 Second, exports of primary commodities have diminished in relative importance (from 87% to 68% of total agricultural exports between the mid-1960s and 1980s) while the relative importance of exports of semi-processed and manufactured agricultural products increased from 13 to 34% (Table 1.34). The growth of the latter has been led by such products as soybean cake and oil, orange juice concentrate, and cocoa products. These processing industries were established with substantial fiscal and credit subsidies. Also because of intermittent trade controls, these processing industries were often able to pay farmers at prices below those in the world market. These trade controls, in effect, transferred income from the producers to the processors.

2.52 On the import side, there has been little -- if any -- structural change. From 1970 to 1987, the proportions of primary/semi-processed products and agricultural inputs (fertilizer, chemicals and machinery) to total agricultural imports remained fairly constant at about 64% and 36%, respectively. However, some significant changes have occurred within the category of primary and semi-processed agricultural imports. Particularly important products in this category are meat, grains, dairy products, and wood and charcoal, all of which experienced significant growth. Cereal imports increased from 1.8 million tons in 1971 to 6.4 million tons in 1986 before falling to 3.9 million tons in 1987. Wheat accounted for the bulk of these imports, but maize and rice imports also grew in importance (Table A.2.36).

III. POLICIES AFFECTING AGRICULTURE

A. Introduction

3.01 In the previous two chapters, Government interventions on both the policy and expenditure sides, have been identified as playing an important causal role in the evolution of the agricultural sector, both in relation to the rest of the economy and to changes within the sector itself. This chapter describes the major institutional and economic features of those interventions. The next chapter evaluates these interventions and makes recommendations.

3.02 Policies (including expenditure decisions which may be viewed as a policy choice) are divided into two categories: those direct, agriculture-specific policy interventions that affect the agricultural sector; and (ii) those indirect, economy-wide policies that also affect the agricultural sector.[1] The policies under the direct category which are examined include: (i) the minimum price support program; (ii) public storage; (iii) wheat subsidies; (iv) sugar marketing controls; (v) trade controls on the import and export of agricultural products; (vi) subsidized rural credit; (vii) agriculture-specific taxes and related fiscal incentives; (viii) land policy; and (ix) government expenditure policy in the agricultural sector. Those policies covered under the indirect category include: (i) exchange rate policy; (ii) trade controls on non-agricultural goods used in the agricultural sector; (iii) general taxes; and (iv) non sector-specific public investments.

B. Direct Interventions

1. Minimum Price Program

3.03 The Minimum Price Program (MPP) is the Government's most comprehensive program of direct price intervention in agricultural product markets.[2] It covers both major grain and food crops (rice, beans, maize, and cassava) as well as export crops (soybeans and cotton) and many minor crops (silk, carnuaba wax, castor beans). The program is administered by CFP (Commodity Financing Corporation), a semi-autonomous agency under the Ministry of Agriculture (MINAGRI). CFP buys commodities covered by the MPP at a minimum price. These prices are recommended by CFP but the final decisions are made by the National Monetary Council. CFP also sells the stocks it accumulates, thus affecting market prices in this manner as well.

3.04 The MPP's objectives are to provide income support for producers and to stabilize domestic market prices through providing both inter- and

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1/ This is the same classification of policy that is used in the forthcoming study by Ann Krueger, Maurice Schiff and Alberto Valdes, The Political Economy of Agricultural Pricing Policies: Country Studies (Oxford University Press).

2/ For a description of the most important agricultural product markets see Annex 9.

intra-annual price supports and incentives for storage. The MPP operates through two interlinked programs:

a) Direct Government purchases (Aquisição do Governo Federal or AGF); the Government guarantees to purchase any quantity of output at a minimum price; and

b) Government storage loans (Emprestimos do Governo Federal or EGF); the Government provides credit (often subsidized) to producers, cooperatives, traders or processors as an inducement to hold stocks for up to 180 days.

3.05 While AGF guarantees minimum prices, EGF is intended to smooth out price fluctuations by encouraging stockholding. Producers and cooperatives may apply for EGF with or without an option to sell to CFP. The buying option allows the EGF holder to convert to AGF if the market price falls below the minimum price. Commodities for EGF financing are valued on the basis of the minimum prices. EGF financing used to be provided through the Bank of Brazil and the commercial banks, using both Government funds and compulsory applications (para. 3.20) from the commercial banks. In the past two years, with changes in rules governing federal monies, EGF has been funded mainly by the Bank of Brazil and state banks. Tables A.3.1 through A.3.5 summarize AGF/EGF operations.

3.06 Under the present operating rules, minimum prices are established in August for the main crops (rice, maize, soybeans, cotton), which are harvested in March to July of the following year. Minimum price recommendations made by CFP are based on a number of considerations, including the cost of production, international prices as well as current policy either to promote or discourage a particular crop. There are no prescribed rules for setting these prices. In recent years, for example, the Government has sought to encourage production of basic food crops (rice, maize and beans) by setting minimum prices which are more attractive than those for export crops (soybeans and cotton). Minimum prices are indexed on a monthly basis. Average annual minimum prices for the major crops purchased by CFP (irrigated rice, dry rice, maize, soybean, black beans and seed cotton) since 1967 are presented in Table A.3.6. Real minimum price trends are shown in Table A.3.7.

3.07 With respect to CFP's sale of stocks to control prices, until recently these operations were not governed by any rules. Table A.3.5 summarizes these operations since 1975. In 1988, CFP introduced a modified price band system for five major commodities (rice, beans, maize, soybeans and cotton). Under this system, when the market price rises above the intervention or ceiling price (defined as 12%, or 17% in the case of beans, above the average wholesale price over the previous 60 months), CFP is supposed to sell stocks. These stocks must be sold for at least the minimum price (i.e. the price at which they are bought from the farmer) plus 5%. This constitutes the floor price.

2. Public Storage

3.08 Of the country's estimated total storage capacity of approximately 60 million tons, the public storage companies own about 20%. In addition,

they are major renters of storage at all levels. In total, the public storage companies use about 50% of the total storage capacity in the country.[3] These public storage companies include the Companhia Brasileira de Armazenamento (CIBRAZEM), which is the federal storage company, and 17 state storage companies. CFP, in the administration of its crop purchase program (AGF), uses the facilities of CIBRAZEM and those of some state storage companies, particularly in Sao Paulo and Parana, as well as those of cooperatives and private companies. CIBRAZEM's policy has been to concentrate its activities in the Center-West, North and Northeast regions. Its dominance in these areas and low subsidized rates have tended to discourage private investment.

3. Wheat Subsidies

3.09 The Government's wheat policy is to become self-sufficient in wheat production. It has sought to achieve this goal by having CTRIN (the wheat department in the Bank of Brazil, which operates as a monopoly) buy wheat from farmers at very high prices that have consistently -- and to a large degree -- exceeded equivalent import parity prices (para. 4.10). At the same time, the Government has chosen not to pass the full cost of its intervention at the producer level on to the millers and consumers. Instead the Government, through CTRIN, sells the wheat to the miller at below cost. In addition, the consumer price is controlled, thus limiting processing and retail margins to the difference between the Government's selling price and the fixed consumer price. A summary of wheat production imports, consumption and prices for producers, millers, and consumers since 1970 is presented in Table A.3.9.

3.10 In 1987, in an effort to cut the fiscal deficit, the Government reduced wheat subsidies.[4] The Government announced its intention to keep the wheat program self-financing by setting consumer prices on the basis of the total costs of the program (i.e. the combined import and domestic acquisition costs, plus the transport, handling and storage costs incurred by CTRIN). However, consumer subsidies continued throughout 1987 as price adjustments were not adequate to cover costs fully. The Government has recently formed a working group to study the impact of privatizing wheat marketing.

4. Sugar Marketing Controls

3.11 The sugar industry complex is one of the more heavily controlled industries in Brazil. The price of sugarcane, sugar ex-mill and ethanol ex-distillery are controlled by the Sugar and Alcohol Institute (IAA). In addition, the IAA sets production quotas for all mills and distilleries in the country. The IAA also intervenes directly in marketing by buying all mill and distillery products in the Northeast and by serving as the country's only (monopoly) exporter of sugar products (para. 3.16). There is currently a growing black market for sugar and alcohol.

3/ World Bank, Agricultural Storage and Marketing Review (Grey Cover, March 2, 1989).

4/ The Bank has supported the reduction of this subsidy under Loan 2727-BR.

3.12 In general, the controlled prices of products have very little to do with market factors at home and abroad and much more to do with Brazil's goal of substituting sugarcane-based ethanol for imported petroleum-based fuels -- the National Alcohol Program (PROÁLCOOL). At present about two thirds of the sugarcane is converted into ethanol. In addition, regional interests have also prevailed, as reflected in the fact that the controlled producer price for sugarcane is higher in the Northeast than it is in the State of Rio de Janeiro, where it is also marginally higher than elsewhere.

5. Agricultural Trade Policy

3.13 Agricultural trade policy has been consistently guided by a model of "exportable surplus" that treats exports as a residual after domestic demand is met. Thus, to ensure supplies at home, outright bans and export quotas have been applied from time to time. This rationale has governed trade policy for many years but has become increasingly dominant in trade policy decisions in recent years because of the need to hold down domestic inflation and the important weight of some of these tradeable commodities in the consumer price index.

3.14 The restrictions on exports have been introduced and removed as and when deemed necessary, effectively reducing the conduct of trade policy to the issuance of administrative decrees. Trade policy is formally decided by the National Monetary Council (with representation from major ministries) and CONCEX -- the public/private sector trade commission, although many important decisions on trade policy (e.g. imposing bans or quotas) have been made at the administrative level. With the ratification of the new Constitution and a movement away from administrative law in Brazil, it is presently unclear how this will affect trade policy and what role the legislature will play.

3.15 Direct government interventions in agricultural trade may be grouped into three basic categories:

(i) Government monopolies (IAA for sugar exports and CTRIN for wheat imports);

(ii) intermittent trade bans and embargoes on commodities controlled by CACEX (soy products, cotton, maize, rice and beef); and

(iii) the monitoring by CACEX of agricultural commodities, the export of which is essentially free (cocoa, orange juice, fruits and vegetables); IBC regulates and monitors coffee marketing.

3.16 Sugar exports are a monopoly of the IAA (para. 3.11), which buys sugar on the domestic market and contracts for export. Brazil is unique among sugar producers in that it exports raw, cristal and refined sugars. Most sugar is shipped from the Northeast due to transportation advantages, but the IAA also ships from refineries in the Southeast. In the past, the IAA ran a stabilization fund (since domestic prices are not linked to world prices), but this function has been taken over by the Treasury. Producers can export high-test molasses directly, with IAA's permission. Sugar export policy is currently changing; a decree was signed in 1988 which prohibits the use of official funds for sugar export operations after June 1, 1989, but no decision has yet been reached on how exports will be handled.

3.17 CTRIN handles all wheat imports -- it also has a monopoly in all domestic marketing of wheat (para. 3.09). The import contracts are drawn up by the National Superintendency of Supply (SUNAB) in the Ministry of Finance. Currently Brazil is under a five-year contract with Argentina. Brazil does not export wheat.

3.18 In 1988, the Government instituted partial trade policy reforms (CONCEX Resolution 155), aimed at reducing trade barriers for four commodities: soy products (beans, meal and oil) cotton fiber, rice and maize.[5] Under this new policy, exports and imports of these four commodities are free from quantitative restrictions but are subject to continued licensing by CACEX and, in the case of maize and rice, a variable tariff. This tariff would raise the CIF import price for these commodities to a level equal to the intervention or the ceiling price, derived from the price band formulas introduced to guide the operations of CFP in the disposal of stocks in the domestic market (para. 3.07). To date this tariff system has not been tested as CIF import prices for these commodities have not been below domestic prices and bumper crops in 1987, 1988 and 1989 have assured ample domestic supplies.

3.19 The Government also intervenes through the IBC (Brazil Coffee Institute in the Ministry of Industry and Commerce) to regulate coffee export marketing. In this role the IBC auctions quota stamps to divide up the quota it receives from the International Coffee Agreement (ICA),[6] it collects an export tax (confisco), which was recently reduced from 36 to 12%, it sets stock retention rules for exporters,[7] and it sets minimum export registry prices (i.e. the minimum price exporters must register when they record their sales) to prevent under-invoicing. The revenue accruing from the sales of the quotas and from the confisco are transferred to the coffee price stabilization fund (FUNCAFE), which was created in 1987. Prior to this, the confisco accrued to the Treasury.

6. Subsidized Agricultural Credit

3.20 In the mid-1960s, the Government began intervening on a large scale in rural credit markets by supplying funds to the banking system

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5/ These reforms were supported by the Bank under the Credit and Marketing Reform Project, Loan 2727-BR, approved in June 1986.

6/ The auction system was introduced in 1987 to replace a complicated non-transparent system for allocating quotas. Brazil currently holds the largest single quota under the ICA: 29% or 16 million 60-kg. bags (960,000 MT).

7/ Under current rules, when the auction price for stamps is bid to or above 50% of the value of the confisco, the purchaser must retain three bags of coffee for every bag exported; less than 50%, two bags must be retained.

(principally Banco do Brasil) to be onlent to agricultural producers at highly concessional fixed rates of interest, and by requiring all banks with demand deposits to earmark a fixed proportion of these funds for lending to agricultural producers at the same highly concessional fixed rates (compulsory applications).[8]

3.21 Rural credit, financed directly by the Government, has accounted for the largest, albeit decreasing, portion of rural credit operations since 1965 (Table A.3.10). During the 1970s, Government-funded credit accounted for about 80-90% of total rural credit. This ratio declined to about 50% in 1986-87 and to about 31% in 1988, reflecting the Government's budgetary problems as well its efforts to broaden the funding base for rural credit. In 1989, the Government was again the major source of funding for rural credit (55% of the total), as funding from other sources declined substantially.

3.22 The sources of financing for Government-funded subsidized credit have changed substantially over time. Until 1985, a major source was the current account (conta de movimento) of the Bank of Brazil with the Central Bank. Funding through this account was relatively uncontrolled, complicating monetary management and exacerbating inflationary pressures. This was especially so in the late 1970s when the volume of rural credit and credit subsidies expanded rapidly. In 1986, the conta de movimento account was abolished as part of a more general fiscal and monetary reform. Government-funded credit is now wholly financed through the fiscal budget, and -- in principle -- subject to greater control than before.

3.23 Compulsory applications of demand deposits have been a variable but important funding source for rural credit. During the 1970's, the proportion of total rural credit financed from compulsory applications ranged from 10-19%. In 1987-88, this proportion was about 31% of a much reduced total volume of rural credit; in 1989, this proportion declined to 16%. To maintain compulsory applications as an important funding source, the National Monetary Council has had to adjust the rates of compulsory applications (as a percent of net sight deposits) periodically to compensate for shifts in the structure of bank liabilities (Table A.3.12).

3.24 In an effort to broaden the funding base for rural credit, the Bank of Brazil was authorized in 1987 to accept rural savings deposits (caderneta de poupanca rural) (Table A.3.13). The authorization has also been extended to two other official banks (Northeast Bank of Brazil and the Bank of Amazonia). Currently, at least 65% of the rural savings deposits are required to be allocated to rural credit. By the end of 1989, rural savings deposits had reached a total of US$3.1 billion equivalent and had become an important source of funding for rural credit.

3.25 Interest rates on official credit (Tables A.3.14-A.3.16) have provided considerable subsidies. These subsidies (rates and total levels) by type of rural credit have been estimated and are shown in Tables A.3.17

8/ For a detailed account of rural credit developments until 1982 see World Bank, Brazil: Financial Systems Review (Washington, D.C., 1984).

and A.3.18. Four phases may be distinguished.[9] Between 1965 and 1973, real interest rates were moderately negative. The second phase, 1974-83, was a period of strongly negative real interest rates, ranging from negative 32 to 35%. In 1980, a system of ex ante indexation of rural credit was introduced in which nominal interest rates were set at levels which incorporated the Government's expectations about future inflation. Since these expectations always understated actual inflation, real interest rates on most official rural credit continued to be highly negative through 1983. During the third phase (1984-88), a system of indexation was adopted in which the outstanding principal was adjusted in accordance with changes in the price of Government bonds (ORTN). As a result, real interest rates on official credit during this period became positive or close to positive, which, however, was still far below market rates. The fourth and current phase began in January 1989 as part of the government's new stabilization program ("Summer Plan"). The interest rate on government-funded rural credit was increased to 12% plus monetary correction based on the Consumer Price Index (IPC), and the interest rate on rural credit financed from compulsory applications of bank deposits was allowed to be freely negotiated between borrowers and lenders up to 12% with monetary correction. The 12% limit is the interest rate limit under the new Constitution, although it has not been enforced for commercial lending.

3.26 The changes in the volume of rural credit by term and use and in current and real terms since 1970 are summarized in Tables A.3.19 through A.3.23. The 1970s was a period of rapid expansion. Credit volume grew at an average annual rate of 17.5% in real terms. By the mid-1970s credit volume had risen to 92% of agricultural GDP, and by end of the decade, had reached a peak of about US$16.7 billion equivalent, or over four times the volume in 1970. In contrast, the 1980s has generally been a period of contraction in rural credit, reflecting mainly the growing funding constraints on the supply side, and also a decline in credit demand due to increased uncertainties in the economy and increases in real interest rates on official credit (para. 3.24). Current policy is to contract further the supply of official rural credit.[10] A summary of the above changes in the volume of rural credit is presented in Table 3.1.

9/ It should be noted, however, that throughout this period, in addition to the "normal" official interest rate, there were many other even lower official interest rates on special programs. The major ones included: PRODECER, a program for the development of the cerrado areas; PROFIR, a program to support investment in irrigation equipment; PROVARZEAS, a program for irrigation of lowland areas; PROINAP, a program to support investments in soil conservation, storage and irrigation; PAPP, a small farmer development program in the Northeast region; PRONI, a program of irrigation outside the Northeast; and PROALCOOL, a program to expand production of alcohol from sugar cane. Until 1983, when official interest rates on special programs were unified with those on normal official credit (except for the PAPP Program), there were over ten different official interest rates depending on the use of the credit, borrower group, region and crop.

10/ Two Bank loans (Loan 2960-BR and 2971-BR) are aimed at assisting the Government to achieve this objective.

Table 3.1: Real Changes in the Volume of Rural Credit: 1970-1989

	Rural Credit (Cz$000 at Constant 1985 Prices)	Index (1980=100)	Change (%)
1970	24,009,418	25	n.a.
1971	26,648,793	28	15.82
1972	33,022,325	35	23.92
1973	46,746,425	50	41.56
1974	57,956,127	62	23.98
1975	84,476,900	90	45.76
1976	86,557,893	92	2.46
1977	77,276,861	83	-10.72
1978	78,575,265	84	1.68
1979	97,899,283	105	24.59
1980	93,626,634	100	-4.36
1981	81,214,315	87	-13.26
1982	78,639,450	84	-3.17
1983	59,362,926	63	-24.51
1984	36,258,733	39	-38.92
1985	51,705,203	55	42.6
1986	77,101,814	82	49.12
1987	60,776,200	65	-21.17
1988	40,285,452	43	-33.72
1989 a/	22,517,524	24	-44.11

a/ Provisional estimates

Source: Central Bank of Brazil - DERUR (1970-87); SEAE/MINIFAZ (1988-89).

3.27 In terms of the distribution of rural credit by region, size of producer and crop, the principal beneficiaries have been the relatively large export crop producers in the South, Southeast and Center-West. This is summarized in Tables A.3.24 through A.3.28.

7. Taxes

3.28 Two taxes which affect agriculture are discussed in this section -- the value-added tax on the production of all goods (ICM) and the income tax.[11] These two taxes are discussed in this section on direct (sector-specific) policy interventions due to the fact that certain treatment accorded agricultural products and income has the effect of making these taxes sector-specific. The land tax is discussed under land policy (paras. 3.40-3.41). Taxes on agricultural exports are limited to coffee and cocoa. As mentioned (para. 3.19), the coffee export tax (confisco) was recently reduced from 36 to 12%. The cocoa export tax is currently 10%.

3.29 Value-added Tax. ICM (Imposto Sobre Circulacao de Mercadorias) is a value-added tax levied by states on the sale of goods at all stages of production, excluding industrial exports and those goods subject to specific excise taxes. Recently, most services, with the exception of financial services, have been included in the ICM tax base of taxable goods. As of 1989, the new constitution transfers to the individual states the authority for setting rates and determining exemptions on intra-state

11/ For a more detailed discussion of the value-added and income taxes in the total economy see: World Bank, Assessment of the Brazilian Tax System, forthcoming report.

sales. The authority for setting rates on inter-state and international sales still remains with the federal government.[12]

3.30 While industrial exports are exempt from the ICM, agricultural exports (mainly coffee, orange juice and soybean products) pay the ICM. Agricultural inputs (fertilizers, chemicals and seeds) are exempt from the ICM tax, although capital inputs (machinery) are taxed. Furthermore, the tax paid on capital inputs is not creditable (i.e., eligible for a tax rebate). In addition, the ICM tax is paid on maize when sold for the production of flour for human consumption, but it is not paid when sold for the production of animal feed. Meat (unless it is frozen) and all fruits and vegetable exports (except pineapple) are exempt from the ICM. It is estimated that the agricultural sector accounts for about 6% of total ICM revenues.

3.31 Income taxes. An estimated 0.6% of the total revenue collected by the Government from income taxes is obtained from the agricultural sector (0.2% from the individual withholding tax and 0.4% from the corporate income tax).[13] At the same time, this sector accounts for about 10% of national income (Table A.1.3). This discrepancy is largely explained by the numerous exemptions, exclusions, fiscal incentives and other special treatment accorded firms and individuals (largely wealthy ones, as the vast majority of the agricultural population are below the minimum taxable income level) in the sector, as well as the lack of enforcement.

3.32 To calculate taxable income, the present income tax code gives corporations and individuals the generous option of using 10% of their gross agricultural income or alternatively subtracting their actual expenses from their gross income. In estimating these expenses, investments in fixed assets, animals and buildings can be totally depreciated in the first year and then depreciated several times after that on the basis of certain formulae. Up to 80% of farm profits can be sheltered in this way, and, if, after all these adjustments, the derived expenditures, including depreciation, exceed current income, the difference can be carried forward to offset tax liabilities in the future.

3.33 Having estimated taxable agricultural income in this way, corporations and individuals can then, under a variety of provisions in the tax code, exclude up to 80 and 90%, respectively. In addition, investments in special programs for regional development can be deducted up to 50% of the tax liability and the interest earned on these investments can be totally deducted.[14] Furthermore, any losses as a result of such

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12/ Current tax rates (which are under review) are 17% for intra-state transactions and final consumption and 12% for most interstate transactions, except for shipments from the South and Southeast to the Northeast, Center-West and Espirito Santo, which are taxed at 9% and 13% for exports.

13/ This figure does not include the revenue obtained from the personal income tax, although its inclusion is unlikely to increase the percentage above 1.0% as many of the largest farms are incorporated and their share is included in the estimate.

14/ These programs include the Northeast Fund (FINOR), the Amazon Investment Fund (FINAM), the Sectoral Investment Fund (FISET) and the Brazilian Aeronautical Enterprise (EMBRAER).

investment can be offset against future tax liabilities. On top of all this, corporate agricultural profits are then taxed at a rate of only 6% compared to 35% to 45% for corporate profits from other sources.

3.34 The net effect of all these provisions is that almost all agricultural income escapes taxation. This makes agriculture a good tax shelter for both agricultural and non-agricultural income. At present, the income tax code is under review, but proposals for change have met with heavy resistance from the agricultural lobby.

8. Land Policies

3.35 Brazil's land policy is based upon a body of laws and decrees, both executive and judicial. These laws and decrees, among other measures to provide secure access to land, specify the circumstances under which Brazilians many acquire title to land. Title to land may be obtained in a number of ways including through grants, transfers and occupation and use of the land.[15] In practice, however, the formalities to be complied with, including the uncertainties introduced by the unreliability of the real estate registries (cartorios), have tended to work against the relatively uneducated smallholder (minifundio) and in favor of the larger, better educated and more sophisticated largeholders (latifundio).

3.36 In an effort to assist the landless and smallholder farmers, and, at the same time, not expropriate land for redistribution, the Government in the 1970s began its official settlement program with the opening up of Amazonia.[16] Most of the settlers were from the South. It is estimated that only about 23,000 settlers in the 1970s were from the Northeast, contrary to the original expectation that such settlements would relieve socio-economic pressures in the Northeast. Plans originally called for settlement of about 70,000 families in Amazonia by 1974. At the end of the decade, however, the National Institute for Colonization and Agrarian Reform (INCRA) had settled only an estimated 8,000 families. By 1983, of the total area of 18.7 million ha of vacant land, official settlement schemes had taken up only about 1.47 million ha (7.9%) and a little over 80,000 families had been settled.

3.37 In general, these official settlement schemes, which accounted for about 20% of the settlers in Amazonia, were not very successful.[17] After a few years many settlers left. INCRA estimates that between 20-30% of the settlers abandoned their plots, unofficial estimates are higher. The lands were then reconsolidated by large landholders, thereby negating the original goal of encouraging smallholder farming.

15/ These methods and the details of the land tenure system in Brazil are presented in Annex 6.

16/ Legal Amazonia comprises seven states and territories (Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia and Roraima) and parts of two others (Goias and Maranhão).

17/ Among the reasons most often cited are: continued underfunding and inadequate staff of INCRA; emphasis on large-scale schemes; inadequate surveys of land quality and insufficient coordination with the extension service.

3.38 To stem the tide of environmentally damaging private settlement in the Northwest (Rondônia and Mato Grosso), the Government in 1980 embarked on the Northwest Region Integrated Development Program (POLONOROESTE) which was aimed at trying to lead development in a more sustainable, and less environmentally damaging direction. However, this program was not successful due in large part to conflicting policies, including fiscal incentives (paras. 3.31-3.34) that have been driving the settlement process. Recently in the State of Rondonia, both the federal and state government have moved to introduce a more consistent set of policies, including: agro-ecological zoning; the suspension of fiscal incentives in selected zones: improved enforcement of environmental legislation; and the promotion of more sustainable farming systems for already settled areas.

3.39 In recent developments, the National Agrarian Reform Plan (PNRA) was published by the Ministry of Agriculture (MINAGRI) in 1985, but has been implemented only in limited areas. An Agrarian Reform Ministry (MIRAD) was also created in 1985. Subsequently, two decrees, passed in 1987 and 1988 abolished INCRA and transferred its functions to MIRAD; prohibited the expropriation of property that has "an area under production regardless of size or social function"; and provided that below a certain size holding (1,500 ha in the North, 1,000 ha in the Center-West, 500 ha in the Northeast and 250 ha in other parts of the country) the land cannot be expropriated, regardless of the number of such holdings. In January 1989, MIRAD was abolished by Provisional Measure and its functions, including agrarian reform, were transferred to the Ministry of Agriculture. Subsequently, Congress overturned the law abolishing INCRA, and, in mid-1989, the Ministry of Agriculture was functioning as its Acting President. Finally, the new Constitution introduced further changes. Although the constitution provides for the expropriation of land in the social interest subject to payment of compensation, it also defines the lands which cannot be expropriated to include "small or medium rural property" where the owner possesses no other land or "productive property." These exemptions require clarification by implementing and subsidiary laws. In general, the political scope for major land reform appears limited.

3.40 The land tax (ITR) was introduced to encourage the more efficient use of land. The tax is calculated on the value of the "bare land useful for agricultural production." This "useful" area is the total area of the farm less the area occupied by (i) structures; (ii) forest reserves (for instance, in the Amazonia this area must cover 50% of the total area, although there is no requirement that the forested area should be in one block); and (iii) uncultivable land. The useful area is then divided by the fiscal module of the municipality in which the land is situated. This module is determined by taking into account: (i) the predominant type of cultivation in the municipality; (ii) the average income derived from such exploitation; (iii) the "family property" needed -- that is, the minimum area of cultivable land deemed necessary to produce subsistence and economic and social development of the farmer and his family; and (iv) proximity to urban areas. Farms up to the module (and up to 25 ha if farmed by the owner with the family's assistance) are exempt from ITR. Thereafter, the tax rate ranges from 0.2% (up to 2 modules) to 3.5% (for areas equal to or more than 100 modules). It is, however, possible to reduce the tax by up to 90% on the basis of the percentage and efficiency of land use in accordance with indexes prepared by INCRA. Use below the

minimum area prescribed results in the imposition of penalties which increase the tax payable in each subsequent year (by a multiple of two in the first succeeding year, three in the next year, and four in the third and subsequent years). Thus the rate could reach 14%.

3.41 In theory, the ITR could be a useful instrument to encourage rational and efficient land use by increasing the cost associated with holding productive land idle or using it in a socially costly or inefficient manner. However, not only is the tax low, but the assessments are based on self-declarations that are rarely verified. Also, it is important to note that forest land, under the land tax code, is considered unused land. Thus, by replacing trees with cultivated fields or pastures for extensive cattle-raising, the land tax is reduced. In this way, the land tax has provided a fiscal incentive for deforestation.

9. Government Expenditures in Agriculture

3.42 While there are many statements about the Government's priorities in agriculture, an analysis of actual Government expenditures is perhaps more revealing (Tables A.3.29-A.3.33). From 1980-1987 the lion's share (66%) of the Government's budgetary allocation to the agricultural sector has gone to the Ministry of Finance, mainly in the form of rural credit and other subsidy programs. This is followed by the Ministry of Agriculture (16%) with its various specialized agencies (CFP, EMBRAPA and EMBRATER, etc.) and the Ministry of Industry and Commerce (14%) which includes the coffee and sugar institutes (IBC and IAA, respectively). No other ministry, including Interior and Irrigation, absorbed more than 5% of budgeted agricultural expenditures. Admittedly, there are large expenditures which fall outside this budgetary framework, but these allocations are roughly indicative of recent Government investment priorities. In general, these expenditure patterns reflect the considerable relative importance that has been given to subsidies and the interest the Government has had in directly participating in activities that often compete with, if not preclude, operations in the private sector.

C. Indirect Interventions

1. Exchange Rate

3.43 Over most of the postwar period, Brazil has maintained an overvalued currency. For the most part, throughout the 1970s and 1980s (although not in every year), Brazil has maintained the purchasing power parity of its currency vis-a-vis the value of the US dollar and a basket of currencies of its other trading partners (Table A.3.34). While these adjustments prevented the erosion of Brazil's external competitiveness in the face of domestic inflation, they did not adjust for the overvaluation of the currency accompanied by trade restrictions (which artificially reduce the demand for imports, hence foreign exchange) nor for the fact that the exchange rate is controlled, and therefore, even in the absence of trade restrictions, would not fully reflect its equilibrium value. To measure the indirect effects arising from exchange rate distortions, shadow exchange rates and the corresponding conversion factors were calculated (Tables A.3.35 and A.3.36). These estimates suggest a rate of overvaluation ranging from about 9% in 1970 to as high as 30% in 1983, and

22-23% in the late eighties. The methodology for deriving the shadow foreign exchange rate (SFER) is presented in Annex 1.

2. Non-Agricultural Trade[18]

3.44 Restrictions on non-agricultural trade indirectly impact the agricultural sector through the higher prices farmers pay for the products (inputs, etc.) they purchase from the industrial sector. At present, industrial products such as tractors, chemicals and fertilizers are subject to very high tariffs ranging from 20 to 50% (Table A.3.37). In addition there are many non-tariff barriers related to the difficulties of obtaining import licences and foreign exchange.

3. Non-Agricultural Public Investment

3.45 Probably the two most important non-sector specific areas of public investment that affect agricultural performance are transport (particularly roads) and human capital development, mainly general education and training.

(a) Transport

3.46 Large investments in road transport, particularly in the late 1960s and early 1970s (para. 1.53) provided a considerable stimulus to agricultural development until the 1980s. However, since the mid-1970s, public investment in transport, particularly in roads, has been drastically curtailed, resulting in a rapid deterioration of large portions of the road network built in the 1960s and 1970s. Current policy is to remove the maintenance backlog on the road system. However, the density of state roads (highways and feeder roads) which play a major role in the transport of agricultural outputs and inputs, is still very low (23 meters per square km and 700 inhabitants per km on average), with most of these roads concentrated in a few states.[19]

(b) Education

3.47 The other area of non sector-specific public investment that has been proven in many countries to play a major role in raising income levels in rural areas is education. However throughout the postwar period, public expenditures on rural education have been insufficient to affect significantly the very low educational attainment levels of the rural

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18/ A full analysis of Brazilian trade policy has recently been carried out by the Bank. World Bank, Trade Policy in Brazil: The Case For Reform, (Green Cover, May 31, 1989).

19/ Five states (Goias, Minas Gerais, Sao Paulo, Mato Grosso and Bahia) account for half the total length and four states (Sao Paulo, Parana, Bahia and Minas Gerais) account for half the length of the paved system.

population.[20] As already noted (para. 1.43), of the rural population in 1980, 94% had no more than four years of formal education, with more than half not having any formal schooling at all (Table A.1.39). While the situation has improved over the last couple of decades, at least with respect to the proportion with no schooling at all (Table A.1.40), present educational levels are far too low by any standard.

3.48 Primary education, or the teaching of basic cognitive skills, is provided by the states and municipalities. These state and municipal schools offer instruction in grades 1 through 8. In the poor rural areas, the continuing existence of any given school and, therefore, access to it, is affected by a number of frequently changing factors, including political support from the local government and rural land owners, the presence of water at or near the school and the availability of a teacher. Inadequate teacher training and supervision, coupled with low teacher salaries (often below the official minimum wage when paid by the municipality) are widespread. Rural schools suffer from high dropout and repetition rates.

3.49 As in most countries, primary education in Brazil is provided free. The only direct costs to the student and the family are the costs of books, supplies and transportation to and from the school -- which can be significant for many poor families. Transportation costs, particularly in rural areas, can sometimes be prohibitive. In addition, there is the high opportunity cost of going to school. Not surprisingly, therefore, girls, who are considered less valuable to the farm, generally have higher levels of educational attainment.

(c) Training

3.50 There is also some non-formal (out of school) training of the rural population. Most rural training activities of this sort, with the exception of those for adult literacy, are organized by the National Service for Rural Apprenticeship (SENAR), which was created in 1976 and is operated by the Ministry of Labor and financed by a special development fund earmarked for that purpose. The national office of SENAR, located in Brasilia, is linked to 23 coordination units which have 318 training agencies and 40 training centers. SENAR also operates a sizable fleet of mobile units equipped with instructional materials for on-site training. SENAR works directly with adults, trade associations, cooperatives, community organizations and other institutions in rural areas. While SENAR does not limit its activities to agriculture, small producers are a major focus. In 1985, about 240,000 people were trained. Of these 230,000 were already employed. The remaining 10,000 were new entrants to the rural labor market. Of the total number of people trained, it is estimated that some 173,000 were small farmers. Though a more independent status for SENAR is envisaged, it does not yet enjoy the semi-autonomous status of

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20/ It may be noted that as a percent of national income, Brazil spends less on public education than many other countries at a similar level of income -- 2.8% compared with 7.7% (Korea), 6.1% (Malaysia), 4.7% (Mexico), 5.1% (Venezuela) and 3.9% for Latin America as a whole. Brazil: Finance of Primary Education (World Bank, Washington, D.C., 1986).

other federal training agencies (SENAI and SENAC), thereby depriving it of the administrative and financial flexibility needed to strengthen staff and expand training programs.

(d) Nutrition

3.51 Another means by which investment in human capital can benefit agriculture is through food support programs which raise the nutritional status of low income groups in rural as well as urban areas. In addition, such programs can play an important sector-specific role, insofar as they remove one of the principal motivations for discriminating against agriculture -- to keep the price of food down for the urban poor.

3.52 Brazil has a variety of programs that provide food to disadvantaged groups. The main federal agencies involved in administering these programs are: the Legiao Brasileira de Assistencia (LBA); the Fundacao Assistencia de Estudante (FAE), which provides resources for the school lunch program; and the Secretaria de Acao Comunitaria (now in the Ministry of Interior), which administers the powerful milk stamp program. Better targeting would require more coordination with health programs. For almost all these programs the food is supplied by COBAL (Companhia Brasileira de Alimentacao). Complementing these programs is the National Institute for Food and Nutrition (INAN), which does nutritional research.

IV. POLICY EVALUATION AND RECOMMENDATIONS

A. Introduction

4.01 This chapter evaluates policies affecting agriculture and makes recommendations. First, the various direct and indirect policy interventions are evaluated in terms of their impact on agricultural output and input prices. This analysis entails the calculation of nominal and effective rates of protection. The subsequent section presents all the policies analyzed within this framework plus others not easily amenable to this quantitative analysis, within a broader context involving financial, operational and institutional aspects. The question of the overall institutional framework for policy-making as it affects agriculture is covered with in the final section.

B. Nominal and Effective Rates of Protection

4.02 To measure the distortionary effects on agricultural producer prices resulting from the various direct and indirect policy interventions, nominal rates of protection (NRPs) at the level of the producer in the different regions throughout the country have been calculated for the major agricultural products. Similarly, to measure the distortionary effects on agricultural prices caused by trade controls on non-agricultural products consumed by the agricultural sector (i.e. inputs of fertilizer, chemicals, machinery, etc.), NRPs at the retail level of the farmer in different regions have been calculated for the major inputs. In addition, the analysis of price distortions on the output and input sides have been combined to measure the extent to which these distortions alter the farmer's net income or value added in the production of crops. This combined effect is the effective rate of protection (ERP). The timeframe covered by this analysis is the last two decades -- from 1970 to 1988. This period was further subdivided into the following shorter intervals: 1970-1973; 1974-1979; 1980-1983; and 1984-1988. A detailed description of the methodologies for calculating the NRPs and ERPs and the derivations appear in Annex 2. The analysis is presented below.

1. Nominal Rates of Protection of Agricultural Products

4.03 The commodities that have been included in this analysis are maize, rice (irrigated and rainfed), wheat, cotton (low and high grade), soybeans and sugarcane. These crops are fairly representative of Brazil's major food and export/industrial crops. The regions covered are those which are most important in the production of these crops. In the case of sugarcane, the available data permitted the analysis to be carried out only for the recent period, 1984-1988. The results of the analysis are summarized in Table 4.1.

Table 4.1 Average Nominal Rates of Protection of Agricultural Products

Products	Regions	NRP a/ (%) - Producer Level 1970-73	1974-79	1980-83	1984-88	1970-88
Cotton (low grade)	Southeast	-28	-21	-29	-31	-27
	Northeast	-32	-27	-29	-36	-31
Cotton (high grade)	Southeast	-33	-28	-41	-36	-33
	Northeast	-39	-38	-44	-44	-40
Soybeans	South	-30	-25	-26	-29	-27
	Center-West	-30	-33	-34	-40	-34
Maize	South	-23	-16	-7	8	-13
	Northeast	11	9	-3	-17	-10
	Center-West	-8	-9	-6	-14	-10
Rice (long grain)	South	-15	-8	-5	-5	-8
Rice (rainfed)	Center-West	-5	-6	-7	-4	-5
Wheat	South	28	14	19	17	19
Sugarcane	Southeast				-16	
	Northeast				-12	

a/ NRP = Domestic Producer Price-Border Price Equivalent/Border Price Equivalent x 100. A negative or positive value (indicating taxation or protection, respectively) is shown only when the domestic price is either below FOB (taxation) or above CIF (protection). When the domestic price lies between the two, this indicates neither taxation nor protection; hence a zero value in those cases.

Note: These estimates take into account exchange rate distortions through the use of the shadow exchange rate in calculating border prices.

Source: Table B.2.8

4.04 The above results indicate: (i) heavy nominal rates of implicit taxation of agricultural export/industrial crops (cotton and soybean) across all regions over the entire period, 1970-1987 (sugarcane was also implicitly taxed in all regions, and at a somewhat higher rate in the Southeast, in the short period analyzed -- 1984-88); (ii) medium rates of implicit taxation of food crops (maize and rice) throughout the regions in the early 70s, tapering off to low levels of taxation thereafter; and (iii) significant levels of protection of wheat throughout the period. The general picture which emerges is one of implicit taxation of agriculture.

4.05 There are also some significant regional variations. For example, the export crop cotton has been more heavily implicitly taxed in the Northeast than it has in the Southeast. The reverse has been the case for sugarcane (i.e., relatively higher rates of implicit taxation in the Southeast) as one would expect given the higher controlled producer price for sugarcane in the Northeast (para. 3.12). Maize has been most heavily taxed in the South, followed by the Northeast and the Center-West, although in the early 1980s the Northeast was more heavily taxed than these other regions. Soybeans have been slightly more heavily implicitly taxed in the Center-West than in the South.

2. Nominal Rates of Protection of Non-Agricultural Products/Inputs)

4.06 The estimates of the NRPs for the major agricultural inputs are presented in Table 4.2.

Table 4.2 Average Nominal Rates of Protection of Inputs
(Annual Averages, 1970-1988)

Products (Inputs)	NRP a/ (%) - Retail Level of Producer				
	North	Northeast	Southeast	South	Center-West
Triple Superphosphate	65	45	61	67	58
Urea	47	24	34	40	37
Muriate Potash	131	98	75	77	97
Compound Fertilizer (5-25-15)	141	114	58	74	88
Herbicide	92	58	41	77	95
Diesel	23	34	26	31	38
Tractors	0	0	0	0	0

a/ NRP = Domestic Retail Price to Farmer - CIF Border Price Equivalent/CIF Border Price Equivalent x 100. A positive value indicates the domestic price is above the equivalent CIF border price and that, therefore, there is protection. A value of zero indicates that the domestic is below the CIF border price but above the FOB border price.

Note: These estimates take into account exchange rate distortions through the use of the shadow exchange rate in calculating border prices.

Source: Table B.2.12

4.07 This analysis shows that, with the exception of tractors, the domestic producers of agricultural inputs have been heavily protected, which is an indirect implicit tax on agriculture. For tractors, these prices throughout the 1970s and 1980s have either been equal to or below the international parity price. The average nominal rate of protection of this input is, therefore, zero. This result reflects the fact that the tractor industry in Brazil has evolved into an internationally competitive operation, owing in large part to its integration with the automotive industry, thus permitting the realization of significant economies of scale. Comparable production economies have not been achieved for the other inputs, such as fertilizers and chemicals, which comprise a much larger proportion of total farm input expenditures.[1]

4.08 The NRPs also show some regional variation. In general, rates of protection have been higher in the North, Northeast and Center-West regions, generally in that order. These results show that even after taking into account the costs of transporting inputs from the nearest port to a retail outlet within these regions, the resulting delivered international or border prices are still less then the delivered prices of the domestically produced inputs which have to be transported from the

1/ In 1987, the relative importance of the tradeable inputs, as measured by the total amount that was spent on them by farmers, was as follows: seeds (16%); fertilizer (43%); chemicals (12%); machinery services (11%); and fuel (18%). See Annex 7.

factories in the South and Southeast. Thus, protection in this case tends to put these poorer and less accessible regions at a further relative disadvantage.

4. Effective Rates of Protection

4.09 Effective rates of protection (ERPs) have been calculated for each crop in the regions considered. The input/output coefficients for this calculation have been derived from crop budget estimates (Annex 5). The results are summarized in Table 4.3.

Table 4.3 Average Effective Rates of Protection of Agricultural Products

		ERP (%) - Producer Level				
Products	Regions	1970-73	1974-79	1980-83	1984-88	1970-88
Cotton (low grade)	SE	-36.5	-27.9	-31.9	-33.2	-31.9
	NE	-48.9	-48.3	-43.2	-51.0	-48.1
Cotton (high grade)	SE	-41.0	-34.8	-39.8	-39.4	-38.4
	NE	-55.8	-57.2	-52.4	-59.2	-56.4
Soybeans	S	-33.5	-25.5	-20.3	-21.4	-25.0
	CW	-30.1	-38.9	-39.7	-33.7	-35.9
Maize	S	-52.7	-41.8	-11.5	-7.6	-28.7
	NE	-28.4	-27.9	-1.1	-21.1	-20.6
	CW	-29.2	-28.5	-21.5	-43.6	-31.1
Rice (long grain)	S	-16.1	-14.8	-7.4	-3.6	-10.6
Rice (rainfed)	CW	-27.8	-32.5	-31.4	-1.2	-23.0
Wheat	S	11.2	1.9	15.3	10.3	8.9
Sugar	SE	--	--	--	-19.4	--
	NE	--	--	--	-15.4	--

Note: These estimates take into account exchange rate distortions through the use of the shadow exchange rate in calculating border prices.

Source: Tables B.4.2, B.4.4, B.4.6, B.4.8, B.4.10, B.4.12, B.4.14, B.4.16, B.4.18, B.4.20, B.4.22, B.4.24, B.4.26, B.4.28

4.10 As can be seen from the above results, the effective rates of protection are highly negative (indicating implicit taxation) for all the crops studied (with the exception of wheat which has been protected) in all the regions over the entire period.[2] While there has been some diminution of implicit taxation of food crops (maize and rice) over the period, the taxation of export crops (cotton and soybeans) has not changed very much.

2/ In some years, when international wheat prices were high (Table B 2.2), resulting in zero rates of nominal protection (mostly in the period 1974-79), the effective rate of protection of wheat wa negative and due entirely to the implicit taxation of inputs. However, the average rate of protection for wheat in all the periods was positive.

5. Direct and Indirect Policy Interventions

4.11 The breakdown of the foregoing analysis by direct and indirect interventions is summarized in Table 4.4.

Table 4.4 Direct and Indirect Policy Interventions Affecting Agriculture: 1970-1988
(Annual Average Rate of Protection)

Policy Interventions	Cotton (Low Grade)		Cotton High Grade)		Soybeans		Maize			Rice (Long Grain)	Rice (Rain Fed)	Wheat	Sugar	
	SE	NE	SE	NE	SO	CW	SO	NE	CW	SO	CW	SO	SE	NE
Direct														
1. Sector-Specific a/ Price and Trade Policies	-6.73	-14.31	-10.40	-24.30	0.00	0.00	-1.51	-7.01	-0.50	-3.41	0.00	46.10	-4.06	-0.24
2. Sector-Specific Tax Policies b/	-13.68	-9.68	-13.13	-9.49	-13.35	-13.23	-8.30	-5.07	-7.03	-4.12	-6.23	1.42	-6.98	-6.38
Total Direct	-20.41	-23.99	-23.53	-33.79	-13.35	-13.23	-9.81	-12.08	-7.53	-7.53	-6.23	47.52	-11.04	-6.62
Indirect														
1.Non Sector-Specific Tax Policies c/	0	0	0	0	0	0	0	0	0	0	0	5.87	0	0
2. Non Agricultural Trade Policies d/	-5.02	-16.60	-1.10	-18.92	-14.84	-19.17	-24.22	-12.98	-22.00	-6.54	-28.53	-21.73	-7.42	-5.89
3. Exchange Rate Policy e/	-10.70	-8.49	-13.41	-8.66	-7.90	-10.52	-0.26	4.10	-6.33	-1.10	10.19	-16.04	-3.72	-6.33
Total Indirect	-15.72	-25.09	-14.51	-22.58	-22.74	-29.69	-24.48	-8.88	-28.33	-7.64	-18.34	-31.09	-11.14	-12.22

a/ This figure is equal to the average ERP for the agricultural product before adjusting for distortions arising from sector-specific taxes and non-sector specific trade, tax and exchange rate policies.

b/ This figure is equal to the difference between the average ERP for the agricultural product with and without sector-specific taxes before adjusting for any other distortions.

c/ This figure is equal to the difference between the average ERP with and without non-sector specific taxes (i.e, port charges). It is equal to zero in all cases except wheat, where it affects the CIF border price.

d/ This figure is equal to the difference between the average ERP, with and without adjustment for distortions on the input side.

e/ This figure is equal to the difference between the average ERP at the official and at the shadow exchange rate.

Source: Tables B.2.13 - B.2.40

4.12 For most of the crops studied, the indirect economy-wide interventions (non-agricultural trade restrictions, exchange rate policy, etc.) have been relatively more, or as important as the direct, sector-specific interventions (price policies, agricultural trade controls, taxes, etc.). In the case of most of the food crops and sugarcane in the Northeast, the indirect effects tend to be relatively more important. This

is also the case for the export crop -- soybeans, due in large part to this crop's reliance on inputs which are heavily protected. For wheat and cotton (the other export crop analyzed), the direct interventions tend to be more important, owing mainly, in the case of wheat, to administered producer prices, and, in the case of cotton, to the frequent direct restrictions imposed on exports of this raw material in order to ensure domestic supplies to the local industry. For irrigated rice in the South and sugarcane in the South/Southeast both types of intervention are about equally important.

C. Further Analysis and Recommendations

4.13 In analyzing policies further, they are grouped into five broad categories: (i) credit and fiscal subsidies; (ii) domestic pricing and marketing policies; (iii) trade policies; (iv) land policies; and (v) expenditure policies.

1. Credit and Fiscal Subsidies

4.14 Both the macroeconomic and microeconomic effects of subsidized rural credit in Brazil have been significantly negative. At the macroeconomic level, the link between the rapid growth in subsidized credit, particularly in the 1970s, and monetary expansion and inflation, has been close and direct. Until 1985, much of subsidized credit was financed essentially through money creation (para. 3.22). The monetary and inflationary pressures exerted by subsidized credit depended on the credit volume and the rate of subsidy, both of which were quite high in the late 1970s and early 1980s, which was also a period of accelerating inflation. This combination of substantial volumes of official rural credit and high subsidy rates pushed rural credit subsidies to 21-22 % of agricultural GDP during 1979-80 or 2.3-2.4 % of total GDP (Table A.4.1). Since then, with Government efforts to control the amount of rural credit and the increase in official interest rates, the volume of rural credit subsidies has waned in importance relative to total GDP (except for a temporary resurgence in 1986), and currently, the macroeconomic impact of official rural credit is not as significant as it was in the late 1970s and early 1980s.

4.15 At the microeconomic level, the main costs have included: (i) the economic efficiency loss, as the recipients of subsidized credit have precluded others, with prospective investments having higher rates of return, from obtaining credit; (ii) the excessive use or waste of subsidized fertilizers and other inputs; (iii) the greater capital intensity of production technology induced by an artificial cheapening of the price of farm machinery and equipment and the attendant displacement of labor; (iv) the under-utilization of farm machinery and equipment, especially on smaller farms; and (v) the increased concentration of land holdings as investors have sought more land as a means to capture the rent transfer associated with credit subsidies. In addition, the costs of managing and administering a complex credit system have been significant as have the costs on the borrower's side of complying with or circumventing credit regulations. The proliferation of special credit programs has increased the segmentation of financial markets. Also, interest rate controls on the official credit supplied by commercial banks through compulsory applications have led these banks to set uncontrolled market rates at levels above what they would otherwise be, discouraging many

economic investments. Given the fungibility of credit, significant diversions or leakages of subsidized credit into other uses, including consumption and highly speculative investments, have also occurred directly or indirectly, by freeing or substituting for, the farmer's own resources or resources borrowed at market rates of interest.

4.16 Subsidized credit has also had an undesirable impact on the income distribution in rural areas. The evidence indicates that the bulk of subsidized rural credit went to the three most commercialized agricultural regions -- South, Southeast and Center-West, to the larger agricultural producers, and consistent with this profile, to cereal and export crops (para. 3.27), thus contributing to greater regional and individual income disparities. This is summarized in Table 4.5.

Table 4.5: Distribution of Total Rural Credit by Region, Size of Producer and Crop
(% of the total value of credit)

Region a/					Size of Producer b/		Crops c/		
N	NE	S	SE	CW	Mini	Larger Producers	Cereals	Exports	Others d/
2	14	35	38	11	9	91	51	41	8

a/ Annual average 1970-1987

b/ The category mini, as defined by the Bank of Brazil, includes producers with a current maximum gross agricultural income of US$3572 per year (March 1989 at the official exchange rate). This category includes the typical small producer in the Northeast. The percentages shown are averages for the years 1980, 1983 and 1987.

c/ The percentages shown are averages for 1978, 1980 and 1986.

d/ Includes root crops, beans and fruits and vegetables.

Source: Tables A.3.25-A.3.26 and A.3.28

4.17 Thus from almost every standpoint, the Government's rural credit policy has had a negative impact.

4.18 Fiscal subsidies (paras. 3.31-3.34) have had similar adverse efficiency, distributional, fiscal and environmental effects. These subsidies have made agriculture a good tax shelter for both agricultural and non-agricultural income, leading to increased demand for land by corporations and individuals, particularly in the high income brackets, and driving up land prices. The net result has been greater concentration of land holdings, the penetration of virgin forest land in some ecologically fragile areas, and a higher price for land than most of the population can afford. As noted (para. 2.37), these high land prices are also partly responsible for the migration of poor people to the frontier areas in the North in search of unclaimed land.

4.19 The frequently stated rationale for the ample direct credit and fiscal subsidies has been the alleged need to offset the implicit taxation of producers (paras. 4.03-4.10). However, the benefit of these direct subsidies has gone to a relatively small number of large-sized producers with taxable incomes and access to subsidized credit, while the implicit taxing through prices has affected all producers, including the relatively poor producers in the Northeast.

4.20 The net effect of the above mix of explicit subsidies and implicit taxation is crop- and producer-specific. Small- to medium-sized producers, particularly of export crops, (which are the most heavily implicitly taxed -- para. 4.10) who have limited access to credit subsidies but experience the full impact of implicit taxation, bear the highest net negative impact. Larger producers, who have had substantial access to highly subsidized credit, clearly offset their implicit taxation to a degree. There are various gradations in-between as well for producers of both domestic food and export crops. The joint sequential production of winter wheat (which is protected -- para. 4.10) and summer soybeans (which is implicitly taxed -- para. 4.10) for producers in Rio Grande do Sul can, to some extent, leverage the net benefits. The clearest conclusion that can be drawn from this complex mosaic of explicit subsidies and implicit taxes is that subsidies, on the scale practiced in the past from the mid-1970s through the early 1980s, were inefficient and inequitable in the extreme as a means to offset other distortions (trade and exchange rate controls) that discriminated against agriculture.

Recommendations

4.21 Present Government efforts to reduce the supply of subsidized rural credit need to be accelerated, leading, as soon as possible, to its elimination.[3] A faster phasing down of direct government funding of official rural credit would help to alleviate the present difficult fiscal situation. As macroeconomic stability is achieved it would also provide greater scope and incentive for private sector funding of rural credit, particularly for long-term investment. Larger reductions in all types of credit -- for production, marketing and investment -- should be considered. Among these credit programs, the deepest cuts in the immediate future could be made in official marketing credit (EGF) since it is relatively easier to attract private sector finance for what is essentially collateralized, short-term credit (i.e., marketing credit backed by commodities) than for production or longer-term investment credit.

4.22 In addition, an accelerated program to reduce government funding of official credit should be accompanied by the abolition of compulsory applications of sight and rural savings deposits. This would help to remove an important cause of distortion and segmentation in rural financial markets. Parallel with the abolition of compulsory requirements, savings deposit rates, which are currently controlled, should be freed to allow banks the scope to mobilize savings.

4.23 However, while the reduction of official rural credit is clearly a move in the right direction, and the liberalization of savings deposits

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3/ The Government, under Bank loan 2971-BR, has undertaken to reduce the volume of official credit by about 14% between 1987 and 1990, which is to be achieved largely by decreasing direct Government funding of official rural credit (the main funding source for rural credit) by 19%. A similar reduction during the same period is also planned in the volume of compulsory applications of sight deposits. However, compulsory applications of rural savings deposits are expected to increase.

would expand the capacity of the banks to mobilize resources from the private sector, such changes alone will not be sufficient to improve the quality and quantity of financial services in all parts of the country. Some regions of the country are not well served by financial intermediaries of the formal or informal kind nor is the population in some of these areas equipped with even the most rudimentary educational skills to deal effectively with financial institutions (Annex 8). These structural impediments will need to be addressed directly through banking and regulatory reforms (principally related to removing market entry restrictions and increasing competition), through institutional innovations (e.g. reform and strengthening of credit cooperatives) which could reduce the high transactions cost and lending risks associated with agricultural credit and through investments in rural education and training, which of course can be expected to have an impact only in the long term.

4.24 With regard to fiscal incentives, removing those provisions of the tax code that virtually exempt agriculture from taxation and convert it into a tax shelter should be given high priority. In particular, the following changes are recommended:

(i) eliminate the tax provisions that allow agricultural producers to shelter between 80-90% of their income by offsetting the costs of investment in multiples of up to six times in favor of only offsetting those costs of investment that are directly related to the agricultural enterprise. This would have the direct effects of reducing the incentive for holding land for non-productive, portfolio management reasons, curbing over-mechanization and increasing labor employment.

(ii) eliminate incentives that permit investment of up to 50% of the tax liability in regions slated for development and that shelter the interest received from such investment. This would discourage investment in non-viable ventures.

2. Domestic Pricing and Marketing Policies

(a) Minimum Price Program (MPP)

4.25 For the most part, the Minimum Price Program (MPP) -- described in paras. 3.03-3.07 has not been effective in meeting its multiple goals. One of these objectives is to improve the access of small farmers, particularly those in remote or disadvantaged regions, to marketing finance. However, the principal beneficiaries have been the commercial farmers, traders and processors of soybeans and cotton in the Center-West, South and Southeast regions (Tables A.3.1-A.3.3), many of whom would otherwise have had access to commercial and, in some cases (e.g. soybeans), overseas marketing credit. Between 1970 and 1988 these regions accounted for 85 to 97% of EGF operations (and 81 to 96% of AGF).

4.26 A second objective of the MPP has been to stabilize prices, both between seasons by encouraging storage (through EGF) between years by guaranteeing floor prices to producers (AGF). Evidence suggests that these objectives have not been met. Seasonal prices have varied considerably. Furthermore, in many years mid-season prices in real terms have been less than harvest prices, indicating negative returns to stockholding (Table A.4.2). While other government policies (such as trade controls and price freezes) are responsible for this result, nevertheless, the MPP appears to have had little, if any, effect.

4.27 Minimum prices have also shown considerable variation between years in real terms (Table A.3.7), precluding their effectiveness in stabilizing prices inter-annually. These minimum prices have also varied considerably in relation to market prices (Table A.4.3), production costs (Table A.4.4) and international prices (Table A.4.5). It is clear from these results that no consistent policy of setting minimum prices from year to year has been followed. This inconsistency of minimum prices, however, has increased uncertainty for producers.

4.28 An example of this vacillation is the fact that from time to time, emphasis and support has shifted back and forth between food and export crops.[4] During the 1970s, the emphasis was clearly on export crops. More recently, CFP has been offering relatively higher minimum price for food crops in an effort to promote greater domestic food production. While theoretically such support might be justified to offset other distortions that discriminate against one set of crops compared to another, such action presumes that policy makers have the required information (i.e. estimates of domestic resource costs) to make these precise quantitative decisions. In practice, they rarely -- if ever -- do. Moreover, the overwhelming evidence from many countries suggests that it would be far better to eliminate those distortions (trade and exchange rate controls) that discriminate between crops, allowing the market to determine the optimal composition of agricultural production, rather than to attempt to offset these distortions by introducing others.

4.29 An additional factor contributing to uncertainty has been CFP's erratic policy of selling stocks to keep consumer prices low over the season. The recent establishment of rules -- price bands -- for the release of stocks for maize, rice and beans (para. 3.07) represents an improvement in that it reduces some of the arbitrariness and unpredictability of government intervention.

4.30 The MPP also has not encouraged stockholding. Evidence suggests that much of the stockholding has shifted from the private to the public sector. In recent years, the proportion of major eligible commodities financed by EGF has increased dramatically (Table A.3.4), as has the proportion of the crop purchased by the Government (Table A.3.5). Several factors under the MPP coupled with other Government policies have contributed to this result. First, Government interventions in domestic and export commodity markets increased uncertainty over future prices and thus increased the risks for private stockholders. Second, the Government has become the major source of finance for agricultural stocks through EGF; inflation and the general economic situation have made many alternative commercial sources of stock financing more restricted or more risky. In addition, subsidized interest rates under EGF, including the option to convert to AGF, (which shifts the price risk entirely to the Government) have squeezed out private commercial credit.

4/ It should also be mentioned that a crop can be both a domestic and an export crop and change from being exclusively one or the other depending on price changes at home and abroad and on productivity breakthroughs. Sugar, soybeans and cotton all illustrate these combinations.

4.31 Unfortunately, reliable data on the financial results of the MPP are not available. One rough estimate of the subsidy or losses incurred by this program in 1987/88 is Cz$33.7 billion or 0.04% of GDP.[5]

(b) Public Storage

4.32 The public storage system, comprising CIBRAZEM and the 17 state storage companies (para. 3.08), has, in general, not fulfilled its original mandate of promoting competition and investment in storage where these were lacking. To the contrary, there is some evidence that operations of state storage companies have provided disincentives to private investment in the more outlying regions. Moreover, it is generally acknowledged that the financial, and, at times, technical performance of the public storage companies has been poor. In general, Government policy has focused on storage investment while failing to address the policy issues discussed above that affect stockholding incentives.

(c) Wheat Subsidies

4.33 The wheat program (paras. 3.09 and 3.10) has proved extremely costly, and its multiple objectives have, in most cases, not been met. In 1986 the Government incurred estimated losses of Cz$25 billion (US$1.8 billion), equivalent to 0.7% of GDP.[6]

4.34 The protection or implicit subsidization of wheat producers has already been demonstrated (para. 4.04). The degree of producer price distortion is reflected in the NRP estimates, which range from 28% in the early 1970s to 17% in the late 1980s. Such subsidies are responsible for considerable resource allocation distortions. Furthermore, contrary to stated objectives, such subsidies have not saved foreign exchange. Previous studies of domestic resource costs (DRCs) have shown that wheat production has been a net user, rather than an earner of foreign exchange.

4.35 Analysis of the effects of the consumer wheat subsidy reveal that most of the benefits have not gone to target groups (i.e., the poor), that its impact on the consumer price index has been negligible, and that costs have been extremely high.[7] Several studies have shown that the subsidy has benefited mainly middle and upper-income groups in the richer and more developed South and Southeast regions, largely because they consume more wheat products. The policy has also distorted the consumption of other domestic foods (rice, beans, maize and cassava) by distorting wheat prices relative to the prices of these goods.

5/ World Bank, Public Expenditure, Subsidy Policies and Budgetary Reform (Green Cover, June 12, 1989).

6/ World Bank, Ibid (June 12, 1989).

7/ Geraldo M. Calegar and G. Edward Schuh in The Brazilian Wheat Policy: Its Costs, Benefits and Effects on Food Consumption, Research Report No. 66 (Washington, D. C.: IFPRI, May 1988).

(d) Sugar/Ethanol Policy

4.36 As a result of the Government's considerable intervention in the sugar industry (paras. 3.11 and 3.12), the total volume, product mix and location of production are quite different from what they would otherwise be if free markets were permitted to operate. These distortions have led to considerable inefficiencies and opportunities for cheating, tax avoidance and the emergence of a growing black market for s : and alcohol. One study estimates that the annual economic losses associated with this program are in the order of US$1.0 - 1.3 billion or 0.3 - 0.4% of GDP.[8]

Recommendations

4.37 While one could envisage a perfectly managed price stabilization system designed to insulate farmers from short-term (non-secular) price shocks, the experience to date in Brazil, as in many other countries, in trying to implement such a system is not very encouraging. Furthermore, the administration of such a system as past exp rience has shown (para. 4.31) is likely to be very costly to the national treasury. The private sector, through its management of stocks, can perform the function of price stabilization far better. Consequently, the stock purchase program (AGF) should be discontinued. Concomitant with this action, CFP would cease to sell stocks on the open market as it would no longer have stocks to sell.

4.38 If these reforms are politically unattainable at this time, as an interim measure, the number of crops covered by the MPP should be reduced. For the remaining few crops, the system for setting minimum prices should be based on prescribed rules that are directly linked to long-term international prices and which reflect regional transport differences. The rules recently introduced for the sale of stocks (para. 3.07) could remain in force. However, it should be noted that the longer the full reform program is delayed and dependence on the old system continues, the more difficult it will be in the future to make the adjustments that are necessary.

4.39 With regard to the Government's stock financing program (EGF), there appears to be little, if any, justification for continued Government involvement in this activity. The program has neither helped small farmers with limited borrowing options (most of the funds have gone to large farmers in the more developed regions of the country -- mainly for soybeans) nor has it contributed to price stabilization. By its very existence, EGF has discouraged private sector participation that would have contributed more to price stabilization than the EGF program. In view of this experience, the EGF program should be phased out and commercial stock financing encouraged (para. 4.21). Brazil has a relatively well developed domestic capital market to offer these services, provided the present disincentives (macroeconomic instability and the EGF program itself) are either removed or reduced. In addition, commodity futures markets, an important instrument in risk management, can be expected to expand once these disincentives are removed.

8/ World Bank, Public Expenditure, Subsidy Policies and Budgetary Reform (Green Cover, June 12, 1989).

4.40 With respect to storage operations, the federal and state governments need to focus much more narrowly on regulations and oversight, and decrease their direct participation. They should begin by divesting themselves of the public storage companies and improving licensing and inspection practices and procedures.

4.41 On balance, the wheat program has resulted in high financial and economic costs and its benefits, especially for target groups, have been limited. Wheat consumption subsidies are not a good policy for redistributing income nor for dealing with malnutrition. Moreover, it is difficult to justify continued high rates of protection for the domestic wheat industry, which is no longer in a developing stage. Thus, it is recommended that the Government should cease to protect wheat producers through support prices, decontrol consumer prices, privatize wheat marketing and address nutritional problems through more direct programs.

4.42 The best course would be to move immediately to implement these reforms in full. If this is not possible, and it is necessary to proceed in a gradual manner, then as a first step, consumer prices should be decontrolled, CTRIN's monopoly status on the domestic purchase of all grain revoked, and quotas for millers removed. This would provide the basis for free entry and competition in the industry. CTRIN, initially, therefore, would retain its control on imports, but a definite time limit for CTRIN's dissolution (say three to four years) should be worked out as there is no justification for the Government's continued direct involvement in this marketing function. With the phasing out of CTRIN, imports should become the responsibility of the private sector. In the transition period, imports could be auctioned to millers.

4.43 Finally, to address the problem of improving the diet of poor people, better targeted food support programs (para. 4.83) would be a much more effective and less costly alternative.

4.44 As a first step towards the liberalization of marketing in the sugar industry, IAA should be dissolved. There is no need for the Government to directly participate in domestic or export marketing. As quickly as possible, Brazil should move to dismantle the administered price and quota system that now regulates the industry.[9]

3. Trade Policies

4.45 Agricultural and non-agricultural trade policies have considerably adversely affected agricultural performance through the distortionary impact these policies have had on agricultural product and input prices. The analyses of nominal and effective rates of protection clearly reveal these price distortions. In addition, this analysis has shown that non-agricultural trade policies (namely, import restrictions on such industrial products as fertilizers and chemicals) have implicitly taxed the less industrialized regions (like the Northeast which is solely a user of these products) more than the industrialized regions (like the South and Southeast where these products are mostly produced) (para. 4.08). Hence,

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9/ For further information on this topic, see World Bank, Sugar Subsector Review (Green Cover, May 4, 1989).

trade policy has not only been economically inefficient but it has been regressive as well, penalizing the less industrialized regions of the country more than the others.

4.46 Recent plans to privatize export trade in sugar (para. 3.16) and the steps already taken to improve the administration of coffee trade through the introduction of quota auctions and improved minimum registry prices (para. 3.19) are moves in the right direction. In addition, the removal of quantitative trade restrictions on a select number of agricultural commodities (soy products, cotton, maize and rice) and the introduction of a variable tariff on maize and rice (para. 3.18) represent a significant beginning at agricultural trade reform.

4.47 However, the commodities mentioned above are still subject to licensing controls. It remains to be seen how this system will be administered. As previously discussed (para. 3.13), agricultural exports have always been subject to ad hoc, intermittent controls (outright bans and quotas), designed to ensure that the demand at home is fully met from domestic production -- a policy that recently has been strongly motivated by an interest in keeping prices down and inflation under control. A resurgence of such controls, either in direct or administrative form, would be very costly to Brazil. It is still to early to judge the effectiveness of the variable tariff system for maize and rice as a substitute for the fixed tariffs, as this system has yet to be tested, but in principle, if based on the present rules, it represents a lower rate of protection than the present fixed tariffs.[10]

Recommendations

4.48 Brazil needs to free all agricultural trade from the vagaries of intermittent controls. All qualitative controls should be removed as was done for soy products, cotton, maize and rice and licences should be issued automatically to any bonafide trader. Tariff barriers should be lowered as soon as possible.

4.49 As already recommended (paras. 4.42 and 4.44), CITRIN's monopoly status on wheat imports and IAA's monopoly control on sugar exports should be revoked, freeing up trade in these commodities.

4.50 For non-agricultural trade, the faster the Government moves to liberalize this trade, the better off will be the economy in general and the agricultural sector in particular. Such reforms should also help to redress the regressive inter-regional distributional effects referred to in para. 4.45.

4.51 With respect to specific actions, there is little, if any, justification for continuing the high tariffs on such industrial products

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10/ In practice, however, in the recent past, whenever these basic food commodities have had to be imported, the tariffs have been brought down to zero.

as agricultural chemicals, fertilizers and farm machinery (Table A.3.36). These industries can no longer be considered in the "infant" category. Some of these inputs (i.e. tractor) are already sold in foreign (though sheltered) markets. The time to lower these barriers and benefit from the advantages of international trade is overdue.

4.52 In addition, the ICM tax should be changed to eliminate the discrimination against primary agricultural exports which are taxed while industrial exports are exempt. In general, there are a number of exemptions to the ICM like the one mentioned, which influence the allocation of resources within and between the agricultural sector and other sectors. The ICM, which provides the states with needed revenue, should be reformed so that it is as neutral as possible with respect to its impact on resource allocation.

4. Land Policies

4.53 From time to time, land reform, or the expropriation and redistribution of land holdings, has been debated in Brazil. However, on each occasion, most recently in the context of framing the new Constitution, such proposals have not obtained a clear political mandate. Moreover, such measures in and of themselves will not succeed in permanently lessening the degree of land concentration and rural poverty. The experience with land reform in other countries is not encouraging. It is normally a costly undertaking and is often politically destabilizing, while not bringing the anticipated benefits.

4.54 In Brazil, the Constitution requires the payment of compensation equivalent to the market value of the land expropriated. This would be a large drain on the fiscal budget under current circumstances even if there were a political will to do this. In addition, the threat of the imposition of land ceilings could encourage present landowners to subdivide land and transfer it to relatives and nominees, releasing only a small proportion of land for actual redistribution. Moreover, unless other complementary factors are in place (skills, infrastructure, financial services, etc.) having title will have only a limited effect on production, as numerous settlement schemes have amply demonstrated (paras. 3.37 and 3.38). However, even if these limitations did not exist, it must be acknowledged that such an approach does not deal with some of the underlying factors that in recent years have contributed to land concentration in Brazil.

4.55 One such factor is the administratively cumbersome legal system governing land tenure. The multiplicity of laws and regulations, which are frequently repealed, re-enacted and re-interpreted, combined with the inadequate maintenance of the real estate registries make it extremely difficult for the small, relatively less educated farmer to obtain title to land. Inheritance laws lead to further land fragmentation which the large landholder is usually able to evade. In recent years, various credit and fiscal subsidies to agricultural producers have added to the attraction of holding (but not necessarily efficiently using) land, thus accelerating the land concentration process. These policies have created substantial distortions. Properties are held merely to capture the rent transfers associated with subsidies or future capital gains.

Recommendations

4.56 There are a number of measures that can be taken to promote a more equitable distribution of land holdings and, at the same time, a more efficient use of the nation's land resources. First, the income tax reforms in para.4.24 would go a long way towards removing the uneconomic incentives for holding land. A more rational agricultural credit policy (para. 4.21) would also help to improve the size distribution of land holdings. To the extent to which subsidized rural credit encourages people to invest in agriculture, including the acquisition of land, the removal of these subsidies should contribute to slowing down the process of land concentration. General price stabilization should also bring on to the land market some portion of the land now being held primarily as a hedge against inflation.

4.57 Title security for land is also needed to reduce the risks for landowners and encourage them to make the long-term investments in land to raise productivity. Security of title is also needed to assure a viable private sector mortgage market for farm real estate. To accomplish this, priority areas need to be delineated within which all existing titles would be verified and revalidated and then unified with the real estate registers and the cadastre. The Bank is currently helping to do this in a land tenure improvement project in the Northeast. Continued effort is needed.

4.58 The land tax (ITR) needs to be reformed as well. In general, the concept of land utilization should be revised to take into account, not just the use of land, but the type of use. Not all uses of land should qualify for a tax exemption or reduction under the ITR. At the same time, some uses that do not currently qualify (e.g. forest management) should receive it. These changes need to be incorporated into the concept of the fiscal module. Further, the tax rate for lands above the module should be progressively increased to make it increasingly costly to hold idle or inefficiently utilized (from a social or national point of view) large tracts of land. Lastly, and perhaps most important, this tax needs to be strictly enforced in all parts of the country.

4.59 Finally, there is a need to assess whether the present regulations of the land tenancy market should be maintained, changed or completely eliminated. The question of enforceability should also be considered.

5. Expenditure Policies

4.60 While some Government expenditures in the areas that directly or indirectly affect agriculture have had a positive impact, others have not. The most positive direct Government expenditure shaping the path of agricultural development has been the continuing investment in agricultural research by EMBRAPA. By the mid-1980s the impact of this effort had become evident through impressive yield increases in a number of important export and domestic food crops (paras. 2.10 and 2.11).

4.61 Another area where Government investment appears to have positively affected sectoral performance is in infrastructure, particularly road transport. Investments in transport carried out mostly during 1960s and 1970s (para. 3.46), substantially reduced the marketing margins associated with many bulky agricultural products and inputs. This is

particularly important in view of the transport-intensive nature of Brazilian agriculture. Further evidence is provided by the fact that 66% of the secondary and feeder roads financed by the Bank over the period 1976-1985, were estimated to yield economic rates of return in excess of 20%; 37% of the roads has estimated rates of return above 30%.[11] Most of these roads are located in agricultural areas throughout the country.

4.62 In the areas of human capital development, particularly in the form of education, the record is much less favorable. Brazil has underinvested in the education and training of its rural population to the detriment of the country in general and agriculture in particular. The extremely low educational attainment levels of the rural population (para. 3.47), appears to be a major factor in explaining the high incidence of poverty among this group, as well as the disparity in per capita incomes between the rural and non-farm sectors. Although in recent years the proportion of total expenditures for education by all governments has increased (from 10.6% in 1970 to 14.8% in the mid 1980s), it remains inadequate. Moreover, primary education, which is the most important to the rural population, since the vast majority end their education in one of the first four grades, accounts for only about 39% of all public expenditures on education.[12]

4.63 Economically, education has much to contribute at a number of different levels. As new production technology is made available to agriculture, cognitive skills are needed to decode it. In addition, research has shown education to be a qualitative improvement in the labor force that has the same effect in the aggregate production function as the labor itself. One well-known study of the relationship of education to farmer productivity found that where technology is available there was approximately a 7.4% increase in farm productivity resulting from the farmers' having four years of schooling as compared to no schooling.[13] Finally, and perhaps most important of all in the case of Brazil, there is the role of education in the labor market, especially in terms of facilitating the migration of labor from agriculture to nonfarm activities.

4.64 Food support programs are another important form of investment in human capital. These programs should not be viewed as mere income transfers. By raising the nutritional status of low income groups, they improve the productivity of the labor force, the learning abilities of young people, and the mental alertness of adults. Improved nutrition also contributes to improved health with similar benefits to productivity, alertness, and learning ability. The main weakness in the current programs

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11/ Ex ante estimates. Brazil Secondary and Feeder Roads Project (Loan 1207-BR). Project Performance Audit Report. September 23, 1986.

12/ Brazil: Finance of Primary Education (World Bank, Washington, D.C., 1986)

13/ Dean T. Jamison and Lawrence J. Lau, Farmer Education and Farm Efficiency (Baltimore: Johns Hopkins, 1982).
Four years of schooling is the UNESCO definition of primary schooling and, in Brazil it is still regarded as the lower level (primeiro grau menor) of primary schooling.

(para. 3.52) is their administration and, in some cases, their design. Some of these programs are bureaucratically unwieldy and not well targeted to the groups they are intended to serve.[14]

4.65 The other general area of public expenditure in the agricultural sector where the record has not been particularly good is the direct participation of government in commercial operations (e.g., CIBRAZEM, CFP, CITRIN, IAA) and in the provision of explicit subsidies (rural credit, wheat, alcohol, etc.). These activities have already been evaluated.

Recommendations

4.66 The Government needs to remove the various untargeted subsidy programs, withdraw from direct participation in operations that compete with or replace the private sector, and, instead, focus its efforts on those regulatory functions and truly "public good" support services and infrastructure that facilitate the efficient operation of the private sector. Subscription to these recommendations would substantially alter the current pattern of Government expenditures.

4.67 In particular, the emphasis should shift to areas like research and extension (where there is clearly no private sector alternative), inspection, grading, licensing, market information, job training, general education, resource conservation activities, regulations, monitoring and enforcement and public infrastructure, such as conservation works, off-farm irrigation facilities, telecommunications, power, and road transport. Even under an austere budget program these expenditures or, at least a large part of them, could very likely be made if other uneconomic expenditures would be eliminated.

4.68 Public Irrigation. Most of the Government's involvement in irrigation in the past has been in connection with particular settlement schemes, mainly in the Northeast, along the Sao Francisco River. Under these schemes, the Government has normally provided all infrastructure down to, and including, on-farm works. The general experience with these schemes is that production under these conditions has not been economic compared with imports and alternative rain-fed production methods.[15] The Government should shift out of this area to investments that complement or stimulate private irrigation investment.

4.69 Other Infrastructure. Resources for costly infrastructure projects are likely to be scarce for the next several years as the Government moves to reduce the public deficit. Therefore, public expenditures on infrastructure will need to concentrate on the first priority -- maintenance and rehabilitation. This is particularly true for transport where there is a large backlog. It is imperative, therefore, in this fiscally-constrained environment, that these investments are made in priority agricultural areas. These areas need to be clearly identified.

14/ World Bank, Brazil: Public Spending on Social Programs: Issues and Options (Grey Cover, May 27, 1988).

15/ World Bank, Irrigation Subsector Review (Green Cover, June 1989)

4.70 At the same time to sustain efficient and equitable agricultural growth over the long term it is essential that the states and municipalities expand their secondary feeder road programs. To do this, it will be necessary to introduce new methods of raising revenues for the states and municipalities.

4.71 Agricultural Services. For the basic agricultural research and extension services, some changes in priorities will be necessary.[16] The Government should be cast as the actor of last resort, intervening when the national interest is at stake and no alternative exists. This means relying increasingly on the expanding research efforts of cooperatives, agricultural suppliers, processors and contractors to meet the needs of commercial farmers. This would enable EMBRAPA to devote more time and resources to the wider issues related to the commercial sector (namely, the continuing intensification of commercial agriculture and the implications for sustainability and environmental safety) and to the selection and adaptation of technology for the small-scale, resource-poor farmers. These are the areas where the short-run returns are not likely to attract widespread participation of the private sector or cooperatives. They should remain matters of legitimate public concern.

4.72 In extension, advice to commercial farmers should become increasingly the responsibility of suppliers, processors and cooperatives or be financed directly by the farmers themselves. Government extension advice to commercial farmers needs to concentrate on advising communities and individual farmers on how to integrate technical advances into sustainable systems of land and resource management. In advanced, commercial farming states, particularly in the South and Southeast, it may be worthwhile to consider organizing state extension services around small water catchment areas -- the so-called microbacias approach.

4.73 For resource-poor and subsistence farmers, extension requirements will need to be met largely by government for lack of alternatives. In the case of these farmers, the need for technical messages to be much more precisely adapted to local farmer demands and constraints implies a very close integration of extension efforts with adaptive research.

4.74 With regard to the institutional structure for extension, at this moment the future status of the federal agency, EMBRATER, is uncertain.[17] Nevertheless, field level extension activities continue to be the responsibility of the state and territorial extension agencies. (EMATER and ASTERs, respectively). Whatever ultimately happens to EMBRATER, it is clear that, in a country as large and diverse as Brazil, priority should be given to strengthening extension services at the state and local levels where contact with the farmer takes place.

16/ For more details and background on the extension and research services, see Annex 10.

17/ The Government, on January 15, 1989, by Presidential Decree, abolished EMBRATER. Subsequently, Congress reinstated EMBRATER by Legislative Decree on April 5, 1989. However, as of mid-1989 no new directorate has been appointed.

4.75 Human Capital Development. Expanding the coverage of primary schools in rural areas should be a matter of highest priority. As noted (para. 3.49), an important part of the problem of increasing educational attainment in rural areas is the high opportunity cost of going to school. There is little solution to this problem other than to pay the family to allow the child to go to school. Food aid is an effective means of doing this, with the added advantage that it raises the nutritional status of the family and helps improve health.

4.76 If more and better primary schools are to be provided in the rural areas it will be necessary to make better use of existing resources. One of the problems in this regard is the existence of a dual system in which both states and municipalities own and operate schools.[18] Considerable economies could be achieved by consolidating these two public school systems into one municipally operated system. States should redefine their role, eventually providing support services to teachers and performing a range of other tasks such as evaluation, curriculum development, warehousing and distribution of supplies and instructional materials, teacher training, and so on. These changes will probably need to be introduced gradually if the general idea is to be accepted.

4.77 Of the three principal impediments to further expansion of schooling in rural areas -- teachers, buildings and books -- the inadequate supply of teachers may be the most difficult to overcome. Given the historically low salaries of municipal teachers, it may not be possible to find even minimally qualified applicants willing to work and live in rural conditions. Consideration should be given to requiring graduates of public teacher training institutions, whose education is heavily subsidized, to provide several years of rural service. However, in the absence of bringing salaries up to a level sufficient to attract and retain qualified teachers, it is difficult to expect much change.

4.78 New schools will also be required in rural areas. The same is true for books and other instructional materials, such as paper, chalk, lesson booklets and so forth. The new locations need to be planned carefully to allow for reasonable access. In the past there has been a tendency to centralize schools to an excessive degree. School mapping in rural Brazil is reasonably advanced and most states have both the technology and the trained manpower to carry out this exercise with reasonable precision. Of greater importance, however, is the need to ensure that the new construction is located under municipal authority with state support, and that the community (i.e parent association) is willing to perform routine maintenance work, the absence of which is a major factor in the rapid deterioration of school buildings.

4.79 Lastly, it needs to be recognized that it makes little sense to subsidize all publicly provided higher education when two-thirds of the population is not completing even four years of primary school education, considered necessary for functional literacy. The priority for public funds is clearly primary education and the hard political choices need to

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18/ In Brazil, all areas of the country, including rural areas, come under the jurisdiction of a municipality. The municipality is not an urban administrative boundary as in many other countries.

be made to transfer resources from lower to higher priorities. Furthermore, less public subsidies for higher education would not burden the relatively poor (if managed properly) since the majority of recipients of free higher education can afford it.

4.80 With respect to agriculture-specific education and training, the Federal Government should assess the system as a whole before embarking on its program to increase the supply of agricultural secondary schools. The high unit costs of the federal schools and the quality of training at state schools are issues that need to be addressed. Greater ties to agricultural business and industry should be sought in connection with these schools including incentives to business and industry for providing specialized agricultural training.

4.81 In regard to university education, Brazil needs to begin to rationalize the provision of costly technical and scientific training in agriculture among its far-flung system of federal universities. The Federal Government should study specific manpower needs nationwide and encourage the development of centers of excellence. For example, states with little timber production or potential should not receive federal support for expensive forestry programs when excellent programs in other states show declining demand.[19]

4.82 At the same time, informal job training to increase the employment options available to rural people (particularly those engaged in low income subsistence agriculture where the development prospects are limited), needs to be expanded. This aspect of training, namely, facilitating the transfer of rural labor from one occupation to another either in or outside rural areas, can often contribute significantly to raising living standards (para. 5.43). As a first step towards expanding this type of training in rural areas, the National Service for Rural Apprenticeship -- SENAR (para. 3.50) should be given the semi-autonomous status of a public company, allowing it the administrative and financial flexibility needed to strengthen its staff and extend its operations.

4.83 Finally, to improve the administration of federal food support programs, many of these should be decentralized, allowing the states and local authorities to assume greater responsibility. At the same time, to avoid unnecessary duplication and gaps and to ensure that resources are being used efficiently, an oversight/coordination function could be usefully performed for the whole system (both federal and local programs). Given the fact that all of these programs should aim at raising nutritional levels, the Ministry of Health would be a logical organ to perform this function.

D. Institutional Framework for Policy Making

4.84 The foregoing assessments indicate that there are a large number of institutions and agencies involved in the process of formulating and implementing policies that affect agriculture. This is neither surprising nor necessarily bad, in view of the fact that many of the most important policies affecting agriculture are not sector-specific and cut across many,

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19/ For more details on agriculture-specific education and training, see Annex 11.

if not all of the sectors. The problem arises when the policies are not consistent nor coordinated or when they reflect the parochial interests of the agencies involved. It is fair to say that these problems do exist. However, it is not at all clear that the centralization of policy making -- say, for example in the Ministry of Agriculture -- would be a solution. Clearly, certain policies need to be maintained in other parts of the Government, particularly those policies which impact the whole economy.

4.85 Nevertheless, there is an urgent need to establish a capacity in Government to monitor agriculture-related policies, assess the merits of the different policies and actions which affect agriculture and to advise officials accordingly. Had such capacity existed, perhaps the present policy bias favoring import substitution and discriminating against agriculture would not have persisted for as long as it has.

4.86 This capacity could be developed in the Ministry of Agriculture, which presently is weak in this area. An Economic or Policy Staff Group would need to be attached to the minister. This group, which could consist of about 10 to 12 economists (agricultural and general), would work for the Minister on a day-to-day basis. It would also do the staff work needed to examine policy alternatives with respect to their impact on agriculture. In addition, it would track developments in the domestic and international economy and assess existing policies. This team would need to develop close relationships with other policy analysis groups in the government.[20]

20/ For more on Government institutional capacity within the agricultural sector, see Annex 12.

V. FUTURE AGRICULTURAL DEVELOPMENT

A. Introduction

5.01 This chapter takes a forward look at the agricultural sector. This future perspective should be neither too long, which would be crystal-ball gazing at best, nor too short, which would preclude its usefulness in assisting the Government and the Bank in identifying sectoral priorities and strategies that are consistent with the country's medium- and long-term development prospects and goals. Consequently, a future period, corresponding to the decade of the 1990s, up to the year 2000 has been chosen. First, the simulation analysis is presented. This consists of evaluating the impact of different exogenous policy changes on the future evolution of the sector. The following section discusses the policy agenda and challenges for the 1990s. The requ.rements for future sector work are presented in the next section. Finally, the implications for developing a sectoral assistance strategy are discussed.

B. Simulation Analysis

5.02 To test the effects of changes in different policies on the performance and structure of the agricultural sector over the medium term, an econometric simulation model was developed. It is a planning tool rather than a refined method for forecasting. As such, what is important are the projected relative changes and directions of change rather than the forecast values themselves.

5.03 The basic approach entails predicting the direction and order of magnitude of change in a number of key variables that describe the structure and performance of the agricultural sector, both in relation to the rest of the economy (Chapter I) and within the sector itself (Chapter II) in response to different policy and other exogenous changes.

5.04 Two basic econometric models were used for this purpose: one for the variables defining the relationship between agriculture and the rest of the economy; and the other for the within-agriculture variables. These are presented below. More technical details are given in Annex 3.

1. Model 1 - Between Agriculture and the Rest of the Economy

5.05 Model 1 is a two-sector (agriculture and non-agriculture) aggregate income model in which the explanatory or exogenous variables are the prices of agricultural and non-agricultural products, and the stock of labor and capital. Labor is further subdivided into agricultural and non-agricultural labor. The dependent or endogenous variables in this model are: agricultural and non-agricultural imports, exports and consumption; total investment and GDP.

2. Model 2 - Within Agriculture By Region

5.06 Model 2 is a two-commodity (food crops and export/industrial crops) model of the agricultural sector in each of the five regions. In

this model the explanatory or exogenous variables for each region are the quantities of total food crops and total export/industrial crops, the rental price of agricultural land, the price of agricultural labor and the price of agricultural machinery. The dependent or endogenous variables for each region are the quantities of agricultural land, labor and machinery, and the cost shares of each of these factors in the total cost of agricultural production.

3. Calibration

5.07 To calibrate the above models, data from the period 1970-1987 were used [1] From the data in Model 2, estimates of own and cross price elasticities of demand for the factors of production by region were also derived (Table A.5.1.).

4. Projecting the Exogenous Variables

5.08 To forecast the dependent variables to the year 2000 using the above models it was necessary to project the exogenous or independent variables. The quantity of non-agricultural labor in Model 1 was estimated by regression analysis based on IBGE demographic projections. To obtain the future values for the other exogenous price and stock variables in both models, first a set of trend values (i.e. the baseline) were used. Then several alternative policy-induced changes in relation to the baseline were tested. All of these are presented below:

Baseline: Trend Extrapolation
Continuation of recent (1980-1987) trends.

Test 1: Agricultural (Product) Trade Liberalization.

Real producer prices of agricultural export products were assumed to increase first by 10, then by 20 and finally by 40% in relation to the baseline. These percentage adjustments are suggested by the results from the analysis of nominal rates of protection (Table 4.1). A 40% adjustment would completely eliminate the implicit taxation of export crops.

Test 2: Non-Agricultural (including agric. inputs) Trade Liberalization

Real prices of non-agricultural imports were assumed to decrease by 20, 40 and 80% in relation to the baseline. These adjustments

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1/ In the case of Model 2, because of limited degrees of freedom, it was not possible to calibrate the model for each region separately. Therefore, the time-series and cross-sectional data from the five regions were pooled. The same equations, therefore, with region-specific estimates of the independent variables, were used to forecast the dependent variables for each region separately.

are suggested by the analysis of the nominal rates of protection of agricultural inputs (Table 4.3). An 80% adjustment would remove the protection of most agricultural inputs.

Test 3: Comprehensive Trade Liberalization

Tests 1 + 2.

Test 4: Exchange Rate Liberalization.

A 20% depreciation of the cruzado was assumed which raises the real prices of exportables and importables by 20% in relation to the baseline. This adjustment is suggested by the fact that in 1988, the degree of overvaluation was estimated at around 20% (para. 3.43).

Test 5: Comprehensive Trade and Exchange Rate Liberalization.

Tests 3 + 4.

Test 6: Removal of Credit and Fiscal Subsidies

The rental price of land and the price of machinery services were assumed to decrease and increase respectively by 10 and 30%.

Test 7: Maximum liberalization.

Tests 5 + 6.

5.09 Although the above changes in the independent variables were assumed to be caused by policy changes, one could just as well postulate that they were induced by other types of change (e.g., world market developments, or even changes in consumer demand). In addition, coefficients could be altered to reflect structural or other types of change. The advantage of using these models is that they provide a consistent framework within which to analyze and trace through the effects of a wide variety of possible changes.

5. Results

5.10 Each of the above policy changes generates a scenario comprising a set of values for the endogenous or dependent variables. These scenarios, along with the baseline and current (1987) values are shown in Tables A.5.2 through A.5.8. First, the results from the baseline are presented, followed by the scenarios resulting from the policy changes.

(a) Baseline

5.11 The baseline projection to the year 2000 indicates that agriculture's share in total output remains largely unchanged (Table A.5.9). Also the total agricultural labor force is projected to decline only slightly as is its share in the total labor force. Agricultural

exports as a share of total exports are projected to continue to decline, reaching 23% in the year 2000, compared with about 40% at present. In general, these results suggest that the path of structural transformation at the national level can be expected to be fairly stable (with the exception of the trade sector) in contrast to the dramatic changes of the previous decade.

5.12 The total cultivated land area is projected to increase by only about 1.3% per annum over the next decade and most of this increase is expected to come from more intensive use of existing, but currently uncultivated, farmland (para. 5.15), reflecting the slowdown in the growth of the agricultural frontier.

5.13 With regard to factor cost shares, the baseline projections indicate a general decline in the factor cost share for labor and a continuing rise in the relative share accruing to machinery which, in the model, is a proxy for capital. Land's share remains relatively constant.

5.14 Across the regions significant changes are projected. This is particularly so in the case of the agricultural labor force. In the Northeast, a large absolute decrease in the agricultural labor force is projected. The Northeast's share in the total agricultural labor force is also projected to decrease significantly. In contrast, the Center-West's share in the agricultural labor force is projected to increase substantially, while the South's share is forecast to remain fairly constant and the Southeast's share is projected to increase.

5.15 In terms of total cultivated land, the projected annual rate of change at the national level is relatively small (para. 5.12) but significant changes are projected in a few regions. In the Northeast and Southeast, significant increases are projected, but this is expected to come mainly from bringing existing farm land into cultivation rather than from expansion of the frontier, as there is no significant amount of unclaimed land in these regions. In the North, cultivated land area is also projected to increase. This is the only region where the additional land is expected to come from an expansion of the frontier. However, this increase represents a relatively small proportion of the country's total cultivated land area. In the Center-West, where most of the land expansion of the last several decades has taken place, the projected rate of growth of cultivated land is small (0.9% per annum).

(b) Policy Changes

5.16 The various policy changes that were tested appear to have little impact on the main structural parameters (agriculture's share in output and employment). However, the more domestic agricultural consumption goods (food production, etc.) are positively affected by policy changes, the greater is agriculture's share in GDP. The effects, however, are relatively small. These findings generally confirm the stability of these parameters over the next decade which is not surprising in view of the fact that for some of the parameters (agriculture's share in GDP), Brazil is already at levels close to that of an industrialized, developed country.

5.17 In the trade sector, agricultural trade liberalization does have, in relation to the baseline, a significant positive effect on agriculture's share of total exports (Scenario 1). However, in relation to agriculture's current share, this parameter declines only slightly, indicating that the steep downward trend of this parameter is more the result of policy distortions than of any other factor.

5.18 Comprehensive trade and exchange rate liberalization (policy test 5), through its overall growth-enhancing effects, tends to reduce the agricultural labor force in all the regions, compared with the baseline. The large absolute decline in the agricultural labor force in the Northeast, as projected in the baseline and further reduced by liberalization measures, is a significant and encouraging result in view of the present large pool of low productivity agricultural labor in this region. It also highlights the importance of general reform measures in the process of combating poverty, through the impact such measures have on facilitating the transfer of labor out of low productivity agricultural employment to higher productivity off-farm jobs. Nevertheless, this result still leaves a large and disproportionate share (in relation to output) of the agricultural labor force in the Northeast, suggesting the need for additional direct measures to deal with this problem (paras. 5.41-5.44).

5.19 The liberalization measures also have a strong positive impact on the overall performance of the economy and the agricultural sector. Compared with the baseline, agricultural exports more than double with agricultural trade liberalization (Scenario 1 shown in Table A.5.2). At the same time, liberalization of non-agricultural trade, including agricultural inputs, has a significant positive impact on domestic agricultural consumption goods (food) production (Scenario 2, Table A.5.3). The combined effect of agricultural and non-agricultural trade liberalization is shown in Table A.5.4. Under this scenario, agricultural GDP and total GDP are significantly higher than the baseline results. Similarly, exchange rate liberalization has a major positive impact on agricultural as well as non-agricultural exports (Scenario 4). The combined effect of both trade and exchange rate liberalization (Scenario 5) is shown in Table A.5.8.

5.20 While agricultural trade liberalization appears to have little effect on the factor cost shares compared with the baseline, the further reduction of credit and fiscal subsidies (which tend to be capitalized in the price of land) does have the effect of holding labor's share relatively constant compared to the present, while reducing the share of land (Scenario 6, Table A.5.7). Under this scenario, the substitution which occurs is largely that of capital for land, rather than capital for labor as in the baseline projection. This scenario implies a more equitable distribution of total agricultural income, both nationally and among the regions, and consequently has important policy implications.

5.21 With regard to the overall impact on agricultural performance of removing credit subsidies, the results from the model are more difficult to interpret, owing to the fact that it has been assumed that the removal of these subsidies only increases the price of machinery. In the model this

change has the effect of lowering the growth of the capital stock, thereby producing a lower total and agricultural GDP compared to their baseline values. However, the removal of credit subsidies would undoubtedly lead to an overall increase in efficiency in the use of capital and resources generally, thus providing a stimulus to output.

C. Challenges for the 1990s

5.22 Brazil faces a number of key policy choices that will shape the pattern and rate of growth of the economy and the agricultural sector in particular over the coming decade. In this regard it should be noted that the baseline (or extrapolation) projection has built into it the more recent liberalization trends of the 1980s, induced to some degree by fiscal pressures. When these fiscal pressures are reduced, Brazil's degrees of freedom will increase significantly. If Brazil resumes the highly distorted policies of the 1970s, not even the baseline projection is likely to be achieved. In this sense, the baseline represents the maintenance of relatively recent policy reforms (reduction of subsidies and partial liberalization of agricultural trade) that are moves in the right direction. Just maintaining this course, which is by no means inevitable without the vigilance of policy makers, would bring substantial economic growth and equity gains.

5.23 However, much more can and should be accomplished. The analysis shows that by adopting further liberalization measures, not only does the performance of the economy improve relative to what is likely to happen if present trends continue, but it also results in a substantially more equitable and, therefore more socially acceptable course as well. This is probably the major choice that policy makers will need to make during the coming years -- to succumb to particular interest groups (as has been the case in the past of protecting certain industries, taxing agriculture generally and then subsidizing large agricultural producers) or to take the more efficient growth path which also turns out to be the more equitable one as well.

5.24 Another challenge which the Brazilian economy and the agricultural sector in particular will face during the coming decade is the general closing of the agricultural frontier, in the sense that agricultural production growth is expected to come mainly from productivity increases and more intensive use of existing farm land rather than from area expansion as was the case until recently throughout the postwar period. In general, this should have overall beneficial efficiency, distributional and environmental effects. At the same time, it will put greater pressure on existing cultivated and unutilized existing farm land. In this setting, agricultural research to develop higher yielding varieties and improved cultivation practices and to stay ahead of disease and insect infestation, should receive high priority. In addition, the problems of resource management and sustainable farming systems will need to receive increased attention from both the research and extension services. Agricultural higher education in Brazil will need to adapt to these changing circumstances to produce the needed scientists and technicians with these specialized skills.

5.25 Increased emphasis on more land-intensive agricultural development in the 1990s can also be expected to focus greater attention on irrigation. Only about 2.2 million ha (or 7.6%) out of an estimated potential irrigable area of 29 million ha (excluding the North) is currently irrigated.[2] The Government has a useful role to play here in providing the needed public infrastructure (dams, canals, power and roads) to complement as well as induce economically sound private sector irrigation development.

5.26 Although the expansion of the agricultural frontier is expected to come to a halt during the 1990s, in the sense noted above (para. 5.24), there is little doubt that settlement of the Amazon basin in the North will continue, albeit at a slower pace than before. There are strong demographic and social forces at work here which will continue to operate with or without fiscal or other economic incentives. The baseline projection clearly indicates this trend. This will present a major challenge to the federal and local governments concerned, as development in some of these areas is not sustainable from a long-term, economic/environmental point of view. The role of government in this situation is crucial both in ensuring that the settlers face the real economic costs (all uneconomic subsidies are removed) and that the appropriate land use and environmental regulations and standards are clearly established, monitored and enforced.

5.27 Agricultural labor force problems will also continue to persist throughout the next decade. The simulation analysis shows that even on the more efficient growth path a large number of agricultural laborers with relatively low productivity are likely to remain in the Northeast. These productivity levels are too low to sustain adequate standards of living.

5.28 Recent political developments are also likely to play a major role in affecting the evolution of the sector in the coming decade. The new institutional environment that emphasizes democratic bargaining and the role of interest groups in congressional coalitions creates a new opportunity for agricultural interests. Farmer organizations can very likely defend their interests more effectively through Congress than they have been able to do in the past in governments dominated by the executive branch. Hence, the return to democracy could promote more conscientious treatment of agricultural interests, especially in regard to penalizing trade and price controls. However, larger and more capitalized farmers will clearly dominate the coalition. The congressional voice for middle-size and smallholder operators will be much weaker. Thus, the potential for the maintenance of compensatory subsidies and capital bias in technology that favor the larger farmers relatively more than small operators, still exists.

5.29 Finally, it must be emphasized that unless there is success on the short-term stabilization front to reduce the fiscal deficit and control inflation, the tendency will be to resort to ad-hoc trade controls and an overvalued exchange rate which penalize agriculture. Such policies are also likely to be used, as they have in the past, to justify the continued

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2/ World Bank, Irrigation Subsector Review, (Green Cover, June 22, 1989).

reliance on costly and inequitable explicit fiscal and credit subsidies as compensatory measures for the implicit taxation. Thus, successful relaxation of agricultural taxation depends critically on a credible stabilization effort for the economy as a whole.

D. Future Sector Work Priorities

5.30 While this report covers many of the subjects of relevance to the Government and the Bank for the formulation of a sector development assistance strategy, some important gaps remain. In some of these cases new sector work needs to be initiated; in others, it is a matter of further analysis on work that has been started. This work will need to be coordinated among the various institutions in Brazil which have the capacity to either carry out or assist with such studies (such as IBGE, FGV, IPEA, CFP, and EMBRAPA) to ensure that the most efficient use is made of the country's scarce research resources. The following sections identify the sector work required in the next several years.

1. New Work

5.31 Five major new sector work areas have been identified: (i) the regional analysis of national income decomposed sectorally; (ii) the analysis of investment across sectors; (iii) the absorptive capacity of industry with respect to agricultural labor; (iv) the livestock subsector; and (v) sustainable agricultural systems.

(a) Regional Income and Its Sectoral Composition

5.32 The most recent regional income accounts are for 1980. In view of the large diversity among regions and the importance of distributional issues in Brazilian economic development in general and in agriculture in particular, resuming the maintenance of these accounts should be a matter of priority. The fact that such accounts have been neglected for so long suggests that the Brazilian Institute of Geography and Statistics (IBGE), which is now responsible for the national income accounts, would be best advised to design an entirely new system -- one that is capable of generating regional accounts at the same time that the national accounts are produced. Before 1980 when the regional accounts were prepared by FGV, they were based on census data and consequently they were produced only for benchmark census years. A new system is needed that is fully integrated within the normal process of producing the country's national income accounts. Technical assistance from a country that is successfully operating such a system would be useful.

(b) Inter-sectoral Investment Analysis

5.33 Virtually no research has been done on the subject of the efficiency with which investment resources are allocated among the different sectors, including agriculture. The paucity of research in this area is mainly due to the fact that aggregate investment in the national income accounts has never been disaggregated into its sectoral components. To allow this important work to be carried out, IBGE needs to begin to construct investment accounts that identify the sectoral composition.

(c) Absorptive Capacity

5.34 The absorptive capacity of industry with respect to agricultural labor has been a debated issue for a long time. Unfortunately, the debate has been based on very little actual empirical work. In view of the importance of this factor in the long-term development of the country, particularly in the Northeast, the time is long overdue to carry out the necessary empirical studies. These studies should identify not only what is currently possible, but what could be achieved in terms of labor transfers under different policy interventions that affect conditions on both the supply and demand sides.

(d) Livestock

5.35 While the livestock subsector is believed to account for roughly 20-25% of agricultural GDP (no official figures are available), very little is known about the factors that influence this subsector's performance. A recently completed report on livestock by MINAGRI did not shed much further light on this subject. A critical assessment of the main factors affecting this subsector's performance is needed.

(e) Sustainable Agricultural Systems

5.36 In view of the likely increased importance of more intensive agricultural development and the continued development of the more ecologically fragile areas in the North, much more needs to be known about the environmental or natural resource management issues in agricultural (including livestock and forestry) development. This is another important area for future sector work.

2. Ongoing Work

5.37 There are also areas where work needs to continue or where the analysis needs to be expanded. Some of the most important areas in this category include: (i) public expenditures in agriculture, including the budget process; (ii) government institutional capacity within the agricultural sector, including institutions at the regional and state level; and (iii) crop and farm budget analysis by agronomic zone to identify areas of agricultural and non-agricultural development potential, particularly in the Northeast.

E. Implications for the Design of a Development Assistance Strategy

5.38 For three consecutive decades, 1950-1980, Brazil experienced very rapid overall economic and sectoral growth. Only in the last decade has this process slowed. However, over the entire period, there was much less progress in terms of raising living standards for the vast majority of the country's poor population. Furthermore, the distribution of income (and wealth) clearly worsened; numerous studies have shown a rise in the Gini indices of income concentration over the last several decades.

5.39 In the Northeast, the country's poorest and most densely populated region, its share in total national income declined from 14% in 1949 to 12%

in 1980 (the last year for which comparable regional income data are available) (Table A.1.10). In 1960, per capita income in the Northeast was about 30% of what it was in the Southeast -- the most developed region. The comparable figure in 1980 was 28%, indicating a further widening in the income disparities between these two regions over this period (Table A.1.21).

5.40 The analyses carried out suggest that many of the same policies that led to serious resource allocation distortions in the economy also contributed directly to the above distributional results. The general bias in policy which discriminates against agriculture adversely affects those regions with a relatively large agricultural sector more than it does those regions in which the agricultural sector is relatively less important. In addition, the analysis of nominal rates of protection of agricultural inputs (fertilizers, chemicals, etc.) has shown that present policies implicitly tax the less industrialized regions (like the Northeast) more than the industrialized regions where these inputs are produced, resulting, in effect, in a net transfer of income from the poorer to the more developed areas. The prevailing policies, therefore, have exacerbated the disadvantages of the less well-endowed and more agriculturally dependent regions. This strongly suggests that the removal of such policy distortions should be a cornerstone of any rural development strategy.

5.41 Regarding the large pool of low-productivity labor in agriculture in the Northeast, it is important not to overlook the impact of general liberalization measures. As the simulation analysis shows, these measures can be very effective in facilitating the transfer of excess labor out of agriculture to higher productivity jobs. Nevertheless, this analysis also shows that there would still be a large number with relatively low productivity who would remain even if these reforms were instituted.

5.42 In some areas in the Northeast, there is considerable room to increase productivity. The direct methods for doing this include extension and research support and complementary infrastructure -- irrigation, roads, power, etc.). The cost of these investments can be considerable. Thus, before committing resources in a particular area, it is important to know, among other things, the agricultural potential of the area. Much more needs to be done to pinpoint these areas where continued efforts at raising agricultural labor productivity are unlikely to succeed and those areas where the potential payoff, in both financial and economic terms, is likely to be significant. This was attempted in selecting priority areas for the Northeast Rural Development Program. The analysis of crop budgets in this report (Annex 5) is an attempt to begin to systematically generate this information for the country as a whole. This analysis shows that in some areas of the Northeast (e.g. the Zona da Mata along the coast, near the ports, in Balsas, close to the Carajas Railway, and in Barreiras which is close to the port of Salvador) the net returns to labor are satisfactory and improve significantly with the introduction of economic prices. However, in other areas (particularly in the dry Sertao), the results indicate that even with the removal of price distortions and projected likely technological improvements, the net returns are too low to support a satisfactory standard of living.

5.43 While more research work in this field is needed before area-specific prescriptions can be made, it is clear that, for many farmers who operate at the margin and for whom significant technological change in the foreseeable future is not an option, the best long-term strategy is to facilitate their transfer to other occupations rather than to continue to invest in raising the marginal productivity of this excess agricultural labor force. Government efforts at all levels will need to be directed at removing the distortions and barriers that restrict occupational and geographic mobility by the labor force. One major barrier is the high rate of illiteracy among the rural population. Hence, formal education, at least in the long term, can play a major role not only in raising agricultural productivity, but also in facilitating the transfer of labor out of agriculture (para. 4.63). In addition, measures which improve the dissemination of employment information and relieve the burden of transport can have an immediate beneficial effect. Another way in which such transfers can be facilitated is through informal job training for the general skills and discipline required of the industrial/commercial labor force. At present, SENAR provides such job training and a recommendation has been made to expand its coverage (para. 4.82). However, to have a major impact, other complementary training programs, both public and private, will be needed.

5.44 At the same time, one cannot be too sanguine about the capacity of industry and the service sectors to absorb agricultural labor. The labor transfers predicted by the model are what the projected economic conditions permit, based on historical (econometrically estimated) absorption rates. To go beyond this result as suggested, and transfer more labor out of agriculture requires that these historical absorption rates be changed. The various measures mentioned above (para. 5.43) are means to do this. However, it is not an easy task. A major long-term commitment on the part of governments at all levels will be required.

5.45 In summary, the development strategy implied for the poorer areas of the country, like those in the Northeast, by the analysis carried out is one which emphasizes: (i) the removal of policy distortions that penalize agriculture generally and, therefore, also adversely impact these areas, both in absolute and in relative terms (this aspect has not been stressed enough in the past); (ii) much greater investment in rural primary education; (iii) the use of direct interventions in agriculture (research, extension, infrastructure, etc.) in selected areas of clearly established economic potential; and (iv) public investment in job training to facilitate the transfer of labor from low-productivity agriculture to higher productivity employment.

F. Future Policy Agenda

5.46 This report makes a number of policy recommendations. The implementation of these would contribute significantly to improving the performance of the economy overall and the agricultural sector in particular. These recommendations should be seen as a package in which individual policies complement each other. However, it would be unrealistic to expect policy reforms to proceed in tandem on all fronts.

It will be necessary for the Government to move on each at the most expeditious time. In doing so, some sense of priority is essential.

5.47 The issue of priorities inevitably leads to the question of the short and the long run. Short run considerations would clearly suggest that the highest priority reforms are those which contribute to improving Brazil's fiscal situation. From this point of view the report's most important recommendations are those which eliminate the various explicit Government subsidies: subsidized agricultural credit; the wheat subsidy; the Minimum Price Program; public storage; PROALCOOL; subsidized public irrigation; and the various agriculture-specific fiscal incentives. At the same time, as the analysis in this report has shown, such reforms would also significantly improve the economic efficiency of resource allocation.

5.48 Specifically, from a resource allocative efficiency point of view, the most important recommendations are those which relate to the liberalization of Brazil's trade and exchange rate regimes. Reforms in these areas would bring forth major economic efficiency gains that would stimulate growth and, through this vehicle, also contribute, at least potentially, to improving the fiscal situation as well.

5.49 However, one would be remiss -- even in the present fiscal crisis environment in which Brazil now finds itself -- not to give appropriate weight to those recommendations that have a bearing on the long term growth prospects of the sector. In this context, land policy reform to improve the efficiency of land use and investments in agricultural research, rural education and training, nutrition and road infrastructure are key. The investments in human capital are particularly important if Brazil is to make significant progress in combating rural poverty.

5.50 The ambitious policy reform agenda outlined in this report represents a formidable challenge to Brazilian policy makers. Brazil can achieve both high levels of growth and greater equity as it enters the twenty-first century. In particular, the prospects are bright for the agricultural sector. Whether it will achieve these goals will, at least in large measure, depend on a commitment to continued policy reform.

APPENDIX A

TABLE A.1.1: GROSS DOMESTIC PRODUCT BY SECTOR: 1950-1970

(Cr$000 at Current Prices)

SECTOR	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
AGRICULTURE	64,139	76,694	95,486	107,663	149,535	178,931	201,021	236,883	260,268	360,974	513,647
INDUSTRY	63,780	81,346	92,417	116,145	159,718	195,490	260,365	322,494	440,206	693,886	932,435
Mining	1,032	1,481	1,972	2,339	2,817	3,812	5,260	6,618	9,173	13,642	22,151
Manufacturing	49,304	61,364	69,405	87,086	124,370	155,601	202,936	2,498,789	338,610	545,535	739,565
Construction	10,850	15,755	18,107	23,513	28,522	30,473	43,606	53,656	74,954	110,946	139,222
Public Utilities	2,614	2,746	2,933	3,207	4,009	5,604	8,561	12,421	17,469	23,763	31,497
SERVICES	136,285	165,337	194,255	233,358	310,801	388,012	491,803	600,233	714,207	1,048,883	1,446,389
Commerce	41,298	50,920	60,209	70,860	97,931	123,528	149,697	188,987	231,404	349,689	490,014
Transport	9,084	11,518	13,711	17,071	23,294	28,242	35,567	43,470	52,007	77,672	114,479
Communications											
Financial Institutions	9,500	10,700	12,600	15,200	21,400	25,600	31,000	41,200	42,400	5,800	78,500
Public Administration	17,407	20,345	23,685	29,981	33,740	46,886	71,348	83,608	96,406	138,114	183,623
Rents	30,476	37,213	43,535	52,112	69,422	84,563	106,102	127,052	150,500	217,914	296,897
Other Services	28,522	34,641	40,565	48,134	65,014	79,193	98,089	117,716	141,490	207,494	282,876
SUBTOTAL	264,204	323,577	382,158	457,166	620,054	762,433	953,189	1,159,610	1,414,681	2,103,743	2,892,471
MINUS: IMPUTED SERVICE CHARGES OF FINANCIAL INSTITUTIONS	8,500	10,500	12,100	15,100	21,600	26,900	31,100	42,300	45,500	59,000	83,400
GDP AT FACTOR COST	255,704	313,077	370,058	442,066	598,454	735,533	922,089	1,117,310	1,369,181	2,044,743	2,809,071
INDIRECT TAXES	26,500	36,200	40,700	47,900	73,600	80,200	111,300	137,000	203,200	294,300	397,400
MINUS SUBSIDIES	600	400	500	500	700	1,000	4,400	4,900	17,500	19,400	24,300
GDP AT MARKET PRICES	281,604	348,877	410,258	489,466	671,354	814,733	1,028,989	1,249,410	1,554,881	2,319,643	3,182,171

SECTOR	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
AGRICULTURE	731,094	1,211,220	1,985,730	3,941,873	6,176,215	7,934,986	10,245,212	11,958,130	15,108,721	20,157,037
INDUSTRY	1,402,147	2,252,359	4,120,904	7,875,477	12,443,288	18,874,728	23,933,074	35,271,884	46,734,784	62,610,589
Mining	36,672	50,178	82,710	168,013	345,594	459,204	555,036	748,297	968,359	1,358,020
Manufacturing	1,164,674	1,820,511	303,385	6,337,250	9,712,036	14,274,745	18,252,412	26,983,936	35,864,943	47,887,408
Construction	158,661	317,303	613,657	1,089,428	1,762,977	2,617,388	3,739,127	5,832,908	7,675,488	9,415,498
Public Utilities	42,140	64,367	121,172	296,788	622,681	1,023,411	1,386,499	1,708,743	2,225,994	3,949,663
SERVICES	2,176,602	3,471,659	6,344,753	12,403,015	20,320,164	29,777,766	40,533,010	54,221,945	70,758,212	91,802,169
Commerce	732,314	1,160,650	2,053,790	3,998,770	6,460,811	9,497,671	12,778,652	17,325,898	22,747,390	28,627,377
Transport	165,695	265,974	500,095	975,663	1,570,752	2,305,813	3,172,715	4,259,889	5,670,193	6,458,913
Communications										
Financial Institutions	118,500	203,100	370,900	722,800	1,334,800	2,091,000	2,872,500	4,142,300	5,811,300	10,511,700
Public Administration	304,790	503,937	992,643	1,922,967	3,122,200	4,599,800	6,614,300	8,690,800	11,322,800	16,116,800
Rents	425,426	674,890	1,234,989	2,460,841	4,040,787	5,842,693	7,859,369	10,246,263	12,935,381	15,206,829
Other Services	429,877	663,108	1,192,356	2,321,974	3,790,814	5,440,589	7,235,474	9,556,795	12,221,148	12,814,125
SUBTOTAL	4,309,843	6,935,238	12,451,387	24,220,365	38,939,667	56,087,480	74,711,295	101,451,959	132,601,717	174,569,795
MINUS: IMPUTED SERVICE CHARGES OF FINANCIAL INSTITUTIONS	128,000	224,900	395,100	834,700	1,501,600	2,372,300	3,165,400	4,391,900	5,886,100	11,215,700
GDP AT FACTOR COST	4,181,843	6,710,338	12,056,287	23,385,665	37,438,067	53,715,180	71,545,895	97,060,059	126,715,617	163,354,095
INDIRECT TAXES	519,800	828,600	1,525,000	3,214,400	5,841,500	9,667,600	11,903,600	18,946,000	25,756,700	32,531,900
MINUS SUBSIDIES	48,900	86,700	205,500	386,500	617,800	594,300	666,900	835,300	1,072,800	1,497,000
GDP AT MARKET PRICES	4,652,743	7,452,238	13,375,787	26,213,565	42,661,767	62,788,480	82,782,595	115,170,759	151,399,517	194,388,995

Source: FGV, Centro de Contas Nacionais.
Presented in IBGE - Estatisticas Historicas do Brasil, Volume 3, 1987.

TABLE A.1.2: GROSS DOMESTIC PRODUCT BY SECTOR: 1970-1987

(Cz$000 at Current Prices)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
AGRICULTURE	20,157	28,644	38,430	55,860	80,122	107,349	186,566	322,048	372,700	599,838	1,232,100	2,242,589	3,790,015	11,602,176	40,553,895	143,530,713	381,828,326	1,275,393,521
INDUSTRY	62,538	85,096	118,677	162,239	248,438	356,447	569,725	848,068	1,288,218	2,212,737	4,678,264	8,750,321	17,455,365	40,591,973	138,403,960	504,275,157	1,306,883,834	NA
Mining	1,358	1,629	1,973	2,303	3,592	5,949	9,309	13,480	18,939	30,629	66,494	153,375	330,468	1,122,295	5,074,789	22,329,584	46,082,783	
Manufacturing	47,870	65,024	86,945	123,976	189,462	268,517	436,088	643,982	986,058	1,690,222	3,581,234	6,725,988	13,176,287	31,333,525	106,639,208	375,805,434	947,670,957	
Construction	9,415	12,902	18,217	27,423	42,368	62,090	96,430	147,491	221,171	403,867	812,738	1,462,198	2,937,551	5,807,832	18,375,401	76,338,766	234,672,999	
Public Utilities	3,895	5,543	6,542	8,447	13,021	19,891	27,898	43,115	62,050	88,219	217,798	408,762	1,011,060	2,328,321	8,314,562	29,800,373	78,457,095	
SERVICES	91,809	123,848	163,682	224,244	334,523	490,455	789,931	1,208,203	1,839,292	3,102,380	6,395,301	13,404,052	27,361,626	68,688,304	220,464,231	809,028,618	1,961,297,916	NA
Commerce	28,628	38,080	52,137	73,647	112,213	158,066	242,746	356,793	520,642	850,058	1,788,803	3,404,427	6,646,714	16,218,777	53,377,955	193,586,418	499,653,767	
Transport	6,459	8,548	11,236	14,587	22,941	32,402	57,422	86,704	133,861	230,169	453,381	951,513	2,045,797	4,671,027	14,894,573	51,736,176	128,298,737	
Communications	1,068	1,331	2,156	3,738	4,691	7,179	11,546	20,281	32,219	55,772	102,686	232,956	491,273	1,152,038	3,595,974	12,415,338	26,520,456	
Financial Inst.	10,512	14,396	18,769	25,393	40,578	55,719	113,610	178,981	299,698	490,429	982,056	2,492,342	5,036,906	14,013,320	43,017,138	160,093,151	285,977,711	
Public Admin.	16,117	21,428	27,578	35,742	49,370	74,918	116,875	163,701	250,215	416,529	780,920	1,583,119	3,563,108	7,752,058	21,832,063	95,974,730	267,338,357	
Rents	16,207	20,947	26,400	33,843	47,682	66,614	100,351	154,201	230,629	383,054	825,651	1,842,622	3,813,635	10,322,385	34,832,228	120,817,975	312,351,057	
Other Services	12,814	18,216	25,406	37,294	56,028	85,357	147,381	240,612	371,968	666,389	1,461,817	2,897,073	5,764,198	14,558,699	48,914,300	177,404,725	461,127,831	
SUBTOTAL	174,498	237,590	315,789	442,043	663,083	954,251	1,546,222	2,378,319	3,500,150	5,914,955	12,305,665	24,396,962	48,607,007	121,082,453	399,422,086	1,456,834,383	3,670,010,076	NA
MINUS: IMPUTED VALUE OF SERVICES OF FINANCIAL INSTITUTIONS	11,216	15,839	20,044	26,090	42,962	66,987	112,585	178,793	290,361	464,853	893,465	2,457,641	4,932,004	13,894,055	42,960,114	163,133,326	256,697,249	NA
GDP AT FACTOR COST	163,282	221,751	295,745	415,953	620,121	887,264	1,433,637	2,194,526	3,209,789	5,448,102	11,412,202	22,039,321	43,675,003	107,188,400	356,461,972	1,293,701,055	3,413,312,827	NA
INDIRECT TAXES	32,532	40,396	53,847	75,437	109,508	145,885	229,455	333,813	484,416	728,201	1,673,805	3,169,880	6,355,445	15,023,597	40,257,119	146,166,859	466,852,920	NA
MINUS SUBSIDIES	1,497	2,083	2,394	5,966	18,109	28,261	25,865	37,307	67,321	114,270	459,607	658,184	1,253,832	3,105,772	6,146,535	21,779,651	53,897,416	NA
GDP AT MARKET PRICES	194,317	260,064	347,198	485,424	713,520	1,004,888	1,628,727	2,490,532	3,626,884	6,059,033	12,626,400	24,551,017	48,776,616	119,106,225	390,572,556	1,418,088,263	3,826,268,331	12,783,578,655

Source: IBGE - Diretoria de Pesquisas - Departamento de Contas Nacionais, June 21, 1988.

TABLE A.1.3: SECTORAL SHARES OF GROSS DOMESTIC PRODUCT: 1950-1987

(%)

Year	Agriculture	Industry	Services	Total
1950	24.3	24.1	51.6	100
1955	23.5	26.6	50.9	100
1960	17.8	32.2	50.0	100
1965	15.9	31.9	52.2	100
1970	11.6	35.8	52.6	100
1975	11.2	37.4	51.4	100
1980	10.0	38.0	52.0	100
1985	9.9	34.6	55.5	100
1986	10.4	35.6	54.0	100
1987	10.0	--	--	100

Note: Includes imputed value of services of financial institutions

Source: Derived from Tables A.1.1 and A.1.2.

TABLE A.1.4: ANNUAL VARIATIONS OF REAL GDP BY SECTOR: 1950-1970

(%)

SECTOR	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	64	1965	1966	1967	1968	1969	1970
AGRICULTURE	1.5	0.7	9.1	0.2	7.9	7.7	-2.4	9.3	2.0	5.3	4.9	7.6	5.5	1.0	1.3	13.8	-3.1	5.7	1.4	6.0	5.6
INDUSTRY	11.3	6.4	5.0	6.7	8.7	10.6	6.9	5.7	16.2	11.9	9.6	10.6	7.8	0.2	5.2	-4.7	11.7	3.0	15.5	10.8	11.1
SERVICES	7.1	9.9	10.8	-0.1	13.0	3.5	4.7	9.0	5.4	1.2	13.0	11.9	3.8	2.9	2.0	1.3	5.8	5.8	8.9	--	--
Commerce	7.1	9.7	3.7	-2.1	11.1	4.0	1.6	9.6	7.0	9.4	5.9	7.0	5.8	0.0	1.1	1.7	7.7	4.4	11.7	8.6	9.0
Trans-Comm.	9.5	10.8	7.2	10.2	8.4	3.9	5.1	7.8	6.1	9.6	17.3	3.3	8.4	7.8	1.6	1.8	6.6	7.8	8.8	11.7	14.9
Others	5.2	9.8	27.7	-2.8	18.5	2.4	8.7	8.8	3.2	-12.9	20.0	18.2	0.9	3.5	3.4	0.7	3.5	3.3	6.4	--	--
TOTAL REAL GDP	6.5	5.9	8.7	2.5	10.1	6.9	3.2	8.1	7.7	5.6	9.7	10.3	5.2	1.6	2.9	2.7	5.1	4.8	9.3	9.0	9.5

Source: Fundacao Getulio Vargas - Vol. 30 No. 3 Marco de 1976
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TABLE A.1.5: ANNUAL VARIATIONS OF REAL GDP BY SECTOR: 1971-1987/

(%)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987 a/
AGRICULTURE	10.15	3.97	0.03	0.99	7.21	2.44	12.13	-2.95	4.92	9.59	8.24	-0.43	-0.82	2.97	10.07	-7.95	14.01
Crop Production											9.84	-3.07	-1.77	0.82	14.19	-11.13	15.51
Animal Production											6.07	3.68	1.92	-5.90	3.68	-2.76	11.67
INDUSTRY	11.81	14.19	18.98	8.57	4.86	11.75	3.28	6.44	6.72	9.24	-9.17	-0.15	-6.56	6.13	8.95	12.14	0.21
Mining	3.60	2.24	0.78	23.24	3.02	2.75	-3.47	7.51	12.35	12.84	-2.48	7.12	15.23	29.99	11.50	3.65	-0.69
Manufacturing	11.88	13.97	18.59	7.76	3.82	12.12	2.27	6.11	6.86	9.11	-10.28	-0.44	-6.13	6.13	8.30	11.28	0.97
Construction	12.50	17.90	20.90	9.10	8.10	10.17	5.24	5.20	3.71	4.04	-7.77	-1.07	-14.11	2.54	11.28	17.65	-3.88
Public Utilities	12.40	11.92	14.55	12.14	10.40	14.29	12.00	11.59	12.61	10.55	5.40	6.30	7.80	12.20	10.20	6.50	3.50
SERVICES	11.20	12.58	15.01	11.13	5.01	9.98	3.92	5.33	8.07	8.94	-0.91	2.28	-0.58	5.85	7.63	8.11	2.75
Commerce	11.45	12.08	13.44	9.88	2.90	8.80	2.60	4.28	8.72	8.73	-6.60	0.12	-5.29	6.45	8.94	9.93	1.98
Transport	10.21	12.50	20.72	14.35	10.57	12.55	5.41	6.00	10.15	7.62	-1.79	2.00	-1.83	4.84	4.72	11.60	4.77
Communications	10.53	20.20	22.80	31.15	27.18	22.86	26.35	21.96	28.36	20.04	9.29	22.00	9.50	9.95	16.89	17.11	10.50
Financial Institutions											6.64	4.24	5.61	7.73	9.98	7.02	2.95
Public Administration											2.22	2.22	2.22	2.22	2.22	2.07	2.07
TOTAL REAL GDP	11.20	12.05	13.98	9.04	5.21	9.79	4.61	4.82	7.21	9.13	-3.13	1.06	-2.93	5.67	8.38	8.04	2.91

a/ Preliminary data.

Source: IBGE - Diretoria de Pesquisas - Departamento de Contas Nacionais.

TABLE A.1.8: REAL GROSS DOMESTIC PRODUCT BY SECTOR: 1950-1967

(C$000 at constant 1980 prices)

SECTOR	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
AGRICULTURE	328,032	330,328	360,388	361,109	389,636	419,638	409,567	447,657	456,810	480,810	504,370	542,702	572,550	578,278	636,794	666,633	645,967	682,788
INDUSTRY	417,196	443,896	466,091	506,641	550,719	609,095	651,122	686,236	799,731	894,699	980,809	1,064,775	1,169,387	1,171,726	1,232,656	1,174,721	1,812,163	1,851,529
Mining	7,254	7,719	8,104	8,810	9,576	10,591	11,322	11,967	13,906	15,561	17,055	18,662	20,334	20,374	21,434	20,428	22,816	23,501
Manufacturing	329,594	350,588	368,222	400,258	435,060	481,198	514,401	543,722	631,605	706,990	774,661	856,906	923,842	925,689	973,825	928,055	1,036,638	1,067,737
Construction	67,006	71,294	74,659	81,371	88,481	97,827	104,577	110,557	128,444	143,729	157,527	174,225	187,815	188,100	197,978	188,572	210,748	217,068
Public Utilities	14,833	15,762	16,572	16,013	19,580	21,656	23,150	24,470	28,434	31,618	34,872	38,569	41,577	41,560	43,826	41,766	45,653	48,053
SERVICES	811,672	874,532	965,719	969,254	1,082,186	1,133,363	1,170,594	1,276,124	1,341,402	1,367,807	1,524,129	1,691,790	1,749,931	1,797,736	1,832,178	1,907,635	1,982,267	2,095,221
Commerce	268,826	294,902	305,813	299,391	332,623	345,926	351,463	385,204	412,168	450,912	477,515	510,942	540,578	540,578	548,822	535,613	598,611	624,950
Transport	35,007	38,787	41,580	45,821	49,670	51,607	54,239	58,470	62,037	67,992	79,755	82,387	89,307	96,273	97,814	99,574	108,148	116,426
Communications	2,814	3,117	3,342	3,683	3,992	4,148	4,359	4,699	4,986	5,465	6,410	6,822	7,178	7,738	7,862	8,003	8,531	9,197
Financial Inst.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Public Admin.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rents	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Services	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL GDP AT FACTOR COST (Includes imputed value of services provided by financial institutions.)	1,556,899	1,648,756	1,792,198	1,837,003	2,022,541	2,162,096	2,231,283	2,412,017	2,597,742	2,743,216	3,009,308	3,319,266	3,491,868	3,547,738	3,650,622	3,749,189	3,940,398	4,129,537

Continued on next page.

TABLE A.1.8: REAL GROSS DOMESTIC PRODUCT BY SECTOR: 1960-1987

(C$000 at constant 1980 prices)

CTOR	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
RICULTURE	692,347	733,887	774,985	853,648	887,538	887,802	898,591	961,238	984,890	1,104,183
DUSTRY	1,561,015	1,729,604	1,921,591	2,140,530	2,453,192	2,869,253	3,116,140	3,298,845	3,630,364	3,770,096
Mining	27,143	30,075	33,413	34,018	35,391	38,848	47,873	49,319	50,875	48,917
Manufacturing	1,233,238	1,358,426	1,518,099	1,698,145	1,935,378	2,258,455	2,431,856	2,624,442	2,830,404	2,894,854
Construction	250,714	277,791	308,626	347,204	409,353	494,908	539,945	583,680	643,041	676,736
Public Utilities	53,501	61,495	68,321	76,792	85,946	98,451	110,403	121,885	139,803	157,183
RVICES	2,260,222	2,456,314	2,690,613	2,991,692	3,362,064	3,868,710	4,297,074	4,512,356	4,982,691	5,157,229
Commerce	698,069	759,499	877,954	922,843	1,033,914	1,172,872	1,288,171	1,323,470	1,441,127	1,478,596
Transport	124,495	139,061	159,781	178,005	198,107	230,154	273,473	301,632	339,712	358,090
Communications	10,008	11,177	12,642	14,168	17,030	20,862	27,361	35,344	43,247	54,643
Financial Inst.	...	...	...	...	...	...	...	...	...	...
Public Admin.	...	...	...	...	...	...	...	...	...	...
Rents	...	...	...	...	...	...	...	...	...	...
Other Services	...	...	...	...	...	...	...	...	...	...
TOTAL GDP AT FACTOR COST (Includes imputed value of services provided by financial institutions.)	4,513,584	4,919,806	5,387,168	5,993,869	6,7?2,792	7,623,785	8,308,814	8,740,138	9,597,744	10,031,457

CTOR	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
RICULTURE	1,071,581	1,124,292	1,232,100	1,333,623	1,327,891	1,323,641	1,382,953	1,500,293	1,382,437	1,578,116
DUSTRY	4,012,090	4,282,836	4,678,284	4,249,207	4,243,743	3,983,854	4,208,430	4,585,084	5,141,713	5,152,511
Mining	52,5?1	58,928	68,494	64,845	69,492	80,110	104,087	118,050	120,294	119,464
Manufacturing	3,071,51.	3,282,223	3,581,234	3,209,802	3,195,380	2,999,503	3,183,873	3,447,593	3,838,481	3,873,695
Construction	718,694	745,357	812,738	749,880	741,567	638,932	653,110	728,781	833,058	821,892
Public Utilities	175,031	197,102	217,798	223,203	239,391	258,063	289,547	319,081	343,365	336,969
RVICES	5,432,109	5,870,480	6,395,301	6,388,908	6,533,295	6,498,402	6,875,383	7,399,975	8,000,113	8,220,116
Commerce	1,541,584	1,645,179	1,760,603	1,689,132	1,671,185	1,581,061	1,683,039	1,833,803	2,015,570	2,053,479
Transport	382,799	421,653	453,361	443,248	454,551	448,233	487,631	489,912	548,742	572,872
Communications	64,643	83,543	102,688	112,225	137,018	150,032	184,990	181,423	194,159	199,887
Financial Inst.	...	...	962,036	1,025,937	1,089,438	1,129,432	1,216,757	1,243,749	1,269,494	1,295,772
Public Admin.	...	...	780,920	798,258	815,978	834,092	852,809	852,809	852,809	852,809
Rents	...	...	...	...	...	...	...	...	...	...
Other Services	...	...	...	...	...	...	...	...	...	...
TOTAL GDP AT FACTOR COST (Includes imputed value of services provided by financial institutions.)	10,816,859	11,277,317	12,303,685	11,971,?98	12,104,929	11,784,397	12,448,788	13,483,262	14,524,263	14,940,743

urce: Obtained by applying the annual variations of real GDP by sector as shown in Tables A.1.4 and A.1.5, to the nominal GDP series shown in Tables A.1.1 and A.1.2, using 1980 as the base.

TABLE A.1.7: GROWTH RATES OF REAL GDP BY SECTOR: 1960-87

(Annual Averages, %)

SECTOR	1960-60	1960-70	1970-80	1980-87	1950-80	1950-87	1950-68	1964-78	1974-79	1980-83	1984-87
Agriculture	4.50	4.04	4.19	2.77	4.45	4.38	2.01	4.70	4.59	2.13	3.61
Industry	9.00	6.03	8.91	2.31	8.52	7.56	9.09	10.44	6.61	-4.85	7.48
Services	6.14	5.11	8.71	4.02	7.00	6.78	6.83	8.58	6.35	1.63	5.40
TOTAL	6.66	5.26	8.23	3.28	7.11	6.68	6.84	8.64	6.26	-1.18	6.44

Note : Growth rates are calculated using the least squares method.
Source: Derived from Table A.1.6.

TABLE A.1.8: GDP BY SECTOR AND REGION: 1949-1980

(At Factor Costs-Current Prices Cr$1,000)

		AGRICULTURE	INDUSTRY	TOTAL SERVICES	TOTAL
NORTH	1949	904	400	2,137	3,441
	1959	8,814	6,093	20,947	35,854
	1970	818,600	525,849	2,131,084	3,475,533
	1980	61,106,194	141,157,229	177,045,477	379,308,900
NORTHEAST	1949	10,325	4,327	13,571	28,223
	1959	102,674	36,803	116,192	255,669
	1970	4,207,000	3,453,504	11,160,054	18,820,558
	1980	240,154,508	446,169,876	785,118,682	1,471,443,066
SOUTHEAST	1949	29,335	33,535	74,187	137,057
	1959	140,059	383,174	627,357	1,150,590
	1970	6,899,900	38,944,309	59,546,077	105,390,286
	1980	427,333,691	3,245,318,083	3,993,634,592	7,666,286,376
SOUTH	1949	11,331	5,931	13,481	30,743
	1959	98,848	60,035	128,296	287,179
	1970	6,899,900	5,886,464	14,244,175	26,867,739
	1980	363,533,034	763,245,923	960,820,667	2,087,599,624
CENTER-WEST	1949	1,717	334	1,418	3,469
	1959	17,085	4,089	20,082	41,236
	1970	1,494,100	435,295	4,295,482	6,224,877
	1980	139,972,653	104,125,797	433,267,308	677,345,758
TOTAL	1949	53,612	44,527	104,794	202,933
	1959	367,480	490,174	912,874	1,770,528
	1970	20,156,700	49,245,421	91,376,872	160,778,993
	1980	1,232,100,080	4,700,016,818	6,349,886,726	12,282,003,624

Notes: Includes imputed value of services of financial institutions.
A few items (construction, public utilities and air transport) have not been distributed among the states (regional) which accounts for a small discrepancy between the national GDP figures shown in Tables A.1.1 and A.1.2 and those presented here.

Source: Fundacao Getulio Vargas, Centro de Contas Nacionais, Centro de Estudos Fiscais. 1970, 1975 and 1980 are presented in: Indicadores IBGE Vol. 6 Numbero 6. The breakdown of the regional data by state is also available from the same source.

TABLE A.1.9: SECTORAL SHARES OF REGIONAL GDP: 1949-1980

(%)

REGION	YEAR	AGRICULTURE	INDUSTRY	TOTAL SERVICES	TOTAL
NORTH	1949	26.3	11.6	62.1	100.0
	1959	24.6	17.0	58.4	100.0
	1970	23.6	15.1	61.3	100.0
	1980	16.1	37.2	46.7	100.0
NORTHEAST	1949	36.6	15.3	48.1	100.0
	1959	40.1	14.4	45.4	100.0
	1970	22.4	18.3	59.3	100.0
	1980	16.3	30.3	53.4	100.0
SOUTHEAST	1949	21.4	24.5	54.1	100.0
	1959	12.2	33.3	54.5	100.0
	1970	6.5	37.0	56.5	100.0
	1980	5.6	42.3	52.1	100.0
SOUTH	1949	36.9	19.3	43.8	100.0
	1959	34.4	20.9	44.7	100.0
	1970	25.1	21.9	53.0	100.0
	1980	17.4	36.6	46.0	100.0
CENTER-WEST	1949	40.5	0.6	40.9	100.0
	1959	41.4	9.9	48.7	100.0
	1970	24.0	7.0	69.0	100.0
	1980	20 6	15.4	64.0	100.0
TOTAL	1949	26.4	22.0	61.6	100.0
	1959	20.7	27.7	51.6	100.0
	1970	12.5	30.6	56.8	100.0
	1980	10.0	38.3	51.7	100.0

Source: Derived from Table A.1.8.

TABLE A.1.10: REGIONAL SHARES OF SECTORAL GDP: 1949-1980

(%)

REGION	YEAR	AGRICULTURE	INDUSTRY	TOTAL SERVICES	TOTAL
NORTH	1949	1.7%	0.9%	2.0%	1.7%
	1959	2.4%	1.2%	2.8%	2.0%
	1970	4.1%	1.1%	2.8%	2.2%
	1980	5.0%	3.0%	2.9%	3.1%
NORTHEAST	1949	19.3%	9.7%	13.0%	13.9%
	1959	27.9%	7.5%	12.7%	14.4%
	1970	20.9%	7.0%	12.2%	11.7%
	1980	19.5%	9.5%	12.4%	12.0%
SOUTHEAST	1949	54.7%	75.3%	70.8%	67.5%
	1959	38.1%	78.2%	68.7%	65.0%
	1970	34.2%	79.1%	65.2%	65.5%
	1980	34.7%	69.0%	62.9%	62.4%
SOUTH	1949	21.1%	13.3%	12.9%	15.1%
	1959	26.9%	12.2%	14.1%	16.2%
	1970	34.2%	12.0%	15.6%	16.7%
	1980	29.5%	16.2%	15.1%	17.0%
CENTER-WEST	1949	3.2%	0.6%	1.4%	1.7%
	1959	4.6%	0.8%	2.2%	2.3%
	1970	7.4%	0.9%	4.7%	3.9%
	1980	11.4%	2.2%	6.8%	5.6%
BRAZIL	1949	100.0%	100.0%	100.0%	100.0%
	1959	100.0%	100.0%	100.0%	100.0%
	1970	100.0%	100.0%	100.0%	100.0%
	1980	100.0%	100.0%	100.0%	100.0%

Source: Derived from Table A.1.8.

TABLE A.1.11: REAL GDP BY SECTOR AND REGION: 1949-1980

(Cr$000)

REGION	YEAR	REAL AGRICULTURAL GDP	REAL INDUSTRIAL GDP	REAL TOTAL SERVICES GDP	REAL TOTAL GDP
NORTH	1949	5,650,000	2,666,667	14,246,667	22,563,334
	1959	11,762,000	7,912,997	27,310,300	46,975,297
	1970	38,960,952	16,130,337	62,495,132	117,606,422
	1975	35,528,790	33,490,048	97,599,393	166,618,231
	1980	61,106,194	141,157,229	177,045,477	379,308,900
NORTHEAST	1949	64,531,250	28,846,667	90,473,333	183,851,250
	1959	136,898,667	47,796,104	151,488,918	336,183,689
	1970	200,333,333	105,935,706	327,274,311	633,543,350
	1975	190,456,807	188,801,761	519,094,599	898,352,168
	1980	240,154,508	446,169,876	785,118,682	1,471,443,066
SOUTHEAST	1949	183,343,750	223,566,667	494,580,000	901,490,417
	1959	186,745,333	497,628,571	817,936,115	1,502,310,019
	1970	328,566,667	1,194,610,706	1,746,219,267	3,269,396,639
	1975	308,488,403	1,894,547,773	2,917,083,816	5,120,119,993
	1980	427,333,691	3,245,318,093	3,993,634,592	7,666,286,376
SOUTH	1949	70,818,750	39,540,000	89,873,333	200,232,083
	1959	131,798,667	77,967,532	167,269,883	377,036,082
	1970	320,814,286	180,566,380	417,717,742	919,098,408
	1975	347,482,762	373,572,846	716,593,504	1,437,649,113
	1980	363,533,034	763,245,823	960,820,667	2,087,599,524
CENTER-WEST	1949	10,731,250	2,226,667	9,453,333	22,411,250
	1959	22,780,000	5,284,416	26,182,529	54,246,945
	1970	71,147,619	13,352,607	125,967,214	210,467,440
	1975	79,487,776	28,771,783	230,653,308	338,912,867
	1980	139,972,653	104,125,797	433,267,308	677,365,758

Notes: Regional GDP deflators do not exist. Therefore to deflate the nominal regional series shown in Table A.1.8, the implicit sectoral GDP deflators with base 1980 were used. This procedure is admittedly less than perfect, as it does not capture the regional variations in prices, but it does reflect the more important price variations between sectors.

Source: Derived from Table A.1.8.

TABLE A.1.12: GROWTH RATES OF REAL GDP BY SECTOR AND REGION

(Annual Averages, %)

REGION	AGRICULTURE	INDUSTRY	SERVICES	TOTAL
NORTH				
1949-59	7.6%	11.5%	6.7%	7.6%
1959-70	11.5%	6.7%	7.8%	8.7%
1970-75	-1.6%	15.7%	9.3%	7.2%
1975-80	11.5%	33.3%	12.6%	17.9%
1949-80	8.0%	13.7%	8.5%	9.5%
NORTHEAST				
1949-59	7.8%	5.2%	5.3%	6.2%
1959-70	3.5%	7.5%	7.3%	5.9%
1970-75	-1.0%	12.3%	9.7%	7.2%
1975-80	4.7%	16.6%	8.6%	10.4%
1949-80	4.3%	9.2%	7.2%	6.9%
SOUTHEAST				
1949-59	0.2%	8.3%	5.2%	5.2%
1959-70	5.3%	8.3%	7.1%	7.3%
1970-75	-1.3%	9.7%	10.8%	9.4%
1975-80	6.7%	11.4%	6.5%	8.4%
1949-80	2.8%	9.0%	7.0%	7.1%
SOUTH				
1949-59	6.4%	7.0%	6.4%	6.5%
1959-70	6.4%	7.9%	8.7%	8.4%
1970-75	1.6%	15.7%	11.4%	9.4%
1975-80	0.9%	15.4%	6.0%	7.7%
1949-80	5.4%	10.0%	7.9%	7.9%
CENTER-WEST				
1949-59	7.8%	9.0%	10.7%	9.2%
1959-70	10.9%	8.8%	15.4%	13.1%
1970-75	2.2%	16.6%	12.9%	10.0%
1975-80	12.0%	29.3%	13.4%	14.9%
1949-80	8.6%	13.2%	13.1%	11.6%

Source: Derived from Table A.1.11.

TABLE A.1.18: NET MIGRATION FROM RURAL AREAS BY REGION AND STATE: 1960-1980

REGION AND STATE	NET MIGRATION (000s) 1960-70	1970-80	MIGRATION RATES a/ 1960-70	1970-80
NORTH	-447	-1	-0.279	0.008
Territorio & Acre	-47	139	-0.218	0.491
Amazonas	-195	-257	0.409	0.446
Para	-205	117	-0.224	0.102
NORTHEAST	-4.373	-4.99	-0.298	-0.279
Maranhao	-598	-598	-0.294	-0.262
Piaui	-220	-319	-0.280	-0.279
Ceara	-523	-899	-0.288	-0.348
Rio Grande do Norte	-180	-182	-0.251	-0.224
Paraiba	-414	-466	-0.317	-0.338
Pernambuco	-846	-760	-0.373	-0.324
Alagoas	-223	-355	-0.266	-0.371
Sergipe	-180	-180	-0.390	-0.370
Bahia	-1.189	-1.248	-0.306	-0.282
SOUTHEAST	-3.801	-5.038	-0.516	-0.463
Minas Gerais	-2.933	-2.611	-0.503	-0.481
Espirito Santo	-273	-408	-0.340	-0.465
Rio de Janeiro	-641	-467	-0.459	-0.428
Sao Paulo	-2.954	-1.552	-0.616	-0.444
SOUTH	-1.079	-4.395	0.145	-0.478
Parana	166	-2.516	0.056	-0.569
Santa Catarina	-391	-617	-0.271	-0.373
Rio Grande do Sul	-854	-1.262	-0.286	-0.406
CENTER-WEST	-135	-1.199	-0.070	-0.455
Mato Grosso do Sul	114	-218	0.209	-0.399
Mato Grosso		-25		-0.070
Goias	-249	-956	-0.186	-.582
Distrito Federal	--	--	--	--
BRAZIL	-12.885	-15.611	-0.331	-0.380

a) Rates = Net Migration / Rural Population in Base Period

Source: G. Maritins, "Changes in Agricultural Production and Rural Migration" Mimeo (Brasilia, January 1988). Calculations based on data from Demographic Censuses.

TABLE A.1.14: URBAN, RURAL AND TOTAL POPULATION BY REGION: 1950-1985

REGIONS	1950			1960			1970			1980			1985		
	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
NORTH	580,867	1,263,788	1,844,655	957,719	1,604,064	2,561,792	1,928,600	1,977,260	3,903,860	3,037,450	2,843,118	5,880,568	5,897,838	NA	NA
NORTHEAST	4,744,608	13,228,805	17,973,413	7,816,500	14,665,880	22,161,680	11,752,977	16,358,950	28,111,924	17,566,842	17,245,514	34,812,356	21,273,704	17,625,719	28,899,513
SOUTHEAST	10,720,734	11,827,760	22,548,494	17,460,897	13,169,831	30,630,728	28,964,604	10,888,897	39,853,501	42,840,081	8,894,044	51,734,125	50,389,328	8,594,080	58,983,408
SOUTH	2,812,965	5,027,885	7,840,870	4,380,691	7,392,884	11,753,075	7,303,427	9,193,066	16,496,493	11,877,739	7,153,423	19.031,162	13,297,714	7,280,051	20,577,765
CENTER-WEST	423,497	1,313,468	1,736,965	1,007,228	1,935,764	2,942,992	2,437,379	2,635,880	5,073,259	5,114,597	2,430.198	7,544,795	6,614,107	2,438,785 a/	9,052,872 a/
BRAZIL	18,782,691	33,161,506	51,944,397	31,303,034	38,767,423	70,070,457	52,084,984	41,054,053	93,139,037	80,438,409	38,566,297	119.002,706	95,472,781	35,938,615	131,411,396

a/ Excludes rural population in the North.

Source: 1950 - 1980: IBGE, Censos Demograficos;
1985, Estimate, IBGE, Diretoria e Inquesitos, Departamento de Populacao, Pesquisa Nacional por Amostra de Domicilios.
The breakdown of the regional data by state is also available from the same source.

TABLE A.1.15: URBAN, RURAL AND TOTAL POPULATION GROWTH RATES BY REGION: 1950 - 1985

(Annual Averages, %)

Regions	1950/60			1960/70			1970/80			1980/85			1950/85		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
North	5.18	2.41	3.84	5.44	2.11	3.47	6.47	3.71	5.04	5.10	NA	NA	5.59	NA	NA
Northeast	4.71	1.04	2.18	4.57	1.10	2.40	4.11	0.55	2.18	3.90	0.40	2.30	4.38	0.82	2.28
Southeast	5.00	1.08	3.11	5.19	-1.88	2.67	3.99	-1.99	2.65	3.80	-0.70	2.70	4.52	-0.91	2.79
South	6.55	2.85	4.18	5.29	2.20	3.45	4.99	-2.47	1.44	2.80	0.80	1.60	5.12	0.79	2.80
Center-West	9.05	3.95	5.41	9.24	3.14	5.60	7.70	-0.78	4.08	5.80	0.00	3.70	8.17	1.78	4.83
Brazil	5.24	1.57	3.04	5.22	0.57	2.89	4.45	-0.61	2.49	3.50	0.60 a/	2.50 a/	4.76	0.28	2.69

a/ Excludes rural population in the North.

Source: Derived from Table A.1.14.

TABLE A.1.16: URBAN AND RURAL POPULATION SHARES BY REGION: 1950-1985

(%)

Regions	1950		1960		1970		1980		1985	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
North	31.5	68.5	37.4	62.6	45.1	54.9	51.7	48.3	ns	ns
Northeast	26.4	73.6	33.9	66.1	41.8	58.2	50.5	49.5	54.7	45.3
Southeast	47.5	52.5	57.0	43.0	72.7	27.3	82.8	17.2	85.4	14.6
South	29.5	70.5	37.1	62.9	44.3	55.7	62.4	37.6	64.3	35.4
Center-West	24.4	75.6	34.2	65.8	48.0	52.0	67.8	32.2	73.1	26.9
Brazil	36.1	63.9	44.7	53.3	55.9	44.1	67.6	32.4	72.7	27.3

Source: Derived from Table A.1.14.

TABLE A.1.17: REGIONAL SHARES OF URBAN, RURAL AND TOTAL POPULATION: 1950-1985

(%)

Regions	1950			1960			1970			1980			1985		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural a/	Total a/
North	3.1	3.8	3.6	3.1	4.1	3.7	3.1	4.8	3.9	3.8	7.4	4.9	4.1	na	2.9
Northeast	25.3	39.9	34.6	24.0	37.6	31.6	22.6	39.9	30.2	21.8	44.7	29.3	22.3	49.0	29.6
Southeast	57.1	35.7	43.4	55.8	34.0	43.7	55.6	26.5	42.8	53.2	23.1	43.5	52.8	23.9	44.9
South	12.3	16.7	15.1	13.9	19.1	16.8	14.0	22.4	17.7	14.8	18.5	16.0	13.9	20.3	15.7
Center-West	2.2	3.9	3.3	3.2	5.0	4.2	4.7	6.4	5.4	6.4	6.3	6.3	6.9	6.8	6.9
Brazil	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a/ Excludes rural population in the North.

Source: Derived from Table A.1.14.

TABLE A.1.18: PER CAPITA GDP AND PER CAPITA AGRICULTURAL GDP: 1950-1985

	(1) GDP	(2) Agricultural GDP	(3) Total Population	(4) Rural Population	(5) Per Capita GDP (1)/(3)	(6) Per Capita Agr. GDP (2)/(4)
	(Cr$m)				(Cr$)	
1950	255.7	64.1	51,944,397	33,161,506	4.9	1.9
1960	2,809.1	513.6	70,070,457	38,767,423	40.1	13.2
1970	163,292.0	20,157.0	93,139,037	41,054,053	1,753	491
1980	11,412,202.0	1,232,100.0	119,002,706	38,568,297	95,900	31,947
1985	1,293,701,055.0	143,530,713.0	131,411,396	35,938,615	9,845,518	3,993,070

Note: Rural population was used as a proxy for the agricultural population in the calculation of Per Capita Agricultural GDP.

Sources: GDP and Agricultural GDP are shown in Table A.1.1.
Total population and rural population figures are shown in Table A.1.14.

TABLE A.1.19: REAL PER CAPITA GDP, REAL PER CAPITA AGRICULTURAL GDP AND GROWTH RATES: 1950-1985

(Base 1980)

	REAL PER CAPITA GDP (Cz$)	AVG. ANNUAL GROWTH RATE (%)	REAL PER CAPITA AGR. GDP (Cz$)	AVG. ANNUAL GROWTH RATE (%)
1950	29.97		9.89	
		3.66		2.78
1960	42.95		13.01	
		3.02		3.79
1970	57.84		18.88	
		5.98		5.40
1980	103.41		31.95	
		0.61		2.71
1985	106.62		41.74	
1950/85		3.69		4.20

Note: Rural population was used as a proxy for the agricultural population in the calculation of Real per Capita Agricultural GDP.

Sources: Real per Capita GDP and Real per Capita Agricultural GDP are derived from the income and population data shown in Tables A.1.6 A.1.14, respectively.

TABLE A.1.20: PER CAPITA GDP AND PER CAPITA AGRICULTURAL GDP BY REGION: 1949 - 1980

REGION	YEAR	(1) GDP (Cr$m)	(2) AGRICULTURAL GDP (Cr$m)	(3) TOTAL POPULATION (000 hab)	(4) RURAL POPULATION (000 hab)	(5) PER CAPITA GDP (Cr$) (1)/(3)	(6) PER CAPITA AGRIC. GDP (Cr$) (2)/(4)
NORTH	1949	3	1	1,785	1,234	2	1
	1959	36	9	2,477	1,566	15	6
	1970	3,476	819	3,604	1,977	964	414
	1980	379,309	61,106	5,881	2,843	64,497	21,493
NORTHEAST	1949	28	10	17,598	13,093	2	1
	1959	256	103	21,719	14,359	12	7
	1970	18,821	4,207	28,112	16,359	670	257
	1980	1,471,443	240,155	34,812	17,245	42,268	13,926
SOUTHEAST	1949	137	29	21,868	11,702	6	2
	1959	1,150	140	29,707	13,029	39	11
	1970	105,390	6,900	39,853	10,889	2,644	634
	1980	7,666,286	427,334	51,734	8,894	148,187	48,047
SOUTH	1949	31	11	7,530	5,369	4	2
	1959	287	99	11,267	7,180	25	14
	1970	26,868	6,737	16,496	9,193	1,629	733
	1980	2,087,600	868,538	19,031	7,153	109,695	50,822
CENTER-WEST	1949	4	2	1,648	1,263	2	1
	1959	441	17	2,792	1,862	158	9
	1970	6,225	1,494	5,073	2,636	1,227	567
	1980	677,366	139,973	7,545	2,430	89,777	57,602

Note: Rural population is used as a proxy for the agricultural population in the calculation of Per Capita Agricultural GDP.
Total and rural population figures for 1949 and 1959 (non-census years) were derived by adjusting the respective figures for the closest census year (1950 and 1960) by the estimated growth rates for the 1950s (Table A.1.15).

Sources: (1) and (2) from Table A.1.11; (3) and (4) from Table A.1.14.

TABLE: A.1.21: REAL PER CAPITA GDP, REAL PER CAPITA AGRICULTURAL GDP AND GROWTH RATES BY REGION: 1949-1980

(Base Year 1980)

REGION	YEAR	REAL PER CAPITA GDP (Cr$)	AVG. ANNUAL GROWTH RATE (%)	REAL PER CAPITA AGR. GDP (Cr$)	AVG. ANNUAL GROWTH RATE (%)
NORTH	1949	12,640		4,579	
			4.14		5.06
	1959	18,964		7,504	
			5.06		9.18
	1970	32,632		19,717	
			7.05		0.87
	1980	64,497		21,493	
	1949/80		5.40		5.11
NORTHEAST	1949	10,447		4,929	
			4.01		6.82
	1959	15,479		9,534	
			3.47		2.30
	1970	22,536		12,246	
			6.49		1.29
	1980	42,268		13,926	
	1949/80		4.61		3.41
SOUTHEAST	1949	41,224		15,668	
			2.06		-0.89
	1959	50,571		14,333	
			4.50		7.00
	1970	82,036		30,174	
			6.09		4.76
	1980	148,187		48,047	
	1949/80		4.21		3.68
SOUTH	1949	26,591		13,190	
			2.31		3.36
	1959	33,404		18,356	
			4.76		6.01
	1970	55,716		34,898	
			7.01		3.83
	1980	109,695		50,822	
	1949/80		4.68		4.45
CENTER-WEST	1949	2,976		8,497	
			20.64		3.71
	1959	19,429		12,284	
			7.14		7.46
	1970	41,488		26,991	
			8.02		7.88
	1980	89,777		57,802	
	1949/80		11.62		6.37

Note: Rural population is used as a proxy for the agricultural population in the calculation of Real per Capita Agricultural GDP.

Source: Real per Capita GDP and Real per Capita Agricultural GDP are derived from the real income and population data shown in Tables A.1.11 and A.1.14, respectively.

TABLE A.1.22: EMPLOYMENT BY SECTOR: 1950-1987

SECTOR	1950	1960	1970	1980	1985	1987
AGRICULTURE	10,252,839	12,276,908	13,087,521	12,661,017	15,190,393	14,116,155
INDUSTRY	2,427,384	2,939,842	5,295,427	10,772,463	11,783,978	13,674,775
Manufacturing	1,608,309	1,954,187	3,241,861	6,939,421	7,847,817	9,005,076
Construction	584,644	781,247	1,719,714	3,171,046	3,097,886	3,813,384
Industry	234,411	204,408	333,852	661,996	839,275	856,315
TOTAL SERVICES	4,437,159	7,582,878	11,174,276	19,802,282	26,282,565	29,618,855
Commerce	943,290	1,478,270	2,247,498	4,037,917	5,814,660	6,655,291
Transport & Communication	637,943	977,345	1,167,886	1,800,243	1,516,009	2,161,421
Services	1,781,041	3,028,933	3,925,001	7,032,126	10,287,630	11,755,461
Social	398,678	755,043	1,531,563	2,971,100	4,150,928	4,654,500
Public Administration	512,644	712,904	1,152,341	1,722,284	2,346,736	2,683,864
Other	163,563	530,383	1,150,012	2,238,562	1,746,602	1,708,318
T O T A L	17,117,382	22,749,628	29,557,224	43,235,712	53,236,936	57,409,785

Sources: IBGE, Diretoria de Pesquisas e Inqueritos Departamento de Populacao, Censos Demograficos, 1950-1980.
IBGE, Pesquisa Nacional por Amostra de Domicilios for 1985 and 1987.

TABLE A.1.23: SECTORAL SHARES OF EMPLOYMENT: 1950-1987

(%)

SECTOR	1950	1960	1970	1980	1985	1987
AGRICULTURE	59.9	54.0	44.8	29.8	28.5	24.6
INDUSTRY	14.2	12.9	17.9	24.9	22.1	23.8
Manufacturing	9.4	8.6	11.0	16.1	14.7	15.7
Construction	3.4	3.4	5.8	7.8	5.8	6.6
Industry	1.4	0.9	1.1	1.5	1.6	1.5
TOTAL SERVICES	25.9	33.1	37.8	45.8	49.3	51.6
Commerce	5.5	8.5	7.6	9.8	10.9	11.6
Transport & Communication	3.7	4.3	4.0	4.2	3.6	3.8
Services	10.4	13.3	13.3	16.3	19.3	20.5
Social	2.3	3.3	5.2	6.9	7.8	8.1
Public Administration	3.0	3.1	3.9	4.0	4.4	4.7
Other	1.0	2.6	3.9	5.2	3.3	3.0
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0

Source: Derived from Table A.1.22.

TABLE A.1.24: GROWTH RATES OF EMPLOYMENT BY SECTOR: 1950-1987

(Annual Averages, %)

SECTOR	1950-1960	1960-1970	1970-1980	1980-1987	1950-1987
Agriculture	1.6%	0.6%	-0.3%	1.6%	0.9%
Industry	1.9%	6.1%	7.4%	3.5%	4.8%
Services	5.4%	4.0%	5.9%	5.9%	5.3%
T O T A L	2.9%	2.7%	3.9%	4.1%	3.3%

Notes: Industry includes manufacturing and construction.

Source: Derived from Table A.1.22.

TABLE A.1.25: EMPLOYMENT BY SECTOR AND REGION: 1950-1980

(000 persons)

REGION	AGRICULTURE	INDUSTRY	TOTAL SERVICES	TOTAL
NORTH				
1950	405.30	86.60	188.30	680.40
1960	518.00	48.10	219.60	785.70
1970	585.90	117.50	325.30	1,028.70
1980	775.10	320.80	676.90	1,772.80
NORTHEAST				
1950	4,157.10	422.60	1,019.30	5,599.00
1960	4,952.50	516.30	1,607.60	7,076.40
1970	5,224.80	887.90	2,241.10	8,353.80
1980	5,400.10	1,742.30	3,690.10	10,832.50
SOUTHEAST				
1950	3,748.20	1,444.80	2,663.30	7,856.30
1960	3,959.60	1,805.40	4,365.60	10,130.60
1970	3,515.70	3,327.10	6,364.50	13,207.30
1980	3,131.30	6,506.80	10,112.70	19,750.80
SOUTH				
1950	1,643.70	302.20	615.70	2,561.60
1960	2,350.00	352.10	1,112.00	3,814.10
1970	2,935.30	784.70	1,707.90	5,427.90
1980	2,504.00	1,762.50	3,038.50	7,305.00
CENTER-WEST				
1950	415.60	24.70	79.50	519.80
1960	628.20	87.40	227.60	943.20
1970	828.70	178.20	532.60	1,539.50
1980	850.50	440.00	1,319.90	2,610.40
BRAZIL				
1950	10,369.90	2,281.10	4,516.10	17,117.10
1960	12,408.30	2,809.30	7,532.40	22,750.00
1970	13,090.40	5,295.40	11,171.40	29,557.20
1980	12,661.00	10,772.40	18,838.10	42,271.50

Source: IBGE, Censos Demograficos. The breakdown of the data by state is also available from the same source.

TABLE A.1.26: EMPLOYMENT BY SECTOR AND REGION: 1979-1987

REGIONS	YEAR	AGRICULTURE	INDUSTRY	TOTAL SERVICES	TOTAL
NORTH AND CENTER-WEST					
	1979 (a)	257,661	619,794	1,876,112	2,753,567
NORTH (b)					
	1985	121,972	309,183	928,162	1,359,317
	1987	135,102	385,372	1,133,603	1,654,077
NORTHEAST					
	1979	6,353,336	1,846,575	3,981,317	12,181,228
	1985	6,790,798	2,206,091	5,652,685	14,649,574
	1987	5,973,421	2,692,522	6,549,428	15,215,371
SOUTHEAST					
	1979	3,490,925	6,194,452	9,978,331	19,663,708
	1985	3,799,770	6,851,245	13,769,442	24,419,457
	1987	3,718,664	7,739,363	15,026,295	26,484,322
SOUTH					
	1979	3,528,250	1,594,642	2,985,518	8,108,410
	1985	3,522,340	1,826,087	3,881,022	9,229,449
	1987	3,334,324	2,209,322	4,544,833	10,087,479
CENTER-WEST					
	1985	956,513	594,372	2,028,254	3,579,139
	1987	954,644	649,196	2,364,886	3,968,726
BRAZIL					
	1979	13,630,172	10,255,463	18,821,278	42,706,913
	1985	15,190,393	11,783,978	26,262,565	53,236,936
	1987	14,116,155	13,674,775	29,619,045	57,409,975

(a) Through 1979, the North and Center-West regions were combined for purposes of the Household Survey. However, the rural populations from these regions were not surveyed.

(b) Excludes the rural population.

Source: IBGE, Pesquisa Nacional for Amostra de Domicilios. The breakdown of the regional data by state is also from the same source.

TABLE A.1.27: SECTORAL SHARES OF EMPLOYMENT BY REGION: 1950-1987

(%)

REGION	YEAR	AGRICULTURE	INDUSTRY	TOTAL SERVICES	TOTAL
NORTH					
	1950	69.83	6.34	23.83	100.00
	1960	65.93	8.12	27.95	100.00
	1970	56.96	11.42	31.62	100.00
	1980	43.72	18.10	38.18	100.00
	1985	8.97	22.75	68.28	100.00
	1987	8.17	23.30	68.53	100.00
NORTHEAST					
	1950	74.25	7.55	18.21	100.00
	1960	69.99	7.30	22.72	100.00
	1970	62.54	10.63	26.83	100.00
	1980	49.85	16.08	34.07	100.00
	1985	46.35	15.06	38.59	100.00
	1987	39.26	17.70	43.04	100.00
SOUTHEAST					
	1950	47.71	18.39	33.90	100.00
	1960	39.09	17.82	43.09	100.00
	1970	26.62	25.19	48.19	100.00
	1980	15.85	32.94	51.20	100.00
	1985	15.56	28.06	56.39	100.00
	1987	14.04	29.22	56.74	100.00
SOUTH					
	1950	64.17	11.80	24.04	100.00
	1960	61.61	9.28	29.15	100.00
	1970	54.08	14.46	31.47	100.00
	1980	34.28	24.13	41.59	100.00
	1985	38.16	19.79	42.05	100.00
	1987	33.05	21.89	45.05	100.00
CENTER-WEST					
	1950	79.95	4.75	15.29	100.00
	1960	66.60	9.27	24.13	100.00
	1970	53.83	11.58	34.60	100.00
	1980	32.58	16.86	50.56	100.00
	1985	26.72	16.61	56.67	100.00
	1987	24.05	16.36	59.59	100.00
BRAZIL					
	1950	60.58	13.03	26.38	100.00
	1960	54.54	12.35	33.11	100.00
	1970	44.29	17.92	37.80	100.00
	1980	29.95	25.48	44.56	100.00
	1985	28.53	22.13	49.33	100.00
	1987	24.59	23.82	51.59	100.00

Source: Derived from Table A.1.25 for the period 1950-1980 and from Table A.1.26 for the period after 1980.

TABLE A.1.28: REGIONAL SHARES OF SECTORAL EMPLOYMENT: 1950-1987

(%)

REGION	AGRICULTURE						INDUSTRY						TOTAL SERVICES					
	1950	1960	1970	1980	1985	1987	1950	1960	1970	1980	1985	1987	1950	1960	1970	1980	1985	1987
NORTH	3.91%	4.17%	4.48%	6.12%	0.80%	0.96%	1.65%	1.71%	2.22%	2.98%	2.62%	2.82%	3.06%	2.92%	2.91%	3.50%	3.53%	3.83%
NORTHEAST	40.09%	39.91%	39.91%	42.65%	44.70%	42.32%	18.94%	18.38%	16.77%	16.17%	18.72%	19.69%	22.57%	21.34%	20.06%	19.59%	21.52%	22.11%
SOUTHEAST	36.14%	31.91%	26.86%	24.73%	25.01%	26.34%	64.76%	64.27%	62.88%	60.40%	58.14%	56.60%	58.97%	57.96%	56.97%	53.68%	52.43%	50.73%
SOUTH	15.85%	18.94%	22.42%	19.78%	23.19%	23.62%	13.54%	12.53%	14.82%	16.36%	15.50%	16.15%	13.63%	14.76%	15.29%	16.13%	14.76%	15.34%
CENTER-WEST	4.01%	5.06%	6.33%	6.72%	6.30%	6.76%	1.11%	3.11%	3.37%	4.08%	5.04%	4.75%	1.76%	3.02%	4.77%	7.01%	7.72%	7.98%
B R A Z I L	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: Derived from Table A 1.25 for the period 1950-1980 and from Table A.1.26 for the period 1980-1987.

TABLE A.1.29: GROWTH RATES OF EMPLOYMENT BY SECTOR AND REGION: 1950-1987

(Annual Averages, %)

REGION	INTERVAL	AGRICULTURE	INDUSTRY	TOTAL SERVICES	TOTAL
NORTH					
	1950/60	2.48	2.71	4.73	3.81
	1960/70	1.24	9.34	4.01	2.73
	1970/80	2.84	10.57	7.60	5.59
	1980/87	(a)	2.65	7.64	(a)
	1950/87	-2.93	6.55	5.95	2.97
NORTHEAST					
	1950/60	1.77	2.02	4.66	2.37
	1960/70	0.54	5.57	3.38	1.67
	1970/80	0.33	6.97	5.11	2.63
	1980/87	1.45	6.42	8.54	4.97
	1950/87	0.98	5.13	5.16	2.74
SOUTHEAST					
	1950/60	0.55	2.25	5.07	2.58
	1960/70	-1.18	6.30	3.84	2.69
	1970/80	-1.15	6.94	4.74	4.11
	1980/87	2.49	3.20	5.92	4.28
	1950/87	-0.02	4.64	4.79	3.34
SOUTH					
	1950/60	3.64	1.54	6.09	4.06
	1960/70	2.25	8.34	4.38	3.59
	1970/80	-1.58	8.43	5.93	3.01
	1980/87	4.18	3.27	5.92	4.72
	1950/87	1.93	5.52	5.55	3.77
CENTER-WEST					
	1950/60	4.22	13.47	11.09	6.14
	1960/70	2.81	7.38	8.87	5.02
	1970/80	0.26	9.46	9.50	5.42
	1980/87	1.66	5.71	8.69	6.17
	1950/87	2.27	9.24	9.60	5.65

(a) The growth rates of agricultural and total employment between 1980 and 1987 in the North are not meaningful since the rural population in the North has been excluded from the Household Survey in these later years.

Source: Derived from Tables A.1.25 and A.1.26.

TABLE A.1.80: REAL LABOR PRODUCTIVITY AND GROWTH RATES BY SECTOR: 1950-1987

SECTOR	YEAR	REAL OUTPUT (Y) (Cz$000)	EMPLOYMENT (L) (000/persons)	REAL LABOR PRODUCTIVITY (Y/L) (Cz$000)	AVG. ANNUAL GROWTH RATE OF Y/L (%)
AGRICULTURE	1950	328,032	10,258	31.99	
					2.53
	1960	504,370	12,277	41.08	
					3.72
	1970	774,985	13,087	59.22	
					5.09
	1980	1,282,100	12,661	97.31	
					1.98
	1987	1,576,116	14,216	111.65	
	1950-1987				3.44
INDUSTRY	1950	417,196	2,427	171.90	
					6.86
	1960	980,809	2,940	333.61	
					0.65
	1970	1,921,591	5,295	362.91	
					1.81
	1980	4,678,264	10,772	434.30	
					-2.01
	1987	5,152,511	13,675	376.78	
	1950-1987				2.14
SERVICES	1950	811,672	4,437	182.98	
					1.01
	1960	1,524,129	7,533	202.33	
					1.76
	1970	2,690,613	11,174	240.79	
					2.98
	1980	6,895,301	19,802	322.96	
					-2.14
	1987	8,220,116	29,619	277.53	
	1950-1987				1.13
TOTAL	1950	1,556,899	17,117	90.96	
					3.62
	1960	3,009,308	22,750	132.24	
					3.26
	1970	5,397,188	29,557	182.26	
					4.56
	1980	12,305,665	43,236	284.62	
					-1.26
	1987	14,948,743	57,410	260.39	
	1950-1987				2.68

Source: Y and L are shown in Tables A.1.6 and A.22, respectively.

TABLE A.1.31: GROWTH RATES OF REAL LABOR PRODUCTIVITY BY SECTOR AND REGION: 1950-1980

(Base Year 1980)

REGION	YEAR	AGRICULTURE Real Labor Productivity (Y/L) (Cz$)	AGRICULTURE Avg. Annual Growth Rates of Y/L (%)	INDUSTRY Real Labor Productivity (Y/L) (Cz$)	INDUSTRY Avg. Annual Growth Rates of Y/L (%)	SERVICES Real Labor Productivity (Y/L) (Cz$)	SERVICES Avg. Annual Growth Rates of Y/L (%)	TOTAL Real Labor Productivity (Y/L) (Cz$)	TOTAL Avg. Annual Growth Rates of Y/L (%)
NORTH	1950	15,000		80,797		109,915		41,830	
			5.36		8.07		2.01		4.50
	1960	25,296		175,533		134,064		64,989	
			10.15		-2.43		3.66		5.81
	1970	66,532		137,279		192,115		114,325	
			1.71		12.35		3.13		6.47
	1980	78,836		440,016		261,554		213,960	
	1950-1980		5.69		5.81		2.93		5.59
NORTHEAST	1950	16,734		71,809		93,464		34,872	
			5.51		3.32		0.79		3.73
	1960	28,610		99,517		101,112		50,311	
			2.97		1.63		3.74		4.19
	1970	38,343		119,310		146,033		75,839	
			1.49		7.94		3.84		6.00
	1980	44,472		256,081		212,763		135,836	
	1950-1980		3.31		4.33		2.78		4.64
SOUTHEAST	1950	49,013		167,582		195,358		120,714	
			0.13		5.94		0.27		2.60
	1960	49,662		298,511		200,662		159,120	
			6.53		1.86		3.18		4.52
	1970	93,457		359,055		274,369		247,545	
			3.86		3.34		2.46		4.60
	1980	136,472		498,758		349,913		388,166	
	1950-1980		3.47		3.70		1.96		3.97
SOUTH	1950	45,842		139,999		155,311		83,248	
			2.86		5.49		0.52		2.56
	1960	60,796		238,929		163,509		107,157	
			6.04		-0.38		4.11		4.68
	1970	109,295		230,109		244,580		169,329	
			2.88		6.53		2.60		5.37
	1980	145,181		433,047		316,215		285,777	
	1950-1980		3.92		3.84		2.40		4.20
CENTER-WEST	1950	27,835		99,262		131,633		47,082	
			3.75		-3.93		0.08		3.29
	1960	40,215		65,783		132,753		65,048	
			7.88		1.31		5.95		7.71
	1970	85,854		74,930		236,514		136,712	
			6.72		12.19		3.33		6.62
	1980	164,577		236,649		328,258		259,487	
	1950-1980		6.10		2.97		3.09		5.85

Note: Figures for 1950 and 1960 are derived from 1949 and 1959 regional income levels, respectively.

Source: Y/L by sector and region derived from the real income and employment data shown in Tables A.1.11 and A.1.25, respectively.

TABLE A.1.32: DISTRIBUTION OF EMPLOYMENT BY SECTOR, REGION AND INCOME CLASS: 1982-1987

(000 Persons by Income Class)

INCOME CLASS (No. of Minimum Salaries)	YEAR	NORTH a/			NORTHEAST			SOUTHEAST			SOUTH			CENTER-WEST			TOTAL		
		Ag.	Ind.	Serv.	Ag.	Ind.	Serv.	Ag.	Ind.	Serv.	Ag.	Ind.	Serv.	Ag.	Ind.	Serv.	Ag.	Ind.	Serv.
Less than 1/2	1982	9	22	82	1,920	621	1,104	514	354	1,479	327	78	401	83	57	259	2,853	1,129	3,325
	1985	5	7	92	1,633	343	1,698	343	147	1,898	174	31	420	44	16	268	2,201	545	3,931
	1987	7	6	102	1,506	347	1,512	349	140	1,209	221	52	374	45	15	220	2,130	559	3,417
1/2-1	1982	30	97	114	1,620	949	798	1,096	1,429	1,899	612	431	489	295	187	299	3,653	3,094	3,894
	1985	25	76	162	1,883	549	1,185	1,045	975	2,515	492	221	706	199	99	401	3,646	1,891	4,971
	1987	22	40	161	1,474	648	1,175	819	614	1,990	400	169	515	145	58	329	2,861	1,529	4,271
1-2	1982	29	160	134	710	932	725	732	2,935	2,327	409	1,031	685	224	296	298	2,194	5,354	4,170
	1985	36	91	195	1,014	649	1,163	977	1,880	2,924	570	629	893	315	221	419	2,912	3,472	9,068
	1987	36	108	247	1,024	758	1,467	1,007	1,758	3,318	571	712	1,123	294	207	579	2,930	3,543	6,734
2-5	1982	14	131	184	195	511	546	278	2,686	2,440	292	697	638	95	200	282	872	4,225	4,040
	1985	27	114	254	302	410	1,066	487	2,383	3,642	433	654	1,042	144	182	496	1,394	3,742	6,510
	1987	37	154	369	382	619	1,373	504	3,305	4,933	428	890	1,378	200	256	869	1,551	5,224	8,723
5-10	1982	3	33	49	34	121	168	76	828	866	68	163	228	30	55	106	210	1,200	1,416
	1985	7	30	110	59	113	359	138	905	1,625	158	168	430	50	44	219	406	1,262	2,743
	1987	7	43	133	45	126	466	121	1,100	1,810	139	222	458	45	58	260	357	1,549	3,127
More than 10	1982	1	16	23	10	57	98	40	446	535	23	76	131	13	26	77	88	621	864
	1985	4	16	67	22	82	212	78	489	1,218	82	90	281	36	19	179	223	677	1,777
	1987	4	27	92	34	88	287	108	721	1,410	54	133	407	47	39	240	247	1,007	2,435
Without Income b/	1982	14	20	9	1,684	186	84	725	171	178	1,600	81	55	170	39	28	4,193	496	355
	1985	17	3	33	1,866	68	186	716	40	251	1,599	26	102	165	107	44	4,362	150	618
	1987	21	7	30	1,454	94	201	593	56	260	1,487	22	112	172	15	62	3,728	194	665
Not Declared	1982	--	1	1	37	11	11	15	31	40	22	4	4	2	1	2	76	47	57
	1985	1	--	1	11	11	29	19	30	76	13	3	9	2	1	2	46	44	118
	1987	2	--	3	51	21	28	16	46	101	25	7	18	5	2	5	100	76	155
Total	1982	101	479	548	6,211	3,388	3,529	3,473	8,880	9,864	3,442	2,559	2,631	918	860	1,351	14,139	16,166	17,620
	1985	122	307	924	6,790	2,205	5,651	3,798	6,849	13,949	3,521	1,822	3,883	955	689	2,028	15,190	11,783	29,736
	1987	135	385	1,184	5,973	2,693	8,539	3,719	7,739	15,026	3,334	2,206	4,544	955	649	2,365	14,116	13,875	29,608

a/ Excludes rural zones.
b/ Includes persons receiving some benefits.

Source: IBGE, Directoria de Pesquisa e Inqueritos, Departamento de Populacao, Pesquisa Nacional por Amostra de Domicilios.

TABLE A.1.33: AGRICULTURE'S SHARE OF THE TOTAL LAND RESOURCE BY REGION: 1950-1985

REGION	YEAR	(1) TOTAL TERRITORY (ha)	(2) TOTAL FARM AREA (ha)	(3) TOTAL FARM AREA/ TOTAL TERRITORY (%) (2)/(1)	INTERVAL	(4) GROWTH OF FARM LAND (% (2)
NORTH	1950	355,400,200	23,107,947	6.5%	1950/60	0.1%
	1960	355,400,200	23,453,086	6.6%	1960/70	-0.1%
	1970	355,400,200	23,182,144	6.5%	1970/75	7.1%
	1975	355,400,200	32,615,983	9.2%	1975/80	5.5%
	1980	355,400,200	42,546,027	12.0%	1980/85	1.1%
	1985	355,400,200	44,884,352	12.6%	1950/85	1.8%
NORTHEAST	1950	154,224,600	58,341,458	37.8%	1950/60	0.9%
	1960	154,224,600	62,990,438	40.8%	1960/70	1.7%
	1970	154,224,600	74,297,115	48.2%	1970/75	1.2%
	1975	154,224,600	78,688,942	51.0%	1975/80	2.6%
	1980	154,224,600	89,553,512	58.1%	1980/85	0.5%
	1985	154,224,600	91,986,500	59.6%	1950/85	1.2%
SOUTHEAST	1950	91,880,800	61,736,592	67.2%	1950/60	0.4%
	1960	91,880,800	64,438,763	70.1%	1960/70	0.8%
	1970	91,880,800	69,500,951	75.6%	1970/75	0.8%
	1975	91,880,800	72,463,938	78.9%	1975/80	0.4%
	1980	91,880,800	73,973,814	80.5%	1980/85	-0.1%
	1985	91,880,800	73,614,725	80.1%	1950/85	0.5%
SOUTH	1950	56,207,100	35,420,380	63.0%	1950/60	1.0%
	1960	56,207,100	38,998,290	69.4%	1960/70	1.5%
	1970	56,207,100	45,458,036	80.9%	1970/75	0.8%
	1975	56,207,100	46,172,034	82.1%	1975/80	0.9%
	1980	56,207,100	48,184,988	85.7%	1980/85	0.2%
	1985	56,207,100	48,718,065	86.7%	1950/85	0.9%
CENTER-WEST	1950	187,935,600	53,604,728	28.5%	1950/60	1.1%
	1960	187,935,600	59,986,565	31.9%	1960/70	3.1%
	1970	187,935,600	81,705,625	43.5%	1970/75	2.8%
	1975	187,935,600	93,953,659	50.0%	1975/80	4.2%
	1980	187,935,600	115,327,931	61.4%	1980/85	0.3%
	1985	187,935,600	117,088,322	62.3%	1950/85	2.2%
BRAZIL	1950	845,648,300	232,211,105	27.5%	1950/60	0.7%
	1960	845,648,300	249,862,142	29.5%	1960/70	1.6%
	1970	845,648,300	294,143,871	34.8%	1970/75	1.9%
	1975	845,648,300	328,894,536	38.8%	1975/80	2.7%
	1980	845,648,300	369,586,272	43.7%	1980/85	0.4%
	1985	845,648,300	376,284,994	44.5%	1950/85	1.3%

Source: IBGE, Censos Agropecuarios.

TABLE A.1.84: AGRICULTURE IN TOTAL EXPORTS: 1951-1987

(US$ million, FOB)

YEAR	AGRICULTURAL EXPORTS				TOTAL EXPORTS	AGRICULTURAL/ TOTAL EXPORTS (%)
	Raw Materials	Semi-Processed	Semi-Manufactured	Total		
1951	1,486	67	3	1,556	1,769	87.96%
1952	1,231	34	2	1,267	1,418	89.35%
1953	1,372	85	2	1,459	1,539	94.80%
1954	1,413	72	2	1,487	1,562	95.20%
1955	1,204	111	6	1,321	1,428	92.53%
1956	1,301	74	5	1,380	1,482	93.12%
1957	1,100	138	7	1,245	1,392	89.44%
1958	955	126	18	1,099	1,243	88.42%
1959	969	106	37	1,112	1,282	86.74%
1960	981	107	17	1,105	1,269	87.08%
1961	1,072	109	24	1,205	1,403	85.89%
1962	936	91	21	1,048	1,214	86.33%
1963	1,117	101	21	1,239	1,406	88.12%
1964	1,097	106	22	1,225	1,480	85.66%
1965	1,125	136	37	1,298	1,595	81.38%
1966	1,270	139	51	1,460	1,741	83.86%
1967	1,145	132	65	1,342	1,654	81.14%
1968	1,319	166	76	1,561	1,981	82.99%
1969	1,567	193	90	1,850	2,269	81.53%
1970	1,737	196	119	2,052	2,739	74.92%
1971	1,639	207	221	2,067	2,904	71.18%
1972	2,297	344	316	2,957	3,911	75.61%
1973	3,489	484	414	4,387	6,199	70.77%
1974	3,764	739	570	5,073	7,951	63.80%
1975	3,756	679	558	4,993	8,670	57.59%
1976	4,829	625	772	6,226	10,128	61.47%
1977	5,757	750	1,042	7,549	12,120	62.29%
1978	4,696	1,075	1,191	6,962	12,659	55.00%
1979	4,944	1,425	1,303	7,672	15,244	50.33%
1980	6,456	1,535	1,818	9,809	20,132	48.72%
1981	6,447	1,258	2,304	10,009	23,293	42.97%
1982	5,564	735	1,958	8,257	20,175	40.93%
1983	6,549	685	2,217	9,451	21,899	43.16%
1984	6,584	1,209	3,064	10,857	27,005	40.20%
1985	6,404	1,012	2,230	9,646	25,689	37.62%
1986	4,832	653	1,651	7,136	22,393	31.87%
1987	--	--	--	9,763	22,471	43.45%

Source: CACEX. The detailed breakdown of each category of agricultural exports is given in Table A.2.85. This data is presented in EMBRAPA, Informacoes e Indices Basicos da Economia Brasileira--Subsidios Para o Economista Agricola, 1988.

TABLE A.1.36: AGRICULTURE IN TOTAL IMPORTS: 1971-1987

(US$ million, FOB)

YEAR	AGRICULTURE-BASED IMPORTS				TOTAL IMPORTS	AGRICULTURAL/ TOTAL IMPORTS (%)
	Primary and Semi-Processed Products	Fertilizer and Chemicals	Machinery and Equipment	Total		
1971	306.4	82.8		478.4	3,245.0	14.59%
1972	344.8	198.0		652.3	4,235.0	15.40%
1973	724.7	227.8		1,090.6	6,192.2	17.61%
1974	1,030.6	569.5		1,900.7	12,641.3	15.04%
1975	806.6	500.7		1,512.8	12,210.3	12.39%
1976	1,034.9	436.6		1,675.8	12,383.0	13.53%
1977	859.8	538.4		1,597.5	12,023.3	13.29%
1978	1,433.7	577.6		2,221.8	13,683.1	16.24%
1979	2,182.9	677.6	20.7	3,137.3	18,063.9	17.36%
1980	2,189.2	845.4	28.9	3,315.9	22,955.2	14.45%
1981	1,944.5	502.4	32.6	2,704.9	22,090.6	12.24%
1982	1,725.6	84.9	30.9	2,308.5	19,395.0	11.90%
1983	1,410.4	142.4	18.5	1,744.5	15,428.9	11.31%
1984	1,476.1	449.1	7.2	2,072.4	13,915.8	14.89%
1985	1,331.9	397.7	6.3	1,860.5	13,168.1	14.13%
1986	2,496.3	521.2	3.6	3,222.8	14,044.0	22.95%
1987	1,526.9	562.4	4.4	2,375.5	15,052.0	15.78%

Source: CACEX. The detailed breakdown of each category of agricultural imports is given in Table A.2.36.

TABLE A.1.36: AGRICULTURAL AND TOTAL TRADE BALANCE: 1971-1987

(US$ million, FOB)

YEAR	AGRICULTURAL TRADE BALANCE (Xa - Ma)	TOTAL TRADE BALANCE (X - M)	AGRICULTURAL TRADE BALANCE/ TOTAL TRADE BALANCE (Xa - Ma)/(X - M)
1971	1,593.6	(341.0)	-4.7
1972	2,304.7	(324.0)	-7.1
1973	3,296.4	6.8	484.8
1974	3,172.3	(4,690.3)	-0.7
1975	3,480.2	(3,540.3)	-1.0
1976	4,550.2	(2,255.0)	-2.0
1977	5,951.5	96.7	61.5
1978	4,740.2	(1,024.1)	-4.6
1979	4,534.7	(2,839.9)	-1.6
1980	6,493.1	(2,823.2)	-2.3
1981	7,304.1	1,202.4	6.1
1982	5,948.5	780.0	7.6
1983	7,706.5	6,470.1	1.2
1984	8,784.6	13,089.2	0.7
1985	7,785.5	12,470.9	0.6
1986	3,913.2	8,349.0	0.5
1987	7,387.5	7,419.0	1.0

Note: Xa = agricultural exports;
Ma = agricultural imports;
X = total exports;
M = total imports.

Source: Derived from Tables A.1.34 and A.1.35.

TABLE A.1.37: DOMESTIC TERMS OF TRADE BETWEEN AGRICULTURE AND INDUSTRY: 1967 - 1985

A. Index of Prices Paid by Agricultural Producers a/

Year	Ceara	Pern.	M.G.	E.S.	S.P.	Parana	S.C.	R.G.S.
1967	52	56	60	66	59	65	63	69
1968	64	66	66	77	71	73	73	77
1969	78	82	78	83	85	87	86	88
1970	100	100	100	100	100	100	100	100
1971	131	120	113	118	119	114	113	116
1972	143	136	131	142	146	137	136	149
1973	182	167	155	194	183	173	163	193
1974	287	245	244	327	320	319	287	301
1975	407	354	311	441	445	443	385	409
1976	595	519	422	604	546	544	484	551
1977	854	741	604	896	808	762	649	772
1978	998	962	810	1,199	1,118	1,015	867	1,124
1979	1,740	1,529	1,235	1,724	1,752	1,550	1,345	1,774
1980	4,143	3,352	2,690	3,664	4,019	3,537	2,904	3,877
1981	9,062	7,588	5,590	8,804	8,212	7,223	6,230	8,337
1982	15,099	13,849	10,512	15,738	14,658	12,972	11,583	14,732
1983	39,362	35,182	29,367	35,462	37,831	30,320	27,689	38,613
1984	127,015	112,407	91,706	117,478	112,924	106,045	90,055	114,112
1985	338,700	322,791	291,758	361,577	354,703	324,167	296,104	352,511

a/ Includes prices of seeds, feed, fertilizers, chemicals, fuel and lubricants, vaccines, medicines and disinfectants, construction materials, machines, implements and others.

B. Index of Prices Received by Agricultural Producers b/

Year	Crops	Livestock	Total
1967	50	57	52
1968	61	65	63
1969	81	76	79
1970	100	100	100
1971	124	128	126
1972	154	163	157
1973	216	227	220
1974	287	332	303
1975	359	379	366
1976	628	470	572
1977	1,059	680	929
1978	1,239	1,005	1,158
1979	1,786	1,793	1,789
1980	3,564	3,518	3,548
1981	6,457	5,751	6,215
1982	10,865	9,956	10,554
1983	30,677	27,249	29,501
1984	99,195	95,464	97,916
1985	330,910	278,593	312,957

b/ Includes prices of 25 permanent and temporary crops and 12 livestock products in all 23 states.

C. Terms of Trade: (B)-(A)

Year	Ceara	Pern	M.G.	E.S.	S.P.	Parana	S.C.	R.G.S.
1967	94	97	88	87	85	87	90	85
1968	92	95	91	86	90	72	93	90
1969	89	98	101	85	95	84	95	96
1970	100	100	100	100	100	100	100	100
1971	92	97	113	104	106	104	112	108
1972	93	90	125	108	111	105	124	112
1973	97	96	147	118	123	125	134	114
1974	98	87	130	96	93	94	114	103
1975	76	68	124	86	83	86	92	89
1976	85	75	134	117	112	134	100	86
1977	83	102	138	129	113	160	127	110
1978	88	88	134	108	103	132	126	109
1979	95	111	146	124	99	126	129	109
1980	83	112	130	106	82	103	131	92
1981	74	99	110	73	74	85	108	74
1982	68	88	100	70	71	78	98	74
1983	70	83	100	81	75	90	107	89
1984	70	63	101	87	87	91	114	90
1985	68	80	107	104	87	101	105	91

Source: Fundacao Getulio Vargas.
Presented in: IBGE Estatisticas Historicas do Brasil, Volume 3, 1987.

TABLE A.1.38: DOMESTIC TERMS OF TRADE BETWEEN AGRICULTURE AND INDUSTRY: 1986-1987

	1986							1987										
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
A. INDEX OF PRICES PAID																			
Seeds	100	105	110	120	125	128	128	133	137	140	146	164	192	235	283	330	384	390	435
Fertilizers	100	102	102	104	106	108	108	109	116	138	197	284	816	861	289	453	500	539	564
Chemicals	100	100	102	105	106	107	109	110	113	131	169	197	238	281	330	380	419	467	532
Services	100	99	100	102	103	105	106	114	132	164	197	240	316	362	382	416	462	575	731
Fuel	100	100	100	100	100	100	100	100	100	128	176	232	336	336	336	365	419	478	561
Labor	100	107	115	128	132	148	160	172	189	198	219	246	271	281	316	348	374	420	469
Total	100	103	106	110	113	117	122	126	134	150	188	222	280	312	342	386	430	476	581
B. INDEX OF PRICES RECEIVED																			
Crops	100	101	103	105	106	108	115	116	121	128	140	178	214	234	258	294	331	370	229
Animal Products	100	108	114	121	123	102	151	180	179	182	210	248	281	311	358	391	422	471	515
Total	100	108	107	111	112	116	128	136	139	148	162	200	237	260	292	328	364	407	462
C. B - A	100	98	100	101	99	99	103	108	104	97	86	90	85	83	85	84	85	85	87

Source: CFP, Indice De Precos Agricolas, Brasilia, June 1988.

TABLE 1.39: EDUCATION LEVELS OF THE TOTAL AND RURAL POPULATION: 1980

YEARS OF STUDY	TOTAL BRAZIL					RURAL ZONE				
	Total	Men	% of Men	Women	% of Women	Total	Men	% of Men	Women	% of Women
TOTAL	102,582,989	50,832,145	100	51,750,844	100	32,386,627	16,780,333	100	15,606,294	100
1 year	6,531,213	3,374,892	7	3,156,321	6	2,237,898	1,212,398	7	1,025,500	7
2 years	8,250,191	4,145,737	8	4,104,454	8	2,811,287	1,469,513	9	1,341,774	9
3 years	9,661,192	4,743,011	9	4,918,181	10	3,024,483	1,534,633	9	1,489,850	10
4 years	18,237,584	9,008,009	18	9,229,575	18	4,095,514	2,100,761	13	1,994,753	13
5 years	3,419,468	1,685,457	3	1,734,011	3	457,106	230,265	1	226,841	1
6 years	3,008,973	1,497,310	3	1,511,663	3	327,284	169,074	1	158,210	1
7 years	2,752,265	1,367,081	3	1,385,184	3	264,202	136,335	1	127,867	1
8 years	4,722,227	2,356,339	5	2,365,888	5	366,988	190,777	1	176,211	1
9 years	1,288,125	621,873	1	666,252	1	82,516	41,431	0	41,085	0
10 years	1,317,205	647,887	1	669,318	1	74,761	38,216	0	36,545	0
11 years	4,192,178	1,869,506	4	2,322,672	4	185,510	84,575	1	100,935	1
12 years	444,297	223,899	0	220,398	0	12,685	6,861	0	5,824	0
13 years	428,403	221,013	0	207,390	0	10,914	5,815	0	5,099	0
14 years	498,874	227,735	0	271,139	1	12,311	5,672	0	6,439	0
15 years	1,076,663	542,179	1	534,484	1	22,403	12,801	0	9,602	0
16 years	468,458	343,461	1	125,027	0	7,330	5,617	0	1,713	0
17 years	228,950	159,035	0	69,915	0	6,223	4,089	0	2,134	0
Unknown	78,740	38,039	0	40,701	0	10,969	5,509	0	5,460	0
No Schooling	35,977,983	17,759,712	35	18,218,271	35	18,376,243	9,525,791	57	8,850,452	57

Note: Includes people five years of age or older. "No Schooling" also includes less than one year.

Source: IBGE, Demographic Census, 1980.

TABLE A.1.40: EDUCATION LEVELS OF THE TOTAL AND RURAL POPULATION: 1960-1980

SCHOOLING	YEAR	BRAZIL				RURAL ZONES			
		MALE		FEMALE		MALE		FEMALE	
		# (000)	%	# (000)	%	# (000)	%	# (000)	%
< 1 yr	1960	14,365	49	15,723	53	10,473	64	10,658	69
	1970	16,632	42	17,847	45	10,671	61	10,476	64
	1980	17,766	35	18,218	35	9,526	57	8,850	57
1 yr	1960	2,448	8	2,127	7	1,510	9	1,182	8
	1970	3,532	9	3,240	8	1,795	10	1,497	9
	1980	3,375	7	3,156	6	1,212	7	1,025	7
2 yrs	1960	3,334	11	2,988	10	1,914	12	1,529	10
	1970	4,023	10	3,842	10	1,873	11	1,618	10
	1980	4,143	8	4,104	8	1,470	9	1,342	9
3 yrs	1960	2,992	10	2,751	9	1,428	9	1,181	8
	1970	3,771	10	3,707	9	1,480	8	1,328	8
	1980	4,748	9	4,918	10	1,535	9	1,490	10
4 yrs	1960	3,178	11	3,173	11	842	5	719	5
	1970	4,517	11	4,579	11	1,062	6	943	6
	1980	9,008	18	9,230	18	2,101	13	1,995	13
5-8 yrs	1960	1,779	7	1,765	7	226	1	190	1
	1970	4,131	11	4,143	10	517	2	474	2
	1980	6,966	14	6,997	14	726	4	689	4
> 8 yrs	1960	1,257	3	1,080	3	65	0	48	0
	1970	2,654	6	2,520	6	108	0	100	0
	1980	4,957	8	5,087	8	205	1	209	1

Source: Demographic Censuses; IBGE, 1960, 1970, 1980.

TABLE A.2.1: GRAINS: AREA, PRODUCTION, AND YIELDS BY REGION: 1965-1989

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
AREA IN PRODUCTION (HA)															
North	145,498	129,925	123,905	171,189	155,297	169,632	173,918	177,324	172,541	225,718	294,959	303,685	321,884	310,577	347,580
Northeast	2,428,015	2,475,817	2,802,392	2,913,488	2,833,882	2,463,557	3,035,068	3,084,284	3,065,176	3,129,747	3,388,885	3,088,194	3,519,812	3,580,983	3,572,195
Southeast	4,919,579	4,556,981	4,792,359	4,987,301	4,880,596	5,043,629	4,811,128	4,762,780	4,586,390	4,218,090	4,509,483	4,913,376	4,526,445	4,146,475	3,946,244
South	4,973,278	4,814,974	5,149,835	5,349,155	6,109,120	7,038,113	7,641,415	7,685,200	6,710,832	7,932,976	8,249,597	9,392,056	9,101,616	8,183,484	9,353,317
Center-West	1,690,216	1,447,303	1,528,046	1,592,333	1,702,676	2,017,591	1,921,884	1,990,618	2,027,320	2,301,952	2,651,561	3,616,630	3,473,077	3,338,012	3,382,179
Brazil	14,156,586	13,425,000	14,396,337	15,013,466	15,681,571	16,732,522	17,583,413	17,680,206	16,542,259	17,808,483	19,092,465	21,313,941	20,942,834	19,559,531	20,601,515
TOTAL PRODUCTION (TONS)															
North	126,844	112,276	113,862	159,791	144,445	161,097	171,472	179,914	195,178	261,265	361,235	390,816	412,317	400,692	484,678
Northeast	2,386,911	2,065,038	2,775,072	2,812,719	2,638,979	1,746,134	2,874,780	2,707,171	2,672,188	2,590,976	2,977,346	2,437,911	3,226,277	3,056,646	2,834,584
Southeast	7,748,391	6,725,317	7,611,194	7,857,817	7,671,601	9,606,210	7,728,405	8,206,776	8,543,579	9,423,913	7,816,245	10,186,208	8,663,779	8,050,436	8,855,385
South	7,205,352	6,824,688	7,442,715	7,095,277	7,932,092	9,376,278	9,588,135	9,812,256	8,997,479	10,480,447	11,263,686	13,131,506	13,355,067	8,704,707	10,022,397
Center-West	2,809,456	2,060,407	2,302,948	2,896,592	2,074,294	2,723,636	2,371,470	2,793,469	2,899,383	3,139,194	3,465,722	4,577,460	4,658,231	3,343,950	4,631,314
Brazil	19,691,570	17,173,269	19,616,490	19,466,026	19,087,720	21,769,092	20,722,928	22,716,585	21,276,467	23,037,265	24,116,054	27,508,156	28,249,632	20,865,543	23,901,594
ESTIMATED YIELD (KGS)															
North	871.79	864.16	918.95	933.42	930.12	949.69	985.94	1,014.61	1,131.19	1,157.48	1,224.70	1,286.91	1,280.95	1,290.15	1,394.44
Northeast	983.07	834.08	990.25	965.41	931.22	708.79	947.19	877.73	871.79	827.85	879.09	789.43	916.60	853.58	793.51
Southeast	1,575.01	1,475.83	1,588.19	1,575.57	1,571.86	1,904.62	1,606.36	1,723.11	1,870.97	2,234.17	1,733.29	2,073.16	1,914.04	1,941.51	2,244.00
South	1,448.81	1,417.43	1,445.29	1,326.43	1,298.40	1,332.21	1,254.76	1,280.19	1,340.74	1,321.12	1,365.36	1,398.15	1,467.33	1,063.69	1,071.53
Center-West	1,662.19	1,423.62	1,507.12	1,505.08	1,218.26	1,349.94	1,233.93	1,403.32	1,430.16	1,363.71	1,314.59	1,265.67	1,341.24	1,001.78	1,369.33
Brazil	1,390.98	1,279.20	1,362.60	1,296.57	1,217.21	1,301.00	1,178.55	1,284.87	1,286.19	1,293.61	1,263.12	1,290.62	1,348.89	1,066.77	1,160.19

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 (e)
AREA IN PRODUCTION (HA)										
North	445,389	521,038	514,568	337,296	564,702	531,186	621,235	622,084	790,018	769,107
Northeast	3,468,293	3,350,794	4,351,426	2,434,012	3,508,441	3,566,822	4,425,331	3,844,803	4,629,266	4,451,271
Southeast	4,086,100	4,208,660	4,269,718	3,870,261	4,051,122	3,903,409	4,219,616	4,330,005	4,114,151	3,782,674
South	9,099,285	7,852,431	8,714,801	7,805,076	7,806,813	8,368,577	9,023,635	9,810,255	8,959,430	5,798,138
Center-West	3,717,475	3,599,327	3,621,604	3,246,662	3,180,514	2,841,504	3,658,958	4,347,158	4,126,394	3,361,333
Brazil	20,816,542	19,542,250	21,472,117	17,693,307	19,111,592	19,211,498	21,948,775	22,954,305	22,619,259	18,142,523
TOTAL PRODUCTION (TONS)										
North	610,720	676,208	729,776	419,191	763,017	720,926	916,796	851,848	1,105,301	1,132,170
Northeast	2,530,174	1,552,424	3,270,543	1,134,156	3,147,693	2,972,021	4,207,584	1,976,443	4,126,730	3,536,894
Southeast	9,366,703	9,152,077	9,634,321	9,506,262	8,617,301	11,395,890	13,260,834	14,318,049	9,241,950	8,857,044
South	15,109,404	15,753,181	14,541,694	13,026,579	15,237,067	15,789,375	12,327,371	18,844,603	20,161,742	16,345,136
Center-West	5,232,044	4,420,975	5,227,941	4,623,571	4,409,560	4,405,295	5,771,786	7,319,921	7,665,948	7,729,760
Brazil	30,147,432	29,345,234	31,577,030	26,472,959	30,191,501	31,036,310	30,945,903	37,211,747	42,301,671	37,611,004
ESTIMATED YIELD (KGS)										
North	1,371.21	1,297.81	1,418.23	1,242.53	1,351.19	1,357.20	1,475.76	1,369.35	1,399.50	1471.00
Northeast	729.52	463.30	751.60	465.96	897.18	833.24	973.39	514.06	1,041.50	933.50
Southeast	2,292.33	2,174.58	2,256.36	2,456.23	2,127.14	2,919.47	3,142.66	3,306.70	2,021.33	2166.00
South	1,660.50	2,008.60	1,668.62	1,668.99	1,951.77	1,886.75	1,366.12	1,920.91	2,648.33	3386.50
Center-West	1,407.42	1,228.28	1,443.54	1,424.10	1,386.43	1,550.34	1,577.44	1,683.84	1,719.67	2268.50
Brazil	1,448.24	1,501.63	1,470.61	1,496.21	1,579.75	1,615.51	1,409.91	1,621.12	1,837.33	2081.50

Note: "Grains" include maize, rice and wheat.

• 1989 estimates not including wheat.

Source: Derived from Tables C.1.58, C.1.64 and C.1.70.

TABLE A.2.2: FOOD CROPS: AREA, PRODUCTION, AND YIELDS BY REGION: 1965-1989

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
AREA IN PRODUCTION (HA)															
North	248,815	219,214	220,512	286,726	273,981	286,614	305,152	309,756	312,324	372,160	475,193	519,253	549,644	552,557	603,113
Northeast	4,423,901	4,628,374	5,305,323	5,471,664	5,345,174	4,588,353	5,646,915	5,727,180	5,801,627	5,754,748	6,285,733	5,936,729	6,760,625	6,629,663	6,638,238
Southeast	6,090,756	5,654,934	5,941,932	6,140,529	6,025,208	6,224,698	5,963,507	5,928,633	5,697,365	5,723,240	5,654,874	6,045,185	5,807,765	5,537,754	5,099,827
South	6,425,607	6,281,868	6,668,393	6,882,417	7,675,279	8,719,241	9,417,684	9,385,904	8,303,820	9,608,395	9,842,320	10,946,247	10,661,498	9,662,526	10,849,895
Center-West	1,989,992	1,745,008	1,825,182	1,893,628	2,024,566	2,352,951	2,257,112	2,328,425	2,345,778	2,644,717	3,021,676	4,019,341	3,889,659	3,743,997	3,733,918
Brazil	19,179,071	18,529,398	19,961,342	20,674,964	21,344,208	22,241,857	23,590,370	23,673,898	22,460,912	24,103,260	25,279,796	27,466,755	27,669,391	26,325,497	26,924,991
TOTAL PRODUCTION (TONS)															
North	1,458,801	1,140,501	1,388,254	1,672,257	1,668,867	1,569,868	1,775,363	1,741,457	1,616,467	1,684,829	2,142,066	2,445,164	2,532,868	2,680,909	3,200,110
Northeast	12,591,513	12,325,399	15,028,831	16,091,741	16,466,060	14,902,425	16,624,211	16,547,619	15,489,825	14,116,202	16,247,626	15,336,628	17,661,107	17,317,777	16,958,339
Southeast	13,521,213	12,130,915	13,081,268	13,513,920	13,335,882	15,364,331	13,177,931	13,915,093	13,119,469	14,151,651	12,179,082	14,463,629	12,927,843	12,393,469	12,883,224
South	15,233,941	14,989,975	16,264,565	16,172,014	17,184,313	19,194,353	19,650,985	19,158,740	17,148,398	18,256,799	18,745,268	19,455,749	19,293,516	14,098,057	15,272,655
Center-West	4,755,861	4,050,277	4,318,643	4,492,170	4,130,208	4,768,557	4,414,977	4,841,821	4,721,120	4,721,962	4,990,272	6,306,099	6,119,828	4,719,504	5,867,364
Brazil	46,973,945	44,031,410	49,432,260	51,088,932	51,381,637	53,445,271	53,632,083	55,221,829	50,063,941	50,072,913	52,516,184	54,791,524	56,469,123	48,518,928	51,050,128
ESTIMATED YIELD (KGS)															
North	5,854.96	5,202.68	6,294.90	5,832.25	6,091.16	5,477.29	5,817.96	5,733.08	5,175.61	4,527.16	4,507.78	4,709.00	4,608.20	4,851.82	5,305.99
Northeast	2,846.25	2,663.01	2,832.78	2,940.92	3,080.55	3,089.60	2,943.95	2,889.31	2,669.91	2,452.97	2,584.84	2,583.35	2,612.35	2,535.67	2,553.89
Southeast	2,219.96	2,145.19	2,201.52	2,200.77	2,213.35	2,468.29	2,209.76	2,347.10	2,302.73	2,472.66	2,153.73	2,392.59	2,225.96	2,240.02	2,488.99
South	2,370.62	2,386.23	2,439.05	2,350.19	2,282.40	2,201.38	2,086.60	2,041.22	2,065.12	1,900.09	1,904.56	1,777.39	1,809.64	1,458.44	1,407.65
Center-West	2,389.89	2,326.22	2,366.14	2,372.26	2,040.05	2,026.63	1,956.03	2,079.44	2,012.60	1,785.43	1,651.49	1,568.94	1,573.28	1,260.58	1,571.37
Brazil	2,449.23	2,376.30	2,476.40	2,471.05	2,406.85	2,402.91	2,273.47	2,332.60	2,228.94	2,077.43	2,077.40	1,994.83	2,04\ 95	1,843.04	1,898.01

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 (e)
AREA IN PRODUCTION (HA)										
North	716,637	835,734	880,810	683,310	947,500	921,936	1,076,376	1,044,939	1,248,949	1,249,593
Northeast	6,552,643	6,543,552	8,218,558	4,955,773	6,827,173	6,900,691	8,312,603	7,282,072	8,623,999	8,171,188
Southeast	5,501,536	5,785,198	5,901,152	5,230,930	5,480,922	5,301,004	5,503,957	5,477,922	5,385,299	4,908,374
South	10,619,194	9,463,296	10,456,359	9,328,526	9,422,452	10,003,300	10,544,028	11,412,732	10,568,856	7,140,345
Center-West	4,085,798	3,988,648	4,060,549	3,619,695	3,569,196	3,267,520	4,046,714	4,732,345	4,479,962	3,706,198
Brazil	27,475,808	26,636,428	29,517,428	23,818,434	26,247,243	26,394,451	29,483,678	29,950,010	30,287,065	26,264,011
TOTAL PRODUCTION (TONS)										
North	3,256,933	3,782,542	4,095,021	3,803,144	4,246,340	4,486,400	5,021,556	4,587,555	4,678,357	5,685,938
Northeast	16,355,798	15,461,286	17,069,342	12,012,721	14,744,349	14,952,598	18,616,640	13,973,484	15,402,780	15,964,199
Southeast	13,043,048	12,948,149	13,215,543	12,930,702	11,671,318	14,634,095	16,488,263	17,045,283	11,984,132	11,586,345
South	19,394,140	20,773,304	19,721,547	17,705,287	20,106,612	21,127,242	17,297,597	24,330,133	25,816,653	21,604,240
Center-West	6,232,942	5,446,891	6,277,499	5,685,253	5,497,987	5,702,895	6,935,792	8,679,915	8,922,380	9,158,368
Brazil	55,581,246	56,202,541	58,552,007	49,901,407	54,283,399	56,656,033	58,721,378	62,617,259	66,804,302	63,999,090
ESTIMATED YIELD (KGS)										
North	4,544.75	4,526.01	4,649.15	5,565.77	4,481.63	4,866.28	4,665.24	4,485.96	3,745.84	4,549.87
Northeast	2,495.06	2,362.83	2,076.93	2,423.99	2,159.66	2,166.83	2,239.57	1,918.89	1,786.04	1,953.73
Southeast	2,370.80	2,238.15	2,239.49	2,471.97	2,129.44	2,760.63	2,995.71	3,111.63	2,233.64	2,360.53
South	1,826.33	2,190.52	1,888.08	1,898.08	2,133.90	2,112.03	1,640.51	2,131.84	2,442.71	3,025.66
Center-West	1,525.51	1,365.60	1,545.97	1,570.56	1,540.39	1,745.33	1,713.93	1,834.17	1,991.62	2,471.10
Brazil	2,022.92	2,109.99	1,983.64	2,095.08	2,068.16	2,146.51	1,991.66	2,090.73	2,205.70	2,438.76

Note: "Food Crops" include maize, rice, wheat, cassava and beans. e 1989 estimates not including wheat.

Source: Derived from Tables C.1.46, C.1.52, C.1.58, C.1.64 and C.1.70.

TABLE A.2.3: EXPORT AND INDUSTRIAL CROPS: AREA, PRODUCTION, AND YIELDS BY REGION: 1965-1989

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
AREA IN PRODUCTION (HA)															
North	27,915	28,752	28,902	31,033	30,753	31,394	31,759	31,[illegible]	31,476	31,783	33,278	32,344	28,573	39,654	48,449
Northeast	3,977,192	3,956,788	4,005,933	4,167,244	4,283,065	4,169,844	4,366,931	4,499,[illegible]65	4,510,619	4,342,222	4,382,106	4,240,578	4,772,552	4,692,376	4,579,116
Southeast	4,172,553	4,009,782	3,152,944	2,963,451	3,017,739	3,204,860	3,141,531	3,166,114	3,467,449	3,472,284	3,550,886	3,291,681	3,747,714	4,183,716	4,415,533
South	2,350,569	2,350,383	2,344,305	2,501,058	2,715,422	3,022,375	3,319,681	3,703,571	4,635,286	5,975,739	6,590,673	6,226,157	7,285,254	7,627,140	8,117,448
Center-West	193,045	198,462	175,755	152,492	175,141	168,183	250,262	420,930	427,158	463,600	438,158	351,326	690,529	792,151	958,791
Brazil	10,721,274	10,542,132	9,707,839	9,815,278	10,222,140	10,636,656	11,110,164	11,822,131	13,071,988	14,285,628	14,995,101	14,142,086	16,524,622	17,535,037	18,099,337
TOTAL PRODUCTION (TONS)															
North	290,085	299,104	300,476	319,358	336,322	348,214	351,076	364,559	469,484	496,854	464,162	412,830	366,215	565,343	414,988
Northeast	26,056,628	25,018,594	26,897,741	29,642,562	28,409,149	27,730,597	28,249,496	31,232,206	38,821,293	35,921,974	35,252,736	38,028,767	45,515,520	47,594,217	50,865,537
Southeast	45,785,067	45,905,227	45,172,390	43,328,892	42,590,923	47,724,043	47,657,603	50,225,042	51,385,374	57,914,555	54,513,984	62,000,686	72,272,635	78,506,514	85,276,377
South	8,288,807	7,846,825	8,083,952	7,590,890	8,092,353	7,274,922	10,036,885	10,012,045	9,755,467	12,852,031	14,606,641	14,883,583	16,695,729	14,311,068	14,411,955
Center-West	2,010,859	2,808,071	2,492,142	1,902,480	2,015,125	2,059,274	2,005,083	2,481,583	1,406,157	1,923,570	1,440,604	1,619,086	2,202,669	2,487,247	3,230,104
Brazil	82,432,946	81,377,821	82,946,701	81,784,202	81,442,872	85,137,050	88,294,123	94,315,435	101,337,755	109,108,984	106,278,127	116,945,152	137,052,768	143,464,389	154,198,961
ESTIMATED YIELD (KGS)															
North	10,391.72	11,180.62	10,396.37	10,290.92	10,936.23	11,091.74	11,054.38	11,417.09	14,914.98	15,632.70	13,948.01	12,763.73	12,816.62	14,256.90	8,565.46
Northeast	6,552.02	6,322.96	6,714.48	6,873.27	6,632.64	6,618.53	6,467.58	6,941.13	8,605.79	8,272.72	8,044.70	8,967.83	9,536.94	10,142.88	11,108.16
Southeast	10,972.91	11,448.40	14,327.05	14,621.09	14,113.52	14,891.15	15,170.18	15,863.31	14,819.36	16,679.10	15,352.22	18,835.63	19,284.4.	18,764.78	19,312.82
South	3,526.30	3,338.53	3,448.34	3,035.07	2,980.15	2,407.02	3,023.44	2,703.35	2,104.61	2,150.70	2,216.26	2,390 49	2,291.72	1,828.39	1,775.42
Center-West	10,413.94	11,629.79	14,179.64	12,475.93	11,505.73	10,942.93	8,011.94	5,895.48	3,291.89	4,149.20	3,287.85	4,608.50	3,189.83	3,139.86	3,440.71
Brazil	7,688.73	7,719.29	8,544.30	8,332.34	7,967.30	8,004.12	7,947.15	7,977.87	7,752.28	7,637.68	7,087.52	8,269.30	8,293.85	8,181.58	8,519.59

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 (*)
AREA IN PRODUCTION (HA)										
North	71,005	85,342	107,597	148,711	161,210	157,198	156,673	162,087	185,997	238,601
Northeast	4,622,167	4,496,974	4,615,665	3,976,474	4,344,072	4,516,331	4,320,486	3,595,913	4,144,167	3,174,702
Southeast	4,619,095	4,942,627	4,801,388	5,327,475	5,632,318	6,060,155	5,913,449	6,202,497	6,708,206	6,773,084
South	8,243,449	7,687,761	7,118,719	7,070,885	7,421,600	7,648,392	6,638,252	6,598,042	7,320,467	7,899,567
Center-West	1,333,181	1,420,848	1,604,388	1,891,725	2,637,948	3,277,667	3,165,219	3,219,768	3,776,958	4,588,016
Brazil	18,888,897	18,833,552	18,247,757	18,415,270	20,197,146	21,659,737	20,194,075	19,778,301	22,135,794	22,673,950
TOTAL PRODUCTION (TONS)										
North	505,107	487,984	500,027	326,142	358,538	492,135	481,011	584,060	842,194	861,748
Northeast	49,791,975	53,980,934	59,003,443	59,060,232	60,791,367	68,028,043	67,188,948	80,820,458	81,001,881	77,653,441
Southeast	95,092,347	97,755,199	119,060,736	144,370,870	147,482,286	160,796,275	150,365,953	163,672,680	169,498,364	245,493,355
South	19,560,139	20,375,207	18,992,015	22,991,726	21,863,716	25,213,600	20,442,151	24,751,785	25,263,886	30,831,686
Center-West	4,879,076	4,819,600	6,540,709	9,584,035	13,105,450	17,101,805	16,525,652	20,168,255	22,280,952	24,101,629
Brazil	168,328,643	177,418,924	204,096,930	236,332,505	243,601,357	271,631,357	257,003,915	289,998,539	299,887,277	378,942,057
ESTIMATED YIELD (KGS)										
North	7,113.68	5,717.98	4,647.22	2,193.13	2,224.04	3,130.67	3,070.16	3,603.36	4,528.00	3,611.85
Northeast	10,556.08	12,003.84	12,783.30	14,852.41	13,994.10	15,062.68	15,551.25	22,475.65	19,546.00	24,460.07
Southeast	20,586.79	19,777.98	24,797.15	27,099.21	26,185.01	26,533.36	25,427.79	26,388.19	25,257.32	36,245.54
South	2,372.61	2,583.14	2,667.90	3,251.61	2,945.96	3,296.59	3,079.45	3,751.38	3,587.73	3,902.98
Center-West	3,284.68	3,392.06	4,076.76	5,066.29	4,968.05	5,217.52	5,852.94	6,263.88	5,899.18	5,253.17
Brazil	8,911.51	9,420.36	11,184.77	12,833.51	12,061.18	12,540.84	12,726.70	14,662.46	13,547.62	16,712.66

Note: "Export and Industrial Crops" include soybeans, oranges, sugar, tobacco, cocoa, coffee and cotton. * 1989 estimates.

Source: Derived from Tables C.1.4, C.1.10, C.1.16, C.1.22, C.1.28, C.1.34 and C.1.40.

TABLE A.2.4: RATES OF GROWTH IN PRODUCTION, AREA, AND YIELDS FOR MAJOR CROPS: 1965-89

	Average Annual Rate of Growth			
	1965-73	1974-79	1980-89	1965-89
PRODUCTION (tons)				
Export Crops:				
Soybeans	28.14	4.75	4.17	17.19
Oranges	9.41	6.06	5.05	9.58
Sugar	2.14	6.32	6.77	6.51
Tobacco	-0.65	6.02	1.03	3.07
Cocoa	2.28	12.96	1.64	4.21
Coffee	-8.02	-3.06	-2.55	-0.19
Cotton	1.51	-2.62	2.26	0.09
Food Crops:				
Wheat	14.40	0.90	* 8.19	* 9.60
Maize	1.71	0.04	2.98	3.32
Rice	-0.62	1.97	2.98	2.18
Cassava	0.71	0.12	-0.13	-0.96
Beans	-0.26	-0.39	1.13	-0.12
AREA (hectares)				
Export Crops:				
Soybeans	26.63	8.21	3.37	14.74
Oranges	12.94	5.24	4.71	7.84
Sugar	1.55	3.56	5.47	4.67
Tobacco	-1.72	5.17	-1.11	0.72
Cocoa	-1.63	-2.10	3.80	1.80
Coffee	-6.13	1.86	2.71	-0.40
Cotton	0.84	-0.80	-8.93	-2.77
Food Crops:				
Wheat	10.21	7.58	* 1.14	6.48
Maize	1.86	0.98	1.70	1.56
Rice	0.42	2.63	-0.96	1.18
Cassava	2.07	0.85	-1.84	0.39
Beans	1.72	-0.30	1.42	2.17
PHYSICAL YIELDS (kg/ha)				
Export Crops:				
Soybeans	1.51	-3.45	0.77	2.14
Oranges	-3.53	0.82	0.33	1.61
Sugar	0.59	2.76	1.23	1.76
Tobacco	1.07	0.85	2.17	2.33
Cocoa	3.91	15.06	-2.09	2.36
Coffee	-1.90	-4.92	-5.12	0.21
Cotton	0.66	-1.62	12.29	2.94
Food Crops:				
Wheat	4.19	-6.68	* 7.05	* 3.13
Maize	0.34	-0.94	1.25	1.72
Rice	-1.03	-0.67	3.98	0.98
Cassava	-1.36	-0.74	1.74	-1.34
Beans	-1.98	-0.09	-0.29	-2.24

Note: Growth rates are derived using the leasst squares method. Percentage figures refer to the relative contribution to rates of growth from area and yield increases. The respective periods ending in 1988, not 1989, were used for these calculations.

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.6: DISAGGREGATION OF RATES OF GROWTH OF PRODUCTION BY AREA EXPANSION AND YIELDS: 1965-1980

	RATES OF GROWTH OF PRODUCTION	DISAGGREGATED RATES OF GROWTH IN AREA EXPANSION AND YIELDS			
		Area (ha)		Yield (kg/ha)	
EXPORT CROPS					
Soybeans	22.95	20.71	(90.24)	2.24	(9.76)
Oranges	10.15	8.75	(86.21)	1.40	(13.79)
Sugar	4.25	2.69	(63.29)	1.56	(36.71)
Tobacco	3.09	0.91	(29.45)	2.18	(70.55)
Cocoa	4.37	0.00	(0.00)	4.37	(100.00)
Coffee	-3.37	-2.54	(75.37)	-0.83	(24.63)
Cotton	-1.06	-0.49	(46.23)	-0.57	(53.77)
FOOD CROPS					
Wheat	9.95	9.17	(92.16)	0.78	(7.84)
Maize	3.28	1.68	(51.22)	1.60	(48.78)
Rice	1.61	1.90	(100.00)	-0.29	(0.00)
Cassava	-0.35	1.70	(0.00)	-2.05	(100.00)
Beans	-0.95	2.13	(0.00)	-3.08	(100.00)

Note: Growth rates are derived using the least squares method. Numbers in parenthesis are the relative contribution to rates of growth from area and yield increases.

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.6: SHARES OF EXPORT AND FOOD CROPS IN TOTAL PRODUCTION BY REGION: 1965-1985

(%)

YEAR	BRAZIL		SOUTHEAST		SOUTH		CENTER-WEST		NORTHEAST		NORTH	
	Export	Food	Export	Food	Export	Food	Export	Food	Export	Food	Export	Food
1965	63.70	36.30	77.20	22.80	35.24	64.76	29.71	70.29	67.42	32.58	16.61	83.39
1970	61.43	38.57	75.65	24.35	27.48	72.52	30.16	69.84	65.83	34.17	18.15	81.85
1975	66.93	33.07	81.74	18.26	43.80	56.20	22.40	77.60	68.45	31.55	17.81	82.19
1980	75.18	24.82	87.94	12.06	50.21	49.79	41.27	58.73	74.89	25.11	13.43	86.57
1985	82.74	17.26	91.66	8.34	54.41	45.59	74.99	25.01	81.98	18.02	9.89	90.11

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.7: SHARES OF EXPORT AND FOOD CROPS IN TOTAL AREA BY REGION: 1965-1985

(%)

YEAR	BRAZIL		SOUTHEAST		SOUTH		CENTER-WEST		NORTHEAST		NORTH	
	Exports	Food	Exports	Food	Exports	Food	Exports	Food	Exports	Food	Exports	Food
1965	35.86	64.14	40.66	59.34	26.78	73.22	8.84	91.16	47.34	52.66	10.09	89.91
1970	32.35	67.65	33.99	66.01	25.74	74.26	7.41	92.59	47.35	52.65	9.87	90.13
1975	37.23	62.77	38.57	61.43	40.11	59.89	12.66	87.34	41.08	58.92	6.54	93.46
1980	40.74	59.26	45.64	54.36	43.70	56.30	24.50	75.50	41.36	58.64	9.01	90.99
1985	45.07	54.93	53.34	46.66	43.33	56.67	50.08	49.92	39.56	60.44	14.57	85.43

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.8: PER CAPITA FOOD PRODUCTION BY REGION: 1970-1985

REGIONS	(1) FOOD PRODUCTION 1970	1980	1985	(2) POPULATION 1970	1980	1985	(1)/(2) PER CAPITA FOOD PRODUCTION 1970	1980	1985
NORTH	1,589,868	3,256,933	4,486,400	3,603,860	5,880,568	NA	0.436	0.554	NA
NORTHEAST	14,392,425	16,355,796	14,952,598	28,111,924	34,812,356	38,899,513	0.512	0.470	0.384
SOUTHEAST	15,364,331	13,043,048	14,634,095	39,853,501	51,734,125	59,983,408	0.386	0.252	0.248
SOUTH	19,194,353	19,394,140	21,127,242	16,496,493	19,031,162	20,577,765	1.164	1.019	1.027
CENTER-WEST	4,768,557	6,232,942	5,702,895	5,073,259	7,544,795	9,052,872	0.940	0.826	0.630
BRAZIL	53,445,271	55,581,248	56,656,033	93,139,037	119,002,706	131,411,396	0.574	0.467	0.431

Source: Tables A.2.2 and A.1.14.

TABLE A.2.9: DISAGGREGATION OF RATES OF GROWTH OF PRODUCTION BY AREA EXPANSION AND YIELDS BY MAJOR CROP: 1980-1989

		RATES OF GROWTH OF PRODUCTION	DISAGGREGATED RATES OF GROWTH IN AREA EXPANSION AND YIELDS			
			Area (ha)		Yields (kg/ha)	
EXPORT CROPS						
	Soybeans	4.17	3.37	(80.82%)	0.80	(19.18%)
	Oranges	5.05	4.71	(93.27%)	0.34	(6.73%)
	Sugar	6.77	5.47	(80.80%)	1.30	(19.20%)
	Tobacco	1.03	-1.11	(0.00%)	2.14	(100.00%)
	Cocoa	1.64	3.80	(100.00%)	-2.16	(0.00%)
	Coffee	-2.55	2.71	(0.00%)	-5.26	(100.00%)
	Cotton	2.26	-8.93	(0.00%)	11.19	(100.00%)
FOOD CROPS						
	Wheat *	8.19	1.14	(13.92%)	7.05	(86.08%)
	Maize	2.98	1.70	(57.05%)	1.28	(42.95%)
	Rice	2.98	-0.96	(0.00%)	3.94	(100.00%)
	Cassava	-0.13	-1.84	(100.00%)	1.71	(0.00%)
	Beans	1.13	1.42	(100.00%)	-0.29	(0.00%)

* Growth rates for wheat were calculated for the period 1980-1988.

Note: Growth rates are derived using the least squares method. Percentage figures refer to the relative contribution to rates of growth from area and yield increases.

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.10: DISAGGREGATION OF RATES OF GROWTH OF PRODUCTION BY AREA EXPANSION AND YIELD FOR FOOD AND EXPORT CROPS BY REGION: 1980-1989

CROP TYPE		RATES OF GROWTH OF PRODUCTION	DISAGGREGATED RATES OF GROWTH IN AREA EXPANSION AND YIELDS			
			Area (ha)		Yields (kg/ha)	
FOOD CROPS						
	North	5.01	6.25	(100.00)	-1.24	(0.00)
	Northeast	0.05	3.00	(100.00)	-2.95	(0.00)
	Southeast	0.38	-1.09	(0.00)	1.47	(100.00)
	South	2.16	-1.27	(0.00)	3.43	(100.00)
	Center-West	5.72	0.58	(10.14)	5.14	(89.86)
	Brazil	2.05	0.74	(36.10)	1.31	(63.90)
EXPORT-COMMERCIAL CROPS						
	North	6.82	11.89	(100.00)	-5.07	(0.00)
	Northeast	5.67	-2.93	(0.00)	8.60	(100.00)
	Southeast	8.98	4.49	(50.00)	4.49	(50.00)
	South	4.33	-0.87	(0.00)	5.20	(100.00)
	Center-West	22.84	15.10	(66.11)	7.74	(33.89)
	Brazil	8.26	2.16	(26.15)	6.10	(73.85)

Note: Growth rates are derived using the least squares method. Percentage figures refer to the relative contribution to rates of growth from area and yield increases.

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.11: DISSAGGREGATION OF RATES OF GROWTH OF PRODUCTION BY AREA EXPANSION AND YIELDS FOR INDIVIDUAL EXPORT CROPS BY REGION: 1980-1989

REGION	CROP	ANNUAL RATES OF GROWTH IN PRODUCTION	DISAGGREGATED RATES OF GROWTH IN AREA EXPANSION & YIELDS			
			Area (ha)	(%)	Yields (kg/ha)	(%)
NORTH						
	Cocoa	29.58	14.84	(50.17)	14.74	(49.83)
	Coffee	12.23	16.46	(100.00)	-4.23	(0.00)
	Cotton	1.16	3.29	(100.00)	-2.13	(0.00)
	Oranges	2.73	2.56	(93.77)	0.17	(6.23)
	Sugar Cane	3.94	2.10	(53.30)	1.84	(46.70)
	Tobacco	-7.74	-8.79	(100.00)	1.05	(0.00)
NORTHEAST						
	Soybeans	10.79	5.12	(47.45)	5.67	(52.55)
	Cocoa	-0.11	2.87	(0.00)	-2.98	(100.00)
	Coffee	5.82	6.05	(100.00)	-0.73	(0.00)
	Cotton	-2.92	-16.12	(100.00)	13.20	(0.00)
	Oranges	3.30	3.57	(100.00)	-0.27	(0.00)
	Sugar Cane	4.11	3.48	(84.67)	0.63	(15.33)
	Tobacco	-7.79	-7.36	(94.48)	-0.43	(5.52)
SOUTHEAST						
	Soybeans	6.25	-1.33	(0.00)	7.58	(100.00)
	Cocoa	-6.97	1.29	(100.00)	-8.26	(0.00)
	Coffee	-3.92	3.36	(100.00)	-7.28	(0.00)
	Cotton	2.25	2.30	(0.00)	-0.05	(100.00)
	Oranges	5.43	5.01	(92.27)	0.42	(7.73)
	Sugar Cane	6.94	5.72	(82.42)	1.22	(17.58)
	Tobacco	-10.88	-9.75	(89.61)	-1.13	(10.39)
SOUTH						
	Soybeans	-1.75	-1.33	(76.00)	-0.42	(24.00)
	Coffee	-2.19	-1.22	(55.71)	-0.97	(44.29)
	Cotton	4.31	3.37	(78.19)	0.94	(21.81)
	Oranges	-0.10	0.94	(0.00)	-1.04	(100.00)
	Sugar Cane	9.54	7.60	(79.66)	1.94	(20.34)
	Tobacco	1.88	3.04	(100.00)	-1.18	(0.00)
CENTER-WEST						
	Soybeans	18.87	15.86	(84.05)	3.01	(15.95)
	Cocoa	49.78	23.07	(46.34)	26.71	(53.66)
	Coffee	0.41	1.99	(100.00)	-1.58	(0.00)
	Cotton	3.85	4.09	(100.00)	-0.24	(0.00)
	Oranges	2.73	4.51	(100.00)	-1.78	(0.00)
	Sugar Cane	25.19	21.25	(84.36)	3.94	(15.64)
	Tobacco	-17.93	-15.87	(88.51)	-2.06	(11.49)

Note: Growth rates are derived using the least squares method. Percentage figures refer to the relative contribution to rates of growth from area and yield increases.

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.12: DISSAGGREGATION OF RATES OF GROWTH OF PRODUCTION BY AREA EXPANSION AND YIELDS FOR INDIVIDUAL FOOD CROPS BY REGION: 1980-1989

REGION	CROP	ANNUAL RATES OF GROWTH IN PRODUCTION	DISAGGREGATED RATES OF GROWTH IN AREA EXPANSION & YIELDS			
			Area (ha)	(%)	Yields (kg/ha)	(%)
NORTH						
	Beans	12.66	11.88	(93.84)	0.78	(6.16)
	Cassava	4.30	3.34	(77.67)	0.96	(22.33)
	Maize	12.33	10.49	(85.08)	1.84	(14.92)
	Rice	3.83	3.34	(87.21)	0.49	(12.79)
NORTHEAST						
	Beans	6.84	5.34	(78.07)	1.50	(21.93)
	Cassava	-1.79	-2.76	(100.00)	0.97	(0.00)
	Maize	12.19	4.96	(40.69)	7.23	(59.31)
	Rice	4.66	0.85	(18.24)	3.81	(81.76)
SOUTHEAST						
	Beans	-1.44	-3.26	(100.00)	1.82	(0.00)
	Cassava	-4.55	-3.25	(71.43)	-1.30	(28.57)
	Maize	2.93	0.06	(2.05)	2.87	(97.95)
	Rice	2.43	-1.18	(0.00)	3.61	(100.00)
	Wheat	5.04	0.01	(0.01)	5.03	(99.90)
SOUTH						
	Beans	-2.44	-1.37	(56.15)	-1.07	(43.85)
	Cassava	2.80	0.94	(33.57)	1.86	(66.43)
	Maize	-0.42	-0.62	(100.00)	0.20	(0.00)
	Rice	4.91	0.93	(18.94)	3.98	(81.06)
	Wheat	8.01	0.41	(5.10)	7.6	(94.90)
CENTER-WEST						
	Beans	4.20	-0.27	(0.00)	4.47	(100.00)
	Cassava	4.18	3.13	(74.88)	1.05	(25.12)
	Maize	11.27	6.59	(58.47)	4.68	(41.53)
	Rice	-0.28	-3.53	(100.00)	3.25	(0.00)
	Wheat	15.73	12.46	(79.20)	3.27	(20.80)

Note: Growth rates are derived using the least squares method. Percentage figures refer to the relative contribution to rates of growth from area and yield increases.

Source: Derived from Tables C.1.1 to C.1.72.

TABLE A.2.18: LIVESTOCK NUMBERS, SHARES, AND GROWTH RATES BY REGION: 1950-1985

REGION	YEAR	LIVESTOCK (#)			LIVESTOCK SHARES (%)			INTERVAL	GROWTH RATES (%)		
		Cattle	Pigs	Poultry	Cattle	Pigs	Poultry		Cattle	Pigs	Poultry
North	1950	1,020,805	377,534	2,240,191	2.3	1.6	3.0	1950/60	1.9	3.6	6.1
	1960	1,234,892	537,347	4,037,478	2.2	2.1	3.1	1960/70	3.3	5.4	6.2
	1970	1,706,177	909,287	7,876,457	2.2	2.9	3.5	1970/75	4.5	6.5	9.3
	1975	2,129,609	1,245,282	11,482,373	2.1	3.5	4.0	1975/80	13.4	8.3	3.9
	1980	3,989,113	1,855,406	13,928,651	3.4	5.7	3.4	1980/85	6.1	2.9	3.1
	1985	5,858,578	2,144,228	18,204,790	4.2	7.1	3.8	1950/85	4.9	5.1	5.8
Northeast	1950	9,632,438	6,019,404	18,828,088	21.6	26.3	24.9	1950/60	1.8	-1.3	5.3
	1960	11,555,757	5,261,688	30,651,158	20.7	20.8	23.4	1960/70	1.8	3.0	1.7
	1970	13,805,621	7,094,820	36,269,301	17.6	22.5	17.0	1970/75	5.5	5.9	9.1
	1975	18,041,177	9,466,962	56,123,798	17.7	26.9	19.6	1975/80	3.6	-5.0	2.9
	1980	21,505,844	7,325,480	64,726,983	18.2	22.5	15.7	1980/85	0.7	1.4	3.8
	1985	22,286,534	7,854,442	77,876,178	17.5	26.1	18.1	1950/85	2.4	0.8	4.2
Southeast	1950	16,765,179	7,324,241	31,484,432	37.6	32.0	42.7	1950/60	2.2	-1.5	4.4
	1960	20,839,801	6,274,011	48,586,538	37.3	24.7	37.1	1960/70	2.6	-0.8	6.3
	1970	26,845,044	5,797,048	89,638,296	34.2	18.4	42.0	1970/75	5.6	2.2	5.5
	1975	35,236,666	6,461,784	117,081,211	34.7	18.4	40.8	1975/80	-0.2	-2.1	7.6
	1980	34,834,792	5,822,852	169,209,576	29.5	17.8	41.0	1980/85	0.5	-1.2	-2.8
	1985	35,661,006	5,482,862	146,799,551	27.9	18.2	34.2	1950/85	2.2	-0.8	4.5
South	1950	10,327,785	7,843,918	18,214,295	23.2	34.3	24.7	1950/60	1.2	4.0	8.2
	1960	11,678,003	11,578,962	40,078,686	20.9	45.7	30.6	1960/70	5.0	2.8	5.4
	1970	18,953,024	15,211,991	68,117,916	24.1	48.3	31.9	1970/75	2.6	-0.3	5.3
	1975	21,516,021	15,006,998	88,060,187	21.2	42.7	30.7	1975/80	2.6	-0.1	10.8
	1980	24,494,853	14,967,703	146,975,673	20.7	45.9	35.6	1980/85	0.2	-4.9	2.5
	1985	24,742,106	11,643,143	166,349,557	19.4	38.7	38.7	1950/85	2.5	1.1	6.5
Center-West	1950	6,816,139	1,321,814	3,412,701	15.3	5.8	4.8	1950/60	4.4	2.5	8.2
	1960	10,532,885	1,687,445	7,532,297	18.9	6.7	6.8	1960/70	5.1	4.1	5.0
	1970	17,252,084	2,510,508	12,226,133	22.0	8.0	5.7	1970/75	7.5	3.4	2.8
	1975	24,750,040	2,970,618	14,062,683	24.3	8.5	4.9	1975/80	6.1	-2.2	5.5
	1980	33,281,008	2,657,292	18,338,711	28.2	8.1	4.4	1980/85	3.5	2.1	4.2
	1985	39,594,876	2,942,378	22,502,259	31.0	9.8	5.2	1950/85	5.2	2.3	5.5
Brazil	1950	44,581,846	22,886,911	73,674,707	100.0	100.0	100.0	1950/60	2.3	1.0	5.9
	1960	55,841,278	25,359,453	130,886,150	100.0	100.0	100.0	1960/70	3.5	2.2	5.0
	1970	78,561,950	31,523,604	213,622,103	100.0	100.0	100.0	1970/75	5.3	2.2	6.1
	1975	101,673,513	35,151,644	286,810,202	100.0	100.0	100.0	1975/80	3.0	-1.5	7.6
	1980	118,085,608	32,628,683	413,179,594	100.0	100.0	100.0	1980/85	1.6	-1.6	0.8
	1985	127,643,100	30,067,046	429,732,335	100.0	100.0	100.0	1950/85	3.1	0.8	5.2

Source: IBGE, Censos Agropecuarios. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.14: LIVESTOCK SLAUGHTERING AND OFF-TAKE RATES: 1950-1985

	CATTLE			PIGS			POULTRY		
	Stock (000)	Slaughterings (000)	Offtake (%)	Stock (000)	Slaughterings (000)	Offtake (%)	Stock (000)	Slaughterings (000)	Offtake (%)
1950	44,562	5,965	13.4	22,887	6,408	28.6	78,675	na	na
1960	55,841	7,207	12.9	25,359	7,092	28.0	130,886	5,433	4.2
1970	78,562	9,560	12.2	31,524	11,229	35.6	231,622	62,408	26.9
1980	118,086	9,578	8.1	32,629	10,271	31.5	413,180	615,627	149.0
1985	127,648	10,606	8.3	30,067	8,571	28.5	429,732	738,148	171.8

Source: IBGE, Estadisticas Historicas do Brasil, 1550 a 1985.

TABLE A.2.15: MILK PRODUCTION: 1950-1988

	QUANTITY (000 lts)	VALUE (a/)	INTERVAL	AVG YEARLY GROWTH RATES OF PRODUCTION (%)
1950	2,419,766	3,949,000		
1951	2,485,232	4,688,000		
1952	2,982,611	6,387,000		
1953	3,384,561	8,154,000		
1954	3,621,828	10,074,000		
1955	3,886,407	13,327,000		
1956	4,114,750	17,624,541		
1957	4,274,482	20,738,715		
1958	4,464,372	25,893,895		
1959	4,648,086	33,101,479		
1960	4,899,816	50,843,570	1950/60	0.395
1961	5,070,204	77,005,166		
1962	5,295,433	122,612,432		
1963	5,383,387	208,155,615		
1964	6,149,541	493,679,918		
1965	6,571,151	729,220,752		
1966	6,688,497	1,067,516,685		
1967	6,703,443	1,287,371		
1968	6,909,350	1,635,088		
1969	6,993,048	2,011,647		
1970	7,182,049	2,502,018	1960/70	0.383
1971	na	na		
1972	na	na		
1973	6,333,263	5,379,626		
1974	7,101,261	8,023,957		
1975	7,947,378	11,925,854		
1976	8,256,942	20,071,647		
1977	9,565,637	27,084,388		
1978	9,782,169	38,190,525		
1979	10,187,228	61,492,456		
1980	11,162,245	133,371,045	1970/80	0.389
1981	11,323,987	261,226		
1982	11,461,215	475,783		
1983	11,463,018	1,221,026		
1984	11,932,908	3,595,136		
1985	12,076,399	na		
1986	12,491,809	na	1980/86	0.375
			1950/86	0.383

a\ From 1950 to 1966, millions of current cruzeiros per the monetary reform of 1942; from 1967 to 1969, millions of "new" cruzeiros per the monetary reform of 1967; from 1970 to 1980, millions of cruzeiros per the monetary reform of 1970; from 1981 to 1984, thousands of cruzeiros.

Source: IBGE, Estadisticas Historicas do Brasil, 1550 a 1985.

TABLE A.2.16: NUMBER AND GROWTH RATES OF FARM ESTABLISHMENTS BY SIZE: 1950-1985

FARM SIZE (ha)	FARMS (000)						GROWTH RATES					
	1950	1960	1970	1975	1980	1985	1950/60	1960/70	1970/75	1975/80	1980/85	1950/85
0 - 10	710.4	1,495.4	2,526.0	2,601.4	2,595.5	3,086.7	7.78%	5.38%	0.59%	-0.05%	3.53%	4.29%
10 - 20	344.9	547.4	768.1	734.0	768.8	816.9	4.78%	3.45%	-0.91%	0.93%	1.22%	2.49%
20 - 50	487.3	674.3	822.3	813.9	851.4	910.3	3.30%	2.00%	-0.21%	0.91%	1.35%	1.80%
50 - 100	218.9	278.7	339.8	354.5	392.2	437.6	2.26%	2.16%	0.85%	2.04%	2.22%	2.00%
100 - 1000	268.5	313.6	413.6	444.4	490.2	519.3	1.57%	2.80%	1.45%	1.98%	1.16%	1.90%
Above 1000	33.0	33.4	34.5	44.9	46.4	52.5	0.10%	0.32%	5.45%	0.66%	2.49%	1.33%
TOTAL a/	2,065.0	3,338.0	4,924.0	4,993.0	5,160.0	5,835.0	4.92%	3.96%	0.28%	0.66%	2.49%	3.01%

a/ Includes undeclared.

Source: IBGE, Censos Agropecuarios.

TABLE A.2.17: NUMBER AND GROWTH RATES OF FARM ESTABLISHMENTS BY SIZE AND REGION: 1970-1985

REGION	YEAR	NUMBER OF FARMS (000) 0-10	10-20	20-50	50-100	100-1000	1000+	Total a/	INTERVAL	GROWTH RATES 0-10	10-20	20-50	50-100	100-1000	1000+	Total
NORTH																
	1970	107.3	21.8	53.0	22.2	39.4	2.3	261	1970/75	6.98%	5.76%	4.40%	3.98%	4.39%	5.24%	5.24%
	1975	150.3	42.1	65.7	27.0	48.9	3.0	337	1975/80	-0.57%	5.35%	5.55%	12.86%	6.10%	13.50%	3.90%
	1980	146.1	54.7	86.1	49.4	65.7	5.7	408	1980/85	2.53%	3.20%	4.74%	9.30%	3.89%	-4.66%	4.15%
	1985	165.5	64.0	108.5	77.0	79.5	4.5	500	1970/85	2.93%	4.76%	4.89%	8.65%	4.79%	4.43%	4.43%
NORTHEAST																
	1970	1498.6	216.3	231.7	112.6	125.8	8.8	2,207	1970/75	1.86%	0.00%	0.29%	0.47%	0.91%	1.27%	1.27%
	1975	1643.3	216.3	235.1	115.2	131.7	9.4	2,351	1975/80	0.14%	--	--	--	1.52%	9.33%	0.81%
	1980	1654.8	--	--	--	142.0	14.7	2,448	1980/85	3.72%	--	--	--	0.24%	-5.16%	2.66%
	1985	1986.7	253.6	279.0	138.1	143.7	11.3	2,818	1970/85	1.90%	1.07%	1.24%	1.37%	0.69%	1.64%	1.64%
SOUTHEAST																
	1970	310.3	164.4	210.9	109.6	125.4	7.4	929	1970/75	-2.19%	-1.90%	-0.93%	-0.11%	1.01%	3.41%	-1.10%
	1975	277.8	149.4	201.3	109.0	131.9	8.8	879	1975/80	0.90%	0.39%	-0.17%	-0.36%	-0.13%	0.27%	0.27%
	1980	290.5	152.4	199.6	108.9	131.0	8.9	891	1980/85	4.31%	2.19%	1.36%	0.91%	0.44%	6.11%	2.31%
	1985	358.6	169.8	213.8	111.9	133.9	12.0	999	1970/85	0.97%	0.22%	0.09%	0.14%	0.44%	3.24%	0.49%
SOUTH																
	1970	538.9	327.4	279.0	67.5	56.1	5.1	1,274	1970/75	-3.10%	-1.98%	-1.11%	0.56%	1.03%	2.57%	-1.91%
	1975	460.5	298.2	263.8	69.4	59.0	5.8	1,157	1975/80	-0.89%	-0.04%	-0.87%	0.14%	1.33%	-0.19%	-0.19%
	1980	451.5	296.7	259.0	69.9	63.0	5.7	1,148	1980/85	2.26%	0.40%	-0.42%	-0.05%	0.59%	0.96%	0.96%
	1985	504.8	301.7	253.6	69.7	64.9	6.0	1,202	1970/85	-0.43%	-0.54%	-0.63%	0.21%	0.98%	1.11%	-0.39%
CENTER-WEST																
	1970	63.5	27.3	49.6	30.6	67.8	13.4	253	1970/75	2.34%	0.28%	-1.38%	1.07%	2.27%	3.08%	1.23%
	1975	71.3	27.7	46.3	32.3	75.9	15.6	269	1975/80	-4.96%	-2.09%	-0.19%	1.69%	2.80%	4.05%	-0.07%
	1980	55.2	24.9	45.8	35.1	87.1	19.0	268	1980/85	5.19%	3.35%	1.86%	3.35%	2.18%	2.18%	3.35%
	1985	71.1	29.4	50.2	41.4	97.0	21.2	316	1970/85	0.76%	0.49%	0.09%	2.03%	2.42%	3.09%	1.49%

a/ Includes undeclared.

Source: IBGE, Censos Agropecuarios. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.16: AVERAGE REAL FARM INCOME AND GROWTH RATES BY REGION: 1970-1980

REGION	YEAR	(1) REAL AGRICULTURAL GDP (Cz$000)	(2) NUMBER OF FARM ESTABLISHMENTS (000)	(3) AVERAGE REAL FARM INCOME (Cz$000) (1)/(2)	INTERVAL	(4) GROWTH OF AVERAGE REAL FARM INCOME
NORTH						
	1970	38,980,952	261	149,352	1970/75	-6.73%
	1975	35,528,790	337	105,427	1975/80	7.27%
	1980	61,106,194	408	149,770	1970/80	0.03%
NORTHEAST						
	1970	200,338,338	2,207	90,772	1970/75	-2.25%
	1975	190,455,807	2,351	81,011	1975/80	3.90%
	1980	240,154,508	2,448	98,102	1970/80	0.78%
SOUTHEAST						
	1970	328,566,667	929	353,678	1970/75	-0.15%
	1975	308,488,403	879	350,954	1975/80	6.45%
	1980	427,333,691	891	479,611	1970/80	3.09%
SOUTH						
	1970	320,814,286	1,274	251,817	1970/75	3.59%
	1975	347,482,762	1,157	300,331	1975/80	1.10%
	1980	363,533,034	1,146	317,219	1970/80	2.34%
CENTER-WEST						
	1970	71,147,619	253	281,216	1970/75	1.00%
	1975	79,487,776	269	295,494	1975/80	12.07%
	1980	139,972,653	268	522,286	1970/80	6.39%

Sources: (1) is from table A.1.11; (2) is from Table A.2.17.

TABLE A.2.19: STRUCTURE OF AGRICULTURAL EMPLOYMENT BY SEX: 1950-1980

STRUCTURE	1950					1960				
	MALE	%	FEMALE	%	TOTAL	MALE	%	FEMALE	%	TOTAL
Wage Earners	3,365.5	94.76%	186.0	5.24%	3,551.5	3,009.2	93.50%	209.1	6.50%	3,218.3
Employers	322.8	97.00%	10.0	3.00%	332.8	221.8	96.16%	8.8	3.82%	230.6
Self-Employed	3,602.9	96.99%	111.9	3.01%	3,714.8	5,424.9	95.11%	278.7	4.89%	5,703.6
Non-Renumerated Family Workers	2,807.8	83.61%	452.0	16.38%	2,760.3	2,523.3	77.52%	731.6	22.48%	3,254.9
Others	10.0	95.24%	0.5	4.76%	10.5	0.8	88.89%	0.1	11.11%	0.9
T O T A L	9,609.0	92.66%	760.4	7.33%	10,369.9	11,180.0	90.10%	1226.3	9.90%	12,408.3

STRUCTURE	1970					1980				
	MALE	%	FEMALE	%	TOTAL	MALE	%	FEMALE	%	TOTAL
Wage Earners	3,115.1	93.55%	214.8	6.45%	3,329.9	4,310.4	89.03%	531.0	10.97%	4841.4
Employers	202.7	96.94%	6.4	3.06%	209.1	312.5	96.54%	11.2	3.46%	323.7
Self-Employed	6,527.8	93.65%	442.3	6.35%	6,970.1	5,030.1	91.94%	440.7	8.06%	5470.8
Non-Renumerated Family Workers	1,986.8	76.98%	594.2	23.02%	2,581.0	1,411.8	69.03%	633.3	30.97%	2045.1
Others	0.3	100.00%	0	0.00%	0.3	55.3	86.00%	9.0	14.00%	64.3
T O T A L	11,832.7	90.39%	1,257.7	9.61%	13,090.4	11,120.1	87.25%	1,625.2	12.75%	12,745.3

Source: IBGE, Censos Demograficos.

TABLE A.2.20: STRUCTURE OF AGRICULTURAL EMPLOYMENT BY REGION (Demographic Census) : 1950-1980

REGION	STRUCTURE	WAGE EARNER	PERCENTAGE (%)	EMPLOYER	PERCENTAGE (%)	SELF-EMPLOYED	PERCENTAGE (%)	NON-REMUN. FAMILY WORKERS	PERCENTAGE (%)	OTHER	PERCENTAGE (%)	TOTAL	PERCENTAGE (%)
NORTH	1950	78.60	0.19	5.50	0.01	207.10	0.51	113.80	0.28	0.30	0.00	405.30	100.00%
	1960	80.00	0.15	3.20	0.01	282.40	0.55	152.40	0.29	0.00	0.00	518.00	100.00%
	1970	76.20	0.13	5.20	0.01	386.30	0.66	118.20	0.20	0.00	0.00	585.90	100.00%
	1980	127.60	0.16	7.40	0.01	494.70	0.64	137.80	0.18	7.70	0.01	775.10	100.00%
NORTHEAST	1950	1149.20	0.28	106.20	0.03	1785.00	0.43	1112.00	0.27	4.70	0.00	4157.10	100.00%
	1960	958.00	0.19	62.30	0.01	2550.40	0.51	1381.70	0.28	0.10	0.00	4952.50	100.00%
	1970	1160.10	0.22	43.40	0.01	3073.20	0.59	948.00	0.18	0.10	0.00	5224.80	100.00%
	1980	1790.50	0.33	76.90	0.01	2684.70	0.50	812.70	0.15	35.30	0.01	5400.10	100.00%
SOUTHEAST	1950	1833.40	0.49	161.60	0.04	891.80	0.24	858.60	0.23	2.80	0.00	3748.20	100.00%
	1960	1583.60	0.40	121.90	0.03	1498.50	0.38	755.00	0.19	0.60	0.00	3959.60	100.00%
	1970	1425.20	0.41	94.80	0.03	1538.20	0.44	457.30	0.13	0.20	0.00	3515.70	100.00%
	1980	1864.80	0.60	138.70	0.04	825.50	0.26	292.90	0.09	9.40	0.00	3131.30	100.00%
SOUTH	1950	390.30	0.24	42.50	0.03	639.70	0.39	569.20	0.35	2.00	0.00	1643.70	100.00%
	1960	456.10	0.19	29.80	0.01	1040.80	0.44	823.10	0.35	0.20	0.00	2350.00	100.00%
	1970	483.50	0.16	46.60	0.02	1443.90	0.49	961.30	0.33	0.00	0.00	2935.30	100.00%
	1980	648.50	0.26	58.90	0.02	1063.20	0.42	725.80	0.29	7.60	0.00	2504.00	100.00%
CENTER-WEST	1950	100.00	0.24	17.00	0.04	191.20	0.46	106.70	0.26	0.70	0.00	415.60	100.00%
	1960	140.60	0.22	18.40	0.02	331.50	0.53	142.70	0.23	0.00	0.00	628.20	100.00%
	1970	184.90	0.22	19.10	0.02	528.50	0.64	96.20	0.12	0.00	0.00	828.70	100.00%
	1980	378.30	0.44	39.70	0.05	367.10	0.43	61.50	0.07	3.90	0.00	850.50	100.00%
BRAZIL	1950	3551.50	0.34	332.80	0.03	3714.80	0.36	2760.30	0.27	10.50	0.00	10369.90	100.00%
	1960	3218.30	0.26	230.60	0.02	5703.60	0.46	3254.90	0.26	0.90	0.00	12408.30	100.00%
	1970	3329.90	0.25	209.10	0.02	6970.10	0.53	2581.00	0.20	0.30	0.00	13090.40	100.00%
	1980	4809.60	0.38	321.60	0.03	5435.20	0.43	2030.70	0.16	63.90	0.01	12661.00	100.00%

Source: IBGE, Censos Demograficos. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.21: STRUCTURE OF AGRICULTURAL EMPLOYMENT BY REGION (Agricultural Census Data): 1970-1985

REGION	STRUCTURE	PERMANENT WAGE EARNER	PERCENTAGE (%)	TEMPORARY WAGE EARNER	PERCENTAGE (%)	SHARE CROPPER	PERCENTAGE (%)	EMPLOYERS, SELF-EMPLOYED & UNPAID FAMILY WORKERS	PERCENTAGE (%)	OTHER (a)	PERCENTAGE (%)	TOTAL	PERCENTAGE (%)
NORTH	1970	18,901.00	0.02	334,803.00	0.27	8,962.00	0.01	885,163.00	0.70	6,195.00	0.01	1,234,024.00	100.00%
	1975	24,816.00	0.02	47,501.00	0.03	2,013.00	0.00	1,333,286.00	0.94	5,031.00	0.00	1,412,647.00	100.00%
	1980	64,904.00	0.04	109,054.00	0.06	5,136.00	0.00	1,592,281.00	0.89	10,236.00	0.01	1,781,611.00	100.00%
	1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
NORTHEAST	1970	298,795.00	0.04	642,745.00	0.08	160,120.00	0.02	6,321,724.00	0.84	145,463.00	0.02	7,568,847.00	100.00%
	1975	391,191.00	0.04	557,024.00	0.08	179,859.00	0.02	7,432,915.00	0.85	78,088.00	0.01	8,738,777.00	100.00%
	1980	669,568.00	0.07	2,015,427.00	0.20	126,657.00	0.01	7,186,205.00	0.72	35,320.00	0.00	10,033,172.00	100.00%
	1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
SOUTHEAST	1970	547,831.00	0.14	520,558.00	0.13	341,909.00	0.09	2,496,092.00	0.63	53,073.00	0.01	3,959,463.00	100.00%
	1975	720,361.00	0.17	563,634.00	0.13	450,111.00	0.10	2,540,835.00	0.59	49,920.00	0.01	4,325,072.00	100.00%
	1980	883,179.00	0.22	793,822.00	0.20	269,148.00	0.07	2,048,500.00	0.51	22,988.00	0.01	3,997,637.00	100.00%
	1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
SOUTH	1970	213,516.00	0.05	199,077.00	0.05	41,587.00	0.01	3,719,624.00	0.89	17,981.00	0.00	4,191,785.00	100.00%
	1975	287,792.00	0.06	278,334.00	0.06	73,375.00	0.02	4,177,357.00	0.86	14,985.00	0.00	4,831,843.00	100.00%
	1980	340,045.00	0.08	42,023.00	0.01	68,314.00	0.02	3,612,651.00	0.89	13,084.00	0.00	4,076,127.00	100.00%
	1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
CENTER-WEST	1970	76,249.00	0.09	91,233.00	0.10	49,686.00	0.05	703,587.00	0.76	7,215.00	0.01	927,970.00	100.00%
	1975	128,955.00	0.11	150,172.00	0.12	35,837.00	0.03	890,041.00	0.73	11,921.00	0.01	1,216,926.00	100.00%
	1980	232,583.00	0.17	191,870.00	0.14	23,888.00	0.02	889,044.00	0.66	7,565.00	0.01	1,344,930.00	100.00%
	1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
BRAZIL	1970	1,155,292.00	0.07	1,488,416.00	0.08	602,264.00	0.03	14,106,190.00	0.80	229,927.00	0.01	17,582,089.00	100.00%
	1975	1,553,097.00	0.08	1,596,865.00	0.08	- 561,336.00	0.03	16,374,435.00	0.80	159,959.00	0.01	20,345,692.00	100.00%
	1980	2,170,654.00	0.10	2,767,880.00	0.13	493,143.00	0.02	15,642,855.00	0.74	89,203.00	0.00	21,163,735.00	100.00%
	1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%

(a) Includes tenants among others.

Source: IBGE, Censos Agropecuarios. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.22: STRUCTURE OF AGRICULTURAL EMPLOYMENT (CADASTRAL DATA) BY REGION: 1972-1987

REGION	STRUCTURE	PERMANENT WAGE EARNER	PERCENTAGE (%)	TEMPORARY WAGE EARNER	PERCENTAGE (%)	SHARE CROPPER	PERCENTAGE (%)	TENANT	PERCENTAGE (%)	WORKING DEPENDENTS OF OWNER	PERCENTAGE (%)	OWNER/ OCCUPANT	PERCENTAGE (%)	OTHER NON-REMUNERATED WORKERS	PERCENTAGE (%)	TOTAL	PERCENTAGE (%)
NORTH	1972	23,957	0.095	141,512	0.561	1,484	0.006	1,163	0.005	84,311	0.334					252,427	100%
	1978	31,578	0.070	181,879	0.401	939	0.002	541	0.001	105,095	0.232	91,413	0.202	41,665	0.092	453,110	100%
	1985	55,465	0.065	284,949	0.334	3,003	0.004	2,642	0.003	209,071	0.245	235,479	0.276	63,011	0.074	853,620	100%
	1987	56,596	0.064	281,674	0.317	2,874	0.003	2,586	0.003	226,709	0.255	256,938	0.289	61,801	0.069	889,257	100%
NORTHEAST	1972	254,505	0.071	2,071,922	0.576	105,143	0.029	38,808	0.007	1,126,334	0.313					3,594,712	100%
	1978	268,686	0.052	2,679,341	0.514	100,427	0.019	30,231	0.005	1,009,819	0.194	829,105	0.159	290,722	0.056	5,208,331	100%
	1985	348,859	0.056	2,727,788	0.436	120,959	0.019	45,378	0.007	1,473,337	0.236	1,206,268	0.193	331,693	0.053	6,260,382	100%
	1987	349,222	0.054	2,662,364	0.413	118,691	0.018	44,726	0.007	1,594,877	0.247	1,344,824	0.208	335,186	0.052	6,450,890	100%
SOUTHEAST	1972	427,540	0.101	2,757,158	0.651	144,768	0.034	39,469	0.009	866,412	0.205					4,235,347	100%
	1978	504,045	0.128	1,683,425	0.426	89,893	0.023	42,240	0.011	721,890	0.183	715,504	0.181	193,948	0.049	3,950,445	100%
	1985	593,923	0.136	1,566,269	0.358	124,892	0.029	53,717	0.012	939,512	0.214	861,012	0.197	240,915	0.055	4,380,240	100%
	1987	606,797	0.136	1,517,415	0.339	139,908	0.031	55,528	0 012	993,244	0.222	918,192	0.205	240,264	0.054	4,471,348	100%
SOUTH	1972	198,558	0.060	1,134,209	0.344	111,986	0.034	30,325	0.009	1,821,805	0.553					3,294,883	100%
	1978	197,619	0.052	785,629	0.205	74,010	0.019	41,790	0.011	1,655,621	0.432	968,486	0.252	113,361	0 030	3,836,516	100%
	1985	230,061	0.057	593,157	0.146	89,687	0.022	55,680	0.014	1,884,182	0.463	1,098,408	0.270	117,828	0 029	4,069,003	100%
	1987	232,549	0.057	561,568	0.137	89,953	0.022	57,064	0.014	1,915,490	0.467	1,130,679	0.276	116,749	0.028	4,104,252	100%
CENTER-WEST	1972	72,590	0.085	740,048	0.866	16,638	0.020	4,374	0.005	20,320	0.024					854,170	100%
	1978	102,505	0.105	470,185	0.483	7,570	0.008	6,648	0.007	155,216	0.159	158,654	0.163	73,030	0 075	973,808	100%
	1985	170,949	0.133	503,929	0.392	18,128	0.014	17,622	0.014	229,213	0.178	244,122	0.190	103,122	0 080	1,286,996	100%
	1987	189,747	0.143	479,119	0.361	18,958	0.014	18,652	0.014	245,586	0.185	269,597	0.203	106,029	0.080	1,327,678	100%
BRAZIL	1972	975,150	0.092	5,013,370	0.474	380,219	0.036	112,139	0.011	4,102,152	0.388					10,583,030	100%
	1978	1,104,433	0.077	5,800,459	0.402	272,839	0.019	121,550	0.008	3,648,141	0.253	2,763,162	0.192	712,726	0.049	14,423,310	100%
	1985	1,399,257	0.083	5,676,092	0.337	356,669	0.021	175,089	0.010	4,741,315	0.281	3,645,389	0.216	856,480	0.051	16,850,241	100%
	1987	1,434,901	0.083	5,502,140	0.319	370,384	0.021	179,553	0.010	4,975,985	0.289	3,920,430	0.227	860,029	0.050	17,243,422	100%

Source: Ministerio da Reforma e do Desenvolvimento Agrario (MIRAD)
Estatisticas Cadastrais Anuais, 1978, 1985 and 1987
Ministerio da Agricultura Instituto Nacional de Colonizacao e Reforma Agraria (INCRA)
Estatisticas Cadastrais, 1972.

TABLE A.2.23: STRUCTURE OF AGRICULTURAL EMPLOYMENT BY REGION (Household Survey Data): 1972-1986

REGION	STRUCTURE	WAGE EARNER	PERCENTAGE (%)	SELF-EMPLOYED	PERCENTAGE (%)	EMPLOYER	PERCENTAGE (%)	NON-RENUM. FAMILY WORKERS	PERCENTAGE (%)	TOTAL	PERCENTAGE (%)
NORTH	1972										
	1976										
	1981(a)	34,061	0.33	50,949	0.49	3,207	0.03	15,894	0.15	104,111	100.00%
	1985(a)	47,246	0.37	57,390	0.45	4,876	0.04	17,333	0.14	126,845	100.00%
	1986(a)	53,451	0.47	44,308	0.39	6,158	0.05	8,987	0.08	112,899	100.00%
NORTHEAST	1972	1,715,495	0.27	2,245,197	0.36	264,603	0.04	2,027,282	0.32	6,252,577	100.00%
	1976	1,775,632	0.28	2,562,836	0.40	109,051	0.02	1,967,131	0.31	6,414,550	100.00%
	1981	1,818,819	0.34	2,048,584	0.38	118,872	0.02	1,385,453	0.26	5,366,728	100.00%
	1985	2,396,845	0.35	2,460,530	0.36	155,179	0.02	1,854,928	0.27	6,867,482	100.00%
	1986	2,338,180	0.36	2,474,875	0.38	133,672	0.02	1,487,269	0.23	6,428,996	100.00%
SOUTHEAST	1972	1,669,138	0.45	896,668	0.24	237,172	0.06	874,124	0.24	3,677,102	100.00%
	1976	1,951,354	0.55	833,604	0.23	142,460	0.04	621,285	0.18	3,548,703	100.00%
	1981	1,924,508	0.55	685,229	0.19	176,578	0.05	730,976	0.21	3,517,289	100.00%
	1985	2,251,978	0.59	658,374	0.17	218,537	0.06	728,539	0.19	3,847,423	100.00%
	1986	2,008,436	0.56	717,617	0.20	226,212	0.06	645,993	0.18	3,596,258	100.00%
SOUTH	1972	475,988	0.12	1,180,928	0.30	158,013	0.04	2,079,964	0.53	3,894,891	100.00%
	1976	718,388	0.20	1,075,026	0.30	108,798	0.03	1,694,550	0.47	3,591,755	100.00%
	1981	729,022	0.21	1,029,778	0.30	98,815	0.03	1,616,850	0.47	3,474,460	100.00%
	1985	782,939	0.20	1,186,086	0.32	88,461	0.02	1,622,828	0.45	3,680,314	100.00%
	1986	782,728	0.24	1,062,808	0.33	80,210	0.02	1,341,471	0.41	3,267,212	100.00%
CENTER-WEST	1972(b)	1,914	0.[illegible]	2,381	0.35	525	0.08	1,906	0.28	6,726	100.00%
	1976										
	1981	367,842	0.44	288,382	0.28	[illegible] 200	0.08	166,825	0.20	837,249	100.00%
	1985	438,617	0.45	310,497	0.32	[illegible],092	0.05	165,139	0.17	967,145	100.00%
	1986	448,261	0.48	289,892	0.31	56,769	0.06	131,343	0.14	926,265	100.00%
NORTH & CENTER-WEST	1976(c)	111,576	0.46	84,769	0.35	21,929	0.09	26,284	0.11	244,508	100.00%
BRAZIL	1972	3,862,533	0.28	4,325,174	0.31	660,313	0.05	4,983,276	0.36	13,831,296	100.00%
	1976	4,551,845	0.33	4,556,235	0.33	382,236	0.03	4,309,200	0.31	13,799,516	100.00%
	1981	4,874,250	0.37	4,047,917	0.30	461,672	0.03	3,915,998	0.29	13,299,837	100.00%
	1985	5,867,520	0.38	4,617,877	0.30	520,045	0.03	4,383,767	0.28	15,389,209	100.00%
	1986	5,621,051	0.39	4,589,495	0.32	505,021	0.04	3,615,063	0.25	14,330,630	100.00%

(a) Excludes the rural population.

(b) Excludes the population of the States of Mato Grosso do Sul, Mato Grosso and Goias. Only the Federal District is included.

(c) Excludes the rural population of the North and the States of Mato Grosso do Sul, Mato Grosso and Goias. In 1976, the North and Center-West regions were considered as one region in the Household Survey.

Source: IBGE, Pesquisa Nacional por Amostra de Domicilios. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.24: AGRICULTURAL WAGES BY TYPE AND REGION: 1970-1987

REGIONS AND TYPE OF EMPLOYMENT	UNIT	1970		1971		1972		1973		1974		1975		1976		1977		1978		1979	
		1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM	1ST SEM	2ND SEM
		Cr$																			
NORTH																					
Administrator	Month	209	239	275	333	392	396	417	474	521	633	750	947	1160	1482	1956	2539	3093	3471	4211	5351
Overseer	Month	195	195	187	180	250	250	364	382	432	465	547	692	916	1131	1502	1832	2029	2501	2851	3592
Tractor Driver	Month	200	300	360	430	450	450	463	467	528	648	689	906	972	1261	1398	2446	2318	2519	2987	4301
Permanent Worker	Month	152	174	187	209	193	210	232	277	307	380	447	475	583	717	815	1022	1330	1597	1920	2499
Temporary Worker	Daily	6.51	7.05	7.59	8.00	8.92	9.49	9.72	10.95	12.98	16.41	19.37	19.72	24.96	26.69	32.29	37.24	48	63	73	90
NORTHEAST																					
Administrator	Month	186	178	191	202	227	251	290	358	437	504	620	709	827	989	1250	1603	196.	2344	2879	3925
Overseer	Month	114	125	142	159	162	181	215	251	293	331	425	479	605	700	850	1061	1307	1582	1965	2678
Tractor Driver	Month	151	168	192	211	233	257	278	313	368	410	512	596	738	842	1063	1296	1706	2007	2526	3415
Permanent Worker	Month	96	99	112	120	130	140	162	188	243	275	337	362	457	540	675	787	1015	1223	1595	2209
Temporary Worker	Daily	2.91	3.41	3.91	4.24	4.60	4.99	5.84	6.96	10.33	12.50	14.58	16.23	19.86	23.61	29.32	33.80	40	49	61	84
SOUTHEAST																					
Administrator	Month	208	249	271	300	345	358	446	510	591	716	865	1018	1218	1508	1934	2375	2843	3337	3986	5115
Overseer	Month	147	163	197	207	234	243	293	330	405	469	595	661	824	961	1337	1595	1977	2240	2765	3801
Tractor Driver	Month	165	203	212	258	264	293	328	426	442	575	615	789	841	1083	1315	1673	1887	2321	2668	3640
Permanent Worker	Month	124	148	167	179	192	214	247	283	330	378	457	512	616	781	945	1176	1470	1651	2035	2739
Temporary Worker	Daily	4.21	4.57	5.13	5.89	6.79	7.24	8.91	11.16	14.07	16.70	19.17	22.09	26.53	31.63	40.68	48.06	55	66	81	107
SOUTH																					
Administrator	Month	295	319	328	354	415	443	515	652	851	1003	1329	1544	1738	2059	2550	3135	3561	3979	4916	6159
Overseer	Month	189	215	236	254	304	328	374	456	562	668	833	892	1132	1345	1676	2027	2309	2522	3233	4118
Tractor Driver	Month	177	201	225	237	287	310	358	389	487	535	699	770	891	1048	1379	1563	1899	2052	2697	3441
Permanent Worker	Month	126	152	172	188	219	230	265	286	365	385	482	539	665	764	978	1094	1400	150.	2001	2593
Temporary Worker	Daily	5.00	5.53	6.82	7.49	8.42	9.37	11.21	12.83	17.55	19.92	23.31	26.61	31.21	36.08	45.75	52.02	57	66	80	111
CENTER-WEST																					
Administrator	Month	260	308	308	326	366	401	453	540	760	962	1272	1532	1697	1975	2446	2798	3366	4035	4920	6734
Overseer	Month	176	190	221	236	257	280	348	401	488	593	687	788	904	1163	1421	1812	2143	2405	2805	3844
Tractor Driver	Month	182	201	241	255	311	358	437	433	515	603	767	833	1009	1248	1499	1668	1938	2229	2701	3598
Permanent Worker	Month	118	131	146	154	173	194	237	267	355	376	481	569	650	788	926	1048	1258	1395	1823	2439
Temporary Worker	Daily	4.84	4.92	5.40	5.93	6.66	7.69	9.46	11.74	14.80	18.88	23.53	26.30	30.41	35.27	39.63	45.15	52	62	74	110
BRAZIL																					
Administrator	Month	212	236	254	275	315	337	399	481	595	711	893	1045	1210	1457	1822	2253	2681	3127	8309	4986
Overseer	Month	145	161	184	199	220	238	286	333	400	465	580	647	809	906	1202	1475	1760	2028	2508	3314
Tractor Driver	Month	170	200	219	248	275	304	348	405	462	555	656	776	872	1076	1343	1613	1887	2198	2674	3554
Permanent Worker	Month	117	134	152	164	180	197	228	259	316	353	432	482	586	716	879	1051	1325	1498	1901	2553
Temporary Worker	Daily	3.80	4.23	4.86	5.40	6.06	6.59	7.97	9.64	12.98	15.49	18.08	20.45	24.56	29.04	36.34	42.10	49	58	72	98

Continued on next page.

TABLE A.2.24: AGRICULTURAL WAGES BY TYPE AND REGION: 1970-1987

REGIONS AND TYPE OF EMPLOYMENT	UNIT	1980 1ST SEM	1980 2ND SEM	1981 1ST SEM	1981 2ND SEM	1982 1ST SEM	1982 2ND SEM	1983 1ST SEM	1983 2ND SEM	1984 1ST SEM	1984 2ND SEM	1985 1ST SEM	1985 2ND SEM	1986 1ST SEM	1986 2N SE	1987 1ST SEM	1987 2ND SEM
		Cr$										Cz$					
NORTH																	
Administrator	Month	6848	11684	15821	22690	31689	42117	81827	105301	190984	304766	635967	14669	2312.34	3521	5938.59	8766.73
Overseer	Month	5253	7456	10752	15373	21303	28708	43299	71188	140193	231551	439083	9117	1388.90	2462	3858 07	6223.29
Tractor Driver	Month	6231	8150	14291	23031	27660	3[illegible]493	57653	86181	164515	279333	511612	12732	1976 77	2876	3896.99	5991.61
Permanent Worker	Month	3540	5336	775[illegible]	11499	15221	20739	32253	48162	95886	170058	333481	6292	910.85	1241	2285.00	3748 19
Temporary Worker	Daily	159	201	294	412	576	771	1188	2008	4031	5987	11771	233	38.33	69	99.87	162.88
NORTHEAST																	
Administrator	Month	5625	7437	11179	15671	21996	2[illegible]244	40858	67777	130607	213281	431280	8418	1502.28	2145	3275.37	5860.64
Overseer	Month	3581	4768	7450	10582	14695	20355	29106	48496	92074	155871	310277	6029	1023.71	1395	2275 47	3961.35
Tractor Driver	Month	4522	6143	9236	13741	19826	28951	42651	66433	121543	202995	405585	8081	1300.23	1891	2750.56	5353.76
Permanent Worker	Month	3009	4034	6353	9388	13941	18748	27143	44550	83030	141218	279746	5395	798.86	993	1834.96	3401.59
Temporary Worker	Daily	124	170	261	353	468	619	901	1544	2858	4733	8945	189	30.29	44	69.91	123.35
SOUTHEAST																	
Administrator	Month	7406	10493	15128	21539	29612	42331	57520	99017	165384	310096	581405	12849	2077.35	3045	4925.07	8757.31
Overseer	Month	4978	7310	10368	14941	20131	29009	40331	69484	114310	218763	414377	8420	1324.91	1886	3274.00	5860.33
Tractor Driver	Month	4793	7156	9682	14096	19786	30262	38993	68797	104770	220069	405110	8435	1279.05	1864	2894.85	5632.57
Permanent Worker	Month	3652	5397	7313	11284	14950	22861	30590	53362	80434	169114	313316	6057	879.70	1257	2114.36	3879.89
Temporary Worker	Daily	153	216	314	414	553	783	1070	1905	3042	6590	12053	234	38.90	63	109.89	175.39
SOUTH																	
Administrator	Month	9936	18339	19724	26710	39586	56865	83129	143717	258264	444032	889324	16900	2581.42	3384	5741.08	10874.33
Overseer	Month	6205	8709	13317	18606	26056	36699	54349	91513	164987	284317	564714	10324	1635.18	2055	3713.90	6660.93
Tractor Driver	Month	5446	7362	10460	15285	21308	31655	46132	77227	145260	238740	471064	8807	1229.78	1569	2714.58	5225.22
Permanent Worker	Month	3913	5548	8321	11765	16143	23028	34117	54907	95938	169114	344534	6251	857.40	1019	2019.25	3735.72
Temporary Worker	Daily	177	256	377	522	686	1085	1521	2336	3973	7348	14532	273	42.63	62	117.08	207.06
CENTER-WEST																	
Administrator	Month	10404	12709	19031	26955	35636	45[illegible]5	75454	122801	228525	406461	783231	15578	2972.98	4555	6892.38	12246.25
Overseer	Month	5920	8142	11793	16698	21752	28885	44732	73334	140555	232511	479697	9507	1603.19	2647	3996.45	7205.66
Tractor Driver	Month	5211	7255	11105	15214	20559	27857	42726	62997	127814	214891	445494	8462	1595.19	2351	3743.90	6305.46
Permanent Worker	Month	3704	4955	7359	10725	14122	19485	29773	46703	90565	158451	325398	5861	923.22	1333	2392.24	4160.92
Temporary Worker	Daily	171	248	356	458	591	848	1297	2211	4040	7121	14336	266	49.73	67	145.02	214.05
BRAZIL																	
Administrator	Month	7486	10047	14781	20684	28811	40050	57943	97256	176108	304782	598984	11993	2020.74	2899	4631.40	8303.23
Overseer	Month	4744	6637	9896	14061	19262	26954	38943	65553	118238	207687	407717	7945	1289.66	1805	3036.53	5384.24
Tractor Driver	Month	5056	7180	10102	15068	20430	30411	42202	70967	122711	225102	433088	8560	1301.39	1809	2923.90	5551.65
Permanent Worker	Month	3541	5046	7262	10854	14706	21585	30921	50868	84851	159308	311560	5914	858.3[illegible]	1151	2046.77	3748.84
Temporary Worker	Daily	145	204	302	405	538	752	1076	1832	3177	5608	11207	222	36.43	57	95.88	159.73

Source: FGV, Precos Medios de: Arrendamentos, Vendas de Terras, Salarios, Empreitadas, Transportes. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.26: REAL AGRICULTURAL WAGES BY TYPE AND REGION: 1970-1987

(Annual Averages)

Wage Class	Year	BRAZIL		NORTH		NORTHEAST		SOUTHEAST		SOUTH		CENTER-WEST	
		Real Wage Cz$/mo.	Index	Real Wage Cz$/mo.	Index	Real Wage Cz$/mo.	Index	Real Wage Cz$/mo.	Index	Real Wage Cz$/mo.	Index	Real Wage Cz$/mo.	Index
Tractor Drivers													
	1970	1,109.72	100.00	1,458.84	100.00	926.48	100.00	1,100.86	100.00	1,226.90	100.00	1,188.89	100.00
	1971	1,143.87	103.08	1,923.81	131.92	1,025.97	110.74	1,084.94	98.60	1,236.76	100.80	1,339.09	112.63
	1972	1,212.54	109.27	1,878.26	128.79	1,000.22	107.96	1,148.62	104.39	1,283.75	104.63	1,349.20	113.48
	1973	1,315.06	118.51	1,804.44	123.73	1,083.19	116.92	1,276.67	116.02	1,392.30	113.48	1,460.86	122.88
	1974	1,371.54	123.59	1,586.06	108.69	1,061.36	114.49	1,290.17	117.25	1,381.61	112.61	1,508.79	126.91
	1975	1,604.96	135.62	1,505.68	103.25	1,189.99	128.45	1,543.33	140.26	1,637.40	133.46	1,918.46	161.37
	1976	1,435.74	129.38	1,540.86	105.62	1,161.74	125.40	1,560.69	141.83	1,565.22	127.59	1,161.26	97.68
	1977	1,537.72	138.57	1,966.91	134.87	1,220.38	131.73	1,700.00	154.49	1,656.68	135.03	1,630.81	137.17
	1978	1,528.82	137.82	1,989.45	136.42	1,300.08	140.33	1,709.41	155.35	1,588.82	129.46	1,872.89	157.53
	1979	1,452.06	130.85	1,886.02	129.33	1,321.58	142.65	1,602.81	145.66	1,521.65	124.02	1,470.97	123.73
	1980	1,388.93	124.98	1,643.59	112.70	1,214.25	131.07	1,347.68	122.47	1,458.96	118.91	1,415.81	119.09
	1981	1,380.53	124.40	2,153.86	147.66	1,240.46	133.90	1,447.81	131.58	1,464.08	119.33	1,456.78	122.53
	1982	1,402.69	126.40	1,834.26	125.78	1,347.56	145.46	1,377.85	125.22	1,461.31	119.11	1,345.20	113.15
	1983	1,141.45	102.86	1,615.96	110.81	1,112.59	120.09	1,079.67	98.12	1,245.04	101.48	1,087.00	91.43
	1984	1,080.83	97.40	1,396.27	95.68	1,022.74	110.40	989.56	89.93	1,213.05	98.87	1,078.91	90.75
	1985	1,206.74	108.74	1,612.69	110.58	1,134.71	122.48	1,159.35	105.36	1,276.52	104.04	1,218.19	102.46
	1986	1,482.68	129.10	2,231.38	153.01	1,380.74	149.04	1,445.20	131.34	1,292.81	105.37	1,813.80	152.56
	1987												
Permanent Workers													
	1970	628.89	100.00	928.78	100.00	518.89	100.00	629.17	100.00	801.48	100.00	764.83	100.00
	1971	662.02	105.27	978.51	105.38	540.03	104.11	675.28	107.33	852.31	106.34	741.02	96.89
	1972	682.83	108.58	914.68	99.01	552.18	106.46	696.56	110.71	905.79	113.01	767.51	100.35
	1973	794.80	126.30	1,028.78	111.87	610.47	117.69	825.66	131.23	975.53	121.72	872.89	114.13
	1974	904.00	143.75	925.75	100.21	699.71	134.90	956.05	151.95	1,015.02	126.64	989.20	129.34
	1975	959.50	152.57	1,022.93	110.73	730.72	140.88	1,008.42	160.28	1,073.03	133.88	1,113.23	145.55
	1976	952.00	151.38	935.89	101.31	702.74	135.48	1,012.37	160.91	1,057.75	131.97	1,070.28	139.94
	1977	984.43	156.53	1,062.88	115.06	712.81	137.43	1,070.49	170.14	1,091.47	136.18	1,042.37	136.29
	1978	1,042.94	165.84	1,202.62	130.18	763.67	147.23	1,137.85	180.85	1,093.84	126.48	991.43	129.63
	1979	1,037.97	165.05	1,190.33	128.85	814.47	157.02	1,115.06	177.23	1,092.14	136.27	980.42	129.50
	1980	972.98	154.71	1,001.10	108.37	802.94	154.80	1,023.01	162.60	1,072.56	133.82	987.39	129.10
	1981	993.17	157.92	1,098.78	118.73	843.64	162.65	1,032.34	164.08	1,110.54	138.56	1,004.27	131.31
	1982	1,002.23	159.36	998.70	108.11	889.10	171.41	1,040.98	165.45	1,084.09	135.26	932.46	121.92
	1983	819.17	130.26	825.26	89.34	725.66	139.90	842.28	133.87	903.67	112.75	779.20	101.88
	1984	756.12	120.23	830.59	89.91	704.76	135.87	760.21	119.24	828.55	103.38	779.03	101.86
	1985	350.66	135.26	907.82	98.27	769.86	148.42	863.32	137.22	920.03	114.79	865.87	113.21
	1986	928.47	147.32	1,031.71	111.68	828.57	159.74	983.04	156.24	869.13	108.44	1,037.59	135.66
	1987												
		Cz$/day		Cz$/day		Cz$/day		Cz$/day		Cz$/day		Cz$/day	
Temporary Workers													
	1970	21.47	100.00	41.15	100.00	18.39	100.00	23.49	100.00	32.11	100.00	29.35	100.00
	1971	22.55	105.03	38.13	92.66	19.38	105.38	23.70	100.89	33.90	105.57	29.45	100.34
	1972	23.87	108.85	38.44	93.41	20.00	108.75	25.13	106.98	34.71	108.10	32.66	111.98
	1973	27.90	129.95	39.94	97.06	22.84	124.20	30.26	128.82	39.38	122.64	38.05	129.84
	1974	38.41	178.90	39.56	96.14	30.76	167.37	41.51	176.71	50.61	157.61	45.35	154.51
	1975	39.82	183.14	43.35	105.35	33.64	182.93	43.06	183.31	52.10	162.25	54.64	186.85
	1976	38.85	180.95	40.68	98.86	31.84	173.14	43.50	185.19	49.11	152.94	50.07	170.60
	1977	39.47	183.84	41.25	100.24	32.10	174.55	46.54	198.13	48.62	151.42	45.28	154.28
	1978	39.89	183.47	53.20	129.28	32.65	177.54	45.92	195.49	47.75	148.71	43.35	147.70
	1979	39.40	183.51	47.22	114.75	33.16	180.82	44.17	188.04	46.84	145.87	43.81	149.27
	1980	39.60	184.44	41.29	100.34	33.44	181.64	41.85	178.16	48.99	152.57	47.40	161.50
	1981	39.12	182.21	44.19	107.39	34.07	185.26	39.99	170.24	49.69	154.75	46.22	157.48
	1982	35.75	166.51	37.46	91.03	30.26	164.55	37.00	157.51	47.43	147.71	39.81	135.64
	1983	29.28	136.38	32.22	78.30	24.60	133.77	29.76	126.69	39.42	122.77	35.31	120.31
	1984	27.46	127.90	32.14	78.10	23.95	130.23	27.07	115.24	35.14	109.44	34.89	118.88
	1985	31.30	145.78	32.88	79.90	25.80	140.29	33.38	141.89	39.54	123.14	38.73	131.96
	1986	42.95	200.05	49.17	119.49	34.44	187.28	47.06	200.34	48.50	151.04	62.78	213.90
	1987												

Source: Real wages were obtained by adjusting the nominal wages shown in Table A.2.24 by the FGV general price index (IGP-DI). The June and December values of the IGP-DI (with base March 1986) were used to adjust the first and second semester nominal values, respectively.

TABLE A.2.28: SIZE DISTRIBUTION OF FARMS AND TOTAL FARM AREA BY REGION: 1970-1985

REGION	YEAR	FARMS							TOTAL FARM AREA							AVERAGE FARM SIZE (ha)
		FARM SIZE (HA)						TOTAL a/ (000)	FARM SIZE (HA)						TOTAL a/ (000)	
		0-10	10-20	20-50	50-100	100-1000	Above 1000		0-10	10-20	20-50	50-100	100-1000	Above 1000		
		%							%							
NORTH																
	1970	41.1	12.2	20.3	8.5	15.1	0.9	261	1.6	1.8	6.6	6.6	35.2	47.7	23,182	88.8
	1975	44.6	12.5	19.5	8.0	14.5	0.9	337	1.7	1.7	5.8	8.0	26.1	57.9	32,615	96.8
	1980	35.8	13.4	21.1	12.1	16.1	1.4	408	1.4	1.7	6.0	8.4	29.9	52.6	41,559	101.9
	1985	33.1	12.8	21.7	15.4	15.9	0.9	500	1.4	1.9	7.3	11.4	30.2	47.8	44,884	89.8
NORTHEAST																
	1970	67.9	9.8	10.5	5.1	5.7	0.4	2,207	5.2	4.0	9.6	10.4	43.2	27.2	74,298	33.7
	1975	69.9	9.2	10.[illegible]	4.9	5.6	0.4	2,851	5.5	3.8	9.2	10.1	42.2	29.2	78,690	33.5
	1980	67.6				5.8	0.6	2,448	5.1	3.7	9.2	10.0	40.3	31.6	88,442	36.1
	1985	70.5	9.0	9.9	4.9	5.1	0.4	2,818	5.4	3.7	9.3	10.1	39.3	32.1	91,987	32.6
SOUTHEAST																
	1970	33.4	17.7	22.7	11.8	13.5	0.8	929	2.2	3.4	9.8	11.2	46.7	26.5	69,501	74.8
	1975	31.6	17.0	22.9	12.4	15.0	1.0	879	1.9	3.0	9.0	10.7	47.4	28.1	72,463	82.4
	1980	32.6	17.[illegible]	22.4	12	14.7	1.0	891	1.9	3.0	8.8	10.3	46.5	29.5	73,503	82.5
	1985	35.9	17.0	21.4	11.2	13.4	1.2	999	2.2	3.3	9.3	10.7	46.7	27.7	73,815	73.7
SOUTH																
	1970	42.3	25.7	21.9	5.3	4.4	0.4	1,274	6.1	9.9	18.2	10.1	32.2	23.4	45,458	35.7
	1975	39.8	25.6	22.8	6.0	5.1	0.5	1,157	5.1	8.7	16.8	10.1	33.1	26.9	47,172	40.8
	1980	39.4	25.8	22.6	6.1	5.5	0.5	1,146	4.7	8.6	16.2	10.0	35.3	25.1	47,912	41.8
	1985	42.0	25.1	21.1	5.8	5.4	0.5	1,202	5.0	8.6	15.6	9.8	35.9	25.0	48,718	40.5
CENTER-WEST																
	1970	25.1	10.8	19.6	12.1	26.8	5.3	258	0.8	0.4	2.0	2.7	26.1	68.3	81,705	322.9
	1975	26.5	10.8	17.2	12.0	28.2	5.8	269	0.2	0.4	1.6	2.5	25.7	69.8	93,958	349.3
	1980	20.6	9.3	17.1	13.1	32.5	7.1	268	0.2	0.3	1.4	2.3	24.3	71.5	113,436	423.3
	1985	22.5	9.3	15.9	13.1	30.7	6.7	316	0.3	0.4	1.6	2.6	25.9	69.3	117,086	370.5
BRAZIL																
	1970	51.3	15.6	16.7	6.9	8.4	0.7	4,924	3.1	3.6	8.6	8.1	37.0	39.5	294,145	59.7
	1975	52.1	14.7	16.3	7.1	8.9	0.9	4,993	2.8	3.2	7.8	7.6	35.8	42.8	323,896	64.9
	1980	50.3	14.9	16.5	7.6	9.5	0.9	5,160	2.4	2.9	7.2	7.5	34.8	45.1	364,854	70.7
	1985	52.9	14.0	15.6	7.5	8.9	0.9	5,835	2.7	3.0	7.5	8.0	35.0	43.8	376,287	64.5

a/ Includes undeclared.

Source: IBGE, Censos Agropecuarios. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.27: AGRICULTURAL LAND PRICES BY TYPE AND REGION: 1970-1987

REGIONS AND TYPES OF EMPLOYMENT	1970			1971			1972			1973			1974			1975			1976			1977			1978			1979		
	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG
	Cr$/ha																													
NORTH																														
Cultivated	400	400	400	450	450	450	395	388	389	298	392	345	439	630	534	780	684	632	907	1,158	1,033	1,544	2,946	2,245	2,505	3,108	2,807	3,218	4,200	3,759
Fields	200	200	200	284	300	292	294	300	297	224	218	221	231	236	234	231	846	289	899	543	471	564	493	529	65[illegible]	951	804	963	1,202	1,083
Pastures	450	450	450	488	400	434	389	483	436	407	612	510	661	974	818	907	1,081	1,039	1,109	1,173	1,141	1,242	1,939	1,591	2,157	2,592	2,375	2,846	4,046	3,446
Forest	250	250	250	227	250	239	163	165	164	124	151	138	185	186	186	250	223	237	296	386	341	500	453	482	755	859	812	1,145	1,585	1,366
NORTHEAST																														
Cultivated	281	276	279	299	306	303	338	377	358	424	564	494	736	1,016	877	1,294	1,556	1,426	1,962	2,216	2,239	3,137	4,070	3,604	4,569	5,048	4,807	6,367	8,990	7,679
Fields	126	132	129	179	181	180	167	198	183	237	309	273	416	591	505	698	783	741	930	1,299	1,115	1,640	1,970	1,805	2,273	2,719	2,496	3,159	4,122	3,641
Pastures	267	288	277	324	342	333	341	390	366	452	653	553	826	1,078	952	1,356	1,712	1,534	1,906	2,347	2,127	2,699	3,548	3,124	3,914	4,475	4,195	5,320	8,912	8,116
Forest	187	199	193	224	237	231	284	292	288	288	395	342	467	610	539	727	845	786	1,065	1,472	1,269	1,908	2,007	1,958	2,190	2,670	2,430	3,188	3,947	3,568
SOUTHEAST																														
Cultivated	764	883	824	1,010	1,159	1,085	1,476	1,825	1,651	3,010	4,187	3,599	5,178	6,042	5,610	7,678	9,013	8,346	10,539	13,329	11,934	16,469	18,364	17,417	22,480	24,105	23,293	31,381	40,289	35,825
Fields	248	269	256	309	340	325	445	545	495	914	1,337	1,126	1,790	2,088	1,939	2,848	3,110	2,979	3,845	4,504	4,175	5,843	6,411	6,027	8,311	9,687	8,999	12,274	15,489	13,882
Pastures	438	495	467	577	645	611	807	994	901	1,544	2,121	1,833	3,029	3,659	3,344	4,671	5,329	5,000	6,350	7,537	6,944	9,067	10,036	9,552	12,453	14,497	13,475	18,106	23,204	20,655
Forest	664	779	722	867	992	930	1,184	1,455	1,320	2,341	3,252	2,797	4,141	4,888	4,515	6,034	7,208	6,621	9,157	10,542	9,850	12,949	14,857	13,903	16,538	18,055	17,297	24,049	30,929	27,489
SOUTH																														
Cultivated	600	715	658	815	901	858	1,135	1,274	1,205	1,978	3,116	2,547	4,831	5,588	5,210	6,501	7,887	7,194	9,419	12,042	10,731	16,095	17,232	16,664	19,253	21,116	20,185	25,820	34,148	29,984
Fields	314	385	350	490	534	512	628	770	699	1,185	1,775	1,480	2,859	3,504	3,182	4,371	5,014	4,693	5,875	6,848	6,362	8,303	9,285	8,794	12,529	15,687	14,108	20,564	32,544	26,554
Pastures	388	490	439	672	705	689	1,001	1,099	1,050	1,369	2,001	1,685	3,361	3,927	3,644	4,734	5,463	5,099	6,539	7,940	7,240	10,025	10,538	10,282	11,744	13,917	12,831	16,448	22,048	19,248
Forest	405	499	452	555	670	612	793	905	849	1,163	1,746	1,455	2,625	3,397	3,011	4,421	4,591	4,506	5,427	7,257	6,342	9,048	10,690	9,869	12,270	13,913	13,092	16,459	20,981	18,720
CENTER-WEST																														
Cultivated	344	389	367	427	460	444	582	766	674	1,201	1,470	1,336	2,072	2,788	2,430	2,921	3,709	3,315	4,185	4,422	4,304	5,084	5,825	5,455	6,571	8,100	7,336	10,858	15,642	13,200
Fields	75	91	83	105	123	114	142	168	154	294	446	370	654	973	814	1,124	1,196	1,160	1,391	1,565	1,478	2,101	2,360	2,231	2,502	3,162	2,832	4,168	5,906	5,037
Pastures	239	277	258	353	408	380	487	597	532	788	1,055	921	1,798	2,273	2,036	2,581	2,800	2,691	3,127	3,443	3,285	4,108	4,706	4,407	5,438	6,482	5,959	8,256	11,613	9,935
Forest	185	204	195	253	288	271	315	426	371	661	881	761	1,047	1,403	1,225	1,602	1,815	1,709	2,177	2,401	2,289	2,788	3,487	3,113	3,945	4,635	4,290	5,628	8,158	6,893
BRAZIL																														
Cultivated	535	610	573	691	768	730	958	1,182	1,045	1,740	2,519	2,130	3,468	4,105	3,787	4,972	5,953	5,463	7,001	8,911	7,956	11,241	12,507	11,874	14,513	15,839	15,178	20,020	26,398	23,209
Fields	170	196	183	237	250	249	311	377	344	599	879	739	1,267	1,597	1,432	2,025	2,240	2,133	2,680	3,149	2,915	3,907	4,424	4,166	5,149	6,239	5,694	7,880	10,375	9,128
Pastures	326	377	352	464	512	488	629	758	694	1,086	1,437	1,237	2,213	2,707	2,460	3,289	3,733	3,511	4,349	5,100	4,725	6,097	6,833	6,465	8,045	9,392	8,719	11,600	15,464	13,542
Forest	302	343	323	386	440	413	489	589	539	785	1,007	896	1,320	1,643	1,482	1,997	2,284	2,141	2,822	3,414	3,118	4,079	4,720	4,400	5,239	5,991	5,615	7,450	9,813	8,632

Continued on next page.

TABLE A.2.27: AGRICULTURAL LAND PRICES BY TYPE AND REGION: 1970-1987

REGIONS AND TYPES OF EMPLOYMENT	1980			1981			1982			1983			1984			1985			1986			1987		
	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG	1ST SEM	2ND SEM	AVG
	Cr$/ha															Cz$/ha								
NORTH																								
Cultivated	5,936	6,555	7,246	13,766	16,706	16,236	34,228	36,171	20,772	64,262	94,073	79,178	192,741	370,558	281,647	661	1,605	1,233	5,530	6,011	4,771	6,066	12,606	10,448
Fields	2,129	3,203	2,556	4,411	6,670	5,541	9,266	6,716	6,491	14,445	29,405	21,925	68,693	182,670	100,682	151	239	195	680	4,415	2,547	5,297	5,789	5,543
Pastures	1,4[illegible]	9,187	5,303	12,742	18,523	15,633	26,760	32,399	29,579	77,162	80,004	78,583	162,216	298,895	229,556	610	1,215	913	2,483	4,388	3,436	8,900	10,974	9,937
Forest	2,5[illegible]	3,571	3,044	5,956	7,451	6,704	8,977	11,627	10,302	20,901	34,851	27,876	84,594	125,282	89,938	210	434	322	1,296	2,238	1,767	3,897	8,696	5,297
NORTHEAST																								
Cultivated	13,457	18,187	15,822	32,361	50,859	41,610	69,738	93,374	81,556	93,374	134,490	113,932	334,339	559,707	447,023	1,166	2,420	1,793	6,498	11,109	8,804	17,852	26,351	22,112
Fields	6,111	8,473	7,292	13,433	18,871	16,152	25,937	34,844	30,391	49,526	76,413	63,970	131,381	226,577	178,979	546	1,221	884	3,133	5,483	4,308	7,694	13,166	10,540
Pastures	10,535	14,063	12,300	22,920	32,309	27,819	42,499	58,779	49,639	61,744	123,345	102,545	222,780	421,584	322,232	947	2,015	1,481	5,019	9,483	6,751	13,013	20,096	15,555
Forest	5,627	7,934	6,781	12,654	16,570	15,712	24,656	32,556	28,606	46,288	72,449	59,369	131,180	241,209	186,195	536	1,130	833	2,595	4,664	3,730	7,366	11,014	9,190
SOUTHEAST																								
Cultivated	60,849	85,689	73,269	129,025	173,411	155,218	246,555	302,071	274,313	428,875	630,407	529,641	1,332,205	2,817,549	2,074,877	5,509	10,809	8,159	27,020	52,746	39,883	63,201	92,862	77,781
Fields	24,135	35,694	29,915	57,479	[illegible]	68,289	97,401	115,300	106,351	192,855	247,658	220,262	509,441	1,109,137	809,289	2,268	4,698	3,483	11,854	24,026	17,940	29,194	42,630	35,912
Pastures	35,228	50,816	42,922	79,606	100,[illegible]	90 [illegible]	133,575	165,550	149,617	249,620	365,447	307,534	799,766	1,712,604	1,251,295	3,424	6,611	5,018	16,686	33,518	25,102	40,898	57,504	49,244
Forest	48,044	68,542	55,793	105,016	132,035	118,526	188,617	237,698	213,158	338,471	492,550	415,511	998,143	2,244,692	1,621,518	4,209	8,262	6,235	20,277	40,463	30,370	53,058	74,210	63,634
SOUTH																								
Cultivated	55,901	78,589	68,245	136,331	177,968	157,150	256,932	360,378	308,655	527,706	911,372	719,539	1,631,068	3,316,289	2,584,677	6,875	13,139	10,007	28,131	41,768	33,450	54,198	90,982	72,590
Fields	32,544	45,540	39,042	73,987	95,729	84,858	136,204	185,267	160,736	269,690	429,990	349,835	825,551	1,555,198	1,190,425	3,105	5,445	4,275	16,054	30,474	23,264	37,810	54,126	45,968
Pastures	36,663	53,369	45,026	81,923	115,888	98,905	169,627	216,918	193,273	332,545	577,402	454,974	987,540	1,920,917	1,454,229	3,508	6,490	4,999	12,246	21,107	16,677	31,653	53,142	43,397
Forest	32,479	47,219	39,848	60,760	111,658	86,208	164,142	225,659	194,901	314,685	513,885	414,285	953,105	1,609,013	1,326,059	3,479	7,380	5,430	17,117	27,755	22,436	38,448	57,688	47,068
CENTER-WEST																								
Cultivated	28,480	39,879	33,180	62,589	84,406	73,398	106,759	141,552	124,156	184,321	322,176	253,249	620,965	1,628,662	1,224,814	5,206	5,789	4,498	13,958	26,814	20,136	33,757	59,622	36,690
Fields	9,632	15,047	12,340	24,597	33,685	29,091	44,571	59,105	51,338	76,019	122,558	99,288	287,170	622,249	454,710	1,214	2,381	1,798	5,534	10,257	7,895	13,662	19,879	16,271
Pastures	19,591	27,627	23,609	42,169	57,177	49,673	74,681	102,493	88,577	128,439	211,140	169,790	499,488	1,044,085	771,787	2,190	4,059	3,129	9,190	17,335	13,263	23,558	39,927	26,748
Forest	12,955	19,106	16,031	29,094	42,978	36,036	55,363	73,186	64,275	88,109	147,963	118,046	316,062	682,721	499,402	1,450	2,552	2,001	6,489	11,154	8,822	15,989	21,301	16,645
BRAZIL																								
Cultivated	41,437	57,621	49,529	99,096	128,611	113,354	182,547	242,497	212,517	349,089	555,647	452,353	1,141,045	2,168,461	1,653,753	4,386	8,505	6,445	18,630	33,986	26,408	43,428	68,718	55,073
Fields	16,235	23,989	20,112	38,545	51,016	44,781	69,480	87,213	77,847	130,986	193,209	162,098	395,915	[illegible]15,363	605,639	1,634	3,217	2,426	7,470	14,668	11,168	18,599	28,660	22,730
Pastures	24,707	35,180	29,944	54,384	72,595	63,490	98,073	126,948	112,511	162,732	288,116	235,424	593,390	1,229,123	911,257	2,488	4,698	3,592	10,865	20,623	15,744	27,348	39,234	33,290
Forest	14,631	21,453	18,142	34,507	48,577	40,892	64,833	89,778	77,305	123,653	195,005	159,429	550,587	742,349	546,468	1,471	3,096	2,283	6,779	12,350	9,564	17,060	26,691	20,676

Source: FGV, Preços Médios de: Arrendamentos, Vendas de Terras, Salários, Empréstimos, Transportes. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.28: REAL AGRICULTURAL LAND PRICES BY TYPE AND REGION: 1970-1987

TYPE	YEAR	NORTH	NORTHEAST	SOUTHEAST	SOUTH	CENTER-WEST	BRAZIL
		Real Price (Cz$/ha)					
CULTIVATED	1970	2,352.94	1,647.06	4,823.53	3,882.35	2,176.47	3,352.94
	1971	2,250.00	1,500.00	5,400.00	4,300.00	2,200.00	3,650.00
	1972	1,695.65	1,565.22	7,173.91	5,217.39	2,913.04	4,565.22
	1973	1,295.80	1,514.81	13,333.33	9,444.44	4,982.96	7,888.89
	1974	1,514.29	2,514.29	16,028.57	14,685.71	6,942.86	10,828.57
	1975	1,844.44	4,085.71	23,857.14	15,977.78	7,377.78	12,133.33
	1976	1,656.13	3,612.90	19,241.94	17,306.45	8,935.48	12,638.71
	1977	2,528.09	4,044.94	19,573.03	18,719.10	6,123.60	13,337.08
	1978	2,263.31	3,676.61	18,784.27	16,277.82	5,919.35	12,241.94
	1979	1,968.59	4,020.94	18,759.16	15,696.34	6,910.99	12,151.63
	1980	1,298.43	3,026.18	13,505.24	13,780.10	8,685.86	12,965.97
	1981	2,024.94	5,188.28	19,478.80	19,594.76	9,152.12	14,133.42
	1982	1,324.62	5,201.53	17,494.26	19,684.95	7,918.37	13,553.57
	1983	1,984.46	2,855.39	13,274.19	18,033.58	6,847.12	11,337.09
	1984	2,201.42	3,493.98	16,217.60	20,202.28	9,573.32	12,925.98
	1985	2,960.46	4,305.03	19,598.71	24,026.99	10,798.58	15,475.76
	1986	4,728.35	8,725.18	39,527.32	33,151.38	19,956.18	26,172.37
	1987	3,187.95	6,746.77	28,732.80	22,148.62	11,194.81	16,804.11
FIELDS	1970	1,176.47	764.71	1,529.41	2,058.82	470.59	1,058.82
	1971	1,450.00	900.00	1,600.00	2,550.00	550.00	1,250.00
	1972	1,304.35	782.61	2,173.91	3,043.48	652.17	1,478.26
	1973	914.81	100.00	4,185.19	5,481.43	1,370.37	2,740.74
	1974	657.14	1,428.57	5,542.86	9,085.71	2,324.29	4,091.43
	1975	644.44	1,544.44	6,622.22	10,422.22	2,577.78	4,733.33
	1976	759.68	1,797.58	6,733.06	10,260.48	2,387.10	4,693.55
	1977	595.51	2,033.71	6,775.28	9,676.40	2,505.62	4,685.39
	1978	648.39	2,012.90	7,257.26	11,377.42	2,292.26	4,588.71
	1979	565.45	1,905.78	7,267.02	13,900.52	2,638.74	4,780.10
	1980	687.70	2,217.28	9,342.93	11,921.47	3,939.79	6,280.10
	1981	690.77	2,013.72	826.56	10,579.80	3,627.16	5,583.54
	1982	541.45	1,938.14	6,782.53	10,251.28	3,274.23	4,964.92
	1983	549.62	1,603.26	5,520.30	8,767.92	2,489.72	4,062.66
	1984	788.93	1,398.94	6,325.54	9,804.52	3,554.09	4,733.78
	1985	468.20	2,121.30	8,362.75	10,264.35	4,291.82	5,823.67
	1986	2,524.68	4,269.34	17,760.38	23,056.40	7,824.58	11,068.33
	1987	1,691.29	3,215.98	10,988.18	14,025.89	4,984.62	6,935.38
PASTURES	1970	2,647.06	1,647.06	2,941.18	2,882.35	1,647.06	2,235.29
	1971	2,150.00	1,650.00	3,050.00	3,450.00	1,900.00	2,450.00
	1972	1,913.04	1,608.70	3,913.04	4,565.22	2,304.35	3,000.00
	1973	1,888.89	2,037.04	7,956.52	6,259.26	3,407.41	4,592.59
	1974	2,342.86	2,714.29	9,542.86	10,400.00	5,815.71	7,028.57
	1975	2,311.11	3,400.00	11,111.11	13,333.33	5,977.78	7,800.00
	1976	1,840.32	3,429.84	11,199.19	11,676.61	5,306.45	7,612.90
	1977	1,786.52	3,505.62	10,741.57	11,550.56	4,955.06	7,269.66
	1978	1,914.92	3,382.65	10,866.94	10,347.18	4,808.45	7,032.26
	1979	1,806.28	3,204.19	10,816.75	10,078.53	5,198.95	7,089.01
	1980	1,091.62	2,497.38	12,921.47	11,109.95	6,180.63	7,837.70
	1981	1,948.68	3,443.69	11,249.38	12,881.67	6,194.51	7,916.46
	1982	1,886.48	3,165.82	9,542.09	12,382.27	5,649.23	7,175.38
	1983	1,989.42	2,570.18	7,707.52	11,402.76	4,255.39	5,900.25
	1984	1,794.28	2,518.60	9,780.37	11,386.50	6,032.44	7,122.56
	1985	2,192.13	3,555.91	12,047.11	12,002.69	7,512.79	8,600.45
	1986	4,405.03	6,690.63	24,877.78	18,528.06	13,144.29	15,603.93
	1987	2,726.88	5,051.15	15,025.57	13,241.50	8,161.29	10,157.57
FOREST	1970	1,470.59	1,117.65	4,235.29	2,647.06	1,117.65	1,882.35
	1971	1,200.00	1,150.00	4,650.00	3,050.00	1,350.00	2,050.00
	1972	695.65	1,043.48	5,739.13	3,695.65	1,608.70	2,347.83
	1973	518.52	1,259.26	10,370.37	5,370.37	2,814.81	3,333.33
	1974	542.86	1,542.86	12,685.71	8,600.00	3,500.00	4,232.86
	1975	533.33	1,755.56	14,711.11	10,022.22	3,900.00	4,755.56
	1976	550.00	2,045.97	15,686.29	10,229.03	3,693.55	5,032.26
	1977	539.33	2,202.25	15,617.98	11,089.89	3,494.38	4,943.82
	1978	654.84	1,959.68	13,943.79	10,557.66	3,540.32	4,532.26
	1979	717.28	1,869.11	14,392.67	9,601.05	3,607.33	4,518.32
	1980	795.81	1,774.87	14,604.71	10,431.94	4,196.34	4,748.69
	1981	835.41	1,958.85	14,779.30	11,996.26	4,493.77	5,061.10
	1982	656.89	1,824.62	13,594.39	12,429.85	4,098.85	4,929.85
	1983	698.75	1,487.97	10,418.78	10,385.71	2,958.65	3,995.74
	1984	702.20	1,455.29	12,674.07	10,364.70	3,903.39	4,271.30
	1985	773.13	2,000.05	14,971.55	13,036.33	4,804.44	5,481.52
	1986	1,750.96	3,696.29	30,099.28	22,232.73	8,743.15	9,479.03
	1987	1,646.83	2,804.02	19,416.18	14,361.48	5,688.90	6,369.70

Source: Derived from Table A.2.27 by applying the general price index.

TABLE A.2.29: POTENTIAL AND ACTUAL AGRICULTURAL LAND USE BY REGION: 1950-1985

(Hectares)

REGION	YEAR	TOTAL TERRITORY	POTENTIAL AGRIC. LAND	TOTAL FARM AREA	UTILIZED FARM LAND	UNUTILIZED PROD. FARM AREA	CROP AREA		PASTURES		TREES	
							PERMANENT	TEMPORARY	NATURAL	PLANTED	NATURAL	PLANTED
NORTH	1950	355,400,200	231,779,682	23,107,947	2,683,595	2,053,974	62,049	172,463	2,344,566	87,846	17,732,008	16,671
	1960	355,400,200	231,779,682	23,453,086	2,710,562	3,005,435	103,397	328,905	2,039,109	180,640	17,058,988	58,711
	1970	355,400,200	231,779,682	23,182,144	5,090,509	3,415,189	132,366	484,785	3,790,845	637,771	13,880,500	45,262
	1975	355,400,200	231,779,682	32,615,983	6,564,796	2,928,167	239,015	956,354	3,708,446	1,572,994	21,505,502	87,987
	1980	355,400,200	231,779,682	42,546,027	9,682,077	2,900,417	555,227	1,208,287	3,951,742	3,770,740	26,047,033	196,081
	1985	355,400,200	231,779,682	44,884,352			669,778	1,350,255				
NORTHEAST	1950	154,224,600	120,079,003	58,341,458	22,497,358	15,351,020	785,482	4,488,322	14,084,067	2,891,777	14,902,518	247,710
	1960	154,224,600	120,079,003	62,990,438	30,952,142	12,564,450	2,264,592	6,463,108	17,657,561	3,991,347	14,817,067	575,534
	1970	154,224,600	120,079,003	74,297,115	38,298,260	15,319,342	3,977,906	6,344,956	22,123,666	5,751,143	16,425,502	100,489
	1975	154,224,600	120,079,003	78,688,942	41,686,998	15,328,270	3,960,167	7,073,088	23,780,661	6,842,093	17,461,426	31,038
	1980	154,224,600	120,079,003	89,553,512	48,580,071	12,298,012	4,848,503	9,433,809	23,812,613	10,345,773	19,611,402	139,373
	1985	154,224,600	120,079,003	91,986,500			4,237,139	10,189,741				
SOUTHEAST	1950	91,880,800	73,423,874	61,736,592	42,423,304	7,549,179	2,841,484	5,606,419	25,028,166	8,481,635	7,197,364	467,600
	1960	91,880,800	73,423,874	64,438,763	48,675,043	4,592,366	3,332,785	6,709,506	28,680,652	9,435,149	6,981,938	717,001
	1970	91,880,800	73,423,874	69,500,951	55,245,306	3,894,773	2,172,974	7,439,490	34,105,976	10,683,300	6,652,194	893,626
	1975	91,880,800	73,423,874	72,463,938	59,273,639	3,171,152	2,596,435	7,835,135	35,717,641	11,559,143	6,457,194	1,565,485
	1980	91,880,800	73,423,874	73,973,814	58,385,001	2,059,979	3,555,478	8,568,727	27,453,621	16,185,643	8,001,125	2,626,532
	1985	91,880,800	73,423,874	73,614,725			3,748,927	9,823,333				
SOUTH	1950	56,207,100	44,466,784	35,420,380	23,525,159	5,021,215	640,009	3,889,568	18,006,436	685,895	5,479,097	302,252
	1960	56,207,100	44,466,784	38,993,290	26,891,005	4,066,631	1,910,788	6,233,299	16,850,626	1,376,291	6,644,648	520,001
	1970	56,207,100	44,466,784	45,458,036	33,220,306	4,498,761	1,557,248	9,471,207	17,976,092	3,636,589	5,714,457	579,260
	1975	56,207,100	44,466,784	46,172,094	35,099,320	2,856,831	1,401,227	11,590,231	16,722,082	4,437,675	4,992,112	948,105
	1980	56,207,100	44,466,784	48,184,988	37,314,962	1,210,131	1,209,150	13,330,968	15,678,715	5,634,741	4,999,605	1,461,388
	1985	56,207,100	44,466,784	48,713,065			891,258	13,735,288				
CENTER-WEST	1950	187,935,600	149,245,167	53,604,728	36,663,480	4,380,025	72,413	535,859	33,174,333	2,787,200	9,368,105	93,575
	1960	187,935,600	149,245,167	59,986,565	43,407,628	3,894,943	185,976	1,179,903	36,981,819	4,868,815	10,127,296	191,115
	1970	187,935,600	149,245,167	61,705,625	57,925,763	6,282,073	143,570	2,259,357	46,409,654	9,073,494	13,550,298	39,488
	1975	187,935,600	149,245,167	93,953,559	65,891,630	6,354,687	188,544	4,161,181	46,020,761	15,289,459	17,441,390	231,685
	1980	187,935,600	149,245,167	115,327,931	74,839,196	6,332,718	328,949	6,151,194	43,000,344	24,665,373	24,492,805	592,326
	1985	187,935,600	149,245,167	117,086,322			288,204	7,446,413				
BRAZIL	1950	845,648,300	618,994,510	232,211,105	127,792,896	34,283,413	4,402,426	14,692,631	92,635,568	14,934,353	54,679,092	1,127,918
	1960	845,648,300	618,994,510	249,862,142	152,836,580	28,143,625	7,797,488	20,914,721	102,209,767	19,852,242	55,529,937	2,062,362
	1970	845,648,300	618,994,510	294,143,871	189,780,234	33,410,088	4,984,064	25,999,715	124,405,933	29,732,297	56,222,951	1,658,225
	1975	845,648,300	618,994,510	323,894,536	208,516,578	30,637,107	8,385,388	31,615,939	125,949,591	39,701,360	67,857,624	2,864,300
	1980	845,648,300	618,994,510	369,586,272	228,700,297	24,796,257	10,497,307	38,887,985	113,897,035	60,602,270	83,151,970	5,015,700
	1985	845,648,300	618,994,510	376,284,964			9,835,301	42,545,025				

Note: Utilized farm land includes crop land, pastures and planted forests.

Source: IBGE, Censos Agropecuarios. The census also provides the same data by state.
Estimates of potential agricultural land are from EMBRAPA.

TABLE A.2.30: AGRICULTURAL LAND USE SHARES BY REGION: 1950-1985

(%)

REGION	YEAR	SHARE OF UTILIZED FARM LAND			UTILIZED FARM LAND - TOTAL FARM AREA	TOTAL FARM AREA - POTENTIAL AGRICULTURAL LAND	UTILIZED LAND - POT AGRICULTUR
		Crops	Pastures	Planted Forests			
NORTH	1950	8.7	90.6	0.7	11.6	10.0	1.2
	1960	15.9	81.9	2.2	11.6	10.1	1.1
	1970	12.1	87.0	0.9	22.0	10.0	2.2
	1975	18.2	80.5	1.3	20.1	14.1	1.4
	1980	18.2	79.8	2.0	22.8	18.4	1.2
	1985					19.4	0.0
NORTHEAST	1950	23.4	75.5	1.1	38.6	48.6	0.8
	1960	28.2	69.9	1.9	49.1	52.5	0.9
	1970	27.0	72.8	0.2	51.5	61.9	0.8
	1975	26.5	73.5	0.0	53.0	65.5	0.8
	1980	29.4	70.3	0.3	54.2	74.6	0.7
	1985					76.6	0.0
SOUTHEAST	1950	19.9	79.0	1.1	68.7	84.1	0.8
	1960	20.5	78.0	1.5	75.8	87.8	0.9
	1970	17.4	81.0	1.6	79.5	94.7	0.8
	1975	17.6	79.8	2.6	81.8	98.7	0.8
	1980	20.8	74.7	4.5	78.9	100.7	0.8
	1985					100.3	0.0
SOUTH	1950	19.3	79.5	1.2	68.4	79.7	0.8
	1960	30.3	67.8	1.9	69.0	87.7	0.8
	1970	33.2	65.1	1.7	73.1	102.2	0.7
	1975	37.0	60.3	2.7	76.0	103.8	0.7
	1980	39.0	57.1	3.9	77.4	108.4	0.7
	1985					109.5	0.0
CENTER-WEST	1950	1.7	98.1	0.2	68.4	35.9	1.9
	1960	3.1	96.4	0.5	72.4	40.2	1.8
	1970	4.1	95.8	0.1	70.9	54.7	1.3
	1975	6.6	93.0	0.4	70.1	63.0	1.1
	1980	8.7	90.4	0.9	64.8	77.3	0.8
	1985					78.5	0.0
BRAZIL	1950	14.9	84.2	0.9	55.0	37.5	1.5
	1960	18.8	79.9	1.3	61.2	40.4	1.5
	1970	16.3	81.2	2.5	64.5	47.5	1.4
	1975	19.2	79.4	1.4	64.4	52.3	1.2
	1980	21 5	76.3	2.2	61.9	59.7	1.0
	1985					60.8	0.0

Source: Derived from Table A.2.28.

TABLE A.2.31: AGRICULTURAL FACTOR PROPORTIONS BY REGION: 1950-1985

REGION	YEAR	TRACTORS PER 1000 HA OF CULTIVATED LAND	TRACTORS PER 1000 PERSONS EMPLOYED		PERSONS EMPLOYED PER 1000 HA OF CULTIVATED LAND	
			Agr. Census	Dem. Census	Agr. Census	Dem. Census
NORTH	1950	0.26	0.19	0.15	1392.00	1728.00
	1960	0.99	0.79	0.83	1258.00	1198.00
	1970	0.77	1.15	1.92	1586.00	949.00
	1980	2.11	3.53	8.12	1022.00	440.00
	1985	1.43	2.73		1104.00	
NORTHEAST	1950	0.08	0.10	0.11	822.00	788.00
	1960	0.36	0.47	0.63	763.00	567.00
	1970	0.70	0.96	1.39	733.00	508.00
	1980	2.12	4.08	7.04	658.00	378.00
	1985	2.55	3.69		719.00	
SOUTHEAST	1950	0.61	1.30	1.37	478.00	444.00
	1960	3.51	7.81	8.62	449.00	394.00
	1970	8.58	20.84	23.47	412.00	366.00
	1980	16.72	48.97	64.69	356.00	258.00
	1985	17.43	49.91		349.00	
SOUTH	1950	0.57	1.32	1.56	430.00	363.00
	1960	2.63	6.72	9.13	392.00	289.00
	1970	5.86	15.56	22.01	376.00	266.00
	1980	16.15	53.49	93.81	302.00	172.00
	1985	19.23	63.03		305.00	
CENTER-WEST	1950	0.23	0.36	0.33	634.00	682.00
	1960	1.61	3.19	3.49	504.00	460.00
	1970	4.30	11.14	12.47	386.00	345.00
	1980	9.78	47.13	74.53	208.00	131.00
	1985	11.61	61.30		189.00	
BRAZIL	1950	0.44	0.76	0.81	576.00	543.00
	1960	2.16	3.97	4.94	544.00	432.00
	1970	4.88	9.43	12.67	518.00	385.00
	1980	11.10	25.76	43.06	431.00	257.00
	1985	12.45	28.02		444.00	

Source: Derived from data in Censos Agropecuarios. Employment data from the Demographic Census are given in Table A.1.25.

TABLE A.2.82: PRODUCTION, DOMESTIC SALES AND TRADE IN WHEEL TRACTORS: 1950-1986

(number of units)

Year	Production	Imports	Domestic Sales	Exports
1950	--	8,375	8,375	--
1951	--	10,967	10,967	--
1952	--	7,368	7,368	--
1953	--	2,124	2,154	--
1954	--	12,258	12,258	--
1955	--	5,345	5,345	--
1956	--	4,117	4,117	--
1957	--	6,810	6,810	--
1958	--	7,135	7,135	--
1959	--	4,597	4,597	--
1960	30	12,702	12,721	--
1961	1,679	6,382	8,027	--
1962	7,586	1,714	9,050	--
1963	9,908	1,330	10,698	1
1964	11,537	1,841	13,373	2
1965	8,121	374	8,446	--
1966	9,069	639	9,653	6
1967	6,223	342	5,816	31
1968	9,671	990	10,158	7
1969	9,547	248	9,907	7
1970	14,048	60	14,236	41
1971	22,122	184	21,844	104
1972	30,207	228	29,932	188
1973	39,232	258	39,712	366
1974	46,848	347	46,342	895
1975	59,166	801	58,732	649
1976	65,827	191	68,967	472
1977	52,966	89	48,607	4,584
1978	48,675	--	41,619	6,184
1979	55,247	--	49,523	7,263
1980	58,812	--	50,994	7,748
1981	39,341	--	28,104	10,073
1982	30,346	--	24,662	6,239
1983	22,663	--	22,546	1,895
1984	45,842	--	41,952	3,299
1985	43,914	--	41,243	2,294
1986	51,559	--	46,388	5,456

Note: Includes four-wheel drive vehicles for both agricultural and non-agricultural use.

Source: Claudio Contador and Leo Ferreira, Insumos Modernos na Agricultura Brasileira, Internal Discussion Paper (Rio de Janeiro: INPES/IPEA, No. 65, 1984). Data after 1984 is from SINFAVEA.

TABLE A.2.33: PRIVATE INVESTMENT IN AGRICULTURE BY REGION: 1970-1985

(Cr$'000)

	LAND ACQUISITION	HOUSES	INSTALLATIONS	NEW PASTURES		SEEDLINGS	BREEDING STOCK AND DRAFT POWER	MACHINES AND INSTRUMENTS		VEHICLES		TOTAL
								New	Used	New	Used	
NORTH												
1970	5,264	9,509	38,996		9,049		16,917		4,910	8,016	2,456	95,117
75	48,745	74,610	224,915	152,987		68,035	154,895	43,541	4,169	35,833	11,707	829,637
80	1,401,644	1,623,765	2,192,202	3,037,426		464,868	4,306,138	855,190	158,079	713,503	431,777	15,182,598
85												
NORTHEAST												
1970	51,646	72,253	223,139		42,647		110,765		23,283	23,851	11,390	558,973
75	436,042	463,673	1,396,830	502,324		6,514	1,091,943	360,034	16,150	262,364	53,502	4,589,375
80	7,244,216	9,294,840	20,297,084	7,452,789		1,240,148	25,805,861	4,547,599	678,412	3,179,833	1,516,861	81,256,329
85												
SOUTHEAST												
1970	348,170	153,122	289,241		226,422		322,035		195,041	135,653	59,952	1,729,636
75	1,931,535	890,156	2,028,761	1,004,783		673,852	1,540,478	1,511,576	103,131	712,658	188,974	10,583,914
80	28,249,642	16,198,611	21,263,551	11,425,223		57,772,987	68,013,764	14,129,172	2,717,022	7,847,278	2,857,269	230,474,525
85												
SOUTH												
1970	357,886	159,465	208,384		109,409		193,887		379,325	117,962	68,668	1,594,486
75	2,102,491	900,168	1,413,716	203,408		343,494	923,042	3,080,074	190,617	785,884	301,937	10,244,830
80	29,026,202	13,880,969	16,490,738	1,675,165		30,026,220	39,784,618	15,863,720	3,670,260	5,146,038	3,099,034	181,562,970
85												
CENTER-WEST												
1970	118,604	43,014	96,179		10,627		112,172		33,678	36,532	18,935	469,742
75	1,278,228	385,825	938,789	122,245		116,643	1,209,139	844,851	79,427	221,526	68,016	5,263,889
80	24,615,867	8,316,754	12,423,723	1,331,656		21,448,458	39,029,593	8,484,833	2,088,742	3,394,064	1,453,147	120,585,873
85												
BRAZIL												
1970	881,569	437,864	855,938		398,154		755,277		636,237	322,014	161,401	4,447,953
75	5,797,041	2,714,132	6,008,010	1,985,746		1,208,548	4,929,496	5,839,775	393,494	2,018,266	622,137	31,511,645
80	90,537,593	47,014,942	72,867,280	24,912,261		83,952,893	176,938,980	43,880,516	9,510,516	20,280,716	9,357,790	579,063,296
85												

Source: Censos Agropecuarios. The breakdown of the regional data by state is also available from the same source.

TABLE A.2.34: COMPOSITION OF AGRICULTURAL EXPORTS (Quantities): 1951-1987

(tons)

	PRODUTOS	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
	A. PRIMARY	2,124,264	1,707,144	1,[illegible]782	1,761,672	2,194,866	1,939,720	1,933,137	2,264,111	2,410,783	2,648,621	3,171,328	2,554,922
1.	Raw sugar	--	[illegible]3,001	202,417	160,133	418,293	14,536	346,770	639,995	483,190	599,984	787,722	439,606
2.	Rice	118,121	162,268	2,787	--	2,483	101,444	329	51,552	9,815	434	150,763	43,678
3.	Raw cotton	143,412	28,130	139,515	309,486	175,706	142,931	66,180	40,197	77,594	95,398	205,676	215,915
4.	Cotton	24,371	32,206	53,285	25,073	23,358	11,459	6,497	2,653	1,841	13,734	10,441	19,072
5.	Bulk peanuts	3,256	1,035	252	13	18,172	893	121	2,056	654	--	4,626	21,912
6.	Bananas	190,265	213,771	178,711	239,224	210,722	188,062	218,489	271,444	213,079	241,944	245,946	216,543
7.	Cocoa almonds	96,125	58,[illegible]42	108,690	120,970	121,923	125,835	109,677	104,018	79,577	125,458	104,170	55,340
8.	Bulk coffee	981,481	949,261	933,732	655,051	821,747	1,008,288	859,152	772,950	1,046,148	1,009,141	1,018,233	982,565
9.	Shrimp	--	--	--	--	--	--	--	7	19	--	100	3
10.	Bovine meat, fresh, refrig. or frozen	4,894	1,972	1,615	--	1,004	8,571	28,491	33,252	23,431	5,993	14,731	12,951
11.	Horse meat, fresh, refrigerated or frozen	--	--	--	--	--	--	--	--	--	--	--	27
12.	Cashewnuts	22	30	--	28	29	36	56	101	88	755	421	673
13.	Brazilnuts	24,820	13,063	22,332	23,243	25,389	30,710	30,559	29,135	15,887	26,394	36,252	23,050
14.	Tea	282	209	533	282	310	229	395	413	798	755	1,176	1,440
15.	Raw bovine livestock hide	52,396	18,848	31,063	21,296	14,986	13,092	14,092	19,388	38,999	21,203	8,498	4,625
16.	Livestock hide (except raw bovine)	1,732	1,535	2,761	1,486	1,991	2,856	2,761	3,878	3,829	3,387	3,832	3,619
17.	Mate herb	50,054	44,566	34,631	49,851	52,404	58,042	55,044	56,602	55,296	56,129	60,946	47,558
18.	Peanut chaff	--	3,321	--	--	--	--	--	--	38,962	58,787	112,857	83,678
19.	Cotton seed chaff	24,717	--	--	--	15,956	5,638	--	--	17,635	30,425	33,001	4,499
20.	Soy meal	--	--	--	--	--	--	--	--	--	--	--	--
21.	Fruits (except 6, 12, 13)	--	--	--	--	--	--	--	--	--	--	--	--
22.	Tobacco	28,893	30,144	22,835	27,409	27,425	30,392	28,259	30,025	28,050	31,268	48,211	41,066
23.	Wool (except string)	772	--	9,977	4,387	5,122	5,624	4,249	1,391	5,794	68	15	--
24.	Lobster	--	--	--	--	40	165	348	432	616	1,197	1,740	2,070
25.	Orange	43,728	48,185	24,990	31,528	45,980	42,868	45,844	72,948	111,430	111,409	112,567	104,426
26.	Bulk corn	295,248	28,416	7	11,622	80,094	--	--	--	--	9,927	4,448	6
27.	Squeezed citrus pulp	--	--	--	--	--	--	--	--	--	--	--	--
28.	Bulk chiles	--	--	--	50	--	75	533	612	2,502	1,919	2,934	2,762
29.	Raw sisal	--	--	22,332	55,201	80,342	106,503	99,894	97,148	113,481	107,914	128,655	137,087
30.	Soybeans	39,675	28,941	26,117	25,344	31,390	41,483	17,399	33,914	42,070	--	73,267	96,771
31.	Edible and non-edible molasses	--	--	--	--	--	--	--	--	--	--	--	--
32.	Frozen fish	--	--	--	--	--	--	--	--	--	--	--	--
33.	Poultry	--	--	--	--	--	--	--	--	--	--	--	--
34.	Corn meal	--	--	--	--	--	--	--	--	--	--	--	--
35.	Residual vegetable oils (exc. 18, 19 and 20)	--	--	--	--	--	--	--	--	--	--	--	--
	B. SEMI-PROCESSED	225,649	107,680	709,428	599,470	989,842	532,910	1,080,271	944,022	764,452	785,057	864,995	667,374
1.	Crystalized sugar	--	--	51,854	1,699	154,963	4,180	77,[illegible]92	118,187	132,876	69,056	570	5,619
2.	Carnaubaira wax	9,579	7,196	7,375	9,211	12,466	12,003	11,976	11,077	9,805	11,080	10,403	9,478
3.	Cut pine wood	--	--	553,188	478,919	668,902	385,799	814,135	641,440	403,000	531,915	854,896	474,115
4.	Cut wood (except pine)	146,178	69,629	55,406	84,213	112,853	88,913	105,950	65,532	67,704	73,574	71,961	71,031
5.	Cocoa butter	6,561	3,860	9,216	3,881	5,991	11,906	14,897	14,617	17,944	22,606	14,990	16,784
6.	Tanned and prepared skins and hides	943	291	505	368	380	424	465	201	1,023	1,363	1,168	947
7.	Raw peanut oil	836	--	--	--	--	--	--	--	--	--	--	222
8.	Cotton oil	--	--	--	--	--	--	--	--	--	--	--	--
9.	Castor oil	29,571	19,958	26,749	15,676	24,816	20,092	48,114	35,318	47,719	41,856	92,635	60,785
10.	Soy oil	--	--	--	--	--	--	--	--	--	--	--	--
11.	Vegetable oils (exc. 7, 8, 9 and 10)	31,981	6,746	5,135	5,503	9,471	9,643	7,598	8,868	7,615	10.297	15,430	24,009
12.	Pulp for paper	--	--	--	--	--	--	--	--	--	280	2,942	4,383
13.	Cocoa liquor or pulp	--	--	--	--	--	--	--	--	--	--	--	--
14.	Other cocoa products, breads (exc. 5 and 13)	--	--	--	--	--	--	--	--	--	--	--	--
	C PROCESSED	4,532	1,945	1,005	381	3,820	2,993	3,788	14,291	38,383	11,515	15,329	13,558
1.	Refined sugar	--	--	--	--	--	--	--	--	--	--	--	--
2.	Ethyl Alcohol	--	--	--	--	--	--	--	--	--	--	--	--
3.	Processed coffee		--	--	--	--	--	4	49	195	2	11	12
4.	Processed wool	4,430	1,549	797	84	3,470	2,516	2,810	11,339	36,195	8,619	13,505	11,272
5.	Sisal twine, rope and cable	--	--	--	--	--	--	--	--	--	--	--	--
6.	Sweet meat and extract	102	109	58	58	90	166	63	329	832	342	458	356
7.	Cotton fiber	--	--	--	--	74	1	321	1,851	241	752	268	79
8.	Silk thread	--	--	--	--	--	--	--	--	--	--	--	--
9.	Menthol	--	--	146	172	165	231	287	430	371	345	623	926
10.	Palm cabbage preserves	--	--	-	--	--	--	--	--	--	--	--	--
11	Refined or purified castor oil	--	--	--	--	--	--	--	--	--	--	--	--
12.	Refined or purified soybean oil	--	--	--	--	--	--	--	--	--	--	--	--
13.	Orange juice	--	--	--	30	--	--	--	--	--	--	1	235
14.	Fruit and vegetable juices (exc. 13)	--	--	--	40	13	27	14	3	9	--	13	246
15.	Woven cotton products	--	287	4	--	8	52	289	790	540	1,445	450	432
	TOTAL	2,354,445	1,816,769	2,529,215	2,361,526	3,188,528	2,475,623	3,017,196	3,222,424	3,213,618	3,445,193	4,051,652	3,235,854

Continued on next page.

TABLE A.2.34: COMPOSITION OF AGRICULTURAL EXPORTS (Quantities): 1951-1987

(tons)

PRODUTOS	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
A. PRIMARY	3,539,724	2,413,398	3,675,558	4,516,257	4,225,309	5,267,782	5,540,409	6,551,227	6,760,792	7,902,452	8,950,764	10,407,441
1. Raw sugar	461,379	252,073	709,849	1,004,549	1,001,311	1,026,245	1,099,008	1,125,223	1,190,563	2,054,454	2,353,573	1,767,392
2. Rice	--	12,425	236,788	289,252	21,882	158,176	70,178	95,051	148,830	1,898	33,432	56,783
3. Raw cotton	221,804	217,028	195,610	235,867	189,867	247,551	439,380	342,834	226,809	284,201	282,867	83,160
4. Cotton	15,358	26,531	14,621	8,794	8,392	21,865	43,556	48,656	30,043	16,276	6,978	4,971
5. Bulk peanuts	14,871	103	18,437	13,727	15,639	10,043	30,841	53,473	35,667	55,924	54,285	52,989
6. Bananas	205,900	225,541	215,746	204,811	170,905	160,123	162,775	204,247	176,325	114,189	138,493	156,019
7. Cocoa almonds	68,684	74,710	91,966	112,498	114,351	75,814	119,574	119,768	119,072	102,256	82,774	129,865
8. Bulk coffee	11,170,784	896,774	808,931	1,009,909	1,004,250	1,107,465	1,121,375	982,629	1,034,266	1,050,156	1,071,377	683,784
9. Shrimp	[illegible]	147	685	449	725	1,657	3,206	3,057	4,391	6,703	2,622	2,437
10. Bovine meat, fresh, refrig. or frozen	12,580	19,004	35,825	20,792	11,577	39,247	77,564	98,309	88,741	155,627	98,530	19,174
11. Horse meat, fresh, refrigerated or frozen	25	2,215	3,479	5,352	8,066	12,586	18,644	19,583	27,175	37,536	51,528	42,357
12. Cashewnuts	1,125	1,219	790	1,857	1,586	3,446	5,205	6,608	4,286	7,171	5,998	7,622
13. Brazilnuts	25,193	24,185	19,911	30,323	19,979	36,172	24,115	32,267	24,192	37,579	33,848	20,664
14. Tea	1,310	1,759	2,107	2,477	3,038	3,034	2,807	3,966	5,330	4,247	5,281	3,844
15. Raw bovine livestock hide	4,534	14,366	37,357	14,989	15,515	15,053	60,123	35,715	22,216	22,606	2,503	--
16. Livestock hide (except raw bovine)	3,829	3,787	5,805	7,234	6,111	6,017	8,055	6,797	7,225	[illegible],615	5,134	--
17. Mate herb	48,427	48,414	41,763	35,421	24,290	25,212	27,714	25,830	30,066	1 .862	18,195	17,825
18. Peanut chaff	107,837	27,964	121,792	154,580	148,394	102,814	135,390	201,174	201,123	169,963	80,380	74,827
19. Cotton seed chaff	33,389	25,641	900	26,043	27,435	78,342	171,894	151,505	132,163	155,921	103,988	86,229
20. Soy meal	62,014	43,821	105,058	184,949	125,359	234,530	295,366	525,365	911,407	1,405,329	1,581,493	2,030,942
21. Fruits (except 6, 12, 13)	--	116,948	185,676	103,524	111,491	97,948	81,444	67,563	81,876	76,876	53,045	55,943
22. Tobacco	43,913	59,793	55,035	45,638	44,851	38,525	47,721	53,539	60,181	63,218	63,599	91,451
23. Wool (except string)	2,883	18,479	14,318	21,727	20,914	19,413	22,640	18,314	19,963	14,376	17,792	17,996
24. Lobster	1,778	1,578	1,181	1,124	977	1,683	2,474	2,794	2,514	2,630	2,549	3,069
25. Orange	143,623	96,963	159,045	79,341	89,922	72,538	56,952	51,101	64,111	66,633	--	--
26. Bulk corn	699,904	62,313	559,675	620,800	430,444	1,237,966	649,640	1,470,619	1,279,696	172,074	41,010	1,108,713
27. Squeezed citrus pulp	--	--	--	--	--	--	--	--	--	--	--	--
28. Bulk chiles	2,377	4,045	7,396	7,396	6,378	9,727	14,503	9,018	17,326	14,298	13,761	15,490
29. Raw sisal	129,995	135,570	150,246	152,611	127,830	146,146	144,419	148,803	147,481	152,124	160,241	139,013
30. Soybeans	33,448	--	75,266	121,241	304,543	65,859	310,147	289,623	213,426	1,037,273	1,786,139	2,730,426
31. Edible and non-edible molasses	22,750	--	--	--	172,069	212,805	293,699	357,736	454,308	587,437	799,349	1,004,456
32. Frozen fish	--	--	--	--	--	--	--	--	--	--	--	--
33. Poultry	--	--	--	--	--	--	--	--	--	--	--	--
34. Corn meal	--	--	--	--	--	--	--	--	--	--	--	--
35. Residual vegetable oils (exc. 18, 19 and 20)	--	--	--	--	--	--	--	--	--	--	--	--
B. SEMI-PROCESSED	726,820	862,066	1,071,679	1,007,159	885,176	1,130,613	1,051,329	1,029 743	1,051,152	1,479,411	1,510,844	1,231,285
1. Crystalized sugar	62,006	1	50,130	--	--	--	--	1,000	70,660	480,456	444,353	487,096
2. Carnaubeira wax	11,277	11,088	12,121	13,591	10,888	13,269	13,426	13,604	12,717	12,572	14,150	8,705
3. Cut pine wood	461,919	614,115	675,330	711,801	603,281	766,530	590,675	543,695	583,011	432,173	303,195	134,759
4. Cut wood (except pine)	77,100	86,474	101,659	118,030	135,623	174,350	178,780	189,742	117,240	156,608	266,386	221,458
5. Cocoa butter	14,041	10,330	17,196	21,016	20,960	18,435	16,012	19,155	21,131	27,333	24,234	28,771
6. Tanned and prepared skins and hides	247	774	4,671	6,310	5,898	4,167	7,648	6,845	5,576	11,381	8,386	7,452
7. Raw peanut oil	8,419	--	--	--	7,791	--	2,165	31,679	57,522	77,189	44,331	31,592
8. Cotton oil	--	--	--	--	--	--	--	--	--	--	--	--
9. Castor oil	77,350	111.014	140,152	95,043	74,648	116,335	184,288	153,485	134,946	127,182	131,683	155,793
10. Soy oil	--	--	--	--	--	--	--	--	--	600	61,408	2,277
11. Vegetable oils (exc. 7, 8, 9 and 10)	13,748	143,841	24,421	17,946	15,264	25,609	31,639	30,935	15,000	13,220	18,540	19,582
12. Pulp for paper	713	13,889	45,999	23,422	11,323	11,918	26,696	39,583	33,349	140,697	194,178	133,800
13. Cocoa liquor or pulp	--	--	--	--	--	--	--	--	--	--	--	--
14. Other cocoa products, breads (exc. 5 and 13)	--	--	--	--	--	--	--	--	--	--	--	--
C. PROCESSED	20,435	21,669	40,927	55,587	64,705	93,746	92,377	123,313	239,053	366,316	341,721	380,610
1. Refined sugar	--	--	--	--	--	--	--	--	--	1	22,027	102,243
2. Ethyl Alcohol	--	--	--	--	--	--	--	--	--	--	--	--
3. Processed coffee	48	123	682	3,974	11,433	11,538	18,459	20,625	23,251	34,254	39,236	37,123
4. Processed meat	6,658	7,400	16,812	10,509	6,540	14,535	15,241	16,552	34,313	36,144	35,801	34,6[illegible]
5. Sisal twine, rope and cable	--	--	--	--	--	--	--	--	--	9,587	28,887	37,238
6. Sweet meat and extract	275	313	647	567	263	573	719	594	860	1,140	1,130	1,191
7. Cotton fiber	45	607	3,862	[illegible],596	2,971	1,847	3,070	5,944	6,541	19,237	29,508	28,326
8. Silk thread	--	--	--	--	--	--	--	--	--	375	477	627
9. Menthol	1,353	1,012	725	873	1,282	1,399	1,528	1,378	1,565	2,226	2,938	1,684
10. Palm cabbage preserves	--	1,802	2,030	2,380	3,643	2,424	3,156	2,371	7,177	7,364	--	--
11. Refined or purified castor oil	--	--	--	--	--	--	--	--	--	--	--	--
12. Refined or purified soybean oil	--	--	--	--	--	--	--	--	--	59,443	29,452	12
13. Orange juice	5,314	3,825	5,760	13,929	18,647	30,096	23,245	33,468	77,334	87,156	120,990	108,460
14. Fruit and vegetable juices (exc. 13)	5,324	3,856	6,015	14,134	16,981	30,526	23,910	34,203	79,138	91,028	6,128	9,075
15. Woven cotton products	1,420	2,731	4,394	1,625	945	808	3,049	7,978	8,874	18,361	25,267	19,806
TOTAL	4,286,979	3,297,133	4,988,164	5,579,003	5,175,190	4,692,141	6,684,115	7,704,283	9,050,997	9,748,179	10,803,329	12,019,336

Continued on next page.

TABLE A.2.34: COMPOSITION OF AGRICULTURAL EXPORTS (Quantities): 1951-1987

(tons)

	PRODUTOS	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
	A. PRIMARY	11,461,051	12,465,763	13,644,049	9,872,530	9,526,718	13,029,153	15,398,458	12,344,638	15,979,650	14,560,335	16,985,399	11,039,307
1.	Raw sugar	1,285,119	600,794	1,536,151	1,164,016	1,282,872	1,391,530	1,563,519	1,152,577	1,575,012	1,544,681	1,047,871	873,643
2.	Rice	2,601	76,350	409,108	184,622	337	--	--	--	--	--	--	--
3.	Raw cotton	107,202	5,579	34,732	44,515	308	--	--	--	180,179	32,273	86,574	36,598
4.	Cotton	1,296	1,887	1,494	--	--	--	--	--	--	--	--	--
5.	Bulk peanuts	59,167	25,252	30,942	17,331	24,468	32,376	30,365	17,369	--	--	--	--
6.	Bananas	147,445	92,149	111,652	132,538	128,492	67,328	66,694	59,178	--	--	--	--
7.	Cocoa almonds	176,628	128,888	107,62'	134,074	156,932	123,580	125,228	143,462	152,778	107,186	172,246	134,474
8.	Bulk coffee	781,990	805,367	512,391	621,301	562,196	784,465	825,443	867,378	939,603	1,031,851	1,033,611	539,899
9.	Shrimp	1,683	1,785	3,110	4,925	7,172	7,498	8,836	9,156	8,984	12,270	15,971	12,316
10.	Bovine meat, fresh, refrig. or frozen	5,333	11,544	31,246	9,612	2,659	5,726	46,899	94,441	120,297	115,096	140,662	--
11.	Horse meat, fresh, refrigerated or frozen	39,762	38,657	29,200	34,846	29,046	24,503	23,417	16,410	13,910	15,368	14,400	7,238
12.	Cashewnuts	11,421	9,265	7,806	11,193	11,898	14,551	15,528	17,256	19,316	14,771	24,988	21,467
13.	Brazilnuts	34,280	23,293	21,292	20,921	29,106	22,436	16,610	18,105	21,962	19,664	24,915	19,900
14.	Tea	4,390	5,430	4,992	7,702	7,203	7,780	7,830	286	--	--	--	--
15.	Raw bovine livestock hide	--	--	--	--	--	--	--	--	12,883	1,295	1,047	--
16.	Livestock hide (except raw bovine)	--	--	--	--	--	--	--	--	--	--	--	--
17.	Mate herb	20,807	24,543	23,129	25,150	26,558	25,678	24,328	23,768	22,321	20,062	22,256	12,975
18.	Peanut chaff	35,573	87,964	4,747,590	52,745	86,121	101,469	46,421	41,454	--	--	--	--
19.	Cotton seed chaff	19,103	3,475	21,707	22,650	30,417	--	--	--	169,434	114,357	161,309	55,220
20.	Soy meal	3,133,581	4,373,867	5,353,663	5,418,999	5,170,808	6,581,925	8,884,373	7,641,005	8,492,849	7,587,025	8,588,020	6,542,234
21.	Fruits (except 6, 12, 13)	82,859	45,499	46,067	62,628	122,354	--	--	--	--	--	--	--
22.	Tobacco	98,158	101,161	101,213	109,524	126,325	128,396	131,690	144,926	155,258	160,908	159,544	149,878
23.	Wool (except string)	27,529	16,662	16,633	18,727	15,586	12,603	14,599	10,284	13,410	--	--	--
24.	Lobster	2,499	2,353	2,797	3,181	3,744	2,541	2,759	2,759	1,585	2,842	2,285	1,448
25.	Orange	--	--	--	--	--	82,239	59,680	70,059	--	--	--	--
26.	Bulk corn	1,147,941	1,371,733	1,420,037	14,732	9,917	--	--	--	765,929	178,245	419	251
27.	Squeezed citrus pulp	--	--	--	--	--	621,845	741,543	819,668	827,370	860,874	998,146	653,483
28.	Bulk chiles	17,944	202,410	17,710	29,957	25,186	31,964	46,682	46,172	30,378	37,154	25,312	21,998
29.	Raw sisal	51,956	108,936	124,409	89,777	87,147	97,044	65,698	33,405	90,586	82,440	82,928	68,762
30.	Soybeans	3,333,334	3,639,497	2,586,866	658,527	638,466	1,549,883	1,449,731	500,804	1,295,095	1,561,110	3,491,476	1,200,151
31.	Edible and non-edible molasses	681,500	843,643	1,041,048	778,200	670,556	831,033	620,143	18,766	386,230	371,125	200,736	374,340
32.	Frozen fish	--	--	--	10,580	8,052	22,835	32,730	30,862	36,192	20,455	33,425	27,598
33.	Poultry	--	--	--	50,805	61,096	168,713	293,933	295,551	289,301	280,284	278,655	--
34.	Corn meal	--	--	--	138,552	181,696	56,795	2,500	1	--	--	--	--
35.	Residual vegetable oils (exc. 18, 19 and 20)	--	--	--	--	--	233,418	249,584	449,584	359,793	388,799	368,603	287,238
	B. SEMI-PROCESSED	1,169,454	1,333,392	1,346,351	1,449,241	1,755,950	1,907,993	1,790,581	1,189,501	926,062	1,349,482	1,219,211	884,028
1.	Crystalized sugar	279,469	205,634	293,481	183,400	110,783	568,922	221,689	397,665	145,820	302,788	308,059	303,837
2.	Carnaubeira wax	7,320	9,223	8,588	10,246	10,862	9,668	10,089	8,460	10,433	10,006	9,417	10,636
3.	Cut pine wood	165,375	62,476	61,425	66,924	78,704	73,920	50,153	36,633	--	--	--	--
4.	Cut wood (except pine)	129,810	178,892	193,422	107,914	57,666	135,713	94,205	94,986	143,426	101,271	140,203	193,065
5.	Cocoa butter	21,564	21,676	19,319	19,117	21,167	26,751	29,032	30,454	32,096	35,808	42,734	43,578
6.	Tanned and prepared skins and hides	9,850	14,786	16,946	20,087	21,569	12,611	20,441	30,518	43,374	31,724	36,310	23,193
7.	Raw peanut oil	37,323	92,822	47,801	59,879	81,265	120,137	42,027	36,474	46,364	13,755	56,431	7,176
8.	Cotton oil	--	--	--	--	--	43,113	64,693	28,807	68,800	--	--	--
9.	Castor oil	91,453	140,895	100,268	140,725	140,339	92,637	54,492	15,159	--	--	--	--
10.	Soy oil	283,183	452,88?	487,225	487,824	524,528	731,052	1,107,622	509,325	354,370	803,028	521,276	218,115
11.	Vegetable oils (exc. 7, 8, 9 and 10)	10,705	13,345	23,246	15,784	37,605	--	--	--	--	--	--	--
12.	Pulp for paper	153,392	140,604	94,630	267,931	212,540	--	--	--	--	--	--	--
13.	Cocoa liquor or pulp	--	--	--	47,606	67,562	68,060	72,505	36,544	52,290	66,845	68,601	50,565
14.	Other cocoa products, breads (exc. 5 and 13)	--	--	--	21,604	21,360	24,609	23,633	25,844	29,089	34,257	86,156	33,565
	C. PROCESSED	565,519	846,519	1,108,970	1,222,090	1,032,810	1,658,617	2,274,928	2,485,422	2,781,203	3,139,252	2,802,528	2,594,224
1.	Refined sugar	216,186	360,706	624,954	614,100	435,573	611,684	915,635	1,035,541	782,642	1,211,590	1,192,104	1,153,959
2.	Ethyl Alcohol	--	--	--	--	--	308,205	133,155	245,734	256,512	367,688	199,656	200,863
3.	Processed coffee	31,378	43,602	31,765	43,953	52,952	41,1?'	48,115	51,042	46,563	49,309	47,639	46,206
4.	Processed meat	42,173	64,033	68,179	53,498	45,778	72,286	98,108	102,713	128,863	141,190	130,274	--
5.	Sisal twine, rope and cable	21,147	60,377	73,037	70,451	96,200	76,570	81,078	56,661	67,304	118,243	105,094	82,221
6.	Sweet meat and extract	528	1,463	2,555	1,391	911	--	--	--	3,124	3,445	3,169	2,686
7.	Cotton fiber	41,933	40,964	52,644	52,931	55,499	57,380	72,204	64,894	81,823	87,649	65,114	47,785
8.	Silk thread	1,004	999	852	798	721	848	968	815	1,031	1,249	1,231	1,117
9.	Menthol	859	1,298	1,270	1,212	629	--	--	--	--	--	--	--
10.	Palm cabbage preserves	--	--	--	--	--	10,056	8,292	8,766	10,691	9,884	5,136	8,425
11.	Refined or purified castor oil	--	--	--	--	--	20,329	49,214	38,526	39,746	62,633	94,977	95,577
12.	Refined or purified soybean oil	1,294	44,767	14,988	15,778	9,206	12,070	173,645	326,300	716,517	125,181	433,087	168,206
13.	Orange juice	180,903	209,858	213,553	335,644	292,354	401,144	639,143	502,034	553,110	904,805	484,782	751,834
14.	Fruit and vegetable juices (exc. 13)	7,186	5,856	11,427	11,427	16,712	21,644	25,412	26,065	--	--	--	--
15.	Woven cotton products	20,950	12,596	20,909	20,909	25,765	25,087	29,959	26,378	43,277	56,185	40,260	35,345
	TOTAL	13,196,024	14,645,674	16,099,370	12,543,861	12,314,978	16,595,763	19,463,967	16,019,561	19,656,915	19,049,069	21,007,138	14,517,559

Source: CACEX. Presented in EMBRAPA, Informacoes e Indicas Basicos da Economia Brasileira -- Subsidios Para o Economista Agricola, 1988.

TABLE A.2.35: COMPOSITION OF AGRICULTURAL EXPORTS (VALUE TERMS): 1951-1967

(US$'000 FOB)

PRODUCTS	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
A. PRIMARY	1,485,855	1,231,042	1,372,514	1,412,584	1,204,205	1,301,241	1,099,810	954,548	969,202	980,975	1,071,745	935,675
1. Raw sugar		4,908	17,059	12,229	33,428	1,254	38,222	45,541	33,361	52,527	65,570	39,111
2. Rice	16,623	26,245	604		238	9,724	32	5,625	1,083	28	13,169	4,748
3. Raw cotton	207,980	34,813	101,758	223,116	131,385	85,944	44,206	24,758	35,541	45,586	109,682	112,166
4. Cotton in linters	12,330	5,619	6,260	2,803	2,2[illegible]	[illegible]38	1,239	580	331	1,504	1,331	1,547
5. Bulk peanuts	836	283	60	3	2,898	168	30	275	95		924	4,057
6. Bananas	11,975	13,895	9,220	11,288	10,251	12,395	13,322	10,900	4,859	4,561	3,799	3,228
7. Cocoa almonds	69,414	41,516	75,223	135,606	90,907	67,207	69,693	89,591	59,447	69,181	45,923	24,227
8. Raw bulk coffee	1,058,100	1,045,305	1,088,270	948,077	843,938	1,029,782	845,531	667,515	733,040	712,714	710,386	642,671
9. Shrimp								3	23		145	3
10. Beef (fresh, refrig. or frozen)	2,071	1,994	873		458	3,241	9,612	12,571	9,873	3,204	7,202	5,457
11. Horse meat (fresh, refrig. or frozen)												6
12. Cashewnuts	28	19		36	48	55	98	194	59	493	342	504
13. Brazilian chestnuts	10,270	7,418	11,126	12,596	13,086	13,635	11,659	11,966	8,095	14,286	15,621	9,910
14. Tea	243	186	559	307	402	327	518	283	559	579	918	959
15. Raw bovine livestock hide	29,822	6,515	9,459	6,605	5,985	5,058	5,178	4,486	9,645	6,610	3,180	1,539
16. Livestock hide (except raw bovine)	3,262	1,470	2,254	1,596	1,648	3,088	2,846	4,161	4,254	4,614	5,779	5,132
17. Mate herb	9,232	8,943	7,246	12,632	13,567	15,103	14,144	15,096	12,650	8,983	9,484	7,476
18. Peanut meal		348							2,205	3,039	6,670	5,084
19. Cotton meal	2,337				920	299			765	1,303	1,359	172
20. Soy meal												
21. Fruits (except 6, 12, 18)												
22. Tobacco leaf	18,513	18,795	15,625	17,937	18,034	19,910	17,023	15,216	15 289	18,579	26,631	23,602
23. Wool (except string)	2,727		16,409	9,427	7,398	9,645	9,530	2,192	5,380	24	6	
24. Lobster					9	84	338	477	692	1,815	2,863	4,039
25. Orange	3,046	6,582	2,866	4,933	5,740	3,581	3,764	4,748	6,812	6,089	6,007	4,686
26. Bulk corn	21,067	2,487	1	594	4,566					408	180	
27. Squeezed citrus pulp												
28. Bulk chiles				482		36	232	350	1,899	2,501	2,909	2,217
29. Raw sisal			3,926	9,114	11,291	14,965	12,784	12,320	18,355	22,347	24,793	24,778
30. Bulk soy	5,084	3,701	3,804	3,003	5,756	4,097	1,809	3,690	4,890		6,872	8,376
31. Edible and non-edible molasses												
32. Frozen fish												
33. Frozen poultry												
34. Corn chaff												
35. Residual vegetable oils (exc. 18, 19 and 20)			-									
B. SEMI-PROCESSED	67,351	34,476	85,087	71,670	111,187	74,034	138,194	125,869	105,892	107,102	109,178	90,612
1. Crystalized sugar			5,160	151	13,483	340	9,648	9,806	9,384	5,204	34	384
2. Carnaubeira wax	17,489	11,752	14,502	16,236	16,857	17,297	18,827	17,713	15,678	17,782	14,142	9,963
3. Cut pine wood			38,058	37,178	57,856	33,333	63,761	51,761	37,791	42,097	46,773	35,228
4. Cut wood (except pine)	9,077	4,569	3,671	4,922	5,668	3,719	5,291	3,685	3,434	3,930	3,587	3,848
5. Cocoa butter	8,378	4,237	11,764	7,179	8,530	10,610	19,750	25,548	25,454	24,641	14,760	16,781
6. Tanned and prepared skins and hides	3,204	893	1,274	614	995	944	975	787	2,569	1,236	1,487	1,595
7. Raw peanut oil												48
8. Cotton oil												
9. Castor oil	13,628	9,518	9,223	3,611	4,997	5,055	17,464	14,302	9,523	9,714	23 883	14,814
10. Soy oil												
11. Vegetable oils (exc. 7, 8, 9 and 10)	15,093	3,507	1,435	1,779	2,531	2,734	2,478	2,267	1,964	2,461	4,116	6,352
12. Pulp for paper										37	416	599
13. Cocoa liquor or pulp												
14. Other cocoa products, breads (exc. 5 and 13)												
C. PROCESSED	3,476	2,480	2,486	2,344	5,503	5,308	6,621	17,542	37,385	16,960	24,230	20,522
1. Refined sugar												
2. Ethyl alcohol												
3. Processed coffee							33	134	452	3	53	56
4. Processed meat	3,278	1,227	630	78	2,512	1,815	1,709	7,457	25,709	7,002	11,838	9,410
5. Sisal twine, rope and cable												
6. Sweet meat and extract	198	282	433	184	279	526	325	2,476	6,335	1,746	2,246	1,731
7. Cotton fiber					365	7	409	2,083	227	778	343	86
8. Silk thread												
9. Menthol			1,402	1,959	2,293	2,695	3,248	4,022	3,396	3,986		6,123
10. Palm cabbage preserves												
11. Refined or purified castor oil												
12. Refined or purified soybean oil												
13. Orange juice				10								84
14. Fruit and vegetable juices (exc. 13)				17	5	8	4	1	2		3	87
15. Woven cotton products		971	21	96	49	257	894	1,389	1,264	3,445	1,296	945
TOTAL	1,556,682	1,267,998	1,459,887	1,486,598	1,320,895	1,380,583	1,244,625	1,097,959	1,112,479	1,105,037	1,205,153	1,046,809

continued on next page

TABLE A.2.35: COMPOSITION OF AGRICULTURAL EXPORTS (VALUE TERMS): 1951-1987

(US$'000 FOB)

	PRODUCTS	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
	A. PRIMARY	117,208	1,097,095	1,124,863	1,269,887	1,145,105	1,319,461	1,567,409	1,737,386	1,638,646	2,297,109	3,488,813	3,764,206
1.	Raw sugar	62,724	32,950	54,029	80,535	60,426	101,576	115 045	126,511	146,554	314,147	454,863	978,300
2.	Rice		851	23,765	33,320	4,817	21,214	7,820	6,800	11,469	152	4,233	18,122
3.	Raw cotton	114,241	108,259	95,651	111,004	90,844	130,817	196,009	154,434	137,682	188,682	218,068	90,934
4.	Cotton in linters	1,536	1,526	1,036	1,206	1,228	2,447	3,382	3,760	2,808	1,860	1,512	1,439
5.	Bulk peanuts	2,492	19	4,100	3,442	3,589	2,294	6,884	12,251	8,813	13,651	19,483	28,186
6.	Bananas	2,924	5,818	8,274	6,280	5,546	5,615	9,769	10,722	10,422	9,583	14,870	22,641
7.	Cocoa almonds	35,030	34,816	27,687	50,731	59,161	46,098	105,490	77,679	61,681	59,158	88,522	21,002
8.	Raw bulk coffee	748,284	759,703	706,587	763,983	704,725	774,474	812,955	939,266	772,479	989,219	1,244,272	864,313
9.	Shrimp	6	231	1,045	796	1,631	3,525	7,672	6,340	11,110	17,954	6,000	8,621
10.	Beef (fresh, refrig. or frozen)	5,344	11,566	24,852	12,932	6,723	20,178	41,648	69,551	98,706	169,205	148,547	29,532
11.	Horse meat (fresh, refrig. or frozen)	7	707	867	1,697	2,917	4,901	7,380	8,325	12,864	21,847	44,087	39,620
12.	Cashewnuts	840	1,042	881	1,915	1,560	3,593	4,937	7,305	5,087	6,853	9,855	15,023
13.	Brazilian chestnuts	8,882	10,421	11,597	15,084	10,129	14,969	12,076	13,639	13,770	20,229	22,763	20,222
14.	Tea	906	1,320	1,706	2,022	2,206	2,278	2,158	2,795	3,973	3,187	3,866	3,297
15.	Raw bovine livestock hide	1,324	2,796	6,204	4,908	3,961	2,744	12,199	8,893	6,251	11,166	2,916	
16.	Livestock hide (except raw bovine)	4,551	4,940	7,764	11,329	6,292	7,715	10,546	7,955	8,436	10,514	14,868	
17.	Mate herb	7,664	7,776	6,940	6,876	4,984	4,890	4,910	4,784	5,662	3,235	3,475	7,522
18.	Peanut meal	6,863	1,829	8,638	11,631	11,645	7,902	9,992	15,710	16,741	14,563	14,521	10,166
19.	Cotton meal	1,867	951	25	1,609	1,585	4,525	9,487	9,684	8,588	11,720	14,514	9,153
20.	Soy meal	4,188	3,024	7,678	14,591	10,219	18,931	23,415	43,637	61,532	152,348	422,635	303,044
21.	Fruits (except 8, 12, 13)		5,001	9,946	6,132	5,072	5,199	6,578	5,519	6,653	5,848	6,541	9,111
22.	Tobacco leaf	24,118	28,291	26,226	21,693	20,260	18,869	26,492	31,195	36,560	46,674	58,458	98,989
23.	Wool (except string)	2,470	23,470	14,991	25,290	19,814	15,503	21,974	17,294	15,294	15,937	45,215	43,786
24.	Lobster	3,521	2,627	3,577	3,650	2,775	5,467	10,237	10,043	12,636	16,352	18,033	27,888
25.	Orange	6,169	3,714	7,398	3,759	3,455	3,104	3,553	3,443	4,087	4,741		
26.	Bulk corn	29,494	2,928	27,915	31,478	22,053	57,009	32,938	80,594	75,431	9,629	3,146	138,991
27.	Squeezed citrus pulp												
28.	Bulk chilies	1,801	3,039	6,028	5,407	6,183	5,586	9,103	8,198	14,943	12,708	16,955	26,125
29.	Raw sisal	36,442	37,480	24,615	23,159	16,276	17,029	16,650	16,524	15,297	22,497	59,445	114,130
30.	Bulk soy	3,107		7,343	13,028	29,243	6,291	29,084	27,084	24,309	127,927	494,153	588,271
31.	Edible and non-edible molasses	463				3,806	4,702	6,826	7,656	8,608	13,523	31,047	58,808
32.	Frozen fish												
33.	Frozen poultry												
34.	Corn chaff												
35.	Residual vegetable oils (exc. 18, 19 and 20)												
	B. SEMI-PROCESSED	101,120	108,850	135,629	139,072	132,117	165,921	192,525	195,705	207,303	343,886	484,076	738,939
1.	Crystalized sugar	9,592		2,697					120	6,397	89,101	97,847	283,330
2.	Carnaubeira wax	10,158	10,243	10,812	9,732	7,509	9,161	9,433	9,585	10,604	11,220	13,311	25,203
3.	Cut pine wood	34,769	46,363	51,482	55,736	48,855	68,863	71,702	67,565	718,484	59,719	62,752	50,034
4.	Cut wood (except pine)	4,723	5,981	10,516	11,962	12,010	11,922	13,446	12,756	10,277	12,849	27,200	35,655
5.	Cocoa butter	15,721	10,646	13,349	20,779	25,062	25,889	30,567	27,965	24,335	33,134	47,655	99,991
6.	Tanned and prepared skins and hides	1,306	1,312	5,168	9,556	8,008	6,188	11,677	15,546	14,014	40,679	40,049	37,635
7.	Raw peanut oil	1,789				1,794		643	9,907	21,737	27,425	19,359	30,508
8.	Cotton oil												
9.	Castor oil	17,787	24,436	26,753	22,333	23,189	36,373	45,153	38,232	39,942	53,818	123,376	128,425
10.	Soy oil											23,808	1,860
11.	Vegetable oils (exc. 7, 8, 9 and 10)	5,195	4,886	8,426	5,988	4,210	6,110	6,739	8,319	8,523	2,345	5,139	9,312
12.	Pulp for paper	100	1,783	6,426	2,988	1,480	1,415	3,165	5,710	4,626	13,296	23,580	36,576
13.	Cocoa liquor or pulp												
14.	Other cocoa products, breads (exc. 5 and 13)												
	C. PROCESSED	20,655	21,961	36,970	51,383	65,392	76,422	89,630	118,588	221,265	315,942	414,465	569,700
1.	Refined sugar											5,976	60,302
2.	Ethyl alcohol												
3.	Processed coffee	245	212	799	9,526	28,262	22,786	32,782	45,540	49,734	67,945	99,986	116,045
4.	Processed meat	5,011	5,888	12,354	8,062	5,687	12,627	13,130	15,788	50,948	50,502	69,769	80,979
5.	Sisal twine, rope and cable										4,615	10,027	40,114
6.	Sweet meat and extract	1,491	3,632	6,597	3,891	1,093	2,032	2,689	2,829	6,391	10,985	1 ,577	18,337
7.	Cotton fiber	31	379	3,316	8,199	2,619	1,886	3,055	5,765	8,813	22,782	45,028	68,404
8.	Silk thread										6,784	14,473	16,331
9.	Menthol	7,905	5,670	4,087	8,623	10,334	10,536	10,025	10,621	17,131	21,781	28,682	46,500
10.	Palm cabbage preserves		884	1,031	1,257	1,996	1,331	1,777	1,385	4,194	5,049		
11.	Refined or purified castor oil												
12.	Refined or purified soybean oil								767	2,245	14,536	8,758	9
13.	Orange juice	2,167	1,437	1,884	4,737	6,693	11,631	10,910	14,736	35,858	41,495	63,622	59,170
14.	Fruit and vegetable juices (exc. 13)	2,171	1,447	1,963	4,812	6,802	11,762	11,176	15,120	36,902	43,649	3,971	6,098
15.	Woven cotton products	1,634	2,912	4,939	2,176	1,906	1,831	4,136	9,037	11,049	25,815	52,621	59 411
	TOTAL	1,238,983	1,224,906	1,297,662	1,460,342	1,342,614	1,561,804	1,849,564	2,051,679	2,067,214	2,956,937	4,387,354	5,072,845

continued on next page

TABLE A.2.35: COMPOSITION OF AGRICULTURAL EXPORTS (VALUE TERMS): 1951-1987

(US$'000 FOB)

	PRODUTOS	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	A. PRIMARY	3,755,943	4,829,109	5,757,411	4,696,446	4,943,898	6,456,419	6,447,206	5,564,411	6,548,923	6,583,891	6,403,897	4,831,908	
1.	Raw sugar	769,902	152,479	276,530	195,929	247,004	624,500	578,928	250,163	332,969	326,055	166,284	137,999	
2.	Rice	4,233	18,1 .	1,237	11,956	82,832	38,387	145						
3.	Raw cotton	97,794	6,957	40,894	52,759	499				188,510	41,556	76,754	16,849	
4.	Cotton in linters	328	405	439										
5.	Bulk peanuts	32,228	13,195	19,833	11,610	15,768	21,421	32,438	11,256					
6.	Bananas	30,659	18,084	19,051	23,249	24,464	11,164	12,741	10,520					
7.	Cocoa almonds	220,369	218,757	435,454	453,813	486,873	291,688	241,582	215,978	282,773	248,876	360,614	272,834	
8.	Raw bulk coffee	854,513	2,172,687	2,298,942	1,946,509	1,917,618	2,486,055	1,516,646	1,854,353	2,095,526	2,564,136	2,369,178	2,062,741	
9.	Shrimp	6,243	11,409	17,485	26,001	55,394	44,957	51,644	72,264	68,468	91,773	98,868	90,110	
10.	Beef (fresh, refrig. or frozen)	8,530	16,022	39,561	17,155	8,041	18,399	123,568	188,288	210,318	213,910	263,548		
11.	Horse meat (fresh, refrig. or frozen)	40,197	40,728	30,796	45,473	48,689	38,772	39,172	25,941	17,217	18,429	15,102	7,832	
12.	Cashewnuts	18,351	17,489	23,752	33,707	38,303	69,178	78,495	67,221	69,010	66,100	103,433	108,020	
13.	Brazilian chestnuts	24,735	21,968	32,082	32,710	43,037	26,821	24,734	32,240	36,038	24,330	25,155	22,018	
14.	Tea	4,747	5,423	8,613	10,604	9,914	11,206	10,778	542					
15.	Raw bovine livestock hide									12,080	2,111	1,118		
16.	Livestock hide (except raw bovine)													
17.	Mate herb	9,955	12,025	13,370	14,810	17,470	37,422	28,298	15,041	17,683	15,649	14,088	16,088	
18.	Peanut meal	3,920	10,785	9,147	8,165	14,599	16,526	9,078	6,122					
19.	Cotton meal	2,034	437	3,520	3,098	4,701				23,461	15,129	10,792	5,610	
20.	Soy meal	465,774	795,004	1,150,152	1,049,908	1,136,933	1,449,013	2,136,176	1,600,322	1,793,219	1,460,179	1,174,857	1,180,579	
21.	Fruits (except 6, 12, 13)	14,127	7,626	8,121	12,154	29,404								
22.	Tobacco leaf	141,950	161,197	166,296	238,933	284,329	248,264	356,486	462,777	457,924	448,821	437,427	395,944	
23.	Wool (except string)	46,264	44,494	53,277	59,558	59,123	59,742	67,947	42,947	31,175				
24.	Lobster	21,534	26,876	30,563	38,359	53,791	37,575	49,993	49,221	29,011	51,539	38,964	28,010	
25.	Orange						14,831	14,328	17,017					
26.	Bulk corn	150,867	164,678	135,668	2,240	1,721				71,779	23,563	265	200	
27.	Squeezed citrus pulp						72,051	77,963	68,270	90,343	64,659	69,329	46,057	
28.	Bulk chiles	20,195	32,939	39,476	59,771	47,519	54,722	58,507	50,416	34,740	73,673	78,381	92,399	
29.	Raw sisal	30,054	35,967	45,664	34,720	46,436	58,049	34,289	15,914	33,722	29,519	26,797	23,160	
30.	Bulk soy	684,901	788,538	709,606	169,886	179,506	393,930	403,672	123,457	308,571	454,116	762,683	243,218	
31.	Edible and non-edible molasses	45,535	40,990	46,287	33,704	48,645	82,372	68,563	1,127	24,676	22,212	9,287	21,211	
32.	Frozen fish				17,937	15,993	35,762	42,344	31,110	31,218	22,004	26,123	28,314	
33.	Frozen poultry				46,872	81,148	206,690	354,291	280,657	242,212	263,538	242,799		
34.	Corn chaff				18,425	28,852	9,813	353	1					
35.	Residual vegetable oils (exc. 18, 19 and 20)			-			35,498	34,194	71,246	46,370	42,014	31,051	31,915	
	B. SEMI-PROCESSED	678,614	624,625	750,103	1,074,557	1,425,154	1,535,039	1,257,546	734,897	685,348	1,208,570	1,012,002	652,891	
1.	Crystalized sugar	204,342	52,420	55,937	32,764	22,972	317,398	88,884	76,911	25,990	47,692	33,421	46,226	
2.	Carnaubeira wax	14,968	17,509	15,208	18,081	19,617	16,983	17,787	14,537	13,081	10,529	12,697	17,285	
3.	Cut pine wood	55,472	20,850	17,984	23,307	39,136	45,647	29,732	19,737					
4.	Cut wood (except pine)	22,006	30,486	37,199	21,955	14,100	38,943	31,418	27,788	54,523	36,937	47,007	69,140	
5.	Cocoa butter	60,209	70,020	96,823	83,027	119,314	158,194	144,824	120,383	128,509	167,815	203,390	198,761	
6.	Tanned and prepared skins and hides	48,151	88,479	92,752	99,300	165,639	101,978	104,934	113,659	112,811	136,321	126,499	99,504	
7.	Raw peanut oil	31,814	59,708	38,379	56,718	72,636	84,927	43,177	20,697	22,052	12,813	45,897	3,863	
8.	Cotton oil						26603	40964	14699	32914				
9.	Castor oil	51,872	76,625	87,497	110,022	106,600	89,002	46,627	13,395					
10.	Soy oil	152,442	174,642	274,216	283,156	326,798	411,111	503,318	222,359	155,057	557,170	331,393	71,371	
11.	Vegetable oils (exc. 7, 8, 9 and 10)	6,766	7,227	14,621	10,782	28,243								
12.	Pulp for paper	30,572	26,650	19,487	57,484	181,308								
13.	Cocoa liquor or pulp				194,385	270,705	219,253	194,923	79,616	118,582	193,500	160,818	124,178	
14.	Other cocoa products, breads (exc. 5 and 13)				83,578	58,086	25,000	12,958	10,886	21,679	45,785	30,880	22,563	
	C. PROCESSED	557,816	772,025	1,042,183	1,191,293	1,302,569	1,818,471	2,303,849	1,957,954	2,217,042	3,063,876	2,229,541	1,651,248	
1.	Refined sugar	125,529	101,646	130,238	121,371	93,832	346,356	395,926	232,345	167,843	212,546	168,250	183,656	
2.	Ethyl alcohol						133,445	69,418	82,396	73,409	105,880	55,523	56,174	
3.	Processed coffee	79,790	225,539	326,002	348,203	418,558	286,864	243,964	278,841	251,596	291,839	263,293	296,756	
4.	Processed meat	70,548	113,609	118,829	97,465	126,860	232,564	293,725	250,493	306,338	306,717	262,095		
5.	Sisal twine, rope and cable	22,718	24,534	33,939	37,444	64,482	70,941	66,167	48,031	54,623	65,226	50,472	48,721	
6.	Sweet meat and extract	7,136	13,899	14,896	6,201	4,996				21,763	21,507	19,581	17,025	
7.	Cotton fiber	67,835	81,249	120,263	117,093	155,249	181,165	183,875	160,142	194,774	234,327	156,295	114,681	
8.	Silk thread	20,008	21,528	19,672	19,175	23,701	27,916	28,259	23,019	26,063	30,536	28,192	26,603	
9.	Menthol	25,583	21,757	20,350	18,908	9,022								
10.	Palm cabbage preserves						34,633	23,652	19,995	27,020	25,685	16,220	23,763	
11.	Refined or purified castor oil						20,687	41,180	31,860	36,415	65,928	57,359	50,052	
12.	Refined or purified soybean oil	1,147	21,782	2,696	11,755	7,111	10,139	147,679	150,822	305,899	941,717	271,124	66,743	
13.	Orange juice	82,213	100,900	177,040	332,638	281,452	338,714	659,206	552,284	607,931	1,414,500	748,925	635,987	
14.	Fruit and vegetable juices (exc. 13)	3,592	3,495	3,460	13,680	17,054	25,341	34,040	34,470					
15.	Woven cotton products	49,717	42,087	68,798	67,360	110,252	109,706	114,758	96,255	143,169	195,014	136,212	131,067	
	TOTAL	4,992,373	6,225,759	7,549,697	6,962,316	7,671,622	9,809,929	10,008,601	8,257,262	9,451,313	10,856,337	9,645,440	7,136,047	

Source: CACEX. Presented in EMBRAPA, Informacoes e Indices Basicos da Economia Brasileira --Subsidios Para o Economista Agricola, 1988.

TABLE A.2.38: COMPOSITION OF AGRICULTURAL IMPT (Value Terms): 1970-87

(US$ Million)

NBM CODE	CATEGORY	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	PRIMARY & SEMI-PROCESSED PRODUCTS																		
1000000	LIVE ANIMALS	0	4,124	6,688	7,132	14,658	16,968	28,507	20,908	37,524	70,910	31,421	20,102	17,821	15,629	9,050	10,784	13,184	22,040
2000000	MEAT	0	4,254	1,245	3,676	73,319	15,373	17,923	22,480	95,068	198,868	92,457	73,181	19,679	20,434	29,165	40,422	429,674	171,172
2010103	--Beef (Frozen)	0	0	0	0	51,257	3,928	2,306	214	35,968	103,310	24,325	15,178	2,576	8,365	18,966	22,668	195,911	76,176
3000000	FISH	0	27,453	28,831	48,806	80,801	49,325	43,470	44,051	58,587	89,822	15,187	54,567	61,939	35,261	31,267	39,136	125,175	117,428
4000000	MILK,EGGS & HONEY	0	10,567	8,045	41,352	28,931	15,177	24,139	43,611	25,803	13,965	82,763	19,840	21,937	26,379	16,231	20,661	257,706	104,476
5000000	OTHER ANIMAL PRODUCTS	0	3,395	2,706	4,071	6,330	6,969	5,794	4,783	4,657	9,449	9,406	7,099	4,915	5,421	4,247	5,428	12,312	15,526
6000000	PLANTS & FLOWERS	0	83	107	165	225	88	120	46	72	247	158	115	82	42	24	80	643	367
7000000	VEGETABLES	0	23,017	27,023	52,125	42,180	47,438	83,371	111,352	87,981	80,353	109,533	68,668	77,931	43,580	60,315	40,273	114,692	59,766
8000000	FRUIT AND NUTS	0	42,133	45,714	66,498	91,166	97,215	104,635	124,897	142,257	151,882	113,353	98,580	112,354	82,407	58,376	58,316	99,640	103,256
9000000	COFFEE, TEA	0	1,459	1,686	5,271	8,578	3,242	9,515	14,560	3,906	199,482	5,276	5,485	5,302	3,352	2,080	2,535	3,327	4,791
10000000	CEREALS	0	113,757	131,900	349,861	486,062	372,291	532,900	279,469	701,842	983,530	1,241,314	1,077,392	848,163	905,066	835,859	731,471	822,847	373,218
10010200	--Wheat	103,839	106,831	121,906	335,369	469,395	325,015	503,582	260,376	541,206	845,417	889,765	831,892	761,953	726,610	755,014	591,095	248,350	249,978
10050000	--Corn	165	61	211	859	1,112	1,098	651	789	137,263	194,732	226,881	143,357	30	33,738	42,281	33,884	247,492	76,177
10080000	--Rice	9	135	1,043	1,399	82	22,853	4,918	196	7,235	222,010	88,845	57,500	46,103	106,712	68	76,040	303,177	27,907
11000000	MILLED AND MALT PRODUCTS	0	16,349	17,648	21,522	36,159	61,865	54,385	60,184	65,448	68,650	63,717	85,564	58,734	52,431	49,816	41,754	45,468	50,972
12000000	SEEDS & OILSEEDS	0	6,515	9,132	17,527	17,927	14,803	18,278	20,347	47,359	107,189	142,039	272,127	329,321	39,796	60,063	74,068	92,307	115,919
12010400	--Soybeans	[illegible]	123	505	1,069	920	25	0	0	21,557	53,992	111,208	245,630	291,927	7,650	30,684	40,306	53,138	77,512
13000000	VEGETABLE EXTRACTS	0	3,089	2,795	4,621	11,889	6,371	7,470	7,279	7,917	10,387	10,448	9,702	9,335	8,919	7,409	9,495	15,941	13,743
14000000	OTHER VEGETABLE PRODUCTS	0	427	330	348	621	633	413	532	519	360	377	742	389	216	102	134	183	214
15000000	FATS AND OILS	0	22,801	25,382	43,819	78,155	40,951	32,153	32,429	60,049	189,189	106,508	44,720	45,958	55,077	123,580	95,824	126,418	53,902
16000000	MEAT & FISH PREPARATION	0	1,503	1,603	2,829	2,715	3,911	3,409	5,207	8,802	7,114	5,958	6,825	6,865	2,102	3,904	3,408	5,170	10,995
17000000	SUGAR & SUGAR PRODUCTS	0	450	784	1,356	1,882	1,518	2,481	1,812	2,355	2,421	3,111	3,341	1,695	945	419	710	1,787	1,160
18000000	CHOCOLATE, CUCOA PRODUCTS	0	98	183	338	385	322	295	356	378	579	195	102	134	47	75	56	114	120
19000000	BAKERY & CEREAL PRODUCTS	0	3,704	3,380	4,179	4,125	1,933	385	204	337	231	158	143	219	114	79	107	387	751
20000000	FRUIT, VEGETABLE PRODUCTS	0	988	1,447	6,231	11,903	830	7,129	8,238	1,680	898	814	553	527	94	431	658	1,573	8,692
21000000	FOOD PREPARATIONS	0	128	178	1,261	657	488	929	1,340	909	785	760	1,426	320	740	563	1,232	1,381	886
22000000	ALCOHOL PRODUCTS	0	8,135	10,110	12,934	20,378	16,864	15,456	13,065	20,856	19,448	14,374	11,517	10,057	9,780	8,060	13,163	26,798	17,591
23000000	OTHER FOOD PRODUCTS	0	2,838	1,817	1,768	3,872	5,963	3,689	2,626	3,745	7,884	6,323	5,715	2,618	1,695	1,219	1,683	4,989	3,850
24000000	TOBACCO PRODUCTS	0	65	370	1,047	5,135	803	2,648	731	718	1,548	1,539	816	853	946	131	102	372	421
	FERTILIZERS AND CHEMICALS																		
25030100	GRANULATED SULPHUR															121,704	150,186	163,062	135,713
25100101	PHOSPHATE ROCK	3,472	4,479	7,101	11,461	53,050	48,835	58,238	49,596	38,398	25,755	23,570	22,635	8,990		307	1,004	3,427	4,052
28060101	SULPHURIC ACID															7,179	1,989	6,652	1,415
28100204	PHOSPHORIC ACID	876	2,235	5,256	9,296	33,481	56,976	76,787	100,235	126,160	185,994	176,129	119,550	88,079	2,694	64,990	1,432	79,434	91,503
28160100	ANHYDROUS AMMONIA															6,251	2 936	4,903	3,729
28392301	POTASSIUM NITRATE	31								6	11	4,560	3,598	2,799	1,062	2,519	899	2,117	1,002
31020101	SODIUM NITRATE	1,069	1,074	1,194	1,327	2,240	2,553	2,755	2,744	3,004	2,523	2,328	2,225	2,555	1,594	1,581	1,773	1,863	1,953
31020300	AMMONIUM SULPHATE		4,993	15,214	17,803	63,673	34,565	20,831	41,344	49,895	58,514	69,149	63,987	44,180	23,925	38,093	38,629	2,748	38 704
31020400	CALCIUM NITRATE		18	40	87	95	247	356	616	711	603	214	98	139	111	169	0	120	180
31020601	UREA (LESS THAN 45% N)		3,958	7,889	6,408	40,561	19,374	19,481	48,542	51,018	72,047	105,851	57,809	27,623	960			4	
31020602	UREA (MORE THAN 45% N)															485	1,388	11,926	3,757
31030400	SUPERPHOSPHATE (22% P2O5)		434	2,203	551	15,748	8,195	4,967	6,479	5,408	6,571	9,875	4,402	4,107	19	675	350	1,961	1,952
31030500	SUPERPHOSPHATE (45% P2O5)		10,549	35,315	38,693	2,981	5,476	5,163	6,891	7,406	12,035	20,326	5,999					739	355
31030600	TRIPLE SUPER					127,724	61,256	29,467	27,653	17,406	29,638	31,339	12,590	7,449	120	7,163	3,702	21,290	32,228
31040200	POTASSIUM CHLORATE		18,999	24,340	29,683	46,867	62,173	60,277	80,9?2	93,840	115,239	255,584	151,081	112,316	88,473	157,251	162,256	174,940	183,081
31040300	POTASSIUM SULPHATE	10	429	745	1,467	2,048	3,664	3,478	2,868	3,607	5,301	5,224	6,166	9,602	4,640	6,803	3,610	5,339	6,930
31040400	DOUBLE MAG. & POT. SULPHATE		28	23,326	355	682	1,125	742	1,290	1,276	1,541	2,205	1,438	1,147	164	1,157	266	1,051	857
31050101	DAP	40	16,455	38,274	36,284	84,100	86,269	36,477	58,329	62,011	82,962	99,352	81,228	16,285		16,792	7,041	19,218	17,913
31050199	MAP					135	2,675	4,124	3,390	5,482	1,060	1,064	340	45	8	6	6	2,538	7,514
31050400	SODIUM & POTASSIUM NITRATE		486	314	1,224	1,087	3,463	4,116	4,355	5,161	7,477	8,450	11,919	11,193	14,739	10,887	10,623	8,432	14,988
31050500	MICRONUTRIENTS		2	26	148	310	526	800	573	689	764	1,745	1,001	727	85	516	912	2,342	1,372
31050600	MIXED FERTILIZERS				1,305	6,079	4,479	2,153	655	733	586	1,266	319	12					1,245
38110200	INSECTICIDES & PESTICIDES		7,711	11,397	18,693	22,233	29,705	24,414	22,595	27,446	28,781								
38110201	INSECTICIDES											10,807	931	2,200	944	453	2,128	864	6,868
38110202	PESTICIDES											2	1,277	9	5	48	79	364	263
38110203	CARRAPATICIDAS (Tick Insecticides)											162		515	1,142	400	302	1,445	1,032
38110299	OTHER PESTICIDES											699	685	10	36	96	18	8	5
38110300	HERBICIDES & FUNGICIDES		10,041	25,237	52,457														
38110301	FUNGICIDES					24,661	9,211	16,300	23,414	18,697	5,944	5,516	1,062	806	318	338	398	848	493
38110302	HERBICIDES					36,698	54,101	61,445	54,343	65,610	13,886	9,124	1,638	844	364	576	1,453	3,875	2,965
38110399	OTHER HERBICIDES & FUNGICIDES					3,657	3,657	58	14	227	264	94	56	53	62	69	94	118	107
38110400	ISCA TOXICA (Ant Insecticides)		369	33	5	61	36	17	43	9	4	143	33	13	6	61	21	115	92
38110500	GROWTH REGULATORS					16	8	112	187	13?	56	65	182	753	439	193	62	7	691
38110800	INSECTICIDES, RETAIL PACKS											60	24						
38110801	METHYL BROMIDE													527	310				
38110899	OTHER INSECTICIDES, RETAIL PACKS													39	11	28	90	64	529
38119000	OTHER AGRICULTURAL CHEMICALS		4	66	111	136	136	72	1,095	5,201	2,144	266	219	167	168	237	35	117	251
	MACHINERY AND EQUIPMENT																		
84000000	AG. MACHINERY & EQUIP IMPORTS									0	0	0	0	0	0	0	0	0	0
	TOTAL	109,514	484,740	650,672	1,264,187	2,086,314	1,634,679	1,947,563	1,620,685	2,700,629	3,919,732	4,303,584	3,664,012	3,082,879	2,336,985	2,598,107	2,353,375	3,772,285	2,321,435

Source: CACEX.

TABLE A.3.1: DISTRIBUTION OF AGF PURCHASES BY PRINCIPAL PRODUCTS: 1970-1987

(In %)

PRODUCTS	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Seed Cotton																		
Tons (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.00	0.01	9.30	0.00	0.00
Cz$ (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.12	0.00	0.03	15.05	0.00	0.00
Cotton (lint)																		
Tons (%)	0.00	0.00	0.27	2.78	0.00	13.90	0.00	0.02	1.14	0.60	0.00	1.15	1.04	0.95	0.22	2.28	0.47	0.11
Cz$ (%)	0.00	0.00	0.86	14.00	0.00	24.55	0.00	0.18	10.35	3.43	0.00	8.71	7.47	5.81	1.73	10.48	3.24	0.62
Rice																		
Tons (%)	94.80	28.43	0.00	32.71	2.94	0.76	65.20	41.94	24.62	25.68	86.06	74.75	12.80	23.38	51.66	17.27	23.10	27.61
Cz$ (%)	94.99	25.61	0.00	36.74	4.56	0.54	55.25	53.06	23.24	17.69	72.58	48.09	11.34	23.21	42.73	15.57	33.35	39.40
Beans																		
Tons (%)	0.01	17.22	75.73	0.04	0.82	9.42	0.00	0.28	10.84	2.52	0.00	1.73	18.33	7.53	9.07	6.61	1.00	0.49
Cz$ (%)	0.02	29.69	68.89	0.05	1.93	8.34	0.00	0.74	19.44	2.96	0.00	4.61	40.24	16.60	25.64	10.78	2.29	1.26
Maize																		
Tons (%)	0.96	17.35	23.53	5.60	73.64	23.68	14.75	52.80	49.23	15.47	0.16	6.02	61.65	64.22	36.54	36.81	55.61	53.56
Cz$ (%)	0.42	6.90	8.54	2.86	74.32	6.10	7.11	38.82	24.53	4.94	0.04	2.29	32.73	45.21	24.60	23.93	40.13	49.82
Soybeans																		
Tons (%)	0.00	0.00	0.00	0.00	0.00	0.44	0.09	0.00	0.00	0.00	5.61	0.02	0.05	0.00	0.00	23.68	14.66	8.23
Cz$ (%)	0.00	0.00	0.00	0.00	0.00	0.17	0.06	0.00	0.00	0.00	3.35	0.01	0.03	0.00	0.00	17.37	15.27	7.50
Others																		
Tons (%)	4.72	36.99	0.47	58.86	22.60	51.59	19.96	4.96	14.17	55.74	8.18	16.31	6.08	3.91	2.50	3.85	5.16	0.00
Cz$ (%)	4.58	37.51	1.71	46.34	19.19	63.31	37.58	7.20	22.45	70.96	24.03	36.24	8.06	8.15	5.27	6.81	5.71	1.39
Total																		
Tons (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Cz$ (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (Absolute Amounts)																		
Tons (000)	549	50	35	37	223	409	996	2,850	684	432	258	1,070	5,727	2,143	1,286	8,764	7,682	10,277
Cz$ (000)	177	18	23	20	122	1,195	1,860	4,373	1,631	2,677	3,430	26,450	193,061	124,806	352,169	9,383,640	15,499,224	31,506

Source: CFP.

TABLE A.3.2: DISTRIBUTION OF EGF CREDIT BY PRINCIPAL PRODUCTS: 1970-1987

(in %)

PRODUCTS	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Seed Cotton																		
Tons (%)	0.00	0.00	0.00	0.00	0.00	2.25	1.65	2.49	3.40	4.28	4.18	3.87	3.68	4.20	5.87	4.78	8.40	7.45
Cz$ (%)	0.00	0.00	0.00	0.00	0.00	3.08	3.31	5.66	6.89	9.13	8.01	7.72	8.36	7.85	8.80	9.34	15.48	10.59
Cotton (lint)																		
Tons (%)	3.88	4.41	5.95	4.97	4.00	4.33	1.65	2.71	3.93	3.85	2.53	1.70	1.70	1.62	2.18	0 94	3.85	1.96
Cz$ (%)	17.59	20.89	29.26	23.54	23.81	16.19	10.02	18.23	25.00	24.62	13.69	10.79	11.93	10.92	9.37	5.78	11.88	7.60
Rice																		
Tons (%)	46.53	35.16	38.18	59.38	18.81	15.23	25.88	17.06	13.75	12.32	13.63	9.88	11.74	14.88	12.37	23.87	34.37	30.37
Cz$ (%)	47.46	33.47	30.43	52.57	19.27	16.53	26.65	16.70	12.27	10.70	12.84	10.39	12.34	16.59	15.31	27.48	25.80	30.64
Beans																		
Tons (%)	0.78	1.48	1.78	0.81	0.94	1.26	0.12	0.61	2.87	2.03	0.24	0.94	1.93	0.55	1.21	1.66	1.31	1.07
Cz$ (%)	0.89	2.11	2.31	0.85	1.52	1.59	0.17	1.12	4.15	2.90	0.49	2.85	4.49	1.35	4.01	3.05	2.03	1.75
Maize																		
Tons (%)	27.10	14.88	15.93	30.07	24.52	14.89	16.58	19.83	9.34	16.22	13.88	26.98	20.60	16.47	22.98	20.97	16.13	17.80
Cz$ (%)	12.37	5.83	6.13	13.30	15.48	7.49	9.03	9.97	3.83	6.68	8.04	14.64	11.86	10.06	14.41	12.67	8.14	9.93
Soybeans																		
Tons (%)	12.66	33.83	35.62	0.33	46.36	53.91	42.66	47.05	41 85	40.22	46.42	40.77	44.83	49.27	39.52	39.11	27.79	41.35
Cz$ (%)	10.99	26.62	27.21	0.28	33.87	41.24	35.16	34.31	24.61	23.31	31.88	28.12	30.60	32.35	21.90	31.24	26.24	25.84
Others																		
Tons (%)	9.05	10.93	4.54	5.20	5.37	8.12	11.45	10.26	24.87	21.08	19.12	16.37	15.52	13.02	15.87	8.66	8.15	0.00
Cz$ (%)	10.70	11.09	4.67	9.86	6.05	13.91	15.66	14.05	23.25	22.46	26.27	25.48	20.43	20.88	26.21	10.43	10.44	13.63
Total																		
Tons (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100 00
Cz$ (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (Absolute Amounts)																		
Tons (000)	1,374	1,200	1,787	1,345	3,210	5,938	7,565	7,900	5,680	6,841	11,040	13,880	14,919	13,504	7,606	7,754	10,381	10,335
Cz$ (000)	397	485	977	877	2,620	7,894	11,519	17,470	18,328	29,634	82,157	212,449	437,417	670,998	943,024	6,595,827	23,579,536	46,705

Source: CFP.

TABLE A.3.3: DISTRIBUTION OF EQF CREDIT AND AQF PURCHASES BY PRODUCT, REGION AND STATE: 1986

(in %)

	SEED COTTON				COTTON LINT				RICE				BEANS			
	EQF (tons)	EQF (Cz$)	AQF (tons)	AQF (Cz$)	EQF (tons)	EQF (Cz$)	AQF (tons)	AQF (Cz$)	EQF (tons)	EQF (Cz$)	AQF (tons)	AQF (Cz$)	EQF (tons)	EQF (Cz$)	AQF (tons)	AQF (Cz$)
NORTH																
RO									0.08%	0.13%	4.37%	4.04%	0.00%	0.00%	0.02%	0.03%
AC									0.00%	0.00%	0.00%	0.00%				
AM									0.00%	0.00%	0.01%	0.00%				
R																
P	1.65%	1.76%			0.24%	0.51%										
AM																
NORTHEAST																
MA					0.02%	0.03%	0.00%	0.00%	0.70%	1.06%	3.16%	2.80%				
PI	0.86%	0.69%	0.00%	0.00%	0.03%	0.06%	0.00%	0.00%	0.08%	0.11%	0.21%	0.19%				
CE	1.84%	1.55%	0.00%	0.00%	1.10%	2.45%	1.29%	0.55%	0.02%	0.03%	0.05%	0.04%				
RN	0.62%	0.86%	0.00%	0.00%	0.05%	0.11%	0.39%	0.18%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
PA									0.19%	0.27%	1.57%	1.51%	0.01%	0.02%	0.74%	0.79%
PE	2.55%	2.86%	0.00%	0.00%	0.46%	1.02%	0.00%	0.00%	0.01%	0.01%	0.16%	0.15%				
AL	0.17%	0.20%	0.00%	0.00%	0.03%	0.07%	0.00%	0.00%								
PN																
SE	0.13%	0.14%	0.00%	0.00%	0.09%	0.20%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%				
BA	14.06%	14.86%	0.00%	0.00%	2.34%	5.09%	9.94%	11.70%	0.09%	0.13%	0.65%	0.51%	0.25%	0.26%	0.25%	0.17%
SOUTHEAST																
MG	9.30%	9.84%	0.00%	0.00%	32.15%	5.66%	5.15%	5.56%	4.07%	2.39%	4.78%	4.11%	0.29%	0.45%	0.13%	0.14%
ES													0.17%	0.26%	0.07%	0.07%
RJ					0.07%	0.14%	0.00%	0.00%	0.24%	0.34%	0.01%	0.01%				
SP	21.20%	22.99%	0.00%	0.00%	9.69%	20.33%	3.81%	3.72%	4.73%	2.04%	3.15%	2.92%	0.42%	0.65%	0.33%	0.35%
SOUTH																
PR	38.27%	34.24%	0.00%	0.00%	48.11%	62.81%	69.01%	67.11%	2.18%	1.08%	0.30%	0.27%	54.78%	44.61%	62.44%	59.87%
SC									2.64%	3.77%	0.48%	0.45%	40.69%	49.35%	34.15%	38.66%
RS					-				77.78%	78.29%	11.54%	11.01%	2.98%	3.91%	1.88%	1.92%
CENTER-WEST																
MS	3.62%	4.17%	0.00%	0.00%	3.19%	5.91%	9.10%	9.69%	1.07%	1.50%	5.73%	4.81%	0.01%	0.01%	0.13%	0.14%
MT	0.13%	0.14%	100.00%	100.00%					1.98%	2.62%	32.63%	39.61%				
GO	5.57%	5.90%	0.00%	0.00%	2.45%	5.60%	1.32%	1.47%	4.07%	5.93%	30.65%	27.39%	0.38%	0.47%	0.00%	0.00%
DF									0.04%	0.06%	0.01%	0.12%	0.01%	0.01%	0.00%	0.00%
TOTAL	871947	3849465329	94	415758	399430	2802246437	35983	502764742	3568291	6062458197	1774555	5168221711	135612	479252803	77166	354425924
PERCENTAGE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Continued on next page.

TABLE A.3.3: DISTRIBUTION OF EGF CREDIT AND AGF PURCHASES BY PRODUCT, REGION AND STATE: 1988

(in %)

	MAIZE				SOYBEANS				TOTAL PRODUCTS			
	EGF (tons)	EGF (Cz$)	AGF (tons)	AGF (Cz$)	EGF (tons)	EGF (Cz$)	AGF (tons)	AGF (Cz$)	EGF (tons)	EGF (Cz$)	AGF (tons)	AGF (Cz$)
NORTH												
RO	0.00%	0.00%	0.12%	0.12%	0.01%	0.01%	0.00%	0.00%	0.03%	0.04%	1.08%	1.41%
AC	0.01%	0.01%	0.00%	0.00%					0.00%	0.00%	0.00%	0.00%
AM									0.05%	0.15%	0.00%	0.00%
R									0.00%	0.01%	0.00%	0.00%
P									0.17%	0.36%	0.02%	0.13%
AM												
NORTHEAST												
MA	0.14%	0.19%	0.61%	0.64%	0.00%	0.00%	0.15%	0.16%	0.26%	0.29%	1.18%	1.38%
PI	0.01%	0.01%	0.21%	0.21%					0.09%	0.15%	0.26%	0.26%
CE	0.39%	0.42%	2.92%	2.08%	0.84%	0.80%	0.00%	0.00%	1.61%	2.44%	1.81%	1.23%
RN	0.00%	0.00%	0.22%	0.16%					0.14%	0.31%	0.17%	0.18%
PA	0.02%	0.01%	0.04%	0.04%					0.11%	0.20%	0.39%	0.55%
PE	0.11%	0.12%	3.13%	2.36%	1.34%	1.30%	0.00%	0.00%	0.67%	0.97%	1.82%	1.04%
AL	0.00%	0.00%	0.06%	0.06%					0.02%	0.04%	0.05%	0.02%
FN												
SE	0.00%	0.00%	0.00%	0.00%					0.05%	0.10%	0.00%	0.01%
BA	0.15%	0.17%	0.21%	0.22%	0.61%	0.60%	0.71%	0.71%	2.03%	3.55%	0.82%	1.24%
SOUTHEAST												
MG	15.42%	10.12%	3.49%	3.44%	6.80%	4.73%	4.99%	4.99%	8.16%	5.33%	3.87%	3.82%
ES	0.07%	0.07%	1.02%	0.39%					0.04%	0.03%	1.56%	0.53%
RJ	0.06%	0.07%	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.11%	0.16%	0.00%	0.01%
SP	17.23%	19.56%	13.37%	17.25%	16.47%	19.63%	0.00%	0.00%	12.62%	15.27%	9.31%	9.41%
SOUTH												
PR	49.44%	49.97%	10.96%	9.56%	21.86%	22.36%	0.01%	0.01%	22.01%	24.51%	6.18%	8.44%
SC	7.46%	8.49%	6.17%	11.16%	3.87%	3.96%	0.01%	0.00%	4.10%	4.20%	5.41%	5.65%
RS	2.00%	2.28%	14.54%	13.08%	21.69%	19.67%	0.02%	0.02%	35.30%	28.28%	10.87%	9.05%
CENTER-WEST												
MS	1.29%	1.45%	2.12%	1.99%	10.09%	10.14%	14.31%	14.22%	3.95%	4.65%	4.84%	5.10%
MT	0.80%	0.90%	3.26%	3.29%	6.56%	6.71%	65.92%	66.01%	2.66%	2.60%	19.20%	25.14%
GO	5.27%	5.99%	35.12%	33.65%	9.27%	9.40%	13.49%	13.47%	5.42%	6.15%	28.92%	25.32%
DF	0.12%	0.13%	0.00%	0.00%	0.59%	0.65%	0.00%	0.33%	0.21%	0.22%	0.05%	0.05%
TOTAL	1674980	1918644791	4271671	622500640	2885308	6186371626	1125807	2367382204	10381214	23579535967	7681558	15499224477
PERCENTAGE	100	100	100	100	100	100	100	100	100	100	100	100

Source: CFP.

TABLE A.8.4: QUANTITIES FINANCED UNDER EGF AS A PERCENTAGE OF PRODUCTION: 1970-1989

YEAR	COTTON	RICE	BEANS	MAIZE	SOYBEANS
1970	9.1	8.5	0.5	2.6	11.5
1971	7.7	6.4	0.7	1.2	19.3
1972	14.1	8.3	1.2	1.9	19.7
1973	9.8	10.1	0.2	2.8	n.a
1974	21.8	8.9	1.3	4.8	18.9
1975	56.5	11.7	3.3	5.4	33.2
1976	45.9	20.8	0.5	7.2	32.1
1977	47.9	15.5	2.1	8.3	32.9
1978	56.1	12.1	7.4	4.3	33.8
1979	71.5	12.2	6.4	7.2	33.2
1980	33.1	17.3	1.6	7.8	41.2
1981	72.3	20.3	5.5	18.1	44.9
1982	72.4	20.9	10.6	14.5	59.9
1983	81.2	28.1	4.5	12.3	50.0
1984	46.3	11.5	3.5	8.5	22.9
1985	21.9	20.6	5.3	7.6	17.9
1986	50.6	36.4	6.0	8.3	20.3
1987	32.0	29.7	5.3	6.9	25.0
1988	19.9	30.6	6.2	15.3	11.7
1989	6.3	17.3	3.4	14.2	4.4

Source: CFP and IBGE.

TABLE A.8.5: QUANTITIES PURCHASED UNDER AGF AS A PERCENTAGE OF PRODUCTION: 1970-1989

YEAR	COTTON	RICE	BEANS	MAIZE	SOYBEANS
1970	-	6.8	-	-	-
1971	-	-	0.3	-	-
1972	-	-	1.0	-	-
1973	0.1	-	-	-	-
1974	-	-	-	1.0	-
1975	10.8	-	1.7	0.6	-
1976	-	6.7	-	0.8	-
1977	-	18.3	0.3	7.8	-
1978	-	2.1	3.1	2.3	-
1979	-	1.4	0.5	0.4	-
1980	-	2.3	-	-	-
1981	2.4	9.7	0.8	0.3	-
1982	10.4	7.5	36.2	16.2	-
1983	4.3	6.5	10.2	7.4	-
1984	0.4	7.4	4.4	2.2	-
1985	51.2	16.2	23.7	13.6	12.1
1986	4.6	16.1	3.4	21.1	8.0
1987	1.9	28.1	2.7	29.5	5.0
1988	4.0	16.8	4.8	6.6	0.0
1989	0.2	7.5	0.0	4.0	0.0

Source: CFP and IBGE.

TABLE A.3.6: MINIMUM PRODUCER PRICES FOR MAJOR CROPS PURCHASED BY CFP BY REGION: 1967-89

	Unit	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
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											Cr$											Cz$			NCz$
IRRIGATED RICE	kg																							
Brazil										1.25	1.58	2.22	2.88	4.04	8.40	16.00	33.52	84.56	224.00	1000.00	2.60	5.22	34.10	0.25
DRY RICE	kg																							
Brazil			0.18	0.24	0.30	0.33	0.44	0.60	0.74	1.14	1.42	2.00	2.50	3.64	6.40	14.40	27.98	53.89	187.00	841.00	2.23	4.48	29.27	0.20
MAIZE	kg																							
North/Northeast						0.24	0.28	0.35	0.55	0.70	0.90	1.20	1.47	2.04	3.75	10.90	23.53	47.04	190.29	791.00	1.32	2.66	22.30	0.16
South/Sao Paulo							0.23	0.30	0.50	0.60	0.80	1.06	1.30	1.80	3.09	7.91	17.14	32.90	103.00	506.00	1.32	2.74	19.84	0.15
SOYBEAN	kg																							
North/Northeast								0.50	0.60	1.00	1.25	1.60	1.60	2.50	7.34	9.00	22.03	42.54	120.70	779.00	2.09	2.84	26.44	0.18
Center/South							0.41	0.50	0.60	1.00	1.25	1.60	1.67	2.50	7.34	11.00	22.03	42.54	120.70	779.00	2.09	2.84	26.44	0.18
BLACK BEANS	kg																							
North/Northeast						0.71	0.88	0.97	1.42	1.90	2.25	3.58	4.63	6.86	15.00	42.00	78.52	156.76	545.93	2580.00	4.27	10.65	76.30	0.59
Center/South			0.27	0.34	0.42	0.68	0.75	0.82	1.25	1.63	2.04	3.58	4.60	6.15	15.00	42.00	78.57	149.08	501.31	2098.00	4.87	10.65	76.30	0.59
SEED COTTON	kg																							
North/Northeast			0.37	0.45	0.54	0.77	1.00	1.09	1.78	2.60	3.50	6.00	7.54	10.16	17.90	52.00	98.99	179.03	661.62	2479.00	4.45	9.93	76.02	0.53
Center/South		0.40	0.47	0.59	0.71	1.01	1.01	1.14	1.63	2.34	3.03	5.20	6.68	9.00	18.46	31.68	63.87	125.74	445.20	1870.00	4.79	8.67	69.12	0.48

Note: Prices shown are for the month of July. Monthly prices for the crops shown and for others purchased by CFP are on file.

Source: CFP.

TABLE A.8.7: REAL MINIMUM PRICE TRENDS: 1972-1989

Year	MAIZE North/Northeast NCz$ /60 kg	MAIZE South/Sao Paulo NCz$ /60 kg	IRRIGATED RICE (paddy) Brazil NCz$ /50 kg	RAINFED RICE (paddy) Brazil NCz$ /60 kg	UNGINNED COTTON North/Northeast NCz$ /15 kg	SOYBEANS Center/South NCz$ /60 kg
1972	85.20	72.29	n.d.	141.40	71.87	127.78
1973	90.88	88.44	n.d.	162.72	74.20	137.85
1974	102.85	107.40	n.d.	162.65	87.12	130.10
1975	107.60	100.91	180.25	191.84	108.68	173.51
1976	97.73	94.09	159.55	172.16	92.94	148.53
1977	89.69	87.20	155.22	168.04	100.53	135.18
1978	82.51	78.16	146.80	154.90	104.49	114.96
1979	70.70	69.95	134.58	141.21	89.32	100.32
1980	57.41	58.92	138.45	127.91	69.83	137.97
1981	66.75	72.75	124.69	133.36	79.63	104.63
1982	81.88	81.83	133.30	134.12	88.03	105.41
1983	68.72	66.60	108.88	109.07	66.92	88.05
1984	65.89	62.55	112.84	113.04	58.93	73.66
1985	83.70	89.06	147.13	126.89	67.71	138.06
1986	79.58	93.41	153.38	156.47	65.27	147.76
1987	52.28	62.14	96.07	98.90	44.75	79.68
1988	46.17	55.77	81.75	84.19	39.51	72.51
1989	39.19	55.92	78.23	72.24	33.20	65.37

Notes: Corrected to Dec 1989 Cruzados Novos with IGP - DI Index.
Prices are annual averages of monthly data.

Source: CFP.

TABLE A.8.8: CFP SALES OF MAJOR CROPS: 1975-1989

YEAR	RICE		BEANS		MAIZE	
	Tons	Sale Price (Cz$/kg)	Tons	Sale Price (Cz$/kg)	Tons	Sale Price (Cz$/kg)
1975	4,821	--	5,974	--	185,642	--
1976	6,881	--	84,003	--	90,488	--
1977	--	--	--	--	100,000	--
1978	970,862	--	--	--	2,045,825	--
1979	768,940	--	39,097	--	1,799,880	--
1980	819,554	0.01788	88,846	0.04591	1,909,858	0.01049
1981	500,042	0.03040	0	0	1,148,042	0.01300
1982	792,196	0.03616	418,320	0.04263	2,501,814	0.02452
1983	784,434	0.09575	597,455	1.78570	1,588,640	0.10350
1984	446,025	0.17457	249,382	0.34448	480,745	0.17072
1985	1,285,896	--	360,215	--	2,847,895	--
1986	417,794	1.34000	273,585	1.67000	3,462,000	--
1987	1,140,603	5.90000	27,560	9.26000	4,688,786	8.78000
1988	1,052,736	58.60583	51,737	260.00000	1,406,467	84.18000
1989	824,417	0.39688 (*)	103,278	0.48288 (*)	1,219,975	0.28388 (*)

Source: CFP, Directoria de Operacoes, Superintendencia de Comercializacao.

(*) NCz$/kg

TABLE A.3.9: WHEAT PRODUCTION, IMPORTS, CONSUMPTION AND PRICES FOR PRODUCERS, MILLERS AND CONSUMERS: 1970-1987

YEAR	PRODUCTION (000 mt)	IMPORTS (000 mt)	CONSUMPTION (000 mt)	PRODUCER PRICE (Cr$/kg)	PRODUCER PRICE (Cz$/kg)	GOVT CONTROLLED PRICE TO MILLERS (Cr$/ton)	GOVT CONTROLLED PRICE TO MILLERS (Cz$/ton)	CONSUMER PRICE (FLOUR) (Cr$/ton)	CONSUMER PRICE (FLOUR) (Cz$/ton)
1970	1,097	1,937	3,034	0.5		410.0			
1971	1,681	1,527	3,208	0.5		483.8			
1972	1,375	2,000	3,375	0.6		556.4			
1973	786	3,011	3,797	0.7		612.0			
1974	1,951	2,165	4,116	1.0		734.0			
1975	2,137	2,300	4,437	1.5		NA			
1976	1,881	3,183	5,064	1.9		1,202.0			
1977	2,736	2,864	5,600	2.5		NA			
1978	1,650	4,200	5,850	3.5		1,563.0			
1979	2,928	3,780	6,708	4.7		NA			
1980	2,702	4,855	7,457	8.1		3,527.0			
1981	2,210	4,360	6,570	19.6		12,644.0		25.1	
1982	1,827	4,223	6,050	0.8		27,144.0		60.8	
1983	2,237	4,182	6,419	100.6		68,227.0		163.1	
1984	1,830	4,868	6,698	331.0		253,330.0			0.5
1985	4,323	4,041	8,364	1,393.0		747,603.0			1.5
1986	5,433	1,492	6,925		3.2		1,060.3		2.6
1987	4,653	2,749	7,402		6.1		7,800.9		10.6

Sources: SUNAB for production, imports and consumer prices; FGV for producer and miller prices.

TABLE A.3.10: DISTRIBUTION OF RURAL CREDIT BY FINANCING SOURCE: 1986-89

(in Cz$ million at current prices)

AGRICULTURE	1986					1987					
	Official (a)					Official (a)					
	Compulsory Applications	Government Resources	Subtotal	Other Credit (b)	TOTAL	Compulsory Applications	Government Resources	Rural Savings (c)	Total	Other Credit (b)	TOTAL
BANK OF BRAZIL											
Production	10,478	59,967	70,445		70,445	44,835	175,795	13,673	234,303	36,442	270,745
Investment	4,282	11,697	15,979		15,979	15,948	5,398	28,700	50,044	6,651	56,695
Marketing (d)	4,387	14,254	18,641		18,641	8,667	43,485	--	52,152	2,705	54,857
											0
OTHER FEDERAL BANKS											
Production	183	1,034	1,217		1,217	1,376	1,223	--	2,599	330	2,929
Investment	292	790	1,082		1,082	911	?,909	--	4,820	855	5,675
Marketing (d)	35	0	35		35	117	57	--	174	11	185
											0
OTHER BANKS											
Production	20,251	2,317	22,568		22,568	51,188	1,720	--	52,908	8,963	61,871
Investment	20,234	248	20,482		20,482	11,954	6,418	--	18,370	1,032	19,402
Marketing (d)	371	2,788	3,157		3,157	3,955	1,207	--	5,162	758	5,920
											0
TOTAL	60,513	93,098	153,606	33,174	186,780	138,951	239,208	42,373	420,532	57,747	478,279

(a) Credit at controlled interest rates.
(b) Credit at market interest rates. Includes commercial credit funded from bank sight deposits and rural savings deposits.
(c) Rural savings deposits were authorized starting in 1987.
(d) Includes the Government's stock financing program (EGF). In the case of marketing under BB, this total does not include the Government's crop purchase program (AGF) which, in the first instance, is a credit line (administered by BB) from the Government to the implementing agency (CFP).

(continued on next page)

TABLE A.8.10: DISTRIBUTION OF RURAL CREDIT BY FINANCING SOURCE: 1988-89

(Cz$ million at current prices)

Description	1988						1989					
	Official Credit (a)				Other Credit (b)	Total	Official Credit (a)				Other Credit (b)	Total
	Compulsory Applications	National Treasury	Rural Savings (c)	Subtotal			Compulsory Applications	National Treasury	Rural Savings (c)	Subtotal		
Banco do Brasil	518,086	742,525	844,070	1,604,681	506,458	2,111,139	1,393,295	10,342,952	403,164	12,139,411	4,641,792	16,781,203
- Production	304,493	268,966	278,899	940,358	363,988	1,304,346	825,509	2,065,884	251,632	3,163,025	4,207,587	7,370,612
- Investment	30,128	2,357	65,171	97,656	140,401	238,057	24,600	18,758	115,682	159,040	148,462	307,502
- Marketing (d)	93,465	473,202	0	566,667	2,069	568,736	543,186	8,238,310	35,850	8,817,346	235,743	9,053,089
Other Official Federal Banks	7,670	11,880	4,204	23,754	8,797	32,551	80,594	8,004	107,240	195,838	205,136	400,974
- Production	4,388	1,422	2,349	8,159	3,540	11,699	42,172	0	3,902	46,074	66,274	112,348
- Investment	2,706	9,704	1,855	14,265	4,844	19,109	38,422	8,004	107,240	195,838	205,136	400,974
- Marketing (d)	576	754	0	1,330	413	1,743	0	0	80	80	257	347
Other Financial Institutions	280,833	22,416	0	303,249	40,454	343,703	1,623,071	504,267	0	2,127,358	480,106	2,607,464
- Production	230,859	2,077	0	232,436	29,914	262,350	864,038	48,061	0	912,899	224,817	1,137,716
- Investment	28,407	13,059	0	41,466	6,604	48,070	473,933	267,593	0	741,526	232,747	974,273
- Marketing (d)	22,067	7,280	0	29,347	3,936	33,283	285,100	187,833	0	472,933	22,542	495,475
Total	806,589	776,821	848,274	1,931,684	555,709	2,487,393	3,096,960	10,855,243	510,404	14,462,607	5,277,034	19,789,641

(a) Credit at controlled interest rates.
(b) Credit at market interest rates. Includes commercial credit funded from bank sight deposits and rural savings deposits.
(c) Rural savings deposits were authorized entering in 1987.
(d) Includes the Government's stock financing program (EGF). In the case of marketing under BB, this total does not include the Government's crop purchase program (AGF) which, inthe first instance, is a credit line (administered by BB) from the Government to the implementing agency (CFP).

Source: Central Bank of Brazil (1988-87)
SEAE/MINIFAZ (1988-89)

TABLE A.8.11: RURAL CREDIT BY LENDING INSTITUTION AND ACTIVITY: 1988

Creditor	No. of Contracts	% of Total	Value (Cz$1000)	% of Total
Official Federal Banks	2,278,074	75.20	117,171,479	62.73
Crop Production	2,082,957	68.91	106,838,813	57.20
Livestock	190,117	6.28	10,331,666	5.53
Official State Banks	277,218	9.17	15,157,996	8.11
Crop Production	187,556	6.20	9,773,733	5.23
Livestock	89,662	2.96	5,384,263	2.88
Private Banks	321,194	10.62	47,753,044	25.56
Crop Production	220,351	7.29	26,509,364	14.19
Livestock	100,843	3.33	21,243,680	11.37
Savings Banks	38,184	1.26	1,775,387	0.95
Crop Production	30,405	1.00	1,243,818	0.66
Livestock	7,779	0.26	531,570	0.28
Rural Credit Cooperatives	112,934	3.73	4,922,179	2.63
Crop Production	98,669	3.26	4,145,628	2.21
Livestock	14,265	0.47	776,556	0.41

Source: Central Bank of Brazil - DERUR.

TABLE A.8.12: CHANGES IN COMPULSORY APPLICATIONS OF COMMERCIAL BANK SIGHT DEPOSITS AT REGULATED RATES OF INTEREST: 1967-1990

Effective Date	Resolution	Requirement
October/67	Res. 69	10% of net sight deposits
August/73	Res.260	15% of net sight deposits
June/79	Res. 556	17% of net sight deposits
January/80	Res. 556	15% of net sight deposits
January/81	Res. 671	20% of net sight deposits
July/81	Res. 698	25% of net sight deposits
September/82	Res. 754	25% of net sight deposits plus 10% of credit transactions subject to ceiling
January/83	Res. 783	45% of credit transactions subject to ceiling
January/83	Res. 793	45% of credit transactions subject to ceiling or 100% of net sight deposits, whichever is smaller.
April/84	Res. 904	10-55% (six steps) of net sight deposits depending on the volume of the bank's credit operations.
May/86	Cir. 1030	30% of net sight deposits for large banks; 20% for medium banks; and 10% for small banks.
July/87	Res. 1349	60% of net sight deposits for banks; 40% for medium banks; 20% for small banks.
September/88	Cir. 1354	90% (including 30% at market interest rates) of net sight deposits for large banks; 60% (including 20% at market interest rates) for medium banks; and 30% (including 10% at market interest rates) for small banks.
September/89	Res. 1644	100% (including 40% at market interest rates) of net sight deposits for large banks; 70% (including 30% at market interest rates) for medium banks; and 30% (including 10% at market interest rates) for small banks.
April/90	Res.1702	25% of gross sight deposits; up to 40% of deposits compulsorily applied can be at market interest rates.

Source: 1967-1988: Table 15 of "The Rural Credit Policy of Brazil", a paper prepared by IBMEC, November 1988.
1984-90: Central Bank of Brazil Resolutions and Circulars.

TABLE A.3.13: RURAL SAVINGS DEPOSITS ("CADERNETA DE POUPANCA RURAL") WITH THE BANK OF BRAZIL: 1988

Region	Balance as of Nov/88 (Cz$1,000)	Percentage of Total
NORTH	44,214,468	2.02
Porto Velho	9,885,881	0.48
Rio Branco	3,300,626	0.15
Manaus	8,878,006	0.41
Belem	22,652.455	1.04
NORTHEAST	319,156,620	14.61
Sao Luiz	19,741,572	0.90
Teresina	13,835,245	0.63
Fortaleza	39,826,353	1.82
Natal	17,004,337	0.78
Joao Pessoa	23,492,455	1.08
Recife	57,540,458	2.63
Maceio	18,405,263	0.84
Aracaju	16,854,535	0.77
Salvador	74,253,311	3.40
Vitoria da Conquista	38,202,991	1.75
SOUTHEAST	1,068,674,493	48.91
Belo Horizonte	140,317,754	6.42
Montes Claros	29,535,401	1.35
Uberlandia	57,598,624	2.64
Varginha	58,160,430	2.66
Vitoria	45,826,039	2.10
Rio de Janeiro	262,298,905	12.00
Sao Paulo	259,631,523	11.88
Bauru	88,451,293	3.96
Ribeirao Preto	128,866,524	5.90
SOUTH	558,189,978	25.55
Curitiba	96,067,027	4.40
Londrina	86,043,143	3.94
Florianopolis	97,836,148	4.48
Porto Alegre	150,830,190	6.90
Santa Maria	127,412,670	5.83
CENTER-WEST	194,792,353	8.91
Campo Grande	61,048,229	1.42
Cuiaba	26,069,030	1.19
Goiania	73,512,860	3.36
Brasilia	64,162,234	2.94
T O T A L	2,185,027,912	100.00

Source: Bank of Brazil.

TABLE A.8.14: EVOLUTION OF INTEREST RATES ON OFFICIAL RURAL CREDIT: 1985-1989

TYPE OF CREDIT	Resolution No. 878 effective 12/20/85			Res. No. 1074 of 12/20/85 effective 1/86	Res. No. 1080 of 1/22/86	Res. No. 1109 of 6/6/86	Res. No. 1181 of 5/15/86	Res. No. 1288 effective 8/1/87	Res. No. 1350 effective 7/1/87	Res. Nos. 1576 and 1577 of 2/2/89 (a)
	until 6/84	from 7/84 to 12/89	1985							
PRODUCTION								*	***	****
Mini/Small Producer										
Areas SUDAM/SUDENE	(70%CM+3) 158.70	(80%CM+3) 176.20	(85%CM+3) 189.00	(50%CM+3)	85%CM+3	8.00	8.00	100%CM+3	100%CM+3	100%CM+12
Other Regions	(100%CM+3) 218.80	(100%CM+3) 218.80	228.80	100%CM+3	100%CM+3	8.00	10.00	100%CM+10	100%CM+7	100%CM+12
Medium Producer										
Areas SUDAM/SUDENE								100%CM+6		
Other Regions								100%CM+10		
Other Producers										
Areas SUDAM/SUDENE	(70%CM+3) 158.70	(85%CM+3) 176.20	(85%CM+3) 189.00	85%CM+3	65%CM+3	8.00	8.00	100%CM+8	100%CM+8	100%CM+12
Other Regions	(100%CM+3) 218.80	(100%CM+3) 218.80	(100%CM+3) 228.80	100%CM+3	100%CM+3	8.00	10.00	100%CM+10	100%CM+10	100%CM+12
INVESTMENT								**	***	****
Mini/Small Producer										
Areas SUDAM/SUDENE	(70%CM+3) 158.70	(85%CM+3) 176.20	(85%CM+3) 189.00	85%CM+3	85%CM+3	8.00	8.00	100%CM+3	100%CM+3	100%CM+12
Other Regions	(100%CM+3) 218.80	(100%CM+3) 218.80	(100%CM+3) 228.80	100%CM+3	100%CM+3	8.00	10.00	100%CM+6	100%CM+7	100%CM+12
Other Producers										
Areas SUDAM/SUDENE	(70%CM+3) 158.70	(80%CM+3) 176.20	(85%CM+3) 189.00	85%CM+3	65%CM+3	8.00	8.00	100%CM+3	100%CM+3	100%CM+12
Other Regions	(100%CM+3) 218.80	(100%CM+3) 218.80	(100%CM+3) 228.80	100%CM+3	100%CM+3	8.00	10.00	100%CM+6	100%CM+7	100%CM+12
MARKETING								*	***	****
Mini/Small Producer										
Areas SUDAM/SUDENE	(70%CM+3) 158.70	(80%CM+3) 176.20	(85%CM+3) 189.00	85%CM+3	85%CM+3	8.00	8.00	100%CM+10	100%CM+7	100%CM+12
Other Regions	(100%CM+3) 218.80	(100%CM+3) 218.80	(100%CM+3) 228.80	100%CM+3	100%CM+3	8.00	10.00	100%CM+10	100%CM+7	100%CM+12
Medium Producer										
Areas SUDAM/SUDENE							8.00			
Other Regions							10.00			
Other Producers										
Areas SUDAM/SUDENE	(70%CM+3) 158.70	(80%CM+3) 176.20	(85%CM+3) 189.00	85%CM+3	85%CM+3	8.00	8.00	100%CM+10	100%CM+7	100%CM+12
Other Regions	(100%CM+3) 218.80	(100%CM+3) 218.80	(100%CM+3) 228.80	100%CM+3	100%CM+3	8.00	10.00	100%CM+10	100%CM+7	100%CM+12

* Monetary correction based on the lower one of the following indices: LBC: yield on Central Bank bills (LBCs) and IPR: Index of Prices Received by Farmers.
** Monetary correction based on the index used for correcting rural savings deposits (which was the OTN).
*** Monetary correction based on the OTN.
**** Monetary correction based on the IPC.
(a) Resolution No. 1576 allowed the interest rate on official rural credit through compulsory applications of deposits to be freely negotiated up to 12% + IPC. Resolution 1577 established an interest rate of 12% + IPC during the period January-June 1989 for official rural credit directly funded by the Government. The BTN, which was created in June 1989, has replaced the IPC as the index of monetary correction.

Source: 1985-1986: Table 2 "Comentarios Sobre o Credito Rural no Brasil e Sua Evolucao Recente", CFP (Special Studies, Vol. 21, September 1987)
1987-1989: Central Bank of Brazil Resolutions.

TABLE A.8.16: NOMINAL INTEREST RATES ON DIFFERENT RURAL CREDIT LINES: 1969-1986

(In percent per year)

	IGP/DI	Average Interest Rate				
	(Dec/Dec)	Production	Investment	Marketing	Fertilizers	Inputs
1969	20.2	16.0	16.0	16.0	16.0	16.0
1970	19.2	17.0	17.0	17.0	7.0	7.0
1971	19.8	17.0	17.0	17.0	7.0	7.0
1972	15.5	15.0	17.0	15.0	7.0	7.0
1973	15.7	15.0	15.0	15.0	7.0	7.0
1974	34.5	15.0	15.0	15.0	7.0	7.0
1975	29.4	15.0	15.0	15.0	15.0	0.0
1976	46.2	15.0	15.0	15.0	15.0	0.0
1977	38.8	15.0	18.0(b)	18.0	0.0	15.0
1978	40.8	15.0	18.0(b)	18.0	0.0	15.0
1979	77.2	15.0	21.0(c)	21.0(b)	0.0	15.0
1980	110.3	38.0(d)	38.0(d)	29.0(d)	0.0	38.0(d)
1981	95.2	45.0	45.0	45.0	45.0	45.0
1982	99.7	45.0	71.9(d)	45.0	45.0	45.0
1983	211.0	117.3(e)	181.6(e)	117.3(e)	117.3(e)	117.3(e)
1984	223.8	226.8	226.8	226.8	226.8	226.8
1985	235.1	230.6	230.6	230.6	230.6	230.6
1986	65.0	6.5(f)	6.5(f)	6.5(f)	6.5(f)	6.5(f)

Source: Central Bank of Brazil - Resolutions and Circulars.

(a) The above interest rates are for medium size farmers in the Center-South Region.
(b) Interest rate for operations ranging from 1,000-5,000 MVR.
(c) Interest rate for operations ranging from 1,000-5,000 MVR with 70%-80% as first parcel limit.
(d) Equivalent to the nominal interest rate + monetary correction (60%, 70%, and 80% respectively of variation in the ORTN in the prior period (Dec/Dec for production, investment and marketing loans).
(e) Annual average interest rates (Resolution Nos. 788 and 827).
(f) Annual average interest rates (Resolution Nos. 1109 and 1131).

TABLE A.3.16: REAL INTEREST RATES ON DIFFERENT RURAL CREDIT LINES : 1969-1986
(in percent per year)

	Production	Investment	Marketing	Fertilizer	Other Inputs
1969	-1.8	-1.8	-1.8	-1.8	-1.8
1970	-1.9	-1.9	-1.9	-10.2	-10.2
1971	-2.3	-2.3	-2.3	-10.7	-10.7
1972	-0.4	-0.4	-0.4	-7.4	-7.4
1973	-0.6	-0.6	-0.6	-7.5	-7.5
1974	-14.5	-14.5	-14.5	-20.5	-20.5
1975	-11.1	-11.1	-11.1	-11.1(a)	-22.7
1976	-21.3	-21.3	-21.3	-21.3(a)	-31.6
1977	-17.2	-15.0	-15.0	-28.0	-17.2
1978	-18.3	-16.2	-16.2	-29.0	-18.3
1979	-35.1	-31.7	-31.7	-43.6	-35.1
1980	-36.8	-34.4	-38.7	-52.7	-36.8
1981	-25.7	-25.7	-25.7	-25.7	-25.7
1982	-27.4	-13.9	-27.4	-27.4	-27.4
1983	-30.1	-9.5	-30.1	-30.1	-30.1
1984	0.9	0.9	0.9	0.9	0.9
1985	-1.3	-1.3	-1.3	-1.3	-1.3
1986	-35.5	-35.5	-35.5	-35.5	-35.5

(a) Excludes the 40% subsidy on fertilizer values.

Source: Derived from Table A.3.15 as follows:
$r = (j-i)/(1+i)$
where r is the real annual interest rate
j is the nominal annual interest rate
i is the inflation rate (measured by the IGP-DI).

TABLE A.8.17 : ANNUAL SUBSIDY RATE PER CRUZADO OF RURAL CREDIT BY TYPE OF CREDIT: 1969-1986

	Production		Investment		Marketing		Fertilizer		Other Inputs	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1969	0.0135	0.0970	0.0135	0.1272	0.0135	0.0884	0.0135	0.0970	0.0135	0.0970
1970	0.0143	0.0978	0.0143	0.1282	0.0143	0.0887	0.0775	0.1562	0.0775	0.1562
1971	0.0173	0.1007	0.0173	0.1320	0.0173	0.0848	0.0814	0.1590	0.0814	0.1590
1972	0.0080	0.0905	0.0080	0.1188	0.0080	0.0811	0.0560	0.1384	0.0560	0.1384
1973	0.0045	0.0915	0.0045	0.1201	0.0045	0.0815	0.0568	0.1393	0.0568	0.1393
1974	0.1109	0.1786	0.1109	0.2308	0.1109	0.0835	0.1581	0.2219	0.1581	0.2219
1975	0.0845	0.1574	0.0845	0.2042	0.0845	0.0555	0.0845	0.1574	0.1756	0.2413
1976	0.1644	0.2238	0.2130	0.2866	0.0581	0.0810	0.1644	0.2238	0.2479	0.3010
1977	0.1320	0.1959	0.1500	0.2328	0.0398	0.0641	0.2184	0.2759	0.1320	0.1959
1978	0.1407	0.2037	0.1620	0.2426	0.0432	0.0671	0.2265	0.2829	0.1407	0.2037
1979	0.2769	0.3197	0.3170	0.3704	0.0909	0.1092	0.3492	0.3874	0.2769	0.3197
1980	0.2912	0.3263	0.3440	0.3872	0.1152	0.1300	0.4278	0.4561	0.2912	0.3263
1981	0.1997	0.2431	0.2570	0.3102	0.0716	0.0887	0.1997	0.2431	0.1997	0.2431
1982	0.2135	0.2550	0.1390	0.1993	0.0769	0.0935	0.2135	0.2550	0.2135	0.2550
1983	0.2355	0.2448	0.0950	0.1089	0.0856	0.0894	0.2355	0.2448	0.2355	0.2448
1984	-0.0067	0.0267	-0.0090	0.0354	-0.0022	0.0090	-0.0067	0.0267	-0.0067	0.0267
1985	0.0098	0.0421	0.0130	0.0557	0.0033	0.0142	0.0098	0.0421	0.0098	0.0421
1986	0.2803	0.3254	0.3550	0.4083	0.1038	0.0123	0.2803	0.3254	0.2803	0.3254

Note: (1) Columns designated (a) are from Ricardo Shirota, Credito Rural no Brasil: Subsidio, Distribuicao e Fatores Associados a Oferta, unpublished M. thesis submitted to USP/ESALQ, 1988. They were derived on the basis of the following equation:

$$S_i = \{[(1+r_i)^{1/12}]^{n_i} - 1\}$$

where S_i = annual subsidy rate for the i^{th} credit type;
r_i = real interest rate for the i^{th} credit type, i.e., $r_i = \frac{i - j}{(1+j)}$ where i is the the nominal rate and j is the inflation rate as measured by the IGP-DI (see Table A.8.16);
n_i = average maturity in months of the i^{th} credit type.

(2) Columns designated (b) were computed based on the same equation as above, except that r_i takes into account an assumed opportunity cost of funds (P) of 15 percent.

$$r_i = \frac{i - j - P}{(1 + j + P)}$$

TABLE A.8.18 : ESTIMATES OF IMPLICIT CREDIT SUBSIDIES BY TYPE OF CREDIT: 1969-86

	Production		Investment		Marketing		Fertilizer		Other Inputs		T O T A L	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1969	296.8	2,124	238.4	1,685	54.4	401	162.8	0	0.0	0	589.0	4,209
1970	357.8	2,446	289.8	1,952	75.6	534	0.0	0	0.0	0	722.8	4,932
1971	487.9	2,839	439.7	2,523	101.4	609	0.0	0	0.0	0	1,029.0	5,971
1972	100.4	3,028	106.8	3,158	20.4	632	0.0	0	0.0	0	227.1	6,818
1973	216.1	4,432	225.2	4,507	41.8	885	0.0	0	0.0	0	484.6	9,804
1974	3,961.8	6,382	6,156.6	9,800	1,330.9	2,201	3,175.6	4,458	1,158.5	1,626	15,787.0	24,467
1975	4,537.6	8,456	7,103.8	13,088	1,479.4	2,833	2,132.9	3,788	2,102.3	2,889	17,256.9	31,034
1976	8,032.4	10,982	14,478.5	19,481	3,093.2	4,311	3,899.4	5,807	3,947.9	4,794	33,451.3	44,926
1977	7,419.3	11,012	6,812.3	10,573	2,120.9	3,414	4,253.8	5,874	1,694.0	2,514	22,300.2	32,887
1978	8,058.8	11,671	7,702.1	11,534	2,249.4	3,492	4,488.6	5,605	1,924.3	2,787	24,423.1	35,089
1979	20,659.9	28,851	16,787.3	21,952	5,331.7	6,404	9,566.9	10,614	4,794.8	5,536	59,140.9	68,357
1980	20,418.8	22,882	14,638.2	16,477	6,441.6	7,272	17,000.9	18,124	5,385.5	6,035	63,885.3	70,790
1981	14,599.3	17,770	7,815.4	9,433	3,646.7	4,519	4,816.1	5,882	3,629.4	4,418	34,506.8	42,003
1982	26,165.3	31,252	3,473.3	4,980	3,306.6	4,019	0.0	0	0.0	0	32,945.9	40,251
1983	21,062.8	21,891	2,281.1	2,615	2,601.9	2,716	0.0	0	0.0	0	25,945.9	27,223
1984	(417.5)	1,653	(97.3)	383	(33.9)	136	0.0	0	0.0	0	(548.7)	2,172
1985	869.9	3,750	211.1	904	211.1	288	0.0	0	0.0	0	1,146.1	4,938
1986	29,285.3	34,001	21,248.9	24,489	21,248.9	2,757	0.0	0	0.0	0	52,883.7	61,198

Note: Columns designated (a) are from Ricardo Shirota, "Credito Rural no Brasil: Subsidio, Distribuicao e Fatores Associados e Oferta," unpublished M.A. thesis submitted to USP/ESALQ, 1988.
Columns designated (b) were derived by multiplying the amounts of the various credit types (at 1986 prices) by the respective annual subsidy rates shown in columns designated (b) in Table A.8.17.

TABLE A.8.19: RURAL CREDIT PROVIDED TO CROP PRODUCERS BY TYPE OF CREDIT: 1970-1987

(In Cz$1000 at current prices)

	Production Credit			Investment Credit			Marketing Credit			T o t a l			Percent of
	Number of Contracts	Average Value of Contract	Credit (Cz$1000)	Number of Contracts	Average Value of Contract	Credit (Cz$1000)	Number of Contracts	Average Value of Contract	Credit (Cz$1000)	Number of Contracts	Average Value of Contract	Credit (Cz$1000)	Total Rural Credit
1970	580,881	0.01	3,604	137,695	0.01	1,137	150,358	0.01	1,899	869,734	0.01	6,640	72.31
1971	619,738	0.01	4,667	174,207	0.01	1,811	123,213	0.02	2,532	917,158	0.01	9,210	71.98
1972	611,979	0.01	6,755	192,159	0.02	3,863	117,426	0.03	3,819	921,564	0.01	13,437	72.28
1973	692,467	0.02	11,163	227,248	0.02	4,820	105,674	0.05	5,271	1,025,389	0.02	21,273	70.31
1974	694,510	0.03	18,821	237,466	0.03	7,496	134,031	0.06	8,483	1,066,007	0.03	34,800	72.10
1975	855.722	0.04	30,611	296,468	0.05	15,727	137,488	0.12	17,126	1,289,678	0.05	63,464	70.52
1976	901,327	0.05	46,988	286,645	0.08	21,700	132,192	0.18	24,252	1,320,164	0.07	92,941	71.38
1977	866,043	0.08	68,206	256,757	0.10	25,825	144,379	0.24	35,154	1,267,179	0.10	129,155	77.90
1978	948,470	0.10	91,894	271,595	0.12	31,670	116,680	0.36	42,213	1,331,745	0.12	165,777	73.21
1979	1,188,804	0.16	195,791	343,968	0.17	57,636	138,045	0.53	73,215	1,668,817	0.20	326,642	72.78
1980	1,669,739	0.26	439,428	316,369	0.32	100,322	132,164	1.21	159,408	2,118,272	0.33	699,158	81.37
1981	1,782,687	0.47	834,813	278,684	0.59	163,418	104,332	3.25	339,548	2,165,703	0.62	1,337,778	85.54
1982	1,650,891	1.05	1,731,674	317,806	0.77	243,347	87,012	6.38	555,208	2,055,709	1.23	2,530,229	85.47
1983	1,581,325	2.09	3,302,890	514,618	1.38	708,938	70,914	14.06	998,504	2,117,057	2.32	4,910,333	86.33
1984	1,122,130	6.57	7,371,818	190,467	4.97	946,811	43,155	36.46	1,574,463	1,355,752	7.30	9,893,068	88.82
1985	1,721,356	20.12	34,635,758	247,903	18.33	4,544,695	42,620	191.62	8,166,830	2,011,879	23.53	47,347,313	91.57
1986	2,165,163	43.92	95,102,457	428,232	72.48	31,038,747	28,653	839.29	22,369,647	2,620,048	56.68	148,510,850	79.51
1987	2,122,812	143.96	305,596,983	228,234	235.70	53,793,782	44,868	1346.86	60,430,941	2,395,914	175.22	419,821,707	87.78

Source: Central Bank of Brazil - DERUR.

TABLE A.3.20: REAL RURAL CREDIT PROVIDED TO CROP PRODUCERS BY TYPE OF CREDIT: 1970-1987

(Cz$1000 at 1985 prices)

	Production Credit			Investment Credit			Marketing Credit			T O T A L			% of Total Rural Credit
	Number of Contracts	Average Value of Contract	Credit (Cz$1000 of 1985)	Number of Contracts	Average Value of Contract	Credit (Cz$1000 of 1985)	Number of Contracts	Average Value of Contract	Credit (Cz$1000 of 1985)	Number of Contracts	Average Value of Contract	Credit (Cz$1000 of 1985)	
1970	560,681	15.53	9,091,834	137,695	20.70	2,850,366	150,358	31.65	4,758,609	848,734	19.15	16,640,308	72.31
1971	619,739	16.35	10,135,778	174,207	21.65	3,771,642	123,213	42.79	5,272,056	917,158	20.91	19,179,476	71.98
1972	611,979	19.60	11,992,196	192,159	31.07	5,969,972	117,426	50.18	5,892,889	921,564	25.89	23,854,987	72.23
1973	692,487	24.95	17,275,317	227,248	32.76	7,445,384	105,674	77.05	8,142,014	1,025,389	32.05	32,862,714	70.31
1974	694,510	32.53	22,595,733	237,466	37.90	8,999,799	134,031	75.99	10,184,850	1,066,007	39.19	41,780,382	72.10
1975	855,722	33.58	28,733,448	296,463	49.80	14,762,498	137,488	116.92	16,075,613	1,289,673	46.19	59,571,558	70.52
1976	901,327	34.65	31,231,810	286,645	50.32	14,423,628	132,192	121.94	16,119,993	1,320,164	46.79	61,775,431	71.38
1977	866,043	36.69	31,778,684	256,757	46.86	12,032,316	144,379	113.44	16,378,740	1,267,179	47.50	60,189,740	77.90
1978	943,470	32.71	30,864,854	271,595	39.17	10,637,074	116,690	121.51	14,178,327	1,331,745	41.81	55,680,255	78.21
1979	1,186,804	35.99	42,715,623	343,968	36.56	12,574,471	138,045	115.71	15,973,171	1,668,817	42.70	71,263,265	72.78
1980	1,669,739	28.68	47,884,656	316,369	34.55	10,932,080	132,164	131.43	17,370,781	2,118,272	35.97	76,187,517	81.37
1981	1,782,687	24.32	43,347,095	278,684	30.45	8,485,348	104,332	168.99	17,630,780	2,165,703	32.07	69,463,224	85.54
1982	1,650,891	27.86	46,001,795	317,806	20.34	6,464,508	87,012	169.51	14,749,065	2,055,709	32.70	67,215,367	85.47
1983	1,531,325	21.63	33,128,287	514,813	14.37	7,399,127	70,914	146.98	10,421,304	2,117,057	24.21	51,248,717	86.33
1984	1,122,130	21.39	23,996,824	190,467	16.18	3,082,073	43,155	118.78	5,125,213	1,355,752	23.75	32,204,110	68.82
1985	1,721,356	20.12	34,635,788	247,908	18.33	4,544,695	42,620	191.62	8,166,830	2,011,879	23.58	47,347,313	91.57
1986	2,165,163	18.13	39,257,782	428,232	29.92	12,812,628	26,653	346.46	9,234,070	2,620,048	23.40	61,304,480	79.51
1987	2,122,812	18.29	38,833,037	228,234	29.95	6,835,722	44,868	171.15	7,679,123	2,395,914	22.27	53,347,882	87.78

Source: Central Bank of Brazil - DERUR.

TABLE A.3.21: RURAL CREDIT PROVIDED TO LIVESTOCK PRODUCERS BY TYPE OF CREDIT: 1970-87

(Cz$1000 at current prices)

	Production Credit			Investment Credit			Marketing Credit			TOTAL			% of Total Rural Credit
	Number of Contracts	Average Value of Contracts	Credit Cz$1000	Number of Contracts	Average Value of Contracts	Credit Cz$1000	Number of Contracts	Average Value of Contracts	Credit Cz$1000	Number of Contracts	Average Value of Contracts	Credit Cz$1000	
1970	63,223	0.01	507	142,962	0.01	1,345	108,321	0.01	690	314,506	0.01	2,543	27.69
1971	65,811	0.01	712	155,450	0.01	1,951	112,599	0.01	925	333,860	0.01	3,589	28.04
1972	75,034	0.01	996	156,313	0.02	2,790	110,716	0.01	1,380	342,063	0.02	5,166	27.77
1973	77,968	0.02	1,744	179,489	0.03	5,186	114,771	0.02	2,055	372,228	0.02	8,985	29.69
1974	94,962	0.03	2,911	171,573	0.04	7,114	117,854	0.03	3,441	384,389	0.04	13,465	27.90
1975	220,823	0.04	8,837	202,224	0.06	12,397	143,411	0.04	5,302	566,458	0.05	26,536	29.48
1976	157,895	0.05	7,962	179,351	0.11	20,511	174,797	0.05	8,795	512,043	0.07	37,268	28.62
1977	145,323	0.07	10,215	119,067	0.12	14,406	190,194	0.06	12,036	454,584	0.08	36,658	22.10
1978	160,054	0.10	16,095	164,951	0.15	24,881	238,773	0.08	19,689	563,778	0.11	60,664	26.79
1979	188,613	0.16	29,943	216,974	0.25	54,489	297,061	0.13	37,738	704,668	0.17	122,169	17.22
1980	206,745	0.23	46,756	187,019	0.33	60,859	254,025	0.21	52,468	647,789	0.25	160,084	18.63
1981	161,673	0.51	82,395	155,952	0.50	78,817	129,581	0.51	65,459	447,206	0.51	226,171	14.46
1982	174,857	0.99	172,567	170,361	0.85	144,898	203,163	0.55	112,615	548,381	0.78	430,080	14.53
1983	138,988	2.40	333,643	125,570	1.92	240,672	88,534	2.29	203,041	353,092	2.20	777,356	13.67
1984	72,012	6.66	479,500	77,392	5.48	424,074	80,263	4.26	341,971	229,667	5.42	1,245,545	11.18
1985	83,588	25.47	2,128,960	175,658	12.28	2,156,501	191	379.21	72,429	259,437	16.80	4,357,891	8.43
1986	97,666	98.12	9,887,341	304,690	94.52	28,816,958	110	590.37	64,941	402,666	95.04	38,269,235	20.49
1987	119,114	251.42	29,947,495	144,973	192.99	27,978,391	196	2710.93	531,342	264,283	221.19	58,457,227	12.22

Source: Central Bank of Brazil - DERUR.

TABLE A.3.22: REAL RURAL CREDIT PROVIDED TO LIVESTOCK PRODUCERS BY TYPE OF CREDIT: 1970-87

(Cz$1000 at 1985 prices)

	Production Credit			Investment Credit			Marketing Credit			T O T A L			% of Total
	Number of Contracts	Average Value of Contract	Credit Cz$1000	Number of Contracts	Average Value of Contract	Credit Cz$1000	Number of Contracts	Average Value of Contract	Credit Cz$1000	Number of Contracts	Average Value of Contract	Credit Cz$1000	Rural Credit
1970	63,223	20.11	1,271,656	142,962	23.57	3,369,499	108,321	15.97	1,730,208	314,506	20.26	6,371,363	27.69
1971	65,811	22.54	1,483,519	155,450	26.13	4,062,515	112,599	17.11	1,926,294	333,860	22.38	7,472,329	28.04
1972	75,034	23.56	1,768,072	156,318	31.68	4,952,455	110,716	22.13	2,450,048	342,068	26.81	9,170,575	27.77
1973	77,968	34.55	2,693,907	179,489	44.64	8,011,521	114,771	27.66	3,174,550	372,228	37.29	13,879,978	29.69
1974	94,962	36.60	3,494,854	171,573	49.78	8,540,701	117,654	35.05	4,131,155	384,389	42.06	16,166,211	27.90
1975	220,623	37.56	8,294,516	202,224	57.54	11,636,654	143,411	34.70	4,977,038	566,459	43.97	24,908,407	29.48
1976	157,695	33.52	5,292,397	179,351	76.01	13,632,912	174,797	33.44	5,845,783	512,043	48.38	24,771,092	28.62
1977	145,323	32.75	4,759,167	119,067	56.38	6,712,605	190,194	29.48	5,607,697	454,584	37.57	17,079,668	22.10
1978	160,054	33.77	5,405,819	164,951	50.66	8,356,795	238,773	27.70	6,612,917	563,778	36.14	20,375,531	26.79
1979	188,613	34.64	6,532,653	218,974	54.29	11,887,727	297,081	27.71	8,233,220	704,668	37.82	26,653,600	27.22
1980	208,745	24.64	5,068,063	187,019	35.48	6,631,868	254,025	22.51	5,717,505	647,789	26.93	17,444,436	18.63
1981	161,673	26.46	4,278,281	155,952	26.08	4,066,580	129,581	26.23	3,398,926	447,206	26.26	11,743,787	14.46
1982	174,857	26.22	4,584,225	170,361	22.59	3,849,214	208,163	14.73	2,991,619	548,381	20.83	11,425,058	14.53
1983	138,988	25.05	3,482,204	125,570	20.00	2,511,875	88,534	23.94	2,119,121	353,092	22.98	8,113,200	13.67
1984	72,012	21.66	1,560,675	77,392	17.84	1,380,453	80,263	13.87	1,113,189	229,667	17.05	4,054,316	11.18
1985	83,588	25.47	2,128,960	175,658	12.28	2,156,501	191	379.21	72,429	259,437	16.80	4,357,891	8.43
1986	97,666	39.68	3,875,044	304,890	39.02	11,895,483	110	243.70	26,807	402,666	39.23	15,797,334	20.49
1987	119,114	31.95	3,805,509	144,973	24.52	3,555,290	196	344.48	67,519	264,283	28.11	7,428,318	12.22

Source: Central Bank of Brazil - DERUR.

TABLE A.3.23: DISTRIBUTION OF RURAL CREDIT BY TYPE AND USE: 1970-1988

(%)

	Production Credit			Investment Credit			Marketing Credit			Total Credit		
	Crop	Livestock	Total	Crop	Livestock	Total	Crop	Livestock	Total	Crop	Livestock	Total
1970	39.25	5.53	44.77	12.39	14.64	27.03	20.68	7.52	28.20	72.31	27.69	100.00
1971	38.03	5.57	43.60	14.15	15.24	29.39	19.78	7.23	27.01	71.96	29.04	100.00
1972	36.31	5.35	41.67	18.08	15.00	33.07	17.64	7.42	25.26	72.23	27.77	100.00
1973	36.96	5.76	42 72	15.93	17.14	33.07	17.42	6.79	24.21	70.31	29.69	100.00
1974	38.99	6.03	45.02	15.53	14.74	30.27	17.58	7.13	24.71	72.10	27.90	100.00
1975	34.01	9.62	43.63	17.47	13.77	31.25	19.03	5.89	24.92	70.52	29.48	100.00
1976	36.09	6.12	42.20	16.67	15.75	32.42	18.63	6.75	25.38	71.38	28.62	100.00
1977	41.13	6.16	47.29	15.57	8.69	24.26	21.20	7.26	28.45	77.90	22.10	100.00
1978	40.58	7.11	47.69	13.99	10.99	24.97	18.64	8.69	27.34	73.21	26.79	100.00
1979	43.62	6.67	50.30	12.64	12.14	24.98	16.31	8.41	24.72	72.78	27.22	100.00
1980	51.14	5.44	56.58	11.68	7.08	18.76	18.55	6.11	24.66	81.37	18.63	100.00
1981	53.38	5.27	58.65	10.45	5.01	15.46	21.71	4.19	25.90	85.54	14.46	100.00
1982	58.50	5.83	64.33	8.22	4.89	13.12	18.78	3.80	22.58	85.47	14.53	100.00
1983	56.31	5.87	62.18	12.46	4.23	16.70	17.56	3.57	21.13	86.33	13.67	100.00
1984	66.18	4.30	70.49	8.50	3.81	12.31	14.14	3.07	17.21	88.82	11.18	100.00
1985	66.99	4.12	71.10	8.79	4.17	12.96	15.79	0.14	15.94	91.57	8.43	100.00
1986	50.92	5.03	55.94	16.62	15.43	32.05	11.98	0.03	12.01	79.51	20.49	100.00
1987	63.90	6.26	70.16	11.25	5.85	17.10	12.64	0.11	12.75	87.78	12.22	100.00
1988	66.00	4.10	70.10	11.92	2.29	14.21	15.24	0.46	15.70	93.15	6.85	100.00

Source: Central Bank of Brazil - DERUR.

TABLE A.3.24: DISTRIBUTION OF TOTAL RURAL CREDIT BY REGION: 1970-1987

(at current prices)

	North			Northeast			Southeast			South			Center West			Brazil		
	Number of Contracts	Total Credit Cz$1000	Average Value of Contract	Number of Contracts	Total Credit Cz$1000	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$	Average Value of Contract
1970	7,792	92	0.01	132,778	994	0.01	550,547	4,575	0.01	427,172	2,925	0.01	69,956	509	0.01	1,188,240	9,183	0.01
1971	11,085	139	0.01	207,271	1,668	0.01	558,521	5,897	0.01	409,898	4,171	0.01	64,963	924	0.01	1,251,018	12,798	0.01
1972	16,995	302	0.02	202,063	2,277	0.01	552,104	7,953	0.01	418,216	6,431	0.02	74,229	1,640	0.02	1,263,627	18,603	0.01
1973	15,660	405	0.03	198,452	3,469	0.02	621,291	13,370	0.02	483,627	10,476	0.02	78,587	2,536	0.03	1,397,617	30,256	0.02
1974	14,530	489	0.03	212,178	5,592	0.03	621,311	20,530	0.03	515,516	17,439	0.03	86,851	4,215	0.05	1,450,396	48,265	0.03
1975	21,248	1,170	0.06	254,374	11,439	0.04	744,598	33,922	0.05	713,866	34,381	0.05	122,045	9,088	0.07	1,856,131	90,000	0.05
1976	25,398	2,244	0.09	280,818	17,666	0.06	710,734	48,439	0.07	705,892	48,736	0.07	109,865	15,125	0.14	1,832,207	130,209	0.07
1977	26,838	3,133	0.12	261,538	21,122	0.08	694,651	60,260	0.09	637,844	65,370	0.10	101,192	15,952	0.16	1,722,063	165,848	0.10
1978	34,383	5,204	0.15	290,676	29,604	0.10	733,215	83,526	0.11	721,743	85,505	0.12	115,306	22,601	0.20	1,895,523	226,441	0.12
1979	57,569	11,785	0.20	434,612	62,691	0.14	848,351	155,560	0.18	879,247	169,505	0.19	153,706	49,070	0.32	2,373,485	448,812	0.19
1980	92,877	26,084	0.28	638,305	142,660	0.22	905,390	292,750	0.32	945,617	306,932	0.32	183,872	90,616	0.49	2,766,061	859,242	0.31
1981	81,580	38,241	0.47	823,653	289,447	0.35	723,858	490,023	0.68	817,478	584,529	0.72	168,340	161,709	0.97	2,612,909	1,563,949	0.60
1982	71,828	59,574	0.83	615,928	425,928	0.69	810,528	1,029,435	1.27	912,924	1,141,322	1.25	192,862	304,050	1.58	2,604,090	2,960,310	1.14
1983	52,509	130,471	2.48	780,995	810,757	1.04	359,132	1,667,606	3.34	926,365	2,247,760	2.43	151,148	631,092	4.18	2,470,149	5,687,689	2.30
1984	25,230	178,212	7.06	455,715	1,525,240	3.35	413,843	3,448,601	8.33	588,941	4,539,259	7.71	101,595	1,447,322	14.23	1,585,424	11,138,633	7.03
1985	27,715	680,288	24.55	961,849	7,557,719	7.86	405,592	13,566,781	33.45	751,447	21,491,680	28.60	124,718	8,408,635	67.42	2,271,316	51,705,203	22.76
1986	48,471	3,404,062	70.23	952,903	26,516,770	27.83	640,324	52,733,352	82.35	1,178,009	70,290,510	59.67	202,879	33,835,392	166.78	3,022,604	186,780,086	61.79
1987	34,923	7,719,944	221.06	1,122,581	65,513,066	58.36	472,904	129,628,475	274.11	866,019	186,918,271	215.88	163,770	88,504,178	540.42	2,660,197	478,278,934	179.79

Source: Central Bank of Brazil - DERUR.

TABLE A.8.25: DISTRIBUTION OF TOTAL REAL RURAL CREDIT BY REGION: 1970-87

(at 1985 prices)

	North			Northeast			Southeast			South			Center West			Brazil		
	Number of Contracts	Total Credit 1000 CZ$ of 1985	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$ of 1985	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$ of 1985	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$ of 1985	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$ of 1985	Average Value of Contract	Number of Contracts	Total Credit 1000 CZ$ of 1985	Average Value of Contract
1970	7,792	280,108	29.53	132,773	2,491,900	18.77	550,547	11,463,397	20.82	427,172	7,328,625	17.16	69,956	1,497,647	21.41	1,188,240	23,011,671	19.37
1971	11,065	289,765	26.19	207,271	3,470,327	16.74	558,321	12,280,925	22.00	409,398	8,886,122	21.72	64,963	1,924,666	29.63	1,251,018	26,651,805	21.30
1972	16,995	536,216	31.55	202,063	4,042,764	20.01	552,104	14,118,660	25.57	418,216	11,416,107	27.30	74,229	2,911,816	39.23	1,263,627	33,025,563	26.14
1973	15,660	625,278	39.93	198,452	5,358,316	27.00	621,291	20,654,788	33.24	483,627	16,186,888	33.47	78,587	3,917,423	49.85	1,397,617	46,742,692	33.44
1974	14,530	586,985	40.40	212,178	6,713,362	31.64	621,311	24,648,641	39.67	515,516	20,937,227	40.61	86,861	5,060,679	58.26	1,450,396	57,946,593	39.95
1975	21,248	1,097,812	51.67	254,374	10,737,761	42.21	744,598	31,841,765	42.78	713,886	32,271,860	45.21	122,045	8,530,768	69.90	1,856,131	84,479,966	45.51
1976	25,398	1,491,215	58.71	280,818	11,742,233	41.81	710,734	30,866,553	43.43	705,392	32,393,278	45.92	109,865	10,053,243	91.51	1,832,207	86,546,523	47.24
1977	26,838	1,459,879	54.40	261,538	9,844,104	37.64	694,651	28,078,326	40.42	637,844	30,456,893	47.75	101,192	7,432,207	73.45	1,722,063	77,269,408	44.87
1978	34,383	1,747,833	50.83	290,676	9,943,270	34.18	733,215	28,054,365	38.26	721,743	28,719,154	39.79	115,306	7,591,163	65.83	1,895,523	76,055,786	40.12
1979	57,569	2,571,213	44.68	434,612	13,720,955	31.57	848,351	33,938,437	40.01	879,247	36,980,705	42.06	153,706	10,705,555	69.65	2,373,485	97,916,864	41.25
1980	92,877	2,842,407	30.60	838,305	15,557,519	24.39	905,390	31,901,056	35.23	945,617	33,448,541	35.37	183,872	9,874,429	53.70	2,766,061	93,631,953	33.85
1981	81,580	1,985,652	24.34	823,653	15,029,327	18.25	728,858	25,444,133	35.15	817,478	30,351,251	37.13	166,340	8,396,647	50.48	2,612,909	81,207,011	31.08
1982	71,628	1,582,573	22.03	615,928	11,314,756	18.37	610,528	27,346,872	33.74	912,924	30,319,148	33.21	192,882	8,077,077	41.88	2,604,090	78,640,425	30.20
1983	52,509	1,361,718	25.93	780,995	8,461,800	10.83	559,132	19,492,065	34.86	926,365	23,459,679	25.32	151,148	6,588,656	43.58	2,470,149	59,361,917	24.03
1984	25,230	580,119	22.99	455,715	4,964,980	10.89	413,843	11,225,931	27.13	588,941	14,776,256	25.09	101,695	4,711,341	46.33	1,585,424	36,258,626	22.87
1985	27,715	680,268	24.55	961,649	7,557,719	7.86	405,592	13,566,731	33.45	751,447	21,491,830	28.60	124,713	8,408,635	67.42	2,271,316	51,705,203	22.76
1986	48,471	1,406,178	28.99	952,903	10,945,980	11.49	640,324	21,768,044	34.00	1,178,009	29,015,544	24.63	202,879	13,957,068	68.84	3,022,604	77,101,814	25.51
1987	34,923	980,994	28.09	1,122,581	8,324,923	7.42	472,904	16,472,242	34.83	866,019	23,751,576	27.43	163,770	11,246,465	68.67	2,660,197	60,776,200	22.85

Source: Central Bank of Brazil - DERUR.

TABLE A.3.26: LOANS MADE BY THE BANK OF BRAZIL TO AGRICULTURAL PRODUCERS AND THEIR COOPERATIVES BY SIZE OF PRODUCER AND REGION: 1980, 1983 AND 1987

	1980				1983				1987			
	Contracts		Value		Contracts		Value		Contracts		Value	
	Number	% of Total	Cz$1000 of 1987	% of Total	Number	% of Total	Cz$1000 of 1987	% of Total	Number	% of Total	Cz$1000 of 1987	% of Total
NORTH	78,745	4.3	14,810,548	3.0	35,758	2.0	3,720,233	1.5	23,644	1.4	5,565,460	1.4
Mini	34,346	1.9	2,553,964	0.5	26,932	1.5	1,167,551	0.5	9,585	0.6	491,921	0.1
Small	33,232	1.8	4,563,617	0.9	5,647	0.3	715,612	0.3	7,661	0.4	1,097,716	0.3
Medium	7,759	0.4	4,762,308	0.9	2,576	0.1	1,106,691	0.5	4,901	0.3	1,545,823	0.4
Large	1,223	0.1	2,470,544	0.5	535	0.0	612,222	0.3	1,414	0.1	2,189,795	0.6
Cooperatives	118	0.0	232,863	0.0	7	0.0	10,602	0.0	35	0.0	54,131	0.0
Other	69	0.0	227,353	0.0	61	0.0	104,556	0.0	48	0.0	65,134	0.0
NORTHEAST	539,799	29.9	87,294,326	17.4	666,649	37.9	33,584,197	13.8	660,792	38.6	48,818,645	12.5
Mini	370,258	20.5	21,272,024	4.2	532,031	30.2	12,127,003	5.0	529,182	30.9	10,290,117	2.6
Small	132,826	7.4	20,658,142	4.1	111,410	6.3	7,516,262	3.1	87,135	5.1	6,461,821	1.7
Medium	29,236	1.6	18,033,160	3.6	21,786	1.2	6,565,241	2.7	33,543	2.0	9,999,538	2.6
Large	5,650	0.3	18,156,365	3.6	3,947	0.2	5,987,700	2.5	10,306	0.6	17,151,686	4.4
Cooperatives	662	0.0	5,142,518	1.0	314	0.0	1,156,176	0.5	341	0.0	1,786,268	0.5
Other	969	0.1	4,032,118	0.8	161	0.0	231,814	0.1	285	0.0	3,124,711	0.8
SOUTHEAST	148,354	24.8	141,798,949	28.8	290,352	16.5	54,800,075	22.5	306,588	17.9	101,470,339	26.1
Mini	110,860	6.1	5,302,317	1.1	117,403	6.7	5,710,016	2.3	71,017	4.1	2,800,281	0.7
Small	187,748	10.4	20,696,955	4.2	114,933	6.5	15,419,060	6.3	112,882	6.6	13,019,596	3.3
Medium	108,929	6.0	38,453,969	7.7	47,721	2.7	17,093,747	7.0	87,350	5.1	26,419,123	6.8
Large	37,616	2.1	65,682,277	13.1	9,539	0.5	12,148,175	5.0	34,178	2.0	40,630,388	10.4
Cooperatives	388	0.0	7,276,633	1.5	280	0.0	3,212,630	1.3	628	0.0	14,134,381	3.6
Other	633	0.0	4,186,598	0.8	476	0.0	1,216,747	0.5	831	0.0	4,466,568	1.1
SOUTH	618,384	34.3	197,516,409	39.4	668,290	37.9	119,965,457	49.3	616,513	36.0	163,636,155	42.1
Mini	193,686	10.7	8,281,508	1.7	371,557	21.1	14,826,989	6.1	184,173	108.0	6,929,297	1.8
Small	289,195	16.0	25,742,693	5.1	210,516	11.9	24,751,132	10.2	260,826	15.2	26,156,624	6.7
Medium	97,122	5.4	37,770,539	7.5	70,281	4.0	29,998,968	12.3	117,828	609.0	35,199,463	9.0
Large	35,162	2.0	60,874,925	12.1	11,851	0.7	22,026,142	9.1	47,781	2.8	54,181,961	13.9
Cooperatives	2,521	0.1	57,353,155	11.4	3,303	0.2	25,211,249	10.4	4,611	0.3	33,638,415	8.6
Other	678	0.0	7,493,398	1.5	782	0.0	3,153,978	1.3	1,294	0.1	7,530,405	1.9
CENTER-WEST	121,621	6.7	60,202,520	12.0	100,561	5.7	31,082,021	12.8	104,096	6.1	69,581,959	17.9
Mini	19,207	1.1	1,137,896	0.2	23,918	1.3	1,370,133	0.6	12,151	0.7	790,061	0.2
Small	56,185	3.1	8,259,528	1.6	44,326	2.5	7,727,066	3.2	31,318	1.8	5,260,536	1.4
Medium	33,540	1.9	19,107,163	3.8	27,398	1.6	13,369,776	5.5	38,906	2.3	19,466,084	5.0
Large	12,482	0.7	28,681,625	5.7	4,744	0.3	7,080,688	2.9	21,027	1.2	39,068,087	10.0
Cooperatives	110	0.0	2,254,548	0.4	59	0.0	921,653	0.4	572	0.0	3,429,977	0.9
Other	147	0.0	611,759	0.1	216	0.0	612,705	0.3	122	0.0	1,567,264	0.4
BRAZIL	1,802,883	100.0	501,622,753	100.0	1,764,610	100.0	243,152,282	100.0	1,711,631	100.0	389,067,556	100.0
Mini	728,355	40.4	38,547,709	7.7	1,071,741	60.7	35,201,692	14.5	806,108	47.1	21,301,687	5.5
Small	699,166	38.8	80,121,035	16.0	486,632	27.6	56,129,152	23.1	499,822	29.2	51,995,795	13.4
Medium	276,568	15.3	118,127,159	23.5	169,762	9.6	58,132,423	23.0	282,528	16.5	92,750,031	23.8
Large	92,501	5.1	176,015,736	35.1	30,616	1.7	47,856,927	19.7	114,706	6.7	153,221,609	39.4
Cooperatives	3,777	0.2	72,259,917	14.4	3,963	0.2	30,512,308	12.5	6,387	0.4	53,043,172	13.6
Other	2,496	0.1	16,551,216	3.3	1,696	0.1	5,319,800	2.2	2,580	0.2	16,775,052	4.3

Source: Bank of Brazil - Department of Statistics.

TABLE A.8.27: RURAL CREDIT SHARES BY TYPE OF CREDIT AND SIZE OF BORROWER: 1984-87

(%)

	1984		1985		1986		1987	
	% of Total No. of Contracts	% of Total Value	% of Total No. of Contracts	% of Total Value	% of Total No. of Contracts	% of Total Value	% of Total No. of Contracts	% of Total Value
Production Credit								
Crop Producers:								
Small	85.87	35.06	84.14	27.07	80.80	28.94	80.57	25.12
Medium	10.14	22.78	11.65	28.48	14.19	27.19	13.86	28.69
Large	3.76	33.14	4.02	38.76	4.86	37.03	5.44	41.79
Cooperatives	0.13	4.40	0.12	4.56	0.11	6.64	0.12	6.45
Other	0.05	4.62	0.08	1.12	0.05	0.20	0.01	0.06
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Livestock Producers								
Small	70.80	21.78	66.79	15.19	64.89	18.24	61.94	15.89
Medium	21.94	24.77	23.60	18.48	24.79	21.82	26.58	22.48
Large	7.00	42.54	9.06	38.19	9.77	53.47	11.23	54.38
Cooperatives	0.19	10.19	0.28	26.49	0.17	4.63	0.18	8.19
Other	0.08	0.71	0.27	1.65	0.38	2.84	0.04	1.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Investment Credit								
Crop Producers:								
Small	81.80	35.58	77.47	36.29	68.09	28.60	62.00	18.69
Medium	14.04	25.97	16.41	25.63	22.25	30.45	24.11	27.20
Large	4.50	30.88	5.88	32.20	9.17	36.16	13.70	49.98
Cooperatives	0.11	6.97	0.08	1.36	0.06	2.29	0.11	3.42
Other	0.05	0.60	0.16	4.52	0.44	2.50	0.08	0.71
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Livestock Producers								
Small	82.52	55.85	84.86	55.55	71.45	34.92	69.97	23.32
Medium	13.92	19.79	12.05	23.06	20.61	29.57	21.15	29.53
Large	3.47	20.41	2.98	20.64	7.50	35.09	8.75	45.08
Cooperatives	0.05	3.21	0.02	0.09	0.08	0.21	0.05	0.80
Other	0.03	0.74	0.10	0.66	0.41	1.22	0.08	1.27
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Marketing Credit								
Crop Producers:								
Small	1.64	0.13	1.87	0.70	5.81	0.88	1.98	0.58
Medium	1.05	0.56	0.67	0.33	3.80	0.98	2.01	0.92
Large	7.01	81.99	1.99	5.78	3.80	5.90	2.70	4.28
Cooperatives	2.36	1.15	2.61	14.53	1.25	4.75	0.25	1.94
Other	87.93	16.18	92.85	78.66	85.84	87.58	93.11	92.37
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Livestock Producers								
Small	2.65	1.48	0.00	0.00	7.14	1.19	13.27	0.94
Medium	0.00	0.00	2.09	0.12	6.25	3.68	7.14	1.18
Large	0.66	0.10	5.76	16.41	9.82	11.59	6.68	5.61
Cooperatives	1.32	0.26	3.14	2.99	0.89	0.76	0.51	1.28
Other	95.36	98.13	89.01	80.47	75.89	82.88	72.45	90.98
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: Totals in 1984, 1985 differ from totals in other tables.
Information prior to 1984 is not available. Information only available at the National Level.

Source: Central Bank of Brazil - DERUR.

TABLE A.8.28: PRODUCTION CREDIT BY MAJOR CROPS: 1976, 1980 AND 1986

(in Cz$1000 at 1986 prices)

	1976		1980		1986		Changes in Value of Contracts (in percent)	
	Number of Contracts	Value	Number of Contracts	Value	Number of Contracts	Value	1976-80	1980-86
Cereals:								
Wheat	56,542	8,771,419	40,376	8,538,462	125,392	2,778,281	-6.8	-21.4
Rice	88,674	4,684,075	198,194	6,018,386	201,120	5,105,288	28.5	-15.2
Corn	164,401	3,149,192	818,338	49,570,242	807,519	6,579,084	1474.1	-86.7
Sorghum	718	81,842	1,156	69,446	5,865	116,216	-15.1	65.9
Root Crops								
Manioc	29,442	258,814	109,735	1,007,357	72,382	406,768	289.2	-59.6
White Potatoes	15,408	478,807	15,582	561,551	14,057	681,790	17.4	21.4
Sweet Potatoes	NA	NA	NA	NA	2,628	22,480	NA	NA
Peanuts	7,802	114,812	8,819	177,584	6,603	145,871	55.8	-17.8
Black Beans	47,008	579,391	278,346	2,768,645	353,389	1,765,099	377.9	-36.2
Fruits and Vegetables								
Pineapples	NA	NA	NA	NA	4,907	68	NA	NA
Bananas	NA	NA	NA	NA	8,819	145,680	NA	NA
Oranges*	11,615	390,859	17,082	809,625	14,872	758,385	107.1	-6.3
Tomatoes	NA	NA	NA	NA	13,780	332,865	NA	NA
Onions	NA	NA	NA	NA	11,517	140,764	NA	NA
Export Crops								
Soybeans	73,226	5,998,959	101,189	7,690,346	163,361	6,997,176	28.3	-10.3
Cocoa	5,645	285,518	7,587	507,617	10,194	536,415	77.8	5.7
Coffee	103,261	8,362,914	156,747	6,601,197	86,110	2,041,725	96.3	-69.1
Tobacco	113,498	441,190	64,168	525,801	118,911	960,697	18.7	83.4
Sisal	NA	NA	NA	NA	4,262	47,358	NA	NA
Sugarcane	22,889	3,026,280	25,340	3,332,822	29,282	2,921,759	10.1	-12.3
Cotton	79,853	2,044,607	132,766	2,601,591	110,915	2,047,303	27.2	-21.3
Coconut	NA	NA	NA	NA	791	16,516	NA	NA

* Figures for 1976 and 1980 include credit for all citrus fruits.

Source: Banco do Brasil - DERUR.

TABLE A.3.29: GOVERNMENT EXPENDITURE IN AGRICULTURE: 1980-1987

YEAR	FISCAL BUDGET	MONETARY BUDGET	TOTAL EXPENDITURE IN AGRICULTURE (A)	TOTAL GOVERNMENT EXPENDITURE (B)	(A)/(B)
1980	1,703,637.00	2,055,800.00	3,759,437.00	23,649,318.20	0.16
1981	1,078,018.20	1,697,600.00	2,775,618.20	25,868,009.50	0.11
1982	1,430,991.80	1,397,000.00	2,827,991.80	27,148,237.90	0.10
1983	1,180,969.00	70,500.00	1,251,469.00	19,342,602.30	0.06
1984	807,284.10	963,900.00	1,771,184.10	19,289,041.20	0.09
1985	738,375.50	2,939,500.00	3,677,875.50	23,958,975.30	0.15
1986	2,856,330.30	3,461,200.00	6,317,530.30	43,615,684.30	0.14
1987	4,904,520.70	4,087,000.00	8,991,520.70	45,183,681.90	0.20

Source: IPEA, "Gastos Publicos na Agricultura: Estrutura e Resultados", in Dados Conjunturais de Agropecuaria, no. 153, Junho 1988.

TABLE A.8.80: GOVERNMENT EXPENDITURE IN AGRICULTURE BY GOVERNMENT AGENCY: 1980-1987

(000 US$)

	1980	1981	1982	1983	1984	1985	1986	1987
Planning Secretariat	112,148.40	27,415.60	19,816.60	12,250.50	10,990.30	4,095.40	2,871.80	
Ministry of Agriculture	408,808.50	656,416.10	804,755.90	540,289.60	525,271.10	557,719.80	1,223,079.50	1,127,657.80
Ministry of Finance	3,232,559.40	2,015,560.50	1,918,556.00	637,795.30	1,193,213.70	2,731,281.90	4,100,323.40	5,928,735.40
Ministry of Industry and Trade	5,833.60	74,995.80	85,084.70	61,183.70	41,709.10	384,828.40	816,190.90	1,239,805.70
Ministry of Interior	593.00	1,225.10	278.70				114.90	407.10
Ministry of Irrigation							36,680.00	485,016.10
Ministry of Justice							11,208.80	217,500.80
Ministry of Agrarian Reform							127,111.00	80.50
Secretariat of Public Admin.								
T O T A L	3,759,487.90	2,775,613.10	2,827,991.90	1,251,469.10	1,771,184.20	3,677,875.40	6,317,580.30	8,999,002.90

Source: IPEA, "Gastos Publicos na Agricultura", in " Jos Conjunturais da Agropecuaria, Junho, 1988.

TABLE A.8.81: AGENCY SHARES OF GOVERNMENT EXPENDITURE IN AGRICULTURE: 1980-1987

	1980	1981	1982	1983	1984	1985	1986	1987
	(%)							
Planning Secretariat	8.000	1.000	0.700	1.000	0.600	0.100	0.045	
Ministry of Agriculture	10.800	28.600	29.500	43.100	29.800	15.100	19.400	12.500
Ministry of Finance	66.000	72.700	67.800	51.000	67.400	74.800	64.858	65.894
Ministry of Industry and Trade	0.200	2.700	3.000	4.900	2.400	10.500	12.900	13.800
Ministry of Interior							0.002	0.005
Ministry of Irrigation							0.600	5.400
Ministry of Justice							0.200	2.400
Ministry of Agrarian Reform							2.000	0.001
Secretariat of Public Adm.								
T O T A L	100	100	100	100	100	100	100	100

Source: Derived from Table A.8.80.

TABLE A.3.82: GOVERNMENT EXPENDITURE IN AGRICULTURE BY PROGRAM: 1980-1987

(000 US$)

	1980	1981	1982	1983	1984	1985	1986	1987
Administration	60,151.5	127,725.2	78,527.8	25,029.4	47,822.0	62,523.9	82,127.9	280,754.1
Financial Administration	93,988.8	47,202.8	84,839.6	35,041.1	99,186.3	77,285.4	151,620.7	134,872.8
Government Planning (a)	18,797.4	24,989.7	19,795.9	689,559.4	12,398.3	14,711.5	18,952.6	656,381.0
Science & Technology	86,467.8	149,938.2	180,991.5	60,070.5	131,067.6	128,725.6	151,620.7	161,847.4
Agrarian Organization (b)	15,037.9	13,883.2	22,623.9	6,257.3	24,796.6	40,456.3	138,985.7	206,805.0
Vegetal Production	3,759.5	77,745.7	110,291.7	32,538.2	46,050.8	40,456.6	69,492.8	53,949.1
Animal Production	30,075.8	68,882.6	79,183.8	25,029.4	44,279.6	33,100.9	31,587.7	35,966.1
Supply	2,879,754.1	2,057,485.6	1,843,850.7	260,305.5	1,172,523.9	3,104,126.9	4,997,166.5	6,779,606.6
Renovations	15,037.9	11,106.5	19,795.9	6,257.3	12,398.3	18,389.4	18,952.6	0.0
Rural Extension (c)	583,844.8	152,714.9	285,627.2	82,596.9	129,296.4	106,658.4	518,037.5	269,745.6
Information Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Integrated Services	18,797.4	47,202.8	107,468.7	28,783.8	51,864.3	51,490.3	101,080.5	26,974.6
Financial Services	3,759.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medical, Health Assistance	0.0	2,776.6	0.0	0.0	0.0	0.0	0.0	0.0
Water Resources (d)	0.0	0.0	0.0	0.0	0.0	0.0	87,905.2	404,618.4
T O T A L	3,759,470.1	2,776,688.7	2,827,991.8	1,251,468.9	1,771,184.1	3,677,875.5	6,817,580.3	8,991,520.7

a) In 1987 this included a specific rural credit account valuing $600.6 million.
b) After 1986, this program included the assets of MIRAD.
c) Includes the expenditures of PROAGRO.
d) Until 1985, expenditures in this program were included in the Regional Development area.

Source: IPEA/IPLAN.

TABLE A.8.33: PROGRAM SHARES OF GOVERNMENT EXPENDITURE IN AGRICULTURE: 1980-1987

(%)

	1980	1981	1982	1983	1984	1985	1986	1987
Administration	1.6	4.6	2.6	2.0	2.7	1.7	1.3	2.9
Financial Administration	2.5	1.7	3.0	2.8	5.6	2.1	2.4	1.5
Government Planning (1)	0.5	0.9	0.7	55.1	0.7	0.4	0.3	7.3
Science & Technology	2.3	5.4	6.4	4.8	7.4	3.5	2.4	1.8
Agrarian Organization (2)	0.4	0.5	0.8	0.5	1.4	1.1	2.2	2.3
Vegetal Production	0.1	2.8	3.9	2.6	2.6	1.1	1.1	0.6
Animal Production	0.8	2.3	2.8	2.0	2.5	0.9	0.5	0.4
Supply	78.6	74.1	65.2	20.8	66.2	84.4	79.1	75.4
Renovations	0.4	0.4	0.7	0.5	0.7	0.5	0.3	0.0
Rural Extension (3)	14.2	5.5	10.1	6.6	7.3	2.9	8.2	3.0
Information Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Integrated Services	0.5	1.7	3.8	2.3	2.9	1.4	1.6	0.3
Financial Services	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medical, Health Assistance	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Water Resources (5)	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.5
TOTAL	100	100	100	100	100	100	100	100

Source: Derived from Table A.8.32.

TABLE A.3.84: OFFICIAL (NOMINAL AND REAL) AND PARALLEL MARKET EXCHANGE RATES: 1970-1988

	OFFICIAL EXCHANGE RATE					PARALLEL
	NOMINAL	REAL INDEX NUMBER b/				EXCHANGE
	RATE a/	R B E R W c/		R M E R W d/		RATE a/
		#	% Change	#	% Change	
1970	4.594	92.64		82.95		5.18
1971	5.288	91.69	-1.0	83.64	0.8	6.08
1972	5.934	92.19	0.5	90.60	8.3	6.77
1973	6.126	95.57	3.7	100.47	10.9	6.77
1974	6.790	98.62	3.2	104.11	4.0	7.79
1975	8.127	100.00	1.4	100.00	-4.0	10.18
1976	10.673	96.76	-3.2	96.30	-3.7	14.04
1977	14.144	94.72	-2.1	95.90	-0.4	17.68
1978	18.078	94.03	-0.7	101.11	5.4	22.51
1979	26.818	103.34	9.9	113.42	12.2	33.34
1980	52.811	126.22	22.1	137.81	21.5	59.08
1981	93.349	118.37	-6.2	115.17	-16.4	111.10
1982	180.366	117.69	-0.6	106.71	-7.3	274.83
1983	576.943	158.21	34.4	140.29	31.5	910.00
1984	1646.980	174.68	10.4	148.84	6.1	2255.83
1985	6200.000	178.45	2.1	150.73	1.3	8685.33
1986	13.66	155.60	-12.8	153.04	1.5	22.00
1987	39.28	80.00	-48.6	86.30	-43.6	52.72
1988	225.26					319.10

a/ Expressed in units of Cr$/US$1 for the period 1970-1985 and in units of Cz$/US$1 thereafter.
b/ Base 1975 = 100.
c/ RBERW is the real bilateral exchange rate index of Brazil's currency with respect to the US dollar, using the wholesale price index of the US and the consumer price index of Brazil.
d/ RMERW is the real multilateral exchange rate index of Brazil's currency with respect to that of its trading partners' currencies, using the wholesale price indices of the trading partners and the consumer price index of Brazil.

Sources: Nominal rates - CECEX; RBERW and RMERW - Macroeconomic Adjustment and Growth Division, Country Economics Dept., World Bank, June 1988;
Parallel exchange rate - Picks Currency Yearbook and Gazeta Mercantil after 1985.

TABLE A.3.35: SHADOW EXCHANGE RATE: 1970-1988

Year	(1) Official Exchange Rate a\ (Cz/US$)	(2) Parallel Exchange Rate a\ (Cz/US$)	(3) Flexible Exchange Rate b\ (No Change in Trade Policy) (Cz/US$)	(4) Structural Adjustment to Remove Overvaluation Due to Trade Policy (%) c\	(5) Shadow Exchange Rate (Base Est.) (3) X (4) (Cz$/US$)	(6) Shadow Exchange Rate (High Est.) d\ (Cz$/US$)	(7) Shadow Exchange Rate (Low Est.) d\ (Cz$/US$)
1970	0.004594	0.005180	0.004701	7.05	0.005033	0.005284	0.004781
1971	0.005288	0.006080	0.005436	12.19	0.006099	0.006404	0.005794
1972	0.005934	0.006770	0.006101	10.73	0.006756	0.007094	0.006418
1973	0.006126	0.006770	0.006255	8.63	0.006795	0.007134	0.006455
1974	0.006790	0.007790	0.006990	20.03	0.008390	0.008810	0.007971
1975	0.008127	0.010180	0.008538	18.18	0.010090	0.010594	0.009585
1976	0.010673	0.014040	0.011346	14.27	0.012966	0.013614	0.012317
1977	0.014144	0.017680	0.014851	9.19	0.016216	0.017027	0.015405
1978	0.018078	0.022510	0.018964	12.61	0.021356	0.022424	0.020288
1979	0.026818	0.033340	0.028122	15.38	0.032448	0.034070	0.030825
1980	0.052811	0.059080	0.054065	14.19	0.061737	0.064823	0.058650
1981	0.093349	0.111100	0.096899	12.53	0.109041	0.114493	0.103589
1982	0.180386	0.274830	0.199259	18.17	0.235464	0.247237	0.223691
1983	0.576943	0.910000	0.643554	11.73	0.719043	0.754995	0.683091
1984	1.846980	2.255830	1.928750	14.40	2.206490	2.316815	2.096166
1985	6.200000	8.685330	6.697066	14.40	7.661444	8.044516	7.278371
1986	13.660000	22.000000	15.328000	14.40	17.535232	18.411994	16.658470
1987	39.280000	52.720000	41.928000	14.40	47.965632	50.363914	45.567350
1988	225.260000	319.100000	244.028000	14.40	279.168032	293.126434	265.209630

a\ This series is presented in Table A.3.34.

b\ Column (3) is the weighted average of columns (1) and (2), applying weights of 4 and 1 respectively;

c\ Estimate made by Brandao, et. al., in A Comparative Study of the Political Economy of Agricultural Pricing Policies: The Case of Brazil, (Draft, November, 1987). This study's estimates cover the period 1970-1983; thereafter, the 1970-1983 average was used.

d\ Columns (6) and (7) are the high and low estimates of the shadow exchange rate obtained by adjusting column (5) by plus and minus 5%, respectively.

TABLE A.8.36: EXCHANGE RATE CONVERSION FACTORS: 1970-1988

Official X Conversion Factor (CF)
= Shadow Exchange Rate

CF = Shadow/Official

Year	Conversion Factors
1970	1.0955
1971	1.1534
1972	1.1385
1973	1.1091
1974	1.2357
1975	1.2415
1976	1.2148
1977	1.1485
1978	1.1813
1979	1.2099
1980	1.1690
1981	1.1681
1982	1.3055
1983	1.2463
1984	1.1946
1985	1.2357
1986	1.2837
1987	1.2227
1988	1.2393

Source: Derived from Table A.8.35.

TABLE A.3.37: NOMINAL IMPORT TARIFFS ON SELECTED AGRICULTURAL INPUTS: JANUARY 1981 AND FEBRUARY 1988

(Percent %)

	Nominal Tariff Rate	
	Jan. 1981	Feb. 1988
1. Chemicals	37	50
Insecticides	37	50
Fungicides	37	37
Herbicides	37	50
2. Machinery and Equipment		
Plows (various types)	30-45	30-45
Planters	30	30
Combines	30-45	30-45
Seed and Bean Cleaning Machines	45	45
Dairy Equipment (creamers, butter makers, cheese makers milk separators)	30-45	45
Crushing and Grinding Machines	45	45
Cocoa Crushers	30	30
Equipment for Sugar Extraction	45	45
3. Tractors		
Two-and Four-Wheel Tractors	45	45
4. Fertilizers		
Phosphates	30	20
Nitrogen	30	20
Potassium	30	20

Source: CACEX.

TABLE A.4.1: RATIO OF IMPLICIT SUBSIDIES TO AGRICULTURAL GDP AND TOTAL GDP: 1970-88

	Subsidy / Agricultural GDP		Subsidy / Total GDP	
	(a)	(b)	(a)	(b)
1970	0.66	0.50	0.08	4.08
1971	0.78	0.58	0.10	4.18
1972	0.16	0.58	0.02	4.18
1973	0.25	0.63	0.03	4.72
1974	7.28	1.36	0.98	10.50
1975	7.58	1.54	0.91	12.71
1976	11.92	1.95	1.55	14.92
1977	6.79	1.33	0.99	9.05
1978	8.85	1.35	1.03	11.57
1979	20.29	2.48	2.24	22.47
1980	21.98	2.35	2.37	21.76
1981	14.11	1.50	1.47	15.08
1982	15.98	1.45	1.37	16.93
1983	10.06	1.01	1.11	9.14
1984	-0.18	0.08	-0.02	0.68
1985	0.78	0.16	0.09	1.48
1986	16.49	1.82	1.56	16.25

Note: Columns designated (a) are from Ricardo Shirota, "Credito Rural no Brasil: Subsidio, Distribuicao e Fatores Associados a Oferta," unpublished M.A. thesis submitted to USP/ESALQ, 1988.
Columns designated (b) were derived by multiplying the amounts of the various credit types (at 1986 prices) by the respective annual subsidy rates shown in columns designated (b) in Table A.8.17.

TABLE A.4.2: RATIOS OF MIDSEASON PRICES TO HARVEST PRICES

(1.00 indicates equality)

	Maize Farmgate Parana	Maize Wholesale S. Paulo	Rice Farmgate RGS	Cotton Farmgate Parana	Cotton Wholesale S. Paulo	Soybeans Farmgate Parana
1974	0.97	1.08	1.19	1.04	0.60	1.10
1975	1.21	1.01	1.14	1.22	1.22	0.95
1976	0.93	0.93	0.77	1.05	1.45	1.84
1977	1.01	1.00	0.98	0.69	0.74	0.70
1978	1.10	0.90	1.06	0.74	1.07	0.99
1979	1.32	0.99	1.33	1.02	1.18	1.20
1980	1.81	1.72	0.95	1.20	1.62	1.28
1981	0.81	0.76	n.a.	0.78	1.03	0.98
1982	0.85	0.97	0.78	0.74	1.07	0.87
1983	2.52	2.08	1.16	n.a.	2.16	1.97
1984	1.04	1.02	1.17	n.a.	0.71	0.87
1985	0.91	0.99	0.88	0.66	1.06	1.04
1986	0.88	0.97	0.91	0.96	1.25	0.99
1987	1.04	1.36	0.97	1.60	1.85	1.42

Notes: Midseason is from October to December and harvest is from March to May.
All prices corrected to a common basis (November 1984).
Years 1985-1987 deflated with IGP - DI.

Source: IBRD, Brazil: Pricing Policy Issues in Agriculture, Dec. 6, 1985
Draft Gray Cover.
Prices from 1985 - 1987 based on CFP data.

TABLE A.4.3: RATIO OF MARKET PRODUCER PRICES TO MINIMUM PRODUCER PRICES FOR PRINCIPAL CROPS PURCHASED BY CFP BY REGION: 1970-1987

PRODUCT & REGION	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
								Cr$/kg									Cz$/kg	
NORTH																		
Maize		1.38	1.39	1.74	1.71	1.63	1.68	1.58	1.71	2.13	2.31	1.72	1.16	1.79	1.09	1 00	1.65	1.57
Soybean																		1.21
Black Beans		1.75	1.52	2 68	2.60	1.98	2.58	2.23	1.63	2.09	2.70	2.43	1.38	1.73	2.17	0.96	1.40	1.53
Seed Cotton										0.64	0.51				0.67	0.40	0.77	1.41
NORTHEAST																		
Rice (Dry)	1.72	1.66	1.70	1.19	1.87	1.96	1.90	1.07	1.70	2.44	2.32	2.02	1.74	2.75	1.85	1.76	1.50	1.50
Maize		1.71	1.29	1.40	1.29	1.29	1.79	1.44	1.38	2.01	2.34	2.01	1.35	1.91	1.29	0.71	1.17	1.50
Soybean																		2.04
Black Beans		1.70	1.79	2.65	1.70	1.61	3.65	2.35	1.50	2.04	3.20	2.36	1.19	2.25	1.90	0.77	1.34	1.81
Seed Cotton	1.28	1.29	1.01	1.29	1.22	0.95	1.48	1.00	0.87	1.11	1.42	0.88	0.71	1.27	1.06	0.72	1.00	1.50
SOUTHEAST																		
Maize			1.52	1.57	1.12	1.32	1.36	1.15	1.66	1.92	2.31	1.66	1.14	2.81	2.03	1.24	1.17	1.27
Soybean			1.49	2.40	1.97	1.33	1.47	1.74	1.91	2.38	1.35	1.61	1.48	3.20	3.28	1.31	1.02	2.33
Black Beans	2.17	1.52	1.53	3.67	1.94	1.88	3.58	2.28	1.63	2.02	3.04	2.31	0.95	1.89	1.84	1.18	1.33	1.52
Seed Cotton	0.97	0.95	1.08	1.37	1.48	1.03	1.90	1.17	1.16	1.26	1.65	1.31	1.14	2.06	1.81	1.06	1.06	2.31
SOUTH																		
Rice (Irrigated)						1.94	1.62	1.31	1.84	2.12	2.26	1.72	1.96	2.42	1.84	1.57	1.45	1.89
Maize			1.39	1.33	1.12	1.18	1.19	1.02	1.53	1.78	2.15	1.40	1.02	2.17	1.75	1.10	1.13	1.16
Soybean			1.24	2.12	1.63	1.24	1.35	1.61	1.74	2.20	1.28	1.51	1.37	2.72	2.96	1.23	1.[illegible]	2.20
Black Beans	1.76	1.17	1.17	2.70	1.65	1.34	2.47	1.64	1.26	1.53	2.50	1.69	0.88	1.51	1.75	0.97	1.[illegible]	1.11
Seed Cotton	0.82	0.80	1.03	1.19	1.39	0.94	1.38	1.06	1.03	1.19	1.43	1.24	1.03	1.66	1.73	0.87	0.95	2.48
CENTER-WEST																		
Maize																		
Soybean			1.22	2.64	1.73	1.23	1.28	1.58	1.70	2.25	1.25	1.45	1.30	2.71	2.64	1.16	0.97	2.09
Black Beans	2.31	1.35	1.43	3.52	2.06	2.06	3.66	2.50	1.65	2.00	2.89	2.23	1.05	1.22	2.26	1.10	1.45	1.64
Seed Cotton	0.83	0.94	1.03	1.25	1.29	0.97	1.66	1.14	1.06	0.92	1.49	1.19	0.94	1.76	1.61	0.88	0.97	1.68

Source: Derived from Tables B.9.2 and A.3.6 for market producer prices and minimum prices, respectively.

TABLE A.4.4: RATIOS OF MINIMUM PRICES TO COSTS OF PRODUCTION: 1978-1988

(1.00 indicates equality)

Year	Cotton	Rainfed Rice	Irrigated Rice	Black Beans	Maize	Soybeans
			Minimum Price/Total Production Costs			
1978/79	1.03	0.95	0.94	0.97	1.08	0.75
1979/80	0.98	0.95	0.95	1.05	0.95	0.92
1980/81	1.00	1.27	1.00	1.42	1.09	0.95
1981/82	1.01	1.08	0.91	1.19	1.11	0.90
1982/83	1.01	0.99	0.91	1.19	1.05	0.85
1983/84	1.15	1.06	1.15	1.19	0.97	0.69
1984/85 a/	1.35	n.a.	1.45	1.30	1.35	1.25
1985/86						
1986/87	1.19	1.39	1.58	1.62	1.43	1.39
1987/88	1.22	1.38	1.55	1.59	1.69	0.67
			Minimum Price/Variable Production Costs (VBC)			
1978/79	1.55	2.05	2.80	1.40	2.05	1.40
1979/80	1.50	2.09	2.88	1.55	1.80	1.68
1980/81	1.83	2.54	2.54	2.11	2.12	1.78
1981/82	1.58	1.98	2.33	1.97	2.09	1.50
1982/83	1.73	1.92	2.51	1.89	2.21	1.63
1983/84	2.76	2.21	3.89	2.74	2.81	2.04
1984/85 b/	3.25	n.a.	4.80	3.25	3.91	3.70
1985/86						
1986/87	1.60	2.01	2.92	2.31	2.15	1.39
1987/88	1.99	2.58	2.44	2.91	1.60	0.88

a/ Cost of production corrected up to the end of the harvest period.
b/ Estimated. In 1985 the real value of minimum prices was sharply increased by two months of additional indexing.

Source: Companhia de Financiamento da Producao (CFP).

TABLE A.4.5: RATIOS OF MINIMUM PRODUCER PRICES TO INTERNATIONAL PRICES

(all prices per kg)

	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
											Cr$								Cz$	
IRRIG RICE: Min Price		--	--	--	--	--	1.26	1.58	2.22	2.88	4.04	8.40	16.00	33.52	64.56	224.00	1000.00	2.60	5.22	34.10
RICE: Int'l Price		0.66	0.68	0.87	1.92	3.68	2.95	2.71	3.85	6.64	8.96	22.90	45.07	52.82	159.75	465.69	1338.68	2.88	9.03	68.15
RATIO: Min/Int'l		--	--	--	--	--	0.43	0.58	0.58	0.43	0.45	0.37	0.36	0.63	0.40	0.48	0.75	0.90	0.58	0.50
DRY RICE: Min Price		0.30	0.33	0.44	0.60	0.74	1.14	1.42	2.00	2.60	3.64	8.40	14.40	27.98	53.89	187.00	841.00	2.23	4 48	29.27
RICE: Int'l Price		0.66	0.68	0.87	1.92	3.68	2.95	2.71	3.85	6.64	8.96	22.90	45.07	52.82	159.75	465.69	1338.68	2.88	9.03	68.15
RATIO: Min/Int'l		0.45	0.49	0.51	0.31	0.20	0.39	0.52	0.52	0.39	0.41	0.28	0.32	0.53	0.34	0 40	0.63	0.78	0.50	0.43
MAIZE (M/ME): Min Price		--	0.24	0.28	0.35	0.55	0.70	0.90	1.20	1.47	2.04	3.75	10.90	23.53	47.04	190.29	791.00	1.32	2.86	22.30
MAIZE: Int'l Price		0.27	0.31	0.33	0.60	0.89	0.97	1.20	1.85	1.82	3.10	6.62	12.21	19.71	78.47	251 08	695.85	1.20	2.97	23.87
RATIO: Min/Int'l		--	0.76	0.85	0.58	0.62	0.72	0.75	0.89	0.81	0.66	0.57	0.89	1.19	0.60	0 76	1.14	1.10	0.96	0.93
MAIZE (S/Sao Paulo): Min Price		--	--	0.23	0.30	0.50	0.60	0.80	1.06	1.30	1.80	3.09	7.91	17.14	32.90	103 00	506.00	1 32	2.74	19.84
MAIZE: Int'l Price		0.27	0.31	0.33	0.60	0.89	0.97	1.20	1.85	1.82	3.10	6.62	12.21	19.71	78.47	251 08	695.85	1.20	2.97	23.87
RATIO: Min/Int'l		--	--	0.68	0.50	0.56	0.62	0.67	0.79	0.71	0.58	0.47	0.65	0.87	0.42	0 41	0 73	1.10	0.92	0.83
SOYBEANS (M/ME): Min Price		--	--	--	0.50	0.60	1.00	1.25	1.60	1.60	2.50	7.34	9.00	22.03	42.54	120.70	779.00	2.09	2.84	26.44
SOYBEANS: Int'l Price		0.54	0.68	0.88	1.78	1.88	1.79	2.47	3.96	4.85	7.99	15.64	26.92	44.12	162.46	521.00	1391.38	2.85	8.46	68.17
RATIO: Min/Int'l		--	--	--	0.28	0.32	0.56	0.51	0.40	0.33	0.21	0.47	0.33	0.50	0.26	0.23	0.56	0.73	0.34	0.39
SOYBEANS (Center/S): Min Price		--	--	0.41	0.50	0.60	1.00	1.25	1.60	1.87	2.50	7.34	11.00	22.03	42.54	120.70	779.00	2.09	2.84	26.44
SOYBEANS: Int'l Price		0.54	0.68	0.83	1.78	1.88	1.79	2.47	3.96	4.85	7.99	15.64	26.92	44.12	162.46	521.00	1391.38	2.85	8.46	68.17
RATIO: Min/Int'l		--	--	0.50	0.28	0.32	0.56	0.51	0.40	0.39	0.31	0.47	0.41	0.50	0.26	0.23	0.56	0.73	0.34	0.39
COTTON (M/ME): Min Price		0.54	0.77	1.00	1.09	1.78	2.60	3.50	6.00	7.54	10.16	17.90	52.00	93.99	179.03	661.02	2479.00	4.46	9.93	76.02
COTTON: Int'l Price		3.10	4.14	4.91	8.52	9.90	9.94	18.65	23.03	29.05	45.79	108.89	174.66	288.09	1069.59	3296.58	8173.36	14.43	64.67	316.15
RATIO: Min/Int'l		0.18	0.19	0.20	0.13	0.18	0.26	0.19	0.26	0.26	0.22	0.16	0.30	0.33	0.17	0.20	0.30	0.31	0.15	0.24
COTTON (Center/S): Min Price		0.71	1.01	1.01	1.14	1.63	2.34	3.03	5.20	6.68	9.00	13.46	31.68	63.87	125.74	445.20	1870.00	4.79	6.67	69.12
COTTON: Int'l Price		3.10	4.14	4.91	8.52	9.90	9.94	18.65	23.03	29.05	45.79	108.89	174.66	288.09	1069.59	3296.58	8173.36	14.43	64.67	316.15
RATIO: Min/Int'l		0.23	0.24	0.21	0.13	0.16	0.24	0.16	0.23	0.23	0.20	0.12	0.16	0.22	0.12	0.14	0.23	0.33	0.10	0.22

Note: International prices converted at official exchange rate.

TABLE A.6.1: OWN AND CROSS-PRICE ELASTICITIES OF DEMAND FOR THE FACTORS OF PRODUCTION BY REGION

(Mean values: 1970-1988)

Region	Price of:	Demand for: Labor	Land	Machinery
North	Labor	-0.072	0.010	0.064
	Land	0.034	-0.039	0.006
	Machinery	0.852	0.022	-0.875
Northeast	Labor	-0.069	0.016	0.053
	Land	0.055	0.051	-0.004
	Machinery	0.886	0.018	-0.888
Southeast	Labor	-0.142	-0.096	0.239
	Land	-0.448	0.296 a\	0.163
	Machinery	0.664	0.091	-0.754
South	Labor	-0.224	-0.096	0.320
	Land	-0.222	-0.036	0.258
	Machinery	0.505	0.176	-0.680
Center-West	Labor	-0.188	-0.022	0.223
	Land	-0.087	-0.080	0.167
	Machinery	0.590	-0.180	-0.770

a\ The positive sign for this elasticity is believed to be caused by the distortionary effect of subsidized credit of which the Southeast was the largest recipient.

Source: Derived from Simulation Model 2 in Chapter V.

TABLE A.5.2: SIMULATION RESULTS (SCENARIO 1): YEAR 2000

		Sensitivity Tests: Year 2000 a\ (Index Numbers: Base 1987 = 100)			
	Year 1987	Baseline	(1)	(2)	(3)
A. Aggregates	(000 Cz$ 1980)				
1. GDP	14,648,745.0	181.7	181.3	180.9	180.4
2. Ag. GDP (without investment)	1,578,116.0	218.5	216.8	214.8	212.0
3. Non-Ag. GDP (without investment)	10,758,367.0	179.0	180.2	181.4	183.6
B. Trade Sector	(000 Cz$ 1980)				
1. Ag. Trade Balance	398,974.0	-13.0	21.1	52.3	107.7
2. Ag. Exports	472,940.0	13.6	41.4	68.9	112.7
3. Ag. Imports	73,966.0	186.3	155.1	152.3	147.4
4. Non-Ag. Trade Balance	(38,461.0)	450.0	431.3	414.1	383.5
5. Non-Ag. Exports	616,722.0	116.9	125.9	134.3	149.3
6. Non-Ag. Imports	655,183.0	136.5	143.9	150.8	163.1
C. Domestic Sector	(000 Cz$ 1980)				
1. Ag. Consumption Goods	1,103,176.0	302.3	297.3	293.7	249.7
2. Non-Ag. Consumption Goods	10,974,656.0	179.9	181.1	182.2	184.3
3. Investment Goods	2,614,260.0	192.1	187.7	183.8	176.9
D. Factor Income Shares	(%)				
1. Rural Labor	9.0	147.8	151.1	154.4	161.1
2. Non-Rural Labor	22.0	85.0	82.7	80.9	77.3
3. Capital + Land	69.0	98.6	98.8	99.0	99.3
E. Agricultural Labor	(000) b\				
1. North	601.0	113.8	113.0	111.3	107.2
2. Northeast	4,519.0	58.5	58.2	57.8	55.9
3. Southeast	3,337.0	112.3	112.5	112.0	107.4
4. South	2,071.0	90.6	90.3	88.3	84.1
5. Center-West	976.0	194.1	194.9	195.5	191.4
F. Total Labor Force	(000) b\				
	54,798.0	132.6	132.6	132.6	132.6
G. Cultivated Land	(000 ha)				
1. North	2,076.0	201.6	201.4	200.1	194.8
2. Northeast	14,456.0	119.7	119.9	119.8	118.9
3. Southeast	13,883.0	124.5	124.6	124.2	119.1
4. South	14,626.0	101.3	100.8	98.4	94.5
5. Center-West	8,013.0	113.2	113.6	113.5	110.2
H. Machinery	(units) c\				
1. North	6,040.0	686.5	674.8	660.0	631.9
2. Northeast	38,324.0	373.6	368.4	363.6	355.8
3. Southeast	244,080.0	172.5	171.8	170.0	163.5
4. South	291,600.0	114.6	113.3	110.0	105.5
5. Center-West	98,300.0	181.3	181.6	181.5	177.3
I. Ag. Labor's Cost Share	(%)				
1. North	87.4	91.2	91.1	90.9	90.7
2. Northeast	86.7	93.4	93.4	93.3	93.0
3. Southeast	90.5	91.2	91.4	91.4	91.4
4. South	40.7	89.9	90.2	90.4	89.9
5. Center-West	87.6	91.0	91.0	91.1	91.3
J. Ag. Land's Cost Share	(%)				
1. North	25.4	105.1	105.5	106.3	107.1
2. Northeast	26.9	101.5	101.9	102.6	103.0
3. Southeast	29.3	104.6	104.8	104.6	104.6
4. South	45.6	100.2	100.2	100.2	100.7
5. Center-West	25.7	107.0	106.6	106.6	105.8
K. Ag. Machinery's Cost Share	(%)				
1. North	7.1	167.6	166.2	164.6	164.6
2. Northeast	6.4	162.5	160.9	159.4	160.9
3. Southeast	10.2	138.2	137.3	137.3	137.3
4. South	13.7	129.2	127.7	127.7	127.7
5. Center-West	6.7	165.7	164.2	164.2	164.2

a\ Scenario 1 refers to agricultural trade liberalization. This is reflected in sensitivity tests 1, 2 and 3 which are as follows: (1) Pxe: + 10% ; (2) Pxe: + 20% ; (3) Pxe: + 40%.
b\ Excludes unremunerated family workers in agriculture.
c\ Includes motor tillers, wheel tractors, crawler tractors and combine harvesters.

Source: Simulation results.

TABLE A.5.3: SIMULATION RESULTS (SCENARIO 2): YEAR 2000

		Sensitivity Tests: Year 2000 a\ (Index Numbers: Base 1987 = 100)			
	Year 1987	Baseline	(1)	(2)	(3)
A. Aggregates	(000 Cz$ 1980)				
1. GDP	1,498,745.0	181.7	180.6	179.9	182.8
2. Ag. GDP (without investment)	1,576,116.0	218.5	232.2	250.5	320.5
3. Non-Ag. GDP (without investment)	10,758,367.0	179.0	176.9	174.7	172.1
B. Trade Sector	(000 Cz$ 1980)				
1. Ag. Trade Balance	398,974.0	-13.0	-27.0	-28.9	-13.0
2. Ag. Exports	472,940.0	13.6	--	--	--
3. Ag. Imports	73,966.0	158.3	145.2	129.0	70.1
4. Non-Ag. Trade Balance	(38,461.0)	450.0	316.4	1163.6	--
5. Non-Ag. Exports	616,722.0	116.9	106.6	94.0	46.6
6. Non-Ag. Imports	655,183.0	136.5	87.5	25.2	--
C. Domestic Sector	(000 Cz$ 1980)				
1. Ag. Consumption Goods	1,103,176.0	302.3	330.3	367.2	522.3
2. Non-Ag. Consumption Goods	10,974,856.0	179.9	178.6	176.4	156.0
3. Investment Goods	2,614,260.0	192.1	184.7	175.9	147.2
D. Factor Income Shares	(%)				
1. Rural Labor	9.0	147.6	143.3	137.6	118.7
2. Non-Rural Labor	22.0	85.0	85.9	87.3	92.7
3. Capital + Land	69.0	98.6	98.8	99.1	100.0
E. Agricultural Labor	(000) b\				
1. North	601.0	113.8	113.8	113.8	113.8
2. Northeast	4,519.0	58.5	58.5	58.5	58.5
3. Southeast	3,337.0	112.3	112.3	112.3	112.3
4. South	2,071.0	90.6	90.6	90.6	90.6
5. Center-West	976.0	194.1	194.1	194.1	194.1
F. Total Labor Force	(000) b\				
	54,798.0	132.6	132.6	132.6	132.6
G. Cultivated Land	(000 ha)				
1. North	2,076.0	201.6	201.6	201.6	201.6
2. Northeast	14,456.0	119.7	119.7	119.7	119.7
3. Southeast	13,883.0	124.5	124.5	124.5	124.5
4. South	14,626.0	101.3	101.3	101.3	101.3
5. Center-West	8,013.0	113.2	113.2	113.2	113.2
H. Machinery	(units) c\				
1. North	6,040.0	886.5	886.5	886.5	886.5
2. Northeast	38,324.0	373.6	373.6	373.6	373.6
3. Southeast	244,080.0	172.5	172.5	172.5	172.5
4. South	291,600.0	114.6	114.6	114.6	114.6
5. Center-West	96,300.0	181.3	181.3	181.3	181.3
I. Ag. Labor's Cost Share	(%)				
1. North	67.4	91.2	91.2	91.2	91.2
2. Northeast	66.7	93.4	93.4	93.4	93.4
3. Southeast	60.5	91.2	91.2	91.2	91.2
4. South	40.7	89.9	89.9	89.9	89.9
5. Center-West	67.6	91.0	91.0	91.0	91.0
J. Ag. Land's Cost Share	(%)				
1. North	25.4	105.1	105.1	105.1	105.1
2. Northeast	26.9	101.5	101.5	101.5	101.5
3. Southeast	29.3	104.8	104.8	104.8	104.8
4. South	45.6	100.2	100.2	100.2	100.2
5. Center-West	25.7	107.0	107.0	107.0	107.0
K. Ag. Machinery's Cost Share	(%)				
1. North	7.1	167.6	167.6	167.6	167.6
2. Northeast	6.4	162.5	162.5	162.5	162.5
3. Southeast	10.2	138.2	138.2	138.2	138.2
4. South	13.7	129.2	129.2	129.2	129.2
5. Center-West	6.7	165.7	165.7	165.7	165.7

a\ Scenario 2 refers to non-agricultural trade liberalization. This is reflected in sensitivity tests 1, 2 and 3 which are as follows: (1) Pwma: - 20% ; (2) Pwma: - 40% ; (3) Pwma: - 80%.
b\ Excludes unremunerated family workers in agriculture.
c\ Includes motor tillers, wheel tractors, crawler tractors and combine harvesters.

Source: Simulation results.

TABLE A.5.4: SIMULATION RESULTS (SCENARIO 3): YEAR 2000

		Sensitivity Tests: Year 2000 a\ (Index Numbers: Base 1987 = 100)			
	Year 1987	Baseline	(1)	(2)	(3)
A. Aggregates	(000 Cz$ 1980)				
1. GDP	14,948,745.0	181.7	180.2	178.9	180.0
2. Ag. GDP (without investment)	1,576,116.0	218.5	230.2	246.5	320.6
3. Non-Ag. GDP (without investment)	10,758,387.0	179.0	178.0	176.9	175.3
B. Trade Sector	(000 Cz$ 1980)				
1. Ag. Trade Balance	398,974.0	-13.0	-5.0	-7.4	--
2. Ag. Exports	472,940.0	13.6	17.8	12.8	--
3. Ag. Imports	73,966.0	158.3	142.1	122.9	58.3
4. Non-Ag. Trade Balance	(38,461.0)	450.0	337.4	1210.0	--
5. Non-Ag. Exports	616,722.0	116.9	115.6	110.8	
6. Non-Ag. Imports	655,183.0	136.5	94.9	39.2	--
C. Domestic Sector	(000 Cz$ 1980)				
1. Ag. Consumption Goods	1,103,176.0	302.3	315.2	338.3	465.9
2. Non-Ag. Consumption Goods	10,974,856.0	179.9	178.6	172.4	159.0
3. Investment Goods	2,614,260.0	192.1	180.3	167.4	130.6
D. Factor Income Shares	(%)				
1. Rural Labor	9.0	147.8	146.7	144.4	130.0
2. Non-Rural Labor	22.0	85.0	84.1	83.2	85.0
3. Capital + Land	69.0	98.6	98.9	99.4	100.9
E. Agricultural Labor	(000) b\				
1. North	601.0	113.8	113.0	111.3	107.2
2. Northeast	4,519.0	58.5	58.2	57.8	55.9
3. Southeast	3,337.0	112.3	112.5	112.0	107.4
4. South	2,071.0	90.6	90.3	88.8	84.1
5 Center-West	976.0	194.1	194.9	193.5	191.4
F. Total Labor Force	(000) b\				
	54,798.0	132.6	132.6	132.6	132.6
G. Cultivated Land	(000 ha)				
1. North	2,076.0	201.6	201.4	200.1	194.8
2. Northeast	14,456.0	119.7	119.9	119.8	116.9
3. Southeast	13,883.0	124.5	124.6	124.2	119.1
4. South	14,626.0	101.3	100.8	98.4	94.5
5. Center-West	8,013.0	113.2	113.6	113.5	110.2
H. Machinery	(units) c\				
1. North	6,040.0	886.5	874.8	860.0	831.9
2. Northeast	38,324.0	373.6	368.4	363.6	355.8
3. Southeast	244,080.0	172.5	171.8	170.0	163.5
4. South	291,600.0	114.6	113.3	110.0	105.5
5. Center-West	96,300.0	181.3	181.6	181.5	177.3
I. Ag. Labor's Cost Share	(%)				
1. North	87.4	91.2	91.1	90.9	90.7
2. Northeast	66.7	93.4	93.4	93.3	93.0
3. Southeast	80.5	91.2	91.4	91.4	91.4
4. South	40.7	89.9	90.2	90.4	89.9
5. Center-West	87.8	91.0	91.0	91.1	91.3
J. Ag. Land's Cost Share	(%)				
1. North	25.4	105.1	105.5	106.3	107.1
2. Northeast	26.9	101.5	101.9	102.6	103.0
3. Southeast	29.3	104.8	104.8	104.8	104.8
4. South	45.6	100.2	100.2	100.2	100.7
5. Center-West	25.7	107.0	106.6	106.6	105.8
K. Ag. Machinery's Cost Share	(%)				
1. North	7.1	167.6	166.2	164.8	164.8
2. Northeast	8.4	162.5	160.9	159.4	160.9
3. Southeast	10.2	128.2	127.8	127.8	127.8
4. South	13.7	129.2	127.7	127.7	127.7
5. Center-West	8.7	165.7	164.2	164.2	164.2

a\ Scenario 3 refers to comprehensive trade liberalization (scenarios 1 + 2) which is reflected in sensitivity tests 1, 2 and 3. These are as follows: (1) Px: + 10% ; Pm: -20% and (2) Px: + 20% ; Pm: -40% and (3) Px: + 40% ; Pm: -60%.
b\ Excludes unremunerated family workers in agriculture.
c\ Includes motor tillers, wheel tractors, crawler tractors and combine harvesters.

Source: Simulation results.

TABLE A.5.5: SIMULATION RESULTS (SCENARIO 4): YEAR 2000

		Sensitivity Tests: Year 2000 a\ (Index Numbers: Base 1987 = 100)	
	Year 1987	Baseline	(1)
A. Aggregates	(000 Cz$ 1980)		
1. GDP	14,948,745.0	181.7	182.1
2. Ag. GDP (without investment)	1,576,116.0	218.5	203.9
3. Non-Ag. GDP (without investment)	10,758,387.0	179.0	183.5
B. Trade Sector	(000 Cz$ 1980)		
1. Ag. Trade Balance	398,974.0	-13.0	74.0
2. Ag. Exports	472,940.0	13.6	66.7
3. Ag. Imports	73,966.0	158.3	163.4
4. Non-Ag. Trade Balance	(38,461.0)	450.0	867.7
5. Non-Ag. Exports	616,722.0	116.9	143.2
6. Non-Ag. Imports	655,183.0	136.5	191.1
C. Domestic Sector	(000 Cz$ 1980)		
1. Ag. Consumption Goods	1,103,176.0	302.3	280.9
2. Non-Ag. Consumption Goods	10,974,856.0	179.9	188.3
3. Investment Goods	2,614,260.0	192.1	190.2
D. Factor Income Shares	(%)		
1. Rural Labor	9.0	147.8	157.8
2. Non-Rural Labor	22.0	85.0	80.0
3. Capital + Land	69.0	98.6	98.7
E. Agricultural Labor	(000) b\		
1. North	601.0	113.8	111.3
2. Northeast	4,519.0	58.5	57.8
3. Southeast	8,337.0	112.3	112.0
4. South	2,071.0	90.6	88.3
5. Center-West	976.0	194.1	195.5
F. Total Labor Force	(000) b\		
	54,798.0	132.6	132.6
G. Cultivated Land	(000 ha)		
1. North	2,076.0	201.6	200.1
2. Northeast	14,456.0	119.7	119.8
3. Southeast	13,883.0	124.5	124.2
4. South	14,626.0	101.3	98.4
5. Center-West	8,013.0	113.2	113.5
H. Machinery	(units) c\		
1. North	6,040.0	886.5	860.0
2. Northeast	38,324.0	373.6	363.6
3. Southeast	244,080.0	172.5	170.0
4. South	291,600.0	114.6	110.0
5. Center-West	96,300.0	181.3	181.5
I. Ag. Labor's Cost Share	(%)		
1. North	87.4	91.2	90.9
2. Northeast	86.7	93.4	93.3
3. Southeast	80.5	91.2	91.4
4. South	40.7	89.9	90.4
5. Center-West	87.6	91.0	91.1
J. Ag. Land's Cost Share	(%)		
1. North	25.4	105.1	106.3
2. Northeast	26.9	101.5	102.6
3. Southeast	29.3	104.6	104.6
4. South	45.6	100.2	100.2
5. Center-West	25.7	107.0	106.6
K. Ag. Machinery's Cost Share	(%)		
1. North	7.1	167.6	164.8
2. Northeast	6.4	152.5	159.4
3. Southeast	10.2	138.2	137.3
4. South	13.7	129.2	127.7
5. Center-West	6.7	165.7	164.2

a\ Scenario 4 refers to exchange rate liberalization (20% real depreciation) as reflected in sensitivity test (1) which is as follows: (1) Pxs: + 20% ; Pms: +20%.
b\ Excludes unremunerated family workers in agriculture.
c\ Includes motor tillers, wheel tractors, crawler tractors and combine harvesters.

Source: Simulation results.

TABLE A.5.6: SIMULATION RESULTS (SCENARIO 5): YEAR 2000

		Sensitivity Tests: Year 2000 a\ (Index Numbers: Base 1987 = 100)		
	Year 1987	Baseline	(1)	(2)	(3)
A. Aggregates	(000 Cz$ 1980)				
1. GDP	14,948,745.0	181.7	180.6	179.1	176.8
2. Ag. GDP (without investment)	1,576,116.0	218.5	218.3	225.5	265.2
3. Non-Ag. GDP (without investment)	10,758,387.0	179.0	182.5	181.3	179.9
B. Trade Sector	(000 Cz$ 1980)				
1. Ag. Trade Balance	398,974.0	-13.0	81.0	81.1	69.9
2. Ag. Exports	472,940.0	13.6	90.4	88.1	88.1
3. Ag. Imports	73,966.0	158.3	149.7	132.2	87.2
4. Non-Ag. Trade Balance	(38,481.0)	450.0	398.1	386.7	--
5. Non-Ag. Exports	616,722.0	116.9	142.1	138.6	131.6
6. Non-Ag. Imports	655,183.0	136.5	157.1	113.6	--
C. Domestic Sector	(000 Cz$ 1980)				
1. Ag. Consumption Goods	1,103,176.0	302.3	261.2	277.7	328.6
2. Non-Ag. Consumption Goods	10,974,856.0	179.9	183.3	179.7	170.8
3. Investment Goods	2,614,260.0	192.1	180.2	169.4	137.2
D. Factor Income Share	(%)				
1. Rural Labor	9.0	147.8	157.8	156.7	153.3
2. Non-Rural Labor	22.0	85.0	79.1	78.6	76.4
3. Capital + Land	69.0	98.6	99.1	99.4	100.6
E. Agricultural Labor	(000) b\				
1. North	601.0	113.8	109.0	107.2	102.5
2. Northeast	4,519.0	58.5	56.8	55.9	52.8
3. Southeast	3,337.0	112.3	109.6	107.4	100.1
4. South	2,071.0	90.6	85.6	84.1	79.6
5. Center-West	976.0	194.1	193.4	191.4	182.7
F. Total Labor Force	(000) b\				
	54,798.0	132.6	132.6	132.8	132.6
G. Cultivated Land	(000 ha)				
1. North	2,076.0	201.6	197.1	194.8	190.4
2. Northeast	14,456.0	119.7	118.4	116.9	110.5
3. Southeast	13,893.0	124.5	121.6	119.1	109.7
4. South	14,626.0	101.3	95.8	94.5	88.2
5. Center-West	8,013.0	113.2	111.8	110.2	104.3
H. Machinery	(units) c\				
1. North	6,040.0	886.5	843.6	831.9	794.5
2. Northeast	38,324.0	373.6	359.1	353.8	345.3
3. Southeast	244,080.0	172.5	168.4	163.5	153.8
4. South	201,600.0	114.6	108.9	105.5	100.0
5. Center-West	98,300.0	181.3	179.3	177.3	168.9
I. Ag. Labor's Cost Share	(%)				
1. North	67.4	91.2	90.8	90.7	90.1
2. Northeast	65.7	93.4	93.1	93.0	92.7
3. Southeast	60.5	91.2	91.4	91.4	91.6
4. South	40.7	89.9	90.2	89.9	90.4
5. Center-West	67.6	91.0	92.0	91.3	91.6
J. Ag. Land's Cost Share	(%)				
1. North	25.4	105.1	106.7	107.1	108.7
2. Northeast	26.9	101.5	103.0	103.0	103.0
3. Southeast	29.3	104.8	104.8	104.8	103.8
4. South	45.6	100.2	100.4	100.7	99.8
5. Center-West	25.7	107.0	106.2	105.8	105.1
K. Ag. Machinery's Cost Share	(%)				
1. North	7.1	167.6	164.8	164.8	164.8
2. Northeast	6.4	162.5	159.4	160.9	164.1
3. Southeast	10.2	138.2	137.3	137.3	139.2
4. South	13.7	129.2	127.7	127.7	128.5
5. Center-West	6.7	165.7	164.2	164.2	164.2

a\ Scenario 5 refers to comprehensive trade and exchange rate liberalizations (scenarios 3 + 4) as reflected in sensitivity tests 1, 2 and 3 which are as follows: (1) Px: +30% ; Pmm: Constant and (2) Px: +40% ; Pmm: -20% and (3) Px: +80% ; Pmm: -60%.
b\ Excludes unremunerated family workers.
c\ Includes motor tillers, wheel tractors, crawler tractors and combine harvesters.

Source: Simulation results.

TABLE A.5.7: SIMULATION RESULTS (SCENARIO 6): YEAR 2000

		Sensitivity Tests: Year 2000 a\ (Index Numbers: Base 1987 = 100)		
	Year 1987	Baseline	(1)	(2)
A. Aggregates	(000 Cz$ 1980)			
1. GDP	14,948,743.0	296.5	296.5	296.5
2. Ag. GDP (without investment)	1,502,150.0	327.9	327.9	327.9
3. Non-Ag. GDP (without investment)	10,936,395.0	295.6	295.6	295.6
B. Trade Sector	(000 Cz$ 1980)			
1. Ag. Trade Balance	338,974.0	67.7	67.7	67.7
2. Ag. Exports	472,940.0	92.8	92.8	92.8
3. Ag. Imports	73,986.0	228.5	228.5	228.5
4. Non-Ag. Trade Balance	(38,461.0)	603.0	935.1	965.1
5. Non-Ag. Exports	616,722.0	232.7	232.7	232.7
6. Non-Ag. Imports	655,183.0	189.5	189.5	189.5
C. Domestic Sector	(000 Cz$ 1980)			
1. Ag. Consumption Goods	1,103,176.0	422.0	422.0	422.0
2. Non-Ag. Consumption Goods	10,974,656.0	292.8	292.8	292.8
3. Investment Goods	2,614,260.0	270.2	270.2	270.2
D. Factor Income Shares	(%)			
1. Rural Labor	9.0	151.1	151.1	151.1
2. Non-Rural Labor	22.0	78.6	78.6	78.6
3. Capital + Land	69.0	100.1	100.1	100.1
E. Agricultural Labor	(000) b\			
1. North	601.0	113.8	115.8	118.5
2. Northeast	4,519.0	58.5	59.3	61.0
3. Southeast	3,337.0	112.3	112.5	112.0
4. South	2,071 0	90.6	91.8	93.1
5. Center-West	976.0	194.1	192.8	190.7
F. Total Labor Force	(000) b\			
	54,798.0	132.6	132.6	132.6
G. Cultivated Land	(000 ha)			
1. North	2,076.0	201.6	209.3	219.4
2. Northeast	14,456.0	119.7	124.0	131.2
3. Southeast	13,883.0	124.5	128.5	135.8
4. South	14,626.0	101.3	106.7	117.7
5. Center-West	8,013.0	113.2	115.2	119.2
H. Machinery	(units) c\			
1. North	6,040.0	886.5	855.2	785.3
2. Northeast	38,324.0	373.6	360.6	333.1
3. Southeast	244,080.0	172.5	384.8	139.6
4. South	291,600.0	114.6	106.5	90.6
5. Center-West	96,300.0	181.3	170.1	148.8
I Ag. Labor's Cost Share	(%)			
1. North	87.4	91.2	92.7	96.9
2. Northeast	86.7	93.4	95.1	99.6
3. Southeast	80.5	91.2	93.1	97.5
4. South	40.7	89.9	92.6	99.5
5. Center-West	87.6	91.0	92.5	96.4
J. Ag. Land's Cost Share	(%)			
1. North	25.4	105.1	98.0	81.9
2. Northeast	26.9	101.5	94.8	79.8
3. Southeast	29.3	104.8	99.0	85.7
4. South	45.8	100.2	96.5	87.7
5. Center-West	25.7	107.0	100.4	85.2
K. Ag. Machinery's Cost Share	(%)			
1. North	7.1	187.6	177.5	197.2
2. Northeast	6.4	182.5	171.9	192.2
3. Southeast	10.2	138.2	144.1	152.0
4. South	13.7	129.2	133.6	142.3
5. Center-West	6.7	165.7	174.6	192.5

a\ Scenario 6 is the removal of fiscal and credit subsidies which is reflected in sensitivity tests 1 and 2. These sensitivity tests refer to the following: (1) Pk: +10% ; Pl: -10% and (2) Pk: +30% ; Pl: -30%.
b\ Excludes unremunerated family workers in agriculture.
c\ Includes motor tillers, wheel tractors, crawler tractors and combine harvesters.

Source: Simulation results.

TABLE A.5.8: SIMULATION RESULTS (SCENARIO 7): YEAR 2000

	Year 1987	Sensitivity Tests: Year 2000 a\ (Index Number: Base 1987 = 100)			
		Baseline	(1)	(2)	(3)
A. Aggregates	(000 Cz$ 1980)				
1. GDP	14,948,743.0	296.5	306.3	303.9	300.9
2. Ag. GDP (without investment)	1,502,150.0	327.9	311.9	332.3	299.7
3. Non-Ag. GDP (without investment)	10,936,395.0	295.6	311.7	309.8	308.9
B. Trade Sector	(000 Cz$ 1980)				
1. Ag. Trade Balance	398,974.0	67.7	187.7	187.7	202.7
2. Ag. Exports	472,940.0	92.8	192.2	188.2	186.8
3. Ag. Imports	73,966.0	228.5	216.5	191.1	114.2
4. Non-Ag. Trade Balance	(38,461.0)	603.0	993.0	2116.3	--
5. Non-Ag. Exports	616,722.0	232.7	288.2	282.4	271.8
6. Non-Ag. Imports	655,183.0	189.5	218.8	147.5	--
C. Domestic Sector	(000 Cz$ 1980)				
1. Ag. Consumption Goods	1,103,176.0	422.0	356.7	384.8	471.0
2. Non-Ag. Consumption Goods	10,974,856.0	292.8	307.5	301.6	298.3
3. Investment Goods	2,614,260.0	270.2	268.4	250.9	198.7
D. Factor Income Shares	(%)				
1. Rural Labor	9.0	151.1	166.7	165.6	162.2
2. Non-Rural Labor	22.0	78.6	70.9	70.5	68.2
3. Capital + Land	69.0	100.1	100.6	100.9	102.0
		SCENARIO 7A			
E. Agricultural Labor	(000) b\				
1. North	601.0	118.8	110.8	109.0	104.2
2. Northeast	4,519.0	58.5	57.8	56.7	53.8
3. Southeast	3,337.0	112.3	109.7	107.4	100.2
4. South	2,071.0	90.6	85.6	83.6	79.1
5. Center-West	976.0	194.1	193.4	192.0	184.8
F. Total Labor Force	(000) b\				
	54,798.0	132.6	132.6	132.6	132.6
G. Cultivated Land	(000 ha)				
1. North	2,076.0	201.6	204.8	202.0	196.8
2. Northeast	14,456.0	119.7	122.3	120.6	113.5
3. Southeast	13,883.0	124.5	124.4	121.5	111.5
4. South	14,626.0	101.3	99.2	97.0	90.7
5. Center-West	8,013.0	113.2	113.8	50.0	106.9
H. Machinery	(units) c\				
1. North	6,040.0	886.5	814.0	801.9	765.6
2. Northeast	38,324.0	373.6	346.7	343.6	335.7
3. Southeast	244,080.0	172.5	155.6	152.6	144.2
4. South	291,600.0	114.6	98.1	96.2	91.7
5. Center-West	96,300.0	181.3	169.8	168.5	162.5
I. Ag. Labor's Cost Share	(%)				
1. North	67.4	91.2	92.3	92.3	91.8
2. Northeast	66.7	93.4	94.9	94.8	94.6
3. Southeast	60.5	91.2	93.4	93.4	93.7
4. South	40.7	89.9	92.9	92.9	93.1
5. Center-West	67.6	91.0	92.9	93.0	93.3
J. Ag. Land's Cost Share	(%)				
1. North	25.4	105.1	99.6	100.0	101.2
2. Northeast	26.9	101.5	95.9	95.9	95.2
3. Southeast	29.3	104.8	98.6	98.3	96.9
4. South	45.6	100.2	96.5	96.5	95.6
5. Center-West	25.7	107.0	99.2	98.8	98.1
K. Ag. Machinery's Cost Share	(%)				
1. North	7.1	167.6	174.6	176.1	174.6
2. Northeast	6.4	162.5	170.3	171.9	176.6
3. Southeast	10.2	138.2	144.1	144.1	148.1
4. South	13.7	129.2	132.8	132.8	134.3
5. Center-West	6.7	165.7	174.6	174.6	176.1

Continued on next page.

TABLE A.5.8: SIMULATION RESULTS (SCENARIO 7): YEAR 2000

		SCENARIO 7B			
E. Agricultural Labor	(000) b\				
1. North	601.0	113.8	114.0	111.8	106.3
2. Northeast	4,819.0	58.5	59.5	58.5	55.4
3. Southeast	3,337.0	112.3	110.2	107.8	100.6
4. South	2,071.0	90.6	86.0	83.0	78.2
5. Center-West	976.0	194.1	194.6	194.4	190.5
F. Total Labor Force	(000) b\				
	54,798.0	132.6	132.6	132.6	132.6
G. Cultivated Land	(000 ha)				
1. North	2,076.0	201.6	215.0	210.8	202.3
2. Northeast	14,456.0	119.7	129.6	127.8	118.9
3. Southeast	13,883.0	124.5	131.2	127.8	116.5
4 South	14,626.0	101.3	107.7	104.1	97.0
5. Center-West	8,013.0	113.2	118.0	117.2	112.8
H. Machinery	(units) c\				
1. North	6,040.0	686.5	752.6	738.0	701.4
2. Northeast	38,324.0	373.8	823.0	319.5	311.2
3. Southeast	244,080.0	172.5	136.4	133.8	126.5
4. South	291,600.0	114.5	82.9	80.4	76.5
5. Center-West	96,300.0	181.3	153.3	153.1	150.8
I. Ag. Labor's Cost Share	(%)				
1. North	67.4	91.2	96.6	96.6	96.4
2. Northeast	66.7	93.4	99.3	99.3	99.1
3. Southeast	60.5	91.2	98.2	98.2	98.2
4. South	40.7	89.9	100.0	100.0	100.2
5. Center-West	67.6	91.0	97.2	97.3	97.6
J. Ag. Land's Cost Share	(%)				
1. North	25.4	105.1	83.1	83.1	83.1
2. Northeast	26.9	101.5	80.3	80.3	79.2
3. Southeast	29.3	104.8	84.6	84.3	82.6
4. South	45.6	100.2	87.3	87.3	86.6
5. Center-West	25.7	107.0	83.3	82.5	81.3
K. Ag. Machinery's Cost Share	(%)				
1. North	7.1	167.6	194.4	195.8	194.4
2. Northeast	6.4	162.5	190.6	190.6	196.9
3. Southeast	10.2	138.2	155.9	155.9	158.8
4. South	13.7	129.2	141.6	142.3	143.8
5. Center-West	6.7	165.7	194.0	194.0	195.5

a\ Scenario 7 is the combination of scenarios 5 and 6. Scenario 7A combines the three sensitivity tests in scenario 5 with the first sensitivity test in scenario 6. Scenario 7B combines the three sensitivity tests in scenario 5 with the second sensitivity test in scenario 6.
b\ Excludes unremunerated family workers in agriculture.
c\ Includes motor tillers, wheel tractors, crawler tractors and combine harvesters.

Source: Simulation results.

TABLE A.5.9: SIMULATION RESULTS: AGRICULTURE'S SHARE IN REAL GDP (SCENARIOS 1 - 7), YEAR 2000

(%)

Scenarios a\	Year 1987	Baseline: Year 2000	Sensitivity Tests: Year 2000 a\ (1)	(2)	(3)
(1)	10.5	12.1	12.0	11.9	11.9
(2)	10.5	12.1	12.9	13.9	--
(3)	10.5	12.1	12.8	13.8	--
(4)	10.5	12.1	11.2	--	--
(5)	10.5	12.1	11.9	12.6	15.1
(6)	10.5	12.1	12.1	12.1	12.1
(7)	10.5	12.1	12.6	12.6	15.1

a\ The scenarios and sensitivity tests are defined in Tables A.5.2 - A.5.8.

Source: Tables A.5.2 to A.5.8.

TABLE A.5.10: SIMULATION RESULTS: AGRICULTURE'S SHARE IN THE LABOR FORCE (SCENARIOS 1 - 7): YEAR 2000

(%)

Scenarios a\	Year 1987	Baseline: Year 2000	Sensitivity Tests a\ (1)	(2)	(3)
(1)	21.0	14.9	14.9	14.8	14.2
(2)	21.0	14.9	14.9	14.9	14.9
(3)	21.0	14.9	14.9	14.8	14.2
(4)	21.0	14.9	14.8		
(5)	21.0	14.9	14.5	14.2	13.4
(6)	21.0	14.9	15.0	15.1	
(7) A	21.0	14.9	14.6	14.3	13.5
B			14.8	14.5	13.7

NOTE: Excludes unremunerated family labor in agriculture.

a\ The scenarios and sensitivity tests are defined in Tables A.5.2 - A.5.8.


COLOMBIA
VENEZUELA
GUYANA
SURINAME
FRENCH GUIANA
Boa Vista
RORAIMA
AMAPA
Macapá
Marajó Island
Salinópolis
Belém
São Luis
Parnaíba
Camocim
Fortaleza
Disputed State Boundary
NORTH
Manaus
AMAZONAS
PARÁ
MARANHÃO
Teresina
CEARÁ
RIO GRANDE DO NORTE
Natal
PARAÍBA
João Pessoa
Campina Grande
Olinda
Recife
PERNAMBUCO
NORTHEAST
PIAUÍ
Miracema Do Norte
Porto Velho
ACRE
Rio Branco
RONDÔNIA
Maceió
ALAGOAS
Aracaju
SERGIPE
PERU
TOCANTINS
BAHIA
Feira de Santana
Salvador
MATO GROSSO
CENTER - WEST
GOIÁS
Cuiabá
Federal District
BRASÍLIA
Jequié
Ipiaú
Ilhéus
Goiânia
BOLIVIA
Araçuaí
Teófilo Otoni
Governador Valadares
Caravelas
Uberlândia
MATO GROSSO DO SUL
Campo Grande
MINAS GERAIS
Belo Horizonte
ESPÍRITO SANTO
Tubarão
Vitória
SOUTHEAST
PACIFIC OCEAN
São José do Rio Prêto
Ribeirão Prêto
SÃO PAULO
Baurú
Juiz de Fora
Campos
ATLANTIC OCEAN
PARAGUAY
Campinas
Sorocaba
São Paulo
Redenção
RIO DE JANEIRO
Cabo Frio
Rio de Janeiro
São Sebastião
Santos
CHILE
PARANÁ
Ponta Grossa
Curitiba
Jaguariba
Paranaguá
SANTA CATARINA
Lajes
Florianópolis
SOUTH
Vacaria
Tubarão
ARGENTINA
RIO GRANDE DO SUL
Santa Maria
Porto Alegre
Tramandaí
Bagé
Pelotas
Rio Grande
URUGUAY
SOUTH BRAZIL
Brasília
AMERICA
PACIFIC OCEAN
ATLANTIC OCEAN
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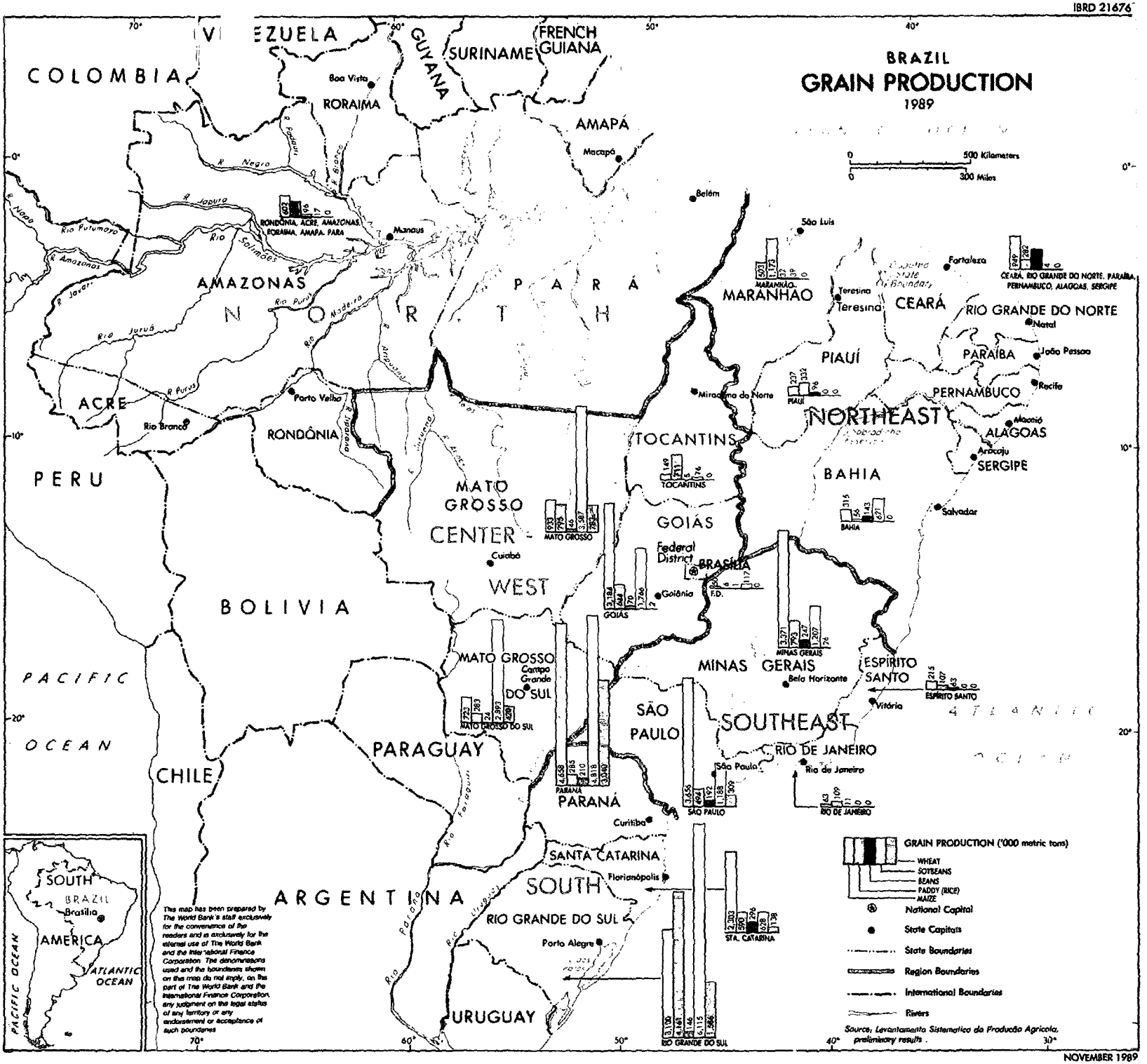
KILOMETERS 0 100 200 300 400 500
MILES 0 100 200 300
BRAZIL
National Capital
State Capitals
Selected Towns
State Boundaries
Region Boundaries
International Boundaries
Rivers

AUGUST 1989

IBRD 21676

BRAZIL
GRAIN PRODUCTION
1989



Source, Levantamento Sistematico da Producão Agricola, preliminary results.

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NOVEMBER 1989