

THE GROSS NATIONAL PRODUCT OF THE BRAZILIAN AGROINDUSTRIAL COMPLEX

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ABSTRACT - In this article, we present an overview of the Brazilian Agroindustrial Complex based on Brazil's input-output matrixes from 1980 through 1994. In that context, pure connection indexes are used to define key economic sectors, outline an useful approach for the identification of the agroindustrial complex's components, and aid in determining the agricultural sector component of the Brazilian Gross National Product (GNP). This study shows that Brazilian agriculture is highly advanced and well integrated with the nation's other productive sectors. Brazil's agroindustrial complex accounts for approximately 32% of the country's Gross National Product. Evaluation of the agro-industrial complex component of GNP confirms that the complex's processing and final distribution segments add the largest value to consumer agricultural products.

Key words: Input-output, linkage indexes, agribusiness.

INTRODUCTION

The process of Brazilian industrialization began during the postwar period of the 1950s; however, agriculture related economic activities were not directly benefited until the sector went through an intense modernization and industrialization process in the 1960s. Industrialization led to the creation of a modern industrial park designed

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for the production of agricultural inputs and capital equipment and stimulated the development of improved agricultural storage, transportation, processing, and distribution systems. At this time, the sector has become more closely integrated with industry and established multiple technological, productive, financial, and commercial relations with the county's other economic sectors.

This work analyzes the behavior of the Brazilian agroindustrial complex in the context of these above mentioned developments, specifically focusing on the new dynamic of industrialized agriculture linked with irreversible worldwide expansion. We outline a methodology which identifies the components of Brazil's agroindustrial complex and estimates the Gross National Product (GNP) of the agricultural sector and the pooled industrial sectors bound to agriculture from 1980 to 1994.

Surveys of the agroindustrial complex are relatively scarce, and the researches available often have scope and periodicity problems. Also, governmental and private institutions assign discrepant values to the agricultural sector's economic output. Therefore, our endeavor to determine this sector's economic magnitude and to develop standardized measurement criteria should provide support for future planning of sector policies and management of the agroindustrial complex.

THEORETICAL REFERENCE

Composition of the Agroindustrial Complex

The Agroindustrial Complex (AIC) is formally defined as the set of successive activities linked to the production and transformation of the products of agriculture and forestry (Müller, 1989). This concept indicates the interdependence of agriculture, industry, and commerce, as well as the association between agriculture and financial, research, and development institutions.

Whenever agriculture is studied as a system or complex, one must ask what is to be included within the system. Farina (1988) formulates the food agroindustrial system, a chain starting with agricultural farm production, going through the process of industrial transformation,

and then the products transportation through the distribution network to reach the final consumer. Streeter et al (1991) enlarges the scope of the AIC by adding the rising tide (basic input and output industrial goods for agriculture), ebb tide (food and raw material processing industry), and the consumer. For Barry et al. (1992), the AIC is a chain of interrelated activities, including production, processing, and marketing, combined with the input of institutions and associations that organize, develop, and implement sector policy. Araújo et al. (1990), considered the Brazilian AIC to be made up of businesses connected with agricultural input, agricultural output, storage, processing, and final distribution. On the other hand, Delgado (1985) defines the industry group as the ebb tide; but he determines that the value of agricultural raw materials must make-up at least 50% of any product's industrial output value for that product to be considered output of the AIC. FIBGE (1995) uses the first processing and/or continuous production process criterion to determine agriculture-derived industrial goods.

In this paper, we develop a procedure to limit and delineate the components of the Agroindustrial Complex by using the Pure Interindustry Linkage Index. The Pure Interindustry Linkage Index is an improvement of the Cella-Clements model. The model was proposed by Cella and applied to Brazil by Clements and Rossi (Cella, 1984; Clements and Rossi, 1991; Guilhoto et al., 1994). The Index's main goal was to isolate a given sector j from the rest of the economy to determine the sector's total links effect: the difference between the total production of the economy and the economic production of sector j provided that sector j refrained from buying input from the rest of the economy and from selling its production to the rest of the economy. We then have a picture representing the opposite of imports replacement or the possible disappearance of an entire industrial sector from the economy.

In order to isolate sector j from the rest of the economy the Leontief's direct coefficient matrix (A) must be broken down:

$$A = \begin{bmatrix} A_{jj} & A_{jr} \\ A_{rj} & A_{rr} \end{bmatrix} = \begin{bmatrix} A_{jj} & A_{jr} \\ A_{rj} & 0 \end{bmatrix} + \begin{bmatrix} 0 & 0 \\ 0 & A_{rr} \end{bmatrix} = A_j + A_r \quad (1)$$

where A_{jj} and A_{rr} are direct input matrixes from sector j and from

the rest of the economy (economy less sector j), respectively; A_{jr} and A_{rj} are direct input matrixes acquired by sector j from the rest of economy and the direct input acquired by the rest of economy from sector j , respectively; A_j is a matrix representing sector j apart from the rest of the economy and matrix A_r represents the rest of economy.

The pure backward linkage indexes (*PBL*) and the pure foreword linkage indexes (*PFL*) are expressed as

$$PBL = i'_{rr} \Delta_r A_{rj} q_{jj} \quad (2)$$

where: i'_{rr} is a unit row vector of appropriate dimension, q_{jj} is the value of the total production in sector j , and $\Delta_r = (I - A_{rr})^{-1}$; the remaining variables were defined in the previous paragraph. Total output value was used instead of final demand value due to the isolation of sector j from the rest of the economy. The *PBL* provides the pure impact of sector j on the economy's total output value, expressing an impact dissociated from the input demand from sector j within sector j itself and from the returns of the economy to sector j , and vice versa.

$$PFL = A_{jr} \Delta_r q_{rr} \quad (3)$$

where: q_{rr} is a column vector representing the total output volume in each sector of the rest of the economy. The total output value is used instead of the final demand value to isolate sector j from the rest of the economy. The *PFL* provides the pure impact of sector j on the total output of the rest of the economy.

The pure total linkage index (*PTL*) of each sector is given by

$$PTL = PBL + PFL \quad (4)$$

From another standpoint, a rectangular matrix can be derived showing direct and indirect input acquired by sector j from the rest of the economy (economy less sector j). In essence, these divisions can be thought to represent two separate economies without commercial relations. Thus,

$$GU_j = \Delta_r A_{rj} q_{jj} \quad (5)$$

where variables are defined as previously stated. Again, the total output value is used instead of the final demand value due to the isolation of sector j from the rest of the economy. In each column, matrix *GU*

provides the direct and indirect impact of the total output value of sector j on the economy. Such impact is dissociated from the input demand of sector j from sector j . On the other hand, the rows comprise the direct and indirect impact of the economy's total output on sector j .

The derivation provides an analytical procedure which allows the quantification of a specific sector's influence on the rest of the economy. Such methodology can be used to aid in analyzing the importance of different economic sectors in terms of global impacts (direct and indirect).

Thus, this model allows the identification and quantification of interrelations among agricultural activities and other economic sectors, revealing both the main sectors providing input to the agricultural sector and the sectors with the greatest demand for agricultural goods.

Gross National Product of the Brazilian Agroindustrial Complex

In this study, we have divided Brazil's agroindustrial complex into four sub-sectors: enterprises supplying input to agriculture, called Industry for Agriculture (Aggregate I); the Agriculture sub-sector, (Aggregate II); the agricultural processing industries sub-sector, called Agriculture-Based Industries (Aggregate III); and the Final Distribution sub-sector (Aggregate IV).

The calculus of Aggregate I (Industry for Agriculture) GNP used the information available in input-output tables that give total value of input purchased by agriculture. Therefore, the GNP of Aggregate I is indirectly estimated from the composition of intermediate agriculture consumption. This indirect estimating procedure was used because of the unavailability of statistical data that would allow the identification of the value added to input supply industries by agriculture and eventually reabsorbed by the rural sector. The hypothesis implicit in the use of agriculture intermediate consumption indicators to calculate the value added by Aggregate I activities is that the industrial sectors supplying input and capital goods to the rural sector use almost no agricultural goods and use very few goods produced by all sectors not belonging to the aggregate. The industries in Aggregate I basically use

intermediate goods that come from Aggregate I industries.

Aggregate II (Agriculture) figures are derived from the value added to the agroindustrial complex by agriculture and vegetal extraction [forestry].

Aggregate III (Agriculture-Based Industry) figures are derived from the value added by the agroindustrial sector.

In the case of Aggregate IV (Final Distribution), the aggregate value of the economy's transportation, commerce (sales), and service sectors is used in the mathematical analyses. From that total value, we considered only the value of final consumer level products derived from agriculture, vegetal extraction [forestry], and agroindustry. This lead to the determination that, on average, the AIC accounts for 14.03% (Version 1) to 18.85% (Version 3) of the final distribution value of the economy's final global demand of products. The system adopted to calculate the agroindustrial complex's final distribution is represented by

$$a) DFGP - IIL - PI_{mp} = DFGP_{r,n} I_n$$

To determine the final demand of internal production, imported goods and indirect net taxes are excluded.

$$b) VAT_r + IIL_{at/tr} + VAC_m + IIL_{at/cm} + VAS_r + IIL_{at/sr} = TD_r$$

$$c) DFPR + DFPA_{groin} = DFGPRA_{groin}$$

$$d) \% DFGPRA_{groin} = \frac{DFGPR A_{groin}}{DFG P_r I_n} \times 100$$

$$e) VAD_r RA_{groin} = \% DFGPRA_{groin} (TD_r)$$

where:

$DFGP$	=	global final demand for goods
IIL	=	indirect net taxes on goods
PI_{mp}	=	imported goods
$DFGP_{r,n} I_n$	=	global final demand for internal production
VAT_r	=	value added by the transportation sector
$IIL_{at/tr}$	=	indirect net taxes of the transportation activity
VAC_m	=	value added by the sales sector
$IIL_{at/cm}$	=	indirect net taxes on the sales activity
VAS_r	=	value added by the service sector
$IIL_{at/sr}$	=	indirect net taxes on the service activity
TD_r	=	total distribution margin (transport and commerce)

$DFPR$ = final demand for agricultural and vegetal extraction
[forestry] goods

$DFPA$ = final demand for agroindustrial goods

$DFGPR_{groin}$ = global final demand for rural and agroindustrial goods

$VAD_{r,groin}$ = value added by the final distribution sector related to
agroindustrial inputs and outputs

Treatment of primary data

IBGE (Brazilian Institute of Geography and Statistics) Input-Output Matrixes for the 1980 to 1994 period were used in this paper. The 1980 Input-Output Matrix is part of IBGE's New System of National Accounts (NSCN) and contains methodological improvements on previously published matrixes, especially concerning the adopted production concept. The 1985 Matrix and those from the 1990s were also prepared according to the theories and classifications adopted by NSCN; however, products and activities have been aggregated into fewer classifications, 42 activities and 80 products, as compared to the 88 activities and 136 products classified in the 1980 Matrix. This reduction in the number of categories under study affects correlation and compatibility between the 1980 Matrix and those of 1985 and 1990. In addition, the 1990 Matrix is limited due to the lack of a 1990 industrial census and was updated using quantum and other corresponding price indexes.¹

Considering the goals of our analysis and the limitations and heterogeneity of basic information, we chose to adjust the sector data to retain the aggregation of 42 sectors and 80 products used in the 1985 through 1994 Matrix estimates. Increased aggregation would imply the sum of very homogenous activities and affect the quality of the analysis. The available data are presented using a product-per-activity approach. This allows each product to be produced in more than one sector; and each product is allowed to produce more than the other, that is, the output matrix and the input matrix must be combined in order to generate Leontief's approach (sector x sector) as described by Miller & Blair (1985).

¹ See FIBGE (1988) and (1991) for further details.

RESULTS AND DISCUSSION

The pure backward and foreword linkage indices from 1980, 1985, and 1990 are presented in Tables 1 and 2, respectively.² Among the five sectors with the highest backward linkage indexes in all three periods analyzed are, 1 - Agriculture; 34 - Civil construction, 35 - Commerce, and 39 - Family Services. Among the sectors occupying key forward linkage index positions in all three periods analyzed are: 1 - Agriculture, 18 - Petroleum refining, 35 - Commerce, and 36 - Transportation.

Pure total linkage indexes are shown in Table 3. In this case, the foreword and backward linkage indexes are totaled to create a basis for determining the economy's key sectors. According to this approach, Sector 1, Agriculture, appears very important in the economy, always placing among the first five most influential activities and likely to be considered a key sector. In 1985, the rural sector ranked first in importance among the 42 sectors analyzed. In 1990, the rural sector's economic importance was surpassed only by the commerce sector.

It is important to stress that the our results show agriculture's important inter-sector role in relation to both backward and foreword connection and in determining key sectors. Concurrently, the results point to the increasing economic importance of service activities, following a tendency found in the more developed economies.

Using *GU* matrix estimates for 1980, 1985, and 1990, industry groups were selected from the Input-Output Matrix's classifications to compose the AIC's aggregates.

Table 4 was derived from an analysis of the backward effects (direct and indirect) of agricultural activity. It shows the linkages between agricultural activity and Brazil's other productive sectors in terms of product and input purchases. The activities responsible for about 80% of agriculture's direct and indirect impacts, include 8 - Manufacturing and Maintenance of Machinery and Tractors, 17 - Manufacturing of Chemical Elements, 18 - Petroleum Refining, 19 - Manufacturing of

² An analysis using the influence field concept complementing the notion of linkage indexes, key-sectors, and identification of AIC's segments is found in Furtuoso (1998).

Several Chemical Products, 30 - Manufacturing of Vegetal Oil, 31 - Manufacturing of Other Food Products, 35 - Commerce, 36 - Transportation, and 40 - Services Rendered to Enterprises.³ These results show that agriculture keeps a higher backward interrelation with sectors supplying machinery and tractors, manure and fertilizers, meal and pies (soybean cake), balanced rations, and services.⁴

Demand for agricultural goods is concentrated in 11 sectors (Table 5), which together represent about 80% of the effect (direct and indirect) of economic activities on agriculture. The following sectors comprise the set of Agriculture-Based Industry: 14 - Wood and Furniture; 17 - Manufacturing of Chemical Elements; 22 - Textile Industry; 25 - Coffee Industry; 26 - Vegetal Products Processing; 27 - Animal Slaughtering; 28 - Dairy Industry; 29 - Manufacturing of Sugar; 30 - Manufacturing of Vegetal Oil; 31 - Manufacturing of Other Food Products; 39 - Services Rendered to Families.

Industry for Agriculture (Aggregate I) is comprised of the group of industries that supply the most important inputs and capital goods to agriculture. Agriculture-Based Industry (Aggregate III) represents, for the most part, those enterprises that perform primary and secondary transformation of agricultural raw material.

In the scope of agroindustrial complex quantification, three versions of Agriculture-Based Industry are adopted; these versions reflect three different compositions of the AIC. Version 1 encompasses the activities corresponding to segments 17 - Manufacturing of Chemical Elements, 25 - Coffee Industry, 26 - Vegetal Products Processing, 27 - Animal Slaughtering, 28 - Dairy Industry, 29 - Manufacturing of Sugar, and 30 - Manufacturing of Vegetal Oil. Version 2 adds the segments 14 - Wood and Furniture and 31 - Manufacturing of other Food Products to Version 1. Version 3 adds segment 22 - Textile Industry to Versions 1 and 2.

³ Notice that the backward linkage of agriculture with sectors 30 and 31 is explained by the fact that these branches encompass, respectively, pies (soy feed) - meals and balanced ration

⁴ For a better picture see IBGE's list of activity classifications linked with corresponding products (IBGE, 1989).

Tables 6 and 7 show agroindustrial complex participation in the Brazilian Gross National Product measured at factor cost in current value and percent value, respectively. In 1980, the AIC conditioned by Version 3 of Aggregate III was responsible for 33% of Brazil's GNP. After structural changes in the 1990s, the AIC is responsible for approximately 32% of Brazil's GNP (at time of writing). Table 8 shows the respective GNP values expressed in US\$.

Brazilian GNP estimates derived from Input-Output Matrixes disagree with GNP estimates derived from census data and officially made public by the IBGE. Based on the Input-Output Matrix, the factor cost participation of agriculture in Brazilian GNP was 7.86% in 1993. Silva et al. (1996), using 1985 base-year values officially calculated by IBGE, combined Gross State Products and found that the factor cost participation of agriculture to Brazilian GNP was 11% in 1993. The IBGE has been developing a New System of National Accounts (NSCN) that should eventually replace the Consolidated National Accounts System (SCNC). Using the NSCN basis, new matrixes will be calculated and create a new structure for determining Brazilian GNP; NSCN is incompatible with the existing Consolidated National Accounts System (IBGE, 1988).

Output analysis of the agroindustrial complex in North American and other developed economies not only aids in understanding the concept of the AIC, but makes possible the detection of a few AIC historical tendencies. Among these observed tendencies are the **increasing participation of rural input**, which becomes more representative in the value of production sold by farmers, the **increasing importance of agroindustry**, which exhibits gradual gains in its proportion of AIC GNP, and agriculture becomes less important as farming becomes less important in the composition of the AIC with a **relative decrease of the sector's income** (Lauschner, 1993).

As shown by Tables 9 and 10, these tendencies are also to be found in Brazil. Tables 9 and 10 show the economic composition of the Brazilian agroindustrial complex's GNP by aggregated economic activities. Table 9 presents the data using current value, and Table 10 gives the values by percent. Both tables were derived using factor costs for seven years between 1980/1994 and include results that reflect the impact of the three Versions of Aggregate III (Agricultural based

Industry) on Aggregates I, II, and IV.

Analysis of Table 9 shows that between 1980 and 1993, the Agriculture segment's share of AIC GNP dropped, from 33.8% to 24.6% (Aggregate II, Version III). In this same period, the combined share of AIC GNP contributed by the segments Agriculture-Based Industry and Final Distribution increased from 56.0% to 66.1% (Aggregates III and IV, Version III). The share of AIC GNP contributed by the Industry for Agriculture segment (Aggregate I) gradually decreased from 10.3% in 1980, to 9.4 in 1993. The same tendencies were observed when AIC Aggregates I, II and IV were adjusted to reflect changes in the make-up of Aggregate III (Aggregate III, Versions I & 2).

In short, the Brazilian AIC adds value to agricultural raw material through its processing and final distribution sector. To better sense the importance of the agroindustrial sector as a great intermediary between rural producer and consumer, one can use input-output matrix data for 1980/1985/1990 which show that approximately 70% of agriculture's production is absorbed as input by other sectors and about 72% of that production is destined for agroindustries. According to Goldberg (1990), agroindustry is capable of accounting for 80% of AIC GNP.

In the early stages of industrialization, the proportion AIC GNP accounted for by Industry for Agriculture tends to increase due to the development and marketing of new farming technology. However, when the AIC reaches a certain technological level, the input segment's relative participation in AIC GNP tends to drop. This is compensated for by a higher proportion of AIC GNP accounted for by agroindustries (processing) and distribution. Over time, the Agriculture segment's relative participation in the AIC's GNP tends to decrease in relation to the other AIC aggregates.

Nonetheless, the 1993/1994 period brought a new perspective to the evolution of the AIC. The Agriculture segment's participation in AIC GNP increased by almost 8%. This was an important recovery by the segment, bringing it back to the levels found in the early 1980s. On the other hand, the participation of both Agriculture-Based Industry and Distribution in the AIC GNP tended to decrease, with drops of approximately 2% and 6%, respectively. Industry for

Agriculture's contribution to AIC GNP continued to drop.

These results show that the Brazilian agricultural complex is following the current worldwide economic tendency. The rural sector adapts as the number of urban consumers increases and their level of sophistication evolves to demand more diversified, more appealing agricultural products.

FINAL CONSIDERATIONS

Analysis of the pure linkage indices reveals Brazilian agriculture's advantageous position, both as a sector demanding input from other sectors and as a sector supplying input to other sectors. In addition, the results also point to the increasing importance of service activities within the economy.

The matrix fractionization method (*GU*) used to delimit the agroindustrial complex allows more accurate measurements of AIC activities and confirms the steady process of integration within the complex. This is important since it evidences the agricultural sector's potential within the economic system by means of its high backward and forward effects. On the other hand, this analytical procedure shows narrow backward inter-linkage between agriculture and sectors 8 (Manufacturing and maintenance of machinery and tractors), 17 (Manufacturing of chemical elements), 18 (Petroleum refining), 19 (Manufacturing of several chemical products), 30 (Manufacturing of vegetal oils), 31 (Manufacturing of other food products), 35 (Commerce), 36 (Transportation), and 40 (Services rendered to enterprises). In the case of sectors that demand agricultural products, narrow backward interlinkage is found in sectors 14 (Wood and furniture), 17 (Manufacturing of chemical elements), 22 (Textile industry), 25 (Coffee industry), 26 (Vegetal products processing), 27 (Animal slaughtering), 28 (Dairy industry), 29 (Manufacturing of sugar), 30 (Manufacturing of vegetal oil), 31 (Manufacturing of other food products), and 39 (Services rendered to families).

In regards to the combined AIC figures, empirical data exhibits the AIC's importance in the Brazilian economy: the AIC accounts for about 32% of Brazil's GNP. The Agriculture segment suffered an expressive

loss of weighting in AIC GNP between 1980 and 1993, dropping from 33.8% to 24.6% when conditioned by Aggregate III Version 3. AIC segments Agriculture-Based Industry and Distribution stand out as dynamic hubs; their combined percentage of AIC GNP increased from 56% to 66.1% between 1980 and 1993. In that period, participation of the Industry for Agriculture segment in AIC GNP gradually decreased from 10.3% to 9.4%.

The evolution the Brazilian agroindustrial complex's GNP confirms that its linked enterprises add value to agricultural raw material in such a way so as to make processing and final distribution the propelling vectors of total consumer directed production. This further consolidates the strong association between agriculture and industry.

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Table 1. Pure backward linkage index (PBL). Brazil: 1980 (Cr\$ million) - 1985 (Cr\$ billion) - 1990 (Cr\$ million). Current values

SECTORS		1980		1985		1990	
IBGE CODE	DESCRIPTION	INDEX (PBL)	ORDER	INDEX (PBL)	ORDER	INDEX (PBL)	ORDER
01	Agriculture	864,569.96	5	91,816.50	5	1,938,272.39	5
02	Mineral Extractive	126,438.74	38	13,922.75	39	327,372.51	37
03	Petroleum and Charcoal Extraction	45,389.17	41	13,404.82	38	340,747.6	35
04	Manufacturing of Nonmetallic Minerals	306,115.01	21	28,283.47	24	653,682.06	22
05	Metallurgy of Iron and Steel	372,452.99	16	37,938.34	17	809,886.38	17
06	Metallurgy of Noniron	157,266.06	34	18,106.91	31	397,838.97	33
07	Manufacturing of Other Metallurgical Products	661,964.06	7	61,223.17	8	1,291,159.76	9
08	Manufacturing and Maintenance of Machinery and Tractors	632,696.70	8	56,504.04	10	1,183,711.54	10
10	Manufacturing of Electrical Material	309,258.51	20	32,388.12	22	772,880.49	19
11	Manufacturing of Electronic Equipment	151,569.85	36	16,468.62	35	469,177.57	29
12	Manufacturing of Automobiles, Trucks and Buses	570,659.84	10	53,716.71	11	1,141,551.92	12
13	Manufacturing of Parts and Other Vehicles	466,724.27	13	45,755.34	13	971,686.79	14
14	Wood and Furniture	292,306.41	23	24,725.62	26	610,551.92	24
15	Cellulose, Paper and Print Shop	259,963.00	25	29,107.61	23	778,334.97	18
16	Rubber Industry	118,378.53	39	11,824.81	40	268,577.05	39
17	Manufacturing of Chemical Elements	164,876.87	33	24,052.28	18	699,615.75	21
18	Petroleum Refining	361,848.46	17	71,931.64	7	1,412,523.55	8
19	Manufacturing of Several Chemical Products	250396.85	27	32,472.12	21	724,352.33	20
20	Pharmaceutical and Perfumery Industry	186,026.23	29	21,653.10	27	500,861.45	28
21	Plastic Goods Industry	183,978.31	30	21,229.86	28	461,198.22	30
22	Textile Industry	352,927.39	18	33,302.09	19	652,199.54	23
23	Manufacturing of Clothing Items	412,612.56	15	45,423.16	15	964,582.10	15
24	Manufacturing of Footwear	154,751.54	35	18,246.99	30	411,529.52	32
25	Coffee Industry	179,582.69	32	28,018.71	25	219,151.79	40
26	Vegetal Products Processing	427,354.68	14	50,619.00	12	1,023,311.38	13
27	Animal Slaughtering	529,263.06	12	45,713.68	14	1,114,262.77	11
28	Dairy Industry	200,050.91	28	17,286.65	34	421,464.30	31
29	Manufacturing of Sugar	182,739.19	31	17,565.59	32	287,888.08	38
30	Manufacturing of Vegetal Oil	315,888.96	19	32,900.14	20	568,214.22	25
31	Manufacturing of Other Food Products	559,947.11	11	60,249.59	9	1,450,231.40	7
32	Several Industries	256,726.39	26	15,211.09	37	371,269.41	34
33	Public Utility Industrial Services	129,368.61	37	17,648.89	33	543,466.90	26
34	Civil Construction	2,125,856.35	1	170,438.96	1	3,730,885.57	1
35	Commerce	1,022,465.33	4	103,016.68	3	2,589,147.48	3
36	Transportation	598,930.22	9	76,430.88	6	1,451,437.44	6
37	Communications	67,760.17	40	5,917.60	41	148,747.03	41
38	Financial Institutions	284,259.76	24	42,293.44	16	830,427.03	16
39	Services Rendered to Families	1,164,242.49	2	107,712.79	2	2,528,748.45	4
40	Services Rendered to Enterprises	1,097,216.49	3	19,626.63	29	513,332.81	27
41	Rental Properties	303,854.37	22	16,163.35	36	339,663.50	36
42	Public Administration	691,502.94	6	96,069.18	4	2,597,092.00	2
43	Private Nonmercantile Services	25,070.59	42	2,548.67	42	52,832.01	42

Source: IBGE's basic data

Elaborated by the authors

Table 2. Pure foreword linkage index (PFL). Brazil: 1980 (Cr\$ million) - 1985 (Cr\$ billion) - 1990 (Cr\$ million). Current values

IBGE CODE	SECTORS DESCRIPTION	1980		1985		1990	
		INDEX (PFL)	ORDER	INDEX (PFL)	ORDER	INDEX (PFL)	ORDER
01	Agriculture	1,503,566.51	3	165,647.98	2	3,124,992.23	2
02	Mineral Extractive	252,710.29	25	27,958.50	20	486,331.67	26
03	Petroleum and Charcoal Extraction	162,067.44	30	84,358.27	5	1,323,835.09	10
04	Manufacturing of Nonmetallic Minerals	443,547.25	12	37,854.76	16	905,237.22	15
05	Metallurgy of Iron and Steel	613,441.27	8	61,381.21	10	1,310,963.24	11
06	Metallurgy of Noniron	269,208.30	22	31,446.02	19	660,212.16	21
07	Manufacturing of Other Metallurgical Products	724,289.40	6	72,484.28	7	1,613,405.20	6
08	Manufacturing and Maintenance of Machinery and Tractors	582,426.94	9	66,359.84	9	1,474,269.12	9
09	Manufacturing of Electrical Material	193,537.22	26	21,171.36	24	541,318.41	24
11	Manufacturing of Electronic Equipment	32,950.72	38	5,283.38	36	144,097.71	36
12	Manufacturing of Automobiles, Trucks and Buses	36,285.37	37	4,001.54	37	113,500.18	37
13	Manufacturing of Parts and Other Vehicles	354,400.95	15	41,069.63	15	792,182.37	17
14	Wood and Furniture	187,611.11	27	14,212.29	30	333,250.25	31
15	Cellulose, Paper and Print Shop	461,007.94	11	48,493.11	11	1,093,998.12	13
16	Rubber Industry	171,637.54	29	21,158.21	25	435,662.95	28
17	Manufacturing of Chemical Elements	277,386.31	20	43,789.81	14	931,612.14	14
18	Petroleum Refining	1,616,156.02	2	178,126.82	1	3,680,755.92	1
19	Manufacturing of Several Chemical Products	660,152.74	7	68,378.32	8	1,548,004.55	7
20	Pharmaceutical and Perfumery Industry	70,397.20	36	6,869.80	35	154,970.91	35
21	Plastic Goods Industry	276,430.33	21	27,592.99	21	725,547.50	19
22	Textile Industry	331,346.10	18	34,660.70	17	736,891.84	18
23	Manufacturing of Clothing Items	30,379.24	39	2,662.21	38	60,930.82	38
24	Manufacturing of Footwear	20,441.77	41	2,336.93	40	52,222.71	40
25	Coffee Industry	10,356.12	42	1,316.04	41	20,179.72	41
26	Vegetal Products Processing	108,265.68	33	14,856.33	29	335,837.47	30
27	Animal Slaughtering	99,358.50	34	7,710.01	34	186,297.56	33
28	Dairy Industry	22,110.99	40	2,309.26	39	58,166.38	39
29	Manufacturing of Sugar	90,337.41	35	9,158.92	33	184,453.59	34
30	Manufacturing of Vegetable Oil	113,472.95	32	13,903.37	31	278,484.50	32
31	Manufacturing of Other Food Products	327,631.34	19	22,987.07	23	554,547.56	23
32	Several Industries	353,561.72	16	26,927.28	22	661,437.19	20
33	Public Utility Industrial Services	379,543.10	14	45,176.34	13	1,539,680.38	8
34	Civil Construction	268,560.13	23	18,376.12	26	421,478.30	29
35	Commerce	1,385,765.50	4	135,992.13	3	3,111,939.65	3
36	Transportation	972,116.23	5	95,580.60	4	2,137,870.61	4
37	Communications	174,792.86	28	17,886.46	27	541,066.68	25
38	Financial Institutions	425,218.42	13	34,133.90	18	558,021.69	22
39	Services Rendered to Families	481,203.16	10	46,744.94	12	1,162,673.16	12
40	Services Rendered to Enterprises	1,733,563.24	1	83,422.76	6	1,830,814.27	5
41	Rental Properties	253,155.23	24	17,188.69	28	440,565.50	27
42	Public Administration	119,737.66	31	13,457.61	32	898,406.11	16
43	Private Nonmercantile Services	335,084.20	17	0.00	42	0.00	42

Source: IBGE's basic data

Elaborated by the authors

Table 3. Pure total linkage index (PTL). Brazil: 1980 (Cr\$ million) - 1985 (Cr\$ billion) - 1990 (Cr\$ million). Current values

SECTORS		1980		1985		1990	
IBGE CODE	DESCRIPTION	INDEX (PTL)	ORDER	INDEX (PTL)	ORDER	INDEX (PTL)	ORDER
01	Agriculture	2,368,136.47	4	257,464.48	1	5,063,264.62	3
02	Mineral Extractive	379,149.03	32	41,881.25	31	813,704.18	32
03	Petroleum and Charcoal Extraction	207,456.61	39	97,763.09	13	1,664,582.69	17
04	Manufacturing of Nonmetallic Minerals	749,662.25	15	66,138.23	20	1,558,919.28	19
05	Metallurgy of Iron and Steel	985,894.26	10	99,319.55	12	2,120,849.62	12
06	Metallurgy of Noniron	426,474.37	31	49,552.93	26	1,058,051.13	27
07	Manufacturing of Other Metallurgical Products	1,386,253.46	8	133,707.45	7	2,904,564.96	8
08	Manufacturing and Maintenance of Machinery and Tractors	1,215,123.64	9	122,863.88	8	2,657,980.66	9
10	Manufacturing of Electrical Material	502,795.72	25	53,559.48	24	1,314,198.91	23
11	Manufacturing of Electronic Equipment	184,520.57	41	21,752.00	39	613,275.28	37
12	Manufacturing of Automobiles, Trucks and Buses	606,945.21	21	57,718.25	23	1,255,052.1	25
13	Manufacturing of Parts and Other Vehicles	821,125.23	13	86,824.97	14	1,763,869.16	16
14	Wood and Furniture	479,917.52	26	38,937.92	32	943,802.17	30
15	Cellulose, Paper and Print Shop	720,970.93	16	77,600.71	17	1,872,333.09	15
16	Rubber Industry	290,016.07	34	32,983.03	34	704,240.00	34
17	Manufacturing of Chemical Elements	442,263.18	29	77,842.09	16	1,631,227.89	18
18	Petroleum Refining	1,978,004.48	5	250,058.46	2	5,093,279.47	2
19	Manufacturing of Several Chemical Products	910,549.6	11	100,850.44	11	2,272,356.88	11
20	Pharmaceutical and Perfumery Industry	256,423.43	36	28,522.90	36	655,832.37	36
21	Plastic Goods Industry	460,408.64	27	48,822.85	27	1,186,745.72	26
22	Textile Industry	684,273.49	18	67,962.79	19	1,389,091.38	20
23	Manufacturing of Clothing Items	442,991.80	28	48,085.37	28	1,025,512.92	29
24	Manufacturing of Footwear	175,193.31	42	20,583.92	40	463,752.24	40
25	Coffee Industry	189,938.81	40	29,334.75	35	239,331.51	41
26	Vegetal Products Processing	535,620.36	23	65,475.33	21	1,359,148.85	22
27	Animal Slaughtering	628,621.56	19	53,423.69	25	1,300,560.33	24
28	Dairy Industry	222,161.90	38	19,595.91	41	479,630.69	38
29	Manufacturing of Sugar	273,076.6	35	26,724.51	37	472,341.67	39
30	Manufacturing of Vegetal Oil	429,361.92	30	46,803.51	29	846,698.72	31
31	Manufacturing of Other Food Products	887,578.45	12	83,236.66	15	2,004,778.96	14
32	Several Industries	610,288.11	20	42,138.37	30	1,032,706.59	28
33	Public Utility Industrial Services	508,911.71	24	62,825.23	22	2,083,147.28	13
34	Civil Construction	2,394,416.48	3	188,815.08	4	4,152,363.87	4
35	Commerce	2,408,230.83	2	239,008.81	3	5,701,087.12	1
36	Transportation	1,571,046.44	7	172,011.47	5	3,589,308.05	6
37	Communications	242,553.03	37	23,804.06	38	689,813.70	35
38	Financial Institutions	709,478.19	17	76,427.34	18	1,388,448.72	21
39	Services Rendered to Families	1,645,445.65	6	154,457.74	6	3,691,421.61	5
40	Services Rendered to Enterprises	2,830,779.73	1	103,049.39	10	2,344,147.08	10
41	Rental Properties	557,009.59	22	33,352.03	33	780,229.00	33
42	Public Administration	811,240.6	14	109,526.79	9	3,495,498.11	7
43	Private Nonmercantile Services	360,154.79	33	2,548.67	42	52,832.01	42

Source: IBGE's basic data

Elaborated by the authors

Table 4. Input supplying sectors to agriculture. Current values (direct and indirect impact) and percent participation of each sector on the total value (total impact). Brazil: 1980 - 1985 - 1990.

IBGE CODE	SECTORS DESCRIPTION	1980 ⁽¹⁾		1985 ⁽²⁾		1990 ⁽²⁾	
		VALOR	%	VALOR	%	VALOR	%
02	Mineral Extractive	6,098.82	0.705	1,393.95	1.518	24,427.07	1.260
03	Petroleum and Charcoal Extraction	4,081.15	0.472	2,881.92	3.139	45,446.77	2.345
04	Manufacturing of Nonmetallic Minerals	5,533.71	0.640	809.05	0.881	17,084.32	0.881
05	Metallurgy of Iron and Steel	13,513.22	1.563	1,438.03	1.566	31,140.94	1.607
06	Metallurgy of Noniron	3,885.33	0.449	494.64	0.539	10,713.97	0.553
07	Manufacturing of Other Metallurgical Products	15,045.85	1.740	1,481.42	1.613	33,378.49	1.722
08	Manufacturing and Maintenance of Machinery and Tractors	15,145.25	1.752	1,967.45	2.143	42,641.10	2.200
10	Manufacturing of Electrical Material	1,648.21	0.191	216.13	0.235	5,733.41	0.296
11	Manufacturing of Electronic Equipment	499.49	0.058	96.80	0.105	2,572.70	0.133
12	Manufacturing of Automobiles, Trucks and Buses	596.54	0.069	75.51	0.082	2,225.61	0.115
13	Manufacturing of Parts and Other Vehicles	4,859.93	0.562	723.84	0.788	13,167.93	0.679
14	Wood and Furniture	3,633.91	0.420	343.06	0.374	8,601.99	0.444
15	Cellulose, Paper and Print Shop	15,797.34	1.827	1,580.23	1.721	36,035.52	1.859
16	Rubber Industry	2,952.39	0.341	455.46	0.496	9,230.18	0.476
17	Manufacturing of Chemical Elements	17,074.32	1.975	2,808.99	3.059	57,870.35	2.986
18	Petroleum Refining	96,980.45	11.217	14,016.41	15.266	287,465.39	14.831
19	Manufacturing of Several Chemical Products	193,913.84	22.429	20,974.71	22.844	417,442.89	21.537
20	Pharmaceutical and Perfumery Industry	8,134.87	0.941	1,000.58	1.090	20,156.20	1.040
21	Plastic Goods Industry	9,749.1	1.128	1,082.68	1.179	27,281.22	1.408
22	Textile Industry	11,740.94	1.358	1,274.51	1.388	26,182.13	1.351
23	Manufacturing of Clothing Items	488.33	0.056	54.84	0.060	1,274.57	0.066
24	Manufacturing of Footwear	919.90	0.106	148.67	0.162	3,088.55	0.159
25	Coffee Industry	389.73	0.045	42.02	0.046	680.44	0.035
26	Vegetal Products Processing	13,241.75	1.532	1,218.40	1.327	26,007.14	1.342
27	Animal Slaughtering	3,202.52	0.370	207.26	0.226	5,282.16	0.273
28	Dairy Industry	1,744.83	0.202	93.86	0.102	2,193.49	0.113
29	Manufacturing of Sugar	7,261.29	0.840	514.25	0.560	9,556.17	0.493
30	Manufacturing of Vegetal Oil	16,393.48	1.896	2,672.13	2.910	49,812.37	2.570
31	Manufacturing of Other Food Products	121,595.63	14.064	6,559.21	7.144	153,723.01	7.931
32	Several Industries	6,900.20	0.798	602.76	0.656	14,724.96	0.760
33	Public Utility Industrial Services	14,384.9	1.664	1,953.35	2.127	59,521.51	3.071
34	Civil Construction	2,470.55	0.286	254.20	0.277	5,349.88	0.276
35	Commerce	79,226.9	9.164	7,995.08	8.708	169,154.55	8.727
36	Transportation	50,600.94	5.853	6,634.16	7.225	143,421.56	7.399
37	Communications	2,796.99	0.324	356.25	0.388	10,311.12	0.532
38	Financial Institutions	16,407.14	1.898	1,424.41	1.551	22,133.72	1.142
39	Services Rendered to Families	14,156.72	1.637	1,585.68	1.727	32,418.06	1.673
40	Services Rendered to Enterprises	60,765.44	7.028	2,663.52	2.901	55,924.73	2.885
41	Rental Properties	4,241.94	0.491	350.78	0.382	8,103.32	0.418
42	Public Administration	8,375.58	0.969	1,370.31	1.492	46,792.93	2.414
43	Private Nonmercantile Services	8,120.53	0.939	0.00	0.00	0.00	0.00
	Total	864,569.95	100.00	91,816.50	100.00	1,938,272.39	100.00

Source: IBGE's basic data

⁽¹⁾ In million Cruzeiros (Cr\$)⁽²⁾ In billion Cruzeiros (Cr\$)

Table 5. Agricultural goods demanding sectors. Current sectorial values (direct and indirect impact) and percent participation of each sector on the total value (total impact). Brazil: 1980 - 1985 - 1990.

IBGE CODE	DESCRIPTION	SECTORS		1980 ⁽¹⁾		1985 ⁽²⁾		1990 ⁽¹⁾	
		VALOR	%	VALOR	%	VALOR	%		
02	Mineral Extractive	1,382.96	0.091	212.89	0.124	4,799.92	0.149		
03	Petroleum and Charcoal Extraction	518.09	0.034	168.44	0.098	4,188.46	0.130		
04	Manufacturing of Nonmetallic Minerals	6,966.47	0.459	705.23	0.411	15,725.60	0.489		
05	Metallurgy of Iron and Steel	24,872.29	1.637	2,808.35	1.639	66,928.85	2.080		
06	Metallurgy of Noniron	2,838.08	0.187	557.72	0.325	10,212.29	0.317		
07	Manufacturing of Other Metallurgical Products	12,860.04	0.846	1278.11	0.746	31,627.26	0.983		
08	Manufacturing and Maintenance of Machinery and Tractor	9,344.69	0.615	974.20	0.568	21,465.95	0.667		
10	Manufacturing of Electrical Material	3,552.56	0.234	465.72	0.272	11,056.53	0.344		
11	Manufacturing of Electronic Equipment	2,283.91	0.150	264.63	0.154	7,404.00	0.230		
12	Manufacturing of Automobiles, Trucks and Buses	7,195.16	0.474	705.09	0.411	15,965.19	0.496		
13	Manufacturing of Parts and Other Vehicles	7,352.47	0.484	778.11	0.454	17,213.55	0.535		
14	Wood and Furniture	43,791.91	2.883	3,836.86	2.239	103,235.89	3.209		
15	Cellulose, Paper and Print Shop	11,545.07	0.760	1,567.44	0.915	38,873.26	1.208		
16	Rubber Industry	6,806.11	0.448	681.58	0.398	17,006.77	0.529		
17	Manufacturing of Chemical Elements	36,581.86	2.408	11,092.10	6.472	179,528.57	5.580		
18	Petroleum Refining	7,596.74	0.500	1,588.15	0.927	28,465.67	0.885		
19	Manufacturing of Several Chemical Products	11,131.00	0.733	1,926.04	1.124	37,325.84	1.160		
20	Pharmaceutical and Perfumery Industry	8,917.67	0.587	1,506.65	0.879	27,518.22	0.855		
21	Plastic Goods Industry	2,089.2	0.138	271.09	0.158	5,656.84	0.176		
22	Textile Industry	49,857.96	3.282	4,503.29	2.628	69,761.15	2.168		
23	Manufacturing of Clothing Items	17,235.16	1.134	1,821.75	1.063	30,601.19	0.951		
24	Manufacturing of Footwear	14,259.85	0.939	1,782.53	1.040	36,938.85	1.148		
25	Coffee Industry	104,944.13	6.908	17,493.97	10.208	112,891.17	3.509		
26	Vegetal Products Processing	179,012.57	11.783	22,903.14	13.364	422,225.75	13.124		
27	Animal Slaughtering	294,510.47	19.386	25,472.16	14.863	585,563.7	18.201		
28	Dairy Industry	100,495.55	6.615	8,449.83	4.930	199,038.36	6.187		
29	Manufacturing of Sugar	72,263.75	4.757	7,068.58	4.124	96,145.30	2.988		
30	Manufacturing of Vegetal Oil	123,255.28	8.113	13,531.32	7.895	201,242.36	6.255		
31	Manufacturing of Other Food Products	113,280.14	7.457	12,484.52	7.285	267,157.50	8.304		
32	Several Industries	4,572.66	0.301	332.31	0.194	7,680.22	0.239		
33	Public Utility Industrial Services	1,697.7	0.112	237.15	0.138	7,420.59	0.231		
34	Civil Construction	33,906.74	2.232	2,716.19	1.585	61,071.51	1.898		
35	Commerce	18,139.8	1.194	2,933.22	1.712	61,543.88	1.913		
36	Transportation	9,411.47	0.619	1,144.79	0.668	21,523.54	0.669		
37	Communications	662.04	0.044	87.40	0.051	1,924.07	0.060		
38	Financial Institutions	4,325.4	0.285	701.71	0.409	12,409.91	0.386		
39	Services Rendered to Families	114,243.2	7.520	10,106.28	5.897	221,742.03	6.892		
40	Services Rendered to Enterprises	17,022.04	1.120	354.99	0.207	8,841.98	0.275		
41	Rental Properties	2,463.45	0.162	126.29	0.074	2,507.00	0.078		
42	Public Administration	33,031.06	2.174	5,404.44	3.153	138,406.30	4.302		
43	Private Nonmercantile Services	2,988.53	0.197	337.64	0.197	6,359.50	0.198		
	Total	1,519,205.23	100.00	171,381.89	100.00	3,217,194.52	100.00		

Source: IBGE's basic data

⁽¹⁾ In million Cruzeiros (Cr\$)

⁽²⁾ In billion Cruzeiros (Cr\$)

Tabela 6. Gross National Product at Factor Cost of the Agroindustrial Complex. Brazil - 1980-1994.

	1980	1985	1990	1991	1992	1993	1994
	Cr\$ million	Cr\$ billion	Cr\$ million	Cr\$ million	Cr\$ million	Cr\$ million	R\$thousand
Agroindustrial Complex							
version 1	2,786,292	329,125	6,356,004	32,822,150	383,131,713	8,600,988	77,747,612
version 2	3,129,968	372,797	7,422,649	38,517,460	447,846,441	10,172,889	89,416,790
version 3	3,401,432	403,848	8,027,778	41,128,411	475,624,242	10,764,985	93,580,199
Gross National Product	10,267,828	1,117,245	27,039,473	144,479,802	1,547,675,795	33,657,539	295,026,158

Source: IBGE's basic data

Elaborated by the authors

Table 7. Gross National Product at Factor Cost of the Agroindustrial Complex. Brazil - 1980-1994 (in percentage %)

	1980	1985	1990	1991	1992	1993	1994
	Agroindustrial Complex						
version 1	27.14	29.46	23.51	22.71	24.75	25.55	26.35
version 2	30.48	33.37	27.45	26.65	28.93	30.22	30.3
version 3	33.13	36.15	29.7	28.46	30.73	31.98	31.71
Gross National Product	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: IBGE's basic data

Elaborated by the authors

Table 8. Gross National Product at Factor Cost of the Agroindustrial Complex. Brazil - 1980-1994 (US\$ million)¹

	1980	1985	1990	1991	1992	1993	1994
	Agroindustrial Complex						
version 1	55,801	53,333	92,811	80,101	87,076	97,131	121,690
version 2	62,983	60,444	108,394	94,000	101,783	114,883	139,954
version 3	58,508	65,333	117,229	100,376	108,096	121,57	146,471
Gross National Product	206,077	180,444	394,9	352,604	351,744	380,096	461,772

⁽¹⁾ Calculated by the mean exchange rate.

Source: IBGE's basic data

Elaborated by the authors

Table 9. Gross National Product at factor cost of the Brazilian Agroindustrial Complex, 1980 - 1994

Aggregates of the Agroindustrial Complex		1980	1985	1990	1991	1992	1993	1994
		Cr\$ million	Cr\$ billion	Cr\$ million	Cr\$ million	Cr\$ million	Cr\$ million	R\$ thousand
I - Industry for Agriculture	version 1	470,654	47,714	983,979	4,940,881	57,210,985	1,209,406	10,277,378
	version 2	352,895	41,361	835,354	4,132,614	47,861,954	1,018,309	8,614,306
	version 3	348,718	40,86	825,652	4,087,830	47,352,969	1,006,887	8,517,917
II - Agriculture		1,147,902	130,418	2,261,619	11,346,876	120,708,295	2,645,906	30,735,346
III - Agriculture-Based Industry	version 1	317,110	45,168	820,843	4,813,055	57,766,863	1,356,911	10,646,559
	version 2	577,728	69,862	1,340,797	7,795,980	89,760,811	2,096,395	16,866,969
	version 3	772,443	92,528	1,770,211	9,559,197	107,713,622	2,460,617	19,593,977
IV - Final Distribution	version 1	850,626	105,825	2,289,563	11,721,338	147,445,571	3,388,765	26,088,329
	version 2	1,051,443	131,156	2,984,879	15,241,990	189,515,381	4,412,279	33,200,168
	version 3	1,132,369	140,042	3,170,296	16,134,507	199,849,356	4,651,575	34,732,959
Agroindustrial Complex	version 1	2,786,292	329,125	6,356,004	32,822,150	383,131,713	8,600,988	77,747,612
	version 2	3,129,968	372,797	7,422,649	38,517,460	447,846,441	10,172,889	89,416,790
	version 3	3,401,432	403,848	8,027,778	41,128,411	475,624,242	10,764,985	93,580,199

Source: IBGE's basic data

Elaborated by the authors

Table 10. Gross National Product at factor cost of the Brazilian Agroindustrial Complex, 1980 - 1994 (US\$ million)¹.

Aggregates of the Agroindustrial Complex		1980	1985	1990	1991	1992	1993	1994
		Cr\$ million	Cr\$ billion	Cr\$ million	Cr\$ million	Cr\$ million	Cr\$ million	R\$ thousand
I - Industry for Agriculture	version 1	9,392	7,556	14,378	12,060	13,003	13,658	16,086
	version 2	7,182	6,667	12,169	10,087	10,878	11,500	13,483
	version 3	7,182	6,667	12,048	9,980	10,762	11,371	13,332
II - Agriculture		23,204	20,889	33,012	27,691	27,434	29,880	48,107
III - Agriculture-Based Industry	version 1	6,630	7,111	12,008	11,745	13129	15324	16,664
	version 2	11,602	11,111	19,598	19,027	2040	23675	26,400
	version 3	15,470	15,111	25,863	23,329	24481	27788	30,668
IV - Final Distribution	version 1	17,127	16,889	33,454	28,604	33511	38270	40,833
	version 2	20,994	21,333	43,574	37,201	43072	49828	51,965
	version 3	22,652	22,667	46,305	39,376	45420	52530	54,364
Agroindustrial Complex	version 1	56,354	53,333	92,851	80,101	87076	97131	121,690
	version 2	62,983	60,444	108,394	94,000	101783	114883	139,954
	version 3	68,508	65,333	117,229	100,376	108096	121570	146,471

Source: IBGE's basic data
Elaborated by the authors

⁽¹⁾ Calculated by mean exchange rate