The performance of the Brazilian imports and exports based on the System of National Accounts: 1980 - 1998

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Paper presented at the
13th International Conference on Input Output Techniques
Macerata, Italy
August 21 – 25, 2000

Abstract

The purpose of this text is to set forth indicators that will allow, in some detail, for the quantification of the behavior of the Brazilian imports and exports in the 1980 – 1998 period, which has been marked by the economic opening, as of 1990, and the monetary stabilization, as of 1995. The disclosure of a more disaggregated System of National Accounts (SNA), in December 1997, allowed for the calculation of indicators in a degree of detail not available in Brazilian statistics until then, and made also available a series of a single data base, calculated through the same methodology, adjusted to the recommendations of the United Nations (SNA 1993). The integration of such data with the input output tables further permitted the utilization of the Impact Matrix (Leontief Matrix) in calculating the multipliers which enable the assessment of the direct and indirect impact of increases in the final demand upon the importation of products.

The text is divided in five sections, besides the introduction. The second section describes the data base and the methodology applied. The third section presents and analyses the import indicators for the period 1980 through 1998. The same procedure has been applied for exports in section four. The fifth section contains the conclusions and, finally, section six presents the Level 80 classification of the Brazilian Institute of Geography and Statistics - IBGE, as an attachment.

KeyWords: Brazilian Economy, National Accounts, Input – Output, External Relations

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The authors would like to acknowledge the support provided by Candido Mendes University – Ipanema.

1. Introduction

Most analysts of the Brazilian economy agree with the idea that the 1980 decade has been a "lost decade". The economy displayed very modest rates of growth, the State, which had until then been the main stimulator of growth, lost itself in a deep financial and credibility crisis unprecedented in the country's recent history, and the several attempts to solve the inflation problem, most of which were of a heterodox nature, resulted in a situation very close to hyperinflation, which made its way through the beginning of the 90's.

The diagnosis presented by the economic team at that time was that the development model based on the substitution of imports, which between the decades of 1950 and 1970 had allowed for the growth and diversification of the Brazilian productive structure, was now exhausted and, most of all, carried in itself elements which would not allow for the retaking of growth in patterns adjustable to the new international economic scene. The high levels of protection to the industry, the state participation in the productive sector and the excessive ruling on the economic activity, according to such diagnosis, would be among the factors which originated the macroeconomic problems which the country had been experiencing in the beginning of the 90's, and would explain the economy's low levels of productivity and competitiveness.

The breaking up with the existing model began in 1990, with the process of economic opening conducted by then president Fernando Collor, who was secluded by impeachment at the end of 1992. The main characteristic of this process was its absolute lack of a major planning concerning the economy. The opening, at that moment, was carried out in a frenetic manner, following absolutely no criteria at all.

In 1995, Fernando Henrique Cardoso became president of the Brazilian Republic. No continuity problems are faced vis-à-vis the previous government, as the new president had been Finance Minister of the "transition" government. At that moment, the economic policies were basically sustained on three major grounds: maintenance and further deepening of the economic opening, the policy of crawling peg**,** and the monetary stabilization plan called "Real Plan". The latter has been introduced in two phases. In the first phase, a unit of reference value has been introduced, the URV, to which all economic transactions were to be chained and based on which all economic adjustments were to be carried out. During the second phase, the old currency was substituted by the "Real". The value of the new monetary unit was 1R$=US$1 at the beginning of the "Real Plan" and even reached the level of 1R$=US$0,84 five months later.

The economic team believed that by eliminating the existing obstacles against imports and urging the local enterprises to compete with imported products, the economy would experience a desired process of "natural selection" in which only the strongest ones would survive, those capable of carrying on even without the support and protection of the State. Such enterprises would invest to face competition and develop every effort for the purpose of getting along the industrial frontiers. Within certain sectors, the excessive presence of oligopolies would be eliminated and competition would enhance consumer gains, and in others, a greater market concentration would help eliminate inefficiency and achieve competitive scales.

As a matter of fact, they were aware that the impact of the economic opening would be much deeper upon imports than vis-à-vis exports, mainly as a consequence of the high level of exchange appreciation and monetary stability; nevertheless, it was then argued that as soon as the productive restructure began to show its positive results, this situation would be reversed, allowing for the equilibrium of the trade balance.

The government bet seemed very risky from the beginning, since it depended highly on the maintenance of a stable international context. Furthermore, the government had been adopting a series of irreversible measures, such as the privatization of large state enterprises.

What actually occurred was that much before the productive structure were even able to show signs of its dynamics, the external context experienced a reversal, with the financial crises of Mexico (March 1995), Asia (November 1997) and Russia (September 1998). In each of these instances the government was forced to abruptly increase interests in order to keep the foreign capital which allowed for the equilibrium of the external accounts. The interests increase aggravated the problem of the public debt and led to a serious decrease in the country's level of activity. In 1999, unable to hold it any longer, the government devaluated the currency but still showed itself incapable of reducing interests to a significant degree.

Brazil is presently facing high levels of unemployment (7,8% in the first semester of 2000). The government intends to reduce interests, although attempts are still very shy in that direction. As a result of the ideological views of the governmental economic team, there are no projects underway aiming at development beyond liberalism. There is neither an industrial policy nor one for the stimulation of exports.

The decade of 1990 could also be called a lost decade since, on the average, indicators of the economic activity were not superior to those of the previous decade. This will not be so exclusively because on one hand, there are those who agree with the economic policy being adopted, and believe that along the second half of the decade there have occurred structural modifications and that the basis for a future promising growth have been implemented. On the other hand, there are those who believe that a decade of economic liberalism, in the way it has been adopted in Brazil, besides not having been beneficial, results in losses for the country, in terms of sale of the patrimony, destruction of the public sector, external vulnerability and social damage.

The purpose of this text is to bring forth indicators, which permit a somewhat detailed quantification of this period. The disclosure of a more aggregated System of National Accounts – SNA for Brazil, in December 1997, allowed for the calculation of indicators which presented a level of detail not available in Brazilian statistics until then, thus making available a series of a single data base, calculated through the same methodology, adjusted to the recommendations of the United Nations (SNA 1993).

The SNA series begins in 1990 and the last year disclosed is 1998; the Input Output Tables - IOT, calculated through a methodology compatible with that of the SNA, are

available for 1980, 1985 and from 1990 through 1996[3]. The classification adopted in the SNA and in the IOT presents 80 products and 43 industries[4].

Such data allows viewing imports and exports from two angles: that of the products (goods and services) and that of the economic industries. The integration of these data with the input output tables also allows for the application of the Leontief tables for the calculation of multipliers which permit the assessment of the direct and indirect impacts of increases in the final demand upon the imports of products.

The text is divided in five sections, besides this introduction. The second section describes the data base and the methodology applied. The third section presents and analyses the import indicators for the period 1980 through 1998. The same procedure has been applied for exports in the fourth section. The fifth section contains conclusions and finally, section six presents IBGE's Level 80 classification, as an attachment.

2. Methodology applied

2.1. Data base

The data utilized for the calculation of the indicators were obtained in the basic tables of the input output tables. These data are set forth in accordance with Figure 1. The advantage of applying data from the basic tables of the input output tables is that both the production and the consumption data are presented with the same value level (basic prices for national products and FOB for the imported ones).

Figure 1

	Domestic Products	**Industries**	**Final Demand**	**Output**
Domestic Products		Un	Fn	q
Imported Products		Um	Fm	m
Industries	V		E	g
Taxes		Tp	Te	
Value Added		y'		
Output	q'	g'		

The tables are represented by capital letters and the vectors, always in columns, by lower case letters.

V – make matrix; presents the output of each product for each industry;

q – vector with total output per product;

m – vector with total imports per product;

Un – domestic use matrix ; presents the value of the domestic products consumed, for each industry;

[3] The Brazilian SNA for every year presents at year t the National Accounts in three versions: year t-1 in a preliminary version, year t-2 in a semi-final version and year t-3 in a final version. The ruling is that the IOT is to be calculated only when the final version for a year is disclosed.

[4] The listing of industries and products of the level 80 classification is presented as an attachment.

Um – imported use matrix; presents the value of the products of external origin consumed, for each industry;

Fn – final demand per domestic product matrix; presents the value of the products of internal origin consumed by categories of final demand, households and governmental final consumption, exports, gross formation of fixed capital and inventory variation;

Fm – final demand per imported product table; presents the value of the products of external origin consumed by categories of final demand;

E – final demand by industry table; represents the share of output of an industry destined to final demand. These data are not observed, but calculated from Fn;

Tp – values of taxes and subsidies associated to products, falling on goods and services absorbed (input) by industries table;

Te – values of taxes and subsidies associated to products, falling on goods and services absorbed by final demand;

g – vector with total output per industry;

y – vector with total value added generated by industries.

The data on final consumption at basic prices detailed by origin (domestic output or importation) for years 1997 and 1998 were calculated by adopting the average structure, for each year, encompassing transforming from consumer prices to basic prices and the production and imports data for the opening of total consumption both for national and imported products, obtained from the resources and uses table of the SNA.

2.2. Deflating

The data at 1990 prices were obtained by the authors through the deflating of the nominal values of the SNA by chaining the price indexes year over year, by type of operation, obtained in the SNA. This calculation has been done for all possible cases, as it allows a much more precise observation of changes occurred in the economy. For the remainder cases, data at current prices have been applied.

2.3. Import Multipliers

The Leontief table allows the calculation of multipliers which quantify, by product or by industry, the impact of variations in final demand upon imports. Such impacts are synthesized through two vectors of import multipliers.

Be it a table Bm of coefficients between the imported goods and the industries. This table presents, for each industry, the participation of the imported consumption of each product by industry. It is possible to view this result as the technical coefficient which provides the need for importation of products when it is desired to increase the industries' production in one monetary unit. Thus, a variation in the industries' production would have an impact on imports according to the following relation:

$$\Delta m = Bm\Delta g \qquad (1)$$

where: Bm = Um.$\langle g \rangle^{-1}$

$\langle g \rangle$ = diagonal matrix calculated from vector g

Δm = vector with variation of imports by product

Δg = vector with variation in production by industry

By the basic equation of Leontief's model it may be given that:

$$\Delta g = [I - A]^{-1}.\Delta Fn \qquad (2)$$

Substituting (2) in(1):

$$\Delta m = Bm[I - A]^{-1}.\Delta Fn \qquad (3)$$

Considering $M = Bm[I - A]^{-1}$, the multipliers are obtained by:

$$BL = i.M$$

where $[BL]_j$ = impact on total imports of products of a unitary increase in the final demand of industry j

$[i]_j = 1$

$$FL = M.i$$

where $[FL]_i$= increase in the imports of product i, given a unitary increase in the final demand of all industries

3. Imports Performance

As previously suggested, the economic opening, together with an exchange policy which maintained the national currency substantially appreciated, caused the Brazilian Commercial Balance to be in deficit for the most part of the decade of the 90's. This was basically characterized by the noted increase in imports vis-à-vis a very modest growth in exports. This result was not surprising at all and, most to the contrary, was not only expected but highly hoped for. The growth in the imports value has been accompanied by an increase in the penetration of imports, whether measured through the imports/apparent consumption relation, the imports/output or the imports/total supply relations. In fact, the three of them displayed very similar results. In the present work the third concept has been applied.

Between 1990 and 1998 (last data available), the imports penetration of at current prices increased 61% (from 3,5% to 5,6%). With the analysis at constant prices for 1990, it can be noted that this increase has been even more significant (of 124%, from 3,5% to 7,8%). (Table 1). In fact, decomposing the coefficient of the imports penetration into price factor and volume factor, such as in Table 2, it can be observed that the main factor responsible for the greater imports penetration into the country, during the 1990 – 1998 period, has been the volume factor, and price, as a matter of fact, has presented a reduction in the same period (i.e., it has varied favorably for the country).

Table 1. Imports participation in the total supply. Current and constant prices for 1990. (%)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998
Current prices	**5,5**	**3,8**	**3,5**	**4,1**	**4,1**	**4,2**	**4,7**	**5,2**	**5,0**	**5,7**	**5,6**
Agriculture, Fish. etc.	4,8	2,6	1,9	2,9	2,9	2,7	2,9	2,8	2,9	2,7	2,6
Mining	64,6	41,4	34,2	33,0	30,2	25,6	26,8	25,1	26,1	25,2	20,9
Manufacturing	5,8	3,7	4,8	6,2	6,4	7,4	8,2	10,0	9,7	11,1	11,4
Services	1,1	1,1	1,4	1,7	1, 7	1,6	1,7	1,5	1,4	1,9	1,9
Constant prices	**Nd**	**2,5**	**3,5**	**3,9**	**4,0**	**4,8**	**5,5**	**6,9**	**7,0**	**7,8**	**7,8**
Agriculture, Fish. etc.	Nd	2,2	1,9	2,5	2,2	2,6	3,2	3,5	3,2	2,9	3,4
Mining	Nd	34,6	34,2	33,7	33,6	31,7	31,6	31,0	31,2	29,6	26,5
Manufacturing	Nd	2,7	4,8	5,4	5,8	7,7	9,4	12,5	12,8	14,6	14,5
Services	Nd	1,1	1,4	1,7	1,7	1,8	1,6	1,6	1,5	1,6	1,9

Source: IBGE

The analysis of more disaggregated data reveals distinct behaviors by category of industry. The main category responsible for the increase in the imports penetration has been manufacturing, as expected, considering the constrained imports demand within most part of the industries of the sector, and the fact that a very large share of the manufacturing industry had been functioning, until the beginning of the economic opening process, exclusively due to the protection which allowed it to drain its production into the internal market. Nevertheless, as it had been operating under phased out technology, high costs and/or insufficient quality, it certainly represented a road to substitution by imports, to occur as soon as they were allowed. Within manufacturing, the growth of imports penetration has been superior to the average in the economy (of 204%), from 4,8%, in 1990, to 14,5%, in 1998, at constant prices for 1990.

Table 2. Decomposition of the coefficient of imports penetration in price factor and volume factor, 1990/98

	1990 A	1998/90 B	1998 C	Value C/A	Price C/B	Volume B/A
Total	**3,5**	**7,8**	**5,6**	**1,6**	**0,7**	**2,3**
Mining	34,2	26,5	20,9	0,6	0,8	0,8
Manufacturing	4,8	14,5	11,4	2,4	0,8	3,0
Services	1,4	1,9	1,9	1,3	1,0	1,4
Agriculture, Fish. etc.	1,9	3,4	2,6	1,4	0,8	1,8

Note: A: 1990 at 1990 prices; B: 1998 at 1990 prices; C: 1998 at 1998 prices.
Source: IBGE

The increase in imports penetration has also reached the agricultural sector and services, although to a lesser extent. These showed increases of 80% and 36%, respectively[5], between 1990 and 1998. The only industry where imports penetration has been reduced has been mining, with a decrease from 34,2% to 26,5% in the same period. This segment, in fact, is that which presents the largest coefficient of imports penetration (26,5% in 1998), but represents only about 1% of the value added for the country, while whereas manufacturing corresponds to approximately 18%. (Table 3).

[5] In this paper the industries of Construction and ISPU (Electricity, Gas and Warter Supply) have been included in the services category.

Table 3. Participation of industries in the value added at basic prices, 1998 (%)

Agriculture, Fish. etc.	8
Mining	1
Manufacturing	18
Services[1]	73

Note: 1: includes the sectors of Construction and ISPU (Electricity, Gas and Water Supply).
Source: IBGE

In spite of the differences observed among the different sectors of manufacturing, there is the fact that practically all of them presented an increase in the coefficient of imports penetration between 1990 and 1998 (the only exceptions were the sectors of meat and alcohol). (Table 4). The main increases corresponded to the sectors of artificial textile fibers (587,6%); automobiles, trucks and buses (4712,2%); tractors/embankment machinery (1148,9%); artificial textiles (739,8%); other textile products (944,3%); plastics (440,5%); other metallurgic products (660,0%); clothing (725,1%); wood and furniture (576,8%); wheat flour (19407,5%); motor gasoline (9371,5%); and sugar (663,7%). Among those sectors, the ones who showed the highest coefficients of imports penetration in 1998 were artificial textile fibers (38,1%) and automobiles, trucks and buses (25,5%). The participation of the first one in the country's roll of imports corresponded in 1998, at current prices for that year, to less than 1% and the latter, to 5%. (Table 5).

Among the remaining sectors which showed high coefficients of imports penetration (superior to 20% in 1998), there were: electronic equipment (50,4%), non-petrochemical chemical elements (38,2%), manufacturing and maintenance of machines and equipment (37,3%), miscellaneous (23,7%), electrical equipment (23,6%), other vehicles and parts (22,8%) and other refined products (22,7%). These sectors presented the following participation in the roll of imports, respectively, for the same year: 10,5%, 2,8%, 10,4%, 3,3%, 4,4%, 6,9%, 2,6%.

Table 4. Participation of imports in the supply of manufacturing. Constant prices for 1990.

	1985[1]	1990[1]	1998[1]	98/90[2]	90/85[2]
Total	**2,5**	**3,5**	**7,8**	**224,9**	**136,8**
Manufacturing	**2,7**	**4,8**	**14,5**	**303,6**	**175,4**
Electronic equipment	10,1	18,5	50,4	273,1	183,7
Non-petrochem. chem.elements	18,1	23,9	38,2	159,5	132,6
Artificial textile fibers	1,1	5,5	38,1	687,6	513,4
Mfg,/maint.mach./equipment/	7,6	14,0	37,3	266,1	185,5
Automob./trucks/buses	0,1	0,5	25,5	4812,2	646,0
Miscellaneous	3,0	6,8	23,7	348,2	223,7
Electrical equipment	5,2	8,9	23,6	266,7	171,1
Other vehicles and parts	7,1	9,0	22,8	253,8	126,1
Other refin.prods.	3,9	9,0	22,7	251,3	233,2
Resins	3,5	5,6	18,8	333,6	161,4
Tractors/embankment mach.	1,9	1,4	17,4	1248,9	74,5
Rice, processed	6,0	8,1	17,1	210,5	136,7
Pharm. and perfum. prods.	2,7	7,1	16,7	235,6	266,4
Rubber products	2,4	4,9	16,0	328,4	202,6
Paints, varnishes and lacquers	2,6	5,3	14,7	277,1	205,5
Artificial textiles	0,3	1,7	14,3	839,8	558,4
Non-ferrous met. prods.	3,6	4,7	14,2	299,4	133,3
Other chem. prods.	4,0	4,5	13,2	293,1	113,5
Basic Petrochem. Prods.	6,2	5,6	13,1	233,8	90,0
Chemical fertilizers	6,0	7,9	12,3	156,5	130,5
Other textile prods.	0,2	1,1	11,9	1044,3	662,1
Plastics	1,1	2,2	11,9	540,5	199,2
Natural textile fibers	1,2	4,3	11,6	270,1	363,5
Rolled steel	1,9	2,8	10,6	373,6	148,5
Other metallurgic prods.	0,7	1,3	10,2	760,0	201,6
Processed milk	2,1	3,0	7,3	244,8	143,1
Fuel oil	2,4	3,1	7,2	235,1	125,3
Paper, pulp, cardboard/art.	1,0	2,5	7,0	286,2	246,3
Leather prods. and footwear	1,6	3,5	5,9	168,2	217,9
Other processed edible prods.	0,8	1,8	5,3	285,9	242,5
Animal food/other provision prods.	1,0	1,6	5,2	324,9	154,9
Beverages	2,2	4,2	5,2	122,0	196,1
Non-metallic mineral prods.	0,5	1,3	4,5	348,7	278,3
Clothing	0,1	0,5	4,5	825,1	464,7
Refined vegetal oil	0,9	1,9	4,1	219,9	203,0
Other dairy products	0,6	2,9	4,1	139,3	513,7
Wood and furniture	0,5	0,4	2,9	676,8	87,2
Vegetable oil, raw	1,3	0,5	2,1	435,0	37,0
Basic metallurgic prods.	0,2	1,0	1,7	166,7	446,4
Natural textiles	0,1	1,1	1,5	138,5	1268,9
Wheat flour	0,0	0,0	0,8	19507,5	-
Meat	1,6	3,3	0,6	19,3	202,8
Motor gasoline	0,4	0,0	0,2	9471,5	0,6
Alcohol	0,0	4,6	0,1	1,9	-
Sugar	0,0	0,0	0,0	763,7	-

Notes: 1: in %. 2: in index-number.
Source: IBGE

Table 5. Imports by products. Structure at current prices. By categories of industries and main products (%)

Products	1980	1985	1990	1995	1998
Mining	**38,2**	**37,5**	**21,8**	**11,7**	**9,0**
Manufacturing	**16,5**	**12,8**	**12,8**	**14,1**	**13,9**
Services	**9,0**	**13,2**	**21,2**	**15,6**	**18,7**
Agriculture, Fish. etc.	**32,4**	**35,0**	**47,4**	**57,2**	**63,3**
Electronic equipment	2,4	4,2	8,3	11,5	10,5
Mfg./maint. machin. and equip.	7,2	5,6	8,1	9,2	10,4
Housing and provisions.	0,1	0,1	4,9	5,3	7,6
Other vehicles and parts	4,5	5,0	4,4	5,1	6,9
Serv. rendered to companies	2,1	3,6	2,8	3,4	5,9
Automobiles, trucks/buses	0,0	0,0	0,2	6,0	5,0
Electrical equipment	4,8	4,4	3,2	3,6	4,4
Pharm. and perfum. prods.	0,7	0,9	1,9	2,5	3,6
Miscellaneous	1,4	1,8	2,9	3,7	3,3
Transport margin	5,6	5,9	6,9	4,1	2,8
Non-petrochem. chem prods.	3,7	3,4	3,8	2,9	2,8
Petroleum and gas	34,7	33,6	17,1	4,1	2,7
Other refin. prods.	1,4	2,0	2,2	3,5	2,6
Paper, pulp, cardboard/art.	1,0	0,8	1,5	2,2	1,9
Resins	1,1	1,2	1,1	2,0	1,8
Other metallurgic. prods.	0,6	0,5	0,7	1,2	1,6
Non-ferrous met. prods.	3,2	1,4	1,3	1,6	1,4
Basic Petrochem. Prods.	3,5	2,4	1,4	1,7	1,4
Other chem. prods.	0,8	1,1	0,9	1,0	1,4
Ind. services of public utility	0,0	0,0	2,9	1,5	1,3
Chemical fertilizers	2,4	1,6	1,3	1,0	1,2
Other agricult. prods.	1,2	1,0	1,5	1,4	1,2
Wheat, unmilled	3,7	3,4	1,0	1,5	1,2
Rubber products	0,4	0,6	0,9	1,1	1,1
Animal food/other provisions	0,4	0,4	0,6	1,2	1,1
Plastics	0,2	0,3	0,5	1,0	1,0

Source: IBGE

Analyzing these data in a reversed manner, it becomes possible to point out the manufacturing sectors which experienced less impact in terms of imports penetration. This picture could be attributed to characteristics of the sector itself (several different difficulties regarding imports) or of the Brazilian industry (a lesser gap vis-à-vis the external supply in terms of cost and quality, for example). In the first case, there would be a situation where very little could be said about the Brazilian industry. In the latter, on the other hand, we would be viewing sectors with a greater capacity to survive in the face of the economic opening. Nevertheless, the data apparently seem to suggest that the situation is mostly that of the first case, rather than the second, considering the sectors which can be pointed out: natural textiles (increase of 38,5% in the imports coefficient between 1990 and 1998), other dairy products (increase of 39,3%) and beverages (increase of 22%), followed by: leather products and footwear (increase of 68,2%), steel products (basic) (66,7%), non-petrochemical chemical elements (59,5%) chemical fertilizers (56,5%). The latter two, nevertheless, showed considerably high coefficients of imports penetration in 1998 (38,2% and 12,3%, respectively).

Although manufacturing displayed the highest coefficients of imports penetration in the economy and an upwards tendency, it cannot be considered that Brazilian manufacturing presents excessively high coefficients of imports penetration with regards to international patterns. According to several analysts of the Brazilian

economy, what did occur was a foreseen and much desired adjustment, after a long period of closed economy. Nevertheless, as the Brazilian exports did not show the same "dynamics" as imports did, and other macroeconomic variables prove to be unfavorable to the country, the generation of permanent commercial deficits ends up by representing an excessively high burden.

The evolution of the structure of Brazilian imports can also be analyzed based on the imports/intermediate consumption, by industry relation. (Table 6). In 1996 (last data available), the sectors which presented the largest coefficients of imports on the intermediate consumption were electronic equipment (22%), automobiles, trucks and buses (14,6%), oil refining (13,5%), various chemicals (12,2%), pharmaceuticals and veterinary (11,0%), non-ferrous metallurgic (10,9%) and textile industries (10,1%). The highest rates of increase in the imports/intermediate consumption relation between 1990 and 1996 were identified in the sectors of automobiles, trucks and buses (386,8%), clothing (260,7%), textile industries (253,3%) and vegetable oil mills (208,4%). On the average, the participation of imports in manufacturing increased from 3,8% to 5,9% between 1990 and 1996, totaling an increase of 55,2%.

Table 6. Participation of imports in the intermediate consumption per industry, current prices

	1980[1]	**1985[1]**	**1990[1]**	**1995[1]**	**1996[1]**	**96/90[2]**	**90/85[2]**	**85/80[2]**	**96/80[2]**
Non-metallic minerals	1,0	1,1	1,8	1,9	2,1	117,7	168,2	103,6	205,1
Steel industries	4,6	5,2	4,8	5,8	5,6	117,3	92,0	113,4	122,4
Non-ferrous metal.	13,4	6,3	7,6	11,5	10,9	143,5	121,2	46,7	81,3
Other metallurgic	2,3	1,3	1,9	2,1	2,0	107,7	146,4	57,4	90,6
Machinery and equip.	3,5	2,0	1,9	4,4	3,5	181,8	95,2	59,0	102,1
Electrical equipment	7,6	3,9	2,9	5,3	5,8	201,5	74,4	51,1	76,6
Electronic equip.	9,4	8,4	10,7	20,4	22,0	206,9	126,4	89,4	233,8
Autom. / trucks/buses	3,1	3,4	3,0	12,6	14,6	487,0	87,8	110,4	472,1
Parts and other vehicles	5,0	3,8	4,2	4,1	4,2	101,2	110,4	75,3	84,1
Wood and furniture	0,5	1,1	1,0	1,4	1,7	168,0	88,9	205,3	306,6
Pulp, paper / graph.	2,6	1,6	3,1	5,9	5,1	165,4	197,5	60,9	198,8
Rubber Industries	6,5	5,2	5,0	7,9	7,7	153,8	97,1	80,2	119,7
Chem. Elements	6,6	4,7	3,7	3,3	3,1	84,2	78,6	71,6	47,4
Oil refining	48,2	27,7	15,5	12,7	13,5	87,4	56,0	57,4	28,1
Various chemicals	21,2	10,0	8,6	11,9	12,2	142,5	85,6	47,5	57,9
Pharmac./veterinary	8,9	5,4	8,9	10,1	11,0	123,0	163,8	61,1	123,1
Plastic articles	2,8	1,3	2,0	5,6	5,6	276,3	155,8	46,2	198,7
Textiles industry	0,7	1,1	2,9	8,8	10,1	353,3	254,0	167,2	1501,0
Clothing	0,1	0,3	0,8	4,0	2,9	360,7	276,8	270,2	2696,9
Footwear mfg.	1,0	3,0	3,9	5,1	4,7	119,8	130,6	310,4	485,4
Coffee industries	0,0	0,1	0,2	0,1	0,2	107,3	268,3	11479,3	33047,1
Vegetal prods. Proces.	16,7	3,5	4,6	4,1	4,2	89,8	132,7	20,9	24,9
Meat and meat ind.	1,0	0,9	0,6	0,6	0,6	102,8	65,1	89,6	60,0
Dairy products ind.	0,2	0,4	0,9	1,6	1,5	166,6	232,3	249,0	963,9
Sugar mfg.	0,2	0,8	1,1	1,6	1,6	135,6	140,4	350,4	667,1
Vegetal oils mfg.	3,2	2,8	1,0	3,4	3,1	308,4	35,7	89,1	98,1
Other provisions	4,6	2,5	3,4	4,2	4,1	122,2	135,9	53,7	89,2
Various industries	3,9	4,2	1,4	3,1	2,8	204,7	33,2	108,4	73,7
Manufacturing	**6,4**	**4,0**	**3,8**	**5,8**	**5,9**	**155,2**	**-**	**-**	**-**
Mining	**1,0**	**2,4**	**1,6**	**1,6**	**1,6**	**103,5**	**-**	**-**	**-**
Services	**1,9**	**1,1**	**1,8**	**1,9**	**1,7**	**96,4**	**-**	**-**	**-**

Notes: 1: in %. 2: in index-number.
Source: IBGE

The participation of imports in the gross formation of fixed capital presented considerably high percentages for five sectors of manufacturing in 1998: electronic equipment (51,1%), manufacturing and maintenance of machinery and equipment (36,1%), other vehicles and parts (23,0%), electrical equipment (23,5%) and miscellaneous (18,6%). (Table 7).

Table 7. Participation of imports in the GFFC, constant prices for 1990 (%)

	1985	1990	1995	1998
Other agricult. prods.	0,0	0,0	0,0	2,4
Non-metallic min. prods.	0,5	1,6	5,0	4,4
Other metallurgic prods.	0,7	1,8	7,9	10,1
Mfg./maint. machinery and equip.	12,4	21,8	39,1	36,1
Tractors/embankment machinery	1,4	1,9	20,9	17,2
Electric material	9,4	14,2	42,8	23,5
Electronic equipment	10,6	25,5	36,1	51,1
Automobiles, trucks/buses	0,2	0,5	9,0	25,1
Other vehicles and parts	31,4	2,2	19,4	23,0
Wood and furniture	0,0	0,1	1,1	2,8
Paper, pulp,cardboard/art.	0,1	0,5	1,5	6,8
Other textile products	0,2	0,0	0,0	0,0
Miscellaneous	19,1	53,4	90,5	18,6
Serv. rendered to companies	6,4	3,4	4,6	6,8
Average	**5,4**	**7,9**	**17,4**	**16,3**

Source: IBGE

The high participation of electronic equipment imports in the household consumption is entirely consistent with the data previously observed. (Table 8). In this case, the impact of the economic opening has been of great importance, since the local industry, protected and facing no competition, presented cost and quality patterns far below those of the international supply. In 1985 and 1990 there has been a participation of less than 1% of imports in the households consumption. Between 1990 and 1995 this coefficient increased to 18,9%, and between 1995 and 1998, to 51,1%. The other sectors of the economy in which the participation of imports in the households consumption exceeded 20% in 1998 were: manufacturing and maintenance of machinery and equipment 36,1%), artificial textile fibers (29,4%), automobiles, trucks and buses (25,1%), electric equipment (23,5%), other vehicles and parts (23,0%) and other refined products (22,6%).

The following sectors are also to be pointed out: rubber products, artificial textiles, and leather products and footwear, where the presence of imports in the households consumption strongly increased between 1990 and 1995 (from 8,0% to 31,7%, from 2,6% to 31,0% and from 1,1% to 10,4%, respectively) but later on became reduced again in 1998, reaching nevertheless in that year levels still much higher than those of 1990. Finally, the imports participation of about 29,8% in the wheat, unmilled sector, in 1985, is also to be noted.

Table 8. Participation of imports in the households consumption, constant prices for 1990 (%)

	1985	1990	1995	1998
Rice, raw	0,0	1,7	0,0	0,0
Wheat, unmilled	29,8	0,0	0,0	0,0
Soya, unmilled	2,7	0,2	0,0	0,0
Corn	0,0	0,0	0,0	8,3
Poultry	0,0	0,0	3,1	1,1
Other agricult. prods.	1,5	2,0	3,7	2,4
Non-metallic min. prods.	0,6	1,8	5,6	4,4
Non-ferrous met. prods.	0,5	7,5	12,1	13,4
Other metallurgic prods.	0,7	1,8	7,9	10,1
Mfg./maint. machinery and equip.	5,4	12,0	13,7	36,1
Electric material	6,7	12,2	20,0	23,5
Electronic equipment	0,1	0,7	18,9	51,1
Automobiles ,trucks./buses	0,0	0,6	37,1	25,1
Other vehicles and parts	4,9	11,0	7,5	23,0
Wood and furniture	0,1	0,1	3,4	2,8
Paper, pulp, cardboard/art	2,5	4,1	11,7	6,8
Rubber products	6,2	8,0	31,7	16,0
Sugar cane alcohol and cereals	0,0	4,9	6,9	0,1
Combustible oils	2,6	1,8	0,9	7,2
Other prods. from refining	7,3	10,1	17,3	22,6
Basic petrochem. prods.	6,9	6,0	11,4	13,1
Chemical fertilizers	0,0	0,0	0,0	12,2
Paints, varnishes and lacquers	0,6	1,6	5,7	14,7
Other chemical products	4,3	0,0	0,0	14,6
Pharmac. and perfum. prods.	0,0	0,2	0,8	16,2
Plastic articles	0,1	0,5	12,9	11,6
Natural textile fibers	1,5	0,0	0,0	10,5
Natural textiles	0,1	1,5	9,5	1,3
Artificial textile fibers	1,2	6,1	27,3	29,4
Artificial textiles	0,1	2,6	31,0	13,8
Other textile products	0,2	1,4	9,6	11,5
Clothing	0,1	0,6	4,5	4,3
Leather products and footwear	0,1	1,1	10,4	6,0
Rice, processed	6,1	8,2	12,8	17,4
Wheat flour	0,0	0,0	3,2	0,9
Other processed	0,7	2,4	4,9	5,4
Meat	1,3	3,7	0,9	0,6
Poultry	0,0	0,0	0,0	0,0
Processed milk	2,3	3,3	9,7	7,2
Other dairy	0,5	3,0	8,5	4,1
Sugar	0,0	0,0	0,2	0,0
Refined vegetal oil	0,0	1,0	2,3	4,4
Animal food/other provisions	1,2	2,0	5,8	5,1
Beverages	0,6	1,2	5,7	4,9
Miscellaneous	2,3	5,5	16,7	18,6
Transport margin	4,0	3,4	4,9	5,9
Communications	0,0	0,0	0,0	0,6
Insurance	0,3	0,3	0,0	0,0
Financial services	1,3	20,7	0,9	0,4
Housing and provisions	0,2	8,4	6,9	10,9
Other services	0,2	0,3	0,1	0,1
Serv. rend. to companies	6,4	3,4	4,6	6,8
Average	**1,8**	**2,7**	**6,9**	**9,9**

Source: IBGE

Tables 9 and 10 present the imports multipliers by industry and their decomposition into direct and indirect effects. Thus, it is possible to identify the sectors where increases in the demand generate higher imports potential increase, and the cases in which these increases have occurred directly along the last stage of the chain (direct effects) or those where the greatest part of the increases represents a stimulation to imports in other sectors of the productive chain (indirect effects).

Table 9. Multipliers of imports by industry

	1980	1985	1990	1995	1996	96/90[1]	90/85[1]	85/80[1]	96/80[1]
Agriculture, Fish. etc.	0,071	0,045	0,044	0,042	0,044	-0,11	-3,00	-35,81	-37,81
Mining	0,066	0,071	0,068	0,067	0,069	1,06	-3,95	6,72	3,59
Petroleum and gas	0,064	0,042	0,030	0,041	0,034	13,58	-28,94	-34,21	-46,90
Non-metallic min.	0,103	0,080	0,071	0,066	0,069	-1,97	-11,09	-22,54	-32,49
Steel industries	0,174	0,148	0,123	0,136	0,132	7,51	-16,62	-15,01	-23,82
Non-ferrous metallurgic	0,257	0,133	0,150	0,191	0,186	24,15	12,59	-48,40	-27,87
Other metallurgic	0,123	0,086	0,084	0,089	0,087	4,00	-2,84	-30,14	-29,40
Machinery and equip.	0,112	0,070	0,064	0,083	0,074	14,74	-8,50	-37,36	-34,23
Electrical equipment	0,179	0,108	0,090	0,123	0,129	43,34	-16,94	-39,48	-27,95
Electronic equipment	0,167	0,130	0,160	0,246	0,257	60,44	23,71	-22,17	54,47
Autom./trucks/buses	0,149	0,115	0,100	0,186	0,205	105,23	-13,02	-23,18	37,12
Parts and other vehicles	0,145	0,098	0,101	0,102	0,106	4,90	3,25	-32,17	-26,53
Wood and furniture	0,087	0,066	0,056	0,055	0,060	7,16	-13,91	-24,77	-30,59
Pulp, paper/graph.	0,109	0,066	0,083	0,116	0,108	29,73	24,97	-39,13	-1,32
Rubber industries	0,265	0,157	0,131	0,161	0,161	22,79	-16,72	-40,72	-39,38
Chemical elements	0,148	0,096	0,082	0,071	0,071	-13,93	-14,01	-35,43	-52,21
Oil refining	0,616	0,370	0,221	0,181	0,194	-12,00	-40,30	-40,02	-68,49
Various chemicals	0,340	0,196	0,156	0,192	0,195	25,06	-20,29	-42,47	-42,65
Pharmac. and veterinary	0,178	0,114	0,135	0,142	0,149	10,17	18,26	-35,62	-16,12
Plastic articles	0,260	0,171	0,104	0,131	0,132	25,91	-38,91	-34,12	-49,32
Textile industry	0,138	0,086	0,090	0,173	0,191	112,88	4,33	-37,50	38,80
Clothing	0,089	0,051	0,058	0,124	0,123	113,12	12,74	-42,50	38,17
Footwear mfg.	0,107	0,098	0,102	0,114	0,110	7,53	3,75	-7,84	2,82
Coffee industries	0,072	0,041	0,039	0,032	0,037	-6,20	-3,87	-43,32	-48,89
Vegetal prods. proces.	0,248	0,078	0,086	0,080	0,080	-6,46	9,66	-68,49	-67,68
Meat and meat ind.	0,081	0,055	0,048	0,044	0,045	-7,17	-12,90	-31,58	-44,67
Dairy products ind.	0,079	0,052	0,053	0,057	0,055	3,85	1,94	-33,48	-29,58
Sugar mfg.	0,074	0,059	0,056	0,068	0,069	22,71	-4,87	-20,14	-6,78
Vegetal oils mfg.	0,127	0,087	0,063	0,086	0,084	34,16	-27,78	-32,02	-34,14
Other provisions	0,140	0,083	0,084	0,091	0,089	5,80	2,34	-41,08	-36,20
Various industries	0,122	0,090	0,054	0,076	0,072	32,88	-39,68	-26,60	-41,17
S.I.U.P.	0,042	0,038	0,083	0,061	0,056	-32,13	114,65	-8,59	33,16
Construction	0,090	0,056	0,042	0,038	0,038	-10,03	-23,96	-38,19	-57,71
Wholesale/retail trade	0,099	0,048	0,042	0,039	0,044	4,94	-14,28	-51,23	-56,13
Transports	0,212	0,150	0,130	0,125	0,103	-20,96	-13,31	-29,34	-51,59
Commnications	0,050	0,026	0,028	0,028	0,031	12,74	4,77	-47,33	-37,79
Financial intermediation	0,019	0,009	0,007	0,015	0,017	155,59	-25,89	-52,93	-10,83
Serv. rend. households	0,063	0,044	0,038	0,036	0,034	-10,38	-14,70	-29,09	-45,79
Serv. rend. companies	0,048	0,017	0,020	0,027	0,026	30,91	19,88	-65,48	-45,83
Real estate	0,013	0,009	0,005	0,003	0,002	-62,22	-44,44	-30,89	-85,49
Public administration	0,025	0,024	0,019	0,032	0,029	56,24	-21,21	-5,21	16,69
Nonmercant. Priv.Serv.	0,007	0,009	0,006	0,006	0,006	6,34	-32,72	24,98	-10,59
Average	**0,1323**	**0,0850**	**0,0763**	**0,0899**	**0,0905**	**19,43**	**-6,47**	**-32,00**	**-25,55**

Note: 1: percent variation.
Source: Prepared by the authors

The sectors which possessed the highest imports inducing potential in 1996 were electronic equipment (0,257), automobiles, trucks and buses (0,205), various chemicals (0,195), oil refining (0,194) and textile industries (0,191). All of them, with the exception of oil refining, presented in 1996 a higher multiplier (and, in certain instances, much higher) than that of 1990. The sectors with lowest multipliers, for that same year, were petroleum and gas (0,034), coffee industries (0,037), agriculture, fish. etc. (0,044) and meat and meat industries (0,045). If those sectors were of special interest as being value added or employment generating, they could be subject to a special incentive policy. But this was not the case. In fact, the most dynamic sectors were exactly those who bore a stronger imports expansion potential, which reveals an intrinsic difficulty for the process of the Brazilian economic opening, as is well known, the consequences of which have been experienced in the country's Trade Balance.

A long range analysis discloses some rather interesting details. Some of the sectors which showed high imports multipliers in 1996 and higher ones, in that year, vis-à-vis the 1990 value, presented even higher multipliers in 1980. Such is the case, for example, of various chemicals (0,340 in 1980), rubber industries (0,265), plastic articles (0,260), non-ferrous metallurgic (0,257) and other vegetables processing (0,248). Finally, the oil refining sector presented a multiplier of 0,616 in 1980, which has been gradually reduced in 1985 and 1990, and only began to increase again in 1996, and even so at still rather modest rates [6].

It is interesting to note that in the sectors which presented the highest imports multipliers in 1996 (electronic equipment and automobiles, trucks and buses), the direct effects were much more important than the indirect ones. The oil refining, various chemicals and pharmaceutical and veterinary sectors also bear this characteristic (more than 60% of the multiplier is due to direct effects).

On the other hand, the sectors where the indirect effects were mostly noted in 1996 (accounting for more than 75% multiplier) were other metallurgic, clothing, coffee industries, meat and meat industries and sugar manufacturing sectors. Nevertheless, none of them stood out for presenting high imports multipliers for that year.

[6] When this is affirmed, it becomes necessary to always bear in mind that the data available refer to these years (1980, 1985, 1990, 1996) and it is seeked to identify patterns of changes along the time. Of course, a sudden change which appears in the data for 1985, for example, may have occurred in 1981, or along the 1981-1984 period, so that when it is said that the variable has increased in 1985 the idea is that in 1985 the variable had been above the 1980 level. In order to allow for more fluidity of the text, it has been said that in 1985 it had been superior to 1980, in the example.

Table 10 Decomposition of imports multipliers into direct and indirect effects, by industry

	i.Bm.[I-A]-1 Direct plus Indirect			i.Bm Direct			(i.Bm / i.Bm.[I-A]-1) x 100		
	1985	**1990**	**1996**	**1985**	**1990**	**1996**	**1985**	**1990**	**1996**
Agriculture, Fish. etc.	4,5	4,4	4,4	0,3	0,7	1,2	5,9	17,0	26,7
Mining	7,1	6,8	6,9	2,6	2,0	2,1	36,0	30,0	29,9
Petroleum and gas	4,2	3,0	3,4	2,3	1,1	1,2	54,2	36,8	35,3
Non-metallic min.	8,0	7,1	6,9	1,0	1,8	2,1	13,2	24,9	29,9
Steel industries	14,8	12,3	13,2	5,2	4,7	5,6	34,9	38,5	42,0
Non-ferrous metal.	13,3	15,0	18,6	6,3	7,6	10,9	47,1	50,6	58,5
Other metallurgic	8,6	8,4	8,7	1,3	1,9	2,0	15,0	22,7	23,5
Machinery and equip.	7,0	6,4	7,4	2,0	1,9	3,5	29,1	30,3	47,9
Electrical equipment	10,8	9,0	12,9	3,9	2,9	5,8	36,0	32,2	45,3
Electronic equipment	13,0	16,0	25,7	8,4	10,7	22,0	65,0	66,4	85,6
Autom./trucks/buses	11,5	10,0	20,5	3,4	3,0	14,6	29,8	30,1	71,3
Parts and other vehicles	9,8	10,1	10,6	3,8	4,2	4,2	38,7	41,3	39,9
Wood and furniture	6,6	5,6	6,0	1,1	1,0	1,7	17,0	17,5	27,5
Pulp, paper/ graph.	6,6	8,3	10,8	1,6	3,1	5,1	23,3	36,9	47,0
Rubber industries	15,7	13,1	16,1	5,2	5,0	7,7	32,9	38,4	48,0
Chemical elements	9,6	8,2	7,1	4,7	3,7	3,1	49,1	44,9	43,9
Oil refining	37,0	22,1	19,4	27,6	15,5	13,5	74,8	70,1	69,7
Various chemicals	19,6	15,6	19,5	10,0	8,6	12,2	51,3	55,1	62,8
Pharmac. /veterinary	11,4	13,5	14,9	5,4	8,9	11,0	47,6	65,9	73,5
Plastic articles	17,1	10,4	13,2	1,3	2,0	5,6	7,6	19,4	42,5
Textile industry	8,6	9,0	19,1	1,1	2,9	10,1	13,0	31,7	52,6
Clothing	5,1	5,8	12,3	0,3	0,8	2,9	5,7	14,0	23,7
Footwear mfg.	9,8	10,2	11,0	3,0	3,9	4,7	30,6	38,5	42,8
Coffee industries	4,1	3,9	3,7	0,1	0,2	0,2	1,7	4,8	5,5
Vegetal prods. Proces.	7,8	8,6	8,0	3,5	4,6	4,1	44,5	53,9	51,7
Meat and meat ind.	5,5	4,8	4,5	0,9	0,6	0,6	16,4	12,3	13,6
Dairy products ind.	5,2	5,3	5,5	0,4	0,9	1,5	7,3	16,7	26,8
Sugar mfg.	5,9	5,6	6,9	0,8	1,1	1,6	13,8	20,4	22,6
Vegetal oils proces.	8,7	6,3	8,4	2,8	1,0	3,1	32,8	16,2	37,2
Other provisions	8,3	8,4	8,9	2,5	3,3	4,1	29,8	39,6	45,8
Various industries	9,0	5,4	7,2	4,2	1,4	2,8	46,4	25,6	39,4
S.I.U.P.	3,8	8,3	5,6	0,7	5,1	3,5	17,0	61,9	62,0
Construction	5,6	4,2	3,8	0,7	1,0	1,3	13,5	23,0	34,4
Wholesale/retail trade	4,8	4,2	4,4	0,4	0,6	1,1	7,9	15,2	24,5
Transport	15,0	13,0	10,3	6,7	8,3	5,8	44,5	63,7	56,1
Communications	2,6	2,8	3,1	1,2	1,6	2,0	47,4	58,2	65,3
Financial intermed.	0,9	0,7	1,7	0,4	0,3	0,8	41,2	44,0	48,7
Serv. rend. to families	4,4	3,8	3,4	0,8	1,1	1,1	18,4	28,4	31,5
Serv. rend. companies	1,7	2,0	2,6	0,4	0,5	1,1	22,4	26,1	42,1
Real estate	0,9	0,5	0,2	0,0	0,1	0,0	5,2	14,2	14,0
Public administration	2,4	1,9	2,9	0,7	0,7	1,7	31,5	37,8	56,8
Nonmercant.priv.serv.	0,9	0,6	0,6	0,0	0,0	0,2	0,1	0,2	40,3
Average	**8,5**	**7,6**	**9,1**	**3,1**	**3,1**	**4,5**	**28,6**	**33,7**	**42,6**

Source: Prepared by the authors

4. Exports Performance

As we know, Brazilian exports began to increase as of the economic opening, even though they have not even as much as come close to the imports behavior during that period. At constant prices, the exports coefficient (exports/value added of production) for the economy as a whole increased from 4,0%, in 1990, to 4,6%, in 1998, totaling an increase of about 14% (therefore considerably less than the increase of the imports penetration for the period). (Table 11).

In the analysis by category of industry, it can be noted that the increases were higher for agriculture, fish. etc. (about 50% between 1990 and 1998, at constant prices), within manufacturing they were of about 28% (as compared to the 204% increase in imports penetration for the same period), and were negative in the mining and service sectors. It should be pointed out that in manufacturing the exports coefficient had been growing even before the economic opening, it reached a maximum of 9,6% in 1994, when the "*Real Plan"* was implemented, experienced a reduction of about 11% in 1995, and has been since then slowly recovering its value, even though it did not reach, in 1998, its 1994 level.

Table 11. Coefficient of exports. Participation of exports in production, current and constant prices for 1990 (%)

	1980	**1985**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Current prices	**4,9**	**6,0**	**4,0**	**4,5**	**5,3**	**4,9**	**5,0**	**4,4**	**4,0**	**4,3**	**4,2**
Agriculture, Fish. Etc.	1,9	2,4	1,6	1,0	1,9	1,6	1,8	0,9	1,2	2,0	2,0
Mining	33,7	19,2	19,8	26,6	26,6	26,7	23,5	22,1	19,5	20,5	26,0
Manufacturing	7,3	10,0	7,3	8,7	11,0	10,6	10,0	8,9	8,6	9,3	9,6
Services	2,3	2,0	1,5	1,4	1,4	1,2	1,4	1,4	1,1	1,1	0,8
Constant prices	**Nd**	**4,1**	**4,0**	**3,9**	**4,6**	**4,9**	**4,9**	**4,7**	**4,5**	**4,7**	**4,6**
Agriculture, Fish. Etc.	Nd	1,8	1,6	1,1	1,6	1,7	1,7	1,2	1,2	2,1	2,4
Mining	Nd	17,2	19,8	19,6	17,4	20.0	18,7	19,2	18,7	18,1	18,9
Manufacturing	Nd	6,8	7,3	7,1	8,7	9,6	9,6	8,6	8,5	8,9	9,4
Services	Nd	1,8	1,5	1,4	1,6	1,3	1,4	1,8	1,5	1,5	0,9

Source: IBGE

The decomposition of the exports coefficient into price factor and volume factor points once again at a disadvantageous picture for the country. In the imports case, most of the growth was explained by volume, confirming the strong increase of the imports volume. Here, the increase in the exports volume seems to be more effective than the price factor in explaining the increase in the value of the coefficient, but not as much as would be desirable. Furthermore, this profile is not uniform for the economy as a whole. In the sectors of mining, agriculture, fish. etc. and services, the price factor appears to be more relevant that the volume factor, and in manufacturing, where the exports increase is more relevant, the relative importance of the volume factor is lower than that desired. (Table 12).

Table 12. Decomposition of the exports coefficient into price factor and volume factor, 1990-98

	1990 A	1998/90 B	1998 C	Value C/A	Price C/B	Volume B/A
Total	**4,0**	**4,6**	**4,2**	**1,0**	**0,9**	**1,1**
Mining	19,8	18,9	26,0	1,3	1,4	1,0
Manufacturing	7,3	9,4	9,6	1,3	1,0	1,3
Services	1,5	0,9	0,8	0,6	0,9	0,6
Agriculture, Fish. etc.	1,6	2,4	2,0	1,2	0,8	1,5

Notes: A: 1990 at 1990 prices; B: 1998 at 1990 prices; C: 1998 at 1998 prices.
Source: IBGE

In manufacturing, the products which presented the highest increases of the exports coefficient between 1990 e 1998 were: other dairy products (866%), alcohol (757%), processed milk (411%), paints, varnishes and lacquers (358%) and artificial textiles (250%). None of them, nevertheless, presented a relevant exports coefficient in 1998 (the highest were paints, varnishes and lacquers, 4,9% and artificial textiles, 2,6%). (Table 13). Also with regards to the roll of exports, none of these sectors presented an expressive participation. (Table 14).

Analyzing the data in a reversed manner, the sectors with highest participation in the structure of Brazilian exports in 1998 (other vehicles and parts, 8,6%, automobiles, trucks and buses, 5,9%, manufacturing and maintenance of machinery and equipment, 4,8%, and other processed provision goods, 4,8%), presented an increase in the exports coefficient, between 1990 and 1998, of 25%, 87%, 33%, 17% only, respectively. This corroborates the conclusions to the fact that the economic opening, at least until 1998, had caused proportionally much larger impact on the Brazilian imports than on the exports.

Table 13. Participation of exports at basic prices in the output at constant prices for 1990. Manufacturing (%)

	1985[1]	1990[1]	1995[1]	1998[1]	98/90[2]	95/90[2]	90/85[2]
Total	**41**	**4,0**	**4,7**	**4,6**	**113,8**	**116,2**	**99,6**
Manufacturing	**6,8**	**7,3**	**8,6**	**9,4**	**127,9**	**117,0**	**106,9**
Nonmetal. min. prods.	1,7	1,7	3,8	3,9	227,7	225,1	97,1
Basic metallurgic prods.	10,6	14,4	15,3	16,4	114,1	106,3	136,0
Rolled steel	17,7	22,4	16,0	13,5	60,2	71,3	126,6
Non-ferrous metal. prods.	8,3	19,9	19,1	17,8	89,2	95,8	240,5
Other metal. prods.	2,5	2,9	3,4	3,1	104,8	116,4	118,6
Mfg.maint. machin./equip.	4,5	6,8	5,8	9,0	133,2	85,5	150,5
Tractors/embankm. mach.	10,7	11,1	29,0	31,0	278,6	260,5	104,6
Electrical equipment	5,0	7,3	10,1	8,1	110,7	137,6	145,9
Electronic equipment	8,3	5,6	4,2	8,0	142,7	74,7	67,1
Autom., trucks/buses	12,2	9,8	8,6	18,4	187,1	87,4	80,5
Other vehicles and parts	10,2	15,6	13,8	19,5	124,7	88,1	153,0
Wood and furniture	4,0	3,9	8,0	8,9	225,4	203,6	99,7
Paper, cell., cardboard/art	4,7	6,1	11,6	10,3	167,3	189,5	129,2
Rubber products	5,1	5,5	8,6	10,1	186,0	157,0	106,7
Non-petroch. chem. elem.	5,3	11,1	17,1	23,3	210,6	154,5	211,1
Alcohol	0,8	0,1	1,5	0,5	857,2	2488,0	7,7
Motor gasoline	13,4	6,2	4,5	6,2	100,6	73,3	46,2
Fuel oil	6,3	3,7	3,9	4,4	119,9	108,2	58,1
Other prods. from refining	7,1	2,8	4,4	1,4	48,5	153,8	40,0
Basic. petrochem. prods.	10,3	7,7	7,0	6,2	80,7	90,8	75,1
Resins	4,6	6,9	10,1	10,9	157,8	145,8	150,1
Chemical fertilizers	0,1	0,3	0,9	0,8	227,2	267,2	252,4
Paints, varnishes etc.	0,8	1,1	3,5	4,9	458,6	325,5	133,9
Other chem. Products	5,8	4,4	5,1	5,4	123,1	115,9	75,7
Pharm./perfumery prods.	1,5	1,6	3,1	3,8	235,4	192,7	111,8
Plastics	3,1	1,4	2,3	2,2	156,7	167,7	44,6
Natural textile fibers	9,6	8,5	7,4	5,0	59,3	88,0	88,4
Natural textiles	4,8	3,8	6,7	6,4	167,9	176,9	78,9
Artificial textile fibers	7,1	5,2	5,8	7,6	146,7	110,8	73,0
Artificial textiles	1,8	0,7	1,8	2,6	350,3	239,0	41,6
Other textile products	4,0	5,7	6,4	6,9	120,2	111,5	144,4
Clothing	1,3	1,2	1,1	0,7	54,8	88,1	99,3
Leather prods./footwear	19,9	24,4	33,0	40,8	167,6	135,5	122,3
Coffee products	27,6	29,8	32,4	29,3	98,4	108,7	108,2
Rice, processed	0,1	0,1	0,1	0,1	168,5	220,9	110,6
Other proces. Provisions	16,2	19,0	18,5	22,2	117,1	97,4	117,3
Meat	6,4	2,6	1,7	2,5	96,3	64,2	40,7
Poultry	12,4	9,8	11,8	13,3	135,3	120,0	79,0
Processed milk	0,0	0,0	0,0	0,1	511,7	110,9	28,7
Other dairy products	0,0	0,0	0,2	0,2	966,5	1041,2	86,0
Sugar	11,8	13,0	33,3	36,1	278,2	257,1	109,6
Vegetable oil, raw	33,8	40,1	49,7	42,4	105,7	124,0	118,6
Vegetable oil, processed	13,0	3,4	2,8	3,9	114,2	81,4	26,2
Animal food/other provis.	2,8	3,8	4,9	4,2	112,0	131,1	134,7
Beverages	0,4	0,9	1,5	1,4	151,3	168,8	256,9
Miscellaneous	2,4	3,2	5,3	5,8	180,6	165,6	135,0

Notes: 1: in %. 2: in index-number.
Source: IBGE

Table 14. Structure of exports at basic prices. By category of industry and main products

	1980	1985	1990	1995	1998
Mining	**8,1**	**6,7**	**6,9**	**5,0**	**5,8**
Manufacturing	**67,4**	**75,2**	**71,5**	**76,2**	**79,4**
Services	**21,6**	**15,3**	**19,2**	**17,3**	**11,6**
Agriculture, Fish. etc.	**2,9**	**2,9**	**2,4**	**1,5**	**3,3**
Other vehicles and parts	4,4	4,8	6,2	6,0	8,6
Autom.,trucks/buses	3,3	3,2	2,6	2,5	5,9
Mfg./maint. machin./equip.	3,1	2,5	3,0	3,3	4,8
Other proces. provisions	4,9	4,7	5,1	4,1	4,8
Iron ores	5,4	4,4	4,8	3,8	4,6
Vegetable oil, raw	8,8	4,9	5,1	5,4	4,2
Serv. rend. to companies	1,2	0,9	0,5	2,5	4,1
Coffee products	6,7	7,5	3,3	4,0	4,1
Basic metallurgic prods.	1,5	3,4	4,3	4,2	3,9
Leather prods./footwear	2,2	3,5	4,0	3,8	3,7
Paper, cell., cardboard/art	2,3	1,9	3,2	5,0	3,5
Sugar	2,7	1,3	1,4	3,4	3,4
Non-ferrous met. products	1,7	2,8	4,5	4,2	3,1
Trade margin	7,2	3,0	2,7	2,7	3,0
Housing and provisions.	0,0	0,0	3,8	2,0	2,9
Soya, unmilled	1,2	1,5	1,5	0,8	2,5
Electrical equipment	1,9	1,1	2,2	2,7	2,4
Wood and furniture	1,5	1,0	1,1	2,3	2,3
Rolled steel	1,7	4,1	4,7	3,4	2,3
Electronic equipment	1,9	1,8	1,8	1,4	1,9

Source: IBGE

5. Conclusions

The analysis carried out enabled the confirmation of the known behavior of the Brazilian imports and exports as of the economic opening of the decade of the 90's, adding a more detailed investigation to the previous works, based on consistent methodology and data sources. In fact, the Brazilian imports have grown at much higher levels than the exports between 1990 and 1998, resulting in a marked commercial deficit in that period.

The decomposition of the imports and exports coefficients into factor price and factor volume has revealed a disadvantageous picture for the country. In the case of imports, most of the growth has been explained by the volume, confirming the strong increase in the volume of imports. Regarding exports, the increase in their volume seems to make a better explanation than the price factor for the increase in the value of the coefficient, but not as much as would have been wished for. Furthermore, this profile is not uniform for the economy as a whole. In the case of mining, agriculture, fish etc. and services, the price factor seems to be more relevant that the volume factor, and in manufacturing, where the increase of exports is more relevant, the relative importance of the volume factor is lower than would be desired.

Manufacturing has been the main responsible for the growth in the imports penetration, as could have been expected, considering the constrained imports demand existing in most part of the industries of that category, and the fact that a very large share of

manufacturing operated, until the beginning of the process of opening, exclusively due to the protection it had been afforded, which allowed it to drain the production into the internal market. But with phased out technology, high costs and/or insufficient quality, it became certain that the substitution for imports would occur, as soon as this became allowed. Within this frame, it was of no surprise that the sectors of electronic equipment, manufacturing and maintenance of machinery and equipment, automobiles, trucks and buses, electrical equipment, other vehicles and parts, tractors and machinery for embankment, artificial textile fibers and artificial textiles stood out. The first two represent about 20% of the Brazilian roll of imports.

In the case of exports, the pattern observed has been completely distinct. The increase in the exports coefficient has neither been that marked, nor that generalized as in the case of the imports. Furthermore, the main increases were noted in very little expressive sectors of the economy, and the most expressive sectors presented very shy increases, mainly when compared to the imports increases for these same sectors.

The economic opening was no doubt necessary and its consequences highly predictable. Nevertheless, it could have been implemented in a different manner, supported by adequate industrial and commercial policies.

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6. Attachment- Level 80 Classification

6. 1) Industries

Codes 80	description at l80
01	Agriculture and related services
02	Metal mining
03	Petroleum and gas mining
04	Non-metallic mineral industries
05	Steel industries
06	Non - ferrous metals metallurgy
07	Other metallurgic industries
08	Machinery and tractors industries
10	Electric equipment industries
11	Electronic equipment industries
12	Automobiles, trucks and buses industries
13	Motors and parts for vehicles industries
14	Wood and furniture industries
15	Pulp and paper industries
16	Rubber industries
17	Chemical
18	Refined petroleum
19	Fertilizers and others chemical industries
20	Pharmaceutical and medicine industries
21	Plastic industries
22	Textile industries
23	Clothing industries
24	Footwear industries
25	Coffee industries
26	Other vegetables processing
27	Meat and meat industries
28	Dairy products industries
29	Sugar industries
30	Vegetable oil mills
31	Other food industries
32	Misc. manufacturing
33	Electricity, gas and water supply
34	Construction
35	Wholesale and retail trade
36	Transport
37	Communications
38	Financial intermediation
39	Personal services
40	Business services
41	Real estate
42	Public administration
43	Private households with employed persons
44	Financial dummy

6. 2) Products

Codes	description
101	Coffee, raw
102	Sugar cane
103	Rice, raw
104	Wheat, unmilled
105	Soya, unmilled
106	Wool in grease
107	Corn
108	Cattle
109	Milk, unprocessed
110	Poultry
199	Other agricultural/fishing products
201	Iron ores
202	Other minerals
301	Petroleum and gas
302	Coal
401	Non-metallic products
501	Steel products (basic)
502	Rolled steel
601	Non-ferrous products
701	Other metallurgic products
801	Machinery and equipment
802	Tractors
1001	Electrical equipment
1101	Electronic equipment
1201	Automobiles, trucks and buses
1301	Other vehicles and parts
1401	Wood and furniture industries
1501	Pulp and paper
1601	Rubber products
1701	Non-petrochemical products
1702	Alcohol
1801	Motor gasoline
1802	Fuel oil
1803	Other refined products
1804	Basic petrochemical products
1805	Resins
1806	Gasoalcohol
1901	Chemical fertilizers
1902	Paints, varnishes and lacquers
1903	Other chemicals
2001	Pharmaceuticals
2101	Plastics
2201	Natural textile fibers
2202	Natural textiles
2203	Artificial textile fibers
2204	Artificial textiles
2205	Other textiles

(continued)

2301	Clothing
2401	Leather and footwear
2501	Coffee products
2601	Rice, processed
2602	Wheat flour
2603	Other food products
2701	Meat
2702	Poultry
2801	Processed milk
2802	Other dairy products
2901	Sugar
3001	Vegetable oil, raw
3002	Vegetable oil, processed
3101	Animal food
3102	Beverages
3201	Miscellaneous
3301	Electricity, gas and water supply
3401	Construction
3501	Trade margin
3601	Transport margin
3701	Communications
3801	Insurance
3802	Financial services
3901	Accommodation services
3902	Other services
3903	Education and Health, private
4001	Business services
4101	Real estate
4102	Imputed rent
4201	Public Administration
4202	Public Health
4203	Public Education
4301	Pivate households with employed persons