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# **Structural Analysis of the Formal and Informal Jobs in the Brazilian Economy**

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## **ABSTRACT**

*The reorganization of the Brazilian economy, in the globalization process, has brought out changes in its productive structure, and, consequently, changes in the job market. These changes had impact on the employment at the sectoral level, with great concerns related to the labor relations and to the growing unemployment rates. In the 1990s, the change in the focus of the development strategy, from a closed protected economy to an open economy with monetary control, has originated deep changes in the labor market. The number of employed persons in the primary and secondary sector was reduced, while in the tertiary sector there was an increase in the number of jobs, but not enough to absorb all the employees released from the previous two sectors. The share of informal jobs in the Brazilian economy was around 52% in 2003. In this way, the question of employment generated by the economic sectors, in number and quality, has become a crucial issue. The goal of this work is to study the characteristics and the evolution of the occupied persons, and to relate it with the formal and informal job market, as well as the economy productive structure, using for that input-output matrices constructed for the Brazilian economy. The main results show that there was a reduction in the capacity of the economy to generate employment for every million of Reais produced in a given sector. The data also shows that despite the ratio of informal workers in the economy being superior to the workers in the formality, the formal sector was responsible for about 60% of the jobs generated in the period of analysis.*

**KEY WORDS:** Job Market; Input-Output; Informality

## 1. INTRODUCTION

The reorganization of the Brazilian economy, in the globalization process, has brought out changes in its productive structure, and, consequently, changes in the job market. These changes had impact on the employment at the sectoral level, with great concerns related to the labor relations and to the growing unemployment rates.

According to Brasil (1998), in 1990 the reorientation of the development model, which moved from protection to the industrial sector to an open economy with monetary control, had originated deep changes in the Brazilian job market. The sectoral composition of the job market changed, with the primary and secondary sectors showing reduction in their capacity of job generation, with the tertiary sector absorbing, in part, the employees released from the other sectors (HILGEMBERG, 2003).

The last decade of the last century was negative for the job market, with an increase in the share of unemployed persons in the total labor force (LACERDA et al., (2000). According to data from the Institute of Applied Economic Research (IPEA) (2004), the annual average rate of unemployment has increased by 70% in period 1990-2002. Beyond the growth of the unemployment rate, the Brazilian economy has been faced with the problem of the informal workers. There is no consensus in the literature about the definition for informality. In this work, it is considered informal those that are considered diligent and do not possess bond with the social security and without a register in the ministry of labor.

In this context, the present work makes a structural analysis of the Brazilian job market from 1992 to 2001<sup>1</sup>, under the optics of the Input-Output analysis, and makes use of the information from the National Household survey to estimate the evolution of the formal and informal jobs in the sectors of the Brazilian economy.

## 2. METHODOLOGY

The analysis of the intersectorial structure will be carried through the application of the Input-Output approach. The input-output analysis brings information on the structure of production of the economy and the sectoral origin of the generated income (RODRIGUES; GUILHOTO, 1998). It portrays the productive relations in the economy, from the application of the model developed for Leontief. The considered model takes as reference the flows of

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<sup>1</sup> The values are presented in constant prices of 2001.

goods and services among the different economic activities, whose database must describe the relations of these activities among themselves and the final demand (FEIJÓ, et al., 2001).

In the Leontief model the intersectoral flows of goods and services can be determined by technological and economic factors from the following system of equations:

$$\mathbf{X} = \mathbf{A}\mathbf{X} + \mathbf{Y} \quad (1)$$

Where  $\mathbf{X}$  represents a vector ( $n \times 1$ ) with the value of the total production for sector,  $\mathbf{Y}$  is a vector ( $n \times 1$ ) with the values of the sectoral final demand and  $\mathbf{A}$  it is a matrix ( $n \times n$ ) with the technical coefficients of the production. The vector of total production is determined solely by the vector of final demand, considered exogenous to the system:

$$\mathbf{X} = \mathbf{L} \times \mathbf{Y} \quad (2)$$

Where  $\mathbf{L}$  is the Leontief inverse ( $\mathbf{L} = (\mathbf{I} - \mathbf{A})^{-1}$ ). The elements in the final demand vector,  $\mathbf{Y}$ , are: a) household consumption ( $\mathbf{Y}_f$ ); b) exports ( $\mathbf{Y}_e$ ); c) government expenditure ( $\mathbf{Y}_g$ ); and e) investment ( $\mathbf{Y}_k$ ).

To estimate the induced effect, that is, how much was the increase, for example, in employment, given the consumption of the newly employed, the family, the household consumption can be made endogenous into the model, so that

$$\bar{\mathbf{A}} = \begin{bmatrix} \mathbf{A} & \mathbf{H}_c \\ \mathbf{H}_r & \mathbf{0} \end{bmatrix} \quad (6)$$

where  $\bar{\mathbf{A}}$  is the new matrix of technical coefficients with size  $(n+1) \times (n+1)$ ,  $\mathbf{H}_r$  is a  $(1 \times n)$  vector with the income coefficient, and  $\mathbf{H}_c$  is an  $(n \times 1)$  vector with household consumption coefficients. Therefore, the new production and final demand vectors would be given by  $(\bar{\mathbf{X}}, (n+1) \times 1)$  and  $(\bar{\mathbf{Y}}, (n+1) \times 1)$  respectively. They would be represented as

$$\bar{\mathbf{X}} = \begin{bmatrix} \mathbf{X} \\ \mathbf{X}_{n+1} \end{bmatrix} \quad e \quad (7)$$

$$\bar{\mathbf{Y}} = \begin{bmatrix} \mathbf{Y} \\ \mathbf{Y}_{n+1} \end{bmatrix} \quad (8)$$

The Leontief system would then be represented by:

$$\bar{\mathbf{X}} = \bar{\mathbf{L}}\bar{\mathbf{Y}} \quad (9)$$

$$\bar{\mathbf{L}} = [\mathbf{I} - \bar{\mathbf{A}}]^{-1} \quad (10)$$

where  $\bar{\mathbf{L}}$  is an  $((n+1) \times (n+1))$  matrix of the Leontief inverse, taking into consideration the induced effect.

### 3. MAIN RESULTS

This section presents the main results to the Brazilian economy from 1992 to 2001.

Table 1 presents the sector participation in the value added value. The sector of Financial Institutions had a brusque fall in the total participation of the economy, passing from 28.45% in 1992 to 10.89% in the year of 1995, remaining relatively stable until 2001. In the beginning of the period it was the activity with the highest share and in the end of the period it dropped to the 9<sup>th</sup> place. This reduction can be explained by the stabilization of the currency that reduced the deriving profits originated from inflationary process.

The participation of the Public Administration represented 23% in 1995, maintaining a value around this share until the end of the studied period and corresponding to the biggest participation in 2001. The sectors Wholesale and retail trade, Food Industries in General, Civil Construction and Agriculture were the others 4 biggest participation, with 15.81%, 15.64%, 15.52%, 15.15%, respectively, in the year of 2001. The sector Petroleum and gas mining, that in the beginning of the decade of 1990 corresponded to about 1.4% of the total added value, in the period from 1995 the 1998 shows shares below 1%, in 1999 it increase its share to 1.6%), and in 2001 reached 3.01% of the participation in the economy.

From Table 2, the sectors that have showed the biggest participation in the total of jobs have been: a) Agriculture, with a falling share from 28% in 1992 to 21% in 2001; b) Wholesale and retail trade, increasing its participation from 12.55% in 1992 to 14.76% in 2001; c) Personal services, 14.1% in 2001; d) Public Administration, 10.66% in 2001; e) Private households with employed persons, 8.61% in 2001; and f) Civil Construction, 6.84% in 2001.

**Table 1 – Sector participation in the value added (%) – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	14.10	13.74	14.57	13.83	13.18	13.59	14.61	15.15
Metal Mining	1.48	1.25	1.04	0.95	0.94	0.93	1.06	1.10
Petroleum and gas mining	1.39	1.04	0.74	0.92	0.89	0.69	1.60	3.01
Nonmetallic mineral	3.11	2.98	2.59	2.36	2.48	2.48	2.50	2.46
Metallurgy / Nonferrous metal production	10.73	10.27	8.87	8.11	8.13	7.56	8.23	9.22
Industrial machinery manufacturing	4.58	4.72	3.82	3.45	3.50	3.26	3.46	4.43
Electrical equipment/ Electronic instrument	4.29	4.36	4.72	4.25	3.90	3.49	3.17	3.65
Autom/Trucks/Bus parts and other vehicles	5.58	6.20	6.47	5.97	6.29	5.19	5.02	6.31
Wood and furniture	2.04	2.25	2.07	1.96	1.87	1.70	1.91	1.84
Cellulose/Paper/Graphic	3.86	3.49	3.35	3.14	2.95	2.86	3.45	4.02
Plastics and rubber	1.31	1.33	1.12	1.00	0.97	0.86	0.99	1.14
Chemical industries	9.89	10.41	6.88	6.45	6.58	6.81	8.75	11.36
Oil Refinery	6.03	6.00	4.51	4.47	4.65	4.34	4.96	5.11
Pharmaceutical and medicine	1.92	2.12	1.71	1.65	1.84	1.96	2.10	1.86
Plastic articles	1.50	1.56	1.36	1.39	1.35	1.25	1.23	1.27
Textile industry	3.82	3.61	2.93	2.62	2.30	2.24	2.47	2.31
Clothing industries	1.88	1.81	1.56	1.43	1.22	1.18	1.22	1.85
Footwear industries	1.34	1.38	0.94	0.87	0.76	0.69	0.77	0.89
Food Industries in General	16.60	16.49	15.13	15.07	14.64	14.41	15.63	15.64
Miscellaneous manufacturing	1.36	1.45	1.16	1.06	1.04	1.04	1.11	1.28
Electricity, gas and water supply	6.82	6.59	4.86	4.86	4.94	5.67	6.19	7.30
Civil Construction	15.39	16.08	15.98	15.99	16.62	16.87	16.33	15.52
Wholesale and retail trade	15.61	16.56	14.36	13.56	13.71	13.58	14.51	15.81
Transports	8.00	8.05	7.01	6.47	6.57	6.61	7.06	7.53
Communications	2.04	2.33	1.86	2.40	2.59	3.27	4.11	5.07
Financial Institutions	28.45	36.02	10.89	9.86	9.40	9.71	9.48	9.49
Personal services	12.96	13.11	12.45	12.66	11.94	11.37	10.97	10.85
Business services	5.67	5.93	4.81	5.32	5.39	5.76	5.81	6.43
Real estate	10.91	7.49	11.03	14.51	15.53	15.58	14.88	12.62
Public Administration	20.91	21.88	24.54	22.56	22.07	23.17	23.29	23.21
Private households with employed persons	1.38	1.42	1.37	1.30	1.28	1.30	1.35	1.34

Source: Research data.

**Table 2 – Sector participation in the employment (%) – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	28.39	27.47	26.10	24.49	24.35	23.62	24.39	20.88
Metal Mining	0.40	0.40	0.34	0.27	0.28	0.30	0.27	0.27
Petroleum and gas mining	0.07	0.05	0.05	0.05	0.03	0.05	0.05	0.07
Nonmetallic mineral	0.99	1.00	0.90	0.89	0.91	0.81	0.84	0.85
Metallurgy / Nonferrous metal production	1.39	1.33	1.34	1.37	1.29	1.34	1.19	1.28
Industrial machinery manufacturing	0.61	0.49	0.60	0.64	0.67	0.54	0.54	0.68
Electrical equipment/ Electronic instrument	0.46	0.39	0.44	0.44	0.46	0.43	0.39	0.41
Autom/Trucks/Bus parts and other vehicles	0.67	0.75	0.69	0.63	0.65	0.60	0.62	0.65
Wood and furniture	1.38	1.47	1.46	1.51	1.43	1.33	1.32	1.44
Cellulose/Paper/Graphic	0.72	0.69	0.71	0.71	0.72	0.70	0.71	0.69
Plastics and rubber	0.11	0.14	0.12	0.10	0.10	0.09	0.08	0.09
Chemical industries	0.12	0.12	0.09	0.09	0.10	0.10	0.09	0.09
Oil Refinery	0.49	0.45	0.42	0.43	0.45	0.40	0.34	0.33
Pharmaceutical and medicine	0.22	0.22	0.18	0.21	0.21	0.23	0.21	0.22
Plastic articles	0.28	0.29	0.25	0.29	0.29	0.26	0.28	0.32
Textile industry	0.80	0.81	0.63	0.65	0.56	0.50	0.54	0.51
Clothing industries	2.56	2.64	2.64	2.60	2.42	2.30	2.32	2.41
Footwear industries	0.67	0.74	0.57	0.62	0.57	0.60	0.59	0.83
Food Industries in General	2.65	2.54	2.57	2.52	2.61	2.53	2.48	2.41
Miscellaneous manufacturing	0.41	0.46	0.43	0.38	0.43	0.51	0.50	0.55
Electricity, gas and water supply	0.57	0.60	0.49	0.50	0.48	0.54	0.47	0.43
Civil Construction	6.39	6.70	6.34	6.65	6.88	7.40	6.97	6.84
Wholesale and retail trade	12.55	13.14	13.50	13.78	13.70	13.87	13.92	14.76
Transports	3.17	3.16	3.33	3.39	3.57	3.61	3.49	3.69
Communications	0.40	0.37	0.42	0.46	0.51	0.46	0.51	0.60
Financial Institutions	1.46	1.46	1.27	1.25	1.23	1.13	1.12	1.16
Personal services	11.89	11.60	12.70	13.13	13.15	13.48	13.45	14.10
Business services	2.37	2.39	2.76	3.00	3.09	3.36	3.27	3.60
Real estate	0.40	0.39	0.47	0.46	0.51	0.47	0.50	0.57
Public Administration	9.98	10.14	10.09	10.31	10.06	10.30	10.34	10.66
Private households with employed persons	7.44	7.59	8.10	8.18	8.28	8.14	8.22	8.61
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Research data.

Tables 3 and 4 show the evolution of the sectors share into formal and informal jobs. The formal jobs corresponded to about 46% of the total jobs of the economy in 2001. The sector of Petroleum and gas mining shows the highest share of formal jobs in this period, while that the Agriculture sector has the highest share of informal jobs (about 90%). One notices that the sectors of Electricity, gas and water supply, Financial Institutions and the Automobiles, trucks, bus, parts and other vehicles also show a high share of forma jobs.

**Table 3 – Formal jobs share into the total employment of each sector (%) – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	9.56	9.93	9.70	11.00	10.40	9.80	10.43	10.69
Metal Mining	41.00	40.18	47.17	43.89	46.61	46.80	44.92	46.14
Petroleum and gas mining	94.10	91.13	98.42	97.14	93.44	92.96	98.45	99.03
Nonmetallic mineral	54.03	50.92	56.81	57.07	58.83	59.6	58.87	60.65
Metallurgy / Nonferrous metal production	82.40	81.57	80.36	77.82	75.44	74.77	70.52	71.14
Industrial machinery manufacturing	87.39	92.85	87.98	84.06	87.15	87.13	82.36	86.73
Electrical eq./ Electronic instrument	90.24	92.33	91.85	87.95	87.84	89.41	85.66	87.34
Autom/Trucks/Bus parts and other vehicle	93.89	95.23	94.02	95.04	91.98	92.46	92.71	92.2
Wood and furniture	49.92	47.82	48.39	48.06	47.04	47.94	49.81	53.16
Cellulose/Paper/Graphic	84.81	82.45	80.94	78.64	79.03	75.19	78.26	76.48
Plastics and rubber	89.54	91.86	94.88	92.93	83.43	84.82	85.81	87.95
Chemical industries	98.31	97.05	95.19	95.65	89.50	96.62	93.19	93.3
Oil Refinery	92.28	90.08	91.55	90.91	87.88	90.99	91.08	89.46
Pharmaceutical and medicine	90.00	89.39	86.58	86.76	85.70	89.65	85.83	86.25
Plastic articles	92.02	88.45	90.52	88.37	86.31	87.19	87.06	84.27
Textile industry	75.19	72.85	70.44	73.52	73.47	73.33	68.24	71.81
Clothing industries	35.32	33.9	34.03	34.02	34.63	32.91	34.71	34.57
Footwear industries	73.87	74.86	77.96	76.41	77.90	74.69	72.29	75.2
Food Industries in General	68.53	68.1	66.49	66.44	64.48	63.79	62.24	62.54
Miscellaneous manufacturing	52.38	55.93	65.04	62.36	56.24	50.70	49.35	46.95
Electricity, gas and water supply	97.35	95.52	94.88	95.09	95.56	94.63	94.06	92.55
Civil Construction	39.51	36.89	34.67	33.64	32.63	29.22	27.88	27.8
Wholesale and retail trade	51.59	50.14	48.99	50.22	50.11	49.48	47.6	48.49
Transports	69.84	69.43	66.15	63.76	61.23	59.57	56.64	55.33
Communications	90.93	93.06	92.34	88.28	90.49	88.98	87.53	88.52
Financial Institutions	94.48	91.98	91.83	89.67	90.13	85.97	88.34	85.72
Personal services	49.50	48.66	47.86	50.67	48.83	48.21	46.84	48.48
Business services	79.23	76.34	74.42	74.83	73.76	71.54	70.48	69.49
Real estate	65.60	63.40	65.64	61.78	64.55	64.12	62.70	60.96
Public Administration	90.64	89.35	90.06	89.69	89.35	88.19	89.18	89.03
Private households with employed persons	23.15	23.04	25.2	27.54	28.24	29.31	30.13	30.93
Total	44.95	44.51	44.54	46.00	45.33	44.72	43.93	46.06

Source: Research data.

In the majority of the sectors there seems to be an inverse relationship between total capacity to employ and the share of formal jobs, i.e., the highest the share of the sector in the total of employed persons the lowest the share of formal jobs inside the sector. For example, the Agricultural sector had a share, in 1992, of the 28.4% of the total employed persons in the economy with 90.44% of informal jobs inside the sector. The Petroleum and gas mining, which has the highest share of formal employed people shows a share of only 0.07% of the total jobs in the economy. This does not mean, however, that there is a relation of cause and effect between formality and capacity to employment.



**Table 4 – Informal jobs share into the total employment of each sector (%)  
1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	90.44	90.07	90.3	89.00	89.60	90.20	89.57	89.31
Metal Mining	59.00	59.82	52.83	56.11	53.39	53.20	55.08	53.86
Petroleum and gas mining	5.90	8.87	1.58	2.86	6.56	7.04	1.55	0.07
Nonmetallic mineral	45.97	49.08	43.19	42.93	41.17	40.4	41.13	39.35
Metallurgy / Nonferrous metal production	17.60	18.43	19.64	22.18	24.56	25.23	29.48	28.86
Industrial machinery manufacturing	12.61	7.15	12.02	15.94	12.85	12.87	17.64	13.27
Electrical eq./ Electronic instrument	9.76	7.67	8.15	12.05	12.16	10.59	14.34	12.66
Autom/Trucks/Bus parts and other vehic.	6.11	4.77	5.98	4.96	8.02	7.54	7.29	7.80
Wood and furniture	50.08	52.18	51.61	51.94	52.96	52.06	50.19	46.84
Cellulose/Paper/Graphic	15.19	17.55	19.06	21.36	20.97	24.81	21.74	23.52
Plastics and rubber	10.46	8.14	5.12	7.07	16.57	15.18	14.19	12.05
Chemical industries	1.69	2.95	4.81	4.35	10.50	3.38	6.81	6.70
Oil Refinery	7.72	9.92	8.45	9.09	12.12	9.01	8.92	10.54
Pharmaceutical and medicine	10.00	10.61	13.42	13.24	14.3	10.35	14.17	13.75
Plastic articles	7.98	11.55	9.48	11.63	13.69	12.81	12.94	15.73
Textile industry	24.81	27.15	29.56	26.48	26.53	26.67	31.76	28.19
Clothing industries	64.68	66.1	65.97	65.98	65.37	67.09	65.29	65.43
Footwear industries	26.13	25.14	22.04	23.59	22.10	25.31	27.71	24.8
Food Industries in General	31.47	31.90	33.51	33.56	35.52	36.21	37.76	37.46
Miscellaneous manufacturing	47.62	44.07	34.96	37.64	43.76	49.30	50.65	53.05
Electricity, gas and water supply	2.65	4.48	5.12	4.91	4.44	5.37	5.94	7.45
Civil Construction	60.49	63.11	65.33	66.36	67.37	70.78	72.12	72.2
Wholesale and retail trade	48.41	49.86	51.01	49.78	49.89	50.52	52.4	51.51
Transports	30.16	30.57	33.85	36.24	38.77	40.43	43.36	44.67
Communications	9.07	6.94	7.66	11.72	9.51	11.02	12.47	11.48
Financial Institutions	5.52	8.02	8.17	10.33	9.87	14.03	11.66	14.28
Personal services	50.5	51.34	52.14	49.33	51.17	51.79	53.16	51.52
Business services	20.77	23.66	25.58	25.17	26.24	28.46	29.52	30.51
Real estate	34.4	36.6	34.36	38.22	35.45	35.88	37.3	39.04
Public Administration	9.36	10.65	9.94	10.31	10.65	11.81	10.82	10.97
Private hous. with employed persons	76.85	76.96	74.8	72.46	71.76	70.69	69.87	69.07
Total	55.05	55.49	55.46	54.00	54.67	55.28	56.07	53.94

Source: Research data.

Throughout the period of analysis the informality was always superior to 54% of the total of the workers, but in recent years its participation fell about 2 percentile points, being, for the first time, a little less than 54%.

Table 5 presents the difference between the number of workers in the year of 2001 considering the number of workers in 1992 as a reference. The values of this table shows in a decreasing sequence the changes in the total number of jobs, and these changes are also separate into formal and informal workers from which it is possible to compare which of the sectors have increased, or not, its capacity to employment.

**Table 5 – The difference between the number of workers of the year of 2001 and 1992**

Sectors	Total	Formal	Informal
Wholesale and retail trade	2,071,162	773,764	1,297,398
Personal services	2,038,213	915,769	1,122,444
Private households with employed persons	1,141,183	695,699	445,484
Public Administration	956,914	756,593	200,321
Business services	913,962	498,197	415,765
Civil Construction	621,584	-270,062	891,646
Transports	496,338	1,921	494,417
Communications	152,378	129,239	23,139
Footwear industries	136,799	108,141	28,658
Real estate	132,633	69,889	62,744
Miscellaneous manufacturing	112,596	39,639	72,958
Wood and furniture	112,543	86,295	26,248
Industrial machinery manufacturing	75,543	63,125	12,418
Plastic articles	36,793	18,022	18,770
Clothing industries	31,767	-474	32,241
Autom/Trucks/Bus parts and other vehic.	21,153	12,811	8,343
Cellulose/Paper/Graphic	15,399	-23,993	39,392
Pharmaceutical and medicine	13,441	6,793	6,648
Petroleum and gas mining	6,247	8,614	-2,367
Metallurgy / Nonferrous metal production	-90	-92,891	92,802
Electrical eq./ Electronic instrument	-3,589	-10,979	7,389
Plastics and rubber	-10,794	-10,542	-252
Oil Refinery	-13,894	-16,599	2,705
Food Industries in General	-19,976	-106,581	86,606
Nonmetallic mineral	-34,296	17,932	-52,227
Electricity, gas and water supply	-57,277	-69,084	11,807
Metal Mining	-67,125	-18,685	-48,440
Chemical industries	-78,613	-78,449	-163
Financial Institutions	-120,227	-178,830	58,603
Textile industry	-144,128	-119,545	-24,583
Agriculture	-3,366,942	-170,068	-3,196,873
Total	5,169,700	3,035,659	2,134,041

Source: Research data.

The sectors Wholesale and retail trade and Personal services have been the ones responsible for the growth in the number of employees in the economy, even so most of this job have been in created in the informal sector. Such result seems to confirm that the opening of the economy, the valuation and stabilization of the national currency, and the increments in the wage have increase the potential of the household consumption, which was restrained in the past by the high inflation rates.

The sectors of Civil Construction, Clothing industries and Cellulose/paper and graphic, despite an increased the number of workers, show a fall in the number of formal workers. The sector Petroleum and gas mining is the only activity that concomitantly presents a surplus of workers and a reduction in the number of informal employees.

It is interesting to notice that although the ratio of informal workers in the total of the employees to be superior to the formal workers, the formal sector was the one responsible for about 60% of the new jobs generated in the period being considered.

Table 6 shows the share of social contributions in the compensation to employees. Given the definition of informality adopted in this work, the compensation to the employees are linked with the total number of workers (formal and informal), while the social contributions are linked only with the formal workers.

With the split of the employees into formal and informal jobs, it is possible to compare how much of the compensation to employees is related to wages and how much of it is related to the social contributions and how it has evolved through time. Some authors say that one of the main causes of the informality is the inflexibility of the social changes and for this reason like to compare the data of the informality and the weight of the social contributions in the compensation to employees. One notices that the share of social contribution has been growing in the great majority of the sectors (Table 6).

With the incorporation of the data from the PNAD (National Household Survey) to the Input-Output system it was possible, to get the total jobs generated in sector, as well as the indirect and induced impacts for the Brazilian economy as a whole and for the formal and informal jobs (Tables 7 to 18).

**Table 6 – Share of Social Contributions in the Compensation to Employees**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	7%	8%	9%	12%	13%	14%	16%	18%
Metal Mining	13%	14%	22%	25%	25%	27%	26%	28%
Petroleum and gas mining	31%	35%	34%	44%	43%	47%	55%	55%
Nonmetallic mineral	16%	15%	16%	21%	23%	24%	27%	30%
Metallurgy / Nonferrous metal production	19%	16%	17%	22%	22%	24%	25%	29%
Industrial machinery manufacturing	16%	15%	16%	22%	23%	25%	27%	31%
Electrical equipment/ Electronic instrument	15%	15%	16%	21%	23%	24%	26%	29%
Autom/Trucks/Bus parts and other vehicles	16%	17%	17%	22%	23%	25%	26%	30%
Wood and furniture	13%	12%	13%	17%	17%	20%	22%	26%
Cellulose/Paper/Graphic	15%	18%	15%	20%	21%	23%	25%	28%
Plastics and rubber	15%	15%	16%	20%	21%	23%	23%	27%
Chemical industries	29%	31%	32%	44%	43%	47%	54%	55%
Oil Refinery	15%	14%	16%	22%	23%	25%	27%	29%
Pharmaceutical and medicine	16%	16%	17%	21%	22%	23%	26%	29%
Plastic articles	17%	16%	16%	21%	23%	25%	27%	30%
Textile industry	16%	16%	16%	20%	21%	23%	25%	27%
Clothing industries	13%	13%	13%	17%	18%	20%	21%	24%
Footwear industries	15%	15%	15%	20%	21%	23%	25%	28%
Food Industries in General	16%	15%	15%	19%	20%	22%	24%	26%
Miscellaneous manufacturing	14%	14%	15%	21%	22%	23%	25%	29%
Electricity, gas and water supply	19%	20%	21%	25%	31%	33%	30%	31%
Civil Construction	14%	13%	13%	17%	18%	19%	21%	24%
Wholesale and retail trade	15%	14%	14%	17%	19%	21%	22%	25%
Transports	15%	16%	16%	20%	21%	23%	24%	27%
Communications	19%	18%	18%	24%	25%	25%	24%	30%
Financial Institutions	16%	17%	18%	21%	19%	20%	19%	20%
Personal services	14%	13%	14%	19%	20%	22%	24%	23%
Business services	16%	15%	15%	19%	21%	22%	25%	27%
Real estate	10%	9%	9%	12%	14%	17%	16%	23%
Public Administration	7%	7%	7%	8%	7%	4%	4%	4%
Private households with employed persons	7%	7%	7%	11%	11%	14%	15%	16%
Total								

Source: Research data.

Table 7 shows the total employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector. Taking out of the analysis the sector of Private households with employed persons, the sectors of Food Industries in general, Agriculture, Personal services, Clothing industries and Wood and Furniture are the one which show the highest increase in employment for a R\$ 1 million increase in the final demand of a given sector.

**Table 7 – Employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	244	224	212	208	203	195	196	167
Metal Mining	108	101	106	109	100	98	90	87
Petroleum and gas mining	75	66	82	83	77	82	70	60
Nonmetallic mineral	115	101	107	113	100	94	95	91
Metallurgy / Nonferrous metal production	138	121	125	132	120	121	110	105
Industrial machinery manufacturing	103	82	93	101	92	88	85	81
Electrical equipment/ Electronic instrument	107	89	89	93	91	91	87	82
Autom/Trucks/Bus parts and other vehicles	131	104	100	102	93	92	88	82
Wood and furniture	177	159	166	171	156	154	148	145
Cellulose/Paper/Graphic	121	108	108	114	105	104	96	87
Plastics and rubber	86	72	83	87	81	80	73	67
Chemical industries	56	41	58	63	61	60	57	50
Oil Refinery	113	224	100	104	100	97	86	81
Pharmaceutical and medicine	98	35	92	98	95	91	88	85
Plastic articles	89	72	80	87	82	79	80	76
Textile industry	118	96	101	105	98	98	98	94
Clothing industries	193	180	173	177	168	163	166	184
Footwear industries	152	137	142	148	135	141	133	139
Food Industries in General	259	240	228	226	216	206	203	187
Miscellaneous manufacturing	118	106	118	117	110	112	106	99
Electricity, gas and water supply	93	91	85	86	87	79	75	69
Civil Construction	111	98	99	103	101	99	100	96
Wholesale and retail trade	159	145	144	150	144	143	142	137
Transports	120	112	113	123	122	119	113	107
Communications	95	82	85	88	86	83	82	77
Financial Institutions	80	70	104	112	108	102	101	91
Personal services	193	180	175	177	176	178	182	177
Business services	129	115	127	130	126	127	125	118
Real estate	43	36	57	63	62	57	61	58
Public Administration	163	157	151	152	146	143	140	135
Private households with employed persons	533	527	509	532	525	512	514	497
Total								

Source: Research data.

In the generation of formal jobs (Table 8), the sectors which show the greatest values are Food Industries in general, Personal services, Public Administration, Metallurgy and Nonferrous metal production, Footwear industries, and Clothing industries.

**Table 8 – Formal employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	53	46	47	51	49	45	46	43
Metal Mining	52	48	50	52	47	46	41	41
Petroleum and gas mining	39	34	39	40	36	40	32	28
Nonmetallic mineral	58	49	52	55	49	46	46	46
Metallurgy / Nonferrous metal production	84	74	72	75	67	67	59	58
Industrial machinery manufacturing	57	45	49	53	48	45	42	43
Electrical equipment/ Electronic instrument	65	53	49	51	50	50	47	46
Autom/Trucks/Bus parts and other vehicles	79	65	57	58	51	52	49	47
Wood and furniture	78	68	69	73	65	64	63	66
Cellulose/Paper/Graphic	64	56	54	57	52	50	47	44
Plastics and rubber	43	37	39	41	37	36	33	32
Chemical industries	28	20	27	30	29	28	26	24
Oil Refinery	54	97	46	49	46	43	39	38
Pharmaceutical and medicine	51	20	45	49	46	45	42	43
Plastic articles	50	40	41	45	42	40	41	41
Textile industry	61	50	48	52	48	47	45	45
Clothing industries	84	76	71	74	69	66	67	73
Footwear industries	85	77	77	82	75	79	72	82
Food Industries in General	122	111	101	103	97	91	89	85
Miscellaneous manufacturing	59	54	59	59	54	54	50	47
Electricity, gas and water supply	49	47	41	43	42	38	35	34
Civil Construction	52	44	42	45	44	41	40	40
Wholesale and retail trade	78	70	66	71	68	67	65	65
Transports	65	60	58	63	61	59	54	53
Communications	50	43	42	44	43	41	39	40
Financial Institutions	41	36	51	55	53	49	48	45
Personal services	92	84	79	84	81	81	81	82
Business services	71	63	66	69	67	66	64	63
Real estate	20	17	25	28	28	25	26	26
Public Administration	89	85	80	82	78	76	73	73
Private households with employed persons	152	149	149	167	166	166	169	168
Total								

Source: Research data.

The same 5 sectors that are the ones responsible for the greatest number of total jobs in the economy are also the ones that show the greatest values for the increase in the informal jobs generated by an increase in the final demand (Table 9).

**Table 9 – Informal employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	191	178	165	156	155	150	150	125
Metal Mining	57	54	56	57	53	52	49	46
Petroleum and gas mining	36	32	43	43	40	43	38	31
Nonmetallic mineral	57	51	55	57	51	48	49	45
Metallurgy / Nonferrous metal production	53	47	53	57	53	54	51	46
Industrial machinery manufacturing	45	37	45	48	44	43	43	39
Electrical equipment/ Electronic instrument	42	36	39	42	41	41	40	36
Autom/Trucks/Bus parts and other vehicles	52	39	42	44	41	41	39	35
Wood and furniture	99	91	98	99	91	90	85	79
Cellulose/Paper/Graphic	57	52	55	57	53	53	49	43
Plastics and rubber	43	35	44	46	44	43	41	35
Chemical industries	28	20	31	33	33	32	31	26
Oil Refinery	60	127	54	56	54	53	47	43
Pharmaceutical and medicine	47	15	48	49	48	46	46	42
Plastic articles	39	32	39	41	40	39	39	35
Textile industry	57	45	53	52	50	52	53	49
Clothing industries	109	104	102	102	98	98	99	110
Footwear industries	67	59	64	66	60	63	61	57
Food Industries in General	137	129	127	123	119	115	115	102
Miscellaneous manufacturing	59	52	58	57	56	58	56	51
Electricity, gas and water supply	44	44	44	44	45	41	40	35
Civil Construction	59	54	56	58	57	58	59	56
Wholesale and retail trade	81	75	77	78	76	76	77	72
Transports	55	52	56	60	61	61	59	54
Communications	45	39	43	44	43	42	42	38
Financial Institutions	39	34	54	56	55	53	53	46
Personal services	102	96	96	94	95	97	101	94
Business services	58	52	61	60	60	61	60	56
Real estate	23	20	32	35	34	32	35	32
Public Administration	74	72	71	69	68	67	67	61
Private households with employed persons	381	379	359	365	358	346	345	329
Total								

Source: Research data.

In the same way, of the 5 main sectors in the generation of total employment, only the sector of Wood and Furniture does not enter in the list of the 5 activities that more generate direct employment (Table 10). The sector Wood and Furniture loses rank for the sector Wholesale and retail trade. The direct employment generated in the sector corresponds to the additional work required by the activity when it has an increase in production. The sectors of Food Industries in General, Personal Services and Wholesale and retail trade are between the 5 sectors that more generate direct formal (Table 11) and informal job (Table 12).

**Table 10 – Direct employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	140	135	116	106	106	103	102	83
Metal Mining	23	23	17	14	14	16	15	15
Petroleum and gas mining	2	2	2	1	1	1	1	1
Nonmetallic mineral	27	26	22	21	20	18	20	21
Metallurgy / Nonferrous metal production	33	30	28	28	26	28	25	25
Industrial machinery manufacturing	12	8	9	10	10	8	9	9
Electrical equipment/ Electronic instrument	21	16	13	13	14	14	15	14
Autom/Trucks/Bus parts and other vehicles	21	19	15	13	12	13	14	12
Wood and furniture	52	49	48	48	45	44	44	48
Cellulose/Paper/Graphic	13	11	11	11	11	11	11	10
Plastics and rubber	7	7	6	5	5	5	4	5
Chemical industries	1	1	1	1	1	1	0	0
Oil Refinery	13	11	10	9	9	8	7	8
Pharmaceutical and medicine	9	9	6	7	7	7	7	7
Plastic articles	15	14	11	11	11	10	12	15
Textile industry	19	20	15	16	15	14	14	13
Clothing industries	77	76	71	72	73	70	73	79
Footwear industries	42	41	36	38	37	44	42	56
Food Industries in General	90	85	74	70	73	69	69	65
Miscellaneous manufacturing	26	28	24	22	24	28	26	26
Electricity, gas and water supply	7	7	5	5	4	5	4	4
Civil Construction	29	29	26	26	25	26	26	27
Wholesale and retail trade	60	59	52	51	49	51	54	57
Transports	33	32	29	29	29	29	28	30
Communications	13	11	9	9	9	8	8	7
Financial Institutions	9	9	9	8	8	7	7	7
Personal services	71	67	67	69	69	72	74	79
Business services	33	32	32	33	33	35	34	34
Real estate	2	2	2	2	2	2	2	3
Public Administration	31	31	30	30	29	29	27	28
Private households with employed persons	401	398	387	410	408	398	400	389
Total								

Source: Research data.

The data show that the great majority of the sectors have decreased they capability of generate direct employment. The generation of direct employment, with the exception of the Private household with employed persons, is greater in the formal than in the informal market (Tables 10 to 12).



**Table 11 – Formal direct employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	13	13	11	12	11	10	11	9
Metal Mining	9	9	8	6	7	7	7	7
Petroleum and gas mining	2	2	2	1	1	1	1	1
Nonmetallic mineral	14	13	12	12	12	11	12	13
Metallurgy / Nonferrous metal production	27	24	23	22	20	21	17	18
Industrial machinery manufacturing	10	8	8	8	9	7	7	8
Electrical equipment/ Electronic instrument	19	15	12	11	12	13	13	12
Autom/Trucks/Bus parts and other vehicles	19	18	14	12	11	12	13	11
Wood and furniture	26	24	23	23	21	21	22	25
Cellulose/Paper/Graphic	11	9	9	9	9	8	8	8
Plastics and rubber	6	7	6	5	4	4	4	4
Chemical industries	1	1	1	0	0	1	0	0
Oil Refinery	12	10	9	8	8	8	7	7
Pharmaceutical and medicine	8	8	5	7	6	7	6	6
Plastic articles	14	13	10	10	9	9	10	13
Textile industry	15	14	11	12	11	10	10	10
Clothing industries	27	26	24	25	25	23	25	27
Footwear industries	31	31	28	29	29	33	30	42
Food Industries in General	62	58	49	47	47	44	43	41
Miscellaneous manufacturing	14	16	16	14	13	14	13	12
Electricity, gas and water supply	7	7	5	5	4	5	3	3
Civil Construction	11	11	9	9	8	8	7	7
Wholesale and retail trade	31	30	25	26	25	25	26	27
Transports	23	22	19	19	18	17	16	16
Communications	12	10	8	8	8	7	7	7
Financial Institutions	8	8	8	7	7	6	6	6
Personal services	35	33	32	35	34	34	35	38
Business services	26	24	24	25	24	25	24	24
Real estate	1	1	2	1	2	1	2	2
Public Administration	28	28	27	27	26	26	24	25
Private households with employed persons	93	92	97	113	115	117	121	120
Total								

Source: Research data.

**Table 12 – Informal direct employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	127	122	105	94	95	93	91	75
Metal Mining	14	14	9	8	8	8	8	8
Petroleum and gas mining	0	0	0	0	0	0	0	0
Nonmetallic mineral	12	13	9	9	8	7	8	8
Metallurgy / Nonferrous metal production	6	6	6	6	6	7	7	7
Industrial machinery manufacturing	2	1	1	2	1	1	2	1
Electrical equipment/ Electronic instrument	2	1	1	2	2	2	2	2
Autom/Trucks/Bus parts and other vehicles	1	1	1	1	1	1	1	1
Wood and furniture	26	26	25	25	24	23	22	22
Cellulose/Paper/Graphic	2	2	2	2	2	3	2	2
Plastics and rubber	1	1	0	0	1	1	1	1
Chemical industries	0	0	0	0	0	0	0	0
Oil Refinery	1	1	1	1	1	1	1	1
Pharmaceutical and medicine	1	1	1	1	1	1	1	1
Plastic articles	1	2	1	1	2	1	2	2
Textile industry	5	5	4	4	4	4	5	4
Clothing industries	50	50	47	48	48	47	48	52
Footwear industries	11	10	8	9	8	11	12	14
Food Industries in General	28	27	25	24	26	25	26	24
Miscellaneous manufacturing	12	12	9	8	10	14	13	14
Electricity, gas and water supply	0	0	0	0	0	0	0	0
Civil Construction	17	18	17	17	17	19	19	19
Wholesale and retail trade	29	29	27	26	25	26	28	29
Transports	10	10	10	11	11	12	12	13
Communications	1	1	1	1	1	1	1	1
Financial Institutions	0	1	1	1	1	1	1	1
Personal services	36	35	35	34	35	37	39	41
Business services	7	8	8	8	9	10	10	10
Real estate	1	1	1	1	1	1	1	1
Public Administration	3	3	3	3	3	3	3	3
Private households with employed persons	308	306	289	297	293	281	280	268
Total								

Source: Research data.

The indirect jobs generated by an increase in the final demand of a given sector are presented in Tables 13 to 15.

The results indicate that the sectors of Food Industries, Wood and Furniture, Agriculture, Oil Refinery and Metallurgy/Nonferrous metal production are the ones that more generate jobs indirectly for each R\$ 1 million of production.

**Table 13 – Indirect employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	49	43	35	35	33	32	33	29
Metal Mining	21	21	20	21	18	19	16	16
Petroleum and gas mining	17	16	16	14	13	19	9	6
Nonmetallic mineral	27	23	21	22	18	17	18	18
Metallurgy / Nonferrous metal production	43	38	35	35	32	34	31	30
Industrial machinery manufacturing	25	20	19	19	16	17	15	15
Electrical equipment/ Electronic instrument	29	25	21	21	21	21	21	21
Autom/Trucks/Bus parts and other vehicles	37	31	26	26	23	24	23	24
Wood and furniture	55	48	46	46	41	41	38	35
Cellulose/Paper/Graphic	35	32	27	28	26	27	24	21
Plastics and rubber	26	22	22	23	21	22	21	18
Chemical industries	13	8	9	10	10	10	9	8
Oil Refinery	45	94	33	33	32	33	26	26
Pharmaceutical and medicine	33	10	26	26	25	24	24	25
Plastic articles	16	11	11	11	11	11	11	11
Textile industry	40	31	30	30	29	31	33	34
Clothing industries	35	30	26	27	23	24	25	43
Footwear industries	43	40	39	37	32	33	30	28
Food Industries in General	109	104	92	88	81	78	77	69
Miscellaneous manufacturing	25	21	22	21	19	20	20	19
Electricity, gas and water supply	16	11	7	7	7	7	7	8
Civil Construction	24	20	16	15	15	15	15	16
Wholesale and retail trade	14	12	10	12	12	12	12	12
Transports	15	14	13	15	15	15	16	16
Communications	9	9	6	7	7	7	7	13
Financial Institutions	4	4	9	11	11	12	12	10
Personal services	35	34	27	25	25	26	28	26
Business services	10	10	10	9	9	9	10	10
Real estate	3	4	2	2	1	1	2	2
Public Administration	18	19	17	15	15	15	15	14
Private households with employed persons	7	7	5	5	5	4	4	4
Total								

Source: Research data.

The 5 sectors that more generate formal indirect jobs for each R\$ 1 million of production (Table 14) are Food Industries in General, Metallurgy / Nonferrous metal production, Automobiles/Trucks/Bus and other vehicles, Footwear industries, Wood and Furniture.

**Tabela 14 – Formal indirect employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	15	13	10	10	10	9	10	9
Metal Mining	13	13	12	13	11	11	9	9
Petroleum and gas mining	11	11	10	9	8	12	6	4
Nonmetallic mineral	16	14	12	12	10	10	10	10
Metallurgy / Nonferrous metal production	29	26	23	23	20	21	18	19
Industrial machinery manufacturing	18	14	13	13	11	11	9	9
Electrical equipment/ Electronic instrument	20	17	14	14	13	14	13	13
Autom/Trucks/Bus parts and other vehicles	27	23	19	18	15	16	14	15
Wood and furniture	21	17	15	16	13	13	13	13
Cellulose/Paper/Graphic	20	18	15	15	14	14	13	11
Plastics and rubber	13	11	10	10	9	9	9	8
Chemical industries	9	5	6	6	6	6	5	5
Oil Refinery	17	35	13	13	12	12	10	10
Pharmaceutical and medicine	18	5	14	14	13	13	13	13
Plastic articles	10	7	7	7	6	7	7	6
Textile industry	20	16	14	14	13	14	14	15
Clothing industries	20	18	14	15	13	13	13	19
Footwear industries	24	22	21	21	18	18	16	16
Food Industries in General	33	31	26	26	23	21	22	21
Miscellaneous manufacturing	16	13	13	13	12	12	12	11
Electricity, gas and water supply	11	8	5	5	5	5	4	5
Civil Construction	15	12	9	9	9	9	9	9
Wholesale and retail trade	9	8	6	7	7	7	7	7
Transports	10	9	8	9	9	9	9	9
Communications	6	6	4	4	4	5	4	8
Financial Institutions	3	2	6	7	7	7	7	6
Personal services	18	17	13	12	12	12	13	12
Business services	7	6	6	6	6	6	6	6
Real estate	1	2	1	1	1	1	1	1
Public Administration	10	10	9	8	8	8	7	7
Private households with employed persons	3	3	2	2	2	2	2	2
Total								

Source: Research data.

The sectors Clothing industries, Agriculture, Food Industries in general, Wood and furniture and Personal services are the main sector in terms of generating the greatest values of informal indirect employment (Table 15). The textile Industry and the Oil Refinery occupy the fifth and sixth position in the generation of informal indirect jobs, despite the fact that they are not among the activities that have the highest coefficients of direct informal job.

**Table 15 – Informal indirect employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	34	31	25	25	23	23	24	20
Metal Mining	8	7	8	8	7	8	7	6
Petroleum and gas mining	5	5	5	5	4	7	4	2
Nonmetallic mineral	11	10	9	9	8	8	8	8
Metallurgy / Nonferrous metal production	14	12	12	13	12	13	13	12
Industrial machinery manufacturing	8	6	6	6	6	6	6	6
Electrical equipment/ Electronic instrument	9	7	7	7	7	8	8	8
Autom/Trucks/Bus parts and other vehicles	10	8	8	8	8	8	8	9
Wood and furniture	34	31	31	31	27	27	25	22
Cellulose/Paper/Graphic	15	13	13	13	12	13	11	10
Plastics and rubber	13	11	12	12	12	13	12	10
Chemical industries	5	3	3	4	4	4	4	3
Oil Refinery	28	59	21	21	20	21	16	16
Pharmaceutical and medicine	15	4	13	12	12	12	12	12
Plastic articles	6	4	4	4	4	4	5	4
Textile industry	20	15	17	16	16	18	20	19
Clothing industries	14	12	12	11	10	11	12	25
Footwear industries	19	18	18	16	14	15	14	12
Food Industries in General	76	74	66	62	58	57	55	48
Miscellaneous manufacturing	9	8	9	8	7	8	8	8
Electricity, gas and water supply	5	3	2	2	2	2	2	3
Civil Construction	9	8	7	6	6	6	7	7
Wholesale and retail trade	5	4	4	5	5	5	5	5
Transports	6	5	5	6	6	6	7	7
Communications	3	3	2	2	3	3	3	5
Financial Institutions	2	1	3	4	4	5	5	4
Personal services	18	18	15	13	14	14	15	14
Business services	4	4	3	3	3	3	4	4
Real estate	1	2	1	1	1	1	1	1
Public Administration	8	9	8	7	7	7	7	7
Private households with employed persons	4	4	3	3	2	2	2	2
Total								

Source: Research data.

Finally, with the proposed methodology it is possible to estimate the induced employment (Tables 16 to 18), also known as the income effect, i.e., it measures the impact on employment given by the expenditures of the newly employed persons.

The results for the total induced jobs (Table 16) as well as the ones for the formal induced (Table 17) and informal induced jobs (Table 18) show the same 5 sectors as being the most important ones: a) Public administration; b) Personal services; c) Business services; d) Wholesale and retail trade; and e) Clothing industries.

**Table 16 – Induced employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	54	45	61	67	65	59	61	55
Metal Mining	64	58	68	74	67	64	59	57
Petroleum and gas mining	56	48	65	68	63	62	59	52
Nonmetallic mineral	61	52	64	70	62	58	58	52
Metallurgy / Nonferrous metal production	61	53	62	68	62	59	54	49
Industrial machinery manufacturing	65	53	65	72	66	63	61	57
Electrical equipment/ Electronic instrument	57	48	55	59	57	55	51	47
Autom/Trucks/Bus parts and other vehicles	74	53	59	63	57	55	51	46
Wood and furniture	71	61	72	77	71	69	66	62
Cellulose/Paper/Graphic	73	65	70	75	69	67	61	55
Plastics and rubber	53	42	54	59	55	52	48	45
Chemical industries	42	32	48	53	51	49	47	42
Oil Refinery	56	119	57	62	59	56	53	48
Pharmaceutical and medicine	56	17	60	64	63	60	57	53
Plastic articles	58	47	58	64	60	58	57	50
Textile industry	58	45	55	58	55	53	50	46
Clothing industries	81	73	75	78	72	69	67	61
Footwear industries	67	56	67	72	67	64	61	55
Food Industries in General	60	51	62	67	63	59	58	53
Miscellaneous manufacturing	67	57	71	74	68	64	60	53
Electricity, gas and water supply	70	73	73	75	75	67	64	57
Civil Construction	59	49	57	62	61	58	58	53
Wholesale and retail trade	85	74	81	86	82	80	76	68
Transports	72	66	71	79	78	76	69	62
Communications	73	62	71	73	70	67	67	56
Financial Institutions	67	57	86	93	89	83	82	73
Personal services	87	78	80	83	82	81	80	72
Business services	86	73	86	87	85	83	80	74
Real estate	38	30	52	59	58	53	57	53
Public Administration	114	107	104	107	103	99	99	93
Private households with employed persons	125	122	117	117	112	110	110	104
Total								

Source: Research data.

**Table 17 – Formal induced employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	24	20	26	29	28	25	26	24
Metal Mining	29	25	29	33	29	27	25	25
Petroleum and gas mining	25	21	27	30	27	27	25	23
Nonmetallic mineral	27	23	27	31	27	25	24	23
Metallurgy / Nonferrous metal production	28	23	26	30	27	25	23	22
Industrial machinery manufacturing	29	23	28	32	29	27	26	25
Electrical equipment/ Electronic instrument	25	21	23	26	25	24	22	21
Autom/Trucks/Bus parts and other vehicles	33	23	25	28	25	23	22	20
Wood and furniture	32	27	30	34	31	30	28	27
Cellulose/Paper/Graphic	33	28	30	33	30	29	26	24
Plastics and rubber	24	18	23	26	24	22	20	20
Chemical industries	19	14	20	23	22	21	20	19
Oil Refinery	25	52	24	27	26	24	22	21
Pharmaceutical and medicine	25	7	26	29	28	26	24	23
Plastic articles	26	21	25	29	26	25	24	22
Textile industry	26	20	24	26	24	23	21	21
Clothing industries	36	32	32	34	31	30	29	27
Footwear industries	30	25	29	32	29	28	26	24
Food Industries in General	27	22	26	30	27	25	24	23
Miscellaneous manufacturing	30	25	30	33	29	27	25	24
Electricity, gas and water supply	31	32	31	33	33	29	27	25
Civil Construction	26	21	24	28	27	25	24	23
Wholesale and retail trade	38	33	34	38	36	34	32	30
Transports	32	29	30	35	34	32	29	27
Communications	33	27	30	32	30	29	28	25
Financial Institutions	30	25	37	41	39	35	35	32
Personal services	39	34	34	37	36	35	34	32
Business services	38	32	36	39	37	36	34	33
Real estate	17	13	22	26	25	23	24	23
Public Administration	51	47	44	47	45	43	42	41
Private households with employed persons	56	54	50	52	49	47	46	46
Total								

Source: Research data.

**Table 18 – Informal induced employment generated by and increase of R\$ 1 million (2001 constant prices) in the final demand of a given sector – 1992 to 2001**

Sectors	1992	1993	1995	1996	1997	1998	1999	2001
Agriculture	30	25	35	37	36	34	35	31
Metal Mining	35	32	39	41	38	36	34	32
Petroleum and gas mining	31	27	37	38	36	36	34	29
Nonmetallic mineral	34	29	37	39	35	33	33	29
Metallurgy / Nonferrous metal production	34	30	36	38	35	34	31	27
Industrial machinery manufacturing	36	30	38	40	37	36	35	32
Electrical equipment/ Electronic instrument	31	27	32	33	32	31	30	26
Autom/Trucks/Bus parts and other vehicles	41	30	34	35	32	31	29	25
Wood and furniture	39	34	41	43	40	39	38	34
Cellulose/Paper/Graphic	40	36	40	42	39	38	35	31
Plastics and rubber	29	24	31	33	31	30	28	25
Chemical industries	23	18	28	29	29	28	27	23
Oil Refinery	31	67	33	34	33	32	30	27
Pharmaceutical and medicine	31	9	35	36	36	34	33	29
Plastic articles	32	26	34	36	34	33	33	28
Textile industry	32	25	32	32	31	30	29	26
Clothing industries	45	41	43	43	40	40	39	34
Footwear industries	37	31	39	40	38	37	35	31
Food Industries in General	33	28	36	38	35	34	33	29
Miscellaneous manufacturing	37	32	41	41	38	37	35	30
Electricity, gas and water supply	39	41	42	42	42	38	37	32
Civil Construction	32	27	33	35	35	33	33	30
Wholesale and retail trade	47	42	47	48	47	46	44	38
Transports	40	37	41	44	44	43	40	34
Communications	41	35	41	41	39	38	39	31
Financial Institutions	37	32	50	52	50	47	47	41
Personal services	48	44	46	46	46	46	46	40
Business services	47	41	49	49	48	47	46	41
Real estate	21	17	30	33	33	30	33	29
Public Administration	63	60	60	60	58	57	57	52
Private households with employed persons	69	69	67	65	63	63	63	58
Total								

Source: Research data.

## 5. FINAL CONSIDERATIONS

From the above, one has that the total number of employees in the economy, from 1992 to 2001, had grown by about 5 million. The sectors that have the greatest growth in the number of people employed were: a) Wholesale and retail trade; b) Personal Services; and c) Public Administration. The increase in the rate of unemployment found in the period analyzed shows that the economy has been incapable to absorb the population that enters every year in the work force.



The Agriculture, Textile Industry and Financial Institutions had decreased significantly their capacity to generate jobs, which was mainly due by the adjustments in their productive process as well as for changes in the economic environment. The Financial Institutions had an brusque fall in the share of its value added between the years 1993 and 1995, what can be explained by the impact that the Real Plan had in the inflationary process.

The share of the Agriculture in the total employment is the highest, followed by the sectors of Wholesale and retail trade, Services, Public Administration and Civil Construction. As it was observed above, despite the highest share of the Agriculture sector, it is a sector which has been showing a decrease in the number of people linked with its activity and at the same time it has a high share of informal jobs.

The share of the informal jobs throughout this period was superior to 50%, confirming the importance of the problem in the Brazilian economy. Of the newly 5 million generated jobs, about 3 million are related the employment created in the formal market job. As so, although the informality represents 50% of the total workers, the formal sector seems to be gaining force in the capacity to generate jobs. A possible explanation for this fact would be the increase of the enforcement of the labor laws and the new forms of act of contract, facilitating the formal act of contract of temporary workers.

The analyzed databases of the National Account Systems, the National Household Survey, and the input-output system, come to confirm the reduction in the capability of Brazilian sectors to generate employment in the decade of 1990, mainly due to changes in the productive structure which were related to changes in the national economic environment and in the continuous process of globalization.

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