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Federal Government of Brazil

Secretariat of Strategic Affairs of the Presidency of the Republic
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EMPLOYMENT STRUCTURE IN BRAZIL AND ITS SENSITIVITY TO THE CURRENT ECONOMIC POLICY*

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1. INTRODUCTION

There is a well established trend towards liberalization and reduction of the role of the government in the economy in developing countries, especially those of Latin America. In addressing the adversities of current account deficits and of rising inflationary pressures on the domestic front, many of these countries have been resorting to more orthodox kinds of adjustment, after a number of heterodox economic policies have failed.

Brazil is no exception to this picture. For a long period of time, the country has followed a development model drawing upon the imports substitution, protectionism and heavy intervention of the government in the economy. Now, the new government intends to break this tradition, and call upon economic orthodoxy in an economic plan where the removal of barriers to international trade, the adoption of a more liberal industrial policy, and the privatization of several state enterprises are the basic underpinnings.

This paper investigates the potential effects of this change of orientation on the structure of employment. Its main purpose is not to evaluate the overall impact of these policy changes on the level of employment, but instead to predict which categories of workers would benefit or be hurt the most by this "new" set of macroeconomic policies.

The firs t section contains a succinct evaluation of the potential effects of these orthodox economic policies on the structure of employment and labor absorption at a theoretical and generic level. Section 2 briefly describes the data and the concepts used in this study. In Section 3 a closer look is taken at the sectoral structure of employment. Next, in Section 4, we investigate how the sectoral structure of employment varies across different categories of workers. The analysis in this section will permit one to predict the impacts of the trade liberalization and the reduction in public employment on different categories of labor. Workers are going to be grouped according to their education level, age, gender, region of residence, and type of labor contract. In Section 5 we investigate the temporal evolution from 1981 to 1989 of the sectoral structure of employment and the distribution of workers according to their type of labor contract. Finally, Section 6 summarizes the main findings.

2. THE IMPACT OF ECONOMIC POLICIES ON EMPLOYMENT: SOME GENERAL CONSIDERATIONS

The optimality of free trade is in the core of the literature on trade policies and development economics. Under some hypotheses it can be shown that a country's welfare maximizing policy grows out of a *laissez-faire* regime, and the Heckscher-Ohlin model proposes

that patterns of trade between countries should be dictated by factor endowments.

These ideas were dominant in the fifties, and an immediate interpretation would suggest that developing countries should keep producing primary commodities and importing industrialized goods. Such a viewpoint promptly raised the objection of economists and policy makers in developing countries and led to the development of a series of *rationales* for the adoption of protectionist practices.

One of the best articulated arguments for intervention is the infant industry approach. It assumes the existence of externalities and dynamic effects, and contends that although not initially efficient, some industries could become competitive in the international markets if adequately protected for some interval of time. In spite of heavy criticism, the spirit of this conception, coupled with the idea of deteriorating terms of trade, formed the basis of the imports substitution strategy. This strategy had a complex scheme of direct and indirect barriers to free trade which contrasted markedly with the "getting the prices right" philosophy of the exports promotion school.

In the context of developing countries labor tends to be the factor of production that is hurt the most by the practice of protectionism, since the production of imports substitutes is usually less labor intensive than the production of exports. Therefore, a reduction in tariffs and other barriers to trade should lead to a higher demand for labor. Moreover, as labor is not homogeneous and unskilled labor is a much more abundant factor in developing economies, the move from an imports substitution orientation to exports promotion should promote a change in the structure of employment, with a relative increase in the demand for unskilled labor.

The effects of such an increase will depend on the elasticities of labor supply. If labor supply is perfectly elastic at the ongoing wage, then liberalization will produce just an increase in labor absorption (or in its composition according to skills). If it is not the case of perfect elasticity, higher absorption and higher wages will be the outcomes (or, for heterogeneous labor, a change in the labor structure coupled with a reduction in the wage differentials). In the case of full employment, the main result will be an income redistribution in favor of labor (unskilled labor).

The shift away from trade barriers and imports substitution is also likely to lead to changes in the regional pattern of employment. Two reasons can explain such changes: (i) the removal of protection will induce the reallocation of labor from highly industrialized regions to less industrialized ones; and (ii) less emphasis on imports substitution will reduce the "penalty" on the

agricultural sector, inducing a flow of labor from the urban to rural areas, thus helping to reduce the metropolitan unemployment burden and to ameliorate poverty.

There are some good reasons supporting the direct participation of the government in some economic activities. First, economic development requires an infrastructure adequate enough in order to make investment in production expansion feasible and attractive. Such investment can be extremely risky and associated with positive externalities which are difficult to internalize. Under-investment by the private sector is not unlikely. It is then necessary to have the government calling upon itself the responsibility for the provision of appropriate infrastructure.

Second, from a social standpoint it seems desirable to have the government being capable of actively smoothing the reflexes of the business cycle on employment. Especially for the more vulnerable (i.e., the less skilled) groups, labor absorption should be expanded during down swings and contracted during periods of overheating.

It is important, however, to distinguish between the areas of intervention. On the one hand, there are the so-called traditional activities, such as satisfaction of basic needs, infrastructure and security. These areas are often characterized as having large externalities that drive a sizable wedge between social and private returns. The government seems to be the most indicated institution to respond for the implementation and maintenance of such activities. On the other, one finds sectors, such as the steel, chemical and oil industries, mineral extraction, and others, where there is no clear economic advantage of government intervention. Activities of this latter kind tend to be more skills intensive than the traditional ones, and they are more often situated in metropolitan areas. As they grow in importance, so does the bias favoring highly skilled workers in big centers. Thus, a movement away from interventionism in those sectors should favor non-skilled labor, as well as improving the regional distribution of employment.

Moreover, as the government embraces more and more duties, it may become progressively harder to efficiently manage the resources involved. Increasing budget deficits are a likely outcome of the process, inducing generalized cuts in government expenditures, usually evenly spread among all activities. Again, the reduction of intervention in non-traditional areas should change the structure of employment in favor of less skilled workers.

3. SOURCES OF INFORMATION ON THE STRUCTURE OF EMPLOYMENT IN BRAZIL

There are essentially two sources of information that allow an investigation of the structure of employment in Brazil. One of them is the "**Relação Anual de Informações Sociais-RAIS**". The **RAIS**,

available since 1976, is an official register of the employment in the so-called formal segment of the labor market, which represents approximately 50% of the Brazilian urban labor force [Ministério do Trabalho (1987,p.9)]. The **RAIS** is not a sample, but instead a "complete" enumeration of all workers in the formal sector. The attempt to reach a complete enumeration minimizes sampling errors, but the non-statistical treatment does not allow an evaluation of potential sources of error due to incomplete coverage. For the present exercise, however, the main limitation of this data set is its the lack of coverage of the rural sector and the informal urban sector. This limitation makes a meaningful addressment of the effects of macro policies on the structure of employment impossible.

The second source of information is the set of household surveys that have been continuously collected by the Brazilian Census Bureau-IBGE. This set has three components: the decennial population censuses, the annual national household surveys (Pesquisa Nacional por Amostra de Domicílios-PNAD), and the monthly employment survey (Pesquisa Mensal de Emprego-PME). The first provides the largest sample (25% of the Brazilian households are interviewed) and the best geographical coverage -it covers all urban and rural areas, but was last conducted in 1980. The PNAD, which is conveniently available on a yearly basis, is a much smaller sample (0.2%) and does not cover the rural areas of the Brazilian Northern Region. Although its sample size is smaller than the census, it is still more than sufficient for the purposes here (0.2% of the Brazilian population corresponds to approximately 50,000 households). Finally, the PME has the disadvantage of covering only the seven largest Brazilian metropolitan areas.

In light of these facts the PNAD was chosen the most appropriated and updated source of information on the overall structure of employment in Brazil. This paper is mainly based on its 1988 edition, but it also uses the PNAD for other years to trace the temporal evolution of the structure of employment in Brazil during the 1980s.

The 1988 PNAD interviewed approximately 300,000 individuals (Table1). Out of this total, approximately 64% are over 15 years old. Among them 39% are either out of the labor force or unemployed. The final sample, formed of all individuals 15 or more years old who are working, has 116,419 observations.

Table 1
Sampling Screening

Screening	Sample Size	Sample Reduction (%)
All Individuals	298,368	----
Aged 15 or more	190,900	36.0
Working	116,419	39.0

4. SECTORAL DISAGGREGATION

The PNAD permits a sectoral disaggregation in up to approximately 150 sectors. However, we found it more convenient to work with a disaggregation of the economy into only 36 sectors. The reasons are twofold: (i) no information concerning effective rates of protection or degree of government intervention is available for more disaggregated levels, and (ii) a further disaggregation is not crucial to the goals of this paper.

The 36 sectors in which we divided the economy roughly correspond to the classification used in the Input/Output matrix produced by IBGE:[1] Agriculture, Mineral Extraction (Fuel and Non-Fuel), 21 Manufacturing sectors, Construction, Trade, Transportation (Railroad and Others), Storage, Credit and Insurance, Services (Public, Private, an Mixed), Public Administration, Defense, and Others.

In 1988 the Brazilian labor force was made of more than 55 million workers. Table 2 presents the distribution of them throughout these 36 sectors of the economy. One can see that 1/4 of the total employment in Brazil is located in Primary activities (23% in Agriculture and 1% in Mineral Extraction). Employment in the Secondary activities also accounts for 1/4 of total employment (16% in Manufacturing and 7% in Construction). The remaining 1/2 of total employment is located in Tertiary activities (Trade (12%), Services (30%), Transportation (4%), Credit and Insurance (2%), and Public Administration and Defense (5%)). The current structure of employment is radically different from the one prevailing 50 years ago. In 1940, 2/3 of the total employment was located in Primary activities, 10% in the Secondary sector and 1/4 in the Tertiary [Almeida (1974, Table III.6)]. In other words, in between 1940 and 1988, Secondary and Tertiary activities doubled

[1] The exact way the PNAD sectors were aggregated into these 36 sectors, as well as a brief description of each of them, can be found in Appendix.

their share of employment while Primary activities had their share more than halved.

Employment in Manufacturing is quite spread out among its 21 sectors. Only three of them employ more than 10% of the total manufacturing labor force: Food, Metal Products, and Clothing and Footwear. The Brazilian structure of employment within manufacturing is remarkably stable over time. Compared to the structure in 1959 [Carvalho and Haddad (1980, Table A.10)], only five sectors exhibit considerable relative change: Clothing and Footwear, Plastics, and Furniture, all of them experienced large increases in their shares, whereas Leather and Textiles experienced considerable relative declines. In any case the rank correlation of the sectoral shares in 1959 and 1988 is quite high, 0.96.[2]

One half of the employment in Tertiary activities is in Services, 1/4 in Trade, and the remaining 1/4 is divided between Public Administration and Defense (10%), Transportation (7%), and Credit and Insurance (4%). The Employment in Public Administration is three times that in Defense. The already mentioned sizable increase in the employment share of Tertiary activities during the past 50 year has produced significant changes in their internal composition. Services, Trade, and Public Administration and Defense have doubled their share in the overall economy, thus keeping constant their share in the Tertiary sector. Credit and Insurance had a big increase, and their share in the economy went up from 0.4% to 2.2%. Finally, Transportation kept its share in the economy as a whole, therefore loosing ground in the Tertiary sector.

4.1. Aggregating by Degree of Protection

To study the effects of changes in the Brazilian trade policy on employment, the previous 36 sectors were grouped into 4 segments.

The first group consists of the Non-Tradeables, and it is constituted by all sectors in Construction, Trade, Transportation and Storage, Credit and Insurance, Services, and Public Administration and Defense. The three remaining segments belong to the Tradeable part of the economy, which encompasses Agriculture, Mineral Extraction (Fuel and Non-Fuel), and 21 Manufacturing sectors. The categorization of these 24 Tradeable sectors into three segments was based on their effective rate of protection as

[2]Also the rank correlation between our estimated sectoral employment shares for 1988 and the shares estimated by Suzigan et alli (1974, Table II.25) for 1966 is very high, 0.96.

estimated by Braga, Santiago, and Ferro (1988).[3] Such estimates are reported in Table 3.

Agriculture and Mineral Extraction are both negatively protected, and, therefore, were put together in a group that is going to be referred to as the Primary segment. Note that Tobacco is also strongly negatively protected. However, since this is a very small sector, it was left with all other Manufacturing sectors which have rates of protection lower than 25%. This set of sectors, constituted of Non-Metallic Products, Machinery, Transportation Equipment, Beverage, Tobacco, and Printing and Publishing,[4] was denominated Unprotected. The remaining 15 Manufacturing sectors form the Protected segment of the economy.

Table 4 illustrates this division of sectors according to their degree of protection, and gives the distribution of employment across the four segments. It shows that, although the Brazilian economy is considered to be strongly protected, only 12% of all employment is related to Protected sectors. All of them are located in Manufacturing, and represent approximately 3/4 of all employment in this segment. Pharmaceuticals, Plastics, Textiles and Clothing and Footwear, which together account for 3.4% of total employment, are heavily protected, displaying ERPs over 100% (and even over 200% in the case of Clothing and Footwear).

One fourth of Manufacturing is classified as Unprotected and responds for 3.9% of total employment, while the negatively protected sectors, the Primary segment of the economy, is responsible for 24% of the overall employment. Almost 60% of the Brazilian labor force is allocated in Non-Tradeable activities, mainly Services, Trade, and Construction.

In summary, only a small fraction of the Brazilian economy appears to be favored by mechanisms of protection against foreign competition. However, a liberalization in the orientation of the trade policy is likely to affect most of the Manufacturing sector, since protection is quite widespread in the sector, particularly in a few specific areas.

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[3] Their estimates refer to the trade policy adopted in 1985, use the Corden's concept of effective rate of protection, and are based on the information contained in the IBGE Input/Output matrix for 1975.

[4] By construction all sectors in this group have protection rates lower than *25%*, but, as a matter of fact, the highest rate of protection in the group is only *10.3%*.

4.2. Aggregating by Degree of Government Intervention

To investigate the effects of changes in the Brazilian policy on public employment it is useful to group the economy into 3 segments based on the extent of government intervention. In each sector this extent was estimated using the methodology proposed by Werneck (1980, 1982), which consists of approximating the degree of intervention in each sector by the average of the government share of the sector's total revenues and the government share of the sector's total net assets. The estimates presented in Table 5 refer to the level of government intervention that prevailed in 1985 and were obtained using the information contained in Visão (1986).

Table 5 presents the degree of government intervention in each of the 35 of the 36 sectors previously considered (we are disregarding the residual sector - Others). In 23 sectors this degree of intervention is less than 5%, and these sectors are grouped together in a segment called No Government Intervention. The remaining 12 sectors are separated in two groups. One group includes activities which often are the traditional business of governments - Public Services, Public Administration, and Defense. This segment is referred to as Government. The other 9 sectors, in which the government intervenes mainly through the State Enterprises, form a segment called Extensive Government Intervention. These sectors, with their respective degrees of intervention, are: Non-Fuel Extraction (55%), Fuel Extraction (99%), Metallic Products (43%), Chemicals and Petroleum Products (53%), Rail Transportation (100%), Non-Rail Transportation (71%), Storage (26%), Credit and Insurance (51%), and Mixed (partially public and partially private) Services (18%). Except for Storage and Mixed Services, all other sectors in this group have degrees of government intervention approaching or exceeding 50%.

Table 6 gives the distribution of employment across the three segments. It is shown that close to 80% of the labor force is employed in sectors without any government intervention. The sectors run by the government employ 55% of the remaining workers; the other 45% finding employment in sectors with approximately 50% of government intervention (Extensive Government Intervention). Thus, a rough estimate of the direct public employment in Brazil is 17% of the total employment in the economy.

In State Enterprises run activities, the largest employers are Transportation and Storage (3.8% of total employment) and a reduced part of Manufacturing (2.6% of the total).

5. SECTORAL STRUCTURE OF EMPLOYMENT OF CATEGORY OF LABOR

This section considers how the structure of employment differs across categories of labor constructed by disaggregating the labor force according to a number of demographic and economic variables.

Its basic purpose is to identify what the consequence of changes in trade orientation and public sector policy will be for employment rates of different categories of workers.
The removal of barriers to trade, as well as the extinction of special treatment for specific sectors via indirect instruments, will generate a reallocation of the productive resources in the economy. As tariffs on imported goods are eliminated, the domestic production of these goods, or their substitutes, becomes less attractive. One should expect a flow of resources away from their production, as well as a decline in employment related to them. At the same time, the trade liberalization has a positive impact on the sectors that make intensive use of previously protected goods as inputs. A flow of resources to these sectors and an increase in employment in them are the expected outcomes. The opposite reasoning applies to the cases where imports are subsidized.

Generally speaking, one should expect the Protected segment of the economy to lose importance with opening to trade, whereas Non-Tradeables, Unprotected and, particularly, the Primary (negatively protected) segments benefiting from a new allocation of productive resources and absorption of employment. If one is primarily concerned with direct effects, this is acceptable. However, the picture may be reversed if indirect effects are brought to consideration, depending upon the nature of the intersectoral relationships in the economy. The computation of such linkages is not an straightforward task, and it is well beyond the scope of this paper. This caveat, however, should be kept in mind, and caution is advised in the interpretation of the results so generated.

One might also wonder how the composition of employment within each sector would be affected by changes in trade orientation. Again, a detailed assessment of this point would require an effort which is beyond our present objectives. For simplifying matters, and for keeping this exercise at a manageable level, neutrality is assumed. In other words, different categories of workers will be affected proportionally and they hold their share of participation in each sector constant.

In summary, by ignoring the existence of indirect effects and assuming neutrality on employment across labor categories at sectoral level, the movement away from protectionism can be considered as penalizing workers who are relatively more concentrated in the Protected segment of the economy, and favoring those that are over-represented elsewhere - Unprotected, Non-Tradeables, and especially those in the Primary segment.

An even more direct line of reason can be applied in evaluating the effects of a reduction in government intervention. Those categories of workers which are prevalent in the sectors with significant government involvement will be the most adversely

affected by any cut in public employment. These categories will benefit if government involvement increases.

The part of the economy with some government intervention can be split in two segments: one called Extensive Government Intervention, which consists of the State Enterprises, and another referred to simply as Government, which consists of all traditional government activities. Therefore, it is possible to separately analyze reductions in public employment in State Enterprises and in the Government itself. Hence, if State Enterprises are targeted for reductions in public employment, then the workers over-represented in the Extensive Government Intervention segment will suffer; if, instead, the traditional government activities are the ones at stake, those categories of workers more concentrated in this segment are going to bear the brunt of the adjustment.

5.1. The Regional Structure of Employment

Since the structure of employment varies considerably across regions in Brazil, changes in trade policy or public employment policy are expected to affect different regions differently. To investigate this phenomenon, the structure of employment can be estimated separately for four Brazilian geographic regions: the South Region, the State of São Paulo, the Southeast Region, and the Northeast Region. Taken together, these four regions account for more than 90% of employment in Brazil. The South Region contains the States of Rio Grande do Sul, Santa Catarina, and Paraná, and this region generates 17% of Brazilian employment. The State of São Paulo creates jobs for 24% of the total number of workers. The Southeast Region, formed by the States of Rio de Janeiro, Minas Gerais, and Espírito Santo, accounts for 23% of the total employment. Containing the poorest areas in the country, the Northeast Region is made of nine states and hires 26% of total employment.

Table 7 reports the sectoral structure of employment by region. Employment in the Primary sector (mainly agriculture) is largest in the Northeast and smallest in the State of São Paulo. On the other hand, employment in Manufacturing is largest in the State of São Paulo and smallest in the Northeast region. The Southeast and South regions occupy an intermediary position, but are quite distinct other than that. The Southeast has the largest Non-Tradeable segment, with particularly high employment in Services. Its employment shares in the Primary and Manufacturing sectors are slightly below the national shares. In the South the Primary segment absorbs much higher percentage of employment than does the nation as a whole, but the Non-Tradeables sector, especially the Services part, stays below national figures. Moreover, Manufacturing plays a more important role for the absorption of the labor force in the South than in the Southeast. One can say that most of the differences between the South and the

Southeast can be seen in the form of a trade off between the employment shares in the Primary segment and the Services sector of their economies.

One can see from Table 7 that within Manufacturing the Protected sectors are responsible for around 20% of employment in São Paulo, 12% in the South, under 11% in the Southeast, and just 7% in the Northeast. It is worth stressing, however, that the composition of employment in Manufacturing according to protection follows an opposite pattern: while in São Paulo 70% of the workers in Manufacturing are in Protected sectors, in the Northeast this percentage goes up to 81%. It is slightly lower for the two other regions. In other words, even though the State of São Paulo is the one that takes most advantage of protection, its industry is the least dependent on it.

It seems valid to conclude that the direct impact of trade liberalization should favor the Northeast relative to São Paulo, since the former would be less penalized by the new disincentive in protected activities, and it will tend to profit more from the release of productive resources for agricultural ones. The Southeast should take an intermediate position, and the South, despite displaying a relatively high concentration of employment in Protected areas, should also benefit from the new policy orientation, since Agriculture (mainly export- oriented) plays an important role in the economy of its States. As an additional remark, even though the Northeast as a whole should be favored by reduction in protection, its industrial sector is expected to be hurt more than São Paulo's industry, because of the higher protection of Manufacturing in the Northeast.

With respect to government intervention, Table 7 reveals mixed evidence. Starting with the segment No Government Intervention, one finds, surprisingly, that the Northeast is the region with the highest fraction of employment in activities not related to the government, closely followed by the South. This goes directly against the popular belief that the Northeastern economy is the most dependent on the government. The picture changes when one concentrates the analysis on the Government sector itself. The Northeast displays a higher share of public employment than São Paulo and the South (by about two percentage points), but a smaller one than the Southeast. More importantly, it is very near the national average, reinforcing the evidence against the claims of over dependency of that region on the government. Interestingly, the differences in public employment across regions are not due to employment in Public Administration, that is basically at the same percentage everywhere, but appear as differences in the proportion of employment in Public Services and Defense.

Although employment in the Government sector is largest in the Southeast, employment in those sectors with extensive government

intervention is largest in São Paulo. The government intervention in the São Paulo's labor market takes place on a greater level through State Enterprises rather than Public Services or Administration. The reverse is true for the other regions, particularly the Northeast. The South, it should be pointed out, is significantly below the national average in both categories of government intervention.

In order to predict now the impact of cuts in public employment will vary across regions one needs first to know the nature of such reduction. If the cuts are going to occur mainly in the traditional areas of government intervention, then the Northeast and the Southeast will be more adversely affected than the South and São Paulo. Otherwise, if the state enterprises are going to be the main target, then São Paulo and the Southeast will suffer the most. In either case the Southeast will tend to be most impacted region, and the South the least.

5.2. The Structure of Employment by Gender

In this section the structure of employment by gender is addressed. Females constitute 35% of the Brazilian labor force, and their sectoral employment structure differs from that of men. Table 8 shows that, in Brazil, women are over-represented in services - more than half of the female labor force is there (compared to only 17% of the male labor force), and under-represented in Agriculture, Construction, and Transportation. Women are also less concentrated than men in Manufacturing, both in its Protected and Unprotected segments, but not by a very large margin (12% against 18%). Therefore, the net result of a reduction in protectionism for men and women is not clear. It will tend to produce benefits for men, since they are highly involved in agriculture, but this gain will be at least partially offset by the contraction of employment in the Protected segment and the positive effects on the sector of Services, where women are highly-represented.

Regarding to the degree of government intervention, one should at first notice that there are no differences in the representation of men and women in the segment of the economy with No Government Intervention. The differences are associated with their proportions in the other two segments. Women are highly-represented in the Government segment (17.5% of the female labor force is there, compared to 9.0% for males), due in a large part to involvement in to Public Services (14% for women and only 3% for men). The opposite happens with the Extensive Intervention segment, i.e., in the segment in which most of State Enterprises are located. There one finds 12.5% of the male labor force compared to just 4.6% of the female labor force. Hence, any policy that affects traditional public employment will have more impact on women than on men, but males will suffer more if employment is cut in State Enterprises.

5.3. The Structure of Employment by Age

In order to investigate how workers in different stages of their life-cycle are going to be affected by changes in the trade policy and public sector policy, the structure of employment can be estimated separately for three age groups: 15 to 25 years old, 26 to 50, and over 50. These age groups represent, respectively, 32%, 54% and 14% of overall employment in Brazil.

These estimates are reported in Table 9. It is revealed there that old workers are highly-represented in Agriculture - they represent 35% of the employment in this segment compared to an average of 24%. Prime-aged workers are highly-represented in Non-Tradeables (63% compared to an average of 60%), mainly due to their concentration in Services. Young workers are highly-represented in Manufacturing, both in its Unprotected and Protected segments. Hence, reductions in protection would tend to favor old workers through the enhancement of employment opportunities in Agriculture, and slightly penalize the younger workers via contraction of Protected activities. Prime-aged workers can be expected to be unaffected by trade liberalization.

The impact of reduction in the size of the government will certainly impose the biggest losses for prime-aged workers, as they are highly concentrated in the traditional activities and in the State Enterprises. Moreover, this loss will be particularly large if biased towards cuts in Public Services, the sector in which these workers are concentrated the most. The effects on both younger and older workers will be dependent on the nature of the reduction. If emphasis were to be placed in Public Administration, older workers would suffer more than youngsters, the opposite occurring if the main target were the State Enterprises.

5.4. The Structure of Employment by Workers' Education Level

To evaluate how changes in trade policy and in the role of the government in the economy would affect workers of different educational levels, the structure of employment can be estimated for workers with at most complete primary education (i.e., 8 or less years of schooling), as well as for workers who have finished at least one year of secondary education (i.e., 9 or more years of schooling). These groups represent 76% and 24% of the Brazilian labor force.

Table 11 reveals that the better educated group is highly-represented in Non-Tradeables (80% of them are there, compared to 53% of the less educated group),[5] but extremely

[5] Construction and Transportation are exceptions. In construction the less educated are the ones who are over-represented.

less-represented in the Primary segment (3%, compared to 30% of the less educated). Both have the same proportional representation in Manufacturing. Thus, reductions in protection will tend to favor the less educated workers since Agriculture benefits more from trade liberalization than do Non- Tradeables.

A worker's educational level is related to his or her chances of working in the government. While 28% of the better educated workers hold Government jobs, only 7% of the others are found in this sector. It is worth noticing that this disparity persists through out all the subsectors: Public Services, Public Administration and Defense. The importance of education can also be seen in the segment with Extensive Government Intervention. Less than 8% of the less educated are employed there, but more than 15% of those with at least secondary schooling work in this segment. Hence, whether cuts are oriented towards employment in the traditional activities of the government or biased towards State Enterprises, the reduction is clearly bound to hurt the better educated workers much more than the less educated ones.

5.5. The Structure of Employment by Type of Working Relationship

The Brazilian labor market can be divided into four parts according to the nature of the working relations between employees and employers: the self-employed, the employees with formal labor contracts (Formal workers), the employees without formal labor contracts (Informal workers), and the public servants. The labor force is distributed across these blocks as follows: 33% of the workers are self-employed, 33% are Formal workers, 21% are Informal workers, and the remaining 13% are public servants.

Table 11 presents the sectoral structure of employment for three of these blocks: Self-employed, Formal workers, and Informal workers. The formal workers are highly-represented both in Manufacturing (Protected and Unprotected) and in the segment of the economy with Extensive Government Intervention. Therefore, any policy towards trade liberalization or reduction in government intervention will affect Formal workers much more than either Informal workers or those who are self-employed.

Table 11 shows an interesting similarity between the sectoral structure of employment for Informal workers and that for Self-employed workers. Both have roughly the same proportion of workers in the Primary segment (33-35%). In Manufacturing the share of Informal workers is 4 percentage points above the share of Self-employed workers, and the reverse is true for the Non-Tradeables segment. Within Non-Tradeables, the Self-employed are highly-represented in Trade and the Informal workers in Transportation.

6. EVOLUTION OVER TIME

This section investigates how the structure of employment by sector and by type of working relation has evolved over the last decade. Studies of the Brazilian structure of employment for earlier periods include Almeida (1974), Suzigan et alii (1974), and Cacciamali (1988, 1989). The present analysis is conducted for 7 segments of the economy: 4 related to trade policy and 3 to government intervention. The evolution of the distribution of workers according to their type of working contract is conducted for five groups: self-employed workers,[6] public servants, other workers with formal contracts, workers without formal contracts, and non-paid workers.

6.1. Sectoral Structure

The yearly evolution of sectoral structure of employment from 1981 to 1989 is reported in Table 12. This table reveals a couple of interesting facts. After displaying a slight contraction during the recession at the beginning of the eighties, employment in Manufacturing experienced a big boost in 1986 with the "Plano Cruzado." It went up by more than one percentage point that year, and stayed in the neighborhood of 16% from then on. The shares of employment in Protected and Unprotected industries show no significant alterations during this period. Employment in the Primary sector has been falling since 1984 (it went down from 28.9% that year to 22.4% in 1989). The reason is the behavior of Agriculture. Besides natural circumstances, credit and price policies towards agriculture activities have made this sector less attractive. Employment in the Non-Tradeable segment of the economy shows movements opposite to those followed by employment in Agriculture: every time there is a reduction in the share of employment in the Primary sector, one also observes a partially compensating expansion of the share of employment in Non-Tradeables (and *vice-versa*), as if the employment in Non-Tradeables were adjusting to exogenous variations in agriculture employment.[7]

As for the role of public employment, the shares of employment are stable in the first half of the decade, and they have a slight tendency to increase from 1985 on. To shed some light on the nature of this behavior, the evolution of the structure of employment within the Government can be inspected. As revealed by Table 12, employment in Defense remained fairly constant during the 1980s. The recent increases are due to the behavior of Public

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[6] Employers are also included in this group.

[7] In fact, it is common to have the government fostering some specific activities, notably small construction when big droughts occur in the Northeast.

Services and Public Administration: between 1986 and 1989 employment grew by 0.6% in the former, and 0.4% in the latter. These increases make up the one percentage point increase in Government employment. The segment of Extensive Government Intervention showed no considerable changes in 1980s.
There is an absence of big swings in the structure of employment in Brazil during the 1980s. This fact is rather surprising since the 1980s were a particularly turbulent decade, when the country experienced a variety of economic and political environments: the transition from a military to a democratic regime in the midst of an adjustment period; a severe recession followed by periods of growth under inflation; a sequence of heterodox attempts of bringing the economy back to its right track, the most famous being the Plano Cruzado; the threat of hyperinflation and the loss of the credibility of the civil government and so on. It is striking that the share of employment in Manufacturing remained stable. Also, there is no indication that public employment was used for ameliorating the effects of the recession in the beginning of the 1980s.

6.2. Structure of Employment by Type of Working Relationship

The temporal evolution of the structure of employment based on the type of working contract is presented in Tables 13a and 13b. These tables present the information for the country as a whole (Table 13a) and for all Brazil excluding the Northeast region (Table 13b). Due to data problems, we have to constrain the analysis to the case where the Northeast region has been excluded.

6.2.1. Why should the Northeast be excluded?

During years of severe drought in the Northeast the government implements some special employment programs that generate a large number of jobs in Construction. In the PNAD data set, workers in these special programs cannot be distinguished from those who work in Construction without a formal labor contract.[8] Hence, the distribution of all Brazilian workers by type of working relation in those years of severe drought is non-comparable with the distribution for other years. The magnitude of this problem can be best understood by contrasting the top two panels in Table 13c. This table presents the evolution of the structure of employment

[8] Cacciamali (1988) estimates that in 1983 1.9 million workers in the Northeast were temporarily hired by the government through these programs. This is clearly an overestimation. According to the figures presented in FIBGE (1982, 1983 e 1984), the total number of Informal workers in construction in the Northeast was 319952 in 1982, 1862217 in 1983 and 280827 in 1984. So, 1.5 million should be closer to the mark. Of course the potential distortion in the data is still huge.

for four selected sectors. The first panel shows that usually the proportion of workers with informal contract in Construction is around 30%. In 1983, however, this figure is above 50%. This fluctuation is completely eliminated when the Northeast is excluded (see the second panel in Table 13c).[9]

6.2.2. Overall Trends

Table 13b reveals an increase in informality during the recession years around 1983. The percentage of workers without labor contract reaches a peak in 1984 and the percentage of workers with a formal contract falls to a minimum in 1983. Somewhat surprisingly, the percentage of self-employers seems to be quite insensitive to the level of economic activity. Notice, however, that when we consider the pool of informal workers and self-employers, the percentages of workers in this pool in the years around 1983 are substantially above the average for the decade, and their peak occurs in 1983.

A comparison between the decade end points, 1981 and 1989, reveals a slight increase (about one percentage point) in the participation of public servants and workers with formal contract.[10] The increase in the participation of these groups was balanced by a reduction in the participation of non-paid workers. The proportions of self-employers laborers and informal workers (when the Northeast is excluded) in 1989 are similar to their levels in 1981. Jointly these two groups account for over 40% of the Brazilian labor force.

6.2.3. Sectoral Trends

Table 13c presents the evolution of the distribution of workers by type of working relation for four sectors: Construction, Private Services, Trade, and Non-Rail Transportation. Apart from Agriculture, these are the sectors in which the share of participation of self-employed workers and workers without formal contracts is the largest.

Construction (Northeast excluded) reveals a considerable growth of informality: self-employed workers and workers without formal

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[9] It is worth mentioning that 1981 and 1987 were also affected by sizable droughts. There are, therefore, substantial changes in the proportions of informal workers in Construction in the Northeast for these years, as it can be easily seen in Table 13c.

[10] When we exclude the Northeast, the variation in the share of employment of public servants drops from 1.4% to 0.8%. This fall indicates that the expansion of employment in the public sector was larger in that region. The participation of self-employers and informal workers did not change.

contract are increasing their shares. The percentage of workers with formal contracts decreases by almost 10 percentage points between 1981 and 1989. This increase is of smaller magnitude when the Northeast is included, basically as a consequence of the upwards biased figures for the informal sector in that region in 1981, as discussed before.

The distribution of workers within Private Services is the same at the beginning and at the end of the decade. However, a cyclical pattern is apparent. The percentage of workers with formal contracts reaches a trough in 1984, while the percentage of informal workers reaches a peak in the same year.

The Trade sector experienced a moderate but steady process of increasing informality in the eighties. The percentage of workers without formal contract increased by almost 2 percentage points in the period. This increase was matched by a similar decrease in the proportion of formal workers. The proportion of self-employers remained roughly constant.

Finally, the Non-Rail Transportation sector experienced increasing formalization at the end of the decade. From 1986 to 1989 the proportion of workers with formal contract increased by 4 percentage points, while the percentage of self-employers decreased by a similar amount.

7. SUMMARY AND CONCLUSIONS

In 1988 the Brazilian labor force was made of more than 55 million workers. Approximately 25% of them were still in the Primary segment of the economy. Out of the remaining 75%, 4/5 were in the Non-Tradeable segment and only 1/5 in Manufacturing (16% of total employment in Brazil). Sixteen of the 21 Manufacturing sectors, which accounts for 75% of industrial employment, have effective rates of protection above 25%. Therefore, even though only about 12% of total employment in Brazil is in protected sectors, 75% of all manufacturing jobs are in protected activities. Although trade liberalization may have little direct impact on overall employment, it will have very strong effects on employment in Manufacturing. As to the role of the government, public employment was estimated at 17% of the total employment in Brazil (or 23% of the non-agricultural employment), with more than 70% of it in the traditional areas of government intervention: Public Administration, Public Services and Defense.

This structure of employment was quite stable in the eighties. There were no big swings, even though that decade was particularly turbulent from the social, political and economic standpoints. After a slight contraction during the recession around 1983, employment in Manufacturing recovered with the Plano Cruzado and remained stable from then on. The internal composition according to Protected and Unprotected industries in Manufacturing showed no

significant changes in the period. Employment in the Primary sector has been falling since 1984, coupled with an increase in the share of employment in the Non-Tradeables sector.
Employment in the Government segment increased about one percentage point in the second half of the decade. This expansion was almost equally divided between Public Administration and Public Services. The segment of Extensive Government Intervention - the State Enterprises, showed no significant changes in the decade. Moreover, there is no indication that public employment was used for ameliorating the effects of the recession in the beginning of the eighties.

There is some evidence of increasing informality in the Brazilian labor market during the recession years around 1983. The peak in the share of employment of Informal workers occurs in 1984; for the pool of Informal and Self-employed workers it happens in 1983. As for the entire decade, there is no indication of a tendency towards informalization. On the contrary, one finds a slight increase in the participation of both workers with formal contract and public servants between 1981 and 1989.

Based on the adopted sectoral structure of employment, the direct effects of trade liberalization are likely to favor workers living in the Northeast over those living in São Paulo, older workers over youngsters, less educated over better educated, and Self-employed and Informal workers over Formal workers. However, the direct effects of reductions on the size of the government are expected to favor workers living in Sao Paulo and the South region over those living in the Southeast and Northeast regions, men over women, younger workers over prime-aged workers, and the less educated over the better educated workers.

In summary, the direct effects of trade liberalization seem to be in the direction of a better income distribution. Although it is biased against women and the poorest regions, reductions in public employment might also lead to income redistribution, since prime-aged and better educated workers are penalized.

Table 2
Sectoral Employment Structure (%)

Sector	Employment Share
Agriculture	22.7
Mineral Extraction	0.8
Non-Fuel	0.6
Fuel	0.1
Manufacturing	15.6
Non-Metallic Products	1.1
Metal Products	1.9
Machinery	0.8
Electrical Equipment	0.8
Transportation Equipment	1.1
Wood Products	1.0
Furniture	0.8
Paper Products	0.3
Rubber Products	0.2
Leather and Hides	0.1
Chemicals and Petroleum Products	0.7
Pharmaceuticals	0.2
Perfumery	0.1
Plastics	0.4
Textiles	1.2
Clothing and Footwear	1.6
Food	2.2
Beverage	0.3
Tobacco	0.1
Printing and Publishing	0.5
Miscellaneous	0.4
Construction	6.6
Trade	12.1
Transportation and Storage	3.8
Railroad	0.2
Others	3.4
Storage	0.1
Credit and Insurance	2.2
Services	29.9
Public	6.9
Private	22.6
Mixed	0.4
Public Administration and Defense	5.1
Public Administration	3.7
Defense and Public Safety	1.3
Others	1.2

Table 3
Effective Rate of Protection (%)

Sector	Effective Rate of Protection
Agriculture	- 24.6
Mineral Extraction	
Fuel	- 10.7
Non-Fuel	- 10.7
Manufacturing	
Non-Metallic Products	10.3
Metal Products	53.0
Machinery	5.6
Electrical Equipment	54.7
Transportation Equipment	- 4.4
Wood Products	39.1
Furniture	53.1
Paper Products	44.1
Rubber Products	43.3
Leather and Hides	29.0
Chemicals and Petroleum Products	63.2
Pharmaceuticals	117.8
Perfumery	26.3
Plastics	189.0
Textiles	112.1
Clothing and Footwear	231.4
Food	45.8
Beverage	- 1.7
Tobacco	- 79.6
Printing and Publishing	- 5.3
Miscellaneous	96.7

Source: Braga, Santiago, and Ferro (1988, Table 4).

Table 4
Sectoral Employment Structure (%)

Sector	Employment Share
NON-TRADEABLES	59.7
Construction	6.6
Trade	12.1
Transportation and Storage	3.8
Railroad	0.2
Others	3.4
Storage	0.1
Credit and Insurance	2.2
Services	29.9
Public	6.9
Private	22.6
Mixed	0.4
Public Administration and Defense	5.1
Public Administration	3.7
Defense and Public Safety	1.3
PRIMARY (Negatively Protected)	23.5
Agriculture	22.7
Mineral Extraction	0.8
Non-Fuel	0.6
Fuel	0.1
UNPROTECTED (Manufacturing)	3.9
Non-Metallic Products	1.1
Machinery	0.8
Transportation Equipment	1.1
Beverage	0.3
Tobacco	0.1
Printing and Publishing	0.5
PROTECTED (Manufacturing)	11.7
Metal Products	1.9
Electrical Equipment	0.8
Wood Products	1.0
Furniture	0.8
Paper Products	0.3
Rubber Products	0.2
Leather and Hides	0.1
Chemicals and Petroleum Products	0.7
Pharmaceuticals	0.2
Perfumery	0.1
Plastics	0.4
Textiles	1.2
Clothing and Footwear	1.6
Food	2.2
Miscellaneous	0.4
Others	1.2

Table 5
Degree of Government Intervention (%)

Sector	Degree of Government Intervention
Agriculture	3.7
Mineral Extraction	
Non-Fuel	54.5
Fuel	99.1
Manufacturing	
Non-Metallic Products	0.0
Metal Products	42.5
Machinery	1.5
Electrical Equipment	0.0
Transportation Equipment	4.5
Wood Products	0.0
Furniture	0.0
Paper Products	4.5
Rubber Products	0.0
Leather and Hides	0.0
Chemicals and Petroleum Products	52.5
Pharmaceuticals	1.3
Perfumery	0.0
Plastics	0.0
Textiles	0.0
Clothing and Footwear	0.0
Food	0.4
Beverage	0.0
Tobacco	0.0
Printing and Publishing	4.8
Miscellaneous	0.0
Construction	1.5
Trade	5.1
Transportation and Storage	
Railroad	100.0
Others	71.2
Storage	25.6
Credit and Insurance	50.9
Services	
Public	100.0
Private	0.0
Mixed	17.9
Public Administration and Defense	
Public Administration	100.0
Defense and Public Safety	100.0

Table 6
Sectoral Employment Structure (%)

Sector	Employment Share
NO GOVERNMENT INTERVENTION	77.1
Agriculture	22.7
Manufacturing	13.1
Non-Metallic Products	1.1
Machinery	0.8
Electrical Equipment	0.8
Transportation Equipment	1.1
Wood Products	1.0
Furniture	0.8
Paper Products	0.3
Rubber Products	0.2
Leather and Hides	0.1
Pharmaceuticals	0.2
Perfumery	0.1
Plastics	0.4
Textiles	1.2
Clothing and Footwear	1.6
Food	2.2
Beverage	0.3
Tobacco	0.1
Printing and Publishing	0.5
Miscellaneous	0.4
Construction	6.6
Trade	12.1
Private Services	22.6
EXTENSIVE GOVERNMENT INTERVENTION	9.7
Mineral Extraction	0.8
Fuel Extraction	0.1
Non-Fuel Extraction	0.6
Manufacturing	2.6
Metal Products	1.9
Chemicals and Petroleum Products	0.7
Transportation and Storage	3.8
Railroad	0.2
Others	3.4
Storage	0.1
Credit and Insurance	2.2
Mixed Services	0.4
GOVERNMENT	12.0
Public Services	6.9
Public Administration and Defense	5.1
Public Administration	3.7
Defense and Public Safety	1.3
Others	1.2

Table 7
Structure of Employment By Region* (%)

Sector	SO	SP	SE	NE	All
NON-TRADEABLES	53.0	63.6	66.7	50.3	59.7
Construction	5.9	7.0	7.1	5.9	6.6
Trade	11.6	13.3	11.9	10.8	12.1
Transportation	3.6	4.5	4.4	2.7	3.8
Credit and Insurance	1.8	3.4	2.3	1.1	2.2
Services	25.5	31.2	35.7	25.3	29.9
Public Adm. and Defense	4.5	4.2	5.4	4.6	5.1
PRIMARY	30.3	7.4	18.3	39.6	23.5
Manufacturing	15.6	28.1	13.5	8.8	15.6
UNPROTECTED	3.3	8.4	3.0	1.7	3.9
PROTECTED	12.3	19.7	10.5	7.1	11.7
NO GOV. INT.	80.1	75.6	74.5	80.6	77.1
EXTENSIVE INT.	8.3	13.4	11.4	5.8	9.7
GOVERNMENT	10.4	10.1	12.6	12.3	12.0
Public Services	5.9	5.9	7.2	7.7	6.9
Public Administration	3.3	3.3	3.4	3.7	3.7
Defense	1.2	1.0	2.0	0.9	1.3
Others	1.2	0.9	1.5	1.3	1.2

* SO: South.
SP: São Paulo.
SE: Southeast (minus São Paulo).
NE: Northeast.

Table 8
Structure of Employment By Gender(%)

Sector	Males	Females	Overall
NON-TRADEABLES	52.1	73.7	59.7
Construction	9.8	0.5	6.6
Trade	12.0	12.3	12.1
Transportation	5.4	0.8	3.8
Credit and Insurance	2.0	2.4	2.2
Services	17.1	53.9	29.9
Public Adm. and Defense	5.7	3.9	5.1
PRIMARY	28.7	13.7	23.5
Manufacturing	17.7	11.9	15.7
UNPROTECTED	5.1	1.6	3.9
PROTECTED	12.6	10.3	11.7
NO GOV. INT.	77.0	77.3	77.1
EXTENSIVE INT.	12.5	4.6	9.7
GOVERNMENT	9.0	17.5	12.0
Public Services	3.3	13.7	6.9
Public Administration	3.8	3.6	3.7
Defense	1.9	0.2	1.3
Others	1.5	0.7	1.2

Table 9
Structure of Employment By Age (%)

Sector	15 to 25	26 to 50	50 and more	Overall
NON-TRADEABLES	57.0	62.9	53.2	59.7
Construction	6.2	6.9	6.0	6.6
Trade	13.6	11.6	10.6	12.1
Transportation	2.8	4.6	3.0	3.8
Credit and Insurance	2.7	2.2	0.6	2.2
Services	28.2	31.7	27.6	29.9
Public Adm. and Defense	3.6	5.8	5.4	5.1
PRIMARY	24.2	20.1	35.0	23.5
Manufacturing	17.6	15.9	10.1	15.7
UNPROTECTED	4.2	4.1	2.2	3.9
PROTECTED	13.4	11.8	7.9	11.7
NO GOV. INT.	81.8	73.0	82.3	77.1
EXTENSIVE INT.	9.2	11.0	5.8	9.7
GOVERNMENT	7.9	14.9	10.2	12.0
Public Services	4.2	9.0	4.8	6.9
Public Administration	2.1	4.4	4.9	3.7
Defense	1.6	1.5	0.5	1.3
Others	1.2	1.1	1.7	1.2

Table 10
Structure of Employment By Workers' Educational Level (%)

Sector	Primary	Secondary and More	All
NON-TRADEABLES	53.4	79.6	59.7
Construction	7.8	2.5	6.6
Trade	10.8	16.3	12.1
Transportation	4.0	3.1	3.8
Credit and Insurance	0.5	7.4	2 2
Services	26.9	39.7	29.9
Public Adm. and Defense	3.3	10.6	5.1
PRIMARY	29.8	3.3	23.5
Manufacturing	15.5	16.0	15.7
UNPROTECTED	3.7	4.3	3.9
PROTECTED	11.8	11.7	11.7
NO GOV. INT.	83.9	55.5	77.1
EXTENSIVE INT.	8.0	15.3	9.7
GOVERNMENT	6.9	28.1	12.0
Public Services	3.6	17.5	6.9
Public Administration	2.6	7.3	3.7
Defense	0.7	3.3	1.3
Others	1.3	1.1	1.2

Table 11
Structure of Employment By Type of Working Relation (%)

Sector	Self-Empl	Formal	Informal	Overall
NON-TRADEABLES	61.0	57.4	55.0	59.7
Construction	7.7	7.8	8.9	6.6
Trade	18.0	15.8	8.0	12.1
Transportation	3.6	6.9	2.5	3.8
Credit and Insurance	0.2	5.9	0.7	2.2
Services	31.4	21.0	34.9	29.9
Public Adm. and Defense	0.0	0.0	0.0	5.1
PRIMARY	33.0	7.3	34.8	23.5
Manufacturing	6.0	35.3	10.2	15.7
UNPROTECTED	1.0	9.3	2.4	3.9
PROTECTED	5.0	26.0	7.8	11.7
NO GOV. INT.	94.4	78.9	94.2	77.1
EXTENSIVE INT.	5.4	21.1	5.8	9.7
GOVERNMENT	0.2	0.0	0.0	12.0
Others	0.0	0.0	0.0	1.2

Table 12
The Temporal Evolution of the
Sectoral Employment Structure (%)

Sector	1981	1982	1983	1984	1985	1986	1987	1988	1989
NON-TRADABLES	55.6	55.6	58.3	55.4	56.4	57.4	58.8	59.7	60.2
Construction	8.4	7.5	9.7	6.1	6.1	6.7	6.9	6.6	6.5
Trade	10.9	10.8	11.1	11.2	11.5	11.9	12.1	12.1	12.8
Transportation	3.9	3.8	3.6	3.6	3.6	3.6	3.7	3.8	3.8
Credit & Insur.	2.2	2.2	2.4	2.4	2.6	2.2	2.2	2.2	2.2
Services	26.0	26.9	27.1	27.6	27.9	28.1	29.1	29.9	30.0
Pub. Adm. & Def.	4.3	4.5	4.4	4.5	4.6	4.9	4.9	5.1	5.0
PRIMARY	27.9	28.2	26.3	28.9	27.2	25.0	23.7	23.5	22.4
Manufacturing	15.4	15.2	14.4	14.6	15.2	16.5	16.1	15.6	16.2
UNPROTECTED	3.8	3.7	3.5	3.5	3.6	4.0	3.9	3.9	3.8
PROTECTED	11.7	11.4	10.9	11.1	11.7	12.5	12.1	11.7	12.4
NO GOV. INT.	79.1	79.2	78.9	78.8	78.1	78.2	77.8	77.1	77.3
EXTENSIVE INT.	9.4	9.8	9.5	9.3	9.8	9.3	9.4	9.7	9.8
GOVERNMENT	10.4	10.4	10.6	10.8	10.9	11.4	11.4	12.0	11.9
Publ. Services	6.1	6.0	6.2	6.3	6.3	6.5	6.5	6.9	6.9
Public Adm.	2.8	3.1	3.0	3.1	3.3	3.5	3.5	3.7	3.7
Defense	1.4	1.4	1.4	1.4	1.3	1.4	1.3	1.3	1.3
Others	1.1	1.1	1.1	1.1	1.2	1.1	1.4	1.2	1.1

Table 13a
The Temporal Evolution of Employment
by Kind of Working Relation - Brazil (%)

Sector	1981	1982	1983	1984	1985	1986	1987	1988	1989
SELF EMPLOYER	26.6	27.3	26.2	27.0	26.4	26.7	26.3	26.8	26.6
EMPLOYEE	32.9	31.9	30.2	30.5	31.9	33.0	33.2	33.2	34.0
PUB. WORKER	10.3	10.4	10.5	10.7	10.9	11.3	11.3	11.9	11.7
INF. WORKER	21.6	21.6	24.9	23.3	22.3	21.9	21.7	21.1	20.5
NON-PAIED	7.5	7.7	7.1	7.4	7.3	5.9	6.1	5.8	6.0
OTHERS	1.1	1.0	1.0	1.1	1.2	1.1	1.4	1.2	1.1

Table 13b
The Temporal Evolution of Employment
by Kind of Working Relation - Brazil w/NE (%)

Sector	1981	1982	1983	1984	1985	1986	1987	1988	1989
SELF EMPLOYER	23.7	23.8	24.4	23.8	23.3	23.7	23.7	24.5	24.1
EMPLOYEE	38.3	37.6	35.8	36.3	37.7	38.9	38.9	39.0	39.8
PUB. WORKER	10.6	10.7	10.8	11.0	11.0	11.3	11.2	11.8	11.4
INF. WORKER	19.3	20.0	21.2	21.6	20.7	19.9	19.3	18.7	18.6
NON-PAIED	7.0	6.8	6.8	6.3	6.2	5.1	5.6	4.9	5.0
OTHERS	1.1	1.0	1.0	1.0	1.0	1.1	1.4	1.2	1.1

Table 13c
The Temporal Evolution of Employment
by Kind of Working Relation in Some Selected Sectors (%)

Sector	1981	1982	1983	1984	1985	1986	1987	1988	1989
Construction (Brazil)									
SELF EMPLOYER	25.7	29.4	21.0	30.9	30.5	32.3	32.7	31.4	32.7
EMPLOYEE	41.2	42.8	27.2	38.9	38.9	39.8	35.2	39.4	37.3
INF. WORKER	32.3	27.1	51.4	29.6	29.9	27.4	31.3	28.6	29.1
NON-PAIED	0.7	0.7	0.4	0.6	0.6	0.5	0.7	0.5	0.8
Construction (w/NE)									
SELF EMPLOYER	30.2	31.2	33.0	33.3	31.8	33.3	35.9	32.8	35.2
EMPLOYEE	48.3	44.6	41.8	40.0	40.5	41.9	38.8	40.9	38.5
INF. WORKER	20.7	23.5	24.4	26.0	26.9	24.3	24.4	25.8	25.5
NON-PAIED	0.8	0.7	0.8	0.7	0.7	0.5	0.9	0.4	0.8
Private Services									
SELF EMPLOYER	35.4	35.7	35.4	34.5	34.3	34.9	35.0	36.4	35.0
EMPLOYEE	31.8	30.0	29.5	28.4	29.0	29.7	29.9	29.8	31.8
INF. WORKER	30.8	32.1	33.1	35.4	34.8	33.9	33.3	32.0	31.2
NON-PAIED	1.9	2.2	1.9	1.8	1.8	1.4	1.7	1.6	1.9
Trade									
SELF EMPLOYER	38.2	39.1	39.4	39.8	38.9	39.0	39.0	39.7	39.3
EMPLOYEE	44.0	42.1	42.3	41.3	42.1	43.5	42.2	43.4	41.7
INF. WORKER	13.3	13.5	13.6	14.4	14.6	14.5	14.8	13.9	14.9
NON-PAIED	4.4	5.2	4.5	4.5	4.3	3.0	3.9	3.1	4.0
Non-Rail Transportation									
SELF EMPLOYER	32.3	31.1	33.1	30.1	28.7	29.6	28.1	27.4	26.0
EMPLOYEE	54.6	54.4	52.9	55.6	56.0	55.8	57.3	58.1	59.8
INF. WORKER	12.3	13.6	13.0	13.5	14.6	13.8	14.0	14.1	13.4
NON-PAIED	0.7	0.9	0.9	0.8	0.7	0.7	0.6	0.4	0.8

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APPENDIX

PNAD Sectoral Classification by Degree of Protection and Government Intervention
Sectoral Employment Structure (%)

	Sector	PNAD Code	Tradable		Degree of Protection	Degree of Government Intervention
			Yes	No		
Agriculture	1	11-28,31-42,581	13-15,18-23 25,27,28,31, 34,36,37	11,12,16,17 24,26,35,41 42		
Mineral Extraction						
Non-Fuel	2	50,53-58	51,53-58		-10.7	54.5
Fuel	3	51,52	51-52		-10.7	99.1
Manufacturing Non-Metallic Products	4	100	100	-	10.3	0.0
Metal Products	5	110	110	-	53.0	42.5
Machinery	6	120	120	-	5.6	1.5
Electrical Equipment	7	130	130	-	54.7	0.0
Transportation Equipment	8	140	140	-	-4.4	4.5
Wood Products	9	150,151	150,151	-	39.1	0.0
Furniture	10	160	160	-	53.1	0.0
Paper Products	11	170	170	-	44.1	4.5
Rubber Products	12	180	180	-	43.3	0.0
Leather and Hides	13	190	190	-	29.0	0.0
Chemical and Petroleum Products	14	200,201	200,201	-	63.2	52.5
Pharmaceuticals	15	210	210	-	117.8	1.3
Perfumery	16	220	220	-	26.3	0.0
Plastics	17	230	230	-	189.0	0.0
Textiles	18	240,241	240,241	-	112.1	0.0
Clothing and Footwear	19	250,251	250,251	-	231.4	0.0
Food	20	260	260	-	45.8	0.4
Beverage	21	270	270	-	-1.7	0.0
Tobbaco	22	280	280	-	-79.6	0.0
Printing and Publishing	23	290	290	-	-5.3	0.0
Miscellaneous	24	300	300	-	1.0	0.0
Construction	25	340	-	All	N.A.	1.5
Trade	26	410-424,463, 582,584	-	All	N.A.	5.1
Transportation and Storage						
Railroad	27	474	-	All	N.A.	100.0
Others	28	472,473,475, 476,586,587,568	-	All	N.A.	71.2
Storage	29	583	-	All	N.A.	25.6
Financial	30	451-453,462, 464,585	-	All	N.A.	50.9

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