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ADJUSTMENT, STABILIZATION AND THE STRUCTURE OF
EMPLOYMENT IN BRAZIL

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Adjustment, stabilization and the structure of employment in Brazil \ [1]

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Abstract:

In Latin America, job creation in the urban areas has been a problem for decades. Informal labor relations and self-employment have been for a long time part of the economic and social structure in the region. Recently, however, the issues of employment creation, unemployment, precarious employment relations and informality have come to the forefront of the debate. There are good reasons for this. First of all, industrial employment has been declining significantly since the late 1980´s. Second, unemployment rates are rising. Third, the share of informal employment relations is growing. Because of all these difficulties the debate over labor market issues has become very heated. The primary aim of this paper is not to analyze the causes of these changes in employment conditions. It is essentially to provide a profile of the changes in the structure of employment in Brazil since the recession years of 1990-92 and the adoption of trade liberalization reforms since the early 1990´s.

Adjustment, stabilization and the structure of employment in Brazil

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1. Introduction

Job creation has become a dominant policy issue both in developed and developing countries in the last decade. In developed countries analysts are divided as for the relative importance of international trade with developing countries and of technology in determining labor market problems -- in particular, the rising unemployment of unskilled workers and the increase in wage differentials between skilled and unskilled workers.

In Latin America, job creation in the urban areas has been a problem for decades. Informal labor relations and self-employment have been for a long time part of the economic and social structure in the region. Recently, however, the issues of employment creation, unemployment, precarious employment relations and informality have come to the forefront of the debate. There are good reasons for this. First of all, industrial employment has been declining significantly since the late 1980´s. Second, unemployment rates are rising. Third, the share of informal employment relations is growing.

Because of all these difficulties the debate over labor market issues has become very heated. The primary aim of this paper is not to analyze the causes of these changes in employment conditions. It is essentially to provide a profile of the changes in the structure of employment in Brazil since the recession years of 1990-92 and the adoption of trade liberalization reforms since the early 1990´s.

Section 2 introduces the main aspects of the structural adjustment and stabilization processes with the aim of presenting the macroeconomic environment in which changes in the structure of employment have taken place. A graphic scheme is developed to illustrate the main changes relating

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Because of all these difficulties the debate over labor market issues has become very heated. The primary aim of this paper is not to analyze the causes of these changes in employment conditions. It is essentially to provide a profile of the changes in the structure of employment in Brazil since the recession years of 1990-92 and the adoption of trade liberalization reforms since the early 1990's.

Section 2 introduces the main aspects of the structural adjustment and stabilization processes with the aim of presenting the macroeconomic environment in which changes in the structure of employment have taken place. A graphic scheme is developed to illustrate the main changes relating

the macroeconomics variables and economic policies, on the one hand, and changes in the structure of employment, on the other.

Section 3 is the core of the paper and looks at the evolution of urban employment in São Paulo between 1985 and 1995, examining the way in which the structure of employment changed in terms of the rates of participation and unemployment, the size of the informal segment of the labor market, and the sectoral and educational profiles of employment.

Section 4 looks at the evolution of industrial employment in São Paulo trying to identify the effects of sectoral changes in labor productivity and in the structure of output on the destruction of jobs. An attempt to separate sectors according to different classifications (modern/traditional, natural resource base/technological base, open/closed) gives rise to some interpretations for the evolution of the structure of industrial employment.

Section 5 provides a few concluding remarks examining the peculiarities of the labor market in Brazil and the alternative proposals for the improvement in labor relations and the creation of jobs with better quality.

2. Structural adjustment, stabilization and distribution

Brazil has lived with chronic and accelerating inflation since the early 1980's. It is hard to disentangle the causality relations between the external debt crises, the deterioration of fiscal accounts and the inflationary process in the country. But there is certainly a cumulative causation process between theses phenomena.

To a certain extent inflation has played the role of the scape valve of the economic system in Brazil. That is to say, in the 1980's, in order to "solve" the external accounts problems in the context of a closed economy without sacrificing growth and employment creation, inflation had to play an accommodative role. The crawling peg process followed by the exchange rate and the progressive indexation of wages created an environment in which inflation became part of the everyday life of agents, almost as if it did no harm to the economy. Indeed it did no harm on a day by day basis as agents got used to inflation. But as inflation accelerated, the uncertainties about the future in general and with bold government initiatives to curb inflation in particular

reduced long term commitments of all kinds in the economy with negative consequences for "investments" in general.

The 1990's have been marked with new initiatives to stabilize inflation in Brazil. The last few years can be divided in two sub-periods. The first corresponds to the Collor years (1990-92) and was marked by a very profound recession and the beginning of a credible process of opening of the economy --both the trade and financial accounts. The recession resulted from the freezing of all financial accounts in the beginning of the Collor government in an attempt to reduce liquidity and aggregate demand. The idea behind the stabilization plan at that time was that a price freeze could only be successful to stop inflation if the levels of liquidity and the access to individuals' financial wealth were severely constrained. However, "leaks" due to loopholes in the freezing of the accounts and the eventual defreezing of the accounts ultimately led to a new inflationary spiral.

The stabilization effort was not successful. But the combination of a profound recession coupled with another unsuccessful stabilization attempt -- fueling uncertainties as for the future -- and the announcement of a credible process of the opening of the economy to external competition has had a huge impact on the behavior of firms and thus on the structure of employment. In a word, firms decided to reduce their "permanent" or "core" group of workers in order to attain greater flexibility to deal with uncertainty and external competition. As a result of the downsizing and sub-contracting drive which characterized this period there was a significant drop in industrial and formal employment.

The second phase goes from 1993 to 1995. The years of 1992 to 1993 were marked by a gradual process of acceleration of inflation. President Itamar Franco, who replace the impeached President Collor early in 1993, did not take any bold measures to deal with inflation until 1994. This year the Real Plan was launched with two important ingredients, namely, a successful "de-indexation" scheme which did not rely on a price freeze and a nominal appreciation of the exchange rate which, coupled with the opening of the economy, allowed imports to play the role of the adjustment variable between aggregate supply and aggregate demand. The latter grew very fast in the first

three quarters of the plan and could only be matched by greater supply because imports grew around 100% on an yearly basis.

However, the trade deficits being accumulated were not sustainable, specially after the Mexican crisis of December 1994. In order to preserve the stabilization plan and sustain the exchange rate anchor, the government decided to rapidly reduce domestic absorption. By the end of 1995, industrial activity, which had grown around 15% on an annual basis in the first semester of 1994, had returned to the pre-Real level. As a result, the level of industrial employment which had grown mere 2% on an annual basis during the boom, started falling.

As far as employment is concerned, a stylized story of the period 1990-1995 can be told based on **Graph 1**:

- On the northwest quadrant there is a downward relation between output (or value added) and the trade account. The idea here is that, given the exchange rate and the degree of openness of the economy, the greater the level of activity the smaller the trade surplus. An appreciation of the exchange rate or an opening of the economy would bring the curve down on, for a given level of activity, a smaller surplus would be obtained. Hence, the trade surplus (T) is a negative function of level of activity (X), and a positive function of the exchange rate (e) and the level of protection (t), that is, $T = T(X, e, t)$ with $T_X < 0$, $T_e > 0$ and $T_t > 0$.

- On the northeast quadrant there is a positive relation between output and formal employment. A fixed coefficient technology is assumed. Given this coefficient, a reduction in the level of activity reduces employment. On the other hand, an increase in labor productivity shifts the line inwards thus reducing the level of employment for any given level of output. Hence, $X = Lf / \Delta$ where L_f is the level of formal employment and Δ is labor productivity.

- On the southeast quadrant, a negative relation between formal and informal employment is drawn. The assumption here is that a

The first two movements in the 1990-95 period where a leftward shift in the productivity line (due to changes in work organization and downsizing) and a reduction in formal employment due to the recessiona. These two movements are represented by a shift from point A to point B and then to point C on the northeast quadrant. Between 1993 and 1994 the level of activity increased but did not quite reverse the movement from B to C.[3]

The appreciation of the currency together with a deepening of the opening of the economy with the introduction of the stabilization program shifted the output-trade account line leftwards which, together with the expansion of the level of activity, gave rise to a trade deficit. This is represented by the movement from point X to point Y in the northwest quadrant. In order to reduce the deficit, a contrationary monetary policy was adopted thus reducing the level of activity. This is represented by the movements from point Y to point Z in the northwest quadrant and from point C to point D in the northeast quadrant.

The end result of the process is a reduction in the level of formal employment and industrial employment. The next two sections will examine this process in greater detail.

3. Changes in the structure of urban employment

There has been important changes in the structure of employment in Brazil, specially after 1990 when, as mentioned above, the main structural changes have been introduced. Brazil is essentially an urban country with 75% of the population living in cities. For this reason and mainly because the most up-to-date data available refers to the metropolitan areas, this section deals with changes in the structure of employment in the metropolitan area of S. Paulo.

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[3] One important reason for the non-reversal movement of employment was the substitution of imported industrial inputs for domestically produced imports which appears as an increase in productivity if productivity is measured as the ratio of gross output to employment. If productivity is measured as the ratio of value added to employment the substitution of imported industrial inputs for domestically produced imports would not show as an increase in labor productivity.

The choice of São Paulo has mainly three reasons. The first and most important is the guarantee of some degree of homogeneity of the population and of the economic and social development. That is, since the Brazilian economy is very diversified and heterogeneous, if the whole metropolitan population was analyzed, the "average" results would probably hide more than illustrate the trends in the structure of employment. The second reason is that the population of the metropolitan area of São Paulo is by far the biggest in the country. The third reason is that São Paulo is the core of the modern economy, with more than 50% of the country's industrial GDP and labor force, and thus very sensitive to the main structural changes in process, in particular the opening of the economy.

In order to examine the changes in the structure of employment a decomposition exercise is performed.[4] The exercise starts with the decomposition of economically active population (E) between the employed (L) and unemployed (U) workers:

1. $E = L + U$

and the definition of participation rate (ε):

2. $\varepsilon = E/P$

where P is the total population. These two equations give rise to the following relation:

3. $\varepsilon = (L/P) + \varepsilon v$

where $v = U/E$ is the rate of unemployment. Taking first differences in [3] (indicated by Δ) gives rise to equation 4:

4. $0 = - (1 - v) \Delta\varepsilon/\varepsilon + v \Delta v/v + (P/E) \Delta(L/P) + \text{interactions}$

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[4] The exercise follows the methodology proposed by Taylor, L. 1995. "Country studies on employment growth and structural adjustment", ILO, Geneva.

According to the equation, the weighted sum of growth rates of participation and unemployment rates plus a multiple (P/E) of the change in the employment/population ratio have to sum zero. That is, changes in the ratio of employment to the population must show up as changes in the rates of participation and unemployment.

This decomposition can be generalized to include changes in the structure of the employed workers (E) according to different classifications. For example, the employed workers can be classified into three groups, namely, formal wage earners (F), informal wage earners (I) and self-employed (S):

$$E = F + I + S$$

The analog of equation [3] in this case would be:

3'. $\quad\quad\quad\quad \varepsilon = h_f + h_i + h_s + \varepsilon_v$

where $h_f = F/P$, $h_i = I/P$ and $h_s = S/P$. The analog of equation [4] would then be:

4'. $\quad\quad\quad 0 = - (1 - v) \Delta\varepsilon/\varepsilon + v \Delta v/v + (1/\varepsilon) \sum_j \Delta h_j$

In this case, changes in composition within the group of employed workers among the three groups would be taken into account. This same method of decomposition will be apllied to educational groups and economic sectors.

Figure 1 shows how changes in the employment:population ratio where accommodated by changes in the participation rate and the unemployment rate in the metropolitan area of São Paulo between 1986 and 1995. The Figure shows annual percentage rates of changes of the participation and unemployment rates. The first point to notice is that the magnitude of the rates of change are low, ranging between -0.5% and +0.5% with two exceptions in 1992 and 1995.

Figure 1

Variation of the participation rate and unemployment rate in Metropolitan Region of São Paulo: 1986-1995
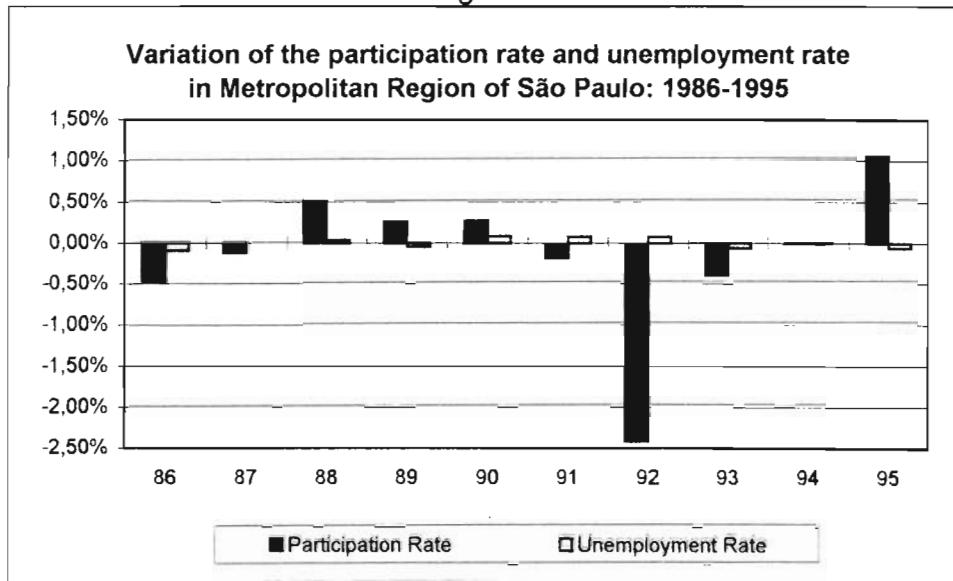
Before 1990, the participation rate fell in 1986 and 1987 (boom years) and increased in 1988-89 (stagnant years). It then increased in 1990 (the first year of a strong recession) and fell in 1991-93. It then increased again in 1995. As for the unemployment rate, which varied around 4% during this period, it almost did not change over the period, not even after 1989 with the recession. It seems clear that neither the participation rate nor the unemployment rate capture very well changes in the structure of the labor force. Indeed, in Brazil, there have been important changes in the structure of the labor force mainly in the composition of the employed workers.

Figures 2 to 5 show the decomposition of the employed population between four groups according to years of schooling. The lines indicate the proportion of workers in the respective category whereas the bars stand for its annual rate of change. As seen in the figures, there was a sharp decline in the proportion of workers with low years of schooling (illiterates and 1 to 4 years of schooling) since the mid 80's. The proportion of workers with 5-8 years of schooling increases from 1985 to 1990 and declines in the 90's. Note that only workers with more than 9 years of schooling increase their share in the early 90's. To sum up, these figures demonstrate a trend towards a more educated labor force in São Paulo.
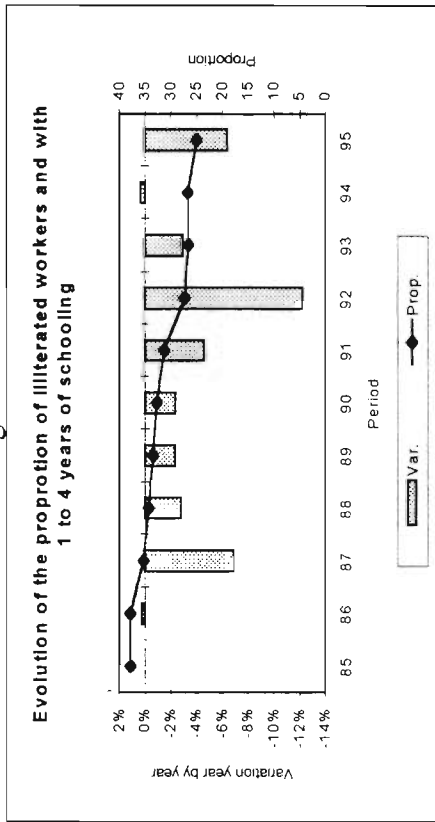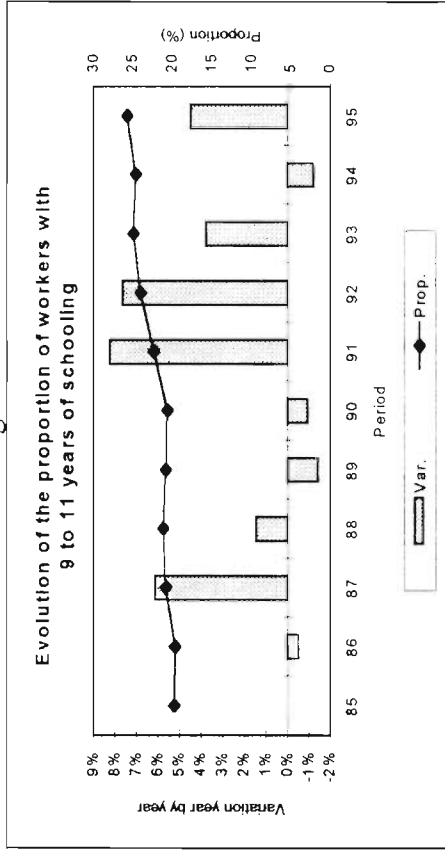
Figure 4

Evolution of the proportion of workers with
9 to 11 years of schooling

Figure 2

Evolution of the proportion of illiterated workers and with
1 to 4 years of schooling

Figure 5

Evolution of the proportion of workers with
more than 11 years of schooling

Figure 3

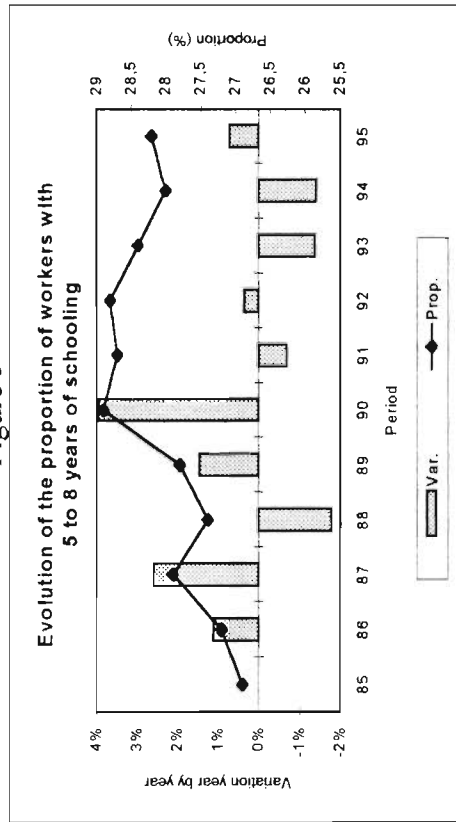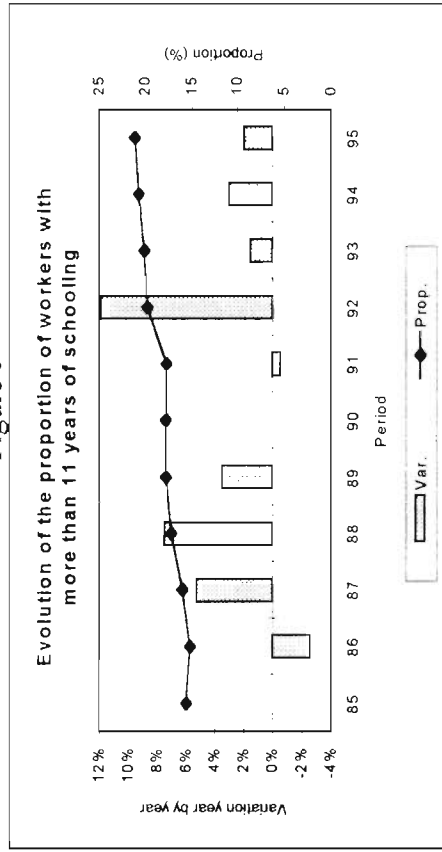Evolution of the proportion of workers with
5 to 8 years of schooling

These results respond to supply factors-- that is, the population is becoming more educated -- and, perhaps, an increasing demand for more educated workers as a result of the adoption of new technologies and new forms of labor and production organization.

Figures 6 to 9 show the decomposition of the employed population between four groups, namely, formal wage earners, informal wage earners, self-employed workers and employers. The proportion of formal wage earners increased from 62% in 1985 to 66% in 1989 and then started falling, reaching around 59% in 1995. Altogether it fell seven percentage points between 1989 and 1995.[5] The share of self-employed and employers remains roughly constant until 1989 whereas the share of informal wage earners falls. Hence, the increase in the share of formal wage earners corresponds to the reduction in the share of informal wage earners. After 1989 the share of informal wage earners, self-employed and employers tend to increase systematically. Not even in the year of 1994 when a boom followed the introduction of the Real plan affected this tendency.[6]

The growth in the share of employers is an evidence of a change in the size structure of firms in Brazil with the share of small firms growing in relation to medium and large firms.[7] On the same vein, there is an increase of self-employed workers relatively to wage workers.

These figures fit well in the framework discussed and the pattern followed by the arrows in Graph 1. The reduction in the share of formal wage earners is associated with the strong recession of 1990-92 and the opening of the economy which forced firms to introduce downsizing strategies.

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[5] The share of formal wage earners in metropolitan Brazil in 1995 was even lower than in São Paulo, reaching 46%.

[6] These results suggest that there is a structural component in the growth of the share of informal wage earners and self-employed workers since they continue to increase when the economy recovers the level of economic activity. On the one hand, we have evidences that informality functions as a buffer but, on the other hand, we don't know if new forms of labor organization are changing the preferences of workers in the direction of informal labor contracts, or if it is an evidence of a precarization of labor relations in the early 90's.

[7] To some extent, these results are correlated with the increasing participation of the informal wage earners since the small firms tend to hire relatively more employees without formal labor contracts.
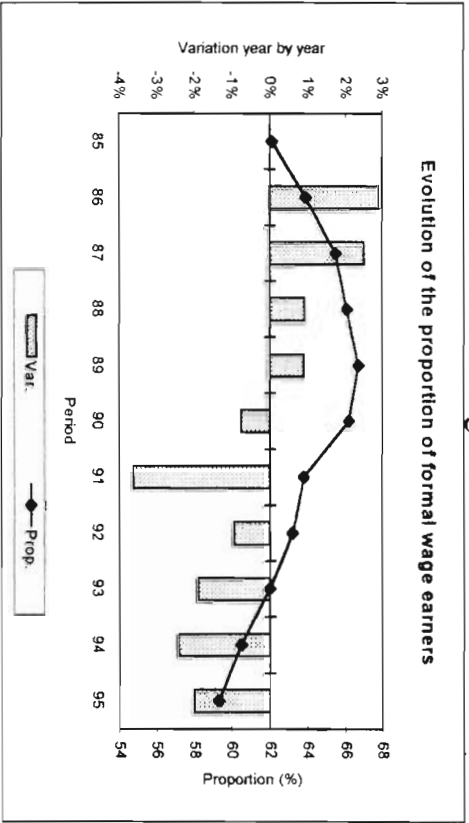
Figure 6

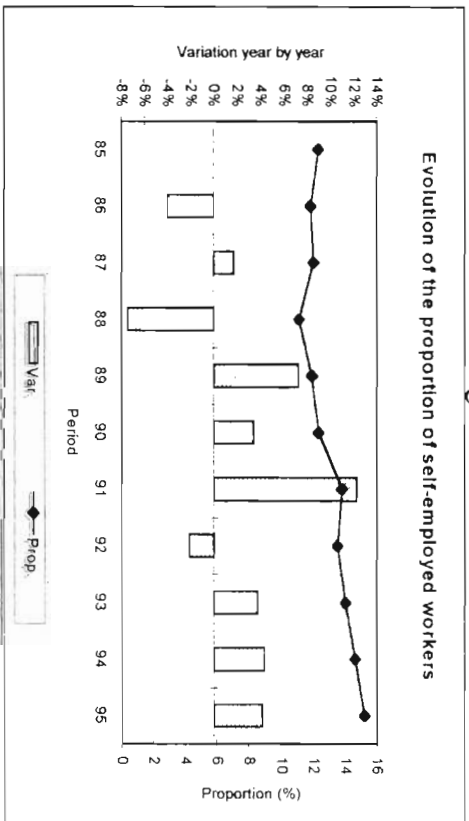Evolution of the proportion of formal wage earners

Figure 7

Evolution of the proportion of informal wage earners

Figure 8

Evolution of the proportion of self-employed workers
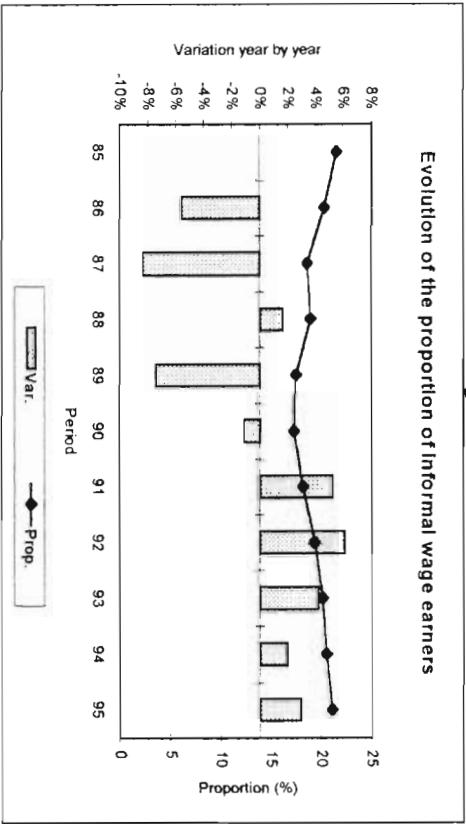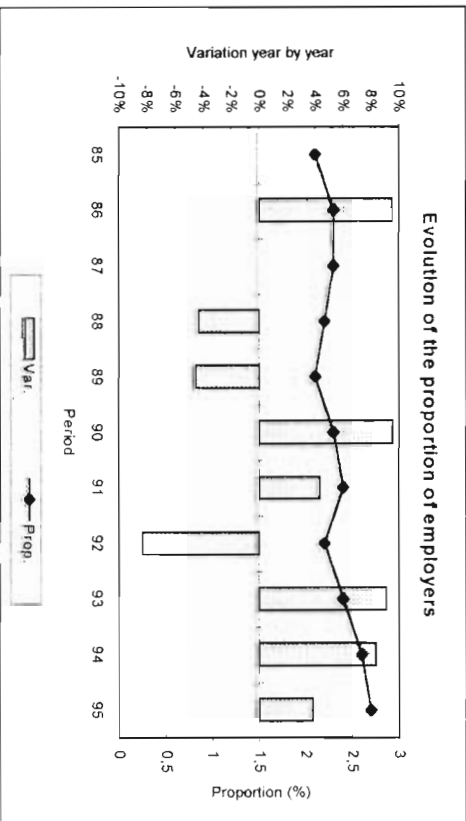

Figure 9

Evolution of the proportion of employers

Figures 10 to 16 decompose employment according to six sectors, namely, modern and traditional manufacturing[8], construction, productive services, distributive services, social services and personal services.[9]

As seen in the figures, there was a sharp decline in the proportion of industrial workers after 1990, in particular in the 1990-92 period. In modern manufacture, employment fell around 10% in 1991 and almost 15% in 1992. The proportion of employed workers in the modern manufacture sector went from approximately 14% in 1989 to 10% in 1994, then recovering a bit in 1995. In the traditional manufacturing sector, the proportion went from around 12% in 1989 to 10% in 1995. On the aggregate, there was a reduction in the share of industrial workers of around six percentage points.

The proportion of construction workers also fell although in this sector the behavior of the share of employment is more cyclical than in manufacturing. That is, the proportion of workers in construction falls in 1992-93, then recovers in 1994 in the boom and then falls again in 1995 when the level of activity is reduced.

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[8] See the sectors classified in these groups in table 3, section 4.

[9] The classification of these services groups is based on the type of demand for services. To illustrate the sectors belonging to each group we present the representative sectors:
- productive services: business, finance, engineering, information, publicity etc.;
- distributive services: trade, transportation and communication, storage;
- social services: public administration, health, education, defense, etc.;
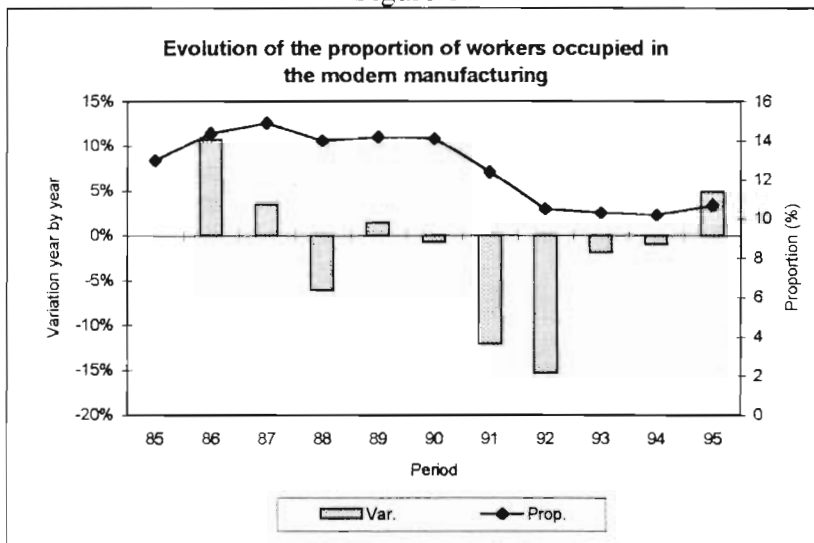- personal services: hotels, restaurants, entertainment, personal etc.

Figure 10

Evolution of the proportion of workers occupied in the modern manufacturing

(Chart: left axis "Variation year by year" ranging from -20% to 15%; right axis "Proportion (%)" ranging from 0 to 16; x-axis "Period" from 85 to 95. Legend: Var., Prop.)

Figure 11

Evolution of the proportion of workers occupied in the traditional manufacturing

(Chart: left axis "Variation year by year" ranging from -15% to 15%; right axis "Proportion (%)" ranging from 0 to 14; x-axis "Period" from 85 to 95. Legend: Var., Prop.)

Figure 12

Evolution of the porpotion of workers occupied in the construction

(Chart: left axis "Variation year by year" ranging from -15% to 35%; right axis "Proportion (%)" ranging from 0 to 5; x-axis "Period" from 85 to 95. Legend: Var., Prop.)
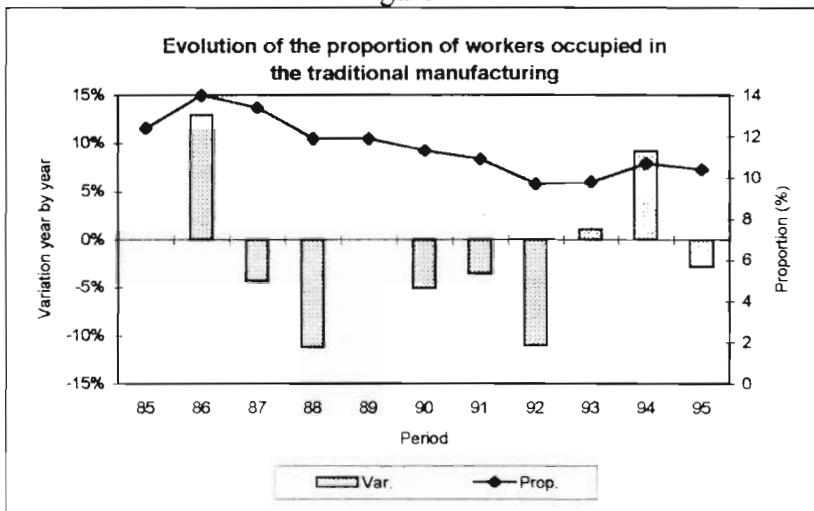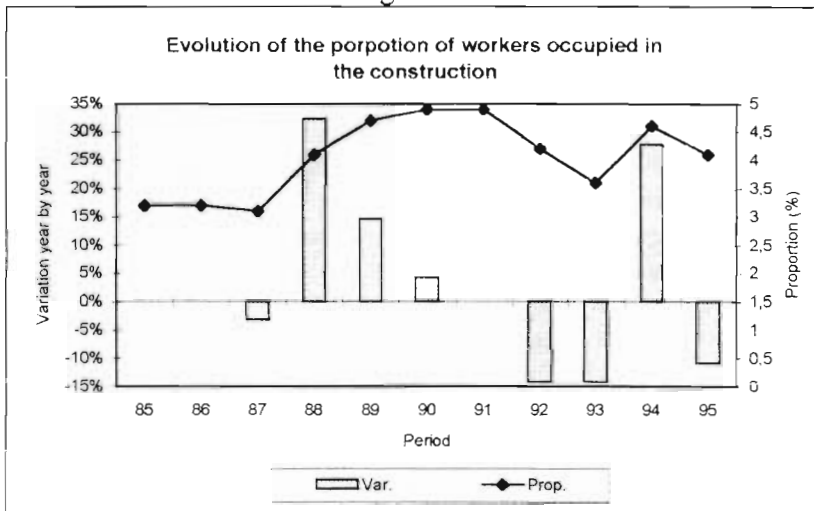
The proportion of workers in the services sectors increased in all the sub-sectors. In part they increased because of changes in management strategies -- subcontracting, in particular -- which in explains the increase in the share of employed workers in the productive and distributive sectors. In 1992, the share of workers in the productive services sector grew almost 15%. Between 1990 and 1993 the share of workers in this particular sub-sector grew almost 2 percentage points. In the distributive services sub-sector the share grew around 3 percentage points.

The share of workers in social services increase from 16% in 1989 to 18% in 1992 and remain relatively stable in 1993-95. The participation of workers in personal services registered the highest growth rate in 1990-91. This sector is the one that contract relatively more unskilled workers and pay lower wages. So, in the beginning of the adjustment process (1990-92), there was an increase of the participation of workers in the service sector that offer lower quality jobs. In the second phase (1992-95), the productive and distribuive services, which are more integrated with manufacturing sectors registered the highest rates of growth.

The increase in the proportion of workers in the services sector as a whole also responds to the reduction in labor demand in the industrial sector, where the quality of the jobs offered is usually better. As seen in the figures, the behavior of the share of workers in the services sector is anti-cyclical: the proportion tend to fall in 1986-7 (boom), increases in 1990-92 (recession years), then fall in 1994 (boom) and increases again in 1995. This stylized behavior supports the notion that, in some extension, the services sector plays the role of a buffer in recessions periods.
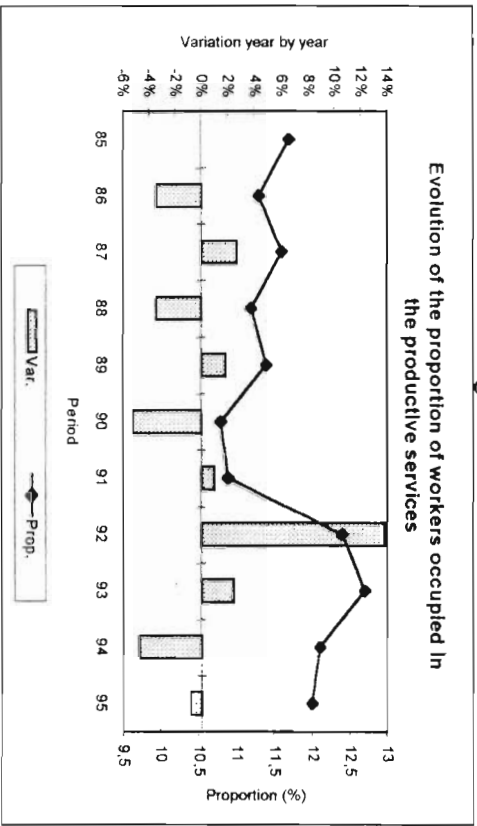
Figure 13

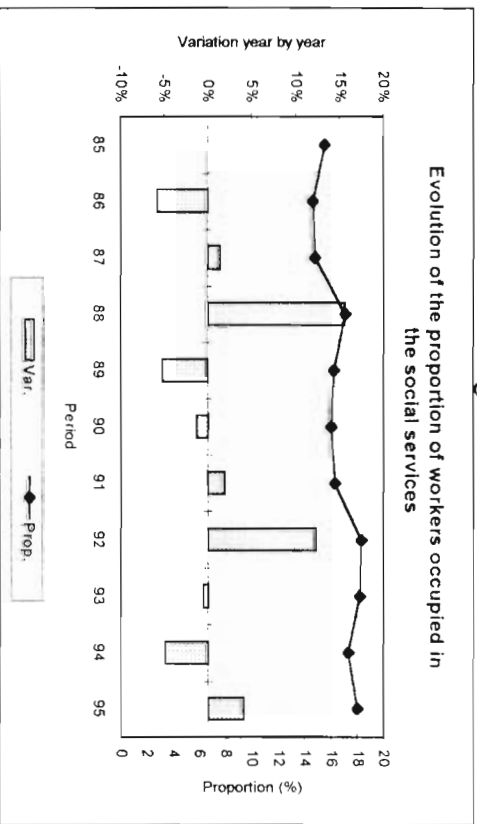Evolution of the proportion of workers occupied in the productive services

Figure 14

Evolution of the proportion of workers occupied in the distributive services

Figure 15

Evolution of the proportion of workers occupied in the social services

Figure 16

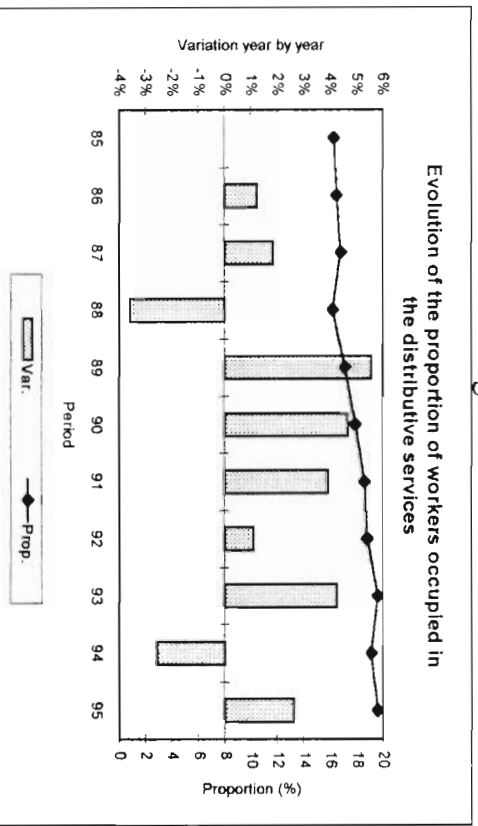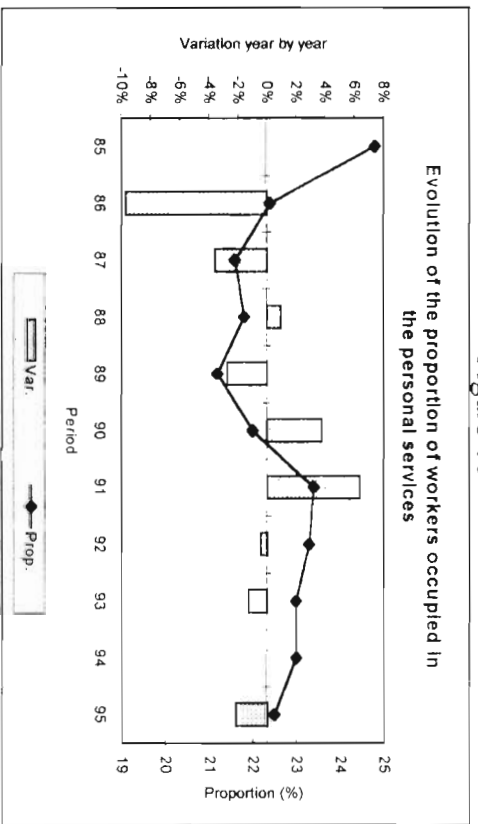Evolution of the proportion of workers occupied in the personal services

16

What these figures show is a tendency towards greater informality of the labor force, a greater incidence of small firms and self-employed workers, greater share of workers employed in the services sector mainly as a result of the decrease in the number of jobs offered in the industrial sector. Hence, at least in the case of Brazil, these changes in the composition of the employed workers seem to be by far more important than changes in the composition of the population between participants and non-participants in the labor market and employed and unemployed workers.

It is usually argued that these changes imply a deterioration of the quality of the jobs being created and a reduction in the income of those workers who leave the industrial sector. In order to confirm such assertion, it is necessary to examine what has happened to the industrial workers in the early 1990´s. What is the probability of a worker employed in the industrial sector, say in 1989, remain in the industrial sector, move to another sector, become unemployed or leave the labor force in 1990? For those who have moved into the services sector, has there been an increase or a decrease in their income? The answer to these questions can be seen an indication of the change in the quality of jobs being created in the early 1990´s when, as seen before, there was an increase in the participation of the services sector in total employment.

In order to answer the questions made above, longitudinal data based on the Monthly Employment Survey (for São Paulo) was used to ask what has happened in year t+1 to a pool of workers who was employed in the industrial sector in year t. This was done for the years 1989-90, 1990-91, 1991-2 and 1992-3.

Table 1 shows the transition of workers employed in the industrial sector. Notice that for the four periods, the greater proportion of workers remain in the industrial sector. Among the service sub-sectors, the distributive services attracts the greater proportion of workers leaving the industrial sector. However, there is a change in these proportions over the period.

In 1990-91, there was a reduction in the proportion of industrial workers who remained in the industrial sector (from 74.59% to 71.22%) and an increase in the share of those who migrated into the services sector, with the

greater proportion being that of workers who ended up in the personal services sector (3.41%). That is, the initial adjustment to the recession and trade liberalization drive in 1991 meant an increase in the probability of industrial workers moving into the personal services sector.

In the 1991-92 period, there was a further reduction in the probability of remaining in the industrial sector (from 71.22% to 69.74%) and a decrease in the transition to the services sectors as well. There was an increase in the probability of becoming unemployed or leaving the labor which went from 10.22% in 1989-90 to 12.01% in 1990-91 to 14.38% in 1991-2. It could be argued that the increase in labor supply in the service sectors in the two previous years led to a situation of excess supply followed by an increase in unemployment and a reduction in the rate of participation.

Table 1: The transition of industrial workers across sectors
(1989-90, 1990-91, 1991-92 and 1992-93)

|	Manufacturing	Distributive Services	Productive Services	Social Services	Personal Services	Others	Unemployed/Out of Labor force
1989/1990	74.59	6.02	2.45	0.69	1.98	4.06	10.22
1990/1991	71.22	5.32	2.65	1.11	3.41	4.21	12.01
1991/1992	69.74	5.00	1.75	1.25	3.27	4.60	14.38
1992/1993	72.61	5.04	2.76	1.05	3.18	3.45	11.91

Source: PME/IBGE.

There is a reversal of these trends in 1993 when the economy started recovering from the 1990-92 recession. The proportion of industrial workers who remain employed there increases and there is an increase in the probability of migrating to the service sectors which maintain direct relations with the industrial sector, namely, distributive and productive sectors. Whereas the first movement (from 1990 to 1992) can be seen as a "defensive" adjustment to the recession, the second movement in 1993 can be associated with the reestructuring of firms in the industrial sector. Sub-contracting was an important ingredient of the reestructuring and that is probably why the chances of workers moving into the distributive and productive sectors increased.

Figure 17 shows the evolution of the proportion of industrial workers who migrated to each of the service sub-sectors in relation to the total number of industrial workers who migrated to the service sector as a whole. As noted

above, the distributive sub-sector attracts the greater proportion of workers leaving the industrial sector in the four pairs of years. However, such proportion falls after 1990 whereas the proportion of social and personal services increase. Only in 1992-3 there is a reduction in the proportion of workers moving into these sectors.

Figure 17
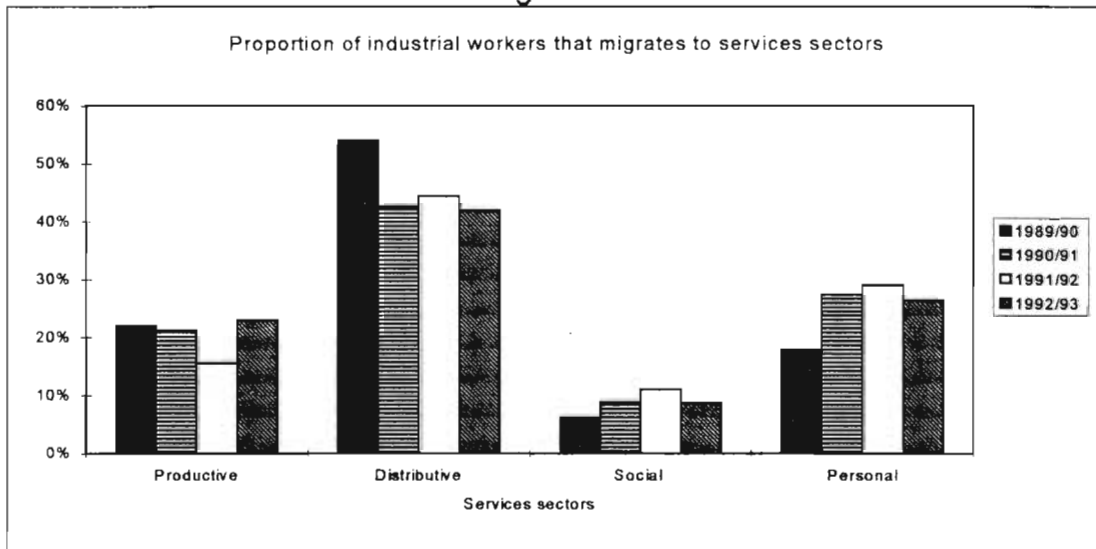
In order to assess changes in the "quality of the jobs" of the workers leaving the industrial sector, we examine their income gains or losses. Table 2 shows the difference (in logs) between the income of those workers who migrated to the services sectors in t+1 and the income of industrial workers in t.

Table 2 shows that until 1992, there was a continual loss of income for all groups. However, it is very clear that the loss of income of the workers who remained in the industrial sector was relatively smaller than the loss of those who migrated to the services sectors, specially to the personal services sector.

For workers leaving the industrial sector, the average income falls between 1990 and 1991 and falls even more between 1991 and 1992. The workers who were in the industrial sector in 1991 and remained there in 1992 suffered a loss of 5.8%. However, those workers who migrated into the services sector suffered a greater loss in income. The workers who migrated into the personal and social services sectors had incomes in 1992 which were

35.6% and 30.2% smaller than the average wage in industry in 1991, respectively.

Table 2: Gain (or loss) of income of workers in period t+1
in relation to the income of industrial workers in period t

	Manufacturing	Productive services	Distributive services	Social services	Personal services	Others
1989/90	-0.04	0.00	-0.06	0.01	-0.16	-0.14
1990/91	-0.13	-0.18	-0.22	-0.26	-0.22	-0.17
1991/92	-0.06	-0.17	-0.25	-0.36	-0.44	-0.26
1992/93	0.11	-0.02	-0.01	0.07	-0.04	-0.06

Source: PME/IBGE.

In 1993, the overall economic situation improves and there is an improvement in the relative average income in relation to the previous period for workers who remained in the industrial sector or migrated to the social services sector. All the other suffered losses but such losses were considerably smaller than in the previous year.

In sum, assuming that the workers who moved into the services sector remained in the same occupation, it could be argued based on the evidences discussed above, that incomes in the services sector are smaller than in the industrial sector. By extension, it could be argued that the jobs offered in the industrial sector are of better quality. If workers change their occupation when they move into the services sector, then the loss in income could be associated with differences in the quality of the occupations not in the quality of the jobs themselves.

In conclusion, it is worthwhile mentioning that if, on the one hand, there was not significant changes in the rate of unemployment or the rate of participation in the early 1990´s, on the other hand, there are evidences that the jobs created during the adjustment are of lower quality in comparison with the jobs offered before the adjustment. Of course, this could be a transitory situation associated with the adjustment. In the long run, after the adjustment, there could be a reversal of this movement with the creation of better jobs. This, however, is something to be seen.

4. Changes in the structure of industrial employment

There has also been important changes in the structure of employment within the industrial sector. These changes can be decomposed into two different effects, namely, changes in the employment-output ratio (or the inverse of the productivity of labor) and sectoral shifts with the output of some sectors going faster than the output of others in relation to the employed population.

In order to illustrate these effects, a decomposition exercise might prove useful. Let Y_j and L_j be the output and employment in sector j so that $\Sigma L_j = L$. Let $z_j = L_j / Y_j$ or the employment-output ratio (that is, the inverse of the productivity of labor), and $y_j = Y_j / P$ or sectoral output per capita.

Then $L/P = \Sigma z_j y_j$. The analog of equation [3] can be written as follows:

3" $1 = (P/E) \; \Sigma z_j y_j + v$

In first differences:

4" $0 = -(1 - v) \; \Delta\varepsilon/\varepsilon + v \; \Delta v/v + \Sigma\lambda j \; [(\Delta y_j / y_j) + (\Delta z_j / z_j)] +$ interactions

where $\lambda_j = L_j/P$.

The notion behind equation [4"] is that changes in employment (participation and unemployment rates) can be related to changes in labor productivity and shifts in output composition.

The data base used in order to analyze changes in labor productivity and sectoral shifts is a monthly survey based on a sample of industrial establishments. The data does not provide information of value added but only on a measure of sectoral physical output and this has certain implications. The most important implication is that it changes the interpretation of z_j , the employment-output ratio. This ratio is meant to represent the inverse of labor productivity. However, in situations where there is a change in the composition of inputs between internally produced and imported inputs and in situations in which firms are in a sub-contracting drive, a reduction of z_j will overestimate

the increase in labor productivity. In other words, the movements of z_j measured by the employment:value added ratio and of z_j as measured by the employment:gross output ratio can be very different. This difference does not matter if the aim is to explain changes in employment. However, the origins of the change in employment could be quite different. In the case of the labor:value added ratio changes in employment would reflect technical changes. Whereas in the case of the labor:gross output ratio, changes in employment could reflect changes in the composition of inputs or changes in managerial practices which affect the level of industrial integration.

Another shortcoming of the data set used is that since it only covers the industrial sector and since it is not a household survey, neither the changes in the participation rate or the unemployment rate can be calculated. To deal with these shortcomings two hypotheses were made. First, that the participation rate is constant. Second that the rate of unemployment is given by a "job loss rate" calculated as follows:

$$\text{Job loss rate sector} = (E_t - E_{88})/ E_{88}$$

The job loss rate is given by the ratio of the job loss in the sector between 1988 and the current year (t) and the level of employment in 1988. The year 1988 was chosen because it was the last year before the structural changes (opening in particular) were announced.

Hence, the figures below show, for each sub-sector of the manufacturing sector, changes in the job loss rate, the employment:gross output rate and output per capita rate. Equation [4"] would then be written as follows:

4"'. $\qquad 0 = [(E_t - E_{88})/ E_{88}] + \Sigma\lambda j\ [(\Delta y_j / y_j) + (\Delta z_j / z_j)] + \text{interactions}$

In order to analyze the data, 16 sectors of the manufacturing industry were grouped according to three classifications as shown on **Table 3**.

- The first classification distinguishes sectors between two groups, namely, *traditional and modern*. In the traditional sector, the value-added per worker is higher (implying a greater capital-employment ratio) and the techniques used tend to be more skill intensive than in the traditional sector.

- The second classification divides sectors according to factor intensity into four groups, namely, *natural resources intensive, unskilled labor intensive, technology intensive and human capital intensive*.

- The third classification is based on the ratio of imports to apparent consumption (m = M/A) and the ratio of exports to domestic production (x = X/Y)in each sector. The sectors were classified depending on the values of m end x in 10 or more years between 1980 and 1992:

  - *Closed sectors* when x < 0.1 and m < 0.1
  - *Open sectors* when x > 0.1 and m > 0.1
  - *Internally open* when x < 0.1 and m > 0.1
  - *Externally open* when x > 0.1 and m < 0.1

Table 3: Classifications of the manufacturing sectors

Sector	Modern	Traditional	Natural resources	Unskilled labor	Technology	Human capital	Closed	Open	Internally open	Externally open
Textiles										
Clothing & Footwear										
Food										
Tobacco										
Beverage										
Non metallic										
Metallurgy										
Paper										
Rubber										
Perfumery										
Plastic										
Machinery										
Transport equipment										
Electrical equipment										
Pharmaceutical										
Chemical										

Table 4: Job loss, sectoral output per capita and employment-output ratio
(Accumulated % change over the period 1988-1995)

Sector	Job loss (%)	% Change in the output per capita	% Change in the employ:output ratio
Manufacturing	21.7	26.7	-21.1
Modern	19.7	30.6	-21.4
Traditional	25.6	14.7	-17.2
Natural resources	12.7	18.8	-7.4
Unskilled labor	37.2	4.3	-24.0
Technology	20.5	23.1	-18.5
Human capital	16.6	28.5	-18.1
Closed	11.7	57.7	-28.5
Open	15.0	17.8	-7.9
Internally open	24.2	29.6	-25.3
Externally open	26.2	20.7	-21.8

Source: PIM/IBGE.

Table 4 and Figures 18 to 20 provide the figures for job loss and changes in the output per capita and the employment-output ratio between 1988 and 1995 for the three groupings of sectors. The figures for the manufacturing sector as a whole --which appear in the first column of Table 4-- show a job loss of 21.7% (which means that the level of aggregate manufacturing employment fell by this amount between 1988 and 1995), a reduction of 21.1% in the employment:output ratio (implying an increase in labor productivity of 26.7%) and an increase in the output per capita of 26.7%. For the manufacturing sector as a whole, the output per capita is the inverse of the employment:output ratio and that is why the change in the former is equal to the increase in labor productivity.

In comparing the job loss and the increase in labor productivity for the manufacturing sector as a whole, it becomes evident that output did not increase much in the period. Employment fell 21.7% and labor productivity increased 26.7%. Since, by definition, the change in productivity is equal to the difference between the change in output and the change in employment, the increase in output was around 5% in seven years.

Output per capita increased in all sectors. This is because total manufacturing employment fell whereas output either fell less than total employment in some sectors or increased in other sectors. Thus, the

expanding sectors are those in which the increase in output per capita is larger than the average increase in output per capita, that is, greater than 26.7%.

As seen in **Figures 18 to 20**, the reduction in employment (job losses) was concentrated in the years 1991 and 1992 when the reduction in the employment:output ratio was not compensated by the expansion of output. In 1993 and 1994, with the recovery in the level of output, the employment:output ratio kept falling but the expansion of output was such that the effect on employment became much smaller.

In the *modern/traditional classification*, job loss was greater in the traditional sector than in the modern sector. The change in the employment:output ratio was smaller in the traditional group but there was a relative shrinking of the sectors. Whereas the output per capita increased 30.6% in the modern group, in the traditional group it increased 14.7% or 12 percentage points less than the average in the manufacturing sector. Indeed, total output in the traditional group fell 10.2% between 1988 and 1995 whereas in the modern group it increased 2.2%. The performance of the traditional group shows quite clearly that there are cases in which productivity growth is not enough to boost competitiveness and output.

It is interesting to note that the two groups had a very different performance in 1995 in face of a deepening of the opening of the economy, the appreciation of the currency and a falling level of aggregate activity . As seen in **Figures 18 (d, e, f)**, whereas the employment:output ratio kept falling and the output per capita kept increasing in the modern sector, in the traditional sector there was a reversal of these trends. In the modern sector, the expansion of output per capital was enough to compensate for the increase in labor productivity (reduction of the employment:output ratio) so that there was an employment gain. In the traditional sector, the contraction of the output per capita ration was such that not even the reduction in labor productivity was enough to avoid a job loss. However, the expansion of the modern sector was sufficient to generate a negative job loss whereas in the traditional sector employment fell.

It seems, therefore, that the modern sectors were better equipped than the traditional sectors to face the opening of the economy and the appreciation of the exchange rate.
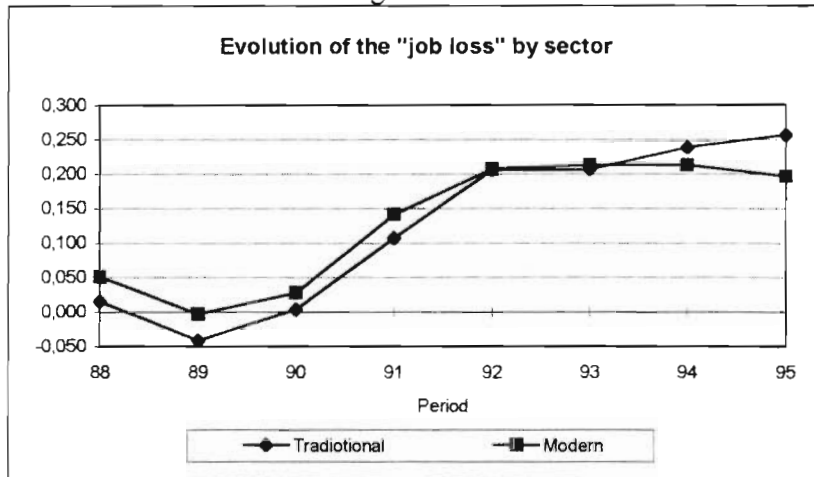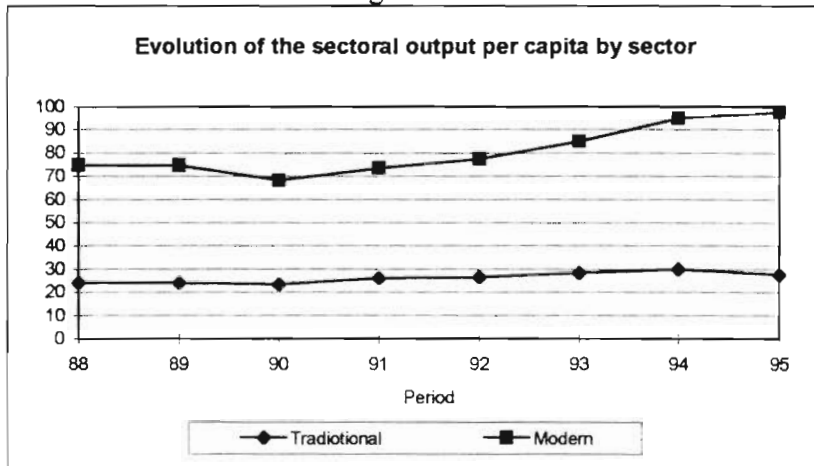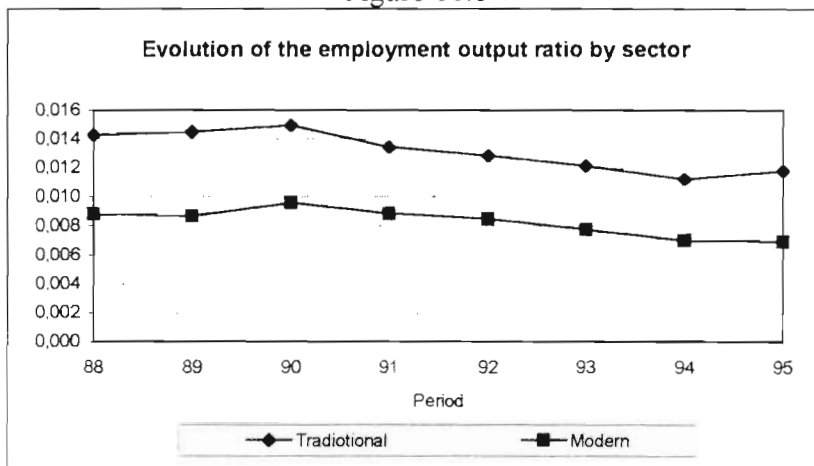
Figure 18.a

Evolution of the "job loss" by sector

Period

◆ Tradiotional ■ Modern

Figure 18.b

Evolution of the sectoral output per capita by sector

Period

◆ Tradiotional ■ Modern

Figure 18.c

Evolution of the employment output ratio by sector

Period

◆ Tradiotional ■ Modern

Figure 18.d

Variation year by year of the "job loss" by sector

Figure 18.e

Variation year by year of the sectoral output per capita

Figure 18.f

Variation year by year of the employment-output ratio
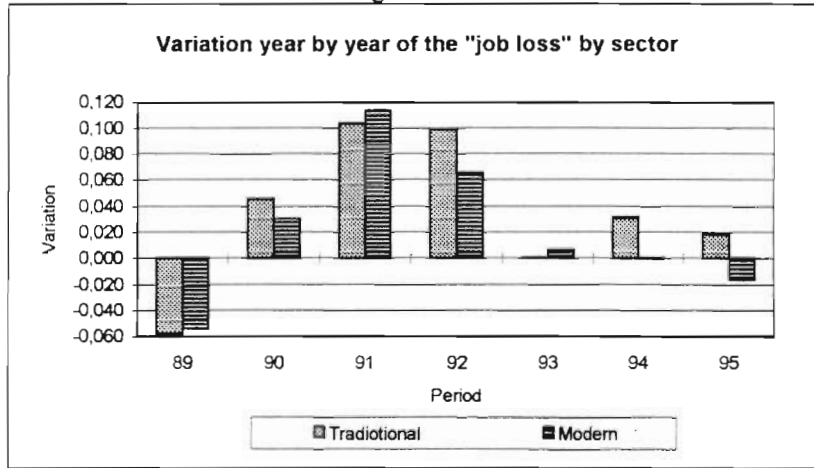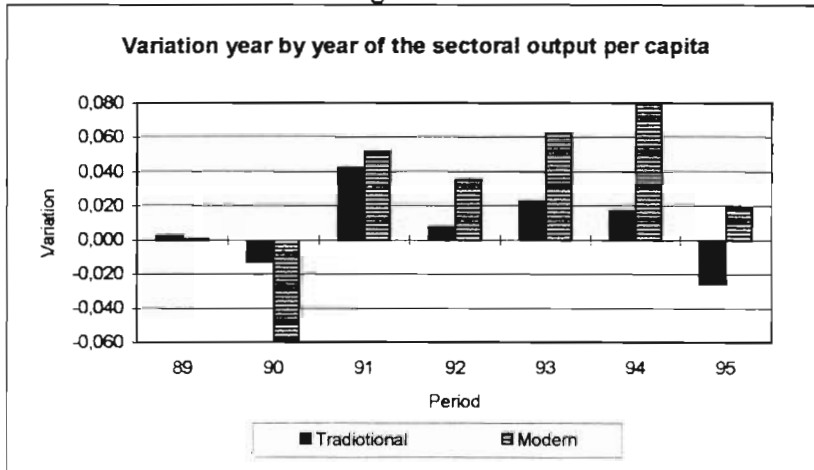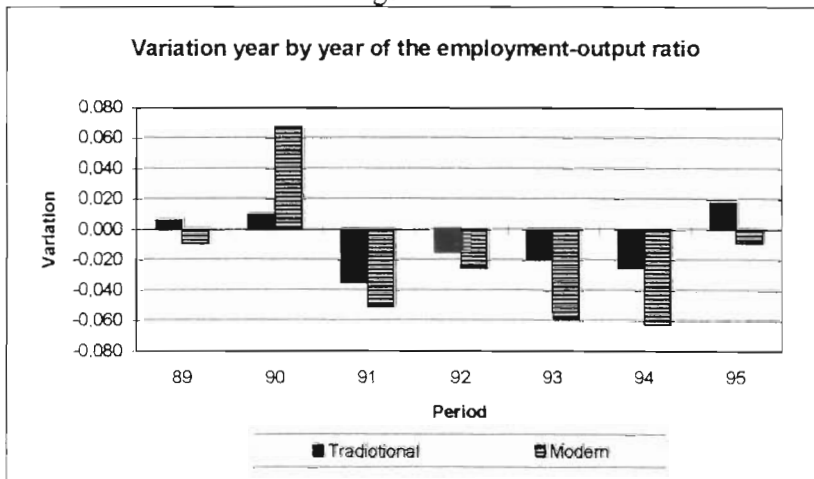
in the classification of sectors according to *factor intensity*, there is a significant difference between the job loss performance of the natural resources intense group and the unskilled labor intense group. Whereas in the former job loss was only 12.7% (well below the average), in the latter it was 37.2% (well above the average). This comparison is interesting because, as seen in Table 3, the traditional group can be decomposed into sectors of the natural resources group (food, tobacco, beverage and non metallic products) and sectors in the unskilled labor group (textiles and clothing & footwear). Hence, the job losses in the traditional sectors were closely related to the job losses in the unskilled labor intensive sectors, namely, group textiles and clothing & footwear.

Table 4 and Figures 19 (a, b, c) show quite clearly that the high level of job losses in the unskilled labor group was due to a dramatic shrinkage of the sector (the output per capita ratio increased mere 4.3%) while the low level of job loss in the natural resources group was due to a very low reduction in the employment:output ratio (-7.4%) which did not lead to a significant relative shrinkage of the group.

There is also an overlapping between the modern group, on the one hand, and the technology (T) intensive and the human capital (HC) intensive groups as seen in Table 3. The small difference in the job loss record between the T and HC groups can be explained by the difference in the output per capita performance since the change in the employment:output ratio was identical. There was an minor relative expansion of the HC group and a minor relative shrinkage of the T group. Therefore, the differences are not great and, as noted already, the modern group had a much better performance than the traditional group as far as the job loss record is concerned.
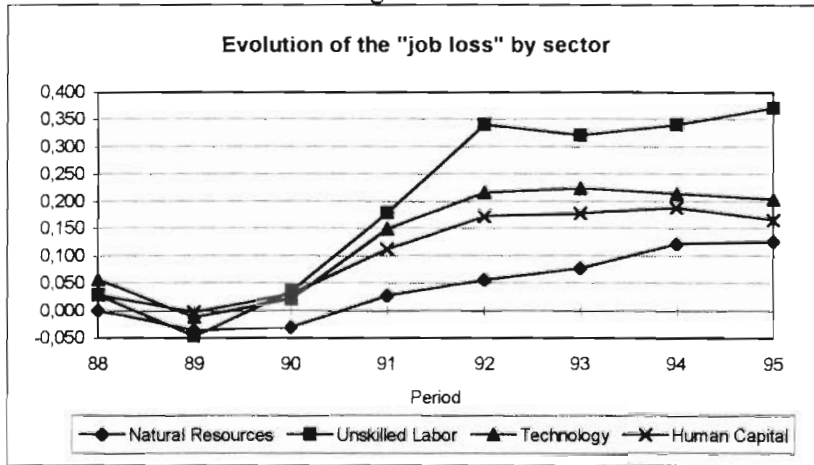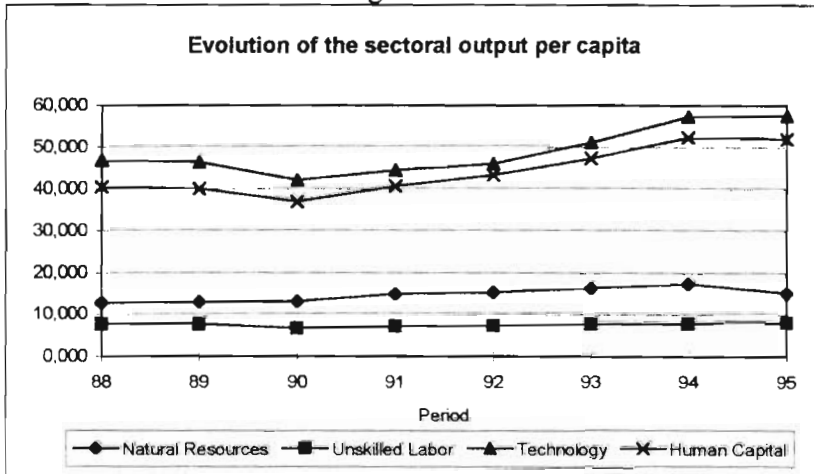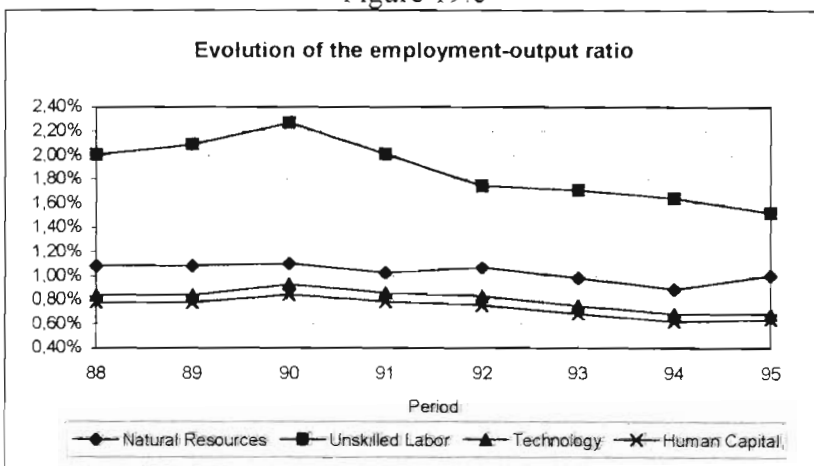
Figure 19.a

Evolution of the "job loss" by sector

Natural Resources   Unskilled Labor   Technology   Human Capital

Figure 19.b

Evolution of the sectoral output per capita

Natural Resources   Unskilled Labor   Technology   Human Capital

Figure 19.c

Evolution of the employment-output ratio

Natural Resources   Unskilled Labor   Technology   Human Capital

30

Figure 19.d

Variation year by year of the "job loss" by sector

Natural Resources ⊞ Unskilled Labor ☐ Technology ▨ Human Capital

Figure 19.e

Variation year by year of the sectoral output per capita

Natural Resources ⊟ Unskilled Labor ☐ Technology ▨ Human Capital

Figure 19.f

Variation year by year of the employment-output ratio

Natural Resources ⊟ Unskilled Labor ☐ Technology ▨ Human Capital

Turning now to the classification according to *openness*, the highlights are the "open" and the "closed" groups where the job loss performance were better than the average but for different reasons. The closed group had an above the average reduction in the employment:output ratio (- 28.5%) but due to a dramatic relative expansion, the job loss was of 11.7%. The star sector in the closed group was beverage with an increase in output of the order of 90% and an increase in employment (job gain) of the order of 22% between 1988 and 1995.

The open group is composed by two sectors, namely, transport equipment and chemicals, both modern and technology intensive. In the two sectors, the reduction in the employment:output ratio was small compared with the average in the modern and technology intensive groups.

It is interesting to note that the behavior of the employment:output ratio in the closed and open groups confirms the expected behavior. In general, it is expected that, after the opening of the economy, labor productivity will increase more in the "closed" sector in face of greater external competition. The open sectors were already exposed to external competition and, therefore, already adjusted.
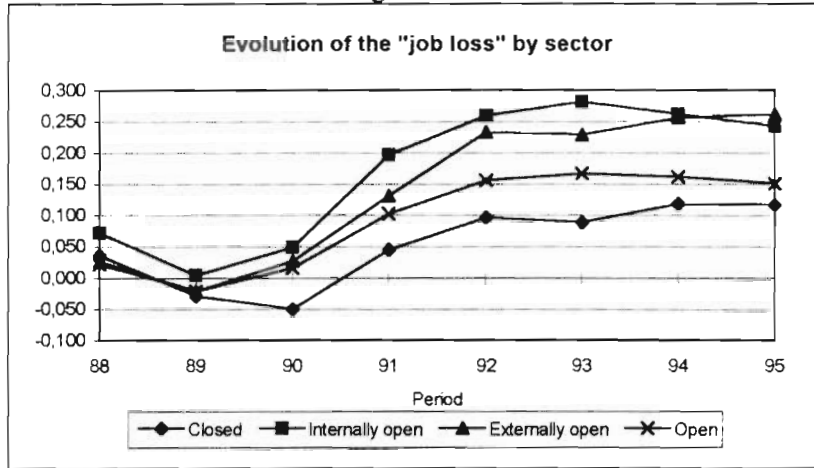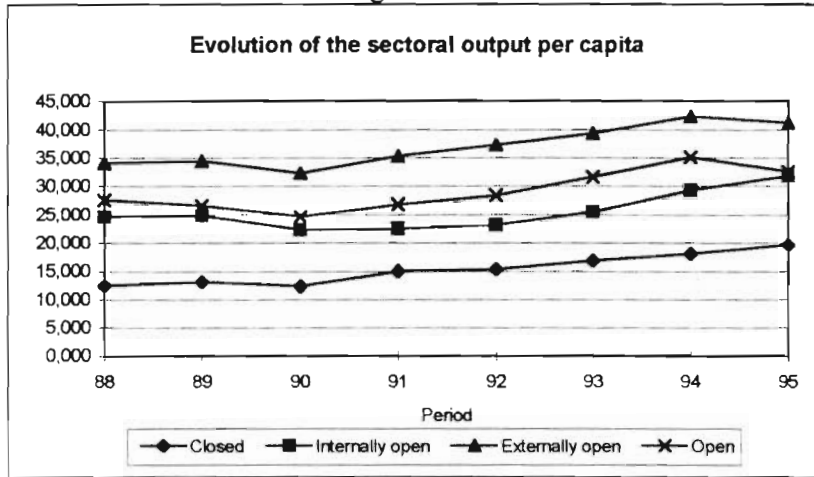
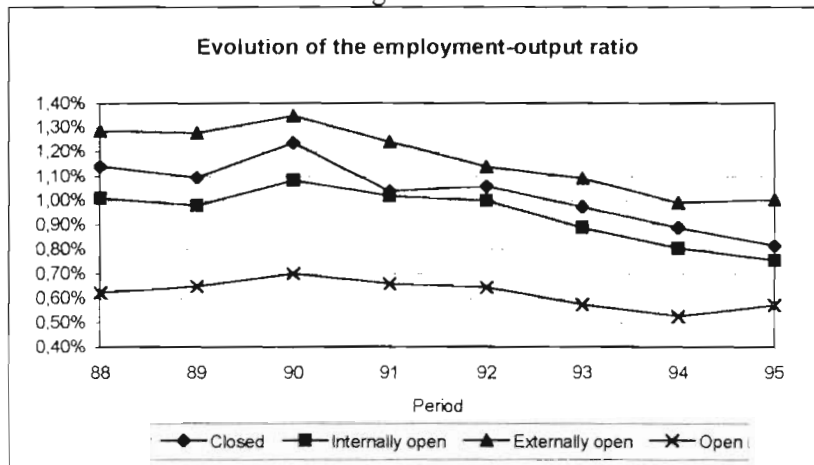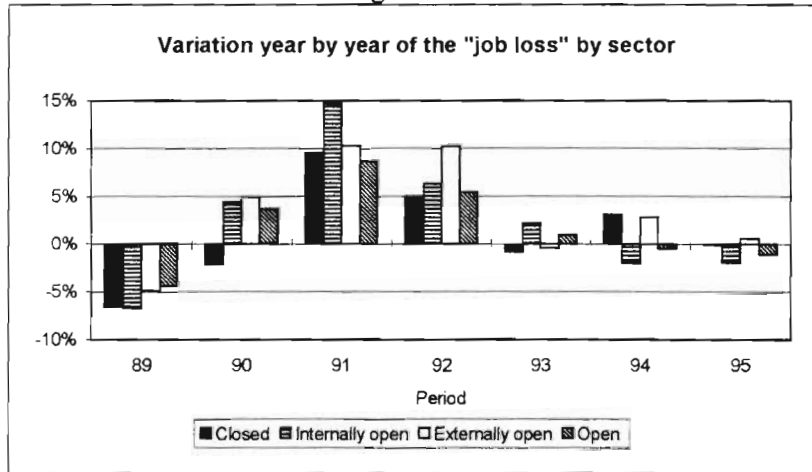Figure 20.a

Figure 20.b

Figure 20.c

Figure 20.d

Variation year by year of the "job loss" by sector

■ Closed ▤ Internally open ▢ Externally open ▨ Open

Figure 20.e

Variation year by year of the sectoral output per capita

■ Closed ▤ Internally open ▢ Externally open ▨ Open

Figure 20.f

Variation year by year of the employment-output ratio
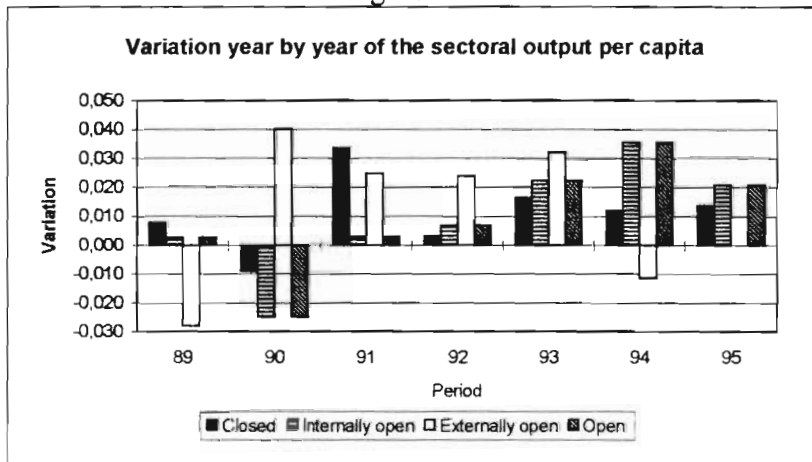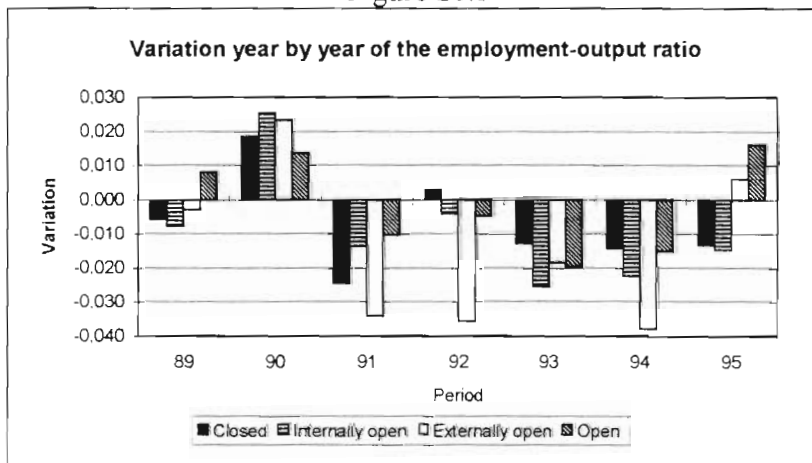
■ Closed ▤ Internally open ▢ Externally open ▨ Open

It is very difficult to make generalizations based on these figures. It seems safe to argue, however, that, first of all, in the modern sectors labor productivity increased more than in traditional sectors. Second, that there was a relative expansion of the modern sectors and a relative shrinkage of the traditional sectors as measured by the output per capita ratio. It could be argued that in the modern sectors, labor productivity boosted competitiveness and hence created the conditions for the expansion. Hence, the increase in labor productivity in the modern group was not only greater but also more effective in the sense of increasing "competitiveness" and implying smaller job losses.

A second group of notes refers to the overlapping between groups. There is an overlapping between the traditional group, on the one hand, and the unskilled labor and natural resources intensive groups, on the other. The other overlapping is between the modern sector, on the one hand, and the technology and human capital intensive groups, on the other hand. These overlappings may explain in part why productivity gains were greater in the modern sectors and, more importantly, why they may have been more effective in increasing competitiveness and thus promoting the expansion of the sectors.

A third group of observations has to do with the role of openness. There are not important differences between the performances of the externally open and internally open groups. But there is a clear difference between the performances of the open and closed groups. In both, job losses are below the average. In the closed group productivity increased above the average but the group experienced a relative expansion which explains why the job loss was small. On the other hand, the open group had a relative contraction of the output per capita ratio but a very small increase in productivity which explains the below the average job loss.

5. Concluding remarks

There has been a significant change in the structure of employment in Brazil in the last five years. Industrial employment is falling with emphasis on the most traditional sectors such as clothing, textile and footwear. There has been a migration of workers from the industrial sector to the services sector, and those workers who migrate have experienced an income loss in relation to the workers who remained in the industrial sector. There has also been an increase in the share of self-employed workers and informal wage earners.

The quality of the jobs being created in the services are not really of the same "quality" as those in the industrial sector. Hence, what has taken place is a clear deterioration of employment conditions and of the labor market performance in Brazil.

It is obviously very hard to anticipate the future of employment in Brazil. But in face of the technological and management practices being introduced in the industrial sector, it seems safe to expect a very slow increase in industrial employment in the next few years, if it in fact increases at all.

In face of these difficulties there has been a heated discussion on the options to increase formal employment. The dominant view is that the main cause of the decline in formal employment is the high level of legal taxes on the wage bill. The reduction in such taxes would reduce the cost of hiring workers in the formal sector, thus increasing formal employment. In order to deal with this problem, a solution being discussed is the introduction of differentiated contracts. Firms would be allowed to hire workers with smaller benefits than those currently employed and with fixed term contracts.

To the extent that the cost of hiring workers under these new terms is smaller, the tendency will be an increase in the share of workers with temporary contracts and the establishment of two separated groups of workers in the economy —those with "full" benefits and those with the new temporary and restricted contracts.

The interesting thing about the existence of the two types of contracts is the possibility of a "legal" segmentation of the labor market. So far, there are formal (legal) and informal (illegal) wage contracts. With the introduction of the restricted contracts, there will be a third category which is, in fact, in the middle of the way between the two others.

The gains from this legal segmentation of the labor market are not quite obvious. One can think of negative effects on labor productivity arising from the uneasy relationship between workers with different contracts in the same firm. If workers with full contracts feel that their jobs are threatened by workers with temporary contracts, this might have a negative impact on productivity. Even if more jobs are created, it is not clear that the employment conditions (or the quality of the jobs being created) will necessarily be better than those created in the informal sector.

Other solutions have been proposed. One is that instead of having the workers' benefits in the labor code, part of them could be directly negotiated between the workers (unions) and the employers. Labor contracts would be different according to the specific conditions of each sector or firm. The merit of such proposal is that it does not segment the labor force and that it gives the unions and workers an opportunity to negotiate over benefits, the level of employment and the conditions of employment.

It is still early to anticipate what type of labor contract and employment model will emerge from the current debate on the institutional structure of the labor market in Brazil. However, it seems clear that, in face of the significant changes in the structure of employment and the nature of employment relations in the last few years, there will probably be important changes in the institutional structure of labor relations.

What seems important to highlight is that since the rate of employment is not very sensitive to labor market conditions in Brazil, the question to be tackled by this change in the institutional apparatus is not " job creation" per se but rather the "quality" of the jobs created. Looking at the problem from this point of view reduces the importance to be attributed to the cost of labor in the formal sector, but rather the incentives provided by the institutional apparatus to both employers and employees. Establishing institutions which reduce labor turn-over and provide alternative adjustment variables –besides the level of employment-- to firms over economic cycles might have important effects on the quality of the jobs being created.

To sum up, it seems the evidences presented in this paper show quite clearly that the peculiarity of the Brazilian labor is the fact that the rate of unemployment is not a very good measure of labor market conditions. As a

collorary, creating jobs per se might not be the target to have in mind. Rather, the objective should be trying to change labor market institutions in order to improve the quality of the jobs and the quality of the labor relations.

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