LABOR MARKET AND POVERTY IN BRAZIL*

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Abstract

This paper investigates if the responsibility of the poverty level registered in Brazil is the poor operation of the labor market, in terms of under-remuneration and under-utilization of the labor factor. By means of a micro-simulation-based decomposition of distributional changes we assess the impact on the degree of poverty of unemployment, segmentation, and discrimination.

In order to estimate the effect of these labor market imperfections on poverty, it was necessary, first, to define precisely the concepts of unemployment, segmentation and discrimination. Secondly, it was necessary to define how an ideal situation where human resources are properly used and remunerated would look like, given the prevailing macroeconomic conditions.

It was found that, if the conditions of the average segment of the Brazilian labor market were extended to all segments, the effect on poverty would not be very significant

to 9,6%). Even if this condition were extended only to those below the mean, the effect on poverty would not be so higher (P1 would drop to 8,1%). Among the items of the effect of under-remuneration and under-utilization of labor, it is worth mentioning that the effect of unemployment is extremely limited in absolute terms, although in relative terms it is the major effect on poverty.

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Resumo

Este trabalho investiga a importância do mau funcionamento do mercado de trabalho brasileiro, tanto em termos de sub-utilização como sub-remuneração do fator trabalho, para a determinação do nível de pobreza registrado no país. Através de uma metodologia baseada em micro-simulações estimamos o impacto sobre a pobreza de cada imperfeição do mercado de trabalho, quais sejam: desemprego, segmentação e discriminação.

Para realizar estas estimativas foi necessário definir previamente os conceitos de desemprego, segmentação e discriminação. Além disso, também foi necessário definir uma situação ideal onde os recursos humanos eram propriamente utilizados e remunerados, dadas as condições da economia brasileira.

Os resultados apontam que o efeito sobre a pobreza da eliminação de todas as imperfeições do mercado de trabalho não seria muito significativo. Esta eliminação das imperfeições foi operacionalizada de duas formas alternativas. Primeiro, se as condições do segmento médio do mercado de trabalho brasileiro fossem estendidas a todos os segmentos, o hiato de renda média (P1) cairia dos 12,1% observados para 9,6%. Segundo, se essa condição fosse estendida somente àqueles abaixo da média, o efeito sobre a pobreza ainda seria não muito alto, com o P1 caindo para 8,1%.

Key Words: Wage determination, poverty, micro-simulations .

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1. Introduction.

How human resources are used and remunerated is one of the main determinants of the level of poverty in a society¹. The greater the efficiency in allocating the available human resources to economic activities² and the better the remuneration received by those engaged in economic activities, the smaller will be the prevailing level of poverty.

¹ For an overall discussion of the determinants of poverty, see Barros, Camargo and Mendonça (1995).

² The inclusion in economic activities does not represent the only way of using human resources with important effects on poverty. For instance, parents helping their children in school activities

In other words, the greater the under-utilization of human resources in economic activities and the greater the under-remuneration received by those engaged in economic activities, the greater will be the level of poverty. Since allocation and remuneration of the available human resources depend to a large extent on the functioning of the labor market, it follows that the prevailing level of poverty depends to a large extent on the functioning of the labor market³.

The under-utilization and under-remuneration of available human resources assume basically three different forms. First, since the economy may not be able to offer jobs to all interested persons available to work, part of the economically active population may remain unemployed. Secondly, human resources may be allocated to jobs of unnecessarily low quality. In this case, workers with equal productive potential will end up with different productivity and wage characterizing the segmentation of the labor market and the under-remuneration of part of the labor force. Finally, to the extent that certain groups are discriminated against while seeking and performing economic activity, these groups will be under-remunerated.

The objective of this paper is to assess the impact on the level of poverty in Brazil for the following three specific forms of labor-market inefficiency: unemployment, under-employment and discrimination. We address these issues by means of a micro-simulation-based decomposition of distributional changes similar to those used by Langoni (1973), Reis and Barros (1991) and Ferreira and Barros (1999).

Precise definitions of unemployment, segmentation, and discrimina-

or in preventive medical habits also has important impacts on the poverty level, at least in the long run.

³For the sake of simplicity, in this study the labor market includes all segments which create jobs, including the self-employed and non-remunerated.

tion and their measurement are still controversial [see Hussmanns, Mehran and Verma and ILO (1995)]. Hence, we dedicate Section 2 to introducing how these concepts and their measurement are treated in this study. Section 3 discusses the empirical application of these concepts.

The following four sections are then dedicated to analyze the relationship between unemployment, segmentation and discrimination on the one hand, and poverty, on the other, in Brazil. Section 4 presents some basic information about the database and magnitudes of poverty. Section 5 describes empirical preliminaries such as unemployment magnitude and wage differentials in Brazil. Section 6 discusses the overall impact on the poverty level of unemployment, segmentation, and discrimination, also comparing the overall impact of these labor market imperfections with the impact of alternative strategies to eliminate poverty. Section 7 addresses the decomposition of the overall impact of labor market imperfections, presenting separate estimates for the impact of unemployment, segmentation and discrimination.

Sections 8 and 9 are then devoted to investigating to what extent temporal and regional differences in the degree of under-utilization and under-remuneration of human resources can explain concomitant variations in the degree of poverty. Finally, Section 10 presents the main conclusions and recommendations of this study.

2. The concepts of unemployment, segmentation and discrimination.

In order to estimate the effect of labor market imperfections on poverty, it is necessary first to define precisely the concepts of unemployment, segmentation and discrimination. Secondly, it is necessary to define how an ideal situation where human resources are properly used and remunerated would look like, given the prevailing macroe-

conomic conditions. Accordingly, the objective of this section is to define these concepts and to specify the ideal situation where human resources are properly used and remunerated.

2.1 Unemployment.

The concept of unemployment that will underlie our analysis is empirically grounded. We pragmatically opted for the definition of unemployment traditionally used to produce the official statistics from household surveys. According to this definition, unemployment prevails whenever someone that did not have a job in a reference week was seeking employment during that period⁴.

Concerning to the definition of the ideal situation, through most of this paper we assume that any level of unemployment represents evidence of under-utilization of the labor force. Later on, in Section 7 we also work with an alternative assumption that considers short-term unemployment (less than three months) compatible with full utilization of the labor force.

It must be mentioned that in order to fully specify the ideal situation, in addition to identifying the unemployed, it is necessary to determine how they would be included in the labor market. In other words, it is necessary to specify which jobs and what remuneration the unemployed would have in the ideal situation. In this study, we opted to place them in the same labor market conditions as those experienced by employed workers with identical observed characteristics. This option implies in particular that unemployed workers in the ideal situation would perceive a market where segmentation and discrimination would prevail at their current levels.

⁴Despite the widespread use of this definition, there are many controversial issues related to it. For example people disagree about which activities should be considered as work, about the reference period, and (less frequently) about the condition of looking for a job.

2.2 Segmentation.

For the purposes of this study, a labor market is considered to be segmented whenever there are workers who are perfect substitutes in terms of production receiving different wages as a consequence of being employed in different economic sectors or regions. As a result, in a segmented labor market some jobs will be better than others.

We are going to assume that workers allocated to inferior quality jobs at a given threshold would be underpaid. In the ideal situation we eliminate these jobs. Workers allocated to jobs with quality above the threshold may be considered overpaid or not, which gives us two ideal situations. This approach to specify the ideal situation raises two difficulties. First, it requires that a threshold must be specified. Secondly, it requires the specification of a method to determine the proper remuneration of workers allocated to jobs with quality below and above the threshold.

As a threshold for workers with a given set of characteristics, we choose the current level of the average compensation of all workers in the same group. The ideal remuneration is specified in two different ways. In both cases we consider that all jobs paying wages below the average should ideally compensate workers at the average level. The two alternatives differ with respect to the remuneration of the workers with above-average wages. The first alternative considers as appropriate the remuneration of all workers with wages above the average. In this case, in the ideal situation the wage bill and so the average wage would be greater than the values actually observed. The second alternative considers that in the ideal situation all workers would be remunerated at the current mean value. In this case, the wage bill and the average wage in the ideal situation would be identical to the current values.

Estimates of the impact of labor-market segmentation on poverty would also depend heavily on the number and nature of segments

one divides the labor market into. In this study we consider two forms of segmentation: regional and sectorial. The specific segments considered in each of these forms of segmentation have important influence on the magnitude of segmentation's impact on poverty. A description of the segments used in this study is presented in Subsection 4.3.

Finally, it is worth noting that when adjusting the income of workers in each segment, their remuneration is altered proportionally, with the income of each worker being multiplied by the ratio between the overall average wage and the average wage for the corresponding segment. This strategy implicitly assumes that all intra-segment wage heterogeneity is due to differences unrelated to segmentation.

2.3 Discrimination.

The concept of discrimination is closely related to the concept of segmentation. Hence, we consider that labor market discrimination exists whenever white and non-white or men and women, all perfectly substitutes in production, do not receive the same remuneration even when employed in the same segment of the labor market. According to this concept, discrimination exists whenever there are wage differentials among perfectly substitutable workers employed in the same segment of the labor market. Those with remuneration below average are discriminated against.

Similar to our proposal to deal with segmentation, we assume that in an ideal situation, both men and women, whites and non-whites will be on average equally remunerated as long as they are perfectly substitute in production and are working in the same segment of the labor market, or the overpaid workers will remain at their original situation.

Finally, it is worth noting that when adjusting the income of workers in each group, their remuneration is altered proportionally, with the

income of each worker being multiplied by the ratio between the overall average wage and the average wage for the correspondent demographic group. This strategy implicitly assumes that all intra-group wage heterogeneity is due to differences unrelated to discrimination.

3. Eliminating under-utilization and under-remuneration: methodological aspects.

The methodology used in this study relies on a series of regressions that are then used to estimate a series of counterfactual wages reflecting the elimination of labor market imperfection. The set of basic regressions is described in the first subsection. In the following four subsections we describe the construction of series of counterfactual incomes, reflecting the elimination of alternative forms of labor market imperfections. In each case two alternatives are investigated. In one case (Alternative A), the remuneration of every worker in the ideal and current situations is different. In the other case, only those with wages below average have different remuneration in the ideal and current situations (Alternative B). Some final methodological remarks are presented in the last subsection.

3.1 The Complete Regression Framework.

To simulate the impact of eliminating labor-market imperfections on the level of poverty, we have to rely on a series of regressions relating remuneration to workers' characteristics and indicators for the segment of the labor market they are employed in. These regressions differ with respect to the set of characteristics used as explanatory variables. The more complete regression can be written as follows:

$$E[\ln(w)|e, i, g, c, s, r] = f(e, i, g, c, s, r)$$

Where:

w = remuneration⁵

e = educational level

i = age

g = gender

c = race

s = segment of the labor market

r = geographical location

In addition to this complete regression, a series of shorter regressions are also necessary. In some cases, it is equally necessary to know how the average logwage varies with the characteristics of individual workers and geographical location unconditioned on the segment in which they are employed. In this case, the relevant regression is the following:

$$E[\ln(w)|e, i, g, c, r] = g(e, i, g, c, r)$$

Sometimes, it is necessary to know how the average logwage varies with the characteristics of individual workers unconditioned by their employment segment and geographical location. In this case, the relevant regression is the following:

$$E[\ln(w)|e, i, g, c] = h(e, i, g, c)$$

Finally, it is also necessary to know how the average logwage varies with the workers' productive characteristics. In this case, the relevant regression is the following:

$$E[\ln(w)|e, i] = m(e, i)$$

⁵The remunerations considered are those earned in the main job (from now on, wage).

In estimating all these regressions, we made use of two simplifying hypotheses:

(a) We assumed that all regression functions were additionally separable, that is, for instance,

$$f(e, i, g, c, s, r) = f_1(e) + f_2(i) + f_3(g, c) + f_4(r) + f_5(s)$$

(b) We also assumed that, as a function of age, these functions are quadratic, for instance,

$$f_2(i) = \alpha_f + \beta_f.i + \delta_f.i^2$$

All other variables are represented by dummies. We did not consider any interaction (besides gender and color) due to complications this procedure would generate in our simulations. Another reason is the lack of theory to guide the correct functional specification.

3.2 The Overall Impact.

Alternative A

According to Alternative A, the income given to each unemployed worker is equal to the average income for all those currently employed with the same schooling and age plus an imputed residual, u_f . This residual term (u_f), is taken from the residuals (ϵ_f) distribution derived from the complete regression ($f(e, i, g, c, r, s)$). In other words, we assume that the distribution of unobserved characteristics of those unemployed is similar to the analogous distribution for the employed (ϵ_f)⁶. In sum, each unemployed person receives a wage w_{A*} equal to

⁶See the complete description for the residual imputation procedure in the Appendix.

$$w_{A^*} = \exp(\mathbf{m}(e, i) + u_f)$$

In the case of the employed, each worker receives the average wage estimated for all those occupied who have the same schooling and age, plus the worker residual from the complete regression. In this case, the calculated wage, w_{A^*} , is given by

$$w_{A^*} = \exp(\mathbf{m}(e, i) + \epsilon_f)$$

Once a new labor income is given to every member of the economically active population, the per-capita family income and the degree of poverty can be recalculated. The contrast between the degree of poverty before and after this simulation indicates the overall impact on poverty of under-utilization and under-remuneration of human resources according to Alternative A.

Alternative B

According to Alternative B, the income given to each unemployed worker is equal to that in Alternative A. Therefore, each unemployed person receives a wage w_{B^*} equal to

$$w_{B^*} = \exp[\mathbf{m}(e, i) + u_f]$$

For employed workers, the alternatives differ. In this alternative, each employed worker receives the maximum between his current wage and the average wage for all those with identical schooling and age plus the worker's residual from the complete regression. In this case, the counterfactual wage, w_{B^*} , is given as

$$w_{B^*} = \max\{\exp[\mathbf{m}(e, i) + \epsilon_f], w\}$$

Once a new labor income is given to every member of the economically active population, the per-capita family income and degree of poverty are recalculated. The contrast between the poverty level before and after this simulation indicates the overall impact of under-utilization and under-remuneration of human resources on poverty according to alternative B.

It might be helpful to have an idea about the relevance of each of the imperfections on this aggregate result. In order to achieve this information, we perform four sequential steps that allow us to infer about the relevance of the respective labor market imperfection.

3.3 Impact of Sectoral Segmentation.

Alternative A

Each employed worker receives the average wage estimated for all those with the same schooling, age, gender, race and geographical location, plus the worker's residual from the complete regression. In this case, the imputed wage, w_{A1} , is given by

$$w_{A1} = \exp[g(e, i, g, c, r) + \epsilon_f]$$

Just as in the previous case, once a new labor income is given to every member of the economically active population, the per-capita family income and degree of poverty are recalculated. The contrast between the degree of poverty obtained after the simulation and the original one indicates the impact of sectoral segmentation on poverty, according to Alternative A.

Alternative B

Each employed worker receives the maximum between his own current wage and the average wage for all those with the same schooling, age, gender, race and geographical location, plus the worker's residual from the complete regression. In this case, the imputed wage,

w_{B1} , is given by

$$w_{B1} = \max\{\exp[g(e, i, g, c, r) + \epsilon_f], w\}$$

Just as in the previous case, once a new labor income is given to every member of the economically active population, the per-capita family income and degree of poverty are recalculated. The contrast between the level of poverty obtained after the simulation and the original level indicates the impact of sectoral segmentation on poverty, according to Alternative B.

3.4 Impact of Unemployment.

Alternative A

Each unemployed worker receives an income equal to the average wage for all employed workers who have the same schooling, age, gender, race and geographical location plus an imputed residual, u_f . This residual is constructed as described in Subsection 3.2. As a consequence, each unemployed worker receives a wage w_{A2} equal to

$$w_{A2} = \exp[g(e, i, g, c, r) + u_f]$$

The income of all employed workers are set as in the previous subsection, i. e. ,

$$w_{A2} = \exp[g(e, i, g, c, r) + \epsilon_f]$$

Just as in the previous case, once a new labor income is given to every member of the economically active population, the per-capita family income and degree of poverty are recalculated. The contrast between the degree of poverty obtained after this simulation and the degree of poverty obtained from the previous simulation indicates the impact of unemployment on poverty, according to alternative A.

Alternative B

The treatment of the unemployed worker is the same as in the alternative A, i. e. , each unemployed worker receives a wage w_{B2} equal to

$$w_{B2} = \exp[g(e, i, g, c, r) + u_f]$$

The income of all employed workers are set as in Alternative B of the previous subsection, i. e. ,

$$w_{B2} = \max\{\exp[g(e, i, g, c, r) + \epsilon_f], w\}$$

Just as in the previous case, once a new labor income is given to every member of the economically active population, the per-capita family income and degree of poverty are recalculated. The contrast between the degree of poverty obtained after this simulation and that obtained from the previous simulation indicates the effect of unemployment on poverty, according to Alternative B.

3.5 Impact of Regional Segmentation.*Alternative A*

The income given to each unemployed worker is equal to the average wage of all workers with the same schooling, age, gender and race plus a imputed residual u_f . In sum, each unemployed worker is given a wage w_{A3} equal to

$$w_{A3} = \exp[h(e, i, g, c) + u_f]$$

Each employed worker is given the average wage for all workers with the same schooling, age, gender and race plus the residual of the complete regression. In this case the imputed wage, w_{A3} , is given by

$$w_{A3} = \exp[\mathbf{h}(e, i, g, c) + \epsilon_f]$$

Just as in the previous case, once a new labor income is given to every member of the economically active population, the per-capita family income and degree of poverty are recalculated. The contrast between the level of poverty obtained after the simulation and that obtained from the previous simulation indicates the impact of regional segmentation on poverty, according to alternative A.

Alternative B

The income given to each unemployed worker is equal to the average wage for all workers with the same schooling, age, gender and race plus a imputed residual u_f . In sum, each unemployed person is given a wage w_{B3} equal to

$$w_{B3} = \exp[\mathbf{h}(e, i, g, c) + u_f]$$

Each employed worker is given the maximum between his own wage and the sum of the average wage of workers with the same schooling, age, gender and race the residual of the complete regression ϵ_f . Hence, w_{B3} , is given by

$$w_{B3} = \max\{\exp[\mathbf{h}(e, i, g, c) + \epsilon_f], w\}$$

Just as in the previous case, once a new labor income is given to every member of the economically active population, the per-capita family income and degree of poverty are recalculated. The contrast between the poverty level obtained after the simulation and that obtained after the previous simulation indicates the impact of regional segmentation on poverty, according to Alternative B.

3.6 Impact of Discrimination.

The income given to each worker is based on the average wage of all workers with the same schooling and age. So the counterfactual compensations used in this step are w_{A^*} and w_{B^*} , already defined in Subsection 3.2. The impact of discrimination on poverty is then determined as a residual according to both alternatives. In order to do this, we contrast the level of poverty estimated after all labor market imperfections are eliminated with the resulting from the previous simulation.

3.7 Methodological Remarks.

The methodology described above can give rise to controversial issues that we would like to address here. First, we do not consider general equilibrium effects that may arise from each of the simulations. For example, we eliminate unemployment as a *caeteris paribus* exercise when this elimination would probably affect the wage level of the labor force. The incorporation of these effects, on the other hand, would enormously complicate the methodological description as well as the analysis of the results.

The second potential controversial issue is related to the order that we choose to present the impact of each of the imperfections. The results would probably differ if we changed this ordering. However, our ordination choice is based on a combination of data limitation and a theoretical argument. The household surveys (PNAD) we employ contain no information about the sector in which the unemployed individual is looking for a job. Therefore, the sectorial step must precede the unemployment step. Besides this, color and gender are the most exogenous characteristics among those associated to imperfections in the labor market. Hence discrimination should be the last imperfection analyzed, since color and gender should be included on the regression framework except when we analyze discrimination.

Finally, we would like to mention the possibility (which can occur even in Alternative B, where we increase the income of all those below the average) of poverty to increase with the elimination of some forms of labor-market imperfection. This possibility is a consequence of the fact that the average wage conditioned on a set of characteristics does not change monotonically with the number of elements of this set. Particularly it does not decrease monotonically as we diminish the number of characteristics of this set. The average wage for an individual conditioned on his characteristics can be higher when it is conditioned on $n - 1$ characteristics than when it is conditioned on n . For instance, when we eliminate discrimination, poverty may increase if the following inequality holds for a sufficient number of workers:

$$\exp(\mathbf{m}(e, i) + \epsilon_f) < w < \exp(\mathbf{h}(e, i, g, c) + \epsilon_f) \quad (1)$$

In this case,

$$w_{A3} = w_{B3} = \exp(\mathbf{h}(e, i, g, c) + \epsilon_f)$$

and

$$w_{A*} = \exp(\mathbf{m}(e, i) + \epsilon_f), w_{B*} = w$$

So we have that,

$$w_{A*} < w_{A3} \quad \text{and} \quad w_{B*} < w_{B3}$$

That is, when (1) holds for some individuals, their income after elimination of segmentation and discrimination (w_{A*} or w_{B*}) will be lower than if only segmentation were eliminated (w_{A3} or w_{B3}). In other words, in this case the elimination of discrimination would decrease

the income of these workers. This result implies that (if the opposite does not happen with a sufficient number of workers), poverty would increase when discrimination is eliminated.

4. Empirical Preliminaries.

In this section we introduce our data base and the basic empirical concepts we are going to use throughout this study.

4.1 Database Description.

The entire empirical analysis in this study is based on the Brazilian national household survey - PNAD. This survey is conducted annually by the Instituto Brasileiro de Geografia e Estatística (IBGE). We concentrate our analysis on the 1995 version of this survey, except in Section 6 where we analyze the temporal stability of the results. This survey covers the entire nation except the rural area of the North region⁷. Every year close to 100 thousand households are interviewed.

4.2 Poverty.

For the purposes of this study, poverty means insufficient monetary income. We classify a person as poor whenever his per-capita household income is lower than a pre-specified threshold, the poverty line⁸. Thus, to estimate the aggregate level of poverty, we need to specify a poverty line and a method to combine individual poverty into an overall index.

We used three alternative monthly wages for poverty lines: R\$ 25.00; R\$ 50.00 and R\$ 75.00. Although these are arbitrarily choices, the first value is similar to the one dollar per person per day poverty

⁷In fact, the survey does cover the rural area of Tocantins, which is located in the North region.

⁸We consider as member of the household those which are part of the family.

line used by the World Bank Reports [e. g. World Bank (1997)], among other studies⁹. In terms of the minimum wage prevailing at the date of the survey, the three values correspond respectively to hourly minimum wages of \$0.25; 0.50 and 0.75.

To group poverty into an aggregate index, we choose the three basic members of the Foster-Greer-Throbecke class of poverty measures, known as $P(\alpha)$, $\alpha = 0, 1, 2$. With three poverty lines and three poverty indices, we end up with nine poverty measures. For the sake of illustration, it is worth mentioning that the poverty level was 12% in 1995 according to the P1 index when a R\$50.00 poverty line is used. The poverty levels obtained according to the other eight alternatives are presented in Table 1.

Table 1: Brazilian Poverty level-1995

	Proportion of poor(P0)	Average income gap(P1)	Average squared income gap(P2)	%
R\$25 poverty line	12,0	5,5	4,1	
R\$50 poverty line	28,2	12,1	7,9	
R\$75 poverty line	40,1	19,2	12,4	

Source: Based on 'Pesquisa Nacional por Amostra de Domicílios' (PNAD) of 1995.

4.3 Categories.

To operationalize the concept of segmentation it is necessary to specify a partition of the labor market into segments potentially subject to segmentation. By the same token, to operationalize the concept of discrimination it is necessary to specify a partition of the labor market into demographic groups potentially subject to discrimination.

⁹The exchange rate in the last week of September (reference period for PNAD) was R\$0.95/US\$1.00.

In this study two types of segmentation are investigated: sectoral and regional segmentation. In the case of sectoral segmentation, we divide the labor market into two alternative partitions. The first partition decomposes the labor market into nine segments according to the nature of the economic activity. The second partition decomposes the labor market into four segments according to the nature of the employment relationship¹⁰.

In the case of regional segmentation, we also divide the labor market into two alternative partitions. The first partition decomposes the labor market into eighteen segments associated with the division of the country into states¹¹. The second partition separates the country by urban and rural areas.

To investigate discrimination, we divide the labor market into six demographic groups based on gender and race. For race we use three categories: white, mulattos, and blacks.

Finally, to operationalize the concepts of segmentation and discrimination it is necessary to specify how workers perfectly substitutes in production are going to be identified. In this study, as an approximation we assume that workers with identical schooling and age are perfect substitutes in production.

¹⁰The activities considered are: industry (excluded in the regression), traditional services, distributive services, productive services, social services, personal services, government activities, agriculture, construction, and a residual activity. The employment relationships are: employee with a formal contract, employee without a formal contract (informal employee), employer and self-employed.

¹¹The majority of these partitions correspond to individual states (the Federal District being counted as a state). The others group more than one state. We combine the eleven states located in the North and Mid-West regions into five groups. The same is done with the nine Northeastern states, which are redefined into six groups.

5. Empirical Evidence on Labor-Market Imperfections.

The objective of this section is to present some evidence on the magnitude of some basic forms of labor-market imperfection: unemployment, segmentation and discrimination. The first subsection presents basic statistics about unemployment in Brazil. Estimates of the degree of segmentation and discrimination are based on a wage regression. Accordingly, the second subsection describes this regression, while estimates of the degree of segmentation and discrimination are reported in the third and fourth subsections¹².

5.1 Unemployment.

The impact of eliminating unemployment on poverty depends on three factors: (a) the original unemployment rate, (b) the concentration of the unemployed among the poor, and (c) the income the unemployed would receive if they were employed. The lower the unemployment rate, the lower the concentration of the unemployed among the poor, and the lower the potential labor income of the unemployed the weaker will be the impact of eliminating unemployment on poverty.

In terms of magnitude, in 1995 the national unemployment rate was a moderate 6.7%¹³. In terms of the concentration among the poor, Figure 1 shows how the unemployed individuals are distributed along the percentiles of the income distribution. This figure reveals that

¹²The ideal information at this point of the analysis would be the average wage of each cell analyzed here. Unfortunately, this would be very troublesome due to the huge number of cells that we consider in our analysis. A complete description of these cells is reported in the next section.

¹³This is the unemployment rate computed for our sample (which does not consider other household members who are not a family member). The unemployment rate for the PNAD sample (widely used as the national unemployment rate) is 6.1%

30% of the unemployed are concentrated among the poorest 20%. Overall, this figure reveals that although the incidence of unemployment is certainly higher among the poor than among the non-poor, less than 50% of unemployed workers are living below the poverty line.

Another determinant of the impact of eliminating under-employment on poverty is the wage given to those who leave the status of unemployed. This means that even when there are many poor among the unemployed pool, the impact of eliminating this pool may be limited if they receive a very low wage in their jobs. According to the procedure described to simulate the wage given to those unemployed, they would have an average (per individual) labor income of R\$210.76. This is a high value compared to the R\$185.57 corresponding to the average labor income computed for employed persons in 1995. This result indicates that the characteristics associated with a

higher wage are more frequent among unemployed individuals than employed.

5.2 Wage Regression.

The fundamental ingredient to estimate the impact of labor market imperfections on poverty is a set of regressions of log-wages on individual and job characteristics as introduced in Subsection 3.1. Tables 2a and 2b display the estimated regression.

Table 2a: Relation between wage and individual characteristics

	Coefficient	P-value
<i>Intercept</i>	1,269	0,000
<i>Schooling</i>		
Illiterate	-1,695	0,000
1st grade	-1,671	0,000
2nd grade	-1,543	0,000
3rd grade	-1,489	0,000
4th grade	-1,367	0,000
5th grade	-1,304	0,000
6th grade	-1,256	0,000
7th grade	-1,216	0,000
8th grade	-1,099	0,000
9th grade	-1,101	0,000
10th grade	-0,997	0,000
11th grade	-0,755	0,000
12th grade	-0,525	0,000
13th grade	-0,485	0,000
14th grade	-0,374	0,000
<i>Age</i>		
Age	0,075	0,000
Age squared	-0,001	0,000
<i>Color/Gender</i>		
Man/mulattos	-0,109	0,000
Man/black	-0,173	0,000
Woman/white	-0,515	0,000
Woman/mulattos	-0,635	0,000
Woman/black	-0,583	0,000

Source: Based on 'Pesquisa Nacional por Amostra de Domicílios' (PNDA) of 1995.

Table 2b: Relation between wage and job characteristics

	Coefficient	P-value
Regions		
Sergipe/Alagoas	-0,470	0,000
Paraíba/Rio Grande do Norte	-0,683	0,000
Maranhão/Piauí	-0,852	0,000
Pará/Amapá	-0,367	0,000
Amazonas/Rondônia/Acre/Roraima	-0,178	0,000
Mato Grosso/Mato Grosso do Sul	-0,210	0,000
Goiás/Tocantins	-0,360	0,000
Rio de Janeiro	-0,292	0,000
Espírito Santo	-0,314	0,000
Minas Gerais	-0,369	0,000
Paraná	-0,274	0,000
Santa Catarina	-0,123	0,000
Rio Grande do Sul	-0,304	0,000
Bahia	-0,502	0,000
Pernambuco	-0,539	0,000
Ceará	-0,637	0,000
Distrito Federal	0,077	0,000
Rural	-0,190	0,000
Sectors		
Traditional services	-0,146	0,000
Construction	-0,033	0,003
Distributive services	-0,084	0,000
Productive services	0,013	0,286
Social services	-0,284	0,000
Personal services	-0,245	0,000
Government	-0,131	0,000
Agriculture	-0,351	0,000
Residual	-0,123	0,000
Informal employee	-0,264	0,000
Employer	0,747	0,000
Self-employed	-0,107	0,000

Source: Based on 'Pesquisa Nacional por Amostra de Domicílios' (PNDA) of 1995.

In this regressions, except for the age coefficients, all others can be interpreted as measures of log-wage differential between the category associated with the coefficient of the reference category¹⁴.

Concerning the impact of productive characteristics, the regression results indicate that wages increase monotonically with schooling¹⁵ and as a function of age have the traditional Mincerian inverted u-shape.

5.3 Segmentation and Discrimination.

With respect to sectoral segmentation, these tables corroborate most traditional results¹⁶. Industry and productive services are the economic activities associated with higher wages, while agriculture and personal and social services are those associated with lower wages. In terms of the type of employment relationship, these tables reveal that employers tend to have a higher income than employees and the self-employed. Among the employees and self-employed, the highest wages are among the formal employees, followed by the self-employed. Informal employees have the lowest wages.

As far as regional segmentation is concerned, these tables reveal that labor income tends to be lower in the Northeast. Wages are the highest in the Federal District, São Paulo, Rio de Janeiro and in the Southern states. The results for rural and urban areas confirm the usual pattern that rural areas are associated with lower wages.

Regarding discrimination, these tables indicate, as expected, that women earn less than men and that mulattos and blacks also earn less than whites. These table also corroborate results from other studies indicating small differences between mulattos and blacks.

¹⁴ Actually the coefficients are the difference between the respective logarithms of wages.

¹⁵ In fact wages for those who completed the 8th or 9th grades are very similar.

¹⁶ Barros and Mendonça (1996) present a valuable survey of these results.

6. The overall impact of under-utilization and under-remuneration on poverty.

This section describes the results obtained in relation to the overall impact on the degree of poverty of under-utilization and under-remuneration. However, the fact that these effects must be increased or reduced represents, ultimately, a relative question. For an easier assessment, in this section the magnitude of this impact is compared to that of other ways to reduce poverty. The comparison is done with three alternative ways to diminish poverty: (a) the effect on poverty of increasing the workforce's education; (b) that of a process of balanced economic growth; and (c) the impact of reductions in the degree of inequality.

6.1 Basic Results.

Table 3 presents the results of the effect of the various simulations on the level of poverty, considering Alternatives A and B. Based on this table, independent of the indicator chosen, elimination of unemployment, underemployment and discrimination in the labor market would have a relatively limited effect on poverty when Alternative A is chosen. On the other hand if Alternative B is chosen, the effects are more significant. This contrast is more evident for higher poverty lines.

Table 3: Overall impact of under-utilization and under-remuneration on poverty – 1995

	Proportion of poor(P0)	Average income gap(P1)	Average squared income gap(P2)
<i>R\$25 poverty line</i>			
Observed values	12,0	5,5	4,1
Simulated Values			
<i>Everyone to the mean(A)</i>	8,4	3,7	2,6
<i>Moving only</i>			
<i>those below the mean(B)</i>	7,3	3,3	2,4
<i>R\$50 poverty line</i>			
Observed values	28,2	12,1	7,9
Simulated Values			
<i>Everyone to the mean(A)</i>	23,3	9,6	5,8
<i>Moving only</i>			
<i>those below the mean(B)</i>	20,1	8,1	5,0
<i>R\$75 poverty line</i>			
Observed values	40,1	19,2	12,4
Simulated Values			
<i>Everyone to the mean(A)</i>	37,0	16,5	9,9
<i>Moving only</i>			
<i>those below the mean(B)</i>	31,9	14,0	8,5

Source: Based on 'Pesquisa Nacional por Amostra de Domicílios'(PNAD) of 1995.

For instance, when using a R\$25.00 poverty line, it is assumed that the proportion of poor would drop from 12% to 7.3% or 8.4%, according to the alternative chosen to eliminate unemployment, under-employment and discrimination in the labor market. The average poverty gap would drop from 5.5% to 3.3% or 3.7%. If we use a R\$75.00 poverty line, the proportion of poor would drop from 40%

to 32% or 37% and the average poverty gap would drop from 19% to 14% or 16.5% according to the alternative chosen.

The results reveal that the importance of the impact on poverty of eliminating under-utilization and under-remuneration of human resources depends on the way we define proper utilization and remuneration. Here we mention results for the P1 indicator and a R\$50.00 poverty line. Analogous results for other indicators and poverty lines are available in the Appendix Tables.

6.2 The Impact of Education.

Figures 2a and 2b demonstrate a series of simulations which permit the comparison of the effect of eliminating unemployment, under-employment and discrimination with the impact of an increase in education. The highest horizontal line presents the poverty level in Brazil in 1995, while the others reveal how poverty would be if all unemployment, underemployment and discrimination were eliminated according to both alternatives (A and B descending). This information was taken from Table 3.

The bars of the figures show how the degree of poverty in Brazil would be affected with an increase in the labor force's education. Two procedures are used to increase the level of education. The first is based on 15 cumulative steps and in each step all workers with less than 15 years of education (full university education) receive one year of extra study.

The results for some of these simulations (the 1st, 3rd, 5th and 10th steps) are reported in Figure 2a. The impact associated with Alternative A is comparable to that resulting from a three-year increase in the schooling level of everyone. Table A 2a in the Appendix extends these results to the other poverty measures. Alternative B, as one would expect, is comparable to a higher increase in educational level. The impact on poverty associated with this alternative is higher than the one obtained by increasing the schooling level by five years.

The second procedure is also based on 15 cumulative steps, but now in each step only workers with the lowest level of education are raised to the level immediately above. In this case, anyone with no schooling moves to one year of study, in the next step everyone with one

year of schooling moves to two years and so on until they all have at least 15 years of education. Figure 2b reports the results for the 1st, 4th, 8th, 11th and 15th steps, while Table A 2b extend them to all poverty measures. The outcome of this simulation shows that the effect of eliminating the imperfections of the labor market is equal to guaranteeing everyone something more than the first four years of basic education (4th grade) or the first eight years (middle education - 8th grade) according to the alternative chosen to eliminate the imperfections.

6.3 The Impact of Neutral Economic Growth.

Figure 3 shows a series of simulations which permit the comparison of the impact of eliminating unemployment, underemployment and discrimination with that of a process of neutral economic growth. Once more the highest horizontal line gives the 1995 poverty level in Brazil, while the other two reveal how poverty would be if all unemployment, underemployment and discrimination were eliminated according to the alternative implemented. This information was taken from Table 3.

The bars on this figure show how the degree of poverty in Brazil would be affected by a process of neutral growth from the distribution point of view. To obtain the impact of economic growth, the average income of 1995 is increased by 10%, 20%,..., 50% and the resulting degree of poverty is recalculated.

The outcome of this simulation indicates (see Figure 3) that the comparison of the impact of eliminating imperfections in the labor market with the impact of neutral (from the distribution point of view) economic growth is sensitive to the alternative implemented. The impact associated with Alternative A is comparable to the one obtained through a 20% rate of economic growth, while a 40% rate is comparable with Alternative B¹⁷. Table A3 extends the results to other poverty measures.

6.4 The Impact of Inequality.

Figure 4 shows a series of simulations which permit comparison of the impact of eliminating unemployment, underemployment and discrimination with that of reducing the degree of inequality. The bars of the figure shows the degree of poverty in Brazil if the total amount of resources were equal Brazil's but the form of its distribution were like that of another Latin American country. The degree of poverty varies according to the country chosen for comparison¹⁸. As already mentioned for previous figures, the highest horizontal line gives the 1995 poverty level in Brazil, while the other two reveal how poverty

¹⁷The 40% rate of economic growth is comparable to what Brazil had from 1970 to 1973, years with the highest growth rates in the post-war period.

¹⁸In fact, we approximate the income distribution by the income share associated to each decile. This information combined with Brazilian average income gives us the average income of each decile according to the alternative income distributions considered. A linear interpolation for the income between consecutive deciles is then enough to provide us the P0 under the alternatives considered.

would be if all unemployment, underemployment and discrimination were eliminated according to the alternative implemented¹⁹. This information was taken from Table 3.

This figure also shows that the impact on poverty of eliminating all the imperfections of the labor market is equal to that which would be obtained using a redistribution program which would lead to a drop in income inequality in Brazil, to the extent of becoming comparable to the level experienced by Mexico or Honduras, according to the alternative implemented. It is worth mentioning that both countries have a higher degree of inequality than the South American countries in the figure²⁰. Table A4 extends the results to other poverty lines.

¹⁹Due to methodology limitation, we have to use P0 as the poverty measure in these simulations. Also due to the methodology employed, the observed value for the poverty level does not correspond to the one previously reported in Figures 2 and 3.

²⁰For the sake of illustration, the Gini index for Brazil was 0.63, while for Honduras and Mexico we had 0.53 and 0.50 respectively [see the World Bank (1997)].

7. Breaking Down the overall effect.

This section shows the breakdown of the impact of eliminating flaws in the labor market on poverty, separating the effect of unemployment, sector and regional segmentation and discrimination.

7.1 The Effect of Sectorial Segmentation.

According to Figure 5, the elimination of sectorial segmentation among those employed has a very limited influence on poverty when Alternative A is implemented (P1 stays around 12%). The analogous simulation based on Alternative B shows a higher impact, but still not very significant. As Figure 5b shows, P1 moves from 12.1% to 11.2%. This greater effect on poverty associated with Alternative B was expected since according to this alternative, we give the average remuneration only for those whose original remuneration was below the mean. Table A 5a extends these results to all poverty measures, according to both alternatives.

Relative to the overall impact on poverty, the one registered for sectorial segmentation is one of the two least significant ones according to both alternatives. Figures 5c and 5d display these relative impacts for Alternative A and B respectively, while Table A 5b extends these results to all poverty measures, according to both alternatives.

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**Figure 5b: Poverty level registered for the various stages in eliminating under-utilization and under-remuneration
Alternative B -1995**

Source: Owns on the Pesquisa Nacional por Amostra de Domicílios (PNAD) of 1991

**Figure 5c: Relative impact on poverty of various stages in eliminating under-utilization and under-remuneration
Alternative A -1995**

Source: Based on the Pesquisa Nacional por Amostra de Domicílios (PNAD) of 1991.

**Figure 5d: Relative impact on poverty of various stages in eliminating under-utilization and under-remuneration
Alternative B -1995**

Source: Based on the Pesquisa Nacional por Amostra de Domicílios (PNAD) of 1991

7.2 The Effect of Unemployment.

Figures 5a and 5b also show that the elimination of unemployment in a non-segmented labor market has a significantly higher impact than the elimination of sectorial segmentation among the employed, but still limited in absolute terms. The poverty level moves from 11.9% to 10.2% if we use Alternative A and from 11.2% to 9.5% for Alternative B. So, despite the 6.7% unemployment rate in 1995, the inclusion of this whole contingent in the employed population would have an impact lower than 2 percentage points on the average income gap, which can be considered relatively small in absolute terms.

It is worth mentioning that both alternatives are associated with a drop of 1.7 percentage points in P1. In relative terms, elimination of unemployment represents around 70% of the effect of eliminating all forms of under-utilization and under-remuneration of human resources in the labor market according to Alternative A (see Figure 5c). The analogous proportion obtained from Alternative B is 42% (see Figure 5d). Table A 5a extends these results to all other poverty measures computed.

So, the impact of eliminating unemployment is limited in absolute terms, as is the overall effect of under-utilization and under-remuneration. On the other hand, in relative terms it represents the major form of under-utilization and under-remuneration of human resources.

7.3 The Effect of Regional Segmentation.

Figures 5a and 5b also show the impact of regional segmentation on poverty. Figure 5a shows a limited drop of only 1 percentage point, falling from 10.2% to 9.1% in average income gap according to Alternative A, and Figure 5b shows an analogous drop from 9.5% to 8.2% for Alternative B²¹.

²¹ Actually this result may depend on the sequence chosen in the simulation (first we eliminate

In relative terms, regional segmentation also represents one of the main sources of imperfection in the labor market, since its impact is close to 42%, according to Alternative A, and 33.6% for Alternative B, of the impact on poverty after the elimination of all kinds of imperfection in the labor market (see Figures 5c and 5d). Table A5a extends these results to all other poverty measures computed, in absolute and relative terms respectively.

7.4 The Effect of Discrimination.

Figures 5a and 5b also help in assessing the effect on poverty of gender and race sex and race discrimination in the labor market. In the case of discrimination, the elimination of this imperfection does not show a significant improvement in the poverty level in either alternative. Actually, eliminating discrimination under Alternative A significantly increases poverty, from 9.1% to 9.6%, as shown in Figure 5a. According to Alternative B, the effect is negligible, with the poverty level dropping only slightly from 8.2% to 8.1%, as shown in Figure 5b. The same negative and significant pattern according to Alternative A prevails in relative terms, as well as the insignificant result for Alternative B (see Figures 5c and 5d for these results).

8. Time Sensitivity.

In order to ascertain to what extent this labor market influence on poverty is a structural characteristic of Brazilian society, the 1987 PNAD is used to obtain the corresponding results²². Figure 6a shows that the overall impact of our simulation for 1987 produces similar results to those for 1995 according to Alternative B. The overall

sectorial segmentation, then eliminate regional segmentation, and finally discrimination).

²²PNADs from 1990 to the present do not investigate duration of unemployment. Some of the PNDAs before 1990 do not consider the color of the individuals. So the 1987 PNAD is one of the few available alternatives that contain all the information we need.

impact for both years is close to 3 percentage points. On the other hand, according to Alternative A, the impact is lower in 1987 (see other poverty measures in Table A6 for 1987 outcome and Table 3 for 1995 results).

According to Figures 6b and 6c, the impacts of regional segmentation and especially discrimination are responsible for the different results according to Alternative A, but similar according to Alternative B (see Figures 5a and 5b for the 1995 results). The results attributed to discrimination are both negative for 1987, which suggests an atypical impact of the elimination of this imperfection during a context of relative low poverty levels. Finally, the elimination of unemployment has a more limited impact on poverty in 1987, according to both alternatives, as was expected, since the unemployment rate was lower that year than in 1995. These partitioned results for the impact on poverty in 1987 are illustrated for other poverty measures in Table A7a and can be compared to the 1995 ones reported in Table A 5a.

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Figure 6b: Poverty level registered for the various stages in eliminating under utilization and under remuneration: alternative A - 1987

Source: Based on Pesquisa Nacional por Amostra de Domicílios (PNAD) of 1987

Figure 6c: Poverty level registered for the various stages in eliminating under utilization and under remuneration: alternative B - 1987

Source: Based on Pesquisa Nacional por Amostra de Domicílios (PNAD) of 1987

The 1987 PNAD also allows us to adopt an alternative relation between unemployment and under-utilization. This alternative, as already described, considers the short-run spells of unemployment compatible with an efficient use of human resources. So, instead of eliminating all the unemployment, this procedure eliminates the unemployment with duration longer than three months.

Table A1 shows the basic unemployment statistics, related to their effect on poverty, for both sets of unemployed individuals considered (besides the analogous numbers for 1995 already mentioned in Subsection 4.3). The unemployment rate was 3.6% for the whole contingent and 2.6% for those with longer duration. These numbers are three and four percentage points lower than those registered in 1995. Other characteristics of unemployment seem not to be much different than what we had for 1995. For example, the concentration of unemployed individuals among the first quintile of the income distribution was near 28% (all unemployed) and 29% (those with longer duration) in 1987, only two or one percentage points lower than the number computed for 1995.

Figure 6a allows a comparison between the two alternative procedures to eliminate unemployment. We can see that the overall impact on poverty is only slightly larger when all unemployment is eliminated (see Table A6 for other poverty measures). This result suggests that our basic results for 1995 are not overestimated, even if someone believes that the correct relation between unemployment and under-utilization is the last one described.

9. Regional Sensitivity.

In the two previous sections, the impact of labor market inefficiencies on poverty level was investigated for Brazil as a whole. However, these imperfections can acquire a differentiated importance according to the degree of regional development. This section offers some

evidence in this respect, to the extent that it shows estimations of the impact of inefficiencies of the labor market on poverty in two sub-samples corresponding to the Northeast and Southeast regions. These estimates are shown in Figures 7a and 7b, for Alternatives A and B respectively, and extended to all poverty measures computed in Tables A 8a and A 8b.

These figures first show that, according to Alternative A, even in absolute terms the effect of the inefficiencies in the labor market tends to be higher in the Southeast than in the Northeast (2.0 and 1.3 percentage points, respectively). On the other hand, we can see that according to Alternative B, the impact tends to be higher in the Northeast than in the Southeast in absolute values. Relative to the initial poverty level, the impact in the Southeast can still be considered higher, even by this alternative.

In terms of the contribution of various parts of labor-market imperfections, Figures 7c and 7d show clear-cut regional differences and similarities. First, according to Alternative A, in relative terms the pattern registered for the Southeast is similar to the national one. On the other hand, the effects of the elimination of unemployment and discrimination are much more pronounced in the Northeast than in the Southeast. According to Alternative B, the relative impacts are shown to be more similar between the two regions, but still there are some differences that are worth noting. The impact of sectoral segmentation is shown to be higher in the Northeast than in the Southeast, in relative terms, while the impact of unemployment is shown to be more important in the Southeast. Extensions to all other poverty measures computed are displayed in Tables A 8c and A 8b.

Figure 7c: Relative impact of various stages of eliminating under-utilization and under-remuneration on poverty - Alternative A - 1995

Source: Based on the 'Pesquisa Nacional por Amostra de Domicílios' (PNAD) of 1995.

Figure 7d: Relative impact of various stages of eliminating under-utilization and under-remuneration on poverty - Alternative B - 1995

Source: Based on the 'Pesquisa Nacional por Amostra de Domicílios' (PNAD) of 1995.

10. Conclusion.

A natural candidate to take the blame for Brazil's poverty rate is the poor operation of the labor market, in terms of under-remuneration and under-utilization of the labor force. When this possibility was investigated for Brazil in 1995, it was found that if the conditions of the average segment of the Brazilian labor market were extended to all segments, the effect on poverty would not be very significant (the average income gap would drop from the observed 12.1% to 9.6%). Even if this condition were extended only to those below the mean, the effect on poverty would not be so great (P1 would drop to 8.1%).

Compared to other alternative policies to reduce the poverty level, these results are equivalent to an increase of 20% or 40% in the average income, or a redistribution of income in order to afford the same pattern as those registered for Mexico or Honduras (depending on the alternative implemented). The results were also compared to those obtained by simulations of two alternative educational policies. According to these comparisons, the results obtained by labor market simulation are equivalent to the simulated impact of a three or five years' increase in the labor force's schooling level. Alternatively, targeting the educational policy guaranteeing at least the first four or eight years of education to the labor force would generate similar results.

Among the items involving under-remuneration and under-utilization of labor, it is worth mentioning that the effect of unemployment is extremely limited in absolute terms, although in relative terms it has greatest effect on poverty. These results are maintained for both regional sub-samples analyzed: the Northeast and Southeast regions.

The stability of these results for other years seems to depend on which alternative we consider to simulate the impact of labor-market

imperfections on poverty. If we extend the average condition to everyone, the impact registered in 1987 is much more limited than the one for 1995.

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References

- Barros, R.P. de, Camargo, J.M. & Mendonça, R. 1995 "Pobreza, estrutura familiar e trabalho". *O Trabalho no Brasil no Limiar do Século XXI*. São Paulo : Ltrs, 138–168.
- Barros, R.P. de & Mendonça, R. 1996 "Os determinantes da desigualdade no Brasil". *A Economia Brasileira em Perspectiva – 1996*. IPEA, Rio de Janeiro : 421–474.
- Ferreira, F.F.G. & Barros, R.P. de. 1999 "The slippery slope: explaining the increase in extreme poverty in urban Brazil, 1976–1996". Rio de Janeiro : IPEA, mimeo.
- Husmanns, R., Mehran, F. & Verma, V. 1990 "Surveys of economically active population, employment, unemployment and underemployment; an ILO manual on concepts and methods". Geneva : ILO, 409p.
- ILO. 1995 "Underemployment: concept and measurement. *Meeting of Experts on Labour Statistics*. Geneva, 77p.
- Langoni C. 1973 "Distribuição de renda e desenvolvimento econômico do Brasil". Rio de Janeiro : Expressão e Cultura, 58–63.
- Pastore, J, Zylberstajn, H. & Pagotto, C.S. 1983 "Mudança social e pobreza no Brasil 1970–1980 (O que ocorreu com a família brasileira?)". São Paulo : Economic Studies – Fipe/Pioneira.
- Reis, J.G.A dos & Barros, R.P.de. 1991 "Wage inequality and the distribution of education: a study of the evolution of regional

differences in inequality in metropolitan Brazil. *Journal of Development Economics* **36**:117–143.

World Bank. 1997 World Development Indicators. Washington, 339p.

APPENDIX

Valuing residual terms for the unemployed

This appendix describes how to introduce a component related to unobserved characteristics in the estimated income for unemployed individuals. This problem has a trivial solution for those employed, which consists of using the residuals estimated through a regression based on observable characteristics such as those described in Subsection 3.1. As the regressions estimate residuals only for those who are employed, the solution for this problem is not so trivial for those who are unemployed.

The crucial assumption of the procedure implemented is that the distribution of these residual terms for both groups (employed and unemployed) is very similar. It means that we are considering an overall effect on wages of all other variables not included on the regression, independent to the group to which the individual belongs. So, the procedure consists of taking values from the estimated residual of the regression based on observed variables for those employed. The procedure is based on five steps, described below.

- (a) Create 200 partitions, with each one containing $1/200$ of the estimated residual observations for employed persons (ϵ_f). The observations should be sorted according to the respective values before the partition.
- (b) Associate a random value to each unemployed individual.
- (c) Sort the unemployed individuals according to their random value.

(d) Create 200 partitions containing, each one, 1/200 of the unemployed individuals.

(e) Associate to each unemployed individual the average of the residuals contained in his corresponding partition. This value corresponds to his imputed residual (u_f). That is, if the unemployed individual belongs to the first partition of the unemployed distribution, we give him the average number of the residuals contained in the first partition of the residuals distribution.

Table A1: Estimation of under-employment magnitude
and its potential impact on poverty

	Years		
	1987	1987	1995
	(3 months)		
Unemployment rate	2,63	3,63	6,67
Proportion of unemployed among the first quintile $I^*(0.20)$	28,81	27,79	30,00

Source: Based on the 'Pesquisa Nacional por Amostra de Domicílios' (PNDA) of 1987 and 1995.

Table A2a: Comparison between the impact of eliminating under-utilization
and under remuneration with the generalized increase in schooling – 1995

	R\$25 poverty line			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Observed values	12,0	5,5	4,1	
Simulated values				
Everyone to the mean(A)	8,4	3,7	2,6	
Moving only those below the mean(B)	7,3	3,3	2,4	
+1 year of education	10,4	5,3	3,9	
+3 years of education	9,0	4,6	3,6	
+5 years of education	7,5	4,2	3,4	
+10 years of education	5,2	3,4	3,0	

Source: Based on the 'Pesquisa Nacional por Amostra de Domicílios' (PNAD) of 1995.

R\$50 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	28,2	12,1	7,9
Simulated values			
Everyone to the mean(A)	23,3	9,6	5,8
Moving only those below the mean(B)	20,1	8,1	5,0
+1 year of education	24,9	11,4	7,4
+3 years of education	22,0	9,8	6,4
+5 years of education	18,8	8,4	5,6
+10 years of education	11,3	5,6	4,1

R\$75 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	40,1	19,2	12,4
Simulated values			
Everyone to the mean(A)	37,0	16,5	9,9
Moving only those below the mean(B)	31,9	14,0	8,5
+1 year of education	37,3	18,1	11,7
+3 years of education	33,3	15,8	10,1
+5 years of education	29,1	13,5	8,7
+10 years of education	18,0	8,6	5,8

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Table A2b: Comparison between the impact of eliminating under-utilization
and under remuneration with the restricted increase in schooling-1995

		R\$25 poverty line		%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Observed values	12,0	5,5	4,1	
Simulated values				
Everyone to the mean(A)	8,4	3,7	2,6	
Moving only those below the mean(B)	7,3	3,3	2,4	
Reading & writing	11,6	5,5	4,0	
Primary	9,5	4,7	3,6	
Middle	7,2	4,0	3,3	
Secondary	5,4	3,4	3,0	
University	3,8	2,9	2,7	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

		R\$50 poverty line	
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	28,2	12,1	7,9
Simulated values			
Everyone to the mean(A)	23,3	9,6	5,8
Moving only those below the mean(B)	20,1	8,1	5,0
Reading & writing	27,5	12,0	7,8
Primary	24,7	10,4	6,7
Middle	19,3	8,2	5,5
Secondary	13,2	6,0	4,3
University	6,9	3,9	3,3

	Proportion of poor(P0)	R\$75 poverty line	
		Average income gap(P1)	Average square income gap(P2)
Observed values	40,1	19,2	12,4
Simulated values			
Everyone to the mean(A)	37,0	16,5	9,9
Moving only those below the mean(B)	31,9	14,0	8,5
Reading & writing	39,4	19,1	12,3
Primary	36,8	17,1	10,8
Middle	31,2	13,8	8,6
Secondary	22,7	9,9	6,4
University	10,3	5,4	4,1

Table A3: Comparison between the impact of eliminating under-utilization
and under remuneration with the rise in economic growth-1995

	Proportion of poor(P0)	R\$25 poverty line		%
		Average income gap(P1)	Average square income gap(P2)	
Observed values	12,0	5,5	4,1	
Simulated values				
Everyone to the mean(A)	8,4	3,7	2,6	
Moving only those below the mean(B)	7,3	3,3	2,4	
+10%growth	9,7	5,0	3,8	
+20%growth	9,0	4,7	3,6	
+30%growth	7,6	4,3	3,5	
+40%growth	7,2	4,1	3,3	
+50%growth	6,9	3,9	3,2	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

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R\$50 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	28,2	12,1	7,9
Simulated values			
Everyone to the mean(A)	23,3	9,6	5,8
Moving only those below the mean(B)	20,1	8,1	5,0
+10%growth	23,4	10,9	7,1
+20%growth	21,7	9,9	6,5
+30%growth	19,5	9,0	5,9
+40%growth	17,9	8,2	5,5
+50%growth	17,0	7,6	5,2

R\$75 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	40,1	19,2	12,4
Simulated values			
Everyone to the mean(A)	37,0	16,5	9,9
Moving only those below the mean(B)	31,9	14,0	8,5
+10%growth	36,4	17,4	11,1
+20%growth	33,7	15,8	10,1
+30%growth	30,8	14,4	9,2
+40%growth	29,2	13,2	8,5
+50%growth	28,2	12,1	7,9

Table A4: Comparison between the impact of eliminating under-utilization and under remuneration with reductions in inequality of income
Proportion of population below the poverty line

Income distribution alternatives	Poverty line—in minimum wages			%
	R\$25	R\$50	R\$75	
Observed values	13,0	30,5	40,0	
Simulated values				
Everyone to the mean(A)	8,4	23,3	37,0	
Moving only those below the mean(B)	7,3	20,1	31,9	
Guatemala	12,0	25,6	37,6	
Panama	12,3	23,7	34,9	
Honduras	8,7	23,2	37,6	
Mexico	6,3	19,0	31,9	
Chile	4,4	17,2	33,5	
Colombia	6,1	16,7	30,4	
Bolivia	6,0	15,6	28,2	
Dominican Republic	3,8	13,5	27,6	
Costa Rica	5,2	12,9	22,2	
El Salvador	4,1	11,4	20,7	
Venezuela	3,6	10,4	20,4	
Uruguay	3,1	8,2	17,6	

Source:Based on the 1992 World Bank data and the 'Pesquisa Nacional por Amostra de Domicílios(PNDA)of 1995

* The observed values do not correspond exactly to those reported in previous tables due to methodological problems.

Note:The income distributions refer to 1989.

Table A5a: Poverty level registered for the various stages
in eliminating under-utilization and under-remuneration—1995

	R\$25 poverty line			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Observed values	12,0	5,5	4,1	
Simulated values				
Everyone to the mean(A)				
Sectorial Segmentation	11,0	5,4	4,0	
Unemployment and sectorial segmentation	9,3	4,1	2,8	
Unemployment,sectoral and regional segmentations	7,9	3,5	2,5	
Unemployment,sectoral®ional segmentations and discrimination	8,4	3,7	2,6	
Moving only those below the mean(B)	10,4	5,1	3,8	
Sectorial segmentation				
Unemployment and sectoral segmentation	8,8	3,9	2,7	
Unemployment,sectoral and regional segmentations	7,2	3,2	2,3	
Unemployment,sectoral®ional segmentations and discrimination	7,3	3,3	2,4	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

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R\$50 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	28,2	12,1	7,9
Simulated values			
Everyone to the mean(A)			
Sectorial Segmentation	26,6	11,9	7,7
Unemployment and sectorial segmentation	24,0	10,2	6,2
Unemployment,sectoral and regional segmentations	22,5	9,1	5,5
Unemployment,sectoral®ional segmentations and discrimination	23,3	9,6	5,8
Moving only those below the mean(B)			
Sectorial segmentation	25,3	11,2	7,2
Unemployment and sectorial segmentation	22,7	9,5	5,8
Unemployment,sectoral and regional segmentations	20,5	8,2	5,0
Unemployment,sectoral®ional segmentations and discrimination	20,1	8,1	5,0
R\$75 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	40,1	19,2	12,4
Simulated values			
Everyone to the mean(A)			
Sectorial Segmentation	39,4	19,0	12,1
Unemployment and sectorial segmentation	36,5	16,9	10,4
Unemployment,sectoral and regional segmentations	36,1	15,9	9,5
Unemployment,sectoral®ional segmentations and discrimination	37,0	16,5	9,9
Moving only those below the mean(B)			
Sectorial segmentation	37,5	17,9	11,4
Unemployment and sectorial segmentation	34,8	15,9	9,8
Unemployment,sectoral and regional segmentations	32,7	14,2	8,5
Unemployment,sectoral®ional segmentations and discrimination	31,9	14,0	8,5

Table A5b: Relative impact of various stages
in eliminating under-utilization and under-remuneration-1995

Impact	R\$25 poverty line			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Everyone to the mean(A)				
Sectorial Segmentation	28,2	8,3	6,4	
Unemployment and sectorial segmentation	48,3	70,6	78,0	
Unemployment,sectoral and regional segmentations	38,1	32,8	22,6	
Unemployment,sectoral®ional segmentations and discrimination	-14,6	-11,8	-7,1	
Total	100	100	100	
Moving only those below the mean(B)				
Sectorial segmentation	33,0	17,8	12,5	
Unemployment and sectorial segmentation	35,4	55,6	68,0	
Unemployment,sectoral and regional segmentations	32,6	28,2	20,8	
Unemployment,sectoral®ional segmentations and discrimination	-1,0	-1,6	-1,4	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

Impact	R\$50 poverty line		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Everyone to the mean(A)			
Sectorial Segmentation	33,0	8,2	9,5
Unemployment and sectorial segmentation	53,7	69,0	69,0
Unemployment,sectoral and regional segmentations	30,3	42,0	36,3
Unemployment,sectoral®ional segmentations and discrimination	-17,0	-19,2	-14,8
Total	100	100	100
Moving only those below the mean(B)			
Sectorial segmentation	35,5	23,7	21,3
Unemployment and sectorial segmentation	31,5	41,7	48,5
Unemployment,sectoral and regional segmentations	27,8	33,6	30,7
Unemployment,sectoral®ional segmentations and discrimination	5,1	1,0	-0,6
Total	100	100	100

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Impact	R\$75 poverty line		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Everyone to the mean(A)			
Sectorial Segmentation	22,0	8,3	9,5
Unemployment and sectorial segmentation	91,9	75,9	70,4
Unemployment,sectoral and regional segmentations	12,4	37,2	38,2
Unemployment,sectoral®ional segmentations and discrimination	-26,3	-21,5	-18,1
Total	100	100	100
Moving only those below the mean(B)			
Sectorial segmentation	30,7	25,1	23,8
Unemployment and sectorial segmentation	33,4	38,1	42,3
Unemployment,sectoral and regional segmentations	25,2	31,6	31,8
Unemployment,sectoral®ional segmentations and discrimination	10,7	5,2	2,2
Total	100	100	100

Table A6: Overall impact of under-utilization and under-remuneration on poverty –1987

	%		
	Proportion of poor(P0)	Average income gap(P1)	Average squared income gap(P2)
R\$ 25 poverty line			
Observed values	10,5	4,5	2,9
Simulated values			
Everyone to the mean(A)			
Moving only those below the mean(B)	7,3	2,9	1,8
<i>Not considering short-term unemployment</i>			
Everyone to the mean(A)	9,0	3,6	2,2
Moving only those below the mean(B)	7,4	3,1	1,9

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

R\$ 50 poverty line			
Observed values	26,6	11,7	7,0
Simulated values			
<i>Considering all unemployment</i>			
Everyone to the mean(A)	25,2	10,3	5,8
Moving only those below the mean(B)	20,8	8,5	4,9
<i>Not considering short-term unemployment</i>			
Everyone to the mean(A)	25,6	10,5	6,0
Moving only those below the mean(B)	21,1	8,7	5,0
R\$ 75 poverty line			
Observed values	39,9	19,9	11,8
Simulated values			
<i>Considering all unemployment</i>			
Everyone to the mean(A)	39,6	17,8	10,5
Moving only those below the mean(B)	33,2	14,8	8,8
<i>Not considering short-term unemployment</i>			
Everyone to the mean(A)	40,0	18,1	10,8
Moving only those below the mean(B)	33,6	15,1	9,0

Table A7a: Poverty level registered for the various stages
in eliminating under-utilization and under-remuneration-1987

%

R\$25 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	10,5	4,5	2,9
Simulated values			
Everyone to the mean(A)			
Sectorial Segmentation	8,2	3,6	2,4
Unemployment and sectorial segmentation	7,3	2,9	1,8
Unemployment,sectoral and regional segmentations	7,6	3,0	1,8
Unemployment,sectoral®ional segmentations and discrimination	8,9	3,4	2,0
Moving only those below the mean(B)			
Sectorial segmentation	7,9	3,5	2,4
Unemployment and sectorial segmentation	7,0	2,8	1,7
Unemployment,sectoral and regional segmentations	6,9	2,7	1,7
Unemployment,sectoral®ional segmentations and discrimination	7,3	2,9	1,8

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1987.

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R\$50 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	26,6	11,7	7,0
Simulated values			
Everyone to the mean(A)			
Sectorial Segmentation	23,4	9,8	5,7
Unemployment and sectorial segmentation	22,0	8,8	5,0
Unemployment,sectoral and regional segmentations	23,3	9,2	5,1
Unemployment,sectoral®ional segmentations and discrimination	25,2	10,3	5,8
Moving only those below the mean(B)			
Sectorial segmentation	22,3	9,3	5,5
Unemployment and sectorial segmentation	21,0	8,4	4,8
Unemployment,sectoral and regional segmentations	20,8	8,3	4,7
Unemployment,sectoral®ional segmentations and discrimination	20,8	8,5	4,9
R\$75 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	39,9	19,0	11,8
Simulated values			
Everyone to the mean(A)			
Sectorial Segmentation	37,3	16,8	10,1
Unemployment and sectorial segmentation	35,7	15,6	9,1
Unemployment,sectoral and regional segmentations	37,7	16,5	9,6
Unemployment,sectoral®ional segmentations and discrimination	39,6	17,8	10,5
Moving only those below the mean(B)			
Sectorial segmentation	35,5	16,0	9,6
Unemployment and sectorial segmentation	34,0	14,9	8,7
Unemployment,sectoral and regional segmentations	33,6	14,7	8,6
Unemployment,sectoral®ional segmentations and discrimination	33,2	14,8	8,8

Table A7b: Relative impact of various stages in eliminating under-utilization and under-remuneration-1987 with all unemployment

Impact	R\$25 poverty line			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Everyone to the mean(A)				
Sectorial Segmentation	137,7	83,3	55,9	
Unemployment and sectorial segmentation	54,3	60,5	69,2	
Unemployment,sectoral and regional segmentations	-18,9	-6,6	-2,7	
Unemployment,sectoral®ional segmentations and discrimination	-73,1	-37,3	-22,4	
Total	100	100	100	
Moving only those below the mean(B)				
Sectorial segmentation	81,5	64,3	48,5	
Unemployment and sectorial segmentation	26,6	41,7	54,9	
Unemployment,sectoral and regional segmentations	3,4	3,5	3,2	
Unemployment,sectoral®ional segmentations and discrimination	-11,5	-9,5	-6,6	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1987.

Impact	R\$50 poverty line		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Everyone to the mean(A)			
Sectorial Segmentation	230,5	137,2	105,4
Unemployment and sectorial segmentation	103,6	67,4	63,7
Unemployment,sectoral and regional segmentations	-97,1	-28,2	-15,1
Unemployment,sectoral®ional segmentations and discrimination	-137,1	-76,4	-54,1
Total	100	100	100
Moving only those below the mean(B)			
Sectorial segmentation	74,1	74,4	69,6
Unemployment and sectorial segmentation	23,4	28,7	35,0
Unemployment,sectoral and regional segmentations	2,7	4,5	4,2
Unemployment,sectoral®ional segmentations and discrimination	-0,2	-7,6	-8,8
Total	100	100	100

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Impact	R\$75 poverty line		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Everyone to the mean(A)			
Sectorial Segmentation	710,0	187,1	138,0
Unemployment and sectorial segmentation	432,2	94,2	73,0
Unemployment,sectoral and regional segmentations	-547,6	-71,0	-34,5
Unemployment,sectoral®ional segmentations and discrimination	-494,6	-110,3	-76,6
Total	100	1.00	100
Moving only those below the mean(B)			
Sectorial segmentation	66,5	72,7	72,3
Unemployment and sectorial segmentation	22,2	26,1	29,6
Unemployment,sectoral and regional segmentations	5,2	3,8	4,0
Unemployment,sectoral®ional segmentations and discrimination	6,1	-2,5	-5,9
Total	100	100	100

Table A7c: Poverty level registered for the various stages in eliminating under-utilization and under-remuneration-1987 with longer unemployment spells

Impact	R\$25 poverty line			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Observed values	10,5	4,5	2,9	
Simulated values				
Everyone to the mean(A)				
Sectorial Segmentation	8,2	3,6	2,4	
Unemployment and sectorial segmentation	7,6	3,1	2,0	
Unemployment,sectoral and regional segmentations	7,9	3,2	2,0	
Unemployment,sectoral®ional segmentations and discrimination	9,0	3,6	2,2	
Moving only those below the mean(B)				
Sectorial segmentation	7,9	3,5	2,4	
Unemployment and sectorial segmentation	7,2	3,0	1,9	
Unemployment,sectoral and regional segmentations	7,1	2,9	1,9	
Unemployment,sectoral®ional segmentations and discrimination	7,4	3,1	1,9	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1987.

R\$50 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	26,6	11,7	7,0
Simulated values			
Everyone to the mean(A)			
Sectorial Segmentation	23,4	9,8	5,7
Unemployment and sectorial segmentation	22,3	9,1	5,2
Unemployment,sectoral and regional segmentations	23,7	9,5	5,4
Unemployment,sectoral®ional segmentations and discrimination	25,6	10,5	6,0
Moving only those below the mean(B)			
Sectorial segmentation	22,3	9,3	5,5
Unemployment and sectorial segmentation	21,3	8,6	5,0
Unemployment,sectoral and regional segmentations	21,1	8,5	4,9
Unemployment,sectoral®ional segmentations and discrimination	21,1	8,7	5,0

R\$75 poverty line			
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Observed values	39,9	19,0	11,8
Simulated values			
Everyone to the mean(A)			
Sectorial Segmentation	37,3	16,8	10,1
Unemployment and sectorial segmentation	36,1	15,9	9,4
Unemployment,sectoral and regional segmentations	38,2	16,8	9,8
Unemployment,sectoral®ional segmentations and discrimination	40,0	18,1	10,8
Moving only those below the mean(B)			
Sectorial segmentation	35,5	16,0	9,6
Unemployment and sectorial segmentation	34,4	15,1	8,9
Unemployment,sectoral and regional segmentations	34,0	15,0	8,8
Unemployment,sectoral®ional segmentations and discrimination	33,6	15,1	9,0

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Table A7d: Relative impact of various stages
in eliminating under-utilization and under-remuneration-1987
-with longer unemployment spells

Impact	R\$25 poverty line			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Everyone to the mean(A)				
Sectorial Segmentation	155,1	99,1	69,1	
Unemployment and sectorial segmentation	45,1	52,2	61,8	
Unemployment,sectoral and regional segmentations	-21,3	-8,0	-3,7	
Unemployment,sectoral®ional segmentations and discrimination	-78,9	-43,3	-27,2	
Total	100	100	100	
Moving only those below the mean(B)				
Sectorial segmentation	86,2	72,0	57,0	
Unemployment and sectorial segmentation	20,8	33,9	46,6	
Unemployment,sectoral and regional segmentations	4,1	4,1	3,8	
Unemployment,sectoral®ional segmentations and discrimination	-11,0	-10,0	-7,3	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1987.

Impact	R\$50 poverty line			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
Everyone to the mean(A)				
Sectorial Segmentation	314,2	164,0	125,6	
Unemployment and sectorial segmentation	109,6	60,3	55,9	
Unemployment,sectoral and regional segmentations	-135,6	-33,9	-17,9	
Unemployment,sectoral®ional segmentations and discrimination	-188,3	-90,5	-63,6	
Total	100	100	100	
Moving only those below the mean(B)				
Sectorial segmentation	78,0	79,6	76,1	
Unemployment and sectorial segmentation	18,9	22,9	28,1	
Unemployment,sectoral and regional segmentations	3,4	5,2	5,0	
Unemployment,sectoral®ional segmentations and discrimination	-0,2	-7,7	-9,1	
Total	100	100	100	

Impact	R\$75 poverty line		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
Everyone to the mean(A)			
Sectorial Segmentation	-8756,7	243,7	168,5
Unemployment and sectorial segmentation	-3973,3	92,3	66,6
Unemployment,sectoral and regional segmentations	6820,0	-93,6	-42,7
Unemployment,sectoral®ional segmentations and discrimination	6010,0	-142,4	-92,4
Total	100	100	100
Moving only those below the mean(B)			
Sectorial segmentation	70,0	77,1	77,6
Unemployment and sectorial segmentation	17,5	20,9	23,6
Unemployment,sectoral and regional segmentations	5,2	4,1	4,6
Unemployment,sectoral®ional segmentations and discrimination	7,3	-2,1	-5,8
Total	100	100	100

Table A8a: Poverty level registered for the various stages in eliminating under-utilization and under-remuneration Northeast and Southeast–Alternative A–1995

				%
Northeast				
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 poverty line				
Observed values	23,7	10,2	6,9	
Simulated values				
Sectorial Segmentation	22,2	9,8	6,6	
Unemployment and sectorial segmentation	20,2	8,5	5,4	
Unemployment,sectoral and regional segmentations	19,5	8,1	5,1	
Unemployment,sectoral®ional segmentations and discrimination	21,3	8,9	5,6	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

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	Northeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$50 poverty line				
Observed values	50,3	23,1	14,8	
Simulated values				
Sectorial Segmentation	49,0	22,9	14,5	
Unemployment and sectorial segmentation	46,5	21,0	13,0	
Unemployment,sectoral and regional segmentations	46,4	20,7	12,5	
Unemployment,sectoral®ional segmentations and discrimination	47,3	21,8	13,5	
R\$75 poverty line				
Observed values	65,0	34,5	22,9	
Simulated values				
Sectorial Segmentation	64,8	34,4	22,7	
Unemployment and sectorial segmentation	62,4	32,3	20,9	
Unemployment,sectoral and regional segmentations	63,1	32,3	20,6	
Unemployment,sectoral®ional segmentations and discrimination	64,1	33,3	21,6	

Table A8a: Poverty level registered for the various stages
in eliminating under-utilization and under-remuneration
Northeast and Southeast--Alternative A-1995

	Southeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 poverty line				
Observed values	6,3	3,3	2,8	
Simulated values				
Sectorial Segmentation	5,4	3,2	2,7	
Unemployment and sectorial segmentation	3,9	1,9	1,5	
Unemployment,sectoral and regional segmentations	3,1	1,7	1,4	
Unemployment,sectoral®ional segmentations and discrimination	3,2	1,7	1,4	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

	Southeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$50 poverty line				
Observed values	16,7	6,7	4,5	
Simulated values				
Sectorial Segmentation	14,3	6,1	4,2	
Unemployment and sectorial segmentation	11,8	4,5	2,8	
Unemployment,sectoral and regional segmentations	10,3	3,9	2,4	
Unemployment,sectoral®ional segmentations and discrimination	10,4	3,9	2,5	
R\$75 poverty line				
Observed values	26,3	11,3	7,1	
Simulated values				
Sectorial Segmentation	24,0	10,3	6,5	
Unemployment and sectorial segmentation	21,1	8,4	4,9	
Unemployment,sectoral and regional segmentations	19,4	7,4	4,3	
Unemployment,sectoral®ional segmentations and discrimination	19,0	7,4	4,3	

Table A8b: Relative impact on poverty of various stages in eliminating under-utilization and under-remuneration
Northeast and Southeast–Alternative A–1995

	Northeast			%
Impact	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 Line				
Sectorial Segmentation	61,5	26,6	20,2	
Unemployment and sectorial segmentation	81,6	101,5	90,4	
Unemployment,sectoral and regional segmentations	28,9	33,1	25,5	
Unemployment,sectoral®ional segmentations and discrimination	-71,9	-61,2	-36,2	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

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Impact	Northeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 50 Line				
Sectorial Segmentation	44,7	17,8	23,1	
Unemployment and sectorial segmentation	85,4	144,5	115,7	
Unemployment,sectoral and regional segmentations	0,3	25,9	31,3	
Unemployment,sectoral®ional segmentations and discrimination	-30,5	-88,1	-70,2	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

Impact	Northeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 75 Line				
Sectorial Segmentation	20,6	8,7	18,4	
Unemployment and sectorial segmentation	258,9	171,3	136,4	
Unemployment,sectoral and regional segmentations	-73,0	3,1	21,7	
Unemployment,sectoral®ional segmentations and discrimination	-106,5	-83,1	-76,5	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

Table A8b: Relative impact on poverty of various stages in eliminating under-utilization and under-remuneration
Northeast and Southeast-Alternative A-1995

Impact	Southeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 Line				
Sectorial Segmentation	30,0	11,8	6,9	
Unemployment and sectorial segmentation	53,1	79,0	87,6	
Unemployment,sectoral and regional segmentations	-7,8	-6,8	-3,4	
Unemployment,sectoral®ional segmentations and discrimination	24,7	15,9	8,9	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

Impact	Southeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 50 Line				
Sectorial Segmentation	34,6	7,3	7,3	
Unemployment and sectorial segmentation	61,0	83,9	83,7	
Unemployment,sectoral and regional segmentations	33,3	30,0	22,0	
Unemployment,sectoral®ional segmentations and discrimination	-28,9	-21,2	-13,0	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

Impact	Southeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 75 Line				
Sectorial Segmentation	22,1	8,9	8,7	
Unemployment and sectorial segmentation	92,5	90,2	84,9	
Unemployment,sectoral and regional segmentations	24,3	32,1	28,0	
Unemployment,sectoral®ional segmentations and discrimination	-38,9	-31,2	-21,7	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

Table A8c: Poverty level registered for the various stages in eliminating under-utilization and under-remuneration
Northeast and Southeast–Alternative B–1995

	Northeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 poverty line				
Observed values	23,7	10,2	6,9	
Simulated values				
Sectorial Segmentation	20,7	9,2	6,3	
Unemployment and sectorial segmentation	18,9	7,9	5,2	
Unemployment,sectoral and regional segmentations	17,6	7,2	4,7	
Unemployment,sectoral®ional segmentations and discrimination	17,9	7,4	4,8	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

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	Northeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$50 poverty line				
Observed values	50,3	23,1	14,8	
Simulated values				
Sectorial Segmentation	46,7	21,4	13,5	
Unemployment and sectorial segmentation	44,2	19,6	12,1	
Unemployment,sectoral and regional segmentations	43,2	18,6	11,2	
Unemployment,sectoral®ional segmentations and discrimination	42,4	18,5	11,4	
R\$75 poverty line				
Observed values	65,0	34,5	22,9	
Simulated values				
Sectorial Segmentation	62,6	32,5	21,3	
Unemployment and sectorial segmentation	60,2	30,6	19,6	
Unemployment,sectoral and regional segmentations	59,8	29,6	18,7	
Unemployment,sectoral®ional segmentations and discrimination	58,9	29,2	18,6	

Table A8c: Poverty level registered for the various stages
in eliminating under-utilization and under-remuneration
Northeast and Southeast-Alternative A-1995

	Southeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 poverty line				
Observed values	6,3	3,3	2,8	
Simulated values				
Sectorial Segmentation	5,7	3,3	2,7	
Unemployment and sectorial segmentation	4,1	2,0	1,6	
Unemployment,sectoral and regional segmentations	3,4	1,8	1,4	
Unemployment,sectoral®ional segmentations and discrimination	3,8	1,9	1,5	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

	Southeast			%
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$50 poverty line				
Observed values	16,7	6,7	4,5	
Simulated values				
Sectorial Segmentation	15,2	6,5	4,4	
Unemployment and sectorial segmentation	12,8	4,9	3,0	
Unemployment,sectoral and regional segmentations	11,4	4,3	2,7	
Unemployment,sectoral®ional segmentations and discrimination	12,6	4,7	2,9	
R\$75 poverty line				
Observed values	26,3	11,3	7,1	
Simulated values				
Sectorial Segmentation	25,6	11,1	6,9	
Unemployment and sectorial segmentation	22,6	9,1	5,3	
Unemployment,sectoral and regional segmentations	21,8	8,4	4,7	
Unemployment,sectoral®ional segmentations and discrimination	23,1	9,1	5,2	

Table A8d: Relative impact on poverty of various stages in eliminating under-utilization and under-remuneration
Northeast and Southeast-Alternative A-1995

	Northeast			%
Impact	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 Line				
Sectorial Segmentation	51,4	35,1	28,0	
Unemployment and sectorial segmentation	31,5	45,7	56,0	
Unemployment,sectoral and regional segmentations	22,5	25,1	22,3	
Unemployment,sectoral®ional segmentations and discrimination	-5,4	-5,8	-6,4	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

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				%
Impact		Northeast		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 50 Line				
Sectorial Segmentation	45,2	38,0	36,7	
Unemployment and sectorial segmentation	32,1	38,7	42,6	
Unemployment,sectoral and regional segmentations	12,1	22,3	24,0	
Unemployment,sectoral®ional segmentations and discrimination	10,6	0,9	-3,3	
Total	100	100	100	

				%
Impact		Northeast		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 75 Line				
Sectorial Segmentation	39,6	36,7	37,1	
Unemployment and sectorial segmentation	38,5	37,4	39,3	
Unemployment,sectoral and regional segmentations	6,5	17,5	21,0	
Unemployment,sectoral®ional segmentations and discrimination	15,5	8,4	2,5	
Total	100	100	100	

Table A8d: Relative impact on poverty of various stages in eliminating under-utilization and under-remuneration
North.east and Southeast-Alternative A-1995

				%
Impact		Southeast		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)	
R\$ 25 Line				
Sectorial Segmentation	28,8	11,4	6,8	
Unemployment and sectorial segmentation	50,9	76,2	86,1	
Unemployment,sectoral and regional segmentations	24,3	14,0	8,0	
Unemployment,sectoral®ional segmentations and discrimination	-4,0	-1,6	-1,0	
Total	100	100	100	

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.

%

Impact	Southeast		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
R\$ 50 Line			
Sectorial Segmentation	38,2	21,7	17,0
Unemployment and sectorial segmentation	38,9	56,6	66,2
Unemployment,sectoral and regional segmentations	23,8	23,1	18,2
Unemployment,sectoral®ional segmentations and discrimination	-0,9	-1,3	-1,5
Total	100	100	100

%

Impact	Southeast		
	Proportion of poor(P0)	Average income gap(P1)	Average square income gap(P2)
R\$ 75 Line			
Sectorial Segmentation	31,9	25,3	22,0
Unemployment and sectorial segmentation	39,3	49,0	56,3
Unemployment,sectoral and regional segmentations	22,9	24,4	22,2
Unemployment,sectoral®ional segmentations and discrimination	5,9	1,2	-0,4
Total	100	100	100

Source:Based on the 'Pesquisa Nacional por Amostra de Domicílios'(PNAD)of 1995.