MIGRATION STRATEGIES AND INCOME IN BRAZIL: IMPLICATIONS FOR RURAL POVERTY[1][2]

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ABSTRACT

Poverty levels in Brazil present a remarkable spatial heterogeneity. The greatest proportions of poor people were observed in the rural parts of the Northeast and the North regions, especially for individuals with low levels of formal education**.** Migration from and to rural areas may have an impact on income and poverty levels for these individuals. In this paper, the actual migrants´ income is compared to a counter factual estimation of revenues if they had not migrated for different strategies of migration using a two-step Heckman procedure. For most migrants, migration was an effective strategy of income increase.

Key words: migration, selectivity, poverty, Brazil, Latin America.

JEL: J10, J60, R23

INTRODUCTION

Despite the Brazilian general socioeconomic development in recent years, for instance the observed increase in schooling levels (Riani et al, 2004); poverty and income inequality did not present this same tendency. Between 1977 and 1999, indicators related to these two variables showed stable values with short term fluctuations (Barros et al, 2000), and just very recently that it was verified a slight advance on them (IBRE/FGV, 2005).

Hoffmann (2000) and Ferreira et al (2000) showed that poverty levels in Brazil present a remarkable spatial heterogeneity. Among the five macroregions of this country, the Northeast Region had the greatest proportions of poor people; around 38.3% of its population was below the poverty line.

For this same region, in rural areas, excluding the metropolitan regions of Fortaleza, Recife and Salvador, this number was much higher, 55%. In terms of proportion of poor people, the Northeast of Brazil was followed by the North Region. In this last one 30.7% of the population was poor and in rural areas, Belém excluded, the number increased to 45%. In the other macroregions of Brazil, Southeast, South and Center-West, the numbers were smaller, but still quite expressive, between 11% and 20% for the population, and between 15% and 31% in rural areas. Besides that, the proportion of poor people also differed for different groups of the population. Not surprisingly, household heads with low levels of education, that is, with 0 to eight years of formal education, presented a much higher proportion of poor people, 27.2%, than heads with higher levels: 5.5% for the nine to 13 years of formal education group, and 0.2% for the heads with 14 or more years of schooling.

Hence, the individuals with low levels of education and the ones that live in rural areas are the ones that present the largest probability of being poor. There are many phenomena that may have an impact on poverty levels for these individuals and migration from and to rural areas is one of them. In this paper the relationship between migration and income variation is examined. In particular, the actual migrants´ income is compared to a counter factual estimation of revenues if they had not migrated to determine if migration was an effective strategy of income increase, similarly as was done in Tunali (2000) and Haurin and Haurin (1991).

In order to do so, this paper is divided in six sections including this introduction. In the next one, the human capital model is briefly presented, the selectivity of the migratory process is discussed, and the individual consequences of migration are cited. As we will see in the following section, which shows some descriptive data, the migrant is not a random sample of the population, and have different average characteristics when compared to non-migrants. Then, due to this selectivity, that includes observable and non-observable attributes, the methodology that was applied in the analyses of the earning-enhancing benefits of migration that is the two-step Heckman procedure, a well know method, is briefly described. In this same section, some points regarding the data base and the used variables are

also presented. In the next section, the main empirical results are showed. Lastly, the conclusions and final commentaries are presented.

HUMAN CAPITAL MODEL, THE SELECTIVITY OF MIGRATION AND THE CONSEQUENCES OF MIGRATION

Many models that analyze the relation between migration, income and poverty utilize the human capital model of migration as the theoretical foundation. The model assumes a rational individual migrates if the expected net return of migration is positive, and if so, he/she maximizes his/her utility among the possible destinies (Stillwell and Congdon 1991). The equation below presents this relation:

$$G_{ij} = \int_0^t (U_{jt} - U_{it}) e^{-pt} dt - C_{ij} > 0,$$

where G_{ij} is the net return of migration between localities **i** and **j**; U_{jt} is the utility (or expected wages) in **j**, which is a possible destiny of the migrant in time **t**; U_{it} is the utility of the person in the currently origin **i** in time **t**; ρ is the discount rate; and C_{ij} are the costs of migration between **i** and **j**.

It is believed that the costs of migration are an increasing function of the distance between the origin and the destiny of the migrant. Other factors besides the distance also influence the costs of migration, and, among them, the presence of effective social nets may diminish decisively these costs by a series of reasons (Duarte, 1979; Gugler, 1992; Hollnsteiner-Racelis, 1988; Massey et al, 1993; Todaro, 1980). Consequently, migration is strongly influenced by net-works and these might have a decisive positive feedback effect, reinforcing the existence of future flows of migrants from the same origins to some specific destinations.

However, it must be emphasized that, as migration implicate in monetary and other types of costs, the individual must hold a minimum amount of capital to have migration as an option. This may not be a feasible situation for all the population strata. Poor people, specially the chronic or extremely poor ones, may not have this possibility (Kothari 2002).

Hence, the analyses concerning the effects of poverty on migration and about the implications of migration on the well-being of low income individuals can be blurred by many factors, because poverty and vulnerability have conflicting effects on migration. On the one hand, poverty may increase migration due to the low levels of utility in the origin of the individual. On the other, poverty may reduce migration, because poor people might not be capable to overcome the costs of migration (Waddington and Sabates-Wheeler 2003).

Utility is a function of personal attributes, and individuals with some specific characteristics will migrate with greater probability than others and to particular places, also because of social nets. Consequently, migrants should not be considered a random sample of the population (Borjas, 1996, 1998, 2005; Greenwood, 1985; Haurin et al, 1991; and Todaro, 1980). It is believed that the typical migrant is a young adult, bachelor, with a reasonable level of formal education, with more effective social nets and more labor market oriented (Castiglione, 1989). But, actually, what a typical migrant is depends also on the context being analyzed and the type of migration that is being studied (De Haan, 1999). For instance, sex ratios of migrant flows are directly influenced by the supply and demand sides of the labor market; typically rural areas may relatively better absorb men, while the contrary may occur in urban areas.

In the above perspective, migration is seen as an investment in which the rational agent seeks better economical conditions and higher levels of quality of life. However, anthropological and sociological literatures have a different approach to migration. They argue that migration is a last resource available for poor people in order to cope with the difficulties that were caused by economical, demographic or environmental shocks (Waddington and Sabates-Wheeler 2003).

An approach that may be seen as an intermediate one between the two discussed previously is the sustainable livelihood approach, in which migration can be seen as an ex-post response to risks and shocks, and also as an ex-ante strategy of income and risks diversification. Ghobadi et al (2005)

concluded that, generally, migration was not an ex-post response to risks and shocks, but a ex-ante strategy of income and risks diversification.

Sustainable livelihood approach considers that the implications of migration are better understood if the particular characteristics of the context of migration are taken into account. The idea of a permanent rural/urban migration dominated the specialized literature in the 1960s and 1970s. Nowadays, the circular nature of migration, and other types of migration, such as rural/rural and urban/rural, or return and multiple step migrations may also have an effect on the consequences of migration (De Haan, 1999).

The impacts of migration for individuals can be determined by the differentials in income between migrants and non-migrants in the destiny (Borjas, 1998). The common view about the economic progress of immigrants is that they initially earn less than natives, because they lack some particular skills that are valued in the labor market when arriving, but the gap between immigrants and natives narrows, as immigrants assimilates. Borjas (1998) pointed out that the economic performance of migrants depends on their origin. Immigrants that have as origin developed regions earn more than the ones which originated in less developed areas. Differences in the origin of the migrant may also impact on the rate of wage increase with time. However, De Haan (1999) observed that these differences do not occur in all places and for all migrants. The author shows that in India, rural-urban migrants have higher per capita consumption than non-migrants.

Nevertheless, in order to analyze the impact of migration on the migrant's earnings, it may be more insightful to compare migrants with non-migrants in the origin. Litchfield and Waddington (2003) observed that migrants were better off in household consumption levels and also showed a lower propensity for poverty than non-migrants. De Haan (1999) emphasized that there are incongruous results when this type of comparison is done, as was observed above for comparisons between migrants and non-migrants in the destiny.

Despite the many insights that can be gained with comparisons in the destiny or in the origin of the migrants, this may present some biased results as groups are not randomly assigned. Hence, the actual earnings of migrants should be compared to counterfactual one if they had not migrated (Haurin and Haurin, 1991). Using a similar methodology, the paradigm of migration as a rational individual act of earning-enhancing choice was empirically tested by Tunali (2000). The author noticed that, although many individuals did show a negative gain, because of a minority, which obtained very high yields from migration, both migrants and stayer did act rationally.

In this paper, the actual migrants´ income is compared to a counter factual estimation of revenues if they had not migrated to determine if migration was an effective strategy of income increase with Brazilian data. However, some descriptive data are presented below beforehand in order to introduce some aspects that will be discussed empirically.

DESCRIPTIVE DATA

In this section, some descriptive data about migration, income and poverty in Brazil is presented. Some topics that will be analyzed empirically, such as the differences observed for distinct types of migration, are introduced. The information was obtained with the use of the Brazilian Demographic Census of 2000. This database has the information in where the person lived five years before the Census research and the current place of residence. Individuals that declared different municipalities were considered migrants in the period of 1995-2000.

Brazil, as is shown in table one, had more than 15 million internal migrants in the analyzed period, roughly 10% of the population in the country, which was slightly under 170 millions. Around 70% of these migrants, over 10 millions, were urban/urban ones, approximately 2.0 millions were rural/urban, over 1.3 million, urban/rural and around 1.1 million, rural/rural[3]. The Northeast and North regions, the two with the lowest socioeconomic levels among the five macroregions in Brazil, had the

[3] Urban and rural as defined by the Brazilian Census of 2000.

greatest proportions of migrants with rural origin, over 25% of the total for both macroregions. For the other macroegions this number was slightly smaller.

[Table one here]

As expected by the human capital model due to the costs of migration, most migrants in Brazil were intrastate ones, around 66% of the total, 10060571, or migrated to a neighbor state in short steps of migration,. Long distance migrations were more numerous from the Northeast to the states of São Paulo and Rio de Janeiro, in the Southeast, and from this first state to the Northeast, many return migrants (Golgher, 2006a). Table two shows the number of individuals for different types of migration with rural origin and also for rural non-migrants for these three types of migration. All the other tables in this section will present data for migrants with rural origin, as these are the ones that are addressed in the empirical analyses. Unsurprisingly, most of them are non-migrants, over 28 million, or 90.6% of the total. The migrants were mainly intrastate ones, 1.3 million rural/urban and 0.9 million rural/rural, which corresponded to more than 75% of the migrants with rural origin. Only one percent of the individuals in rural areas or with origin in these regions migrated from a non-neighbor state, in a long step of migration.

[Table two here]

In the previous section, the selectivity of migration was briefly presented, and as discussed, migrants can not be considered a random sample of the population. There is a selection of those with some specific characteristics. Besides these differences between migrants and non-migrants, due to the spatial heterogeneity of Brazil, it is expected that the flows of migrants between specific localities are also very distinct among them and context dependent. Consequently, because of factors, such as, spatial localization of the origin and of the destiny, type of flow, distance of migration, etc., the flows may

present remarkable differences in many aspects. The flows of different types, rural/urban and rural/rural, for different distances, intrastate, interstate between states that are neighbors and interstate between states that are not neighbors, maybe very dissimilar.

The last column in table two presents the proportion of poor individuals for the flows of migrant and for non-migrants. An individual who lived in a household with a per capita income lower than 0.5 Brazilian minimum salaries (around 80 American dollars in 2000) was considered poor. Rural non-migrants presented the greatest proportion of poor people, 62.3%. The short step rural/rural flows had very similar numbers as the one observed for non-migrants, respectively 60.6% and 59.7% for intrastate and interstate between neighbors. Rural/rural flows between non-neighbor states and rural/urban flows, especially non-neighbors ones, had much smaller proportions of poor people.

Next table presents data for these same flows and for non-migrants in rural areas for mean per capita household income, mean wage and mean hourly wage. As expected, the data resembles the one of the last column in the table above. It can be seen that migrants had higher values than non-migrants, in particular rural/urban flows and rural/rural non-neighbor ones. Moreover, as in table two, it can be seen that intrastate and interstate between neighbors flows are very similar regarding income and the proportion of poor people for rural/urban, and for rural/rural. Once more, short distance flows of this last type are very similar to the rural non-migrants.

[Table three here]

These income differentials presented above are at least in part caused by dissimilarities in schooling levels, as showed in table four. The different types of migrants and the rural non-migrants are classified in five categories of educational level: less than the former primary level, zero to three years of formal education; less than fundamental level, four to seven years; less than a high school degree, eight to 10; a high school degree holder, 11 years; and complete or incomplete tertiary education, 12

and above. Notice that the rural/urban flows are similar for all three distances and present higher proportions of individuals with eight and above years of formal schooling than rural/rural flows or than non-migrants. Migrants live in their present local of residence for around two years on average. Hence, part of this education was obtained in the destiny, although a small one, what could explain, but very little, the difference between these two types of flows. Non-migrants had similar proportions than rural/rural intrastate and interstate between neighbors flows for the groups with zero to 10 years of instruction. For high school degree holders, non-migrants resemble more the flows of rural/rural interstate between non-neighbors, with a positive correlation between education and distance.

[Table four here]

The next table shows the data for per capita household income classified by the head of the household schooling. Unsurprisingly, all the flows and the non-migrants present the positive correlation between education and income. In addition, it can be seen that rural/urban flows have higher mean values of income for all education categories, in particular the between non-neighbors one. As was noticed in the table above, also in table five rural non-migrants are similar to rural/rural migrants for short steps of migration for lower levels of formal education and comparable to rural/rural longer steps migrants for higher levels of schooling.

Among other things, part of these differences may be caused by prices differentials between urban and rural areas and non-monetary consumption. In order to overcome these limitations, this same table was estimated with adjusted earnings, which were obtained relatively to regional poverty lines. The earning differentials, although smaller, were again observed.

[Table five here]

This section presented some descriptive data about the selectivity of migration and earnings. In general, rural non-migrants show lower levels of education and earnings than long distance rural/rural

migrants and rural/urban ones. Short distance rural/rural migrants present similar levels of both variables when compared to non-migrants. These descriptive data indicate that some types of migrants are positively selected and, possibly, also show self-selection for non-observable characteristics. However, do migrants really obtain greater earnings than they would in case they had not migrated? In the next section, it is presented the methodology and the data that were used in the empirical analyses which discussed this question.

METHODOLOGY AND DATA

Previously, it was seen that migrants are not a random sample of the population, variables, such as sex, race, civil status, earnings and schooling, impact on the probability that a person will migrate and for which type of migration.

The focus of the empirical analysis in this paper is the following: do migrants earn more than they would if they had not migrated. At least partially, an equation, such as: $\ln(Y) = \beta' X + \varepsilon$, where Y are hourly income, β are coefficients, and X are the independent variables, which include a dummy for migration, and ε are the errors, would answer this question.

However, the increase in earnings that is attributed to migration without taking into account the self-selection of individuals may present biases problems. Migrants may present the same observable characteristics of non-migrants but might have some non-observable features that distinguish them from stayers. Consequently, if this selection biases is not considered, the results may present inconsistencies (Tunali, 2000; Nakosteen and Zimmer, 1980; Haurin and Haurin, 1991).

In order to overcome these selectivity bias difficulties, a common technique that is employed is the Heckman´s two-step estimation (Heckman, 1979) or, similarly, the mover-stayer model presented in Nakosteen and Zimmer (1980). Tunali (2000) and Haurin and Haurin (1991) also used similar procedures, although with some modifications.

The table below, that is based on Tunali (2000), clarifies these. The individual can stay, M = O (O stands for origin), or move, M = D (D stands for destiny). Hence, y_O are the earnings in the origin and y_D, in the destiny. Notice that $E[y_O|M=O]$ are the expected earnings for the group that stayed given that they have not migrated. $E[y_D|M=D]$ is the same for the group that moved providing that they are migrants. Both possibilities are actual realizations. The other two are counterfactual ones. $E[y_D|M=O]$ are the expected earnings in the destiny for non-migrants, and, conversely, $E[y_O|M=D]$ is the same for migrants if they had not migrated.

[Table six here]

The earning differentials in favor (or not) of migrants can be obtained by the differences in the two actual realizations: $\sigma = E[y_D|D] - E[y_O|O]$. However, other comparisons can be done, such as the difference between the expected values of what the migrant presently earns and what they would earn if they had not migrated, $\delta = E[y_D|D] - E[y_O|D]$ (See Tunali, 2000, for other comparisons).

As was discussed above, based on the human capital model for migration, rational individuals will migrate if the net benefits of migration are positive. As proposed by Haurin and Haurin (1991), the benefits of migration for each region are given by similar equations: $y_{Oi} = \beta_O' X_i + \varepsilon_{Oi}$ and $y_{Di} = \beta_D' X_i + \varepsilon_{Di}$, where X are the explanatory variables, β are the coefficients and ε are the stochastic error. The costs of migration are given by: $C_i = \delta' Z_i + \varepsilon_{ci}$, where Z are the independent variables, δ are the coefficients and ε is the stochastic error. The stochastic errors are assumed to have a trivariate normal distribution.

Therefore, the net gains of migration are given by $NG_i = \beta_D' X_i - \beta_O' X_i - \delta' Z_i + (\varepsilon_{Di} - \varepsilon_{Oi} - \varepsilon_{Ci})$. Migration will occur if the net gains are positive:

$I_i^* = \beta_D' X_i - \beta_O' X_i - \delta' Z_i \geq \varepsilon_i = -(\varepsilon_{Di} - \varepsilon_{Oi} - \varepsilon_{Ci})$. Otherwise, the individual will not migrate. However, we do not observe I^*, but we do observe if the individual is a migrant or not. Consequently, following the expression above and giving the values one for migrant and zero otherwise, we obtain for $I_i^* > 0$, $I_i = 1$, and for $I_i^* < 0$, $I_i = 0$. Given this dichotomous response, a probit maximum likelihood is used to analyze this selection process, which is the first step in the Heckman two-step procedure.

In the second step, the model is completed with the earning equations. Following Nakosteen and Zimmer (1980), based on the truncated normal distribution, the expected conditional values for the error of the equations above are given by: $E[\varepsilon_{Di} | I_i = 1] = \sigma_{De}[-\phi(I_i^*) / \Phi(I_i^*)]$ and $E[\varepsilon_{Oi} | I_i = 0] = \sigma_{Oe}[\phi(I_i^*) / (1 - \Phi(I_i^*))]$, where σ_{De} and σ_{Oe}, are respectively the covariance of ε_D and ε_O with ε_i, $\phi(*)$ is the density function and $\Phi(*)$ is the cumulative distribution function of the standard normal distribution. These two expected values are equivalent to the inverse Mill´s ratio, and are included in the earnings equations in order to correct for the selectivity bias.

Therefore, the two earning equations become, for migrants, $\ln(y_{Di}) = \beta_D' X_i + \sigma_{De} \lambda_{Di} + \eta_{Di}$, and, for non-migrants, $\ln(y_{Oi}) = \beta_O' X_i + \sigma_{Oe} \lambda_{Oi} + \eta_{Oi}$, where the errors have zero mean, but are heteroscedastic. Consequently, the equations were not estimated with OLS, but by a GMM estimator.

The expected value for the actual earnings are: $E[y_D | D] = \beta_D' X_i + \sigma_{De} \lambda_{Di}$ and $E[y_O | O] = \beta_O' X_i + \sigma_{Oe} \lambda_{Oi}$. And similarly for the counter factual possibilities presented in the table above: $E[y_O | D] = \beta_O' X_i + \sigma_{Oe} \lambda_{Di}$ and $E[y_D | O] = \beta_D' X_i + \sigma_{De} \lambda_{Oi}$. Hence, the difference between the migrant's expected earning in the destiny and the amount they would earn if they had stayed in their origin is given by: $\delta = E[y_D | D] - E[y_O | D] = (\beta_D' - \beta_O') X_i + (\sigma_{De} - \sigma_{Oe}) \lambda_{Di}$ (Haurin and Haurin, 1991).

The actual wages and the counterfactual ones if the individual had not migrated were the ones compared in this paper: **(1)** $\varsigma = y_D|D - E[y_O|D] = y_D|D - (\beta_O' X_i + \sigma_{De}\,\lambda_{Di})$.

The database used was the Brazilian Demographic Census of 2000. In this paper the focus is rural dwellers and migrants that had as origin a rural area. Thus, a sub-sample with rural non-migrants, rural/rural and rural/urban migrants was initially selected. The dependent variable was the natural logarithm of hourly wage. In order to overcome part of the difficulties of dealing with zero income, males with age between 18 and 64 with positive wages were selected, similarly to what was done by Nakosteen and Zimmer (1980), and also by Avelino (2006) for Brazil, although this last author discussed other types of models. Only persons that did not attend school were included in the sample, because many migrants may postpone their increase in wages while investing in human capital. Besides that, employers were also not included in the econometric analyses. This sub-sample had 100396 observations for migrants, which weighted corresponded to 731869 individuals, and respectively 781051 and 5137843 for non-migrants.

Internal migrants in Brazil, due to regional diversity and also because of the dimensions of the country, might pursue different strategies of migration depending on their characteristics. That is, different types of opportunities are available for distinct groups of the population. Whether a particular type of migration does improve the individuals´ income is analyzed for six different migration strategies, three categories of distances, intrastate, interstate between state that are neighbors, interstate between non-neighbors, and two types of migration, rural/rural and rural/urban. In the next section, the main results are presented.

EMPIRICAL RESULTS

This section presents the empirical results that were obtained with the methodology mentioned above. The results of the first step of the Heckman procedure, which is a probit regression that analyses the

selectivity of migration, are shown in table 7. The dependent variable is a dummy if the individual was a migrant or not (one for migrant and zero otherwise). The explanatory variables include age (years), age squared, a dummy for ethnic group (one for White/Asiatic, zero for Blacks/Pardo/Indigenous), a dummy for civil status (one if married, zero otherwise), schooling level (years of formal education), number of individuals in the household, a microregional dummy (one if the individual lived in a metropolitan region, zero otherwise), and four regional dummies for present macroregion of residence (North, Northeast, Southeast and South. Center-West was omitted).

The table shows the coefficients, the standard errors and the marginal effect on the mean values of the variables. Some very brief commentaries will be given, because this is not the equation of main interest. Notice that all variables were significant at one percent, but the age squared, that was not significant. As expected, the age coefficient is negative, that is, the probability of being a migrant decreases with age. This is expected because the sub sample does not include children/adolescents under 18 years old. Young adults tend to be the most mobile in the population. If younger groups were in the sample, the relation between mobility and age would be an inverted U shape. The coefficients for ethnic group and civil status showed a negative sigh. This indicates that the probability of being a migrant is smaller for White/Asiatic and for married individuals. These results are similar to the ones observed by Golgher (2006b) for short distance migrations, the most numerous ones. For longer distances, the results were exactly the opposite. The probability of being a migrant increased if the person was more educated, normally the more educated a person, the easier it is to cope with the cost of migration. The sigh for the size of the household was negative, indicating that living in smaller households increased the probability of being a migrant. This may be caused because smaller households may be more mobile and/or other aspects such as household arrangements of migrants may differ from non-migrants in Brazil. All the other variables are regional ones and indicate the propensity of migration to each destiny, which is positive for metropolitan regions. Conversely, all the regional dummies were negative, indicating the greater mobility of the population in the Center-West region.

[Table seven here]

The results that were obtained for migrants in the second step of the Heckman procedure are shown in table eight. The same equations were adjusted for non-migrants with very similar outcomes and these are not shown. Three different models are presented and they vary only in the amount of explanatory variables. For all of them are shown the coefficients and the standard error of the independent variables. The ones in bold face were not significant. The last column in the table presents the exponential of the coefficients for the dummies and for schooling of model three, indicating the approximately variation on wages for each dummy or for a year more of formal education.

As already discussed, the dependent variable was the natural logarithm of hourly income. The explanatory variables include many that are normally used in wage equations. Further commentaries will be given while discussing the obtained results. These are: age (years), age squared, a dummy for ethnic group (one for White/Asiatic, zero for Blacks/Pardo(Mixed)/Indigenous), a dummy for head of the household (one if yes, zero if no), schooling (years of formal education), three dummies for schooling (fundamental, zero to three years of formal education (omitted); low education, between four and seven years; intermediate education, eight to 10; higher education, 11 and above), a undergraduate degree holder dummy (one if yes, zero if no), a dummy for more qualified occupations (public works in higher positions and managers, and professional of arts and science), two dummies for economic sector (primary and secondary. Tertiary omitted), three dummies for type of occupation (formally employed non-domestic, non-formally employed non-domestic, self-employed. Domestic worker omitted), head of the household schooling (years of formal education), 26 regional dummies for states (Federal District omitted) and the inverse Mills ratio.

Wages tend to increase with experience in a concave relationship. Age here is used as a proxy for experience. It is assumed that a great proportion of the population acquires labor experience while

still in school, as many had part or full time jobs while studying. As expected, in all models the coefficient for age was positive and the coefficient for the age squared was negative showing the above concave relation with a maximum between 45-55 years old, depending on the model.

In Brazil, as in many other countries, there are remarkable socioeconomic differences between ethnic groups. Whites and Asiatic people are inclined to have higher wages, while Blacks, Pardos and Indigenous are more prone to be in the lower socioeconomic strata of the population. The dummy for ethnic group showed, as expected, even after the inclusion of the other variables in the model, a positive sigh in the three models. Note that the coefficients decreased in magnitude in the models with more variables, indicating that part of the ethnic differences can be explained by the other variables in the model, such as the state dummies. Notice that in the third model, the exponential of the coefficient of this dummy was 1.095, indicating an approximately 10% variation in wages that were related to ethnic differences.

The head of the household dummy coefficients were also all positive and of the same greatness in all models, demonstrating that these workers earned more than the other members of the household, even considering that the dependent variable is hourly wage and that heads may work longer hours than others in the household.

A positive correlation between schooling and wages is expected. In Brazil, this relationship tends to be convex due to higher returns on education for higher levels of schooling, particularly the undergraduate one. In order to analyze this, four variables were included in the first model, one continuous and three dummies, and five in the other two, with the inclusion of another dummy. Also as expected, the variables for schooling showed that higher levels of education, specially the undergraduate degree holders, implied greater wages. All coefficients were positive and significant, with only one exception that was the dummy for intermediate education in model two. As can be seen by the positive coefficients with the increasing magnitude obtained for low, intermediate and higher education, the relation between schooling and wages is a increasing convex one. Even after controlling

for these schooling variables, the individuals that had undergraduate degree tended to earn more than less qualified workers, as is suggested by the positive coefficient for this variable in the last two models.

The next six dummies are related to different types of occupation, activities and positions in the labor market. They can be divided in three groups. The first one is composed of a dummy for higher quality occupation, that is, among the many types of occupation, some were selected. The included were: public workers in high positions and managers; and professionals of arts and science. The one excluded were: high school level technician; unskilled service workers; sellers; workers in agriculture and husbandry, forestry, hunting and fishing; industrials workers; maintenance workers; and members of the military forces. Even after controlling for schooling levels, the expectation is that workers in this type of occupation tend to earn more than others. This is demonstrated by the positive coefficient of the respective dummy.

In the second group of variables, workers were divided considering their sector in the economy: primary, secondary and tertiary. Normally, activities in the first of this sector tend to pay lower wages. It can be seen, due to the negative coefficients in models two and three, as expected, that workers in the primary sector had a propensity to earn less than similar workers in the tertiary sector. For the industrial sector, the coefficient was positive in model two, but not significant in model three, indicating a less clear difference between industrial and service workers. This observed difference among primary workers and the others must be emphasized in studies that include rural/urban migration because of the likelihood that this type of migration will be accompanied by a transition between this and the other sectors in the economy.

The last group of variables that are related to the labor market is the one that includes different types of positions: domestic, formal, informal and self-employed. It is expected that this first type may earn less than the others. As expected, domestic workers, which were the reference for the other categories, showed lower wages than similar ones that were formal, informal and self-employed

workers, as is seen by the positive coefficients. The coefficients were greater for formal and for self-employed (a very heterogeneous group) and smaller for informal ones.

Besides all these variables, the household head schooling was included in the equation, because, despite all the individual variables yet included in the model, household variables may also be important. As is indicated by the positive coefficient, individuals in households with more educated heads tended to earn more.

The results obtained by the regional fixed effects will not be discussed nor showed in the table. These variables were included in order to control for spatial heterogeneities. They are related to the place of residence five years prior to the Census, that is, before migrating, so that the counter factual comparisons could be made.

All these variables showed the influence of many personal, household and regional characteristics on the person's earnings. Of special interest here are the coefficients obtained for the inverse Mills ratio, which were all positive and significant, indicating that the positive self-selection of migration does exist. That is, an analysis of wages differentials without considering this self-selection would be biased, as discussed in the previous section.

Similar models were adjusted for non-migrants (not shown). The self-selection coefficients were also positive, suggesting that there is also a positive self-selection for non-migrants, as was observed by Tunali (2000).

[Table eight here]

As was discussed in table six in the previous section, and with the use of equation **(1)**, the actual wages of migrants were compared with the counterfactual one if they had not migrated. In order to estimate this counterfactual wages, model three for migrants and for non-migrants were used. Some tables and histograms present the results.

As is presented in the last line in table nine, most migrants, 65.9%, did earn more in the destiny than they would if they had not migrated. This proportion was higher for unskilled migrants, 70.2%, than for skilled, 52.7%, although for all categories, the positive gains of migration occurred for the majority of the migrants.

[Table nine here]

Table 10 presents this same type of data, but for the macroregion of destiny. The poorest macroregion in Brazil, the Northeast, had the highest proportion of migrants with positive gain from migration, 70.7%. Most of these migrants had as origin this same region (Golgher, 2006a), indicating that migration can have a remarkable impact on rural poverty in the region. In all regions, the majority of migrants presented positive gains from migration.

[Table 10 here]

The next table shows the results for different types of migration. Due to the cost of migration, migrants, especially low income ones, tend to migrate in short steps of migration, mainly in a intrastate change of municipality of residence. However, as can clearly be seen, the differences between the different strategies of migration are very small, all around 65%, suggesting that although most of the low-income population can not afford to move to far destinies, short step migration is also effective in enhancing wages.

[Table 11 here]

The main point of interest here is to discuss the impact of migration on poverty. In order to highlight this relationship, the following table presents data only for workers with zero to three years of formal education, which are the ones more prone to fall into poverty or to be trapped in it. The six strategies of migration, presented in the previous table, are discussed separately for each macroregion of destiny. First, it must be emphasized that in all strategies, the majority of migrants showed a positive gain from migration. The lowest value was 54.6% for intraestadual rural/urban in the North Region and the highest was 82.8% for the interstate between non-neighbors rural/urban with destiny in the South Region. In two regions, Northeast and Southeast, all the values were between 71.2% and 78.2%, of similar magnitude for all strategies. In this first region, the differences between rural/rural and rural/urban or between intrastate and interstate were small. For the Southeast, the values for the proportion of migrants with positive gain increased slightly with distance. In the North and Center-West regions, the rural/rural migrations seem somewhat more effective. Lastly, for the South Region, the interstate between non-neighbors showed the greatest values, the strategy less probable to be implemented by low-income workers.

[Table 12 here]

The data showed above presents the results for positive or negative gain from migration without describing the magnitude of these gains. In order to complement these discussion, histogram one presents the value of the ratio of actual and counterfactual wages for all migrants. Values above five for this ratio, which were few, were omitted in order to make the analyses more insightful. As can be seen and was also pointed out above, most migrants earn more in their destiny than they would if they had stayed in their origin. As showed in table nine, the total number of migrants after the sample was weighted is 731869, of these 249567 had negative gain and the rest, 482302, a positive. The histogram

shows that for around 50% of the individuals that had smaller actual wages than counterfactual ones, the ratio was above 0.75, that is, the loss existed but was small. A little over 5% of all migrants did lose a considerable amount in terms of wages, with values below 0.5 for the ratio. However, for the overall picture, this is well compensated by the positive gains of most of the migrants. For around 25% of the migrants, the gains are small but positive, with a ratio above one and below 1.5. A great proportion did gain significant with migration. Approximately 20% showed values between 1.5 and 2.0 for the ratio. Besides that, remarkably, roughly 20% did show a ratio above two, although most of these below three.

[Histogram one here]

The next histogram shows the data for workers with zero to three years of formal education. As was seen in table nine, the proportion of migrants with positive gain for the non-skilled group is greater. For this group, only 30%, or 109880, showed a ratio below one and around 50% of these above 0.75, which is small loss owing to migration. That is, a small proportion did lose with migration, but this, as was noticed above for all migrants, is well compensated by the positive expand in wages for most migrants in the group.

[Histogram two here]

Next table presents the data for the proportion of migrants by range of values of the ratio actual /counterfactual wages for low-skilled workers for all types of migration discussed in table 12. Four categories are shown in each table for the ranges of the ratio: 0 to 0.75, that is, the proportion of migrants that lost remarkably with migration; 0.75 to 1.0, proportion that lost slightly; 1.0 to 1.5, the ones that gained slightly with migration; and 1.5 and above, the ones that increased significantly their wages due to migration.

Notice that in the estimates of counter factual wages and consequently of the ratios, the vector with the characteristics of the individuals was the same in the origin and destiny. Most of then do not pose a problem, but some do so, particularly the ones related to the labor market. In rural/rural migrations, the labor markets in the origin and destiny may be rather similar. However, rural/urban migrants might face very different labor conditions, such as different unemployment rates. Unfortunately, we do not know some of previous aspects of the individual before migration. In order to overcome part of this difficulty, table 14 present the same data than table 13, but it is assumed that the workers in the urban areas work in secondary and tertiary activities and that workers in the rural areas work in primary activities. This is a clear oversimplification and overestimate of the impacts of migration, but, when compared to the data in table 13, can give an idea of the range that may be expected. Some general trends that were observed in the two tables are discussed below.

As was seen in the above histograms, few migrants presented a ratio below 0.5, but, as can be verified in the tables below, the proportions below 0.75 were not so small, especially for some types of migration. In table 13, five of then had values over 20%, four of then rural/urban ones. Conversely, four types of migration presented less than 10% in this category, all of then interstate migration. The highest observed value was for the intrastate rural/urban migration in the North Region, 28.4%. All the other values for this region were around 20%. For the Northeast Region, all the types of migration showed similar values, around 15%, indicating that some migrants do lose with migration, despite the type of migration chosen. In the Southeast Region, the rural/rural and the rural/urban showed similar trends with a decrease in the values with an increase in the distance. The values were all around 10%, and were among the lowest. The rural/urban migration presented much lower numbers than rural/rural ones in the South Region, and also showed the same trend with distance than the previous region. In the Center-West Region, the rural/rural migration presented lower values than the rural/urban one, indicating the attractiveness of the rural areas of this region.

All these number presented above for the rural/urban migration can be seen as a lower limit for the range of the impact of migration. The data in table 14 can be regarded as the upper extreme. For the Southeast and South regions, very few migrants showed a ratio below 0.75 for the rural/urban migration, suggesting that this type of migration is very effective in enhancing the migrant's wages, especially the long distance one. In the Northeast and in the Center-West the values were around 10% for this type of migration, also lower than the rural/rural migration. The comparison between rural/rural and rural/urban migration in the North Region showed that for short distances they were roughly similar, but for longer ones, this second one presented smaller numbers of losers from migration.

Concluding the above remarks, some general commentaries are made. In the North Region, only one type of migration, rural/urban between non-neighbors seemed more effective in securing the migrants earnings, all the other showed higher values. For the Northeast, rural/urban migration, after considering the data from the two tables, presented lower values than the rural/rural one. Rural/urban migrations, especially the longer steps, present very small proportions of migrants with ratios below 0.75 in the Southeast and South regions, indicating that these strategies are secure ones. For the Center-West, rural/rural and rural/urban migrations for all distances are similar in the proportions of losers from migration, showing the relative power of attraction of the rural areas.

[Table 13 here]

All the above discussion was done with the ratios from 0 to 0.75, that is, with the migrants that lost with migration quite reasonably. However, as already pointed out, most of the migrants do have their wages increased with migration. Note in table 13, that in two types of migration, both long distance ones with destiny in the Northeast, more than 50% of the migrants present a ratio over 1.5 and many other migration strategies had a proportion of over 40%. For the Northeast, Southeast and South regions, it can be seen that the values are high in both tables for all types of migration, indicating that to

migrate is very effective in increasing low-skilled wages for a great proportion of migrants, especially the longer steps and rural/urban ones. All types of migration were similarly effective in the North and Center-West regions, without a clear distinction either between rural/rural and rural/urban or for the diverse distances.

[Table 14 here]

CONCLUSIONS

As discussed above, migration might alleviate poverty, but given the cost of migration, not all strategies of migration are feasible for low income groups of the population. That is, different types of opportunities are available for distinct groups of the population. Whether a particular type of migration does improve the individual's wage, particularly for men with age between 18 and 64 years, was the subject of empirical analyses in this paper.

In order to do so, this issue was empirically analyzed with the two-step Heckman procedure. The first step considered different aspects that might impact on the probability that a person is a migrant. Features that had a negative impact on the probability of being a migrant were being older, White/Asiatic, married and less educated. Other aspects as to live in a large household, outside a metropolitan region and not in the Center-West Region also diminished the individuals´ probability of being a migrant.

The wages of migrants and non-migrants were analyzed separately in the second step of the Heckman procedure with similar results. Wages presented a concave initially increasing relation with age. Persons with the following attributes showed the tendency to earn more: White/Asiatic, household head, with higher levels of education, with high quality occupation, in the tertiary or secondary sectors of the economy, as a formal, informal or self-employed worker, and living in a household with a

household head with higher levels of schooling. Besides this, the positive coefficients for the inverse Mills ratio indicated that there was a positive self-selection for migrants and for non-migrants alike.

The comparison between actual and counterfactual wages indicated that for most migrants, migration does impact positively on wages, and this was especially true for non-skilled workers. This suggests that migration does have a positive impact on rural poverty, including short step rural/rural migration.

When migration was analyzed in details for low-skilled workers for macroregion of destiny and for different types of migration, some general trends were noticed. In the North Region, all types of migration were correspondingly successful for increasing wages and only one, the rural/urban between non-neighbors seemed to be a little more effective in securing the migrants earnings. For the Northeast, Southeast and South regions, it could be seen that the proportion of migrants that showed a lower actual wage than counter factual one were small and, on the contrary, the ones with high gains from migration were the majority, indicating that to migrate is very effective in increasing low-skilled workers wages for a great proportion of migrants, especially the longer steps and rural/urban ones. All types of migration were similarly and highly effective in the Center-West regions, without a clear distinction between rural/rural and rural/urban migrations for the different distances.

Despite the many aspects of migration, income and poverty, as proposed by Ghobadi et al (2005), migration appear to be mainly an ex-ante strategy, and, hence, migration from rural areas is a response to employment and other types of opportunities in rural areas. De Haan (1999) observed that most studies that analyzed rural and agricultural regional development did not give the appropriate importance to migration. Human mobility is much more common than normally assumed by the notion that population is essentially sedentary. Therefore, given the importance of migration for the rural population, policies that promote mobility or, that increase the positive effects of migration, should be encouraged. Policies that diminish the costs of migration would have a positive impact on the range of possibilities for the low income population strata. For instance, policies that: improve channels for

information exchange; facilitate the absorption of the migrant in the destiny; minimize environmental damages; increase the effectiveness of the use of remittances for local development, etc are some of them.

REFERENCES

Avelino, R. Estimation of dynamic discrete choice models with flexible correlation in the unobservables with an application to migration within Brazil, http://www.econ.fea.usp.br/seminarios/2006_1/avelino_30_06_2006.pdf , 2006.

Barros, R., Henriques, R. and Mendonça, R. A estabilidade inaceitável: desigualdade e pobreza no Brasil. In: Henriques, R. (org.). Desigualdade e Pobreza no Brasil. Rio de Janeiro: IPEA, 2000.

Borjas, G. Labor Economics. The McGraw-Hill Companies, Inc, 1996.

_____ The economic progress of immigrants, NBER working paper series, number, 6506, 1998.

_____ Native internal migration and the labor market impact of immigration, NBER working paper series, number 11610, 2005.

Castiglioni, A. Migration, urbanisation et dévelopement: le cas de l,Espírito Santo - Brésil. Ciaco Editeur, 1989.

De Haan, A. Livelihoods and poverty: the role of migration – a critical review of the migration literature. The journal of development studies, December, 36, 2, ABI/INFORM Global, 1999, pp 1-38.

Duarte, R. Migration and urban poverty in northeast Brazil. Glasgow, University of Glasgow, (Ph.D. dissertation), 1979.

Ferreira, F, Lanjouw, P. and Neri, M. A new poverty profile for Brazil using PPV, PNAD and Census Data, Texto para discussão, No. 418, Departamento de Economia da PUC-RIO, 2000.

FIBGE. Censo Demográfico de 2000, 2000.

Ghobadi, N., Koettl, J., Vakis, R. Moving out of poverty: migration insights from rural Afghanistan..www.mrrd.gov.af/vau/, 2005.

Golgher, A.Diagnóstico do processo migratório no Brasil 2: migração entre estados. Belo Horizonte, CEDEPLAR/FACE/UFMG, texto para discussão nº 283, 2006a.

_____ Determinantes da migração no Brasil: implicações para pobreza rural. In**:** II Congreso de la Asociación Latinoamericana de Población – ALAP, México, anais, 2006b.

Greenwood, M. Human Migration: Theory, Models, and Empirical Studies. Journal of Regional Science, v.25, 1985, pp.521-544,

Gugler, J. Cities, poverty and development: urbanization in the third world. Oxford, Oxford University Press, 1992.

Haurin, D and Haurin, J. Youth migration in the United States: analysis of a deindustrializing region. In: Stillwell and Congdon: Migration models: macro and micro approaches. London and New York, Belnavn Press, 1991.

Heckman, J. Sample selection bias as a specification error, Econometrica, 47, 1979, pp. 153-161.

Hoffmann, R. Mensuração da desigualdade e da pobreza no Brasil. In: Henriques, R. (org.). Desigualdade e Pobreza no Brasil. Rio de Janeiro: IPEA, 2000.

Hollnsteiner-Racelis, M. Becoming an urbanite: the neighborhood as a learning environment. In: Gugler, J. The Urbanization of the Third World, Oxford, Oxford University Press, 1988.

IBRE/FGV. Miséria em queda: mensuração, monitoramento e metas. Rio de Janeiro: Centro de Políticas Públicas do IBRE/FGV, 2005.

Kothari, U. Migration and Chronic Poverty, Chronic Poverty Research Centre, Working Paper No. 16, Institute for Development Policy and Management, University of Manchester, 2002.

Litchfield, J. e Waddington H. Migration and poverty in Ghana: evidence from the Ghana Living standards survey, Sussex migration working paper no. 10, Sussex Centre for Migration Research, 2003.

Massey, D; Arango, J; Hugo, G; Koraoua, A; Pellegrino, A; Taylor, J. Worlds in motion: understanding international migration at the end of the millennium. Oxford, Clarendon Press, 1998.

Nakosteen, R. and Zimmer, M. Migration and income: the question of self-selection, Souththern Economic Journal, 46, 1980, pp 840 – 851.

Riani, J and Golgher, A. Indicadores educacionais confeccionados a partir de bases de dados do IBGE. In Introdução a Demografia da Educação, Rios-Neto and Ruas (org), Campinas, ABEP, 2004, pp 89-128.

Todaro, M. Internal migration in developing countries: a survey. In Easterlin, R. Population and economic change in developing countries. Chicago, University of Chicago Press for National Bureau of Economic Research, 1980.

Tunali, I Rationality of migration. International Economic Review, vol. 41, N. 4, November, 2000, pp 893-920.

Stillwell, J. and Congdon, P. Migration modeling: concepts and contents. In: Stillwell and Congdon. Migration models: macro and micro approaches. London and New York, Belnavn Press, 1991.

Waddington, H and Sabates-Wheeler, R. How does poverty affect migration choice? A review of literature, Working Paper No T3, Development Research Centre on Migration, Globalization and Poverty, University of Sussex, 2003.

Table one – Migrants by type of migration

	Macroregion - Proportion (%)					Brazil	
Type of migration	North	Northeast	Centre-West	Southeast	South	Proportion (%)	Number of migrants
Urban/urban	59.3	61.5	70.8	78.0	69.4	70.4	10775021
Rural/urban	15.3	16.0	12.1	11.2	14.1	13.3	2032908
Urban/rural	13.6	11.6	9.7	6.3	8.0	8.8	1345422
Rural/rural	11.7	10.9	7.4	4.5	8.4	7.6	1161891
Total number of migrants	1369035	3473122	1656427	6276944	2539714	100	15315242

Source: FIBGE, 2000.

Table two – Migrants by type of migration with rural origin and rural non-migrants and the proportion of poor people

Type of migration	Number of individuals	Proportion (%)	Proportion of poor people (%)
Rural/urban intrastate	1358417	4.3	39.7
Rural/urban between neighbors	268825	0.8	39.3
Rural/urban between non-neighbors	217074	0.7	29.5
Rural/rural intrastate	905424	2.8	60.6
Rural/rural between neighbors	143050	0.4	59.7
Rural/rural between non-neighbors	85904	0.3	49.6
Total migrants	2978694	9.4	46.5
Rural non-migrants	28845578	90.6	62.3

Source: FIBGE, 2000.

Table three – Migrants by type of migration with rural origin and rural non-migrants and income

Type of migration	Mean per capita income (Brazilian minimum salaries)	Mean wage (Brazilian minimum salaries)	Mean hourly wage (Reais)
Rural/urban intrastate	1.15	2.13	7.35
Rural/urban between neighbors	1.14	2.04	7.11
Rural/urban between non-neighbors	1.41	2.43	8.12
Rural/rural intrastate	0.62	1.26	4.30
Rural/rural between neighbors	0.66	1.37	4.54
Rural/rural between non-neighbors	0.86	1.78	5.92
Rural non-migrants	0.68	1.41	5.09

Source: FIBGE, 2000.

Table four – Migrants by type of migration with rural origin and rural non-migrants and schooling

	Years of formal education				
Type of migration	0 to 3	4 to 7	8 to 10	11	12 and above
Rural/urban intrastate	48.8	33.3	10.6	5.9	1.3
Rural/urban between neighbors	49.0	34.0	10.9	4.9	1.2
Rural/urban between non-neighbors	45.2	35.3	11.9	6.2	1.5
Rural/rural intrastate	62.1	30.5	5.4	1.8	0.2
Rural/rural between neighbors	64.6	28.6	4.8	1.6	0.4
Rural/rural between non-neighbors	55.8	33.6	7.1	3.0	0.5
Rural non-migrants	66.8	24.9	5.4	2.5	0.5

Source: FIBGE, 2000.

Table five – Migrants by type of migration with rural origin and rural non-migrants, income and schooling

	Mean household per capita income by years of formal education of the household head			
Type of migration	0 - 3	4 - 7	8 - 10	11 and above
Rural/urban intrastate	0.86	1.30	2.17	3.38
Rural/urban between neighbors	0.89	1.28	2.24	3.55
Rural/urban between non-neighbors	1.13	1.54	2.51	3.78
Rural/rural intrastate	0.54	0.78	1.15	2.04
Rural/rural between neighbors	0.54	0.83	1.54	3.40
Rural/rural between non-neighbors	0.70	0.98	1.55	3.08
Rural non-migrants	0.57	0.93	1.55	3.07

Source: FIBGE, 2000.

Table six – Possibilities of earnings for migrants and non-migrants

Observed decision	Expected earnings in destiny	Expected earnings in origin
Stay (O)	$E[y_D \mid O]$	$E[y_O \mid O]$
Move (D)	$E[y_D \mid D]$	$E[y_O \mid D]$

Table seven – Probit model for migration selectivity

Variables	Coefficient	Standard error	Marginal effect
Intercept	-0,273	0,0075	-0,052
Age	-0,011	0,0004	-0,002
Age squared	**0,000**	**0,0049**	**0,000**
Ethnic group	-0,080	0,0016	-0,015
Civil status	-0,041	0,0016	-0,008
Schooling	0,004	0,0002	0,001
Number of individuals in the household	-0,032	0,0003	-0,006
Metropolitan region	0,677	0,0020	0,130
North region	-0,266	0,0031	-0,051
Northeast region	-0,566	0,0027	-0,108
Southeast region	-0,234	0,0026	-0,045
South region	-0,314	0,0028	-0,060

Note: all the coefficients were significant at 1% when not bolded face.

Likelihood: with intercept 4471871; with intercept and covariates 4185720

Table eight – GMM regression for migrants' income

	Model 1		Model 2		Model 3		
Variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error	Exponential of coefficient
Intercept	0.843	0.0240	0.728	0.0286	0.619	0.0311	-
Age	0.049	0.0013	0.043	0.0015	0.038	0.0014	-
Age squared	-0.001	0.0000	0.000	0.0000	0.000	0.0000	-
Ethnic group	0.180	0.0045	0.161	0.0050	0.091	0.0052	1,095
Head of the Household	0.111	0.0056	0.103	0.0062	0.112	0.0059	1,119
Schooling	0.063	0.0010	0.043	0.0012	0.036	0.0012	1,037
Low education	0.078	0.0057	0.047	0.0092	0.035	0.0089	1,035
Intermediate education	0.082	0.0100	**0.021**	**0.0185**	0.042	0.0181	1,043
Higher education	0.255	0.0121	0.113	0.0251	0.173	0.0247	1,188
Undergraduate degree	-	-	0.499	0.0447	0.532	0.0448	1,703
High quality occupation	-	-	0.332	0.0159	0.339	0.0159	1,404
Primary sector	-	-	-0.192	0.0069	-0.246	0.0069	0,782
Secondary sector	-	-	0.032	0.0066	**0.008**	**0.0065**	**1,008**
Formal employee	-	-	0.338	0.0124	0.355	0.0120	1,426
Informal employee	-	-	0.130	0.0128	0.179	0.0124	1,196
Self-employed	-	-	0.267	0.0135	0.320	0.0132	1,377
Head of the household schooling	-	-	0.010	0.0023	0.008	0.0023	1,008
State fixed effects	No	No	No	No	Yes	Yes	-
Inverse Mills Ratio	0.458	0.0081	0.363	0.0094	0.148	0.0116	-

Note: all the coefficients were significant at 5% when not bolded face.

Table nine – Proportion of migrants with positive gain from migration by schooling level

Schooling (years)	Number of migrants	Proportion with positive gain from migration (%)
0 to 3	368726	70.2
4 to 7	254720	63.9
8 to 10	59949	58.7
11 and over	48475	52.7
Total	731869	65.9

Source: FIBGE, 2000.

Table 10 – Proportion of migrants with positive gain from migration by region of destiny

Macroregion	Number of migrants	Proportion with positive gain from migration (%)
North	81288	58.6
Northeast	179306	70.7
Southeast	223276	68.7
South	160262	64.2
Center-West	87737	59.4

Source: FIBGE, 2000.

Table 11 – Proportion of migrants with positive gain from migration by type of migration

Type of migration	Number of migrants	Proportion with positive gain from migration (%)
Intraestadual rural/urban	312291	64.6
Interstate between neighbors rural/urban	66402	64.5
Interstate between non-neighbors rural/urban	60690	67.0
Intraestadual rural/rural	231787	67.2
Interstate between neighbors rural/rural	36666	69.2
Interstate between non-neighbors rural/rural	24034	67.5

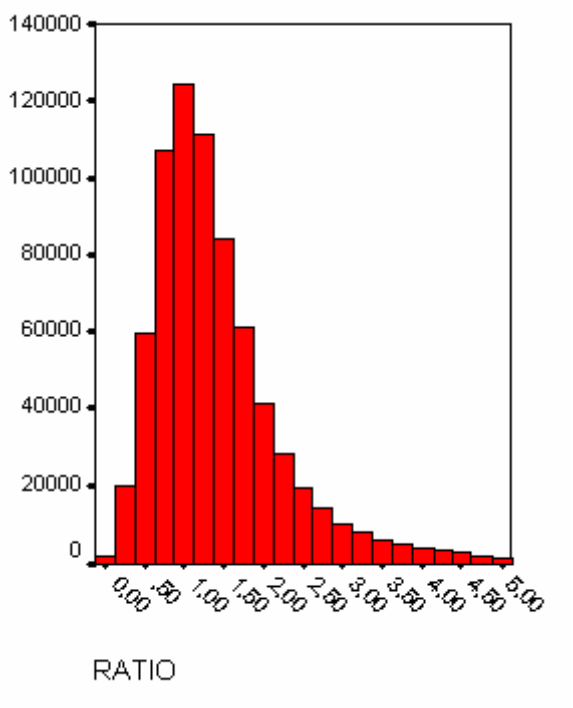
Source: FIBGE, 2000.

Table 12 – Proportion of migrants with positive gain from migration by type of migration and region for low-skilled workers

Macroregion of destiny	Type of migration	Number of migrants	Proportion with positive gain from migration (%)
North	Intraestadual rural/urban	14788	54.6
	Interstate between neighbors rural/urban	5119	60.4
	Interstate between non-neighbors rural/urban	2455	61.8
	Intraestadual rural/rural	17287	69.5
	Interstate between neighbors rural/rural	4404	66.8
	Interstate between non-neighbors rural/rural	3261	70.1
Northeast	Intraestadual rural/urban	52441	71.3
	Interstate between neighbors rural/urban	7460	71.4
	Interstate between non-neighbors rural/urban	3569	77.1
	Intraestadual rural/rural	53658	74.5
	Interstate between neighbors rural/rural	7219	76.1
	Interstate between non-neighbors rural/rural	2717	71.3
Southeast	Intraestadual rural/urban	36063	72.1
	Interstate between neighbors rural/urban	9311	74.2
	Interstate between non-neighbors rural/urban	12897	77.8
	Intraestadual rural/rural	34489	71.2
	Interstate between neighbors rural/rural	5793	77.0
	Interstate between non-neighbors rural/rural	4958	78.2
South	Intraestadual rural/urban	20248	70.0
	Interstate between neighbors rural/urban	3071	69.8
	Interstate between non-neighbors rural/urban	1775	82.8
	Intraestadual rural/rural	20463	64.6
	Interstate between neighbors rural/rural	1642	67.9
	Interstate between non-neighbors rural/rural	767	71.4
Center-West	Intraestadual rural/urban	12244	58.6
	Interstate between neighbors rural/urban	4853	61.3
	Interstate between non-neighbors rural/urban	5808	57.9
	Intraestadual rural/rural	14489	72.1
	Interstate between neighbors rural/rural	3711	68.6
	Interstate between non-neighbors rural/rural	1764	69.1

Source: FIBGE, 2000.

Histogram one– Number of migrants by values of the ratio actual wages/counterfactual wages for all migrants



Histogram two – Number of migrants by values of the ratio actual wages/counterfactual wages for migrants with 0 to three years of formal education

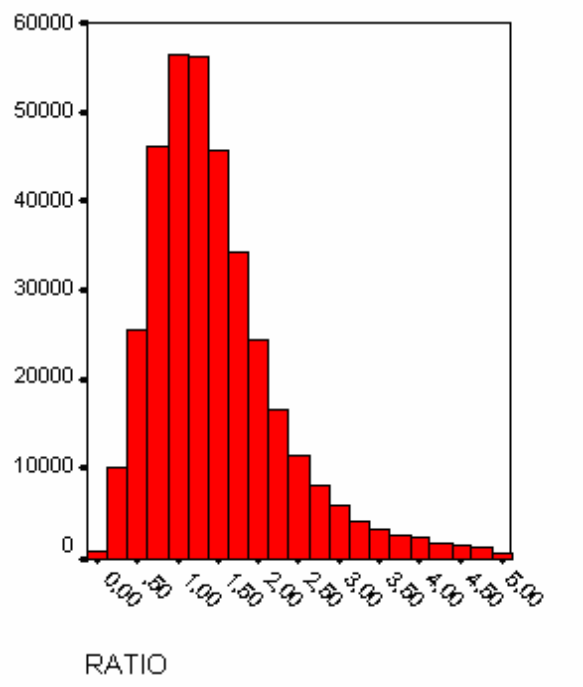


Table 13 – Proportion of migrants by values of the ratio actual wages/counterfactual wages for low-skilled workers

Macroregion of destiny	Type of migration	Values of the ratio			
		0 to 0.75	0.75 to 1.0	1.0 to 1.5	1.5 and above
North	Intraestadual rural/urban	28.4	17.0	26.0	28.6
	Interstate between neighbors rural/urban	19.9	19.7	29.8	30.6
	Interstate between non-neighbors rural/urban	20.1	18.1	27.4	34.4
	Intraestadual rural/rural	17.5	13.0	26.1	43.4
	Interstate between neighbors rural/rural	17.1	16.1	27.7	39.1
	Interstate between non-neighbors rural/rural	19.4	10.5	25.0	45.1
Northeast	Intraestadual rural/urban	15.6	13.1	28.5	42.7
	Interstate between neighbors rural/urban	17.4	11.2	25.8	45.6
	Interstate between non-neighbors rural/urban	12.6	10.3	25.1	52.0
	Intraestadual rural/rural	14.8	10.7	27.9	46.7
	Interstate between neighbors rural/rural	13.6	10.3	27.6	48.5
	Interstate between non-neighbors rural/rural	17.0	11.7	20.2	51.1
Southeast	Intraestadual rural/urban	11.7	16.2	31.8	40.3
	Interstate between neighbors rural/urban	10.7	15.1	33.1	41.1
	Interstate between non-neighbors rural/urban	8.4	13.8	29.6	48.2
	Intraestadual rural/rural	13.3	15.5	34.2	37.0
	Interstate between neighbors rural/rural	9.5	13.5	31.7	45.2
	Interstate between non-neighbors rural/rural	7.5	14.3	30.2	48.0
South	Intraestadual rural/urban	14.0	16.0	36.2	33.8
	Interstate between neighbors rural/urban	12.6	17.6	31.1	38.7
	Interstate between non-neighbors rural/urban	6.7	10.5	39.8	43.0
	Intraestadual rural/rural	20.2	15.2	28.0	36.6
	Interstate between neighbors rural/rural	17.2	14.9	31.4	36.4
	Interstate between non-neighbors rural/rural	15.6	13.0	28.6	42.8
Center-West	Intraestadual rural/urban	21.7	19.7	28.2	30.4
	Interstate between neighbors rural/urban	18.6	20.1	30.3	30.9
	Interstate between non-neighbors rural/urban	23.0	19.1	32.2	25.7
	Intraestadual rural/rural	13.9	14.0	31.2	41.0
	Interstate between neighbors rural/rural	15.8	15.6	30.5	38.1
	Interstate between non-neighbors rural/rural	14.9	16.0	31.4	37.7

Source: FIBGE, 2000.

Table 14 – Proportion of migrants by adjusted values of the ratio actual wages/counterfactual wages for low-skilled workers

Macroregion of destiny	Type of migration	Values of the adjusted ratio			
		0 to 0.75	0.75 to 1.0	1.0 to 1.5	1.5 and above
North	Intraestadual rural/urban	15.8	15.0	24.8	44.4
	Interstate between neighbors rural/urban	11.5	11.1	29.0	48.5
	Interstate between non-neighbors rural/urban	9.6	12.7	26.1	51.6
	Intraestadual rural/rural	17.5	12.9	26.1	43.4
	Interstate between neighbors rural/rural	17.1	16.1	27.7	39.1
	Interstate between non-neighbors rural/rural	19.4	10.5	25.0	45.1
Northeast	Intraestadual rural/urban	9.3	7.8	23.0	59.9
	Interstate between neighbors rural/urban	10.3	7.8	18.4	63.6
	Interstate between non-neighbors rural/urban	8.2	5.8	19.1	67.0
	Intraestadual rural/rural	14.8	10.8	27.8	46.7
	Interstate between neighbors rural/rural	13.6	10.3	27.6	48.5
	Interstate between non-neighbors rural/rural	17.0	11.7	20.2	51.1
Southeast	Intraestadual rural/urban	5.8	7.6	26.3	60.3
	Interstate between neighbors rural/urban	5.1	7.2	24.6	63.1
	Interstate between non-neighbors rural/urban	3.9	5.9	22.2	68.1
	Intraestadual rural/rural	13.2	15.6	34.1	37.0
	Interstate between neighbors rural/rural	9.6	13.4	31.8	45.2
	Interstate between non-neighbors rural/rural	7.5	14.3	30.2	48.0
South	Intraestadual rural/urban	6.5	9.3	27.3	56.9
	Interstate between neighbors rural/urban	6.1	8.4	29.1	56.4
	Interstate between non-neighbors rural/urban	3.4	3.8	23.9	68.9
	Intraestadual rural/rural	20.2	15.2	28.0	36.6
	Interstate between neighbors rural/rural	17.2	14.8	31.6	36.4
	Interstate between non-neighbors rural/rural	15.6	13.0	28.5	42.8
Center-West	Intraestadual rural/urban	11.2	12.9	28.2	47.6
	Interstate between neighbors rural/urban	9.1	11.5	32.8	46.5
	Interstate between non-neighbors rural/urban	10.5	13.7	31.7	44.2
	Intraestadual rural/rural	13.9	14.0	31.1	41.0
	Interstate between neighbors rural/rural	15.8	15.5	30.6	38.1
	Interstate between non-neighbors rural/rural	14.9	16.0	31.4	37.7

Source: FIBGE, 2000.