**THE IMPACT OF THE *BOLSA FAMÍLIA* PROGRAM ON THE LABOR MARKET IN BRAZIL**

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**RESUMO**

O propósito do presente estudo é realizar uma investigação das consequências do Programa Bolsa Família (PBF) sobre o mercado de trabalho. Como metodologia utiliza-se modelos de regressão Logit, Probit e Log-Linear e o método de decomposição de Oaxaca e Blinder. Após a operacionalização dos modelos, analisam-se os resultados e conclui-se que o PBF tem incentivado os seus beneficiários adultos a ofertar trabalho informal. Tal fato, provavelmente, decorre do interesse do beneficiário em ocultar a real renda da família para continuar recebendo o auxílio pecuniário do programa. Como prova de que esse comportamento é perseguido racionalmente, este artigo encontra que, embora o rendimento do trabalho tende a diminuir devido à informalidade, o total de renda familiar aumenta, porque complemento de renda do PBF excede a redução da renda do trabalho.

**Palavras-chave:** Programa Bolsa Família. Transferências Condicionadas de Renda. Mercado de Trabalho. Informalidade.

**ABSTRACT**

The purpose of this study is to investigate the consequences of the Bolsa Família Program (BFP) on the labor market. The methodology uses Logit, Probit and Log-Linear regression models and the Oaxaca and Blinder decomposition method. After the operationalization of the models, the results were analyzed and the conclusion was that the BFP has encouraged its beneficiaries to offer informal labor. This fact is, probably, due to the beneficiary's interest in concealing the real income of the family to continue receiving the cash assistance program. As evidence that this behavior is rationally pursued, this paper find that although labor income tends to decrease due to the informality, the family’s total income increases because the PBF’s income supplement exceeds the reduction of labor income.

**Keywords**: Bolsa Família Program. Conditional Cash Transfers. Labor market. Informal labor

**JEL Classification**: H23. I38. J22.

**Área ANPEC:** Área 5 – Economia do Setor Público

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1. **Introduction**

The *Bolsa Familia* Program (BFP) is a conditional cash transfer program first implemented in 2003 in Brazil with the main goal of reducing poverty. It is often held as an example of how such programs can play an important role in combating poverty (Lindert et al., 2006; The Economist, 2010). Since its creation the program has expanded significantly, both in terms of coverage as well as the size of the benefits. There has been great interest in evaluating the program’s impact and performance along several dimensions. Tapajós et al. (2010) analyzed its impact on education, health and nutrition; Soares et al. (2010), Barros et al. (2007), Barros and Carvalho (2006), Soares, Ribas and Osório (2007) and Sátyro and Soares (2009) studied the direct impact of the program on poverty and income inequality; and Soares, Ribas and Osório (2007), Ferro and Nicolella (2007), Tavares (2008), Foguel and Barros (2010), Teixeira (2011) and Barbosa and Corseuil (2011) have analyzed its impact on the labor market; not to mention several studies that examine the political and electoral effect of the BPF, such as Constanzi and Fagundes (2010). In general, these studies deliver positive evaluations of the program.

In this study we analyze the effect of the BFP on the labor market, but differently from most of the extant literature the focus is on the beneficiaries’ decision whether to supply labor in the formal or the informal market. That is, we seek to evaluate whether the program promotes informality. Because informality is seen as a perverse characteristic of labor markets, the existence of such incentives would be a negative aspect that may counterbalance the program’s many other positive aspects. With the exception of Barbosa and Corseuil (2011) no other study has approached this issue.

Graph 1 shows aggregate data on the growth of the number of beneficiaries and the informality rate for Brazil from 2004, approximately when the program began, to 2013. Whereas the coverage of the program has increased significantly during this period the rate of informality has actually dropped. In the same period the rate of unemployment has also dropped slightly from 9.7% to 7.1%. The simple correlation of the number of beneficiaries with unemployment is -0.83, so the aggregate evidence seems to corroborate the findings in the evaluation literature that failed to find much moral hazard in the BFP. Similarly, the correlation of the number of beneficiaries with informality is -0.93, which seems to indicate that the program also has no deleterious effect on formalization.

**Graph 1 – Beneficiaries, Unemployed and Informality, 2004 – 2013.**

Source: The informality series, unemployment series and number of beneficiaries are available at [www.ipeadata.gov.br](http://www.ipeadata.gov.br). Missing information was complemented from CENSO 2010 data and the [www.mds.gov.br](http://www.mds.gov.br).

Yet, aggregate data may be too coarse to evaluate the effect of the BFP on individual households. In this paper we use micro-level data to determine if the program induces informality at that level. The program’s eligibility criteria certainly contain some rules which might predispose a beneficiary to move toward informal rather than formal employment. For a household to remain eligible it must be classified as being in extreme poverty (R$77 per capita per month) or in poverty (R$154 per capita per month) as well as fulfilling all the conditionalities, such as keeping the children in school. The government uses a series of different databases for monitoring these requirements and is able to detect fairly well, though there might be a lag, whether these eligibility criteria remain met over time. Thus, a beneficiary that obtains a formal job will have a fairly high probability of seeing his/her benefits from the BFP reduced or terminated if the income received pushes the household above the program’s eligibility criteria. There is therefore, at least in principle, an incentive for beneficiaries to purposefully seek to remain informal even when formalization is possible, thus retaining the BFP benefits in addition to the income form the informal employment. The purpose of this paper is to determine whether this potential moral hazard is present in the *Bolsa Familia Program*.

The main result of this paper is that the PBF does in fact encourage informal employment of its adult beneficiaries. As evidence that this behavior is rationally pursued, this paper find that although labor income tends to decrease due to the informality, the family’s total income increases because the PBF’s income supplement exceeds the reduction of labor income. In the next section we describe the methodology that will be used in the empirical test. Section 3 then lays out the theoretical analysis of how *Bolsa Familia* affects labor market decisions. The econometric results are shown in Section 4, 5 and 6, which use respectively discrete choice estimation, Blinder-Oaxaca methodology and log-linear estimation. The final section concludes.

1. **Methodology and Data**

In this section we describe some key concepts, the data and the statistical procedures used in the analysis.

2.1. Informality

Corseuil and Reis (2011) analyzed various different definitions of informality commonly used in the literature for Brazil. The traditional definition of a formal occupation is that which is registered in the worker’s official employment booklet, which is the record that is used for social security purposes. Informal employment is thus work that is not officially registered. This definition of formal work also encompasses the military, civil servants, registered domestic workers and employers. Informal work includes unregistered domestic workers, those who work on their own and those who are not remunerated. In this paper we use this traditional definition expanded to also consider as formal an unregistered worker who has voluntarily opted to pay the social security contributions.

* 1. Data

In this study, we used two databases to study two different years: 2006 and 2010. In 2006, we used the PNAD. The PNAD (*Pesquisa Nacional por Amostra de Domicílios*) is a nationwide household sampling survey performed every year in Brazil by the government’s census bureau (IBGE). The PNAD is the main source of data on income and inequality in Brazil and is widely recognized as an excelent source of information. In 2006 a special supplement was added to the survey including additional questions on access to income transfer and other social programs. For that year we can therefore know if the respondants participated in the *Bolsa Famila* Program. In 2010, we use a sample of the CENSO 2010. The CENSO 2010 is the XII Brazilian Population Census which consists of a big portrait, in both size and reach, of the Brazilian population and of its socio economic features. This survey was realized by IBGE and also included additional questions on access to income transfer programs and other social programs, for example, whether the person is participated in the Bolsa Famila Program.

* 1. Control Group

In order to evaluate the impact of the BFP on informality in the labor market it is necessary to have a control group that is similar to the treatment group but has not received the BFP benefits. As the selection for participation in this program was not random, we could not create a perfect control group to evaluate the effect of program participation. Thus, in order to evaluate the effect of the Bolsa Família on informality and on labor incomes we create control groups that would tend to provide results that are naturally contrary to those sought by this study. Thus, if we find our expected results they would be strong evidence that the effect of the program exists and that it is slightly larger than estimated. If we do not find these results, nothing can be said.

We ran our tests on three different control groups. The text will focus on our preferred definition and the other two set of results will be presented in appendices. The first control group is composed of all the people who did not receive the *Bolsa Familia* benefits. A potential problem with such a broad definition is that the causation might not be straightforward. It is possible that there are other omitted characteristics that make a person prone to informality, such as education and income, which also promote participation in social programs. Because this would confound the identification of the treatment effect the second control group includes people who are not *Bolsa Familia* beneficiaries **and** also have a per capita household income of less than half a minimum monthly wage. This group will be compared with those who do receive the transfers and are also subject to the same per capita household restriction. Finally, our third strategy is to limit the sample in both groups to those who receive less than half a minimum wage per capita **and** live in a household in which no one has at least 5 years of education.

In the evaluation the effect of Bolsa Família on informality the preferred control group was the third, individuals not in the program in households receiving less that half minimum wage per capita and less than 5 years of education. By limiting the sample to poor and uneducated households we set up the test to favor a positive relationship between not being part of *Bolsa Familia* and informality. If there are other characteristics besides income and education that make individuals more likely to understand and fulfill the steps and conditionalities to get enrolled in the program, these characteristics should also make the individual more capable of finding a formal job. If nevertheless we find a negative relationship, then there will be strong evidence of moral hazard in the BFP towards informality.

In the evaluation of the effect of Bolsa Família on labor and household incomes the preferred control group was the second, individuals not in the program in households receiving less that half minimum wage per capita. We believe, and try to show this in the appendix, that because the focus of the BFP is on the poorest families among the poor families, the treatment group had lower income in both, wages and household income. Thus, with this control group we set up tests to favor a negative relationship between not being part of Bolsa Familia and labor income and household income. If nevertheless we find a positive relationship between not being part of Bolsa Familia and household income, then there will be strong evidence of increase in household income due to the BFP, although labor income has decreased because of informality, therefore, the agents were being rational to choose to receive the benefits of the BFP and work informally.

### 2.4 The Blinder and Oaxaca decomposition

The Blinder and Oaxaca methodology aims to explain the difference between the average log wages of two controlled groups, that is, given group A and group B, then:

where E(.) is the expectation function in brackets, represents income of group A, represents income of group B, and is the natural logarithm of the function in parentheses.

Considering and , also = 0, could be rewritten as:

Thus, these differences can be explained through three componentes. The first would be due to differences between the explanatory variables, the second by the difference between the coefficients (which would be related, in this case, to the differences arising from BFP) and the third would be the interaction between the first two. In order to avoid a decomposition in three components, and reduce it to two terms, one can cite the wage difference from a vector of coefficients . It allows R to be rewritten as:

That is:

While the first part refers to the wage gap from the explanatory variables (not considering the variable of interest), the second part comes from the unexplained components and are related to the variable of interest, which in this study is; whether the person lives in a household that receives the BFP benefit. This term of the decomposition will be greatly affected if there are other components that can explain the wage equation, but not included in the model, as highlighted Jann (2008). It can be noted that the vector of non-discriminatory coefficients was taken as a reference to persons of group A, such that . Or could be defined as a vector of persons of group B, such that . But neither case would be independent when measuring the wage decomposition. In this study, will be used as a combination of two vectors, as suggested by Reimers (1983), Cotton (1988), Neumark (1988), Oaxaca and Ransom (1994), also considering the indicator variable interest as an additional covariate, as suggested by Jann (2008).Thus, it is noteworthy that the technique of counterfactual decomposition of Blinder (1973) and Oaxaca (1973) is often used in attempt to explain wage differences, decomposing the difference in the log wages, in part explained by the explanatory variables and in part unexplained, but with a close relation with the control variable. This technique is commonly used (Loureiro and Carneiro, 2001) to explain wage differences arising from discrimination in the labor market, either by race or by gender. However, nothing prevents the use of this methodology to explain differences in income arising from the comparison of a variable. In this sense, this methodology will be applied so as to separate the wage difference (and family income) arising from other explanatory variables (such as gender, age, years of education, experience, etc.) and the difference in income provided by the receipt of BFP. Group A will be the group of people who are not beneficiaries of the BFP, and group B will be the set of people who received this benefit. Thus, the BFP variable will always be equal to zero for group A. Therefore, using the methodology of Heckman (for the analysis of labor income), to error correct for sample selectivity, we arrived to the following regressions:

and

Resulting in

Since the decomposed results are expressed in terms of logarithms, in order to facilitate interpretation, a method for understanding the difference in monetary terms-will be applied.

That is, *R* is the geometric mean of ratio of incomes. Thus,

The Blinder and Oaxaca method should decompose the explained and unexplained parts in monetary terms, rather than in terms of logarithms, because in that way one has:

But as the values of and are very small[[4]](#footnote-4), it will be assumed for simplicity that,

Thus, we estimate the wage gap between the explained and unexplained parts as follows:

It´s important to note, as pointed out by Jann (2008), that the unexplained part can be influenced by other factors that were not explained by the wage equation. Thus, if the is low, the conclusion regarding the unexplained part of the Blinder and Oaxaca procedure could be compromised. In spite of this possibility, the methodology is interesting because it can also allow us to see if the counterfactual control group is admissible, since it would be expected that in the control group, due to the similarity provided by the other explanatory variables, the decomposition part (explained) should be considerably reduced when compared with the unexplained part.

### 2.5 Average Treatment Effect by Log-linear Models

Consider the regression:

Where BFP = 0 if a person is living in a household that did not receive the BFP benefits, and BFP = 1 if a person lives in households that received the benefits.According to Halvorsen and Palmquist (1980), one can measure the effect of a change in the BFP benefits on income by examining a person who receives the benefit (moving from zero to one) according to the following formula:

The sign of this expression indicates whether the beneficiary has a higher or lower income after receiving the BFP benefits, with the magnitude of the change being equal to . This estimate can then be used together with the salary obtained from the averages of the explanatory variables in the regression model without the variable for receiving the benefit of the Bolsa Família, following the result of methodology already used by Blinder and Oaxaca to get the average salary of families without BFP. Thus, whether receiving the benefit of BFP increases or decreases labor (or family) income can be estimated in monetary terms, as follows:

where is the set of explanatory variables, except for the BFP

**3. Theoretical Analysis**

This section provides the microeconomic reasoning for how *Bolsa Familia* benefits can affect labor supply decisions. The first issue of interest is to determine the conditions under which a substitution of leisure for work might occur as a consequence of those benefits, sometimes called the ‘laziness effect.’ We will consider three potential effects on an individual’s choice of supplying labor: the pure income effect; the impact of a reduction in child labor in the family; and the effect on the opportunity cost of leisure.

3.1. The Pure Income Effect

Let an individual’s full income given his/her endowment be: [[5]](#footnote-5)

(1)

Where:

is individual *i*’s wage;

is individual *i*’s time endowment;

is the interest rate;

is individual *i*’s capital endowment; and

is the income that is not derived from labor, including therefore government transfers such as the *Bolsa Familia* and other private transfers among families.

Given that the families that are on the *Bolsa Familia* program are poor, we assume that the capital invested is equal to zero. Thus:

(2)

Let the leisure consumption function for individual *i* be a function of the price of leisure and income:

(3)

If a worker’s wages increase we have the following decomposition:

(4)

By the Slutsky equation we have that[[6]](#footnote-6):

(5)

Which means that:

(6)

Assuming that leisure is a normal good (that is, ) and that (where is the net supply of labor of individual *i*), we have that:

(7)

If the income effect is smaller in absolute value than the substitution effect, then an increase in the wage would increase net labor supplied for individual *i*. If, however, the income effect is greater in absolute values than the substitution effect, the net supply of labor would decrease.

As noted by Foguel and Barros (2010) the increase in income due to the *Bolsa Familia* benefits would constitute a pure income effect. That is:

(8)

Given that we have assumed that labor is a normal good, .

Also, given that , we have that:

(9)

Thus, an increase in income due to the BFP would result in a pure income effect, which would lead to an increase in the consumption of all normal goods. Assuming that leisure is a normal good, an increase in the consumption of leisure would imply a lower net supply of labor, which constitutes the ‘laziness effect’, as the BFP benefits result in a decrease in hours worked.

3.2. The Impact of Child Labor Reduction on the Labor of other Family Members

The previous analysis was based on a simplified formulation of the case where income is increased due to the *Bolsa Familia* benefits, keeping other variables constant and without considering the requirements that the program imposes on the participants. One of these requirements is that the children must go to school, reaching a minimum attendance of 85% of classes. In those families where some of the children worked to help with the family budget, the reduction of their labor could result in the increase of the amount of labor supplied by some of the adults so as to avoid a decrease in the family’s income. If the children helped the parents directly in their productive activities, the elimination of this help in order to attend classes implies that the adults have to work more hours just to achieve the same total amount of labor.

In the first case, where the adults’ labor supply would increase due to income considerations, income would be expressed as follows:

(10)

where the *c* subscript indicates the child’s wage and time endowment. In this case the child’s endowment depends on whether the family receives the *Bolsa Familia* benefit, so that . Thus, for a family that receives those benefits total income would be affected as follows:

(11)

(12)

Thus, the effect of the reduction of child labor may lead to an increase in the supply of labor of some of the adults in the family. In this case the pure income effect would be inverted, as the transfer benefits would lead the adults to work more hours.

3.3. The Effect on the Opportunity Cost of Leisure

Another requirement of the program is that the participants must not surpass a given income ceiling . In order to assess the impact of this restriction on the family’s labor supply decisions, consider the following criteria for taking part in the program:

(13)

where, is income that is not derived from work, from the *Bolsa Familia* or from capital, such as help from friends or acquaintances; and is the BFP benefit.

In the case where an increase in the amount of work does not cause a switch from [1] to [2], . However, when an increase in labor supplied does cause a switch, then:

(14)

This equation shows that the relationship between the net hours worked and the increase in transfers caused by the *Bolsa Familia* benefit is negative. The question is thus, what would a beneficiary do when faced with the choice of how many hours to work? In order to analyze this question we first assume that the length of the work day is fixed, as if the worker could not choose how many hours to work, only whether or not to work. In this situation either or, so that:

(15)

We can see that the individual has the choice between not working yet receiving the BFP benefit, and working yet not receiving the benefit. For not-working to be preferable the size of the benefit must be bigger than the family’s total wages. But since the size of the *Bolsa Familia* benefit is relatively small, this effect on the supply of labor, though negative, is not very large.

From what has been shown thus far the effect of the *Bolsa Familia* benefits on the amount of labor supplied by a household can be either negative (through the pure income effect and the opportunity cost effect) or positive through the impact on reduced child labor. Most of the literature has not found a `laziness effect` associated with the BFP, suggesting that the positive impact seems to predominate. In the next section we allow for the possibility of the household switching to work outside of formal markets as a means to circumvent the program`s maximum income restriction.

3.4. The Effect on the Opportunity Cost of Labor in the Presence of Informal Labor Markets

Let be the wage rate in the informal labor market, the wage rate in the formal labor market, the supply of informal labor, and the supply of formal labor. Assume that the size of the work load in the formal market is fixed but is totally flexible in the informal markets. Under these circumstances:

(16)

In the first case the worker receives a higher income working only in the informal market and keeping the *Bolsa Familia* benefits than giving up those benefits to retain a formal job. Although the informal sector job provides less social security and other formal benefits, it is easier to remain undetected by the program administrators. In the second case the formal sector job provides a sufficiently high income to compensate the loss of the BFP transfers. Thus analysis shows that there can be circumstances where though the program does provide incentives for increased labor supply by households, the incentive can be stronger for informal work. Given that there are several reasons why informality may be undesirable from a personal and a policy perspective, this effect, if detected empirically, may indicate a negative impact in what has been an otherwise successful program.

**4. Probit Results**

In this section we estimate whether the *Bolsa Familia* benefits induce informality. Our interest is to determine whether these benefits provide incentives, *ceteris paribus,* for those that are economically active to tend towards informal rather than formal employment. The basic specification that will be used is as follows:

(17)

The dependent variable is a discrete variable that equals one if the individual is formally employed and equals zero if he/she is informally employed. Education is measured as years of schooling; experience is measured as the difference between age and years of schooling etc. We allow for a separate effect of the interaction of education with experience as well as allowing experience to have a quadratic impact. A dummy is included to control for the impact of race (white versus others) and state dummies in *X* control for fixed local effects. The variable of interest is *BFP*, a dummy which captures the impact of participating in the *Bolsa Familia Program* on the probability of being formally, as opposed to informally, employed. We present here the results for the third control group, which are those individuals that are not beneficiaries, live in a household where the per capita income is less than or equal to half the minimum monthly wage and have less than 5 years of education. The results using two other definitions for the control group are presented in Appendix 2. By and large the conclusions are the same irrespective of which control group is used.

**Table 1 – Impact of *Bolsa Familia* on Informality in the Labor Market. Control Group: Individuals who do not receive *Bolsa Familia* benefits, in households with income per capita lower than ½ a minimum wage and less than 5 years of education.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Dep: Formal** | | | | | | | | |
| Experience | 0.041 | 0.044 | 0.073 | 0.036 | 0.073 | 0.04 | 0.065 | 0.042 |
| (0.013)\*\*\* | (0.0026)\*\*\* | (0.025)\*\*\* | (0.0045)\*\*\* | (0.013)\*\*\* | (0.0028)\*\*\* | (0.027)\*\* | (0.0051)\*\*\* |
| Experience squ. | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 |
| (0.0002)\*\*\* | (0)\*\*\* | (0.0004)\*\*\* | (0.0001)\*\*\* | (0.0002)\*\*\* | (0)\*\*\* | (0.0004)\*\* | (0.0001)\*\*\* |
| Edu. x Exp. | 0.0012 | 0.0005 | 0.0024 | 0 | 0.0006 | 0.0006 | 0.0034 | 0.0003 |
| (0.0006)\* | (0.0002)\*\*\* | (0.0011)\*\* | (0.0003) | (0.0007) | (0.0002)\*\*\* | (0.0016)\*\* | (0.0003) |
| White | 0.0085 | -0.008 | -0.11 | -0.028 | -0.14 | -0.024 | -0.096 | 0.0075 |
| (0.073) | (0.013) | (0.13) | (0.02) | (0.078)\* | (0.013)\* | (0.16) | (0.021) |
| Bolsa Familia | 0.033 | -0.14 | 0.045 | -0.48 | -0.15 | -0.064 | -0.098 | -0.27 |
| (0.063) | (0.012)\*\*\* | (0.12) | (0.018)\*\*\* | (0.07)\*\* | (0.012)\*\*\* | (0.15) | (0.021)\*\*\* |
| Constant | -1.14 | -0.48 | -2.66 | -0.56 | -0.71 | -0.67 | -2.88 | -1.18 |
| (0.31)\*\*\* | (0.11)\*\*\* | (0.65)\*\*\* | (0.13)\*\*\* | (0.64) | (0.23)\*\*\* | (0.58)\*\*\* | (0.34)\*\*\* |
| **N** | 2,400 | 72,207 | 1,263 | 40,430 | 3,097 | 104,029 | 1,846 | 53,229 |
| **R2** | 0.056 | 0.054 | 0.093 | 0.079 | 0.11 | 0.069 | 0.12 | 0.049 |
| **Log-Likelihood** | -560,000 | -3,603 | -150,000 | -1,762 | -460,000 | -2,724 | -100,000 | -938 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Dependent variable=1 if the individual is formally employed (0 if informally employed). Control group: individuals not in the program in households receiving less that ½ minimum wage per capita and less than 5 years of education. Probit estimation. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | | |
|
|

Table 1 presents the results of the estimation of equation (17). Each column shows the estimation of a different sample that varies across year (2006 or 2010), gender (male or female) and urban or rural. The key result is the negative coefficient for the *Bolsa Familia* dummy. This result indicates that the program`s beneficiaries are more likely to have informal employment. This is a remarkable result because one might expect that those who have managed to take part in the program would have characteristics that would also make them more likely to also manage to obtain the benefits of a formal job. The negative result confirms the suspicion that many beneficiaries might be purposefully avoiding formality so as to avoid losing the *Bolsa Familia* benefits while receiving an income above the prescribed upper limit for participation. The coefficients in Table 1 are not the marginal effects, as these have to be calculated separately, which shows that participating in the *BFP* reduces the probability of being in a formal job by 5% for an urban male in 2010 (from a probability of 35% when all other variables are placed at their mean values and dummies set to zero); 14% for a urban female (from a probability of 22%); 1.5% (from 15%) for a rural male; and 4% (from 7.7%) for a rural female. In all cases this is a very strong impact that should be taken into consideration by the program’s formulators.

These results suggest that the BFP tends to generate a distortion in the labor market, by influencing its beneficiaries to seek more informal than formal labor. The result is consistent with the maximum income requirement imposed on the beneficiaries for them to maintain the benefit, given that the income from informal employment is much easier to misreport. Although the income from informal employment tends to be smaller than that from the formal sector, they choose the informal job because those earnings can be had together with the BFP benefits. The next two sections explain the consequence of that choice on labor and family income.

## 5) The results of the Blinder and Oaxaca Method

In this section the impact of the BFP on labor and family income is investigated taking into account that this program tends to encourage informal labor supply from the adult beneficiaries, as well as the fact that informal labor remuneration tends to be considerably lower than that from formal labor. The intuition behind these findings is the households are rational to the extent that labor income diminishes, as a consequence of the choice of offering informal labor, but the family's total income increases, since the BFP will be another source of income to contribute to household expenses.

As described in the methodology, the table with the Blinder-Oaxaca decomposition presents an estimate in percentage and monetary terms[[7]](#footnote-8) of the effects of the explained and the unexplained parts, in addition to estimate default.

**Table 2 – Blinder-Oaxaca decomposition of wages. Control Group: Individuals who do not receive *Bolsa Familia* benefits, in households with income per capita lower than ½ a minimum wage.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Models with and without the Bolsa Família Variable in natural logarithm of wages** | | | | | | | | |
| **Model 1 (without BF)** | 6.04 | 6.57 | 6.38 | 6.99 | 5.60 | 6.25 | 5.71 | 7.02 |
| (0.0078)\*\*\* | (0.0023)\*\*\* | (0.029)\*\*\* | (0.0068)\*\*\* | (0.014)\*\*\* | (0.0028)\*\*\* | (0.28)\*\*\* | (0.017)\*\*\* |
| **Model 1 (with BF)** | 5.86 | 6.28 | 6.03 | 6.71 | 5.32 | 5.97 | 4.45 | 6.46 |
| (0.0095)\*\*\* | (0.0017)\*\*\* | (0.037)\*\*\* | (0.0077)\*\*\* | (0.014)\*\*\* | (0.0027)\*\*\* | (0.15)\*\*\* | (0.015)\*\*\* |
| **Difference** | 0.18 | 0.29 | 0.35 | 0.28 | 0.29 | 0.28 | 1.27 | 0.56 |
| (0.012)\*\*\* | (0.0028)\*\*\* | (0.047)\*\*\* | (0.01)\*\*\* | (0.02)\*\*\* | (0.0039)\*\*\* | (0.32)\*\*\* | (0.023)\*\*\* |
| **Blinder-Oaxaca decomposition in natural logarithm of wages** | | | | | | | | |
| **Explained** | 0.11 | 0.13 | 0.16 | 0.2 | 0.12 | 0.14 | 0.21 | 0.22 |
| (0.0078)\*\*\* | (0.0012)\*\*\* | (0.013)\*\*\* | (0.0021)\*\*\* | (0.012)\*\*\* | (0.002)\*\*\* | (0.038)\*\*\* | (0.0039)\*\*\* |
| **Unexplained** | 0.068 | 0.16 | 0.19 | 0.076 | 0.16 | 0.13 | 1.05 | 0.34 |
| (0.012)\*\*\* | (0.0029)\*\*\* | (0.047)\*\*\* | (0.01)\*\*\* | (0.019)\*\*\* | (0.0039)\*\*\* | (0.32)\*\*\* | (0.023)\*\*\* |
| **Model without the Bolsa Família Variable in Brazilian Real of wages** | | | | | | | | |
| **Model 1 (without BF)** | R$ 516.03 | R$ 712.09 | R$ 728.55 | R$ 1,085.36 | R$ 334.49 | R$ 517.53 | R$ 373.22 | R$ 1,118.55 |
| **Blinder-Oaxaca decomposition in Brazilian Real of wages** | | | | | | | | |
| **Explained** | -10.4% | -11.9% | -14.9% | -18.5% | -11.5% | -13.4% | -19.2% | -19.4% |
| -R$ 53.68 | -R$ 84.89 | -R$ 108.86 | -R$ 201.02 | -R$ 38.50 | -R$ 69.41 | -R$ 71.77 | -R$ 216.93 |
| **Unexplained** | -6.6% | -15.0% | -17.4% | -7.3% | -15.0% | -12.5% | -65.1% | -29.0% |
| -R$ 34.08 | -R$ 106.59 | -R$ 127.03 | -R$ 79.44 | -R$ 50.25 | -R$ 64.71 | -R$ 243.06 | -R$ 324.92 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Control group: individuals not in the program in households receiving less that ½ minimum wage per capita. Blinder-Oaxaca decomposition of wages. Heckman procedure was used to overcome the bias of the sampling selectivity. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |
|
|

Analyzing table 2 one can see that the BFP tends to reduce the labor income of benefited working adults. This is corroborated by the results presented in the previous section, with Probit models, indicating that there is a strong tendency of the BFP to encourage its beneficiaries to offer informal labor, given that there is a a greater probability for informal labor to have a lower remuneration when compared with formal labor.

**Table 3 – Blinder-Oaxaca decomposition of household income. Control Group: Individuals who do not receive *Bolsa Familia* benefits, in households with income per capita lower than ½ a minimum wage.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Models with and without the Bolsa Família Variable in natural logarithm of household income** | | | | | | | | |
| **Model 1 (without BF)** | 6.11 | 6.55 | 6.02 | 6.53 | 5.90 | 6.30 | 5.85 | 6.35 |
| (0.0063)\*\*\* | (0.0012)\*\*\* | (0.0091)\*\*\* | (0.0017)\*\*\* | (0.012)\*\*\* | (0.002)\*\*\* | (0.017)\*\*\* | (0.0029)\*\*\* |
| **Model 1 (with BF)** | 6.19 | 6.56 | 6.06 | 6.52 | 5.93 | 6.09 | 5.84 | 6.04 |
| (0.0068)\*\*\* | (0.0013)\*\*\* | (0.0097)\*\*\* | (0.0019)\*\*\* | (0.0093)\*\*\* | (0.002)\*\*\* | (0.012)\*\*\* | (0.0027)\*\*\* |
| **Difference** | -0.08 | -0.007 | -0.042 | 0.0075 | -0.033 | 0.21 | 0.011 | 0.31 |
| (0.0093)\*\*\* | (0.0018)\*\*\* | (0.013)\*\*\* | (0.0026)\*\*\* | (0.015)\*\* | (0.0028)\*\*\* | (0.02) | (0.004)\*\*\* |
| **Blinder-Oaxaca decomposition in natural logarithm of household income** | | | | | | | | |
| **Explained** | 0.078 | 0.09 | 0.075 | 0.091 | 0.081 | 0.12 | 0.11 | 0.14 |
| (0.0041)\*\*\* | (0.0008)\*\*\* | (0.0058)\*\*\* | (0.0012)\*\*\* | (0.0063)\*\*\* | (0.0013)\*\*\* | (0.0095)\*\*\* | (0.0019)\*\*\* |
| **Unexplained** | -0.16 | -0.097 | -0.12 | -0.083 | -0.11 | 0.085 | -0.1 | 0.17 |
| (0.0094)\*\*\* | (0.0017)\*\*\* | (0.013)\*\*\* | (0.0026)\*\*\* | (0.015)\*\*\* | (0.0029)\*\*\* | (0.021)\*\*\* | (0.0042)\*\*\* |
| **Model without the Bolsa Família Variable in Brazilian Real of household income** | | | | | | | | |
| **Model 1 (without BF)** | R$ 551.78 | R$ 701.44 | R$ 507.60 | R$ 682.19 | R$ 447.45 | R$ 544.52 | R$ 429.46 | R$ 574.76 |
| **Blinder-Oaxaca decomposition in Brazilian Real of household income** | | | | | | | | |
| **Explained** | -7.5% | -8.6% | -7.3% | -8.7% | -7.8% | -11.6% | -10.5% | -13.4% |
| -R$ 41.39 | -R$ 60.12 | -R$ 36.90 | -R$ 59.29 | -R$ 34.69 | -R$ 63.01 | -R$ 45.25 | -R$ 77.16 |
| **Unexplained** | 17.1% | 10.2% | 12.5% | 8.7% | 12.1% | -8.1% | 10.5% | -15.6% |
| R$ 94.20 | R$ 71.36 | R$ 63.50 | R$ 59.37 | R$ 53.94 | -R$ 44.32 | R$ 45.21 | -R$ 89.66 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Control group: individuals not in the program in households receiving less that ½ minimum wage per capita. Table x – Blinder-Oaxaca decomposition of household income. Control Group: Individuals who do not receive Bolsa Familia benefits, in households with income per capita lower than ½ a minimum wage. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |

In Table 3, it can be seen that family income increased in both the urban and rural areas in 2006, due to the unexplained part. From the data above, the unexplained part of the of Blinder and Oaxaca decomposition is closely related to the receipt of the BFP benefit, but it can also be greatly affected by the existence of other factors, that are not included in the income equation. However, it serves as a reference for comparison with other results presented in the following section. In short, the results in Table 3 show that the agents acted rationally in 2006, since family income was higher due to the BFP (for both men and women in urban and rural areas). In 2010, this results was obtained only in the urban area. This contrast may be due to the greater difference in wages paid between formal and informal work in rural areas, as shown in Graph 2.

**Graph 2 – Difference between labor incomes in 2006 and 2010**



Source: IBGE: PNAD 2006 National Survey of a Sample of Households & CENSO 2010. Brazilian Population Census.

As we are looking at the opportunity cost of working in the informal as opposed to the formal market, the interest in this graph lies in the first and second quartile of each distribution. That's because people who are informally employed when they have the chance to work in a formal job normally receive lower starting salaries. Thus, we can note the difference between the median of formal and informal wages increased between 2006 and 2010 in rural areas.

## 6 Results of Log-Linear Models

In this section, we continue the investigation started in the previous section, in order to verify the impact of the BFP on labor and family income, knowing that this program tends to encourage the informal labor supply of its adults beneficiaries and that the informal labor tends to have a considerably lower remuneration compared to formal labor. The ideia behind these findings is that households are rational enough to allow the reduction of labor income as a result of the option to offer informal labor, but that the household`s income increases with the added transfers from the BFP

**Table 4 – Average Treatment Effect on the Treated by log-lin regression with wages and dummy BF. Control Group: Individuals not in the program in households receiving less that ½ minimum wage per capita.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Dep: natural logarithm of wages** | | | | | | | | |
| Education (years) | 0.02 | 0.016 | -0.019 | -0.045 | 0.022 | 0 | 0.08 | -0.046 |
| (0.0049)\*\*\* | (0.001)\*\*\* | (0.0097)\*\* | (0.0018)\*\*\* | (0.0084)\*\*\* | (0.0017) | (0.042)\* | (0.0034)\*\*\* |
| Experience | 0.0016 | -0.008 | -0.047 | -0.075 | 0.0056 | -0.02 | 0.037 | -0.07 |
| (0.0032) | (0.0007)\*\*\* | (0.0064)\*\*\* | (0.0014)\*\*\* | (0.0046) | (0.0011)\*\*\* | (0.036) | (0.0025)\*\*\* |
| Experience squ, | 0.00001 | 0.0002 | 0.00067 | 0.0011 | -0.0001 | 0.00035 | -0.0005 | 0.0011 |
| (0) | (0)\*\*\* | (0.0001)\*\*\* | (0)\*\*\* | (0.0001) | (0)\*\*\* | (0.0005) | (0)\*\*\* |
| Edu, x Exp, | 0.0005 | 0.0008 | 0.0011 | 0.0023 | 0 | 0.0012 | -0.001 | 0.0019 |
| (0.0002)\*\*\* | (0)\*\*\* | (0.0004)\*\*\* | (0.0001)\*\*\* | (0.0003) | (0.0001)\*\*\* | (0.0011) | (0.0001)\*\*\* |
| White | 0.029 | 0.035 | 0.083 | 0.098 | -0.019 | 0.0075 | -0.067 | -0.001 |
| (0.013)\*\* | (0.0022)\*\*\* | (0.024)\*\*\* | (0.0042)\*\*\* | (0.021) | (0.004)\* | (0.062) | (0.0082) |
| Formal | 0.29 | 0.22 | 0.55 | 0.36 | 0.46 | 0.35 | 1.14 | 0.59 |
| (0.0091)\*\*\* | (0.0026)\*\*\* | (0.019)\*\*\* | (0.0049)\*\*\* | (0.018)\*\*\* | (0.0028)\*\*\* | (0.042)\*\*\* | (0.0058)\*\*\* |
| Bolsa Familia (BF) | -0.051 | -0.13 | -0.098 | -0.18 | -0.069 | -0.13 | -0.04 | -0.28 |
| (0.0093)\*\*\* | (0.0016)\*\*\* | (0.014)\*\*\* | (0.0028)\*\*\* | (0.017)\*\*\* | (0.0028)\*\*\* | (0.045) | (0.0056)\*\*\* |
| Constant | 5.83 | 6.32 | 6.98 | 7.92 | 5.61 | 6.48 | 4.44 | 8.23 |
| (0.06)\*\*\* | (0.016)\*\*\* | (0.13)\*\*\* | (0.029)\*\*\* | (0.12)\*\*\* | (0.035)\*\*\* | (1.06)\*\*\* | (0.07)\*\*\* |
| **Lambda** | -0.58 | -0.62 | -1.05 | -1.05 | -0.64 | -0.82 | 0.02 | -1.19 |
| **se lambda** | 0.01 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 | 0.34 | 0.01 |
| **qui square** | 3,063 | 61,062 | 1,637 | 27,843 | 1,965 | 34,429 | 1,669 | 22,787 |
| **p-value** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | 16,665 | 646,806 | 22,376 | 820,241 | 6,948 | 339,582 | 4,768 | 355,851 |
| **Average Treatment Effect on the Treated calculated in Brazilian Real of wages** | | | | | | | | |
| **Model 1 (without BF)** | R$ 1,085.36 | R$ 516.03 | R$ 1,085.36 | R$ 712.09 | R$ 1,085.36 | R$ 728.55 | R$ 1,085.36 | R$ 1,085.36 |
| **Average Treatment Effect on the Treated of Bolsa Família** | -4.9% | -12.6% | -9.3% | -16.5% | -6.7% | -12.3% | -3.9% | -24.7% |
| -R$ 53.65 | -R$ 65.08 | -R$ 101.30 | -R$ 117.21 | -R$ 72.77 | -R$ 89.51 | -R$ 42.71 | -R$ 267.84 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Control group: individuals not in the program in households receiving less that ½ minimum wage per capita. Average Treatment Effect on the Treated by log-lin regression with wages and dummy BF. Heckman procedure was used to overcome the bias of the sampling selectivity. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |
|
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In Table 4, we can see that labor income is always reduced by the influence of the BFP. That is compatible with our previous results. Because the Bolsa Família Program encourages beneficiaries to work informally, labor income tends to be smaller, since informal jobs, on average, remunerate their workers less than formal jobs. According to Table 4, the level of reduction of labor income varies from 4.9% to 24.7%, while in monetary terms this value tends to be decreased 53-267 reais.

**Table 5 – Average Treatment Effect on the Treated by log-lin regression with household income and dummy BF. Control Group: Individuals not in the program in households receiving less that ½ minimum wage per capita.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Dep: natural logarithm of household income.** | | | | | | | | |
| Education (years) | 0.0043 | 0 | 0.023 | 0.0021 | -0.001 | -0.006 | 0.043 | 0.029 |
| (0.0035) | (0.0007) | (0.006)\*\*\* | (0.0011)\* | (0.0059) | (0.0012)\*\*\* | (0.0081)\*\*\* | (0.0016)\*\*\* |
| Experience | -0.01 | -0.011 | 0.0078 | -0.007 | -0.03 | -0.031 | -0.001 | -0.005 |
| (0.002)\*\*\* | (0.0005)\*\*\* | (0.0037)\*\* | (0.0008)\*\*\* | (0.0028)\*\*\* | (0.0007)\*\*\* | (0.0042) | (0.001)\*\*\* |
| Experience squ, | 0.00016 | 0.00014 | -0.0001 | 0.00004 | 0.00049 | 0.00047 | 0.00023 | 0.00021 |
| (0)\*\*\* | (0)\*\*\* | (0.0001)\* | (0)\*\*\* | (0)\*\*\* | (0)\*\*\* | (0.0001)\*\*\* | (0)\*\*\* |
| Edu, x Exp, | 0.0004 | 0.0005 | 0 | 0.0001 | 0.0005 | 0.0007 | -0.001 | 0 |
| (0.0001)\*\*\* | (0)\*\*\* | (0.0002)\* | (0) | (0.0002)\*\* | (0)\*\*\* | (0.0003)\*\* | (0.0001)\*\*\* |
| White | -0.029 | -0.021 | -0.003 | -0.022 | -0.019 | -0.021 | -0.002 | -0.017 |
| (0.0099)\*\*\* | (0.0018)\*\*\* | (0.014) | (0.0027)\*\*\* | (0.017) | (0.0031)\*\*\* | (0.022) | (0.0045)\*\*\* |
| Formal | 0.24 | 0.23 | 0.31 | 0.27 | 0.32 | 0.44 | 0.42 | 0.43 |
| (0.0085)\*\*\* | (0.0017)\*\*\* | (0.013)\*\*\* | (0.0025)\*\*\* | (0.016)\*\*\* | (0.0026)\*\*\* | (0.026)\*\*\* | (0.0045)\*\*\* |
| Bolsa Familia (BF) | 0.16 | 0.097 | 0.12 | 0.083 | 0.11 | -0.085 | 0.1 | -0.17 |
| (0.0094)\*\*\* | (0.0017)\*\*\* | (0.013)\*\*\* | (0.0026)\*\*\* | (0.015)\*\*\* | (0.0029)\*\*\* | (0.021)\*\*\* | (0.0042)\*\*\* |
| Constant | 6.12 | 6.56 | 5.87 | 6.57 | 6.58 | 6.75 | 6.01 | 6.18 |
| (0.057)\*\*\* | (0.013)\*\*\* | (0.082)\*\*\* | (0.02)\*\*\* | (0.072)\*\*\* | (0.035)\*\*\* | (0.11)\*\*\* | (0.048)\*\*\* |
| **N** | 16,391 | 571,007 | 10,624 | 333,443 | 9,512 | 402,774 | 5,800 | 207,594 |
| **R2** | 0.11 | 0.09 | 0.081 | 0.079 | 0.099 | 0.11 | 0.1 | 0.1 |
| **Average Treatment Effect on the Treated calculated in Brazilian Real of household income,** | | | | | | | | |
| **Model 1 (without BF)** | R$ 1,085.36 | R$ 516.03 | R$ 1,085.36 | R$ 712.09 | R$ 1,085.36 | R$ 728.55 | R$ 1,085.36 | R$ 1,085.36 |
| **Average Treatment Effect on the Treated of Bolsa Família** | 17.1% | 10.2% | 12.5% | 8.7% | 12.1% | -8.1% | 10.5% | -15.6% |
| R$ 185.30 | R$ 52.50 | R$ 135.77 | R$ 61.97 | R$ 130.84 | -R$ 59.30 | R$ 114.25 | -R$ 169.32 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Control group: individuals not in the program in households receiving less that ½ minimum wage per capita. Average Treatment Effect on the Treated by log-lin regression with household income and dummy BF. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |
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As for Table 5, considering only the statistically significant results we can see that family income tended to increase due to the BFP in 2006. The same result arises for urban areas in 2010 but not for rural areas, possibly due to the increase in formal and informal wages between 2006 and 2010 in the rural area, shown in graph 2. This is an intuitive result and matches the results obtained by the Blinder and Oaxaca, differing only in the estimates of monetary impact; which may be affected by the fact that the part not explained by the methodology may be strongly affected by the existence of other variables omitted in the income equation. This shows that the family behaves rationally when they opt for informal work and keep on receiving the benefit of BFP, because, although the labor income was lower, the family income, in whole, tends to increase due to the sum of social benefit and the income from informal labor. According to Table 5, household income increases from 52 to 185 reais values. Thus, considering what has been presented throughout this paper, we can conclude that the Bolsa Família Program tends to encourage informality. According to the theoretical analysis this can be explained by the existence of upper limits on capita household income for a family to be classifued as being in poverty and extreme poverty. Based on this fact, the adult beneficiaries seek work in sectors where it would be difficult to prove the receipt of remuneration of labor, so that, in the eyes of the managers of BFP the family continues to be seen as being in poverty or extreme poverty and continues to qualify for social benefits.

**7 CONCLUSION**

This study investigated some consequences of the Bolsa Família Program on the labor market. We assessed the effect of the BFP on the beneficiaries` decision to offer their labor in the informal labor market. We found that the Bolsa Família Program does in fact encourage beneficiaries to seek employment in the informal market. These incentives derive from the existence of an upper limit for household income for participation in the program. The adult seek work in sectors where the income is less easily detected by the program administrators.

Some consequences of the engagement in informal labor market were estimated, such as the reduction of labor remuneration of the adults beneficiaries (due to the choice of informal job), by 53-267 reais; and the increase in total family income, from 52-185 reais in 2006 and 2010. This shows that the family is being rational to opt for informal work while also receiving the benefit of BFP, as total income increases in value.

It is important to point out that the BFP may have other consequences on the labor market which are not analyzed in this study, such as other positive externalities in certain areas where the program has benefited many families. Other consequences also not analyzed may arise from the choice of informal job, such as the lack of information in this sector of the labor market; the lack of labor rights, which are only felt by the worker at the time when he or she is in need; and the total dependence of these people on government assistance. This is due both to continuous dependence on BFP benefit as well as the fact that these people do not contribute to social security when they are working, so they will get old and will not emancipate from the program. These can be future topics of research regarding this subject.

## 

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**Appendix 1 – Control Group for Income Estimates**

In order to evaluate the impact of the BFP on informality in the labor market is necessary to have a control group that is similar to the treatment group but has not received the BFP benefits. As the selection for participation in this program was not random, we create control groups that create contrary natural results to those sought by this study. Thus, if we find our expected results they will be strong evidence that the effects are real and are slightly larger than estimated. If we do not find these results, nothing could be said.

In the evaluation the effect of Bolsa Família on labor income the preferred control group was individuals not in the program in households receiving less that half a minimum wage per capita. In this Appendix, we will analyze the differences between this control group and the first and we will check if this control group is appropriate for this purpose.

So as to test whether the counterfactual control group 2 is better than group 1, we note the difference in values in the estimation of the explanatory variables when compared with those receiving the benefit of BFP, in the Blinder-Oaxaca decomposition. This can be seen in Table A1.1 that has the “explained” part of the Blinder and Oaxaca decomposition (control group 1) to wages with large values when compared to the values in Table 5 (control group 2). The same can be seen when we compare Table A1.2 and Table 6, in terms of household income.

**Table A1.1 – Blinder-Oaxaca decomposition of wages. Control Group: Individuals who do not receive *Bolsa Familia* benefits.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Models with and without the Bolsa Família Variable in natural logarithm of wages** | | | | | | | | |
| **Model 1 (without BF)** | 6.78 | 7.18 | 6.32 | 6.43 | 6.03 | 6.53 | 5.71 | 6.52 |
| (0.0067)\*\*\* | (0.0011)\*\*\* | (0.044)\*\*\* | (0.0035)\*\*\* | (0.012)\*\*\* | (0.0026)\*\*\* | (0.059)\*\*\* | (0.024)\*\*\* |
| **Model 1 (with BF)** | 5.91 | 6.43 | 6.00 | 6.52 | 5.46 | 6.04 | 5.65 | 6.39 |
| (0.014)\*\*\* | (0.0021)\*\*\* | (0.024)\*\*\* | (0.0056)\*\*\* | (0.014)\*\*\* | (0.0032)\*\*\* | (0.081)\*\*\* | (0.014)\*\*\* |
| **Difference** | 0.86 | 0.75 | 0.32 | -0.093 | 0.57 | 0.49 | 0.056 | 0.13 |
| (0.015)\*\*\* | (0.0024)\*\*\* | (0.05)\*\*\* | (0.0066)\*\*\* | (0.018)\*\*\* | (0.0041)\*\*\* | (0.1) | (0.028)\*\*\* |
| **Blinder-Oaxaca decomposition in natural logarithm of wages** | | | | | | | | |
| **Explained** | 0.57 | 0.49 | 0.65 | 0.58 | 0.35 | 0.33 | 0.6 | 0.43 |
| (0.0075)\*\*\* | (0.0012)\*\*\* | (0.0092)\*\*\* | (0.0015)\*\*\* | (0.012)\*\*\* | (0.0018)\*\*\* | (0.027)\*\*\* | (0.0029)\*\*\* |
| **Unexplained** | 0.29 | 0.26 | -0.33 | -0.67 | 0.22 | 0.16 | -0.54 | -0.3 |
| (0.015)\*\*\* | (0.0023)\*\*\* | (0.051)\*\*\* | (0.0066)\*\*\* | (0.016)\*\*\* | (0.004)\*\*\* | (0.099)\*\*\* | (0.028)\*\*\* |
| **Model without the Bolsa Família Variable in Brazilian Real of wages** | | | | | | | | |
| **Model 1 (without BF)** | R$ 1,082.19 | R$ 1,310.54 | R$ 685.10 | R$ 619.43 | R$ 512.15 | R$ 685.54 | R$ 371.09 | R$ 678.11 |
| **Blinder-Oaxaca decomposition in Brazilian Real of wages** | | | | | | | | |
| **Explained** | -43.6% | -38.9% | -47.8% | -43.8% | -29.8% | -28.2% | -45.1% | -35.0% |
| -R$ 472.27 | -R$ 510.28 | -R$ 327.23 | -R$ 271.31 | -R$ 152.84 | -R$ 193.36 | -R$ 167.36 | -R$ 237.27 |
| **Unexplained** | -25.3% | -22.8% | 38.9% | 95.4% | -19.4% | -14.7% | 72.2% | 35.1% |
| -R$ 273.66 | -R$ 298.50 | R$ 266.55 | R$ 590.68 | -R$ 99.51 | -R$ 100.92 | R$ 267.98 | R$ 237.82 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Control group: individuals not in the program in households. Blinder-Oaxaca decomposition of wages. Heckman procedure was used to overcome the bias of the sampling selectivity. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |
|
|

**Table A1.2 – Blinder-Oaxaca decomposition of household income. Control Group: Individuals who do not receive *Bolsa Familia* benefits.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Models with and without the Bolsa Família Variable in natural logarithm of household income** | | | | | | | | |
| **Model 1 (without BF)** | 7.30 | 7.74 | 7.31 | 7.80 | 6.63 | 7.13 | 6.68 | 7.27 |
| (0.0036)\*\*\* | (0.0007)\*\*\* | (0.0042)\*\*\* | (0.0008)\*\*\* | (0.008)\*\*\* | (0.0014)\*\*\* | (0.01)\*\*\* | (0.0018)\*\*\* |
| **Model 1 (with BF)** | 6.51 | 6.98 | 6.43 | 7.00 | 6.14 | 6.38 | 6.05 | 6.36 |
| (0.0064)\*\*\* | (0.0013)\*\*\* | (0.0082)\*\*\* | (0.0017)\*\*\* | (0.0094)\*\*\* | (0.002)\*\*\* | (0.012)\*\*\* | (0.0027)\*\*\* |
| **Difference** | 0.79 | 0.76 | 0.88 | 0.8 | 0.49 | 0.75 | 0.63 | 0.91 |
| (0.0073)\*\*\* | (0.0015)\*\*\* | (0.0093)\*\*\* | (0.0019)\*\*\* | (0.012)\*\*\* | (0.0024)\*\*\* | (0.016)\*\*\* | (0.0032)\*\*\* |
| **Blinder-Oaxaca decomposition in natural logarithm of household income** | | | | | | | | |
| **Explained** | 0.55 | 0.47 | 0.59 | 0.5 | 0.29 | 0.34 | 0.43 | 0.45 |
| (0.006)\*\*\* | (0.001)\*\*\* | (0.0071)\*\*\* | (0.0013)\*\*\* | (0.0077)\*\*\* | (0.0014)\*\*\* | (0.011)\*\*\* | (0.0021)\*\*\* |
| **Unexplained** | 0.24 | 0.29 | 0.29 | 0.3 | 0.21 | 0.41 | 0.2 | 0.46 |
| (0.0076)\*\*\* | (0.0015)\*\*\* | (0.0096)\*\*\* | (0.0019)\*\*\* | (0.013)\*\*\* | (0.0025)\*\*\* | (0.017)\*\*\* | (0.0035)\*\*\* |
| **Model without the Bolsa Família Variable in Brazilian Real of household income** | | | | | | | | |
| **Model 1 (without BF)** | R$ 1,818.15 | R$ 2,304.59 | R$ 1,831.53 | R$ 2,450.89.19 | R$ 935.23 | R$ 1,249.06 | R$ 978.14 | R$ 1,435.95 |
| **Blinder-Oaxaca decomposition in Brazilian Real of household income** | | | | | | | | |
| **Explained** | -42.3% | -37.4% | -44.3% | -39.1% | -25.1% | -29.0% | -34.6% | -36.4% |
| -R$ 768.67 | -R$ 862.36 | -R$ 811.85 | -R$ 957.11 | -R$ 235.01 | -R$ 361.95 | -R$ 338.84 | -R$ 522.87 |
| **Unexplained** | -21.0% | -25.5% | -25.1% | -26.2% | -18.6% | -33.8% | -18.3% | -37.0% |
| -R$ 382.11 | -R$ 586.89 | -R$ 460.37 | -R$ 643.32 | -R$ 173.58 | -R$ 422.23 | -R$ 179.28 | -R$ 530.60 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Control group: individuals not in the program in households. Blinder-Oaxaca decomposition of household income. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |
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We can note that the explained part always has lower income (wages and household income) than the group not receiving benefits from Bolsa Familia. That would be proof of the focus of the BFP in the poorest among the poor. Thus, although estimates of the explained part are smaller with control group 2, they are still negative and it shows that this control group is not in the same condition as the treatment group. It shows that the expected outcome of the control group would have lower estimates of wages and family income than the treatment group. The same expected outcome can be noted from the table of the T-test between control and treatment groups with observable variables (Table A1.3).

**Table A1.3 – T-test of control and treatment groups with observable variables in 2010. Control Group: Individuals not in the program in households receiving less that ½ minimum wage per capita.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | | **(1)** | | **(2)** | | **(3)** | | **(4)** | |
| **Male** | | **Female** | | **Male** | | **Female** | |
| **Urban** | | **Urban** | | **Rural** | | **Rural** | |
| **BFP = 0** | **BFP = 1** | **BFP = 0** | **BFP = 1** | **BFP = 0** | **BFP = 1** | **BFP = 0** | **BFP = 1** |
| White | Means | 0.36 | 0.27 | 0.38 | 0,27 | 0,34 | 0,26 | 0,36 | 0,26 |
| (0.0006)\*\*\* | (0.0006)\*\*\* | (0.0005)\*\*\* | (0,0006)\*\*\* | (0,0008)\*\*\* | (0,0006)\*\*\* | (0,0008)\*\*\* | (0,0007)\*\*\* |
| Difference | 0.094 | | 0.11 | | 0.081 | | 0,093 | |
| (0.0008)\*\*\* | | (0.0008)\*\*\* | | (0.001)\*\*\* | | (0,001)\*\*\* | |
| Black | Means | 0.11 | 0.11 | 0.095 | 0,1 | 0,083 | 0,087 | 0,073 | 0,08 |
| (0.0004)\*\*\* | (0.0004)\*\*\* | (0.0003)\*\*\* | (0,0004)\*\*\* | (0,0004)\*\*\* | (0,0004)\*\*\* | (0,0004)\*\*\* | (0,0004)\*\*\* |
| Difference | -0.007 | | -0.01 | | -0.004 | | -0,007 | |
| (0.0006)\*\*\* | | (0.0005)\*\*\* | | (0.0006)\*\*\* | | (0,0006)\*\*\* | |
| Age | Means | 37.29 | 34.47 | 38.03 | 34,36 | 38,67 | 35,35 | 38,17 | 34,28 |
| (0.019)\*\*\* | (0.02)\*\*\* | (0.018)\*\*\* | (0,017)\*\*\* | (0,026)\*\*\* | (0,021)\*\*\* | (0,029)\*\*\* | (0,02)\*\*\* |
| Difference | 2.82 | | 3.67 | | 3.32 | | 3,89 | |
| (0.028)\*\*\* | | (0.026)\*\*\* | | (0.033)\*\*\* | | (0,034)\*\*\* | |
| Educ, (years) | Means | 7.41 | 6.40 | 7.91 | 6,95 | 5,83 | 5,35 | 6,50 | 5,93 |
| (0.0047)\*\*\* | (0.0051)\*\*\* | (0.0046)\*\*\* | (0,0049)\*\*\* | (0,0059)\*\*\* | (0,0051)\*\*\* | (0,0069)\*\*\* | (0,0055)\*\*\* |
| Difference | 1.02 | | 0.96 | | 0.48 | | 0,58 | |
| (0.0071)\*\*\* | | (0.0068)\*\*\* | | (0.0077)\*\*\* | | (0,0087)\*\*\* | |
| **N - BFP = 0** | | 747,390 | | 857,266 | | 387,817 | | 336,516 | |
| **N - BFP = 1** | | 514,202 | | 611,948 | | 458,631 | | 443,506 | |
| Source: CENSO 2010 - IBGE. Brazillian Population Census. Control Group: Individuals not in the program in households receiving less that ½ minimum wage per capita. T-test of control and treatment groups with observable variables. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | | |
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All the means of the observed variables are statistically different between the two groups. In addition, the estimated values contribute to lower wages for the control group, due to the characteristics of the labor market. The fact that the control group has less white and more black members tends to generate lower wages due to the still existing discrimination in the labor market. When we look at the years of education and age, we also expect lower wages for the control group because education is lower and age, besides being smaller, has a difference that compensates for age and generates lower measures of experience. Aware of these differences, we control the observable variables, as well as for regions (due to differences in Table A1.4), by placing them as explanatory variables in the regressions. However, as there may be other unobserved variables in the same direction that generate lower incomes for the control group, we hope that the control group with per capita income control present salary and household income estimates lower than the treatment group and in moderate values when compared to the control group 1 (no control of per capita income).

Thus, considering the probit estimates that the BFP encourages informal work and that this type of work is paid less than in the formal market, if estimates of the control group present increases in household income, this is a strong indication that, despite the choice of informal work and lower remuneration for work, people are rational and family income is increasing due to the Bolsa Família benefits.

**Table A1.4 – T-test of control and treatment groups with variables of regions in 2010. Control Group: Individuals not in the program in households receiving less that ½ minimum wage per capita.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | | **(1)** | | **(2)** | | **(3)** | | **(4)** | |
| **Male** | | **Female** | | **Male** | | **Female** | |
| **Urban** | | **Urban** | | **Rural** | | **Rural** | |
| **BFP = 0** | **BFP = 1** | **BFP = 0** | **BFP = 1** | **BFP = 0** | **BFP = 1** | **BFP = 0** | **BFP = 1** |
| Metropolitan área | Means | 0.41 | 0.24 | 0.43 | 0.25 | 0,11 | 0,08 | 0,11 | 0,084 |
| (0.0006)\*\*\* | (0.0006)\*\*\* | (0.0005)\*\*\* | (0.0006)\*\*\* | (0,0005)\*\*\* | (0,0004)\*\*\* | (0,0005)\*\*\* | (0,0004)\*\*\* |
| Diff, | 0.17 | | 0.17 | | 0.025 | | 0.029 | |
| (0.0008)\*\*\* | | (0.0008)\*\*\* | | (0.0006)\*\*\* | | (0.0007)\*\*\* | |
| Northeast | Means | 0.35 | 0.55 | 0.34 | 0.55 | 0,42 | 0,64 | 0,42 | 0,64 |
| (0.0006)\*\*\* | (0.0007)\*\*\* | (0.0005)\*\*\* | (0.0006)\*\*\* | (0,0008)\*\*\* | (0,0007)\*\*\* | (0,0009)\*\*\* | (0,0007)\*\*\* |
| Diff, | -0.2 | | -0.2 | | -0.22 | | -0.23 | |
| (0.0009)\*\*\* | | (0.0008)\*\*\* | | (0.0011)\*\*\* | | (0.0011)\*\*\* | |
| South | Means | 0.12 | 0.078 | 0.13 | 0.081 | 0,15 | 0,075 | 0,15 | 0,076 |
| (0.0004)\*\*\* | (0.0004)\*\*\* | (0.0004)\*\*\* | (0.0003)\*\*\* | (0,0006)\*\*\* | (0,0004)\*\*\* | (0,0006)\*\*\* | (0,0004)\*\*\* |
| Diff, | 0.044 | | 0.045 | | 0.073 | | 0.079 | |
| (0.0006)\*\*\* | | (0.0005)\*\*\* | | (0.0007)\*\*\* | | (0.0007)\*\*\* | |
| Midwest | Means | 0.081 | 0.054 | 0.082 | 0.056 | 0,072 | 0,03 | 0,071 | 0,03 |
| (0.0003)\*\*\* | (0.0003)\*\*\* | (0.0003)\*\*\* | (0.0003)\*\*\* | (0,0004)\*\*\* | (0,0003)\*\*\* | (0,0004)\*\*\* | (0,0003)\*\*\* |
| Diff, | 0.027 | | 0.026 | | 0.043 | | 0.041 | |
| (0.0005)\*\*\* | | (0.0004)\*\*\* | | (0.0005)\*\*\* | | (0.0005)\*\*\* | |
| North | Means | 0.11 | 0.13 | 0.1 | 0.12 | 0,18 | 0,13 | 0,17 | 0,12 |
| (0.0004)\*\*\* | (0.0005)\*\*\* | (0.0003)\*\*\* | (0.0004)\*\*\* | (0,0006)\*\*\* | (0,0005)\*\*\* | (0,0006)\*\*\* | (0,0005)\*\*\* |
| Diff, | -0.024 | | -0.02 | | 0.05 | | 0.046 | |
| (0.0006)\*\*\* | | (0.0005)\*\*\* | | (0.0008)\*\*\* | | (0.0008)\*\*\* | |
| Southeast | Means | 0.33 | 0.18 | 0.34 | 0.19 | 0,18 | 0,12 | 0,19 | 0,13 |
| (0.0005)\*\*\* | (0.0005)\*\*\* | (0.0005)\*\*\* | (0.0005)\*\*\* | (0,0006)\*\*\* | (0,0005)\*\*\* | (0,0007)\*\*\* | (0,0005)\*\*\* |
| Diff, | 0.15 | | 0.15 | | 0.054 | | 0.061 | |
| (0.0008)\*\*\* | | (0.0007)\*\*\* | | (0.0008)\*\*\* | | (0.0008)\*\*\* | |
| Source: CENSO 2010 - IBGE. Brazillian Population Census. Control Group: Individuals not in the program in households receiving less that ½ minimum wage per capita. T-test of control and treatment groups with variables of regions. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | | |

**Appendix 2 - Effect of *Bolsa Familia* on Informality using Different Control Groups**

Table A2.1 replicates the estimation of equation (17) in Table 1, of the impact of the *BFP* on the probability of formality, using as the control group the broad set of individuals who do not participate in the program. Table A2.2 does the same yet using as the control group the narrower set of individuals who receive less than half a minimum wage per capita.

**Table A2.1 – Impact of *Bolsa Familia* on Informality in the Labor Market. Control Group: Individuals who do not receive *Bolsa Familia* benefits, in households with income per capita lower than ½ a minimum wage.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Dep: Formal** | | | | | | | | |
| Education (years) | 0.19 | 0.14 | 0.25 | 0.14 | 0.15 | 0.1 | 0.24 | 0.17 |
|  | (0.01)\*\*\* | (0.0017)\*\*\* | (0.014)\*\*\* | (0.0024)\*\*\* | (0.016)\*\*\* | (0.0023)\*\*\* | (0.028)\*\*\* | (0.0039)\*\*\* |
| Experience | 0.11 | 0.069 | 0.13 | 0.068 | 0.11 | 0.065 | 0.14 | 0.093 |
|  | (0.007)\*\*\* | (0.0012)\*\*\* | (0.0086)\*\*\* | (0.0017)\*\*\* | (0.009)\*\*\* | (0.0015)\*\*\* | (0.017)\*\*\* | (0.0031)\*\*\* |
| Experience squ, | -0.002 | -0.001 | -0.002 | -0.001 | -0.002 | -0.001 | -0.002 | -0.001 |
|  | (0.0001)\*\*\* | (0)\*\*\* | (0.0001)\*\*\* | (0)\*\*\* | (0.0001)\*\*\* | (0)\*\*\* | (0.0002)\*\*\* | (0)\*\*\* |
| Edu, x Exp, | -0.004 | -0.003 | -0.005 | -0.003 | -0.003 | -0.002 | -0.004 | -0.002 |
|  | (0.0004)\*\*\* | (0.0001)\*\*\* | (0.0005)\*\*\* | (0.0001)\*\*\* | (0.0006)\*\*\* | (0.0001)\*\*\* | (0.0011)\*\*\* | (0.0002)\*\*\* |
| White | 0.018 | -0.037 | -0.028 | -0.002 | -0.002 | -0.071 | 0.022 | -0.01 |
|  | (0.026) | (0.0045)\*\*\* | (0.036) | (0.0062) | (0.041) | (0.0059)\*\*\* | (0.064) | (0.0092) |
| Bolsa Familia | -0.091 | -0.23 | -0.19 | -0.43 | -0.16 | -0.13 | -0.16 | -0.3 |
|  | (0.024)\*\*\* | (0.0042)\*\*\* | (0.033)\*\*\* | (0.0058)\*\*\* | (0.037)\*\*\* | (0.0054)\*\*\* | (0.061)\*\* | (0.0087)\*\*\* |
| Constant | -2.26 | -1.15 | -3.19 | -1.57 | -1.90 | -1.16 | -3.55 | -2.55 |
|  | (0.14)\*\*\* | (0.035)\*\*\* | (0.18)\*\*\* | (0.044)\*\*\* | (0.26)\*\*\* | (0.088)\*\*\* | (0.43)\*\*\* | (0.15)\*\*\* |
| **N** | 16,484 | 577,279 | 10,705 | 336,702 | 9,640 | 427,307 | 5,914 | 218,948 |
| **R2** | 0.089 | 0.067 | 0.1 | 0.083 | 0.11 | 0.069 | 0.13 | 0.093 |
| **Log-Likelihood** | -4,100,000 | -33,547 | -2,100,000 | -18,851 | -1,700,000 | -12,915 | -610,000 | -5,011 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Dependent variable=1 if the individual is formally employed (0 if informally employed). Control group: individuals not in the program in households receiving less that ½ minimum wage per capita. Probit estimation. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |
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**Table A2.2 – Impact of *Bolsa Familia* on Informality in the Labor Market. Control Group: Individuals who do not receive *Bolsa Familia* benefits.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **Male** | **Male** | **Female** | **Female** | **Male** | **Male** | **Female** | **Female** |
| **Urban** | **Urban** | **Urban** | **Urban** | **Rural** | **Rural** | **Rural** | **Rural** |
| **2006** | **2010** | **2006** | **2010** | **2006** | **2010** | **2006** | **2010** |
| **Dep: Formal** | | | | | | | | |
| Education (years) | 0.18 | 0.12 | 0.22 | 0.14 | 0.15 | 0.11 | 0.26 | 0.19 |
|  | (0.0034)\*\*\* | (0.0006)\*\*\* | (0.0042)\*\*\* | (0.0008)\*\*\* | (0.0082)\*\*\* | (0.0012)\*\*\* | (0.013)\*\*\* | (0.0018)\*\*\* |
| Experience | 0.092 | 0.045 | 0.1 | 0.049 | 0.08 | 0.047 | 0.12 | 0.084 |
|  | (0.0021)\*\*\* | (0.0004)\*\*\* | (0.0026)\*\*\* | (0.0005)\*\*\* | (0.0044)\*\*\* | (0.0007)\*\*\* | (0.0076)\*\*\* | (0.0012)\*\*\* |
| Experience squ, | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.002 | -0.001 |
|  | (0)\*\*\* | (0)\*\*\* | (0)\*\*\* | (0)\*\*\* | (0.0001)\*\*\* | (0)\*\*\* | (0.0001)\*\*\* | (0)\*\*\* |
| Edu, x Exp, | -0.003 | -0.002 | -0.004 | -0.002 | -0.002 | -0.002 | -0.004 | -0.003 |
|  | (0.0001)\*\*\* | (0)\*\*\* | (0.0001)\*\*\* | (0)\*\*\* | (0.0003)\*\*\* | (0)\*\*\* | (0.0004)\*\*\* | (0.0001)\*\*\* |
| White | 0.049 | -0.025 | 0.036 | 0.016 | 0.015 | -0.054 | 0.017 | 0.013 |
|  | (0.011)\*\*\* | (0.002)\*\*\* | (0.013)\*\*\* | (0.0024)\*\*\* | (0.025) | (0.0038)\*\*\* | (0.037) | (0.0056)\*\* |
| Bolsa Familia | -0.26 | -0.32 | -0.41 | -0.54 | -0.24 | -0.25 | -0.38 | -0.47 |
|  | (0.015)\*\*\* | (0.0026)\*\*\* | (0.018)\*\*\* | (0.0033)\*\*\* | (0.026)\*\*\* | (0.0039)\*\*\* | (0.039)\*\*\* | (0.0058)\*\*\* |
| Constant | -1.72 | -0.73 | -2.31 | -1.06 | -1.55 | -0.95 | -3.02 | -2.26 |
|  | (0.049)\*\*\* | (0.013)\*\*\* | (0.059)\*\*\* | (0.015)\*\*\* | (0.13)\*\*\* | (0.047)\*\*\* | (0.19)\*\*\* | (0.067)\*\*\* |
| **N** | 86,783 | 2,850,950 | 67,114 | 2,064,444 | 20,381 | 912,177 | 12,587 | 498,455 |
| **R2** | 0.13 | 0.087 | 0.16 | 0.12 | 0.14 | 0.1 | 0.24 | 0.16 |
| **Log-Likelihood** | -23,000,000 | -170,000 | -18,000,000 | -130,000 | -4,700,000 | -31,185 | -2,200,000 | -15,000 |
| Source: PNAD 2006 – IBGE. National Survey of a Sample of Households. CENSO 2010 - IBGE. Brazillian Population Census. Dependent variable=1 if the individual is formally employed (0 if informally employed). Control group: individuals not in the program in households. Probit estimation. Results of state dummies in X control for fixed local effects were omitted. Standard errors in parenthesis. \*\*\* p-value < 1%, \*\* 1% < p-value < 5%, \*5 < p-value < 10%. | | | | | | | | |
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1. Secretaria do Tesouro Nacional [↑](#footnote-ref-1)
2. Universidade de Brasília [↑](#footnote-ref-2)
3. Universidade de Brasília [↑](#footnote-ref-3)
4. In the results reached so far we found that a great part oscillates between -1 and 1 with a maximum of 2 and minimum of -1.33 [↑](#footnote-ref-4)
5. As shown by Varian (2006, p. 182 and 183) a budget constraint composed of consumption goods (except leisure) and income derived from work (measured income) is equal mathematically to a budget constraint composed of consumption goods, leisure and the income derived from the initial time endowment (full income). [↑](#footnote-ref-5)
6. (Jehle and Reny, 2000, chap. 1). [↑](#footnote-ref-6)
7. Attention is drawn to the fact that after the described procedure, all the monetary values were corrected for inflation according to Corseuil and Foguel (2002) for the PNAD data. [↑](#footnote-ref-8)