

THE IMPACT OF CONDITIONAL CASH TRANSFERS ON LABOR SUPPLY: NEW EVIDENCE FROM BRAZIL'S *BOLSA FAMILIA*

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RESUMO

A teoria econômica convencional sobre oferta de trabalho prevê que, se lazer for um bem normal, um incremento de renda do não-trabalho irá reduzir a oferta de trabalho via efeito renda. Assim, no caso de um programa de transferência condicionada de renda, beneficiários poderiam ser desencorajados de trabalhar ou de buscar um emprego, caso não tenham um. No entanto, tal interpretação pode não necessariamente ser aplicável a tal tipo de programa, uma vez que as condicionalidades podem afetar a relação entre renda adicional (transferência de renda) e oferta de trabalho. Este estudo estima o impacto do programa Bolsa Família sobre a oferta de trabalho de adultos, com base em microdados para o período 2001-2009, utilizando estimação via modelo de efeitos fixos. Os resultados mostram que, no geral, a participação no Bolsa Família aumenta a oferta de trabalho na margem extensiva, mas a reduz na margem intensiva. O programa tem impacto positivo tanto na taxa de emprego quanto na taxa de desemprego. Efeitos positivos são observados também sobre a participação na força de trabalho bem como sobre o emprego de mulheres, de não-brancos e de residentes de áreas rurais, enquanto efeitos não significativos foram constatados para homens e para indivíduos brancos. Por fim, os resultados também sugerem que o programa implica em aumento no emprego informal em detrimento do setor formal, com tais efeitos sendo mais fortes para mulheres.

Palavras-chave: Transferências Condicionadas de Renda, Oferta de Trabalho, Brasil.

ABSTRACT

The standard economic theory of labor supply predicts that, if leisure is a normal good, additional non-labor income will reduce labor supply via an income effect. Thus, in the case of a conditional cash transfer (CCT) program, beneficiaries could be discouraged from working, or from searching for a job if they do not have one. Such an interpretation, however, may not necessarily apply to CCT programs, since the conditionalities may affect the relationship between additional income (cash transfer) and labor supply. This study estimates the impact of Brazil's CCT program *Bolsa Família* on the labor supply of adults, based on survey microdata for the period 2001-2009, using a fixed effects estimation approach. The results show that, in general, participation in *Bolsa Família* increases labor supply at the extensive margin, but also reduces labor supply on the intensive margin. It has a positive impact on both employment and unemployment rates. Positive effects are observed for both labor force participation and employment of females, non-whites, and rural area residents, while no significant effects are found for male and for white individuals. The results also suggest an increase in informal employment at the expense of formal sector employment, with the effects being stronger for women.

Key words: Conditional Cash Transfers, Labor Supply, Brazil.

JEL: O1, I3, J2.

1. Introduction

Conditional cash transfer (CCT) programs have been widely implemented over the past two decades, and they have become an important part of the social safety net in many developing countries. A recurrent question, however, is whether transfers might affect individual participation in the labor market by generating disincentives to work. Given the possibility of a negative income effect on labor supply, one could expect that cash transfer beneficiaries would be discouraged from working, or from searching for a job if they do not have one, due to the cash transfer.

Even though the literature on the effects of CCT programs on labor supply in developing countries is still somewhat limited, the existing studies indicate that, in general, such programs do not reduce labor force participation. Such evidence is provided by Skoufias and Di Maro (2008), who analyzed Mexico's *Progresa*, as well as by Alzúa et al. (2013), who found that cash transfer programs in Mexico, Nicaragua, and Honduras did not reduce labor supply in those countries. Indeed, some previous studies have estimated an increase in labor force participation, in rural areas of Chile and Colombia, as a result of CCT programs (Galasso, 2006; IFS et al., 2006). More recently, Banerjee et al. (2015) re-analyzed data from seven different randomized controlled trials (RCT)¹ and found no systematic evidence of effects of such programs on labor supply.

The largest conditional cash transfer (CCT) program in the world is Brazil's *Bolsa Familia*, implemented in 2004 as a merger and expansion of programs implemented in 2001, which has proven effective in improving several educational outcomes (Glewwe and Kassouf, 2012). In spite of the program's successes, its effects on labor supply remain an open question.

In the case of Brazil, the results provided by the literature are somewhat divergent, due to the fact that existing studies follow different specifications and empirical strategies, despite using the same data source, namely the Brazilian National Household Survey (PNAD). Using data from the PNAD of 2004, Tavares (2010) finds an increase in labor force participation due to *Bolsa Familia*. A positive effect is also found by Ferro et al. (2010), who find evidence of a positive impact of conditional cash transfers² on labor force participation of parents using a 2003 PNAD sample, and also by Teixeira (2010), whose estimates are based on data for the year of 2006. Foguel and Barros (2010), using a pseudo-panel of municipalities for the period 2001-2005, find no evidence of statistically significant effects on the labor force participation rate. Employing data aggregated at the same level (census tract level) for the years 2001, 2004 and 2006, Ribas and Soares (2011) obtain differences-in-differences estimates which indicate that *Bolsa Familia* increases labor force participation in rural areas but reduces it in the formal sector in metropolitan areas. Barbosa and Corseuil (2014) use a regression discontinuity design along with the data from the 2006 PNAD and find no effects of the program on the occupation choice of adults for both the formal and the informal sectors. Two more recent studies use datasets other than the PNAD and find evidence of negative effects of the cash transfers on labor supply. De Brauw et al. (2015) use propensity score weighting applied to household survey data from the AIBF (*Bolsa Familia*

¹ The authors identified a total of 18 RCT's and, based on methodological criteria and data availability, selected seven of them. Their analysis is based on the following studies: Galiani and McEwan (2013), and Glewwe and Olinto (2004), for Honduras; Benhassine et al. (2015), for Morocco; Parker and Skoufias (2000), Skoufias and di Maro (2008), for Mexico (*Progresa*); Skoufias et al. (2013), also for Mexico (*Programa de Apoyo Alimentario*); Chaudhury et al. (2013), for the Philippines; World Bank Office Jakarta (2011), for Indonesia; and Maluccio and Flores (2005), for Nicaragua.

² Conditional cash transfer programs have existed at the federal level in Brazil since 2001. These programs are discussed in more detail in Section 2.

Impact Evaluation) project³ for the year of 2009 and find that, in general, *Bolsa Familia* has no significant impact on either labor force participation or hours worked, but leads to a shift from the formal to the informal sector and also significantly reduces women's employment rate. Finally, using data from the 2010 Brazilian Census and propensity score matching with a quantile treatment effect estimator, Cavalcanti et al. (2016) find negative effects on hours worked for several quantiles, especially among rural area residents.

Thus, the literature remains unresolved about the actual effects of the *Bolsa Familia* program on labor supply. Also, most scholars have not yet analyzed a set of more recent years that would cover the continuous expansion, increases in benefits and operational changes made to *Bolsa Familia*. Therefore, this paper aims to answer the following question: Does Brazil's *Bolsa Familia* conditional cash transfer program discourage individuals from working, or at least from searching for a job?

The main contribution of this study is to estimate the effects of *Bolsa Familia* on labor force participation and weekly hours worked using a fixed effects approach applied to a larger and more recent census tract-level panel data set based on the PNAD surveys from 2001 to 2009. The use of longitudinal data allows one to control for the influence of unobserved time invariant variables that could lead to biased estimates, and also to include the impact of precursor programs. Thus, besides covering a longer period post implementation, this study includes data for years before the official creation of *Bolsa Familia*, in 2004, thereby taking into consideration the fact that the cash transfers effectively started in 2001. Another contribution consists in assessing the impacts of the program in the long term by testing for lagged impacts, as cash transfer recipients may change their behavior as they remain in the program over the years.

A potential limitation of most of the aforementioned studies on *Bolsa Familia* is that all but two studies (Foguel and Barros, 2010; and Ribas and Soares, 2011) use methods that leave unresolved the problem of self-selection into the program due to unobservable characteristics. Moreover, this paper also avoids the potential endogeneity problems of several papers that have evaluated this program. The results obtained by Foguel and Barros (2010), as well as by Teixeira (2010) and Tavares (2010), may reflect such endogeneity due to the inclusion of post-treatment income and/or unemployment rate as regressors in the labor force participation equation. In the case of Tavares (2010), that issue might arise from the use of income thresholds when defining some of the control groups. Finally, most papers above use household data for years no later than 2006, which limits their analyses to a period that is very close to the time of the program's implementation. Also, only two of them assess the effects of pre-existing programs. Starting in 2001, two conditional cash transfer programs that preceded *Bolsa Familia* were already operating and had a non-negligible coverage at the national level, so ideally *Bolsa Familia* should be considered in conjunction with those programs and, ideally, the initial period of any analysis should be prior to 2001.

The remainder of this paper is organized as follows. Section 2 presents a brief description of *Bolsa Familia* and discusses possible channels through which it might affect labor supply. Section 3 describes the dataset, while the next section addresses the empirical framework. The results are presented and discussed in Section 5, followed by the conclusions in Section 6.

2. Description of *Bolsa Familia* and some Theoretical Considerations

³ The AIBF is a research project run by CEDEPLAR/UFMG (at Federal University of Minas Gerais, Brazil) which collects data on a sample of Brazilian households in order to evaluate impacts of *Bolsa Familia*.

The Brazilian experience with conditional cash transfers programs started in 2001 with *Bolsa-Escola* (“School Stipend”) and *Bolsa-Alimentação* (“Food Stipend”), managed respectively by the Ministry of Education and the Ministry of Health. While the first aimed to increase school attendance by conditioning transfers on a minimum of 85% attendance among children at ages 6 to 15, the second had the objective of reducing child mortality by requiring updated vaccination records for children from birth to age 6 and regular clinical visits for pregnant women. Besides these two “*Bolsas*”, the federal government also implemented two unconditional cash transfers targeted to poor households: *Auxilio-Gas* (“Cooking Gas Subsidy”), which was a subsidy for cooking gas purchases that also started in 2001; and *Cartão-Alimentação* (“Food Card”), similar to *Bolsa-Alimentação* but without the conditionalities and with a temporary duration (6 to 18 months).

Bolsa Família (“Family Stipend”) was created in 2004 as a result of the merger of the aforementioned programs. The program is coordinated by the Brazilian Ministry of Social Development (MDS) and targets poor and extremely poor families, reaching 13.6 million families in 2016. The amount of money given to a household depends on the household’s per capita income, the number of household members between age 0 to 15 (extended to 17 years, in 2007), and the presence of a pregnant woman⁴. The transfers are conditional on children’s school enrollment (grades 1 to 12) and attendance, vaccination, and clinic visits for children ages 0 to 6 and pregnant women (MDS, 2015).⁵

The eligible families are those with household per capita income below the program’s poverty and extreme poverty lines, which are currently 170 *Reais* (about US\$52) and 85 *Reais* (US\$26)⁶ per month, respectively. Households that are below the poverty line but above the extreme poverty line enter the program only if they have at least one child or adolescent younger than 18 years of age, while families with per capita income below the extreme poverty line are eligible for an additional basic benefit regardless of the ages of the household members. The highest amount possible a family may receive is a total of 372 *Reais* (approximately US\$114) per month.⁷

The standard economic theory of labor supply applied to the case of cash transfers suggests that, because those transfers constitute additional non-labor income, they would lead to an income effect. Considering an individual who maximizes utility over income and leisure, and allocates time between work and leisure, if we assume that the latter is a normal good, the cash transfer undoubtedly produces a negative effect on labor supply. This type of effect is widely found in the literature on several welfare programs (Bertrand et al., 2003; Edmonds, 2006). Such an interpretation, however, may not apply to CCT programs mainly because of their conditionalities, eligibility criteria, and the fact that they are usually targeted at the household level.

In a program like *Bolsa Família*, the income effect discussed above may occur as a result of the transfer itself and hence may reduce labor supply. In addition, in order to continue receiving the benefit, individuals may adjust downward their labor supply decisions within the household, either by working less or even by leaving the labor force, so that their

⁴ For a given household, the maximum number of children that will count towards the calculation of the transfer amount is limited to five children ages 0 to 15 (pregnant women included in this quota) and two teenagers ages 16 and 17.

⁵ Pregnant women became effectively eligible only starting in 2011.

⁶ Based on the Brazilian *Reais* to US Dollar exchange rate of R\$3.25 or, inversely, the US Dollar to Brazilian *Reais* of US\$0.308 (May 19, 2017).

⁷ This is the case of a family under the extreme poverty line and with 5 children between age 0 to 15 and 2 adolescents between age 16 to 17. Such a family gets 39 *Reais* per child, 46 *Reais* per adolescent plus the basic benefit of 85 *Reais* for being extremely poor, implying a total of 372 *Reais*. Exceptions are allowed for families whose incomes do not exceed the (per capita) poverty line even after receiving the cash transfer. In these cases, the total received can exceed the stipulated maximum amount.

income level remains within the eligibility criteria. Nevertheless, one could argue that this latter pathway is unlikely, at least in the specific case of *Bolsa Familia*, since the program's benefits are relatively small and the cash transfers are only enough to raise the household's income above the established poverty line.

Conversely, program conditionalities such as the children's school attendance requirement can lead to an effect in the opposite direction. Because of this requirement, children would spend more time at school to the detriment of other activities, although one cannot predict what the new time allocation will be (Ravallion and Wodon, 2000; Foguel and Barros, 2010). If it reduces child labor, the amount of labor available within the household also decreases and, if the received benefit is lower than the child's earnings, then adult members may attempt to compensate for this reduction by increasing their labor supply. Moreover, the increased school attendance may reduce the time spent, mainly by mothers, in child-care activities and, consequently, allow them to devote more time to work, although complying with the school attendance itself (e.g. taking their children to school) as well as with the other program conditionalities (vaccination, clinic visits) may act in the opposite direction. Finally, an additional channel through which the cash transfers may lead to higher labor supply is the removal of credit constraints, since the additional income may, to some extent, enable households to increase investment in production, especially in rural areas.

3. The Data

Ideally, one would prefer to use data at the individual or household level, as the cash transfers are provided at those levels. In Brazil, however, there is no periodic survey that measures participation in *Bolsa Familia*. The 2010 Brazilian Census (IBGE, 2015a) has a question in which individuals report whether they were in *Bolsa Familia*, but this is only for one year (2010). The only annual survey that provides such information is the Brazilian National Household Survey (PNAD), and it does so only for two years, 2004 and 2006 (IBGE, 2015b). Therefore, the data available do not allow for matching program participating households over time. The literature has, in general, relied on the PNAD survey for obtaining information on program participation. Since the PNAD usually does not ask respondents about their participation in *Bolsa Familia*, researchers have taken advantage of an alternative method for imputing program participation status, which is based on the responses to a question that asks the amount of money that individuals received from non-labor income. Based on the possible fixed amounts beneficiaries can receive from the program, one can "guess" the participation status of a surveyed individual by matching the exact possible transfer amounts and the amounts reported by individuals in the question about non-labor income received. This procedure was first recommended by Barros et al. (2007) and is known in the literature as the "typical value" method. Since the PNAD surveys of 2004 and 2006 had a question about participation in that program, it is possible to verify the success rate of this procedure. A simple validation has been carried out and shows that the method above correctly identifies 92.3% of the beneficiaries in 2004 and 96.2% of those in 2006.

Although administrative data on *Bolsa Familia* participation is publicly available at the municipality level, it is not possible to use these data in this study because there is no annual survey that is sampled at that geographic level. Nevertheless, the PNAD survey does draw samples of households from the same census tracts each year in the period between the Brazilian censuses⁸, randomly sampling households within each tract. Thus, a fixed effects

⁸ The most recent Brazilian censuses were conducted in 2010, 2000 and 1991.

estimation remains feasible if based on a panel of census tracts. Thus, this paper relies on (individual and household) panel data aggregated at the census tract level from the Brazilian National Household Survey (PNAD) for the 2001-2009 period, obtained from the Brazilian Institute of Geography and Statistics (IBGE). The questionnaires of the PNAD surveys provide demographic and socio-economic information on households and on each resident as well.

This data set is comprised of 7,235 census tracts that were surveyed for nine years (a total of 65,115 observations), excluding the rural areas of the North region, except for the State of Tocantins, since these rural areas were included in the PNAD sample only starting in 2004. More specifically, the questionnaires allow one to obtain the information of interest for this study, such as the working-age (age 18 to 65) individuals' work status and weekly hours worked, in order to verify whether they were employed or unemployed (did not work, but searched for a job) and thus were in the labor force, and to make inferences about labor supply on the intensive margin (hours of work, conditional on working) as well. Additionally, treatment heterogeneity can be checked by gender, race and area of residence (urban or rural) and separate effects of the program can be estimated for formal and informal sector employment.

Table 1 shows some summary statistics for the overall sample and also for two separate groups, one comprising census tracts that never had any *Bolsa Familia* participant ("Untreated") and the other comprising census tracts for which at least one individual eventually participated in the program ("Eventually Treated").

One can infer from Table 1 that program beneficiaries are mostly non-white (53%), and are concentrated in the Northeast (32%) and in the Southeast (30%) regions of the country. Also, census tracts that had program participants any time in the period 2001-2009 show lower schooling, a 56% lower income, as well as a higher proportion of residents from rural areas. Although this paper does not further analyze the program's targeting performance, the information above suggests that *Bolsa Familia* is focused on groups of individuals that the program was designed to serve, especially because the Northeast is the poorest region of the country in both relative and absolute terms, followed by the Southeast, in absolute terms.

Figure 1 displays the annual averages of the outcome variables of this study for both eventually treated and untreated census tracts over the period 2001-2009. Although it allows for only a simple visual examination of the labor supply outcomes, the graphs might give a hint about what to expect from the regression results. Comparing treated and untreated census tracts, one could expect a positive and significant impact of the program on employment and labor force participation, a slight increase in unemployment, and also a reduction in hours worked (conditional on working). As for the formal and informal sectors participation, the differences between treated and untreated census tracts seem to maintain over time.

4. Empirical Framework

This article contributes to the literature by identifying the impact of participation in *Bolsa Familia* on labor supply, as measured by labor force participation, weekly hours worked, as well as employment and unemployment of working age individuals (age 18 to 65 years), based on fixed effects estimation applied to census tract-level data aggregated from the individual level. The estimation strategy relies on a specification in which the coefficient of interest is the effect of the program on these outcome variables of interest.

Let y_{icjt} be one of the outcomes of interest (labor force participation, hours worked, employment, or unemployment) for an individual i , in census tract c , in state j at time t . The individual level equation that measures the impact of participation in *Bolsa Familia* is given by:

$$y_{icjt} = \alpha' \mathbf{x}_{icjt} + \gamma \bar{p}_{cjt} + \delta p_{icjt} + \varepsilon_{icjt} \quad (1)$$

where \mathbf{x}_{icjt} is a vector of individual and household characteristics, such as age, gender, area of residence, race and schooling level, \bar{p}_{cjt} is the proportion of households participating in the program in census tract c , p_{icjt} is a dummy variable indicating *Bolsa Familia* participation, and ε_{icjt} is an error term with mean zero.

If data on *Bolsa* participation and individual and household characteristics were available at the individual level for the entire period of the analysis, Eq. (1) could be estimated such that δ would measure the impact of participating in the program. The data available in the PNAD, however, do not allow for matching individuals or households over time, but do allow for matching census tracts across years. Therefore, the impact of *Bolsa Familia* is estimated by aggregating Eq. (1) up to the census tract level:

$$\bar{y}_{cjt} = \alpha' \bar{\mathbf{x}}_{cjt} + (\gamma + \delta) \bar{p}_{cjt} + \bar{\varepsilon}_{cjt} \quad (2)$$

Note that $(\gamma + \delta)$ measures the overall impact of participation in *Bolsa Familia* which reflects both the effect on program participants (δ) and the spillover effect onto non-participants and also participants (γ). Since the effects in $(\gamma + \delta)$ cannot be individually identified, the impact of *Bolsa Familia* on labor supply provide both the direct average treatment effect of the program as well as spillover effects.

Ordinary Least Squares (OLS) estimation would generate unbiased estimates of α and δ only if data for all variables in $\bar{\mathbf{x}}_{cjt}$ were available. However, many of these variables are unobserved, and they are likely to be correlated with observed individual and household characteristics ($\bar{\mathbf{x}}_{cjt}$), or may influence program participation (\bar{p}_{cjt}). Examples of such variables could include innate ability, motivation, innate preferences for work and leisure, among others. Since these variables are not observed, they become part of $\bar{\varepsilon}_{cjt}$, and if they are correlated with observed variables in $\bar{\mathbf{x}}_{cjt}$ and \bar{p}_{cjt} , this implies that the error term will be correlated with $\bar{\mathbf{x}}_{cjt}$ and \bar{p}_{cjt} , and the estimates of the impact of the program will be biased. Thus, to minimize bias due to correlation of $\bar{\mathbf{x}}_{cjt}$ and \bar{p}_{cjt} with unobserved determinants of labor supply outcomes, census tract fixed effects and state-year fixed effects are added as controls in Eq. (2):

$$\bar{y}_{cjt} = \alpha' \bar{\mathbf{x}}_{cjt} + (\gamma + \delta) \bar{p}_{cjt} + \sigma_c + \pi_{jt} + \bar{\varepsilon}_{cjt} \quad (2')$$

where σ_c indicates time invariant census tract fixed effects and π_{jt} represents census tract invariant state-year fixed effects.

In order to check for treatment heterogeneity, estimates are also obtained separately by gender, race, and area of residence (urban/rural). Also, to further investigate the impacts of *Bolsa Familia* on labor supply, the effects of the program on employment and unemployment, as well as on the participation in the formal and informal sectors, are also estimated.

Unlike some other conditional cash transfer programs, the *Bolsa Familia* program was not implemented as a randomized controlled trial. Thus, one must consider the impact of

self-selection of individuals into the treatment group, which can be due to observable and/or unobservable characteristics, on estimates of the program's impacts. The underlying problem then would be correlation between those characteristics and the treatment variable, which would result in biased estimates. In order to deal with this selection problem, this study relies on a fixed effects estimation approach, which allows one to deal with the problem of selection on both observables and unobservables.

The identifying assumption is that after controlling for census tract and state-year fixed effects, and also for observable individual and household characteristics, unobservable variables that affect labor supply outcomes are uncorrelated with the variable measuring participation in *Bolsa Familia* and with all other variables in Eq. (2'). One way to check whether this assumption holds is to carry out a placebo test, in which one can test, for instance, whether the outcome variables in pre-treatment periods are affected by program participation in subsequent years. If no statistically significant effects are found, then the identifying assumption is more likely to hold, and, more generally, any possible omitted variable bias is minimized.

Another potential problem for the identification strategy is reverse causality. A household's eligibility for *Bolsa Familia* is solely determined by its level of per capita income and number of children. Although labor supply is an important determinant of income, that does not translate into a direct effect from the first onto program participation status. That is, changes in labor supply might not really affect participation in the program, since, in general, eligibility is checked only every two years, and a participant's actual income might not be captured by the checking procedures. Thus, reverse causality does not appear to be an issue in this setting.

5. Results

The estimated results of the impact of *Bolsa Familia* on labor force participation and hours worked are presented in Tables 2 to 8. In order to account for treatment heterogeneity, besides the overall results, estimates were also obtained by gender, race and area of residence (urban vs. rural). The effects of the program on both employment and unemployment rates are also estimated and discussed in order to provide further understanding of how the program affects labor supply. Lastly, the effects of the program on participation in both the formal and informal employment sectors are estimated. Whenever two columns of estimated results are presented for the same outcome, the analysis focuses on the second column as it corresponds to the most complete specification, which includes the control variables described in the previous section.

The results in Table 2 suggest that the program has statistically significant, but modest, impacts on both labor force participation and hours worked. Participation in *Bolsa Familia* increases labor force participation by 1.2 percentage points. However, the estimated coefficient for hours worked suggests that program participation implies a reduction of 0.5 hours in weekly hours worked. Despite the negative effect found on hours worked, the program slightly increases employment and, to a lesser extent, also increases unemployment, which implies a higher proportion of individuals searching for a job.

Table 3 provides estimates of the impacts of *Bolsa Familia* on men and women separately. Although negative for both labor force participation and hours worked, the estimated coefficients for male individuals are not statistically significant, implying that the program has no effects on the labor supply of men. On the other hand, statistically significant estimates are found for women, indicating that program participation increases women's labor force participation by 2.8 percentage points while it reduces hours worked by 0.6 hours

a week. The positive result for participation becomes clearer when considering the estimated impact on women's employment, which exhibits a 2.3 percentage point increase, while no significant effect is found on women's unemployment. The fact that the program impacts only women's labor supply appears to support the idea that, because children are required to meet the school attendance conditionality, mothers have more time available and, consequently, become more able to take a job.

The results disaggregated by race, reported in Table 4, show that the estimated coefficients are similar for both white and non-white individuals for labor force participation and hours worked, differing mostly in terms of statistical significance. *Bolsa Familia* appears to have only one statistically significant effect on white workers, increasing by one percentage point the unemployment rate for this group, suggesting that the program increases the proportion of white individuals searching for a job. For non-white individuals, the program raises both labor force participation and employment by 1.2 percentage points. It also reduces the number of hours worked by 0.7 hours, but has no significant impact on unemployment. The increase in the employment of non-white workers suggests that the cash transfers somehow contribute for reducing the racial disparities in the labor market, especially considering that around 52% of the population in participating census tracts are black or brown as opposed to a proportion of 30% in untreated census tracts.

The estimated results in Table 5 show the impact of *Bolsa Familia* by area of residence. For both urban and rural areas, program participation has a significant positive effect on labor force participation, and a negative but statistically insignificant impact on hours worked. The main difference between the estimates for the two types of areas is that, in rural areas, the cash transfers increase employment and do not affect unemployment, while in urban areas they slightly increase unemployment and have no significant impact on employment. As previously shown (Table 3), *Bolsa Familia* is more common in rural areas, which, summed with its positive effect in rural employment, appears to indicate that this constitutes another case in which the program helps reduce inequalities.

The results in Tables 2 to 5 show that *Bolsa Familia* has a positive impact on the employment rates of several groups. Thus, it is important to check in more detail how the program affects employment among participants. Table 6 displays the results for the impact of *Bolsa Familia* on participation in both the formal and informal sectors of the economy. The estimated coefficients suggest that participation in the program increases the informal sector participation rate by 4.2 percentage points while reducing that of the formal sector by 3.3 percentage points. It is possible that cash transfer recipients migrate to the informal sector in order to make it harder for the government to measure their income by the time of the periodic registration updates (annual or biannual, depending on the local government). In this case, program participants would remain within the eligibility criteria and avoid losing the benefit even if their income rises above the program's poverty lines. A similar conclusion is drawn in Ribas e Soares (2011), who also found a negative effect of *Bolsa Familia* on formal sector employment, as opposed to Barbosa and Corseuil (2014) who found no effects on either formal or informal sectors.

Further results for participation in the formal and informal sectors, estimated separately for men and women, are shown in Table 7. The estimates indicate that both the decrease in the formal sector participation and the increase in informality are stronger for women. A possible intuition for this finding is that, even though sending children to school could allow mothers to dedicate more of their time to work, they might face difficulties managing child care and work. For instance, complying with the school attendance conditionality might demand additional time, as public school transportation is scarce (and, many times, inadequate), and having children in school does not mean it will allow mothers to have a full day available to work, since the typical school day in Brazil is held in only one

shift (either morning, afternoon or evening). Therefore, it is likely that having an informal job might make it easier to balance child care activities and work.

Overall, the results presented up to this point are in line with most previous findings for the Brazilian conditional cash transfers experience and may be explained in light of the discussion developed in Section 2. Previous studies have found evidence that the program is also associated with improved children's educational outcomes as well as with lower child labor (Glewwe and Kassouf, 2012; Ferro et al., 2010). Thus, one of the main results, the increase in labor force participation for women, might be related either to mothers having more time available to work or also to the necessity of compensating for the foregone income from child labor.

An approach to test the validity of the results presented and discussed in this study is to carry out a placebo test, for which the results are reported in Table 8. In this setting, the test consists of checking for the pre-treatment period whether program participation in one or two periods ahead has any effect on an outcome variable at the present time period. If the empirical model is correctly identified, one would expect to obtain coefficients that are neither large nor statistically significant. Since several locations already had individuals receiving cash transfers as early as 2001, there is no pre-treatment period for these census tracts and, for that reason, they are excluded from the test. For the census tracts considered in the test, the pre-treatment period corresponds to the 2001-2003 interval. Thus, the placebo test was carried out using program participation status in 2004, when the cash transfers were merged and officially structured as *Bolsa Familia*, applied to previous years (2003 and 2002).

The results of the placebo test show that none of the estimated coefficients are statistically significant, although their magnitudes are not negligible. Yet, the estimates in Table 8 suggest that there are no identification issues and, for that reason, the main results of this study appear to “pass” the placebo test.

6. Conclusions

This study attempts to estimate the impact of Brazil's *Bolsa Familia* program on labor force participation, since in response to the cash transfers beneficiaries could be discouraged from working or, if they do not have a job, from searching for one. The main contribution to the literature consists in using a broad dataset for assessing program participation in conjunction with a fixed effects approach applied to a panel of census tracts covering the period 2001-2009.

Overall, the results show that participation in *Bolsa Familia* increases labor force participation, but also implies a reduction in hours worked. Despite this negative effect, the program has a positive impact on both employment and unemployment rates, that is, also increasing the proportion of individuals searching for a job. The estimated effects are different, however, across specific groups of individuals. Positive effects on both labor force participation and employment are observed only for females, non-whites, and also those living in rural areas. The results also suggest that the cash transfers increase the proportion of informal jobs to the detriment of the formal sector, with the effects being stronger for women.

Therefore, the overall findings of this study are in line with most of the previous research in the sense that, in general, the estimates suggest that the cash transfers provided by *Bolsa Familia* do not imply a lower participation in the labor market, and thus do not introduce disincentives to work.

References

- Alzúa, M. L., Cruces, G., Ripani, L. (2013). "Welfare Programs and Labor Supply in Developing Countries: Experimental Evidence from Latin America." *Journal of Population Economics*, 26:1255-1284.
- Banerjee, A., Hanna, R., Kreindler, G., Olken, B. A. (2015). "Debunking the Stereotype of the Lazy Welfare Recipient: Evidence from Cash Transfer Programs Worldwide." HKS Working Paper No. 76.
- Barbosa, A. L. N. H., Corseuil, C. H. L. (2014). "Conditional Cash Transfer and Informality in Brazil." *IZA Journal of Labor & Development*, 3(37):1-18.
- Barros, R. P., Carvalho, M., Franco, S. (2007). "O Papel das Transferências Públicas na Queda Recente da Desigualdade de Renda Brasileira." In *Desigualdade de Renda no Brasil: Uma Análise da Queda Recente*, Volume 2, 41-86. Org. Barros, R. P., Foguel, M. N., Ulyseia, G. Brasília: Ipea.
- Benhassine, N., Devoto, F., Duflo, E., Dupas, P., Pouliquen, V. (2015). "Turning a Shove into a Nudge? A "Labeled Cash Transfer" for Education." *American Economic Journal: Economic Policy*, 7(3):86-125.
- Bertrand, M., Mullainathan, S., Miller, D. (2003). "Public Policy and Extended Families: Evidence from Pensions in South Africa." *The World Bank Economic Review*, 17(1):27-50.
- de Brauw, A., Gilligan, D. O., Hoddinott, J., Roy, S. (2015). "Bolsa Família and Household Labor Supply." *Economic Development and Cultural Change*, 63(3):423-457.
- Cavalcanti, D. M., Costa, E. M., Silva, J. L. M., Sampaio, R. M. B. (2016). "Impactos do Programa Bolsa Família na Renda e na Oferta de Trabalho das Famílias Pobres: Uma Abordagem Usando o Efeito Quantílico de Tratamento." *Economia Aplicada*, 20(2):173-201.
- Chaudhury, N., Friedman, J., Onishi, J. (2013). "Philippines Conditional Cash Transfer Program Impact Evaluation 2012." Report Number 75533-PH, Manila: World Bank.
- Edmonds, E. V. (2006). "Child Labor and Schooling Responses to Anticipated Income in South Africa." *Journal of Development Economics*, 81:386-414.
- Ferro, A. R., Kassouf, A. L., Levison, D. (2010). "The Impact of Conditional Cash Transfer Programs on Household Work Decisions in Brazil." In *Child Labor and the Transition Between School and Work (Research in Labor Economics, Volume 31, 193-218)*. Ed. Akee, R. K. Q., Edmonds, E. V., Tatsiramos, K. Emerald Group Publishing Limited.
- Foguel, M. N., Barros, R. P. (2010). "The Effects of Conditional Cash Transfer Programmes on Adult Labour Supply: An Empirical Analysis Using a Time-Series-Cross-Section Sample of Brazilian Municipalities." *Estudos Econômicos*, 40(2):259-293.
- Galasso, E. (2006). "With Their Effort and One Opportunity: Alleviating Extreme Poverty in Chile." Washington: Inter-American Development Bank.
- Galiani, S., McEwan, P. J. (2013). "The Heterogeneous Impact of Conditional Cash Transfers." *Journal of Public Economics*, 103:85-96.

Glewwe, P., Kassouf, A. L. (2012). "The Impact of the *Bolsa Escola/Familia* Conditional Cash Transfer Program on Enrollment, Dropout Rates and Grade Promotion in Brazil." *Journal of Development Economics*, 97:505-517.

Glewwe, P., Olinto, P. (2004). "Evaluating the Impact of Conditional Cash Transfers on Schooling: An Experimental Analysis of Honduras' PRAF Program." Unpublished Manuscript, Department of Applied Economics, University of Minnesota.

IBGE (2015a). Brazilian Institute of Geography and Statistics. Censos Demográficos. Retrieved from: <http://www.ibge.gov.br/home/estatistica/populacao/censo2010/default.shtm>

IBGE (2015b). Brazilian Institute of Geography and Statistics. Pesquisa Nacional por Amostra de Domicílios. Retrieved from: <http://ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/>

IFS, Econometria, and SEI (2006). "Evaluacion de Impacto Del Programa Familias en Accion: Informe Final." Bogotá: Departamento Nacional de Planeacion (DNP).

Maluccio, J., Flores, R. (2005). "Impact Evaluation of a Conditional Cash Transfer Program: the Nicaraguan *Red de Protección Social*." Report 141, Washington: International Food Policy Research Institute.

MDS (2015). Ministry of Social Development and Fight against Hunger. *Bolsa Família*. Retrieved from: <http://mds.gov.br/assuntos/bolsa-familia>

Parker, S. W., Skoufias, E. (2000). "The Impact of PROGRESA on Work, Leisure, and Time Allocation." Washington: International Food Policy Research Institute.

Ravallion, M., Wodon, Q. (2000). "Does Child Labour Displace Schooling? Evidence on Behavioural Responses to an Enrollment Subsidy." *The Economic Journal*, 110(462):158-175.

Ribas, R. P., Soares, F. V. (2011). "Is the Effect of Conditional Transfers on Labor Supply Negligible Everywhere?" University of Amsterdam and International Policy Centre for Inclusive Growth (IPC-IG/UNDP). Retrieved from: <http://dx.doi.org/10.2139/ssrn.1728287>

Skoufias, E., Di Maro, V. (2008). "Conditional Cash Transfers, Adult Work Incentives, and Poverty." *The Journal of Development Studies*, 44(7):935-960.

Skoufias, E., Unar, M., Cossio, T. G. (2013). "The Poverty Impacts of Cash and In-Kind Transfers: Experimental Evidence from Rural Mexico." *Journal of Development Effectiveness*, 5(4):401-429.

Tavares, P. A. (2010). "Efeito do Programa Bolsa Família sobre a Oferta de Trabalho das Mães." *Economia e Sociedade*, 19(3):613-635.

Teixeira, C. G. (2010). "A Heterogeneity Analysis of the *Bolsa Família* Programme Effect on Men and Women's Work Supply." Working Paper 61, Brasília: International Policy Centre for Inclusive Growth, UNDP.

World Bank. (2011). "Main Findings from The Impact Evaluation of Indonesia's Pilot Household Conditional Cash Transfer Program." Jakarta: World Bank.

TABLES AND FIGURES

Table 1 – Descriptive Statistics for the Overall Sample, and for Eventually Treated and Untreated Census Tracts, 2001-2009

Variable	Overall		Eventually Treated		Untreated	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
<i>Dependent Variables</i>						
Labor force participation	0.759	0.105	0.760	0.105	0.751	0.107
Hours worked	29.013	5.613	29.014	5.613	29.001	5.615
Employment	0.694	0.121	0.695	0.121	0.688	0.114
Unemployment	0.064	0.063	0.065	0.063	0.063	0.060
Formal employment	0.316	0.156	0.302	0.155	0.416	0.127
Informal employment	0.319	0.187	0.338	0.189	0.189	0.107
Bolsa participation	0.086	0.142	0.098	0.147	-	-
<i>Individual Characteristics</i>						
Geographic region						
North	0.093	0.291	0.098	0.298	0.057	0.233
Northeast	0.287	0.453	0.315	0.464	0.092	0.290
South	0.172	0.377	0.176	0.381	0.143	0.350
Central West	0.110	0.312	0.105	0.306	0.144	0.351
Southeast	0.338	0.473	0.306	0.461	0.563	0.496
Income (Reais/month)	680.34	712.21	590.08	594.75	1326.32	1063.25
Male	0.478	0.068	0.481	0.066	0.458	0.077
Age	37.2	3.1	37.0	3.0	38.7	3.4
Rural	0.143	0.350	0.161	0.367	0.017	0.129
Race						
White	0.497	0.278	0.471	0.273	0.685	0.230
Black	0.073	0.098	0.075	0.100	0.058	0.081
Brown	0.422	0.263	0.447	0.260	0.245	0.210
Yellow	0.005	0.022	0.004	0.019	0.010	0.036
Indigenous	0.003	0.020	0.003	0.021	0.002	0.012
Non-declared	0.000	0.004	0.000	0.003	0.000	0.005
Years of schooling	8.522	2.663	8.124	2.480	11.370	2.134
Number of observations	65,115		57,132		7,983	
Number of census tracts	7,235		6,348		887	

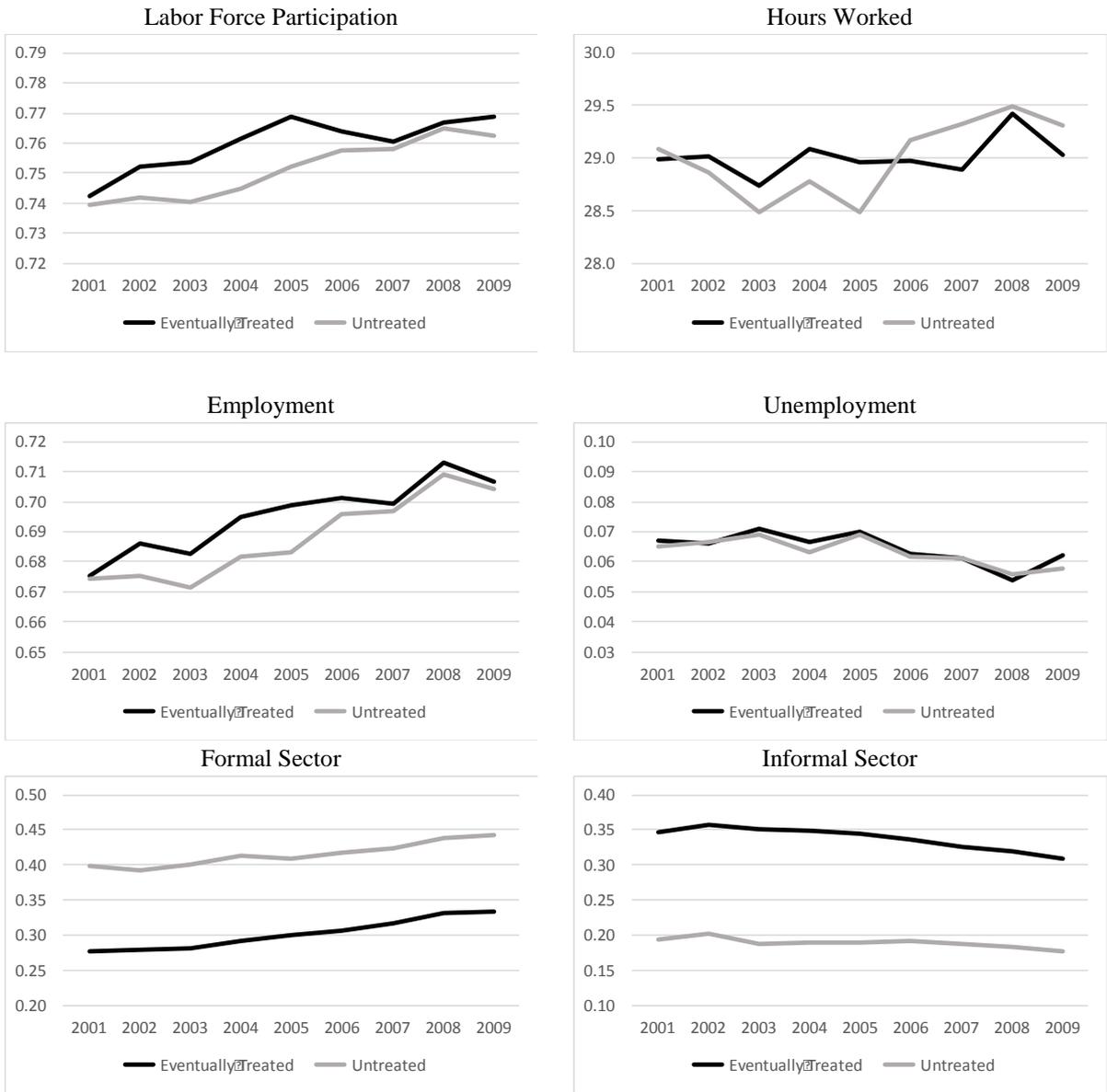


Figure 1 – Labor Force Participation, Hours Worked, Employment, Unemployment, and Formal and Informal Sectors Participation for Eventually Treated and Untreated Census Tracts, 2001-2009.

Table 2 – Estimates of the Impact of *Bolsa Familia* on Labor Force Participation, Hours Worked, Employment, and Unemployment, 2001-2009

Variables	(1)	(2)
Dependent Variable: Labor force participation		
<i>Bolsa</i> participation	0.019*** (0.004)	0.012*** (0.004)
Dependent Variable: Hours worked		
<i>Bolsa</i> participation	-0.105 (0.216)	-0.542*** (0.208)
Dependent Variable: Employment		
<i>Bolsa</i> participation	0.015*** (0.004)	0.008* (0.004)
Dependent Variable: Unemployment		
<i>Bolsa</i> participation	0.004** (0.002)	0.004* (0.002)
Number of observations	65,115	65,115
Number of census tracts	7,235	7,235
Control variables	No	Yes
Census tract fixed effects	Yes	Yes
State-year fixed effects	Yes	Yes

Notes: Robust standard errors clustered at the census tract level. ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.

Table 3 – Estimates of the Impact of *Bolsa Familia* on Labor Force Participation, Hours Worked, Employment, and Unemployment, 2001-2009: by Gender

Variables	Male		Female	
	(1)	(2)	(3)	(4)
Dependent Variable: Labor force participation				
<i>Bolsa</i> participation	0.011*** (0.004)	-0.000 (0.004)	0.033*** (0.007)	0.028*** (0.007)
Dependent Variable: Hours worked				
<i>Bolsa</i> participation	0.534* (0.290)	-0.264 (0.289)	-0.418 (0.269)	-0.607** (0.265)
Dependent Variable: Employment				
<i>Bolsa</i> participation	0.008* (0.005)	-0.003 (0.005)	0.027*** (0.007)	0.023*** (0.007)
Dependent Variable: Unemployment				
<i>Bolsa</i> participation	0.003 (0.003)	0.003 (0.003)	0.006* (0.003)	0.005 (0.003)
Number of observations	65,108	65,108	65,107	65,107
Number of census tracts	7,235	7,235	7,235	7,235
Control variables	No	Yes	No	Yes
Census tract fixed effects	Yes	Yes	Yes	Yes
State-year fixed effects	Yes	Yes	Yes	Yes

Notes: Robust standard errors clustered at the census tract level. ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.

Table 4 – Estimates of the Impact of *Bolsa Familia* on Labor Force Participation, Hours Worked, Employment, and Unemployment, 2001-2009: by Race

Variables	White		Non-white	
	(1)	(2)	(3)	(4)
Dependent Variable: Labor force participation				
<i>Bolsa</i> participation	0.015* (0.008)	0.007 (0.008)	0.018*** (0.006)	0.012** (0.006)
Dependent Variable: Hours worked				
<i>Bolsa</i> participation	-0.224 (0.416)	-0.676 (0.412)	-0.348 (0.296)	-0.710** (0.292)
Dependent Variable: Employment				
<i>Bolsa</i> participation	0.004 (0.008)	-0.003 (0.008)	0.018*** (0.006)	0.012** (0.006)
Dependent Variable: Unemployment				
<i>Bolsa</i> participation	0.011*** (0.004)	0.010** (0.004)	0.001 (0.003)	0.000 (0.003)
Number of observations	64,372	64,372	62,598	62,598
Number of census tracts	7,233	7,233	7,231	7,231
Control variables	No	Yes	No	Yes
Census tract fixed effects	Yes	Yes	Yes	Yes
State-year fixed effects	Yes	Yes	Yes	Yes

Notes: Robust standard errors clustered at the census tract level. ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.

Table 5 – Estimates of the Impact of *Bolsa Familia* on Labor Force Participation, Hours Worked, Employment, and Unemployment, 2001-2009: by Area of Residence

Variables	Urban		Rural	
	(1)	(2)	(3)	(4)
Dependent Variable: Labor force participation				
<i>Bolsa</i> participation	0.017*** (0.005)	0.012** (0.005)	0.027*** (0.007)	0.021*** (0.007)
Dependent Variable: Hours worked				
<i>Bolsa</i> participation	-0.019 (0.260)	-0.326 (0.253)	0.333 (0.375)	-0.088 (0.353)
Dependent Variable: Employment				
<i>Bolsa</i> participation	0.010* (0.005)	0.006 (0.005)	0.031*** (0.008)	0.024*** (0.008)
Dependent Variable: Unemployment				
<i>Bolsa</i> participation	0.007** (0.003)	0.006* (0.003)	-0.004* (0.002)	-0.003 (0.002)
Number of observations	55,809	55,809	9,306	9,306
Number of census tracts	6,201	6,201	1,034	1,034
Control variables	No	Yes	No	Yes
Census tract fixed effects	Yes	Yes	Yes	Yes
State-year fixed effects	Yes	Yes	Yes	Yes

Notes: Robust standard errors clustered at the census tract level. ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.

Table 6 – Estimates of the Impact of *Bolsa Familia* on Formal and Informal Sectors Participation, 2001-2009

Variables	(1)	(2)
Dependent Variable: Formal sector participation		
<i>Bolsa</i> participation	-0.036*** (0.004)	-0.033*** (0.003)
Dependent Variable: Informal sector participation		
<i>Bolsa</i> participation	0.054*** (0.005)	0.042*** (0.005)
Number of observations	65,115	65,115
Number of census tracts	7,235	7,235
Control variables	No	Yes
Census tract fixed effects	Yes	Yes
State-year fixed effects	Yes	Yes

Notes: Robust standard errors clustered at the census tract level. ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.

Table 7 – Estimates of the Impact of *Bolsa Familia* on Formal and Informal Sectors Participation, 2001-2009: by Gender

Variables	Male		Female	
	(1)	(2)	(3)	(4)
Dependent Variable: Formal sector participation				
<i>Bolsa</i> participation	-0.025*** (0.005)	-0.026*** (0.005)	-0.045*** (0.004)	-0.038*** (0.004)
Dependent Variable: Informal sector participation				
<i>Bolsa</i> participation	0.040*** (0.006)	0.026*** (0.006)	0.072*** (0.007)	0.060*** (0.007)
Number of observations	65,108	65,108	65,107	65,107
Number of census tracts	7,235	7,235	7,235	7,235
Control variables	No	Yes	No	Yes
Census tract fixed effects	Yes	Yes	Yes	Yes
State-year fixed effects	Yes	Yes	Yes	Yes

Notes: Robust standard errors clustered at the census tract level. ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.

Table 8 – Placebo Test for the Estimates of the Impact of *Bolsa Familia* on Labor Force Participation, Hours Worked, Employment, and Unemployment: Including Lagged Terms, 2001-2003

Variables	Labor Force Participation	Hours Worked	Employment	Unemployment
	(1)	(2)	(3)	(4)
<i>Bolsa</i> participation (1-year lead)	-0.025 (0.034)	-1.298 (1.605)	-0.047 (0.033)	0.022 (0.018)
<i>Bolsa</i> participation (2-year lead)	-0.002 (0.032)	-0.272 (1.551)	0.000 (0.032)	-0.002 (0.018)
Number of observations	9,153	9,153	9,153	9,153
Number of census tracts	3,051	3,051	3,051	3,051
Control variables	Yes	Yes	Yes	Yes
Census tract fixed effects	Yes	Yes	Yes	Yes
State-year fixed effects	Yes	Yes	Yes	Yes

Notes: Robust standard errors clustered at the census tract level. ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10% level.

This analysis takes program participation status in *Bolsa Familia* for 2004 and applies it to 2003 and 2002, testing, for the period 2001-2003, whether the outcome variables are affected by participation status in 2004.