The Impact of the Expansion of the Bolsa Família Program on the Time Allocation of Youths and Labor Supply of Adults

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Abstract

This paper evaluates the impact of the 2007 expansion of the *Bolsa Família* Program to families with youths aged 16 to 17 years (*Benefício Variável Jovem*) on the time allocation of youths and on the labor supply of adults. The differences-in-differences estimator was used to compare households among the poorest 20% with 16 years old members with households in the same income bracket with youths of 15 years of age. The results show that granting the benefit had a significant and positive impact on school attendance and on the decision of young people to study and work at the same time. The effects on school attendance were stronger for males and when the child was the youngest of the household. With respect to the labor supply of parents, a positive impact was found on the employment probability of the mother.

Keywords: *Bolsa Família* Program, Impact Assessment, Differences-in-Difference.

JEL Classification: D13, I38, J22

1. Introduction

Conditional Cash Transfer (CCT) Programs have been extensively used by many governments worldwide with the dual purpose of alleviating poverty in the short term and incrementing investment in human capital in children from poor families so that they can achieve better living conditions in the long term. The first goal is achieved via the money transfer component of programs, while the second by making the transfer conditional on the observation of certain actions by beneficiary families, such as pre-natal care, child immunization and school attendance of children and adolescents. Therefore, it is expected that the children of beneficiary families will acquire the necessary conditions to escape from poverty in the long term.

However, the success of such programs in reducing poverty depends on how and to what extent transfers and programs' conditions impact the allocation of family time, particularly with respect to the time made available for the labor market., Although CCTs are concerned with families' long-term investments, they can also influence current decisions regarding the allocation of the time and resources of their members. For instance, this influence can produce changes in the labor supply of family members that can take different directions.

By assuming, for example, that leisure is a normal good, receiving a social benefit can generate an income effect that reduces participation in the labor market. This reduction in labor supply can be viewed as an adverse effect of the program, that is, an undesirable change in behavior because the family assisted by the program would become more dependent on the benefit due to the reduced labor income.

Also, the fact that the transfer requires a minimum level of school attendance by children and adolescents can affect the behavior of beneficiary household members in various ways. For example, if an adolescent that used to work to supplement family income now spends more time in school, another family member may have to increase the supply of labor to generate more income. Alternatively, the leisure time of the adolescent may be reduced so that achieving the requirement of minimum school attendance can occur without affecting his labor supply. Thus, as in theory CCTs can

affect the time allocation decisions of all household members in various ways, it becomes an empirical question to unveil the direction and magnitude of their impacts.

The key contribution of this study is an empirical assessment of the schooling and labor supply effects of extending the coverage of a CCT program to youths. More specifically, the paper evaluates the impacts of expanding the Brazilian *Bolsa Família* Program (Programa Bolsa Família - PBF) with the creation of the Variable Benefit for Youngsters (*Benefício Variável Jovem – BVJ*) in 2007 on the time allocation of beneficiary household members. The BVJ is a variable benefit component of the PBF that concedes cash transfers and imposes school attendance conditions to poor families who have youth members between 16 and 17 years of age.[1] As school dropout in Brazil increases significantly at approximately age 15, the main purpose of introducing the benefit was to stimulate young people to stay longer in school. To the best of our knowledge, this is the first study that investigates the impacts of an expansion of coverage of a CCT program to youths on school and labor supply decisions of treated family members.

This paper estimates the effects of the BVJ on changes in the behavior of young people and other members of the beneficiary household with respect to the youngster's school attendance and participation in the labor market and to the working hours of the adolescent and his/her parents. The data used are from the Pesquisa Nacional por Amostra de Domicílios (PNAD), the main household survey in Brazil. The effects of the BVJ are estimated using the differences-in-difference method.

Because PNAD does not inform directly which households do or do not receive PBF benefits, we focus on the poorest households. Thus, households that are among the poorest 20%and have 16-year-old adolescents are included in the treatment group. The control group consists of households that are also part of the 20% poorest segment of the population and have 15-year-old children.

[1] Before the creation of the BVJ, PBF aid was intended for families with a *per capita* monthly income of up to R$60.00 (extremely poor) or with a *per capita* income of up to R$120.00 (poor) and children aged up to 15 years. With the launching of the BVJ in 2007, poor families with adolescents aged 16 to 17 years became eligible to receive R$33.00 per adolescent on the condition that each is regularly enrolled in school with at least 75% attendance, up to a limit of two adolescents.

The paper is organized as follows: Section 2 describes the main features of the PBF and presents a historical evolution of the selection criteria and benefit amounts. In Section 3, we discuss the evidence on the effects of Conditional Cash Transfer Programs on beneficiaries' time allocation. In Section 4, we describe the data and present our findings on both young people's school attendance and the participation of youngsters and their parents in the labor market. Section 5 discusses the methodology used to measure the impact of the BVJ. The results obtained regarding the impact of the program on the time allocation of household members are presented in Section 6. This section also provides robustness tests for the results. Section 7 presents our final considerations.

2. The Bolsa Família Program

The Bolsa Família Program (Programa Bolsa Família – PBF) is a large scale conditional cash transfer program that was created in January 2004 with the aim of promoting immediate relief from poverty and reducing the intergenerational transmission of poverty. [2] The program was established through the unification of other social programs, both conditional and unconditional, such as the School Allowance (Bolsa Escola), Food Allowance (Bolsa Alimentação), Food Card (Cartão-Alimentação) and Gas Aid (Auxílio Gás).

The PBF benefits families in situation of poverty and extreme poverty throughout Brazil and is based on three main axes: cash transfer, conditions and complementary programs. Beneficiary families are selected based on the information collected for the Unified Registry for Social Programs (Cadastro Único para Programas Sociais). The main criterion for selection is the *per capita* family income; however, registration does not imply immediate entry into the program nor the receipt of benefit. The benefits are preferably paid to women through the banking system using a card that acts as a debit card.

[2] Although the conception of the program began in 2003, it was officially established by Law No. 10,836 in January 2004, and has been managed by the Ministry of Social Development and Fight against Hunger (Ministério do Desenvolvimento Social e Combate à Fome – MDS).

The PBF eligibility criteria currently classify as 'extremely poor' families whose *per capita* monthly income is up to R$70.00 (around US$35), regardless of family composition, and as 'poor' those whose *per capita* monthly income is between R$70.00 and R$140.00 (US$70). The group of poor families must include pregnant women, nursing mothers or children and adolescents of 0-17 years of age. Families in extreme povertyare entitled to the Basic Benefit (Benefício Básico) regardless of family composition. There are also various variable benefits, of which two stand out: i) the Variable Benefit (Benefício Variável), which is given to households with a *per capita* monthly income of up to R$140.00, provided that they have children or adolescents of up to 15 years or pregnant and/or nursing mothers, and ii) Variable Benefit for Youngsters (Benefício Variável Jovem - BVJ), which is granted to poor families with teenagers between 16 and 17 years of age who are attending school.[3] Each family can receive up to five Variable Benefits and up to two BVJs. The historical evolution of the benefits as well as the eligibility criteria of the program during the period of our analysis are shown in Table 1.

The PBF covers more than 13 million homes and is currently one of the major instruments of social policy in Brazil in terms of the number of beneficiaries. According to Soares and Satyro (2009), the PBF beneficiaries are outnumbered only by those of the Unified Health System (Sistema Único de Saúde - SUS), which in theory covers the entire Brazilian population; the public education system, which covers 52 million students; and the Social Security system, which grants 21 million benefits. In budgetary terms, however, the PBF is relatively small and accounts for approximately 0.3% of Brazilian GDP.

Various studies have shown that the PBF has played an important role in the decline of income inequality that has been observed in Brazil in the last decade (see,

[3] Additionally, there are two other forms of benefit: I) The Extraordinary Variable Benefit (Benefício de Caráter Extraordinário - BVCE) is the amount calculated on a case-by-case basis that is paid to families in the Gas-Aid, School Allowance, Food Allowance and Food Card programs, whose migration to the PBF would cause financial loss. II) The Benefit for Overcoming Extreme Poverty in Early Childhood (Benefício para Superação da Extrema Pobreza na Primeira Infância - PBF) includes an amount corresponding to that required for all PBF beneficiary families with children between 0 and 6 years of age to reach the level of R$70.00 monthly income per person.

e.g., Hoffman (2007), Barros et al. (2007), Soares et al. (2007), Soares and Satyro (2009)). Though the studies vary on the methodology employed, the inequality measure used, and the period of analysis, the range of the estimated contribution of the PBF to the overall decline in income inequality has been between 10 and 25%. As for the poverty, the evidence shows that the impact is not large on headcount poverty but quite large on the poverty gap and on the severity of poverty (see, for instance, Soares and Satyro (2009)).

There has been some research effort to capture the effect of the PBF on health indicators. The available results indicate that the program beneficiaries did not have better vaccine coverage than individuals from the comparison group and that there was no significant difference between the PBF beneficiaries and non-beneficiaries with regard to the probability of malnutrition in children between 6 to 60 months of age (Cedeplar (2006)).

Another widely discussed issue is the impact of CCTs on labor supply. One of the most frequent criticisms of the PBF in the media is that making the benefit conditional on family income may lead members of beneficiary families to become "comfortable" with their situation and thus reduce their labor supply. The argument is that the transfer can create a disincentive to work, the so-called 'laziness effect.'

In this respect, Blundell and Macurdy (1999) suggest that, to properly evaluate the impact of a conditional cash transfer policy, it is necessary to carefully examine the labor supply decisions of the individuals who are already employed and who now can gain greater benefits by reducing their labor supply. Therefore, the success of the PBF in reducing poverty and income inequality cannot only be measured through its direct effect on family income, and one must also assess the extent to which program transfers affect the household members' labor supply.

The channels through which CCTs can impact household members' time allocation are diverse, however. The combination of all of the possible incentives implies that the total effect of CCTs on the labor market is ambiguous from a theoretical point of view. Thus, the presence of any impact, and its direction, is a matter for empirical analysis.

3. Literature Review

The literature addressing the impact of conditional cash transfer programs on different variables of interest is vast and continuously growing. This section presents international evidence on the effects of CCTs on labor market and education indicators.

The Mexican program 'Oportunidades,' originally known as PROGRESA - *Program Educación, Salud y Alimentación* [Education, Health and Food Program], stands out among CCTs due to the fact that it was implemented using social experiment techniques. With respect to the impact of PROGRESA on the time allocation of individuals benefitting from the program, Parker and Skoufias (2000) found evidence that the program reduced the labor force participation of children, both for boys and for girls. With respect to adults, the results showed that there was no reduction in the rate of participation in the labor market.

Skoufias and Maro (2008) found no significant effect of PROGRESA on adults' labor supply. In particular, the results of the study showed that there was no reduction in labor market participation. However, there is evidence that soon after they begin receiving the cash transfers, individuals used part of the subsidy to seek work in remunerated activities and to reduce participation in less profitable family ventures. This impact, however, disappeared with time. Alzua et al. (2010) estimated the effects on the labor market of three CCTs, including PROGRESA, the program implemented in Nicaragua, called *Red de Protección Social* [Social Protection Network] (RPS), and the *Programa de Asignación Familiar* [Family Allowance Program] (PRAF) implemented in Honduras. The empirical results indicated that none of the three programs led to significant changes in adults' labor force participation. However, the analysis found a significant reduction in adult working hours in Nicaragua and a positive and significant effect on the wages of men in eligible households in Mexico.

Recently, several studies have tried to diagnose the effects of the PBF on school attendance of children and on youths' and adults' labor supply in Brazil. Pedrozo (2010) found that the program led to a negative impact on adults' labor supply, especially that of single or divorced mothers, and found that the PBF selection rule can be

circumvented by the voluntary reduction of labor supply. The author also found that children's participation in the labor market did not change.

Tavares (2008) found evidence that mothers receiving PBF showed a 5.6% increase in the probability of participating in the labor market; they also extended their weekly working hours by 1.6% more than non-beneficiary mothers. However, higher benefits were associated with lower probability of participation and lower weekly working hours. Thus, it may be concluded that there is indeed a negative income-effect, i.e., there is a reduction in participation in the labor market as a result of receiving the benefit, which is overcome by a positive substitution-effect. In other words, adults must work more to compensate for the reduction in child labor.

In a similar study, Ferro and Nicolella (2007) found that participation in a conditional cash transfer program did not affect the probability that parents participate in the labor force. However, the PBF led to some changes in working hours, with the effect being positive for mothers in urban areas and negative for mothers in rural areas and fathers in urban areas. Further, the authors found that the program was more effective in reducing female child labor than male child labor. Medeiros et al. (2007) showed that, while the participation rate in the labor market of people in beneficiary households was 73% for the first decile of the distribution, 74% for second and 76% for the third, the rates were 67%, 68% and 71%, respectively, for those living in households with no beneficiaries.

According to Teixeira (2008), to carry out a precise causal analysis of the effects of the PBF, one should take into account the amount of the benefit relative to household income, the so-called budget shock, i.e., a sudden increase in household income, in this case, disconnected from labor income. The results obtained showed a reduction in the number of weekly working hours that could vary between zero and three and a half hours. However, it was argued that the effects of the PBF on labor supply were not equal for the different shares of the benefit relative to household income. The effects were more intense for the benefits of R$15.00, R$50.00 and R$60.00, households including only one child and those whose per capita income was less than R$20. Moreover, an analysis showed that the elasticity of supply of working hours varied by

gender and across occupations. Among occupations, formal employment was less elastic, and self-employment had the highest elasticity.

Foguel and Barros (2010) found that the impact of the PBF on the female participation rate is not significant either on statistical grounds or in terms of magnitude. This was observed for all females and for those below median per capita income. As for males, there is evidence that the effect on the participation rate is positive, though very small in magnitude. This result was observed for all males and for those below median per capita income. In terms of the supply of hours, the results indicate a small negative effect on all females but an insignificant impact on those that live below median per capita income. The authors did not find significant impacts of the program on the number of hours worked by males.

In relation to the impact of the PBF on school attendance, Costanzi et al. (2010) found that the PBF has expanded the beneficiaries' access to education and that participation in the program has resulted in an increased probability of attending school. Moreover, their analysis, based on the program conditions, seemed to indicate the existence of a so-called dose effect, in which the length of stay in the program implied improvement in school attendance.

In a recent study, Pellegrina (2011) found for students in São Paulo effects of the PBF on variables that were directly tied to program conditions, such as enrollment and attendance, but no effect on school performance variables. Janvry et al. (2007) found evidence that the School/Family Allowance Program in the Northeast region of Brazil reduced dropout rates by approximately 8% but had little effect on retention rates. Glewwe and Kassouf (2008) used a panel at the school level that went from 1998 to 2005 and found a positive impact on enrollment, negative on dropout and positive on grade promotion.

4. Data and Descriptive Statistics

The data used in the empirical analysis were drawn from PNADs, which are conducted annually by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística - IBGE) and provide information on the

demographic and socioeconomic features of all household members. The period used for analysis included the years 2001 to 2009, and for the first differences estimation, the years of 2006 and 2009 were used.

To justify the use in the analysis of households among the poorest 20%, a comparison was first conducted of these groups with two other groups of PBF beneficiaries. Because the data of PNADs do not usually provide the exact information regarding PBF beneficiaries, this information can be constructed in a manner similar to that used by Soares et al. (2006), who broke down the income included in the category 'other income'[4]. This procedure identifies the individuals benefiting from the PBF according to the typical amounts received (associated with the program), thus allowing us to infer which households have at least one member served by these programs.

Through this procedure, people who reported receiving amounts consistent with typical PBF amounts and their correlates[5], as well as the possible combinations of these amounts, were included among the beneficiaries. As the PBF came into force in 2004 through the unification of other social programs, from 2001 to 2003, people who declared receiving typical benefit amounts of the related programs and combinations of the programs were included in the beneficiary group.

Using the procedure explained above for all years of the sample, it was possible to verify that the amounts declared in the 'other income' variable corresponded to the possible benefit amounts approximately 50% to 70% of the time. To validate the procedure, we compared the results for the year 2004 with those provided by the PNAD supplement for this year, which provides detailed information regarding access to social cash transfer programs. According to the PNAD supplement, the number of PBF beneficiaries in 2004 was 69,617, while our proposed procedure identified 64,498 beneficiaries. The results in Table 2 indicate that approximately 94% of households were classified identically by both criteria. Further, it should be noted that this method tends to slightly underestimate the participation in the program.

Thus, Table 3 shows the distribution of PBF beneficiaries in 2004 by quantiles

[4] Variable v1273 - Interest on savings accounts and other investments, dividends, social programs and other income received, usually in the reference month.

[5] Among the program correlates are School Allowance, Food Allowance, the Food Card, Gas Aid and Eradication of Child Labor (Programa de Erradicação do Trabalho Infantil - PETI)

of *per capita* familial income. The results were very similar when we used the PNAD (supplement) data to identify the beneficiaries and when we used the identification procedure based on the 'other income' variable. The data show that 50% of beneficiaries were in the first and second deciles of *per capita* household income and that 90% of the program beneficiaries were located among the poorest 50% of the population.

In late 2007, the establishment of the Variable Benefit for Youngsters sought, among other aims, to reduce the increase in school dropout observed in 16- and 17-year-olds compared to those between the ages 7-15 because of the greater pressure on poor young people to join the labor market. From the information available in the 'other income' variable, we can identify when the government really started to pay the BVJ and how much these transfers represent in relation to the total PBF transfers. The results indicate that the benefits aimed at young people of 16 and 17 years of age really began to be granted in 2008 because the amounts declared in 'other income' compared with the possible amounts of BVJ in 2007 (the year in which the benefit was created) do not even reach 1.0%, while in 2008, more than 34% of the declared amounts in 'other income' are identical to the BVJ amounts.

In analyzing the impact that the BVJ had on the benefit amount already received by households in 2007, it was found that, among extremely poor families (*per capita* familial income less than or equal to R$60.00) with children of 16 and 17 years old, the granting of the BVJ represented an increase of over 38% in the benefit amount received. A similar result was found for poor families (*per capita* familial income below R$120.01 and above R$60.00) with children of 16 and 17 years of age, for which granting the new benefit would represent an increase of approximately 36% of the benefit amount received.

A descriptive analysis of the data was performed to make a preliminary assessment of the effects of the PBF on these young people's participation in the labor force and that of other household members. For the analyses that follow, the treatment group was composed of families with 16-year-olds that were among the poorest 20% according to *per capita* household income. The fact that 15-year-olds were not affected by the policy change allowed us to construct a possible comparison group. Thus, the

control group comprised families with 15-year-olds that were among the poorest 20%. Groups formed by PBF beneficiaries were also included in the descriptive analysis.

It is important to note that the estimates were calculated considering only households with one family because it was not possible to identify the PBF beneficiary (in the case where there was only one) in beneficiary homes with more than one family.[6] Thus, the terms household and family are used interchangeably throughout the paper. Another change that was needed in the database was the exclusion of households including adolescents of both 15 and 16 years of age because these households had young people in both the treatment and control groups, and the effect of the program on one youngster could affect the behavior of the other.

4.1. Data analysis

Table 4 shows a series of descriptive statistics for households that were among the poorest 20% in 2006 and that were made up of young people aged 15 to 16 years, for the treatment and control groups. These features enable the comparison of treatment and control groups in terms of observable features of the household and individuals, in the period *preceding* the creation of the BVJ.

As might be expected, both the treatment and control groups were very similar in terms of the observables. Regarding household composition, on average, all groups had more than five people per household, and the number of children in each household averaged 3.5. In all groups, over 60% of households were located in urban areas. The age of the head of the household was higher in households with 16-year-olds. As might be expected, the age of the eldest offspring, who was 18 years on average, was higher among households with 16-year-olds in their composition. For these three variables, indicative of age the differences between the groups were significant at the 1% level.

Regarding individual features, it is worth highlighting the educational levels of the household members. On average, mothers and fathers in households with 15-year-olds had more years of schooling than mothers and fathers of 16-year-olds. Regarding

[6] Note that in 2004, the year in which PNAD introduced a supplement on government transfer programs, the question in the survey regarding the PBF was as follows: "In September 2004, did any resident of this household receive money from the PBF social program?'

the variables related to the labor market, it was not possible to confirm that mothers and fathers of 15-year-olds has a greater participation in the labor market than mothers and fathers of 16-year-olds because the differences were not statistically significant. In both the treatment and control groups, over 60% of mothers were part of the employed population, while among fathers, the participation was above 90%. On average, fathers worked more hours than mothers and received a higher wage.

Finally, the characteristics of the labor market for young people followed in line with expectations. Young people in the treatment group (older) had a greater participation in the employed population (over 40%) than the 15-year-olds (approximately 34%), had a longer working period by approximately 1.8 hours per week and received higher average wages.

An analysis was then performed regarding the time allocation decisions of household members in the period comprising the years 2001 to 2009. Table 5 shows the relative variation in school attendance between 2001 and 2009 for the treatment and control groups. In this table, it is important to note the increasing school attendance among young people in the treatment group. This group showed increased school attendance of 8.9% in the first decile and a reduction of *per capita* household income of -1.3% in the second decile during the 2001 to 2006 period. However, granting the benefit seems to have impacted these results significantly because the relative variation in the period of 2006 to 2009 was 9.8% and 17.1% for the first and second deciles of income, respectively, while the control group continued the trend of increased school attendance that had been observed since the beginning of the period.

Table 6 shows a comparison of the attendance variations between groups. Consider that ΔFreq16 and ΔFreq15 represent the variation in school attendance for young people aged 16 and 15 years, respectively, between two years, i.e., it represents a temporal variation. Thus, ΔFreq16-ΔFreq15 represents the difference between these two groups of youngsters in terms of that temporal variation. This difference is shown in the second and third columns of Table 6.

The results show that the treatment group exhibited a variation in school attendance between 2006 and 2009 for the first decile of *per capita* familial income that

was approximately 5.2% higher than that of the control group. The result is even more significant when considering the second decile of *per capita* familial income, where the variation in school attendance for the treatment group was 13.9% higher than that of the control group. It is worth mentioning the fact that, in the previous period from 2001 to 2006, in the second decile of income, the treatment group had an approximately 5.9% lower variation in school attendance than the control group.

The fourth column of Table 6 compares differences between these two time periods. It shows the variation in 16-year-olds' school attendance between 2006 and 2009, subtracted from the 15-year-olds' variation in school attendance in the same period, in relation to that same difference between 2001 and 2006: $\Delta(\Delta Freq16-\Delta Freq15)$. The results found indicate that the difference in variation between the two groups of adolescents in the period of 2006 to 2009 was greater than the difference in variation between these groups in the 2001 to 2006 period. The difference is significant at 1.5% in the first decile of *per capita* familial income and 19.52% in the second decile. In this sense, the fact that the largest increase occurred in the first two deciles of *per capita* household income is an indication that the expansion of the PBF may have had a positive effect on the probability of the school attendance of poor youngsters aged 16 and 17 years.

5. Identification Strategy

The effect of receiving the PBF benefit on school attendance and labor supply was estimated using the method of differences-in-difference (*diff-in-diff*). The purpose of this method is to compare two groups, one of which was affected by a particular policy change (the treatment group), and another that was not affected but that has features similar to the previous one (the control group). It is assumed that the second group represents the counterfactual to the group receiving treatment.

This procedure removes the comparison bias in the second period between the two groups that would be the result of permanent differences between groups, as well as the comparison bias between the two periods of time that the treatment group experienced and that are the result of trends and features that are fixed in time for the

two groups. To present this argument formally, consider the following structure for the program's impact:

$$Y_{it} = \beta_0 + \beta_1 Treat_i + \beta_2 After_t + \beta_3 (Treat_i * After_t) + \beta_4 X_i + e_{it} \quad (6)$$

in which Y_{it} is the variable of interest, and $Treat_{it}$ is an indicator that takes a value of 1 when the individual receives the treatment and is 0 otherwise. This variable captures the possible differences between the treatment and control groups before the policy change. $After_t$ is an indicator equal to 1 if the individual is in the second period and is 0 if he/she is in the baseline period, which captures aggregate factors that would have changed the Y_{it}, even if the policy change had not occurred. X_i represents a vector of control variables that prevent possible systematic differences within a group in different time periods from being correlatesd with the treatment effect. Additionally, e_{it} are the unobserved variables, which affect the dependent variable and are uncorrelated with the treatment (by assumption). In this model, β_3 is the *diff-in-diff* estimator and measures the program's impact on the variable of interest, β_1 measures the group effect, and β_2 measures the time effect.

However, for the time trend in the control group to become a valid counterfactual for the treatment group, it is necessary to assume the following hypothesis:

$$E(e_{i1} - e_{i0} \mid Treat_i = 1) = E(e_{i1} - e_{i0} \mid Treat_i = 0)$$

This condition is known as the hypothesis of parallel trends. The idea is that a similar time trajectory indicates that both groups reacted similarly to any factor that affected the variable of interest before the intervention. Thus, it is assumed that whatever happened with the control group after the intervention is what would have happened to the treatment group in the absence of the program. Note that this condition does not require that groups depart from exactly the same point before the program, only that they have the same time trend.

However, this condition is not directly testable because it is not possible to know if the evolution of the variable of interest for the control group accurately represents the

counterfactual of this variable for the treatment group after the program. Suppose *Y* follows a different trend for the treatment and control groups so that the control group's trend is $\beta_2^C = \beta_2$, while the treatment group's trend is $\beta^T_2 = \beta_2 + \Delta$. In this case, the differences-in-differences estimator would be biased. One way to identify this problem is to use data from other time periods, before and after treatment, to check whether there is any difference in trends. Another possible solution would be to find other control groups that may provide additional evidence.

In addition to the assumption of parallel trends, the differences-in-differences method also requires that, between the periods before and after the program, the compositions of the treatment and control groups were not significantly altered and that these groups were not affected differently by changes of any type that occurred in the time interval analyzed.

6. Results

6.1. The impact on young people

A poor family must meet certain conditions with respect to education and health and social care to have access to the PBF benefits. In particular, to receive the BVJ, young people of 16 or 17 years of age belonging to a family eligible for the program must be properly enrolled in school and achieve attendance of at least 75%. In this context, our objective was to analyze the impact on young people benefitting from the program with regards to school attendance, labor supply decisions and their working period. First, the basic impacts on these variables of interest are presented in order, followed the heterogeneous impacts according to the country's regions and the features of the young people who make up our treatment and control groups.

The impact of the BVJ on young people's school attendance was estimated using Ordinary Least Squares (OLS) regression with "school attendance" as the dependent variable, being equal to 1 for those attending school and equal to 0 for those who were not attending. Thus, the DD model used to estimate the effect of the BVJ on the variables of interest has the following form:

$$Y_i = \beta_0 + \beta_1 Treat_i + \beta_2 2009_t + \beta_{3+} Treat_i^* 2009_t + \beta_4 X_i + e_i \quad (7)$$

where *i* represents the individual, Y_i is the dependent variable of interest (school attendance, participation in the labor market or weekly working hours), $Treat_i$ is the *dummy* for the treatment group, 2009_t is the *dummy* for the second period, X_i represents the control variable vector and e_i comprises random shocks. The controls include the number of children in the household, the educational level of the mother or father (whichever is greater), the age of the mother or father (whichever is greater), indicators of households with only the mother, indicators of households with only the father, indicators of Caucasian subjects, indicators for urban areas and state indicators.

Table 7 shows the results of the estimation of Equation 7 to obtain the effect of the BVJ on school attendance. It can be observed that the estimated effect is positive and significant at the 5% level, regardless of whether the control variables are included or not. According to the estimations reported in that table, it is clear that the expansion of the PBF for young people of 16 years of age increased the probability of these beneficiaries attending school by approximately 4% in relation to 15-year-olds. This result is noteworthy because of the fact that, in addition to the immediate relief of poverty, one of the main purposes of the PBF is to reduce the transmission of poverty in the medium and long terms by increasing school attendance among the poorest. The results suggest that the expansion of the PBF to 16-year-olds has contributed to that goal.

A multinomial logit was then estimated to ascertain the impact of the program on young people's labor supply decisions. In this formulation, the dependent variable is "Participation in the labor market" and consists of four categories, designated as "Studying Only," "Working Only," "Studying and Working," and "Neither Studying Nor Working," with the last being considered the baseline category. Regarding the young people's labor supply decisions, Table 8 shows that the BVJ had a significant effect on the probability of the young "Studying and Working." We find that the effects were positive and significant at the 5% level. However, for the estimated results to be properly analyzed, it is necessary to calculate the marginal effects. The marginal effect

results showed that the probability of a youngster "Studying and Working" is 25% and increases by 4.5% with the BVJ. The estimated coefficients for the categories "Studying Only" and "Working Only" were positive but not significant.

The same procedure was then followed to check the effects of the program while separating the sample into the different regions of Brazil. This analysis seems reasonable given the heterogeneity found within the country. According to the MDS data, the spatial distribution of the PBF resources is highly uneven across regions of the country. It appears that the main destination of program resources is the Northeast region (53.2%), followed by the Southeast region (23.4%). Far from representing a failure in the distribution of resources, this fact is a result of the program's main objective, which is to reduce poverty levels in the country because, according to the MDS, almost three-quarters of poor families in Brazil in 2006 were concentrated in these two regions.

A brief analysis of the sample used also corroborates these facts. When considering the families belonging to the first two-deciles of *per capita* household income and containing 15- and 16-year-olds, it was found that more than half of the individuals were residents in the Northeast region (52.9%). The impact of the expansion of the PBF on the school attendance of young people by region is shown in Table 9. According to the results, the granting of the new benefit only had a significant impact in the Northeast and Southeast regions. In the first region, the probability of the youngster attending school increased by 6.5%, while in the second, the impact was greater, at approximately 7.6%; these effects were significant at the 1% and 10% levels, respectively.

Concerning the other dependent variables, the results in Table 10 indicate that the expansion of the PBF in the Northeast region had significant positive impacts on the young people's labor supply decisions. The marginal effects calculation shows that the probability of the beneficiary adolescent choosing "Studying Only" was 61.9% and increased by approximately 2.2% due to the new benefit. The probability of choosing the category "Working Only" was 4.5% and decreased by approximately 0.1% when the household started to receive the BVJ. The probability of the adolescent choosing

"Studying and Working," which was 28.5%, increased by 1.6% when the benefit was being received. Other regions did not have significant results for any category.

It is known that the effects of the expansion of the PBF can be heterogeneous according to the features of the adolescent beneficiaries. Thus, these effects were examined by separating the sample of young people by gender and by considering only those youngsters who were the youngest child in the household in which they resided for both the treatment and the control groups. According to the results reported in Table 11, young males who were the youngest child in the household were those whose attendance was most significantly affected by the creation of the BVJ. The probability of attending school increased by 5.4% for young males as a result of the benefit, while for young females, the results were not significant. The individuals who were the youngest child in the household in which they resided showed an 11.3% increase in the probability of attending school. This increase may have occurred because the family did not receive aid before the creation of the BVJ because they had no younger children. When these two features were combined, i.e., only male youngsters who were the youngest child, the probability of attending school increased by 16.2%; this increase was significant at the 1% level.

6.2. Impact on mothers and fathers

In addition to analyzing the direct impact that granting the BVJ can have on young people aged 16 to 17 years, it is important to carefully examine how this program's cash transfers can impact the family's time allocation, in particular, the time allocated to the labor market. To verify whether there is indeed a disincentive for other beneficiary household members to work, the so-called 'laziness-effect,' the impact of the BVJ on the labor supply of fathers and mothers was assessed both in terms of the participation in the labor market and the length of the working period.

The results of interest are related to the following variables: "work" that takes a value of 1 when the individual is employed and is equal to 0 otherwise, and "weekly working hours" that reports the number of hours spent in all types of work. The DD model has the same form as described in equation 7 for the youngsters. For the

estimates that follow, the same control variables were added, with the difference that the dummy for households with only a father was omitted in the regressions of mothers, and the dummy for households with only a mother was omitted for the regressions of fathers.

First, we sought to examine the impact of increasing the PBF on the labor supply of mothers. It can be observed in Table 12 that, in the estimation in which the controls are included, there was a change in the behavior of mothers regarding their labor force participation. The results indicate that, as a result of the benefit there was an increase of 4.5%, significant at the 10% level, in the probability of mothers being employed. Regarding working hours, the results were positive although not significant.

It is possible that this increase in mothers' labor supply occurred to compensate for the reduction in household income due to the youngsters' reduced labor supply. Another plausible explanation for this phenomenon is that because young people are now spending more time in school, their mothers have more free time and, consequently, could increase their labor supply. When the same exercise was developed for fathers in program beneficiary households (results not shown), no significant result was found either in relation to participation in the workforce or in relation to working hours.

Although most of the results in the regressions with and without controls were not significant, the fact that all coefficients found were positive suggests that the so-called 'laziness-effect' is not prevalent in the beneficiary households. This is because labor market participation and working hours increased, especially for the mothers analyzed. This fact also can be interpreted as an indication that the substitution effect is predominant in other household members' labor supply decisions. By separating the sample according to the regions of Brazil, no significant effects of the program were found for any variable of interest, either for mothers or for fathers.

6.3. Robustness Exercise - Placebo (2003/2006)

To test the quality of the results obtained, we estimated the same models using samples from another time period. Again, the treatment group was formed by households belonging to the poorest 20% according to the *per capita* household income

with membership including 16-year-olds. The control group households included 15-year-olds, and they were also among the poorest 20% according to *per capita* household income. For this exercise, the years 2003 to 2006 were used, corresponding to the period prior to the creation of the BVJ. This is a placebo test in which 2006 was defined as the post-treatment year. Thus, the dummy variable for year D_2009_t in equation 7 is substituted by D_2006_t, which is equal to 0 when the year is 2003 and is equal to 1 when the year is 2006.

Table 13 shows that it was not possible to obtain any significant coefficient for this sample, irrespective of whether the control variables were included. This shows that the results achieved thus far were not the result of a statistical artifact. The same robustness test was then applied to verify the effects on young peoples' time allocation (Table 14). The results were similar to those obtained for school attendance, i.e., there were no statistically significant coefficients, which strengthens the causal interpretation of the results found in the present study.

7. Final Considerations

The objective of this study was to evaluate the impact of the expansion of the *Bolsa Família* Program, which occurred from 2007 with the creation of the Variable Benefit for Youngsters, on the time allocation of the program beneficiary household members. The establishment of this new type of benefit sought to help poor young people aged between 16 and 17 years to stay in school because there is an increase in the dropout rate in this age group.

The effects of the benefit were investigated with regard to not only the school attendance of these young people but also to their time allocation decisions by analyzing the impact of these effects on the labor force participation and the length of working period. Further, the effects of the PBF on a possible behavioral change in the fathers and mothers of these young people with respect to participation in the workforce and working hours were investigated. The data used were taken from PNAD, and the analysis covered the years 2006, before the creation of the benefit, and 2009, following the introduction of the BVJ.

Regarding the effects of the program on the variable 'school attendance,' it was possible to conclude that the creation of the BVJ had a positive effect on 16-year-olds from poor families staying in school because the results indicated that there was a 4.4% increase in the probability of the youngster in the treatment group attending school. When separating the sample by the regions of Brazil, positive effects were found on young people's school attendance in the Northeast and Southeast regions of 6.5% and 7.6%, respectively. Moreover, the effects on school attendance were greater for young males (5.4%) and for individuals who were the youngest child in the household in which they resided (11.3%). When considering only male youngsters who were the youngest child, the effect was even greater (16.2%). There was no significant effect on young females' school attendance[7].

Regarding labor supply decisions, positive effects were found on the decision 'Studying and Working.' The results of the marginal effects indicated that the probability of the young people in the treatment group choosing 'Studying and Working' instead of 'Neither Studying Nor Working' increased approximately 4.5% in the formulation with control variables.

The analysis of impact on mothers and fathers did not provide many significant results. It is only possible to say that, in the estimation with control variables, the benefit had a positive (4.5%) effect on the probability of the mother being employed. The labor force participation of fathers and the working hours of mothers and fathers were not affected, even when the sample was separated by region.

This result contradicts that suggested by microeconomic theory, in which the increase in income derived from a Conditional Cash Transfer Program induces the income effect, with consequent reduction in the household members' labor supply. Instead, the creation of the BVJ not only seems to have accomplished its main goal, which was to increase school attendance, and thus, to increase the accumulation of human capital among poorer young people, thereby reducing the intergenerational transmission of poverty, but it has also generated positive effects on young people's

[7] The results of the sample separated by regions or of samples by young people's features always refer to the estimates that include the control variables.

labor supply, concurrent with school attendance, as well as on the probability that the mother is employed. Although other results regarding mothers and fathers were not significant, they all indicate increased participation in the workforce and working hours.

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Table 1: The evolution of eligibility criteria and the benefits of the PBF, 2004-2009 (R$)

Eligibility criteria	2004	2005	2006	2007	2008	2009
Extremely Poor	50	50	60	60	60	70
Poor	100	100	120	120	120	140
Basic Benefit	50	50	50	58	62	68
Variable Benefit	15	15	15	18	20	22
Variable Benefit for Youngsters	-	-	-	-	33	33

Source: Ministry of Social Development and Fight against Hunger (Ministério do Desenvolvimento Social e Combate à Fome- MDS)

Table 2. The number of beneficiary families - Data and procedure

		Procedure - 2004	
		Receives BF	Does not receive BF
PNAD 2004	Receives BF	16.5%	3.7%
	Does not receive BF	2.2%	77.6%

Source: PNAD 2004

Table 3. The Number of Beneficiary Families - Data and Procedure

	PNAD 2004		Procedure 2004	
	Frequency	**Accumulated**	**Frequency**	**Accumulated**
1 (poorest)	26	26	25.2	25.2
2	24.4	50.4	24.1	49.3
3	19.5	69.9	19.1	68.4
4	12.9	82.7	12.8	81.2
5	8.5	91.3	8.4	89.7
6	4.4	95.7	4.4	94
7	2.5	98.1	2.7	96.7
8	1.1	99.2	1.4	98
9	0.5	99.7	0.9	98.9
10 (richest)	0.3	100	1.1	100

Source: PNAD 2004

Table 4: Descriptive statistics - Treatment and control

	15 years old Control Group	16 years old Treatment Group	Difference
Household:			
Household size	5.55	5.57	-0.02
	(1.88)	(1.95)	
Number of children	3.63	3.62	0.01
	(1.77)	(1.82)	
Age of the head of household	43.56	44.82	-1.25***
	(8.37)	(8.19)	
Age of the youngest child	9.10	9.85	-0.75***
	(4.67)	(4.89)	
Age of the oldest child	17.22	18.35	-1.13***
	(3.29)	(3.65)	
Urban	0.66	0.62	0.04**
	(0.47)	(0.49)	
Other income	87.48	88.39	-0.91
	(67.55)	(66.57)	
Individuals:			
Mother:			
Age	40.18	41.56	-1.38***
	(6.85)	(6.92)	
Educational level	3.75	3.49	0.26**
	(3.27)	(3.22)	
Employment	0.65	0.63	0.02
	(0.48)	(0.48)	
Weekly working hours	27.56	27.50	0.06
	(16.87)	(16.45)	
Wage from main job	188.18	189.42	-1.25
	(129.32)	(129.02)	
Father:			
Age	44.19	45.76	-1.57***
	(8.79)	(8.45)	
Educational level	3.14	2.88	0.26*
	(3.21)	(3.17)	
Employment	0.93	0.91	0.02
	(0.26)	(0.28)	
Weekly working hours	44.22	43.77	0.46
	(12.67)	(12.52)	
Wage from main job	283.82	293.77	-9.96
	(147.99)	(154.7)	
Son:			
Educational level	5.68	6.17	-0.49***
	(2.01)	(2.26)	
Employment	0.33	0.41	-0.08***
	(0.47)	(0.49)	
Weekly working hours	24.28	26.05	-1.77*
	(14.03)	(13.78)	
Wage from main job	97.99	109.92	-11.92
	(70)	(76.14)	

Notes: Households including young people aged 15 to 16 years, among the poorest 20% in 2006. Standard deviation in parentheses. *** 1% significance, ** 5% significance, * 10% significance

Table 5: Young people's school attendance by quantiles of *per capita* familial income (%)

	Variation - 2001 to 2006		Variation - 2006 to 2009	
Tenths of income	15-years-old adolescents	16-years-old adolescents	15-years-old adolescents	16-years-old adolescents
1 (poorest)	5.1	8.9	4.6	9.8
2	4.3	-1.3	3.2	17.1
3	3.6	7.4	3.9	1.1
4	4.4	3.3	2.4	3.4
5	3.9	-1.8	1.7	2.4
6	1.8	5.3	0.1	0.7
7	-1.1	-1.2	3.9	3.7
8	2.7	2.7	-1.1	-2.5
9	-0.5	4.1	0.3	-1.9
10	-0.3	-0.7	-1	0.8
Total	2.4	1.9	2	3.5

Source: PNAD 2001,2006 and 2009.

Table 6: Young people's school attendance by quantiles of *per capita* familial income (in %).

Tenths of income	Δfreq16 - Δfreq15		Δ(ΔFreq16- ΔFreq15)
	2001 and 2006	2006 and 2009	
1 (poorest)	3.7	5.2	1.5
2	-5.6	13.9	19.5
3	3.8	-2.8	-6.6
4	-1.2	1	2.2
5	-5.8	0.7	6.4
6	3.5	0.7	-2.8
7	0	-0.2	-0.2
8	0	-1.4	-1.4
9	4.6	-2.2	-6.8
10	-0.5	1.8	2.3
Total	-0.5	1.6	2

Source: PNAD 2001,2006 and 2009.

Table 7: Impact of the BVJ on School Attendance

Variables	Without Controls	With Controls
Treated	-0.07	-0.066
	(0.014)***	(0.014)***
2009	0.035	0.028
	(0.011)***	(0.011)**
Treated*2009	0.044	0.040
	(0.018)**	(0.018)**
Constant	0.88	0.921
	(0.008)***	(0.040)***
Observations	5451	5441
R^2	0.013	0.049

Source: PNAD 2006

Note: Robust standard error in parentheses. ***1% significance;

Table 8: Impact of the BVJ on Time Allocation

Variables	Without controls			With controls		
	Studying Only	Working Only	Studying and Working	Studying Only	Working Only	Studying and Working
Treated	-0.551	0.169	-0.255	-0.542	0.151	-0.254
	(0.160)***	(0.203)	(0.168)	(0.163)***	(0.207)	(0.173)
2009	0.263	-0.466	-0.093	0.228	-0.416	-0.055
	(0.165)	(0.223)**	(0.176)	(0.168)	(0.238)*	(0.180)
Treated*2009	0.358	0.301	0.498	0.329	0.366	0.542
	(0.237)	(0.318)	(0.250)**	(0.239)	(0.323)	(0.254)**
Constant	2.392	0.124	1.552	2.401	-0.013	1.882
	(0.115)***	(0.151)	(0.121)***	(0.567)***	(0.727)	(0.605)
Observations	5451	5451	5451	5441	5441	5441
Pseudo-R^2	0.012	0.012	0.012	0.0898	0.0898	0.0898

Source: PNAD 2006 and 2009

Table 9: Impact of the BVJ on School Attendance by Region

Variables	Midwest	Northeast	North	Southeast	South
Treated	-0.048	-0.062	-0.041	-0.114	-0.061
	(0.056)	(0.019)***	(0.038)	(0.035)***	(0.043)
2009	-0.003	0.027	0.058	0.019	0.012
	(0.043)	(0.015)*	(0.028)**	(0.025)	(0.028)
Treated*2009	0.013	0.065	-0.009	0.076	-0.032
	(0.074)	(0.023)***	(0.046)	(0.044)*	(0.025)
Constant	0.859	0.958	0.777	0.981	0.904
	(0.142)***	(0.042)***	(0.084)***	(0.090)***	(0.000)***
Controls	Yes	Yes	Yes	Yes	Yes
Observations	342	2884	906	913	396
R^2	0.063	0.036	0.069	0.065	0.057

Source: PNAD 2006 and 2009

Note: Robust standard error in parentheses. ***1% significance; **5% significance; *10% significance.

Table 10: Impact of the BVJ on Time Allocation by Region

Dependent variable	Midwest	Northeast	North	Southeast	South
Studying Only	-0.319	0.910	-0.182	0.050	-0.438
	(1.091)	(0.352)***	(0.613)	(0.573)	(0.697)
Working Only	-0.726	0.852	0.328	-0.271	0.251
	(1.359)	(0.483)*	(0.756)	(0.825)	(1.011)
Studying and Working	-0.367	0.931	0.134	1.057	0.332
	(1.152)	(0.369)**	(0.646)	(0.644)	(0.776)
Working hours	-0.695	0.801	4.416	-1.197	0.207
	(6.596)	(1.874)	(3.356)	(4.571)	(5.309)

Source: PNAD 2006 and 2009

Note: Robust standard error in parentheses. ***1% significance; **5% significance; *10% significance.

Table 11: Impact of the BVJ on School Attendance by Characteristics

Variables	Boys	Girls	Youngest	Boys and Youngest
Treated	-0.081	-0.046	-0.126	-0.179
	(0.021)***	(0.019)**	(0.032)***	(0.045)***
2009	0.03	0.023	-0.016	(0.046)
	(0.017)*	(0.015)	(0.025)	(0.039)
Treated*2009	0.054	0.027	0.113	0.162
	(0.026)**	(0.024)	(0.041)***	(0.059)***
Constant	0.933	0.894	0.852	0.815
	(0.061)***	(0.051)***	(0.100)***	(0.151)***
Observations	2922	2519	1182	639
R^2	0.062	0.041	0.07	0.101

Source: PNAD 2006 and 2009

Note: Robust standard error in parentheses. ***1% significance; **5% significance; *10% significance.

Table 12: Impact of the BVJ on Mother's Time Allocation

	Without controls		With controls	
Variables	Work	Working Hours	Work	Working Hours
Treated	-0.019	-0.063	-0.016	-0.186
	(0.019)	(0.905)	(0.018)	(0.869)
2009	-0.034	0.68	-0.035	-0.480
	(0.018)*	(0.834)	(0.017)**	(0.810)
Treated*2009	0.040	0.862	0.045	1.302
	(0.027)	(1.234)	(0.026)*	(1.186)
Constant	0.647	27.559	0.800	29.756
	(0.013)***	(0.608)***	(0.059)***	(2.754)***
Observations	5280	2788	5270	2783
R^2	0.001	0.001	0.090	0.110

Source: PNAD 2006 and 2009

Table 13: Placebo: Impact on School Attendance

Variables	Without Controls	With Controls
Treated	-0.062	-0.062
	(0.014)***	(0.014)***
2006	-0.004	-0.012
	(0.012)	(0.012)
Treated*2006	-0.009	-0.004
	(0.020)	(0.020)
Constant	0.885	0.853
	(0.008)***	(0.043)***
Observations	5277	5264
R^2	0.009	0.043

Source: PNAD 2006 and 2009

Note: Robust standard error in parentheses. ***1% significance; **5% significance; *10% significance.

Table 14: Placebo: Impact on Time Allocation

	With controls		
Variables	Studying Only	Working Only	Studying and Working
Treated	-0.483	0.194	-0.311
	(0.159)***	(0.212)	(0.170)*
2006	-0.026	0.142	-0.063
	(0.163)	(0.221)	(0.175)
Treated*2006	-0.06	-0.02	0.053
	(0.228)	(0.297)	(0.244)
Constant	1.812	-0.086	1.39
	(0.500)***	(0.657)	(0.542)**
Observations	5264	5264	5264
R^2	0.099	0.099	0.099

Source: PNAD 2006 and 2009

Note: Robust standard error in parentheses. ***1% significance.