THE IMPACT OF CONDITIONAL CASH TRANSFER PROGRAMS ON HOUSEHOLD WORK DECISIONS IN BRAZIL

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Resumo

Os programas de transferência condicionada de renda têm se disseminado nos países subdesenvolvidos e em desenvolvimento como forma de aliviar a pobreza (transferência de renda) e fornecer investimento em capital humano para levar as famílias a atingirem melhores condições de vida no longo prazo, através das condicionalidades. Esses programas, no entanto, podem também afetar a alocação do tempo dentro da família beneficiária. Usando dados da PNAD de 2003, mediu-se o impacto do programa Bolsa Escola no trabalho das crianças e dos pais nas famílias beneficiadas. Utilizando como grupo controle as famílias elegíveis, mas não beneficiadas, e estimando-se um modelo probit, observa-se uma redução do trabalho de crianças de 6 a 15 anos e aumento da freqüência escolar. Ademais, ocorre aumento da participação dos pais no mercado de trabalho. Esses resultados são confirmados ao se utilizar a técnica de propensity score matching.

Palavras chaves: Bolsa Escola, avaliação programa, trabalho infantil
JEL: Jo8
Anpec: Economia Social e Demografia

Abstract

Conditional Cash Transfer (CCT) programs have become widespread in developing and underdeveloped countries as a way to alleviate current poverty and provide investments in human capital that could lead families to better life conditions in the long-term. However, these programs may also have impacts on time use decisions within beneficiary household/families, particularly with respect to time spent working. Using data from 2003, we aim to measure the impact of the Brazilian *Bolsa Escola* conditional cash transfer program on children's and parents' labor status using the econometric framework of policy evaluation. Probit regressions and propensity score matching methods show that this program reduces the probability of work for children ages 6-15, increase school enrollment and increase mother and father participation in the labor force.

Keywords: Bolsa Escola, program evaluation, child labor

THE IMPACT OF CONDITIONAL CASH TRANSFER PROGRAMS ON HOUSEHOLD WORK DECISIONS IN BRAZIL

Introduction

Conditional Cash Transfer (CCT) programs have become widespread in developing and underdeveloped countries as a way to alleviate current poverty and provide investments in human capital that could lead families to better life conditions in the long-term. The first goal is accomplished when poor families receive money from governments on a monthly basis, as a complementary income source. The second goal is reached by conditioning the cash transfers on certain behaviors, such as visiting health facilities, immunizing children, and enrolling children in school. However, these programs may also have a huge impact on time use decisions within recipient families, particularly with respect to time spent working. In this paper, we aim to measure the impact of the *Bolsa Escola* (School Grant) conditional cash transfer program on children and parents' labor status in Brazil. Although this program was subsumed into the broader *Bolsa Familia* (Family Grant) program in 2004, we use survey data from 2003, before that restructuring occurred.

Policy makers want social programs to alleviate poverty without causing beneficiaries to become dependent on the program. The problem with cash transfers is that when the flow stops, families return to poverty. One solution is to stimulate families to use the money that they receive from social programs to invest in family members' human capital. In this way, they may have better opportunities in the future when the transfers stop, since, as is well known, education is highly correlated with earnings. Thus, conditioning a cash transfer program on behaviors that represent investment in human capital adds long-term dimensions to a short-term income transfer policy.

Poor families with children of school-going age (15 years) or younger are eligible for the conditional cash transfer program in Brazil. The government pays a monthly grant to the children's mother, conditional on certain requirements being met: school-age children have to be enrolled and have to attend a certain percentage (85%) of school days during the month; children have to visit health care facilities for checks of their nutritional and developmental status; parents must attend workshops regarding health and healthy behavior, and so forth.

Although those programs are concerned with long-term investments in human capital, CCT programs may influence current family decisions as well. We are interested in whether *Bolsa Escola* affects how family members allocate activities and resources among themselves. In other words, if a child used to work in the paid labor force, thereby earning income, and now he/she has to spend a certain amount of time in school, someone else in the family may have to produce more income. Alternatively, child leisure time or time spent in household chores may be reduced to allow school attendance, without changing a child's labor force hours. In theory, CCT programs may affect time allocation decisions for all members of the family. Another aspect of work decisions and cash transfer programs is that when the economic status of the family improves, for any reason, it may find itself ineligible to continue receiving the CCT benefits. In particular, a better job or more hours of employment for one or more family members may increase family income enough, that they may lose program eligibility. In the face of this possibility, adults may choose not to increase their paid work in order to continue receiving the transfers.

Economically speaking, because benefits are linked to children's school attendance, the relative value (or shadow price) of time spent in school increases, and the relative values of all other activities performed by children, including labor force work, tend to decrease. This effect would be consistent with goals of the Brazilian government regarding children's labor force work: anti-child-labor campaigns have been highly visible in Brazil since the mid-1990s (Arends-Kuenning, Kassouf and Fava 2005). However, we do not have enough information about the characteristics of the work of particular children to judge whether they are, on the whole, harmful or beneficial for the children in question. When we use the term "child labor" in this paper, we do not do so in a pejorative sense as is often done to indicate harmful or dangerous work; "child labor" and "child work" are used interchangeably with no value judgment.

The total effect of the transfers can be decomposed into two effects: an income effect and a substitution effect. The income effect implies that an increase in household resources (due to cash transfers) leads family members to increase their consumption of normal goods (such as leisure and education). The substitution effect implies a decrease in the demand for substitutes for schooling and an increase in the demand for goods or services that are complementary to school. In general, we would expect cash transfers to result in an increase in the consumption of notebooks and pencils and – if work and school are substitutes – a decrease in the time that children spend working. If, however, work and school are complementary rather than substitutes, the effects of cash transfers on child labor will be ambiguous (Ravallion and Wodon, 2000).

Whether or not labor force work and school are complements or substitutes is an empirical matter that is likely to be context-specific. In Brazil, public schools often function in shifts, and children may work before or after the four hours (or so) that they spend in school each day that they attend. In Brazil, in fact, more working children attend school than not: In 2003, 9.26 percent of 10-14 year-old children combined school and labor force employment. Another 88.16 percent went to school (only), 0.55 percent did labor force work (only), and 2.02 percent were not recorded as doing either, according to PNAD-2003 data.[1] School and work may be complementary not only in the sense of both fitting into the same day; there may be true complementarities when on-the-job learning makes particular kinds of school learning more comprehensible and valuable for children, or when, for example, numeracy increases marketable skills. The quality of local schools, especially those attended by poor children, as well as local labor market possibilities must, logically, affect the degree of substitutability between school and work for children eligible for cash grants.

Adult labor supply may also be affected. Considering adult labor supply in a simple static model in which individual utility depends on consumption and leisure, the income effect would lead to reduced time spent on work, because in the presence of cash transfers individuals can afford to purchase more goods. Nevertheless, in a family labor supply model, time allocation of every member will depend on the value of time of all other members. The question now is how cash transfers affect the work of other family members if work and school are substitutes for children.

One possible answer, considering a family acting as a unit, is that when children stop or reduce their work activities, there will be less labor supplied by members of their family, in total. This would imply

[1] For 6-15 year olds, we observe 7.02% doing both school and labor force work; 88.69% in school only; 0.65% at work only; and 3.65% neither in school nor working. The higher number for the last category is due to the presence 6 year-old children, who were not obligated to be in school.

that the relative price of work would be higher for the whole family. This would, in turn, lead to an increase in the hours worked by other (non-child) family members. Still, some ambiguity in the final result can arise due to the own-income effect of CCT grants on adult labor supply (Parker and Skoufias, 2000). The final outcome is an empirical matter; it may, in fact, vary from family to family.

The preceding discussion has implicitly assumed a Becker-style household time allocation model (Becker, 1965), where all household members either agree on their joint time use allocation or where there is an altruistic dictator. Although a model incorporating conflict and family dynamics would be more realistic (see, for example, Quisumbing 2003), our data unfortunately cannot support the incorporation of such details.

Evidence from studies of conditional cash transfer programs

A number of studies have shown that CCT programs in Latin America improve student educational outcomes, but there are relatively few analyses of the impact of CCT programs on child labor. Maluccio and Flores (2004), using a double-difference estimator, found that Nicaragua's *Red de Proteccion Social* program raised enrollment by 17.7 percentage points and reduced the number of children ages 7-13 working by 4.9 percentage points. Attanasio et al (2006) estimated a positive impact of Colombia's *Familias en Accíon* program on school participation enrolment and a negative impact on children participation in domestic work. However, child participation in income-generating work remained almost unaffected by the Colombian program. Duryea and Morrison (2004) estimated that the *Superémonos* CCT program in Costa Rica increased children school attendance, but again they found no evidence that the program decreased child labor.

Evaluating the impact of the Food for Education (FFE) program, implemented in 1994 in Bangladesh, on child labor and schooling, Ravallion and Wodon (2000) found a positive effect on school attendance and a negative effect on child labor. However, they noted that the decrease in labor time corresponded to a small share of the increase of schooling time, indicating that time dedicated to school was mainly subtracted from leisure and not from work time.

The Mexican PROGRESA (*Programa de Educación, Salud y Alimentación* – Education, Health and Nutrition Program) CCT Program began in 1997 and continues under the name of *Oportunidades*. For purposes of evaluation, PROGRESA was implemented with an experimental design, with treatment and control groups randomly assigned. Thus, it was possible to accurately evaluate the impacts of this program, and it has become the most important reference for program evaluation research of its kind. The Mexican CCT program achieved its goals of increasing school enrollment and attendance and reducing children's participation in labor force work (Schultz, 2001). Regarding parents' labor status, mothers' and fathers' work decisions were not affected by the transfers, it seems, mainly because their program eligibility was determined only once for the following three years and was not regularly re-evaluated (Parker and Skoufias, 2000).

Both ex-ante and ex-post evaluations of the *Bolsa Escola* Program on school attendance and child labor are available (Bourguignon, Ferreira and Leite, 2002; Cardoso and Souza, 2003; Ferro and Kassouf, 2005). The conclusions are all the same: Brazil's CCT program has a big impact on increasing school enrollment – although it is not possible to assess the quality of education received – but it has no influence on child labor. The ex-post evaluations, however, took place using data collected more or less coincidentally with the widespread implementation of *Bolsa Escola* in 2001: they relied upon the 2000 Demographic Census) and the 2001 PNAD, or National Household Sample Survey. Another weakness is that the PNAD-2001 asked if individuals were "signed-up for or a beneficiary of" a cash transfer

program conditioning on education. Thus, the analysis using PNAD-2001 may have considered as "treated" someone who was not actually receiving the benefits but rather still on the waiting list for *Bolsa Escola*.

The Bolsa Escola Program. The Brazilian experience with CCT programs started with the *Renda Mínima* (Minimum Income) program in the city of Campinas and the *Bolsa Escola* (School Grant) program in Brasília, both in 1995. The programs consisted of cash transfers to guarantee a minimum income level for poor families, conditional on child school attendance. Between 1995 and 1999 other cities adopted the same model of social programming, based on the positive experiences of their predecessors.

In April 2001 the Brazilian federal government launched *Bolsa Escola* as a national conditional cash transfer program focused on education. In order to be eligible to receive a transfer, a family had to have a per capita income below one-half of a Brazilian minimum salary (i.e., below the usual Brazilian poverty line) and had to include individuals aged 6 to 15. It paid 15 Reais (approximately US$ 6) for each child attending at least 85 percent of school days, with payments for a maximum of three children per family to avoid incentives for fertility increases.

Most CCT programs do not aim to fully compensate children's earnings. In 2003, the grant per child (for up to three children per family) was 15 Reais. In Brazil overall in 2003, when children were paid for their work, they earned on average 100 Reais per month, or about 4 Reais per hour (rural children and girls earned less than urban children and boys). However, many children are unpaid workers; other low-income children are unemployed or out of the labor force; and yet other paid workers may continue to work in non-school hours. Without longitudinal data, it is not possible to figure out whether *Bolsa Escola* has increased household income for poor families with children or led to decreases in total income due to reduced child earnings. It is also possible that a smaller amount of income will be put to better use when it is controlled to a greater extent by children's mothers (Quisumbing 2003).

In January 2004, the Brazilian government merged four cash transfer programs, including *Bolsa Escola*, in the same administrative / management set, implementing the *Bolsa Família* (Family Grant) program. Characteristics of the school grant program remained essentially the same, but requirements for program participation increased to include pre-natal care and vaccinations for children ages 0-6 as the program was broadened to include poor families without 6-15 year-olds.

The implementation of a *Bolsa* cash transfer is done initially through the Federal government, which establishes a quota on the number of federally-financed stipends that a municipality can provide to its population. To enroll in the program, families must fill out an application, available at the city hall of their municipality, that requests information on income and household composition. The information determines admission to the program, subject to the *municipio's* budget for the program. The municipality then selects households to receive the program from among the group of qualifying beneficiaries. [2]

De Janvry et al (2005) analyzed the *Bolsa Escola* program with respect to targeting, monitoring and accountability. They used data from 261 municipalities that were randomly selected out of more than

[2] de Janvry et al. (2005) report that in almost all *municipios* the number of potential beneficiaries greatly exceeded the number of beneficiaries they could fund with the budget allocated by the central government.

5500 municipalities in four states of Northeast Brazil. They concluded that there is considerable variation across municipalities in implementation quality and strategies. However, according to the authors, "there was considerable transparency with respect to the beneficiary identification and selection process, with ample dissemination, public knowledge, and information on the criteria used".

Program evaluation methodology. The main issue in program evaluation is finding a good comparison group. When programs have experimental designs in which treatment and control groups are randomly assigned, we can assume that the primary difference between the participants (treatment group) and non-participants (control group) is their participation in the program. Thus, the differences between their outcomes after treatment (finding a new job, school enrollment, children reducing work hours etc.) are due to the treatment – in this case, participation in *Bolsa Escola*. Like most social programs, however, *Bolsa Escola* did not have an experimental design, so we need to find a substitute for the random control group – a "good" comparison group.

Finding a comparison group depends in part on how the program works. CCT programs in Brazil are mostly funded by federal resources, but municipalities are in charge of parts of the bureaucratic process. First, the family has to meet the eligibility criteria: have children of school age (6 to 15 years) and have a monthly per capita income lower than one-half of a national minimum salary.[3] Eligible families can sign-up for the program, and if their requests are approved, they will receive monthly transfers if their children attend at least 85 percent of school days during the month.

Schools have to inform the Ministry of Education about the attendance of beneficiary students. The Ministry of Education consolidates the information coming from all Brazilian schools and sends it to the Ministry of Social Development, which orders the payments. The payment is made directly to the beneficiaries through magnetic cards – it works as if the beneficiary had a special bank account for the transfer. Beneficiaries can get cash from Federal Bank tellers, ATMs, Post Offices and authorized retail stores, so the magnetic cards are supposed to work even in the poorest and most technological delayed regions[4].

The "irregular" part of the process is the selection of the beneficiary families. The selection process is decentralized to the city level. Families have to meet the same national eligibility criteria, but cities can vary the processes of publicity, application, selection and approval. In general a city's Social Development Office is in charge of these duties. The Social Development Office may either send social workers to poor areas to visit families and offer the program or it may use another way of publicizing the program – such as distributing brochures, giving interviews on community radio stations, or using cars with loud speakers in targeted neighborhoods – and wait for interested families. If municipalities want to reach the program's target population with the lowest cost, the second approach is more likely to be used.

Non-governmental organizations dealing with poverty-relief and educational issues are also engaged in providing program information and helping eligible families through the process. Other people hear of the program through other routes. For example, if they go to their political representatives to ask for

[3] Monthly minimum salaries are set by the federal government. One minimum salary is approximately the amount of income that an adult would need to earn by working full-time (8 hours per day, 5 days per week) for a month in order to meet basic (minimal) standards of living. The minimum salary in 2003 was 240 reais or 82 dollars a month (exchange rate in September, 2003 was 1US$ = 2.92 Reais).

[4] This structure of direct payments is supposed to avoid corruption and deception, as beneficiaries do not need an intermediary in order to receive the money transfer.

help finding a job or paying for electricity or water bills, the city representatives may send them to the Social Development Office to check for eligibility in and apply for the CCT program.

In spite of differences in the publicity and selection systems within municipalities, the overall strategy relies on the families' willingness to participate. The mother or the father has to apply for and accept the conditions of the program. Because of this, the comparison between beneficiary and eligible individuals may omit unobservable characteristics that lead some families to the program but not others. This is known as the self-selection problem: some families want to participate while other families choose not to apply.

One way to deal with the self-selection problem that arises from the comparison between beneficiary and eligible groups is to limit the analysis to a comparison between individuals who are in the program and individuals who have been found to be eligible, who have applied for the program, but who are not yet receiving benefits – that is, those who are on the waiting list. These people are waiting for bureaucratic processes to be completed; they are queuing for an opening in the quota-restricted program. In other words, those who want to be participants but are not actually receiving the money can be considered a good comparison group, since they are likely to have similar unobservable characteristics to those already accepted into the program.

There remain some concerns with using the waiting-list group as a comparison group. Because program approval is on a first-come-first-served basis – given that the family meets the eligibility criteria – it is possible that persons who are already receiving the benefits have a stronger desire to participate or are more motivated than people who signed up later. In this case, the self-selection problem still exists within the treatment and comparison groups. However, after three years of the program, it has received a substantial amount of publicity. Television commercials have shown beneficiary families being better-off due to transfers, and television is seen by most of Brazil's population, including the poor. The re-election campaign of incumbent president Luís Inácio Lula da Silva and other politicians emphasized the benefits of the *Bolsa* program to people's lives.[5] We argue that information about the CCT program was very well diffused in Brazil by 2003. By late 2003, in fact, *Bolsa Escola* was paying monthly stipends to over 8.6 million children from 5 million families. In spite of this, Schwartzman (2005) asserts that 12 million 5-17 year-old persons were living on less than one dollar per day in Brazil in 2004.[6] Thus, we consider eligible signed-up families to be a good comparison group for beneficiaries.

Data. The 2003 Brazilian annual household survey, *Pesquisa Nacional por Amostra de Domicílios* or PNAD-2003, included two questions regarding conditional cash transfers. One of the questions asked whether the person was signed-up for a cash transfer program conditional on education, and the other asked whether the person was actually receiving benefits in the form of cash transfers from such a program. The PNAD-2003, unlike previous PNAD survey, allows us to distinguish between those who want to be beneficiaries, i.e., those who are waiting for approval to start receiving benefits, and those who actually are beneficiaries and receive their transfers monthly. These two questions allow us to measure the impact of Brazilian conditional cash transfers on both child and parent work decisions through the analysis of treatment (eligible persons who are receiving benefits) and comparison (eligible

[5] During election times, some politicians try to get the support of poor people by claiming that they are responsible for some social programs (or for the access to existing social programs), even if they are not.

[6] One dollar per day was a bit less than the poverty line of one-half minimum salary per month in 2003 (about $1.30 per day).

persons who are signed-up for the program and still waiting for approval) groups. The treatment group will be described as "beneficiaries", while the control or comparison group will be called "non-beneficiaries".

The PNAD is a nationally representative sample survey. We focus this analysis on individuals between 6 and 15 years of age who belong to families with per capita income levels below one-half of one Brazilian minimum wage (or below 120 Reais in September 2003)[7]. Furthermore, we limit our sample to those who declared themselves signed-up for (comparison group) or a beneficiary of (treatment group) the CCT program and have complete information. Complete information indicates that we have non-missing information on the variables used in the analysis, including those about mothers and fathers.[8] Thus, our sample does not include potentially vulnerable mother-only or father-only households; we lose 28 percent of children because of this, or 4,090 observations. After dropping observations with incomplete information, our sample consisted of 14,434 children (4,230 controls and 10,204 beneficiaries) of 8,202 parents (2,334 controls and 5,868 beneficiaries).[9]

Propensity score matching. Another methodological approach used in this study to estimate the effect of *Bolsa Escola* on work participation and enrollment is propensity score matching. In this case, participants are explicitly matched with an individual in the non-participant (signed-up) group, in order to ensure that the outcomes are being compared between individuals who have similar a priori propensities of participating in the program. While the observations compared are very similar in terms of the probability of program participation, one limitation is that the sample size must be large in order to find statistically significant differences between treatment and control groups. However, this is not an impediment here, since we are dealing with a large household survey.

To implement the propensity matching methodology, we used Stata statistical software with a routine (psmatch2) developed by E. Leuven and B. Sianesi (2003) to estimate treatment effects. The propensity score was based on variables that would affect program participation, such as age, family composition, parents' education and age, geographical region and family income (without CCT benefits).

Descriptive information

Brazilian educational CCT programs target families with children from 6 to 15 years old; transfers may be received for up to three children per family. Based on the PNAD-2003 data, 67 percent of the urban children whose families want to participate in a CCT program are receiving the transfers. The percentage of beneficiaries in rural areas is higher than in urban areas (78 %).

Labor force workers, by definition, are those who have spent at least one hour in the reference week in paid or unpaid work. Contrary to what one might expect, program beneficiaries are more likely to work and to be enrolled in school than non-beneficiaries. Close to 13 percent of beneficiary children work, while less than 10 percent of non-beneficiaries work. Enrollment rate in both groups is very high, reaching 98 percent for beneficiaries and 96.5 percent for non-beneficiaries. (It is possible, however,

[7] This corresponds to approximately US$ 41 at the September 2003 exchange rate (US$ / R$ = 2.92).
[8] We are able to find the actual mother, but not the father. Thus, we assign the male head or spouse to role of "father" even though some of them are step-fathers or boyfriends rather than fathers.
[9] In urban areas, the sample includes 9,843 children (3,229 controls and 6,614 beneficiaries) and 5,661 parents (1,824 controls and 3,837 beneficiaries). In rural areas, it includes 4,591 children (1,001 controls and 3,590 beneficiaries) and 2,541 parents (510 controls and 2,031 beneficiaries).

that attendance varies substantially between the two groups; this information is not available in PNAD-2003.)

Differences by urban and rural residence reflect typical patterns of child work, and breaking down the above statistics by urban-rural explains why the overall pattern is contrary to expectations. Among rural boys who are program beneficiaries, 49.1 percent are working, as compared to 52.9 percent of non-beneficiaries. Among boys in urban areas, 12.1 percent of beneficiaries and 18.8 percent of non-beneficiaries are working. In general, girls work in the labor force less than boys, although they may do as many (or more) hours of work in total when non-labor-force work is taken into consideration. Among 11-15 year-olds, 20.9 percent of rural beneficiary girls and 6.9 percent of urban beneficiary girls work in the labor force, compared to 32.6 percent (rural) and 8.1 percent (urban) of non-beneficiaries. Thus, the overall pattern is explained by the fact that relatively more rural children are beneficiaries, because there is more poverty in rural areas. Within urban and rural areas (separately), beneficiaries are less likely to work than non-beneficiaries.

Table 1 includes descriptive statistics for the variables used in the children work participation equations and children's enrollment equations. Means for the control and treatment groups, as well as for the whole sample are presented those for rural and urban areas. In addition to the program participation variables, a number of controls are included in these regressions, which are described in more detail below. We control for the child's age, sex, and skin color. Skin color is self-described by the survey's respondents and includes the categories white, mulatto, black, yellow (that is, of Asian descent) and indigenous; we have recoded this into white and non-white. We also control for the ages and numbers of years of schooling completed by the child's father and mother. (The age variable for the mother reflects the difference between her age and the father's age, with a positive difference indicating that the mother is older.) Family composition is described with respect to the reference child and includes the number of her/his siblings by age and gender. Region of residence is also controlled. To estimate propensity scores, we used family per capita income net of CCT transfers. We did not control for family income in the probit regressions to avoid endogeneity problems, given that it is part of the criteria used to select beneficiaries. Although we attempted to include non-earned income, this variable was frequently missing or zero to be usable.

Comparing the means of the control variables for the treatment (beneficiary) and control (non-beneficiary) groups in Table 1, we observe that the groups are similar in many ways; there is no statistical difference between close to half of the variables. (An asterisk indicates no statistically significant difference between groups.) Moreover, when using the propensity score matching method, as shown in Table 2, practically all the means of the exogenous variables are the same across groups.

Finally, we analyze the age difference between fathers and mothers. As suggested by Assaad, Levison and Zibani (2007), our hypothesis is that as the difference between fathers' age and mothers' age increases, fathers might increasingly dominate the relationship – and the household and family choices. Table 1 shows that urban mothers are in general 4 years younger than their spouses, while rural mothers are approximately 5 years younger. Mothers' age ranges from 34 to 38 while average fathers' age ranges from 38 to 43 years. Although the average age differences do not seem to be very large, they may have influence in the family decision-making.

In order to increase mothers' role as decision makers within their families, CCT benefits are generally paid to children's mothers. There is evidence that mothers spend a higher proportion of their money on children's education and health (Thomas and Strauss, 1992; Thomas, 1994). Also, when they have

some money that does not come from their husbands or other family members, they may have increased self-esteem, which would help them to express their opinions in the household.

The *per capita* monthly income does not include children's earnings and CCT benefits, but it does include all other sources of family income. Urban beneficiary families have a monthly *per capita* income of 60 Reais while non-beneficiary families' average *per capita* income is 63 Reais. The overall averages are lower in rural areas, where beneficiary *per capita* income is 47 Reais per month compared to 53 Reais in non-beneficiary families.

Children in non-beneficiary families seem to be better off than those in beneficiary families, since the former have slightly higher income levels. This may be indicative that the program is being appropriately targeted to poorer families. It is important to highlight that this sample contains only families found to be eligible for the CCT program – those that the Brazilian government considers to be under the official poverty line.

Size is another important family background component. Urban families are in general smaller than rural families. Urban girls and boys have, on average, 2.6 siblings if they are beneficiaries and 2.3 siblings if they are non-beneficiaries. In rural areas, beneficiary girls and boys have 3 siblings while non-beneficiaries have 2.8 siblings. Bigger families in a poor environment may face more difficulties in meeting their needs, thus depending more on governmental assistance.

Table 3 includes sample means of the exogenous variables used in the parents' work participation equations; these are given separately for parents in the beneficiary group and in the non-beneficiary (waiting-list) groups. Similarly, Table 4 shows the means for the matched sample of parents. Labor force participation rates are higher for the beneficiary group; they are also higher in rural areas than in urban areas.

Table 3 shows that 42 percent of urban mothers who are beneficiaries and 38 percent of those who are not beneficiaries are working in the labor force, while more than 68 percent of rural mothers (regardless of beneficiary status) are in the labor force. More than 95 percent of rural fathers and approximately 80 percent of urban fathers are working in the labor force. Only mothers from urban areas show statistically significant differences in labor force participation – at the 10% level – between beneficiary and non-beneficiary. Indeed, it seems that conditional cash transfers may not impact parents' work decisions.

Tables 3 and 4 also show mothers' and fathers' educational levels as measured by their completed years of schooling. Mothers are in general more educated than fathers. However, most have not continued beyond the fifth grade. According to Table 3, urban mothers from beneficiary families have, on average, completed 4.1 years of schooling, while non-beneficiary urban mothers completed 4.7 years. In rural areas educational attainment is even lower: 2.7 years for beneficiary and 3.1 years for non-beneficiary mothers.

Fathers from urban areas have completed, on average, 3.6 years of schooling if their families are in the beneficiary group and 4.2 years of schooling if they are not in a beneficiary family (Table 3). As we observed for mothers, father's educational attainment in rural areas is much lower than in urban areas – fathers in the treatment group in rural areas have 1.8 years, while those in the control group have completed an average of 2.3 years.

As we did for the children's analysis, we compare the means of the variables in the treatment and control groups, indicating a lack of statistically significant difference by an asterisk. In urban areas, most variables are statistically significant between groups, whereas in rural areas only about half differ. However, when using the propensity score matching method, as shown in Table 4, practically all the means of the exogenous variables in the treatment group are statistically the same as the means for the control group.

Empirical Models

The main goal of this paper is to evaluate the impact of the *Bolsa Escola* conditional cash transfer program on the work decisions of children, mothers and fathers and on children's school enrollment. We assume that the family maximizes a utility function for all of its members, thus using a unitary model of time allocation. As mentioned above, although we recognize the evidence indicating the failure of unitary models to capture intrahousehold bargaining, we do not have adequate data to implement a collective model.

We estimate the effect of treatment for both children and parents[10] looking at the impact of the benefits on the decision to work, estimating equations in which the dependent variables are the work status of children, mothers and fathers – that is, whether they performed some labor force work activity or not and also whether the child is enrolled in school or not. The explanatory variables are individual and household characteristics, as well whether or not they are receiving the grant. We estimate the labor force participation and enrollment equations conditional on cash transfers using a probit model.

The empirical equation for labor force participation and school enrollment is

$$W_i = \alpha_0 + \sum_{j=1}^{J} \alpha_j X_{ji} + \delta T_i + \varepsilon_i$$

where W_i is an indicator variable that assumes the value 1 if the individual is working in the labor force or is in school, and 0 if not; i indexes individuals; X_{ji} represents J individual, family and regional characteristics (or control variables); and T_i is a binary variable that indicates whether or not the person belongs to the treatment group. Its value is 1 if the child receives the grants and 0 otherwise.

In both children' and parents' equations, individual characteristics included the person's age and skin color (1 if they report themselves as white and zero otherwise). To represent household composition we used variables for the number of children in several groups broken down by age (0-5, 6-10, 11-15 and 16+) and gender[11]. Geographic differences were captured using dummy variables for each region (North, Northeast, South, Southeast and Midwest).

Also, parents' characteristics are included in children's equations, as controls for family background. These variables describe the father's age, the difference between father's and mother's age, and father's and mother's completed years of schooling.

[10] We use unweighted data in the econometric analysis. For a discussion about the use weights in regression analysis, see duMochel and Duncan (1983), Korn and Graubard (1995), and Lohr and Liu (1994).

[11] In the children's equations these variables represent the number of siblings (without counting the observed child) while in parents' equations they are the total number of children in the family.

Results

In this section we discuss the estimated outcomes of children and their parents, focusing on the exposition of a program that provides them an extra monthly income source but requires that children attend school.

It is important to remember that data used refers mostly to the *Bolsa Escola* program, which joined other social programs in the broader *Bolsa Família* in 2004. Until 2003, however, the condition for receiving the monthly grants was children's school attendance. As a consequence, measuring the effects of the Brazilian CCT program on child work and on their parents' labor using PNAD-2003 is essentially investigating a spillover effect of a program aimed at increasing education.

Again, the PNAD-2003 survey asked two different questions regarding the program – whether or not the person was receiving a transfer and whether or not the person had signed-up for a transfer but was not receiving it. The survey carried out in 2001 asked whether the person was receiving or had signed-up for a conditional cash transfer program in the same question, aggregating both treated and "waiting for treatment" in one group. We expect that the change in the question – and consequently in the treatment and comparison groups – and the time span since the implementation in 2001 will lead to results different than those found in former research regarding child labor (Cardoso and Souza, 2003; Ferro and Kassouf, 2005). Parents' labor decision under this program has not been studied before.

Children's outcomes. We perform separate estimations for children in urban and rural areas, besides the estimation for the whole sample. Moreover, in each case, we presented the impact of the *Bolsa Escola* program from the probit equations, using beneficiaries and eligible signed-up families as well the results from the propensity score matching method. This gives us six sets of results for the probability to work regressions and six for the children school enrollment equations. These are presented in table 5.

We argued above that beneficiaries may be compared with eligible signed-up families who are not yet getting the benefits. These individuals have the same propensity to participate and are eligible. In principle they should be an appropriate comparison group. However, for some of the exogenous variables, means statistics of those who are in the program and those who are eligible and have applied but do not receive the program are statistically significant. Because of that, a propensity score matching method was applied. When using matching, the mean of the exogenous variables for the new sample of control and treatment groups are practically the same.

The program impacts from the probit equations and from the matching method are very similar, showing robustness in the results. This was also true using different propensity score matching strategies, such as nearest neighbor (one-to-one), k-nearest neighbor, and Mahalanobis. We also analyzed different sets of variables to identify the propensity scores, including income variables, interactions between parents' education and income, parent's age and education, household size and composition, and regions of residence. The results were always very similar. Three years after being adopted nationally, the *Bolsa Escola* CCT program seems to have had the expected effect on school enrollment, as shown in Table 5. The impact of *Bolsa Escola* on children school enrollment is positive

and statistically significant, ranging from 2 percentage points in urban areas up to 4 percentage points in rural areas. The impact is small, but this is not surprising given the high percentage of children already enrolled in school. Program participation may have made a substantial impact on actual attendance, which we are unable to measure. We also lack information about program impacts on actual learning. Achievement may increase with attendance, but it may also decrease if schools' resources have not been increased to match greater numbers of children attending.

Also as expected, *Bolsa Escola* had a negative effect on children's labor force work. This result is observed for both urban and rural areas. Participation in *Bolsa Escola* reduces the probability that a child works by 3 percentage points overall. For those living in urban areas the effect is a reduction in 2 percentage points and for those living in rural areas, where the percentage of children working is higher, the impact is 6 or 9 percentage points, depending on which estimation method is used. These estimated effects show the largest differences in measured impacts observed, among all the significant estimates in Table 5.

These results obtained for the impact of *Bolsa Escola* on child labor are different from previous ex-post evaluations, in which the program showed no effect in reducing child labor (Cardoso and Souza, 2003) or had an unexpected positive effect (Ferro and Kassouf, 2005). It may be that the time span between the implementation of the program and the evaluation was not enough to capture significant impacts[12].

Although the results are now in the expected direction, it is perhaps surprising that the effect of conditional cash transfers on labor force work status seems relatively small. These results, however, are consistent with Skoufias and Parker (2001), who find a negative program effect for Mexico's PROGRESA of 3.2 percentage points on the labor force work of boys ages 12-17. They also note that this is a relatively big percentage change (8.5%) given the boys' pre-program level of labor force work (37.75%). In Brazil, it is likely that previously employed children reduced their labor force hours in order to accommodate more schooling, instead of leaving the labor force entirely. Indeed, in an analysis of hours worked, we tentatively find that program participation results in a reduction of 1.8 hours (for rural children) of labor force work per week, conditional on employment; these results are not included here because of our dissatisfaction with the identification of the selection equation.

Parents' outcomes. What is the effect of an increase in household income due to governmental transfers on the work participation of adults – mothers and fathers? Assuming that children decrease their labor market work, as we can infer from the results described above, family labor supply is reduced. This could lead to an increase in the labor supply of other family members – parents – as the relative price of work would be higher for the whole family. However, taking into account the income effect on adult labor of cash transfers, parents could choose to work less. The final outcome is an empirical matter.

As for children, we take into account the role of individual characteristics, such as education and age, family composition and geographic region, in explaining parents' work decision. We performed separated estimations for mothers and fathers and for those living in urban and rural areas, using probit equations and propensity score matching methods, ending up with 10 sets of regressions. Results for

[12] Even estimating equations with the same specifications as Ferro and Kassouf (2005) we find that the CCT program reduces child labor (boys and girls from 6-15 years) by 2.12 percentage points in urban areas and 5.31 percentage points in rural areas. Our findings are exactly opposite those of Ferro and Kassouf, due only to the use of a different sample.

the impact of *Bolsa Escola* participation variable, as estimated in these 10 regressions, are presented in Table 5.

Cash transfers increase mothers' work participation by 3 percentage points overall, according to both methods of estimation. When estimating probits separately for urban and rural areas, there was a similar increase of 3 percentage point for mothers in urban areas; there was no effect of cash transfers on mothers' labor force work in rural areas. For fathers, the effect was also positive and significant, equal to 3 percentage points, for the whole sample and for urban areas, using the propensity score matching method. We did not find an effect for fathers using probit regressions, and neither method found an effect for rural fathers.

These results are important for program sustainability. If parents' labor force work participation were known to decline because of *Bolsa*, that could imply increased dependency on government transfers – an undesirable effect. This could have influential political ramifications. Current critics of the Bolsa program argue that parents will take advantage of the cash transfers to stop working (implying that they are lazy), buy liquor or other things not related to children's needs, and thus the program will be ineffective in reducing poverty in the long run. Our results provide evidence that this argument is no valid; they should thus enhance the program's political feasibility.

Given that parents eligible for the *Bolsa* program are typically adults with relatively little formal education, it is striking that they have been able to increase their labor force work. It is possible that they took advantage of other social programs to increase employment; but since no such programs were not coordinated with *Bolsa*, this seems unlikely. Programs not coordinated with the CCT program should have affected program beneficiaries and non-beneficiaries similarly.

One possible interpretation is that as children's time in the labor force diminishes, they not only spend more time studying but also take on some of their parents' household tasks. This may be the case for urban girls, as 80% of beneficiaries and 76% of non-beneficiaries in the 10-15 year-old group do household chores. Parents with fewer household responsibilities may thus be more likely to enter the labor market.

Conclusions

In this paper we estimated the impact of the Brazilian *Bolsa Escola* conditional cash transfer program on household work decisions and children's school enrollment. The empirical strategy involved producing separate estimates of the children, mothers and fathers' probability to be enrolled in school and to work, conditional on beneficiary status, using a probit estimation and propensity score matching methods. The analysis sample included only program-eligible families; that is, families with children aged 6-15 and monthly per capita incomes below half of a national minimum salary (120 Reais). Finally, our treatment group was made up of children/parents receiving the benefit, while our comparison group was children/parents who had signed up for the program but did not actually received benefits.

We conclude that the Bolsa Escola CCT program had a negative effect on children's labor force employment, with a larger effect for children living in rural areas. The program reduced urban children´s probability of working by 2 to 3 percentage points and rural children's probability by 6 to 9 percentage points. These findings are contrary to preceding research specific to *Bolsa Escola* (although similar to those for Mexico's PROGRESA). We believe that the change in the PNAD survey's

questions about program participation and the longer time relative to program introduction are the reasons for the difference. We also conclude that the *Bolsa Escola* CCT program was effective in increasing children school enrollment – by 2 to 4 percentage points - although the percentage of children enrolled in school was already very high.

The effect of cash transfers on parents' work decisions has not been previously investigated for Brazil. We find that the program increased mothers' and fathers' probability of participation in labor force work. Urban mothers and urban fathers increased their probabilities of working in the labor force by 3 percentage points.

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Table 1. Means of Children's Variables – Rural, Urban, and Total Sample – by Control and Treatment Groups, using the Program Beneficiary plus Signed-up Sample

	Rural			Urban			Total		
	Control	**Treatment**		**Control**	**Treatment**		**Control**	**Treatment**	
Dependent Variables									
Work participation	0.220	0.262		0.058	0.064	*	0.096	0.134	
School enrollment	0.950	0.986		0.969	0.990		0.965	0.981	
Covariates									
Child									
Age	9.708	11.373		9.710	11.204		9.708	11.373	
White (1)	0.315	0.271		0.322	0.290		0.315	0.271	
Male	0.511	0.521	*	0.513	0.510	*	0.511	0.521	*
Fathers									
Age	41.615	43.108		38.454	40.725		41.615	43.108	
Schooling	2.065	1.711		4.132	3.576		2.065	1.711	
Mothers									
Age difference	5.294	4.692	*	3.889	4.202	*	5.294	4.692	*
Schooling	2.789	2.449		4.449	3.966		2.789	2.449	
Number of siblings									
ages 0-5	0.622	0.527		0.616	0.052		0.622	0.527	
ages 6-10, males	0.393	0.416	*	0.391	0.393	*	0.393	0.416	*
ages 11-15, males	0.410	0.464	*	0.303	0.387		0.410	0.464	*
ages 16+, males	0.350	0.534		0.221	0.325		0.350	0.534	
ages 6-10, females	0.405	0.427	*	0.344	0.372	*	0.405	0.427	*
ages 11-15, females	0.393	0.395	*	0.284	0.371		0.393	0.395	*
ages 16+, females	0.233	0.271	*	0.154	0.227		0.233	0.271	*
Geographic region (3)									
North	0.021	0.029	*	0.141	0.154	*	0.021	0.029	*
Northeast	0.630	0.716		0.477	0.497	*	0.630	0.716	
South	0.113	0.079		0.114	0.082		0.113	0.079	
Southeast	0.158	0.123		0.200	0.170		0.158	0.123	
Mid-west	0.078	0.052		0.068	0.097		0.078	0.052	
Per capita family income (2)	52.542	46.834		63.362	60.233		52.542	46.834	
Number of observations	1001	3590		3229	6614		4230	10204	

* difference is not statistically significant

(1) Non-white includes black, mulatto, yellow and indigenous.

(2) Without CCT transfers

Table 2. Matched Sample Means of Children's Variables – Rural, Urban, and Total Sample – by Control and Treatment Groups

	Rural			Urban			Total		
	Control	**Treatment**		**Control**	**Treatment**		**Control**	**Treatment**	
Dependent Variables									
Work participation	0.348	0.261		0.090	0.064		0.166	0.134	
School enrollment	0.956	0.986		0.966	0.990		0.961	0.988	
Covariates									
Child									
Age	11.521	11.374	*	11.269	11.206	*	11.364	11.265	
White (1)	0.288	0.271	*	0.294	0.290	*	0.295	0.283	*
Male	0.503	0.521	*	0.504	0.510	*	0.509	0.514	*
Fathers									
Age	43.176	43.118	*	40.733	40.789	*	41.550	41.614	*
Schooling	1.785	1.712	*	3.718	3.563		3.063	2.908	
Mothers									
Age difference	4.846	4.704	*	4.163	4.203	*	4.365	4.380	*
Schooling	2.567	2.452	*	4.112	3.963		3.583	3.428	
Number of siblings									
ages 0-5	0.560	0.530	*	0.509	0.520	*	0.511	0.523	*
ages 6-10, males	0.593	0.597	*	0.591	0.591	*	0.584	0.593	*
ages 11-15, males	0.794	0.800	*	0.687	0.700	*	0.729	0.735	*
ages 16+, males	0.469	0.533		0.317	0.327	*	0.381	0.400	*
ages 6-10, females	0.627	0.614	*	0.567	0.573	*	0.595	0.588	*
ages 11-15, females	0.734	0.686		0.660	0.660	*	0.688	0.669	*
ages 16+, females	0.278	0.271	*	0.227	0.230	*	0.243	0.244	*
Geographic region (3)									
North	0.024	0.029	*	0.155	0.153	*	0.110	0.109	*
Northeast	0.680	0.715		0.490	0.496	*	0.555	0.573	*
South	0.097	0.080	*	0.085	0.082	*	0.083	0.081	*
Mid-west	0.056	0.052	*	0.092	0.098	*	0.091	0.082	*
Rural							0.323	0.354	
Family Income Variables									
Per capita family income (2)	48.062	46.960	*	60.310	60.041	*	56.810	55.410	

* difference is not statistically significant

(1) Non-white includes black, mulatto, yellow and indigenous.

(2) Without CCT transfers

Table 3. Means of Parents' Variables – Rural, Urban and Total Sample – by Control and Treatment Groups, using the Program Beneficiary plus Signed-up Sample

	Rural			Urban			Total		
	Control	Treatment		Control	Treatment		Control	Treatment	
Mothers									
Dependent Variable									
Work Participation	0.681	0.722	*	0.379	0.422		0.447	0.525	
Covariates									
Schooling	3.067	2.569		4.672	4.080		4.291	3.557	
Age	35.786	38.442		34.538	36.618		34.882	37.244	
White (1)	0.339	0.284	*	0.320	0.276		0.319	0.280	
Head of the family	0.018	0.015	*	0.075	0.061	*	0.060	0.046	
Fathers									
Dependent Variable									
Work Participation	0.959	0.956	*	0.803	0.815	*	0.838	0.863	
Covariates									
Schooling	2.294	1.786		4.219	3.628		3.757	2.998	
Age	41.222	43.006		38.264	40.731		38.928	41.537	
White (1)	0.318	0.379	*	0.328	0.285		0.321	0.284	
Head of the family	0.982	0.985	*	0.925	0.939		0.940	0.954	
Parents									
Covariates									
Number of kids									
ages 0-5	0.623	0.517		0.634	0.527		0.641	0.519	
ages 6-10, males	0.596	0.526	*	0.593	0.529		0.611	0.520	
ages 11-15, males	0.445	0.663		0.398	0.582		0.403	0.614	
ages 16+, males	0.306	0.517		0.215	0.322		0.243	0.388	
ages 6-10, females	0.614	0.527	*	0.571	0.497		0.570	0.511	
ages 11-15, females	0.382	0.576		0.354	0.554		0.381	0.555	
ages 16+, females	0.218	0.268	*	0.162	0.231		0.171	0.245	
Geographic region (2)									
North	0.024	0.029	*	0.126	0.145		0.104	0.105	*
Northeast	0.602	0.705		0.497	0.511		0.518	0.579	
South	0.118	0.090	*	0.109	0.082		0.113	0.083	
Southeast	0.182	0.120		0.202	0.167		0.197	0.151	
Mid-west	0.075	0.057	*	0.067	0.086		0.068	0.082	
Family Income Variables									
Per capita family income (2)	55.401	50.443		65.005	62.378		62.852	58.260	
Number of observations	510	2031		1824	3837		2334	5868	

* difference is not statistically significant

(1) Non-white includes black, mulatto, yellow and indigenous.

(2) without CCT

Table 4. Matched Sample Means of Parents' Variables – Rural, Urban, and Total Sample – by Control and Treatment Groups

	Rural			Urban			Total		
	Control	**Treatment**		**Control**	**Treatment**		**Control**	**Treatment**	
Mothers									
Dependent Variable									
Work Participation	0.715	0.721	*	0.401	0.420	*	0.496	0.524	*
Covariates									
Schooling	2.651	2.587	*	4.086	4.074	*	3.522	3.557	*
Age	38.518	38.396	*	36.669	36.683	*	37.304	37.278	*
White (1)	0.282	0.284	*	0.287	0.278	*	0.295	0.280	*
Head of the family	0.023	0.016	*	0.065	0.061	*	0.046	0.046	*
Fathers									
Dependent Variable									
Work Participation	0.954	0.956	*	0.783	0.815		0.833	0.864	
Covariates									
Schooling	1.834	1.802	*	3.628	3.630	*	2.993	2.998	*
Age	43.216	43.014	*	40.957	40.782	*	41.732	41.554	*
White (1)	0.285	0.279	*	0.296	0.287	*	0.287	0.284	*
Head of the family	0.980	0.984	*	0.934	0.938	*	0.951	0.954	*
Parents									
Covariates									
Number of kids									
ages 0-5	0.510	0.518	*	0.510	0.519	*	0.496	0.519	*
ages 6-10, males	0.510	0.517	*	0.505	0.521	*	0.517	0.520	*
ages 11-15, males	0.675	0.667	*	0.589	0.587	*	0.611	0.615	*
ages 16+, males	0.493	0.515	*	0.334	0.321	*	0.385	0.388	*
ages 6-10, females	0.584	0.533	*	0.489	0.499	*	0.523	0.511	*
ages 11-15, females	0.596	0.563	*	0.556	0.551	*	0.568	0.555	*
ages 16+, females	0.256	0.267	*	0.243	0.234	*	0.247	0.246	*
Geographic region (2)									
North	0.028	0.030	*	0.147	0.145	*	0.109	0.105	*
Northeast	0.697	0.702	*	0.499	0.514	*	0.561	0.579	*
South	0.811	0.879	*	0.084	0.081	*	0.087	0.083	*
Mid-west	0.068	0.057	*	0.091	0.096	*	0.085	0.082	*
Rural							0.335	0.346	*
Family Income Variables									
Per capita family income(2)	51.467	50.470	*	62.631	62.398	*	58.571	58.274	*

* difference is not statistically significant

(1) Non-white includes black, mulatto, yellow and indigenous.

(2) without CCT

Table 5. Impacts of Brazil's *Bolsa Escola* CCT Program on Children's Work Participation and School Enrollment and Mother / Father Work Participation

Results are the marginal effects of the CCT variable using both probit and propensity score matching methods.

		Impact of CCT on Work Participation			
Equation		**Probit Marginal Effect**	**t-stat**	**ATT (matching)**	**t-stat**
Children		-0.02818	-5.29***	-0.03173	-4.40***
Children	Urban	-0.01828	-4.15***	-0.02528	-3.84***
	Rural	-0.05877	-3.44***	-0.08701	-4.42***
Mothers		0.02581	1.98**	0.02811	1.89*
Mothers	Urban	0.02729	1.88*	0.01910	1.14
	Rural	0.01352	0.60	0.00601	0.22
Fathers		0.00750	0.93	0.03028	2.78***
Fathers	Urban	0.01275	1.12	0.03203	2.35**
	Rural	-0.00163	-0.18	0.00117	0.10
		Impact of CCT on School Enrollment			
		Probit Marginal Effect	**t-stat**	**ATT (matching)**	**t-stat**
Children		0.02545	9.63***	0.02733	6.81***
Children	Urban	0.02056	7.28***	0.02374	5.48***
	Rural	0.03904	6.58***	0.02947	3.14***

*** significant at 1% level

** significant at 5% level

* significant at 10% level