

Silveira, Fernando Gaiger; van Horn, Ross; Campolina, Bernardo

Working Paper

A substitute for substitution: Bolsa Família's effects on the combination of work and school for children and adolescents aged 10 - 18

Working Paper, No. 121

Provided in Cooperation with:

International Policy Centre for Inclusive Growth (IPC-IG)

Suggested Citation: Silveira, Fernando Gaiger; van Horn, Ross; Campolina, Bernardo (2013) : A substitute for substitution: Bolsa Família's effects on the combination of work and school for children and adolescents aged 10 - 18, Working Paper, No. 121, International Policy Centre for Inclusive Growth (IPC-IG), Brasilia

This Version is available at:

<https://hdl.handle.net/10419/119806>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

A SUBSTITUTE FOR SUBSTITUTION:

BOLSA FAMÍLIA'S EFFECTS ON THE COMBINATION OF WORK AND SCHOOL FOR CHILDREN AND ADOLESCENTS AGED 10-18

Working Paper number 121 December, 2013

Fernando Gaiger Silveira

Institute for Applied Economic Research (IPEA)

Ross van Horn

Lyndon B. Johnson School of Public Affairs, University of Texas at Austin

Bernardo Campolina

CEDEPLAR/UFMG

Copyright© 2013
International Policy Centre for Inclusive Growth
United Nations Development Programme

International Policy Centre for Inclusive Growth (IPC - IG)
United Nations Development Programme

SBS, Quadra 1, Bloco J, Ed. BNDES, 13º andar
70076-900 Brasília, DF - Brazil
Telephone: +55 61 21055000

E-mail: ipc@ipc-undp.org ▪ URL: www.ipc-undp.org

The International Policy Centre for Inclusive Growth is jointly supported by the United Nations Development Programme and the Government of Brazil.

Rights and Permissions

All rights reserved.

The text and data in this publication may be reproduced as long as the source is cited. Reproductions for commercial purposes are forbidden.

The International Policy Centre for Inclusive Growth disseminates the findings of its work in progress to encourage the exchange of ideas about development issues. The papers are signed by the authors and should be cited accordingly. The findings, interpretations, and conclusions that they express are those of the authors and not necessarily those of the United Nations Development Programme or the Government of Brazil.

Working Papers are available online at www.ipc-undp.org and subscriptions can be requested by email to ipc@ipc-undp.org

Print ISSN: 1812-108X

A SUBSTITUTE FOR SUBSTITUTION:

BOLSA FAMÍLIA'S EFFECTS ON THE COMBINATION OF WORK AND SCHOOL FOR CHILDREN AND ADOLESCENTS AGED 10-18

Fernando Gaiger Silveira; Ross van Horn and Bernardo Campolina*

1 INTRODUCTION

In the evaluation of conditional or unconditional cash transfer programmes, research that examines their effects on children's and adolescents' school performance and participation in the labour market figures prominently. The programme effect is important because such programmes are designed with a view to fighting the so-called 'poverty trap'. In general terms, prior analyses have claimed that insufficient household income, due largely to low levels of human capital of members of economically active age — especially parents — requires hourly labour supplementation by children and adolescents. As a result, this pressure for children and adolescents to enter the labour market results in less time available for school activities and, ultimately, in school drop-out. In a cyclical fashion, the substitution of work¹ for school reproduces the reality experienced by low-income parents, derived from low schooling levels, for future generations.

For this reason, most evaluations of cash transfer programmes focus on measuring impacts on school indicators — attendance, drop-out, repetition and progression — and on child labour. In addition, evaluations have addressed the programme's effects on labour supply, in general, as well as on health indicators. In regards to the former, the underlying issue is to what extent cash transfers (i.e. the amount transferred) discourage the work of economically active household members. The latter relates to the potential for improved human capital, stemming from the spill-over of better health conditions and education indicators.

This study seeks to examine specifically the extent to which the benefit has affected the allocation of time between school and work by children and adolescents. The study takes into account that, in Brazil, it is possible and likely to combine study and work, since the vast majority of schools operate in shifts. We return to this point in our analysis.

* Fernando Gaiger Silveira, Institute for Applied Economic Research (IPEA); Ross van Horn, Lyndon B. Johnson School of Public Affairs, University of Texas at Austin; and Bernardo Campolina, CEDEPLAR/UFMG.

On the one hand, it can be argued that the programme has beneficial effects on children's time allocation if it increases school attendance and time devoted to studying and reduces working time. The programme can also be seen as having beneficial effects if it hinders or prevents an increase in the number of working hours, given the strictness in the time devoted to school. In the former case, it is expected that one will observe, simultaneously, an increase in the time devoted to studying and a decline in labour market participation. In the latter, one can observe greater dedication to school without, however, resulting in a decline in labour market participation. Some studies that have reviewed the programme effects on schooling and labour market decisions show a positive effect on school attendance, as well as a decrease in labour market participation, while others show only increased school attendance, without any reduced labour market participation. Taking a middle ground, the results from this paper show that the programme has positive effects on school attendance, but instead of having a negative or insignificant effect on labour market participation, the programme effect simultaneously increases the likelihood of working. We discuss these results in five sections.

The second section features the rationale of Bolsa Família and its characteristics that are important for programme evaluation. The third section surveys existing evaluation studies on cash transfer programmes, including Bolsa Família, focusing on the relationship between work and school among children and adolescents. Section four presents the database, its potential, the problems that arise in the estimation of programme effects, and the empirical modelling employed. It also presents descriptive statistics on the participation of children and adolescents in the labour market according to age, place of residence (urban/rural) and gender. This will show that the programme, according to its rationale, takes effect in the school-to-work transition, which occurs mainly between 14 and 15 years of age, with greater emphasis at the age of 17. The fifth section presents the results of estimates of programme impacts on the allocation of time for work and school among children and adolescents aged 10–18 and for an age group of 15–17. Estimates were developed with the use of the multinomial logit and bivariate probit models, both using inverse propensity weighting (IPW) and trimming. Finally, the sixth section presents the main findings of the research and final considerations.

2 THE BOLSA FAMÍLIA PROGRAMME

2.1 RATIONALE AND FOUNDATION

Implemented in underdeveloped countries in Latin America in the 1990s, cash transfer programmes targeting poor families, conditional or unconditional to certain provisions, hold the assumption that traditional social protection schemes do not reach this population effectively and efficiently. In traditional social protection schemes most benefits are targeted at segments with formal links to the labour market, among which those for people who fulfilled public retirement requirements are known for a high level of leakages to the non-poor, and for having low quality and low coverage of universal programmes. Since the poor population is overrepresented among children, cash transfers reach the working-age population or, in other words, 'young' families. It is also characteristic for most of these programmes to be associated with conditionalities which are simply provisions regarding investment in human capital and, in some cases, productive inclusion.

Thus, given their focused nature, most programmes aim to alleviate extreme poverty, on the one hand, and, on the other, to increase future income possibilities, by improving children's education or better equipping parents for the labour market. The increased income for poor families is derived from the benefit and is hoped to result in greater investment in human capital, the so-called 'income effect'. In other words, targeted cash transfer programmes with redistributive objectives result in changes in household expenditure and composition, as well as in greater investment in human capital arising from the income effect.

It should also be noted that credit restrictions for poor families are a determinant for underinvestment in education, with the work of children and adolescents serving as a buffer for income fluctuations. One must remember, as pointed out by the Avaliação do Impacto do Bolsa Família (AIBF I — Bolsa Família Impact Assessment), *"the income elasticity of investment in human capital is not always sufficient to cause significant changes in inter-generational poverty"* (Cedeplar, 2008: 45).

It is clear, then, based on the above discussion that even with no conditionalities the programme (i.e. the transfer) still serves as a 'buffer' to income volatility in the poorest segments, which affects consumption and sometimes leads to the use of child labour in times of shortage.

It is argued that, when a programme is conditioned to minimum school attendance by children, there is further increase in human capital investment, since one can observe a situation of substitution, where part of the time devoted to work (in the broad sense — i.e. including unpaid work and household chores) becomes devoted to school. In other words, conditionalities seek to correct adverse incentives faced by families when investing in human capital, especially regarding the decision of whether or not to send their children to school, whether to focus on potential future gains or on the earnings deriving from child labour, considering that, sometimes, the income effect is insufficient to change the allocation of children's and adolescents' time towards school instead of work.

Conditionalities are closely related to the substitution effect of school for work, originating in consumer economics and applied to family economics, based on family production functions, both budget constraint and current consumption income expected from children and investment in human capital.

Targeted cash transfers entail educational effects, given that income volatility and associated credit restrictions for the poorest segments — i.e. credit market flaws — bring about the relationship between investment in education and current income, with the expansion of investment in education derived from income growth. Thus, there is a clear income effect on investment in education, leading to the question of whether the inclusion of conditionalities is necessary — or, rather, if such inclusion would generate a substitution effect between present consumption and schooling. In fact, for the substitution effect to occur, three other conditions or behaviours should be observed, which would be altered by conditionalities, enhancing the educational gain of targeted cash transfer programmes. They are: the short-sightedness of poor families, as regards to the gains from education, the use of heavier future discount rates by families, and the fact that family decisions are, in fact, made by key agents which, associated with the credit restrictions faced by poor households, constitute the economic basis for the application of conditionalities. That is, for a conditionality to be justified, another imperfection is required: income transfers 'relax' credit restrictions, but not such conditions.

The agency dilemma, besides supporting the conditionality, is one of the reasons that favour the granting of benefits to mothers. It is a consensus that mothers favour their children's education more than fathers do, even more so as regards their daughters.

From its very creation, Bolsa Família made clear the dual purpose of poverty alleviation and fighting low investment in education — the foundations of the intergenerational poverty cycle. In the explanatory memorandum of the provisional measure that created Bolsa Família, the association between these two goals emerges. It appears, although not explicitly, under the programme's objectives: *"The Bolsa Família Programme aims to fight hunger and poverty, enabling beneficiary families to face their situation of vulnerability... The programme also aims to contribute to the emancipation of these families, creating social inclusion opportunities, i.e. providing the means to enable them to change the situation they find themselves in"* (Brazil, 2003).

The association becomes more explicit when it addresses the importance of the programme with respect to the multidimensionality of the causes of poverty: "... poverty is a multidimensional and complex phenomenon, and one cannot fight it in a lasting manner with income transfers alone — transfers constitute a means of access to improved living conditions, and associated conditionalities encourage access to universal rights" (Ibid.). It continues, establishing a relationship between conditionalities and emancipation (i.e. showing that investments in education today will enable higher income levels in the future): "Indeed, the Bolsa Família programme, besides carrying out direct cash transfers, includes mechanisms that introduce the possibility of sustained emancipation of beneficiaries, by means of the so-called conditionalities" (Ibid.).

After addressing each of the benefits, it presents the conditionalities as investment in family capacities providing sustainability to the social inclusion process: "In order to receive benefits, families must comply with the so-called conditionalities, depending on the type of benefit and age profile of household members, aiming at facilitating the overcoming of poverty. Making benefits conditional to actual 'investments' by families in their capacities is vital to ensuring the sustainability of the social inclusion process" (Ibid.).

Thus, the evaluation proposed in this study, to measure the impact of Bolsa Família in the way school and work are combined, examines a central aspect in the rationale of conditional cash transfer programmes: that increased rates of school attendance are associated with a decline in child labour by reducing the opportunity costs of schooling. As made clear, not only is the focus of time allocations between school and work appropriate from an empirical standpoint, the goal of reducing work and increasing school attendance is contained in the programme's official originating document, which states that conditionalities seek to provide sustainability to the process of empowering families, by investing in their educational capacities.

2.2 CHARACTERISTICS AND IMPLICATIONS FOR EVALUATION

This subsection presents the characteristics of Bolsa Família that have implications in the evaluation of effects. First, programme implementation was not based on an experimental design, which would allow for the use of evaluation techniques with more robust results, as they correct for selection-related problems. The federal government took the decision not to implement the programme in an experimental fashion on the basis of ethical premises, as contained in technical reports of the two programme evaluations carried out under the agreement between the Brazilian government and the World Bank (CEDEPLAR/UFMG and

SAGI/MDS, 2007; and SAGI/MDS, 2012). This decision seems to be a consequence of the association of the goal of reaching the potential audience as soon as possible and two central aspects present in the programme's institutional design: registration of beneficiaries and the granting of benefits. To that effect, the participation of municipalities was essential, as they play a crucial role in programme operation. Therefore, in the context of this design, any future efforts to improve data collection, upgrade administrative records and consolidate the programme were believed to be challenging if the programme were run on an experimental basis; even though, later, some municipalities had to go through with it on an experimental basis.

It is also important to note here that Bolsa Família was established as a substitute for existing cash transfer programmes. Its introduction merged all existing programmes into a single national programme. The implementation of the previous programmes — Bolsa Escola (School Allowance), Bolsa Alimentação (Food Allowance), Cartão Alimentação (Food Card), Auxílio Gás² (Cooking Gas Allowance) — did not include a focus on experimental design during their creation either. Thus, the merger to a new, single programme made the task of developing an experimental design for Bolsa Família even more complex. It is evident, given the challenges mentioned above, that it is very difficult to isolate the effects of Bolsa Família from the remaining impacts of the benefits granted by its predecessor programmes. Also, it is not possible to address the effects deriving from the time of concession of Bolsa Família benefits (i.e. programme effects are evaluated based on data of a given moment in time). One cannot, however, consider the so-called 'dosage effect' derived from the time households have received benefits.

Bolsa Família was created as a cash transfer programme, with one benefit for households in extreme poverty and other benefits related to children in poor families. That is, the programme uses two income levels to grant benefits — currently, R\$70 and R\$140 monthly, per capita. The basic benefit, targeting extreme poverty, defines eligibility by insufficient income alone, with no links to conditionalities or to any type of family composition, such as the presence of children.

Recently, an extra benefit was created, also targeting households in extreme poverty. It provides all households unable to leave extreme poverty with current benefits of the exact value of this income deficit. With this extra benefit, the programme seeks to eliminate extreme poverty in the country or, as rightly pointed out by Osório, Soares and Souza (2011), to reduce it to a marginal proportion of the population.

The other benefits are intended for poor households defined as those with per capita monthly income below R\$140 and with children aged 7–15 and adolescents aged 16–17, as well as children under 6 years of age, pregnant women and nursing mothers. The benefits associated with children and adolescents differ in the amounts and in the maximum number of benefits. The benefit targeted at 16–17-year-olds was created at a later stage. Both are conditional on minimum school attendance of 85 per cent for 7–15-year-olds and 75 per cent for 16–17-year-olds.

Administrative registration into the programme takes place through the Single Registry (Cadastro Único), a joint effort of the federal government (Ministry of Social Development and Caixa Econômica Federal, the Federal Savings Bank) and municipalities, with the cooperation of states. The registration of potential beneficiaries is carried out by municipalities, using the estimates of the target population and of the registry as parameters; financial support comes from the federal government, through the payment of a certain amount per registered household, weighted by indicators of quality and efficiency in household registration and the

monitoring of conditionalities. Certainly, there are major differences among municipalities in managing registration and monitoring, depending on their administrative capacity and on the relevance of Bolsa Família for each municipality. Based on the 2010 Sample Census, which has municipal representation, it becomes possible to incorporate variables related to the municipal situation in the evaluation modelling, especially the quality of public administration.

Bolsa Família covers a large population and has significant expenditures. Therefore, it places greater emphasis on the inclusion of eligible groups that are not yet in the programme and less on the search for and exclusion of beneficiaries whose income exceeds eligibility criteria. In effect, Bolsa Família beneficiaries account for a sizeable share of the population. Currently, it has around 14 million beneficiary households in a population of around 57 million permanent private households — thus nearly a quarter of the Brazilian population. These numbers are much higher than the proportions of poor and extremely poor households derived from the estimates resulting from the application of Bolsa Família eligibility values to data from the National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílios — PNADs) and the Census, both undertaken by IBGE.

Considering Census data and disregarding the estimated income transfers from Bolsa Família, the programme's target population is estimated at 9 million households. This difference is because the programme addresses poverty from a temporal perspective, considering poor those households which have been below the income eligibility threshold over a period of time: for two years. That is, the programme considers income volatility, one of the hallmarks of poverty, as it reflects poor market integration, especially in the labour market. It is noteworthy that, after its consolidation in the 2006–2007 biennium, the programme has increased its target population by nearly 2 million households, since that very period witnessed a relatively significant decrease in poverty and inequality. It is, therefore, clear that Bolsa Família does not follow strictly the dictates of targeted cash transfer programmes. When this is associated with inclusion and exclusion errors, the potential of evaluation becomes evident, as the possibilities emerge for the building of treatment groups based on the heterogeneity of beneficiary households and the presence of a large contingent of poor families that are not beneficiaries.

Programme inflows and outflows constitute another important aspect to be considered, reflecting, to some extent, the programme's spill-over effects. Every year, around 600,000 families leave and, therefore, enter the programme (*Folha de São Paulo*, 31 March 2013). On 19 October 2010, the MDS announced "*studies show... that over 2.2 million households left the programme because they had improved their income.*" In May 2013, in an article in *O Globo*, the MDS highlighted the positive aspect that 1.7 million households spontaneously left the programme, as they exceeded the income eligibility criterion.

3 RESULTS OF IMPACT EVALUATION STUDIES ON CONDITIONAL CASH TRANSFER PROGRAMMES

This section presents the main impact evaluation studies and surveys on the effects of conditional cash transfer programmes in the allocation of time spent between work and school among children and adolescents. The main goal is to show the variety of results, highlighting the disparities of effects of different programmes on labour activities. This section is divided into two parts: the first covers international studies, and the second addresses national studies on the topic.

3.1 INTERNATIONAL

Numerous impact evaluation studies on conditional cash transfer programmes focus on impacts related to schooling and work for children and adolescents. Studies that cover programme effects on child labour do so as part of the family decision to work. One can divide relevant studies into three groups: a) those addressing the effects on children's and adolescents' education and labour separately; b) those addressing family labour supply, including children; and c) those addressing the effects on children's and adolescents' education and labour jointly.

The study by Ravallion and Wood (2000) for the Food for Education (FFE)³ programme in Bangladesh concluded that the programme has positive effects on school attendance and child labour, with growth in the former and a reduction in the latter. On the other hand, they concluded that the increased time spent in school is greater than the reduction in time spent at work, indicating that beneficiaries' children seek to adjust the time they allocate to school and work so as to preserve income without exceeding the income eligibility criterion, and in such a way as to comply with the conditionality of a minimum of 85 per cent school attendance. As mentioned by the authors, such a solution is only possible when schools operate in shifts, which is the case of basic education in Brazil. The authors found significant effects with an increased likelihood of attending school and reduced participation in the labour force.

Studies on the effects of Progresá, in Mexico, the Red de Protección Social (RPS) in Nicaragua, and Bono de Desarrollo Humano, in Ecuador, rely on the fact that these programmes were designed so as to allow experimental studies. In the beginning, benefits were granted based on an experimental design and, at a later stage, based on their evaluations, they were scaled up with the adjustments suggested in such evaluations.

The study by Maluccio and Flores (2005) on the impact of the Nicaraguan government's RPS points to significant gains in school enrolment and a reduction in work among children aged 7–13. The programme incorporated the experimental design in its implementation, with repeated investigation rounds on the standard of living of the beneficiary population and a control group. The double difference method was used, with surveys conducted in 2000, 2001 and 2002. According to authors' estimates, the programme reduces the likelihood of children participating in the labour market by 5.6 percentage points and increases, by 12.8 percentage points, the share of children enrolled in schools. In Nicaragua, the RPS reduced child labour by between 3 and 5 percentage points in the population aged 7–13. Furthermore, the share of students who only study increased significantly, from 59 per cent to 84 per cent (Maluccio and Flores, 2005).

Parker and Skoufias (2001) evaluated the impacts of Progresá on the time allocation of children and adolescents aged 8–17, based on a survey conducted specifically for the evaluation, with four rounds developed in the late 1990s. The double difference method was used, taking into account the panel nature of the household survey carried out. They conclude that, between 1997 and 1999 the programme increased school attendance by 1.8 and 5.8 percentage points among boys aged 8–11 and 12–17, respectively. Among girls, no significant effects on school attendance were observed for those aged 8–11, whereas an increase of 9.5 percentage points was observed for those aged 12–17. In the case of workforce participation, the study showed a decline of 1.1 and 4.7 percentage points among boys in both age groups, respectively, and among girls, the programme's effects on workforce participation were

observed only in the 12–17 age group, showing a reduction of 2.3 percentage points. The authors also concluded that Progresas's impacts are mainly an increase in school enrolment and a reduction in the number of children participating in the labour market, without necessarily reducing the working hours of those children attending school.

In the case of Ecuador, Edmonds and Schady (2008) point out that the programme Bono de Desarrollo Humano has the effect of increasing school attendance among children at a vulnerable stage, during the transition from school to work. The authors focus on programme impacts among children at age cohorts and educational levels when school-to-work migration is observed: children around 12 years of age and those in transition to secondary school. They concluded that the programme maintains enrolment levels and causes a decline in paid work among children more likely to make the school-to-work transition, and that such impacts are more significant among girls and rural residents.

In another evaluation of the Bono de Desarrollo Humano (Schady and Araujo, 2008), the authors focus the analysis on the effects on enrolment rates, evaluating the effects of conditionalities with a model similar to that already used: inverse propensity weighting and sample trimming. They concluded that lottery winners in the selection for benefits have between a 3.2 and 4.0 percentage points greater likelihood of being enrolled in school, and if they have become programme beneficiaries, the probability increases by about 10 percentage points, using the predicted probability of winning/losing, estimated in the first stage.⁴

The study by Attanasio, Fitzsimmons and Gomes (2006) evaluated, among other impacts, the effects of the Colombian programme Familias en Acción on school enrolment and work of children between 8 and 17 years of age, employing in both cases the methods of propensity score matching, and differences in differences. They estimate a growth of 5–7 percentage points in school attendance rates of 14–17-year-olds. For younger children, aged 8–13, the increase is between 1.5 and 2.5 percentage points. As for the effects on the participation of children and adolescents in income-generating work, the estimates indicate a decrease of 1 percentage point among children aged between 10 and 13 living in cities, without significant results for the other groups of children. On the other hand, they observed a very marked decline in participation in household chores. And, as for the estimates of time devoted to school, income-generating activities and household chores, there is an increase in time devoted to school and a decrease in time spent on housework, with no conclusive results regarding time dedicated to work.

Another programme evaluated regarding its effects on school and work is the Superémonos of Costa Rica. It used propensity score matching, since the programme has not been implemented on an experimental basis. Duryea and Morrison (2004) estimate that children aged 12–15 who receive Superémonos benefits are more likely to be enrolled at school than if they had not received the benefit, with increases of 5.0 and 8.3 percentage points in attendance in 2001 and 2002, respectively. The authors found no significant coefficients for labour market participation.

Findings from Glewee and Olinto (2004) produce similar results, whereby their analysis of the programme Asignación Familiar (PRAF)⁵ in Honduras has positive effects on school attendance and no findings with regards to labour market participation. To a large extent, these findings are shown through the non-significance of the coefficients. They indicate a 1–2 percentage point growth in the enrolment of children between 6 and 13 years of age, as well as positive impacts in other education indicators such as a reduction of truancy by 2–3 percentage points and an increase in school attendance of 0.8 days/month.

3.2 NATIONAL

In Brazil, several studies on the effects of conditional cash transfers on children's and adolescents' time allocation address the Bolsa Escola (School Allowance) programme. These studies used the best evaluation techniques at the time, adding to the boom in studies on cash transfer programmes conducted in the late 1990s, especially those relating to Progresá. The work by Cardoso and Souza (2003), Bourguignon, Ferreira and Leite (2003) and Ferro, Kassouf and Levison (2010) fall into this group, all of which concluded that there were positive effects on school attendance and, except for the first, showed a reduction in children's and adolescents' participation in the labour market and in the time devoted to work.

Let us focus on those that address programme impact on schooling and child labour jointly. In this case, the number of studies is reduced, and some of them have their results weakened, since their methodological choices fail to address the recurrent selection bias.

Bourguignon, Ferreira and Leite (2003) carry out an *ex ante* impact evaluation of Bolsa Escola, using the 1999 PNAD. They develop their estimates, considering model design and proposing alternatives with potentially greater positive effects, based on a behavioural model of poor families. The authors concluded that 40 per cent of children not enrolled in school could change their status and enrol in school, with over one third choosing to study and work. Considering only poor households, they estimate that 60 per cent of children who did not go to school would go to school, and two thirds of them would study and work.

Cardoso and Souza (2004) evaluate the impact of cash transfer programmes by focusing on children's participation in the labour market and its interconnection with school attendance. The authors assessed the effects of the programme based on the 2000 Census and by means of propensity score matching, and concluded that Bolsa Escola has a significant impact, around 3 percentage points, on the enrolment of children aged 10–15. On the other hand, they find no effect on the participation of these children in the labour market. They suggest that the small amount transferred does not provide the necessary incentives for families to give up the income derived from their children's work. Thus, they suggest that potential beneficiary households are likely to combine school and work, showing that the transfer value may not be effective as a policy to reduce child labour, notwithstanding the effects on school attendance. On examination of the effects on each of the combinations of school and work, the authors concluded that there were fewer children who only work, indicating in turn an increase in the likelihood of combining work and school. Also, they suggested that the increase in school attendance stems from school enrolment of those children who only worked and those who neither worked nor studied.

Conversely, the evaluation of Ferro, Kassouf and Levinson (2010) on the effects of Bolsa Escola on school attendance and children's and adolescents' participation in the labour market show effectiveness in both the first and second indicators. Indeed, based on the 2003 PNAD and employing propensity score matching techniques, the authors concluded that the programme increases school enrolment rates of children aged 8–15 by 2.7 percentage points, and reduces the participation of such children in the labour market by 3.2 percentage points.

The Bolsa Família Impact Evaluation, commissioned by the MDS and supported by the World Bank, was of great importance, given the quality of the analysis and expertise of the research institutions in charge of the studies. They showed that some effects are difficult to

measure, and other results are dubious, but it can be stated that the programme improves the living conditions of poor families, with positive effects on children's education and without any disincentives to labour supply by household members that are legally and physically fit to work.

The first evaluation developed by the Centre for Development and Regional Planning (CEDEPLAR) of the Federal University of Minas Gerais concluded that the programme increases school attendance rates of children and adolescents aged 7–14 by 3.6 percentage points, as compared to non-beneficiaries, but shows lower attendance than among beneficiaries of preceding programmes. The results about the probabilities of each of the four possible combinations of study and work show, on the one hand, that the comparison of the proportion of girls and boys who only study against those who only work, work and study, and neither work nor study indicate positive differences, suggesting a greater allocation of time for school among Bolsa Família beneficiaries. On the other hand, the comparison of the proportion of girls and boys who work against those who only study, or neither work nor study, indicate a higher likelihood of labour market participation among Bolsa Família beneficiaries.

The second round of evaluation of Bolsa Família, developed by the International Food Policy Research Institute (IFPRI), used the double difference technique and inverse propensity weighting, given that the sample survey is not randomised. It should be noted that the paper concludes that there are socially positive effects both in schooling and child labour. It should be highlighted that effects on school attendance were restricted to the northeast region, showing an extremely significant impact: a 19.9 percentage point increase. Unlike AIBF I (CEDEPLAR, 2008), the 5–17 age bracket was considered (and 6 for education data), with more significant results in the decline of child labour.

They disaggregated the analysis by age and gender, as the stylised facts clearly show this segmentation in access to the labour market. Thus, programme effects on the allocation of time to school and work should focus on children over 10 years of age, especially those aged 15–17. There is very little room for increases in enrolment and decreases in labour market participation among children under 11. Study results show that the decrease in the probability of children and adolescents aged 5–17 participating in the labour market due to the programme is 1.9 percentage points, and is more marked among boys, at 3.0 percentage points. Additionally, the programme delays entry into the labour market, on average, by 0.8 years.

Three studies were selected that show the effects of cash transfer programmes on the allocation of time for school and work of children and adolescents by using the (PNADs) of 2004 and 2006. It should be noted that studies concentrating on the effects on education indicators are much more numerous than those aimed at measuring the impact on poverty and inequality, and on adult labour supply.

In chronological order of publication, and of the PNADs employed, the first one is an article by Euclides Pedrozo, presented at the Anpec Meeting in 2007. Replicating the modelling of *ex ante* evaluation developed by Bourguignon, Ferreira and Leite (2003) for the Bolsa Escola, the author estimates Bolsa Família's potential impact on child labour and school attendance, based on the 2004 PNAD. Once again, one can observe a decline in the share of those who do not study from 4.6 per cent to 1.5 per cent, and from 7.7 per cent to 1.3 per cent in extremely poor households. Moreover, the programme brought about a significant increase in the share of extremely poor children who study and work, from 17.0 per cent to 23.6 per cent. This is because one third of the poor children who did not study before and started to study resulted in the combination of school and work.

The article by Cacciamali, Tatei and Batista (2010), based on the 2004 PNAD and using the bivariate probit model, estimates the effect of Bolsa Família on labour market participation and school attendance of children between 7 and 15 years of age. The authors do not employ quasi-experimental techniques, limiting the analysis only to poor households and using the requirement of belonging to the programme contained in the 2004 PNAD. While the use of the bivariate probit has its benefits, since it addresses the decisions of studying and working as joint and correlated, there are, however, questions about the robustness of the results, because assessing impact without considering the recurrent selection problems raises doubts about their estimates. The results show an increase in the probability of just studying and of studying and working of 1.36 per cent and 1.37 per cent, respectively. And, in turn, they estimate reductions of 2.5 per cent and 0.5 per cent in neither studying nor working, and only working, respectively. These changes generate as a final result an increase in child labour, which is also indicated by the bivariate probit coefficients. The coefficient of the variable presence of Bolsa Família has positive and significant effects on studying and working.

Araújo, Ribeiro and Neder (2010), based on the 2006 PNAD and the propensity score matching technique, conclude *“the Bolsa Família programme increased school attendance and reduced idleness among children, adolescents, boys and girls, but these impacts are modest.”* They add *“the programme had no impact on the proportions of children, adolescents, boys and girls who only work or who work and study.”* They conclude, similarly to the way we do here, that Bolsa Família *“increases school attendance, but does not contribute to the fight against child labour”*.

Finally, the paper by Ferro and Nicollela (2007) examines, in the Brazilian case, the impact of cash transfer programmes on family decisions regarding labour market participation and the time dedicated to work. The authors' results indicate a reduction in children's and adolescents' labour market participation as a result of participation in the programme. For the evaluation, two econometric models were used. Specifically, the programme reduces the probability of girls aged 11–15 in rural areas by 12.9 percentage points, but by only 0.6 percentage points for those aged 6–10 in urban areas. The reduction of 4.8 percentage points in the probability of working among boys aged 11–15 shows how significant the results obtained by these authors are in the reduction of children's and adolescents' work. On the other hand, it is also true that the authors concluded that there is no decrease in the time devoted to work by this population.

4 DATABASE AND METHODOLOGY

This article uses the 2010 Census to estimate the impact of Bolsa Família on children's and adolescents' allocation of time between school and work. The research has a wealth of socio-economic variables, including the most fundamental ones, in the estimation of the effects of Bolsa Família, such as age, school attendance, activity, occupation, hours worked, carrying out household chores, benefits brought by the family grant and income.

On the other hand, it is necessary to stress that there is an absence of important variables, such as the age when the parents started working, time dedicated to household chores and the activity status of children between 5 and 9 years old, as well as little precision in other variables, notably the absence of the benefit amount. To measure the benefit amount for participating families, we consider all non-labour income, with benefits identified by the

typical (or potential) values granted to the families according to concession rules. Thus, the typical values can be used in three ways:

- considered as a benefit value, the sum of household income not arising from work being equal to the potential benefit amounts;
- treated as benefits of all values of household income not arising from work that do not fall between the minimum and maximum amount that can be paid as benefit; and
- as benefits of the grant, all other positive household income with values lower than the maximum amount of the benefit.

These approaches are employed by studies that use the PNADs to identify the amount of benefits and the number of beneficiaries, since the PNADs do not specifically identify households that receive the family allowance.

The estimation based on the lowest and highest values reaches an undercount close to that determined when using the criteria for participation in the programme. Table 1 shows the undercount rates in the PNAD and 2010 Census when the assessment is straightforward, as well as when the beneficiary population is estimated according to the two methods described above.

TABLE 1

Undercount Rates of the Bolsa Família Programme in the PNADs and 2010 Census, according to the Determination of the Beneficiary Population

Years	Typical values	Between lowest and highest typical value	Declared
2004	32%	46%	50%
2005	31%	39%	
2006	62%	79%	76%
2007	33%	56%	
2009	36%	73%	
2010	36%	59%	71%

Source: PNAD and Sample Census of 2013.

It is worth noting that the undercount is higher when the estimation is not done directly with the beneficiary population, but by using indirect methods of population estimation. Thus, the best assessments were in the 2006 PNAD and the 2010 Sample Census. The result for 2004 should be taken with caution, as that year the population that had benefited from the previous programmes was very pronounced, and it was decided that all programmes would be considered.

The undercount implies a big problem when assessing the effects of Bolsa Família, because some of the families selected as a control group may have been part of those undercounted. Thus, all of the works that have used the PNADs and Sample Census in their evaluation study have been subjected to this problem, which implies, in fact, the presence of selection bias due to measurement/assessment error.

The choice of using the 2010 Census as a database was based, on the one hand, on the fact that it is a recent survey, with a strong sample that directly determines the beneficiary population, which minimises undercount-related consequences. Furthermore, as previously mentioned, it allows for the insertion of municipal-level variables into the estimation of the probability of taking part in the programme and in the decision model between studying and/or working. On the other hand, that year, Bolsa Família found itself consolidated and with a stable number of benefiting families — that is, the programme was not going through adjustments nor was it going through an expansion, as in 2005 and 2009.

Souza (2010) discusses the undercount of Bolsa Família beneficiaries in household surveys, seeking its reasons, and, along with other researchers, proposed adjustments in the undercount (Souza, Osório and Soares, 2011) as a way to compare different income transfer policies for children and adolescents (Souza and Soares, 2011) and to propose modifications in the programme design that would reach the goal of eliminating poverty (Osório, Soares and Souza, 2011).

According to Souza, Osório and Soares (2011), in 2009, the PNAD determined that beneficiary households accounted for 78.4 per cent of the total number of families that received the benefit, according to the administrative registry, with relatively close average benefit amounts. The number of beneficiary households is estimated by Osório and Soares (2011) by considering every household that declared having received, as other income, an average monthly household income of less than R\$200.00 as a beneficiary. According to the authors, the underestimation of both the number of families and the amount spent “*occurred, for the most part, due to the actual sample design of the survey*”. They concluded that the choice of premises, census areas or cities for the survey accounted for 40 per cent of the observed difference between the official data and the PNAD, with the remaining 60 per cent due to the uptake and interaction between the uptake and representativeness, the name given to the bias originating from the PNAD sample.

With the objective of adjusting the registry data to the PNAD information, Souza, Osório and Soares (2011) decided to define as beneficiaries a group that is not actually so, according to the methods of estimation of beneficiaries, by using the techniques employed in quasi-experimental evaluations. In other words, they sought to identify pairs of beneficiaries/non-beneficiaries that had similar probabilities of being part of the programme, estimated based on a set of observed socio-economic variables that define the profile of programme beneficiaries.

When defending their adjustment method of the PNAD to the administrative records, they raised questions about all impact evaluations conducted for Bolsa Família, based on PNADs. According to them, “*to estimate the effects and costs of changes in the design of the programme... a procedure that ‘finds’ the 2.4 million families that are ‘missing’ is necessary*” (Souza, Osório and Soares (2011: 12).

The discussion of other benefit designs requires that the non-determined families in the PNAD (in other words, those that are missing) be found, to achieve compatibility with administrative records. It would then be important to ponder whether the Bolsa Família evaluations were not based on the PNADs comparing those treated with those not found. In other words, in the evaluations, the control group becomes those who are missing in the ‘treated’ count. Actually, the authors first estimate the probability of participation in the Bolsa Família for all families. Then they select a random sample of families that have identified themselves as beneficiaries, of the same size as the number of families that are missing,

vis-à-vis the administrative records. Ultimately, these families are paired with the non-beneficiary families, whose probability of participation is most similar to the former. Through the use of the random sample, the adjustment to the number of beneficiary families in the household survey preserves the inclusion and exclusion errors. It is, therefore, evident that the authors' methodology considers that some of the households that did not declare having received the Bolsa Família benefit did actually receive it.

The challenge about quasi-experimental evaluations is to take into account the characteristics that can be correlated to both the status as a beneficiary and the results achieved by the programme, in terms of its objective indicators.⁶ Because they will inherently affect the variable of interest, the difference between beneficiaries and non-beneficiaries before the programme must be considered to avoid biased impact estimates. As Bolsa Família targets poor households, non-beneficiaries differ systematically from beneficiaries, and impact assessment methodologies appropriate for programmes with non-random selection should be employed.

Our selected methodology for this evaluation is the use of propensity score weighting, which is an approach that involves the estimation and application of weights to statistically balance the characteristics between beneficiaries and the specific selection of non-beneficiaries used in comparison.

First, a propensity score for each household is estimated — the probability that predicts whether the household will be a Bolsa Família beneficiary, including those who are non-beneficiaries, based on a collection of observed variables. Then the propensity score is used to weigh the comparison group's characteristics. This rebalancing procedure considers the fact that some households in the control group (non-beneficiaries) do not count on the high probability of receiving the benefit based on their observable characteristics. They thus receive a lower weight in the ATT estimation.

On the other hand, other households in the control group show similar characteristics to beneficiaries, thus receiving greater weights in the impact estimation. Intuitively, attributing high weights to non-beneficiary households with similar characteristics as beneficiaries and low weights to non-beneficiaries with less similar characteristics to beneficiaries, observable characteristics between beneficiaries and non-beneficiaries are balanced, even if they were unbalanced before the rebalancing. Other research has drawn on the strength of this methodological approach. Hirano, Imbens and Ridder (2003), for example, show that the application of the propensity score leads to non-biased ATT impact estimations.

A key criterion in using the weighted propensity score is that, differently from the other standard impact estimation models for non-randomised programmes, the sample weights can be used in the data. The incorporation of these weights allows for the interpretation of ATT estimations as representative of the treated population. Furthermore, due to its greater flexibility, it allows for the propensity score estimation for households and the regressions for the combination of school and work for children and adolescents at the individual level.

The validity of this approach is based on two assumptions: the 'conditional average independence' or, in other words, benefited non-beneficiaries showing the same average value as the result variable, conditioning the observable characteristics, in case there was no benefit. And, second, with a basis on the set of observable variables, all of the households in the comparison group have a predicted probability to be beneficiaries.

Based on these assumptions and other techniques, Hirano, Imbens and Ridder (2003) show that it is possible to obtain non-biased estimations of the ATT through the weighted regression model if the attributed weights are 1 for the beneficiaries and $\frac{P(X)}{1-P(X)}$ for the control or comparison group. Furthermore, the set of observable variables X used to estimate the propensity score can be directly included in this weighted regression, taking into account additional variations and, therefore, improving the precision.

In the estimation of propensity scores, a logit model was used for households taking part in the Bolsa Família programme, based on the following explanatory variables:

- a) average age of the parents;
- b) level of parental education;
- c) log of the monthly household income per capita, discounting Bolsa Família;
- d) adequacy of housing material;
- e) existence of electricity;
- f) existence of adequate sewage;
- g) number of residents per room;
- h) existence of a car and/or motorcycle;
- i) existence of a mobile phone;
- j) existence of a refrigerator;
- k) existence of a television;
- l) number of people;
- m) household status (urban/rural);
- n) adequate water supply;
- o) number of children under 14 years old;
- p) number of adolescents between 15 and 18 years old;
- q) female single parent.

As previously mentioned, there is a possibility to increment the propensity score estimation of participating in Bolsa Família, through the incorporation of municipal information, notably that regarding the provision of public services — schooling and levels of health care and their degrees of complexity — and the quality proxies of municipal management and the demand for labour. This is a gap that this work presents but aims to remedy by its next publication.

To evaluate how the weights constructed based on the estimated propensity scores balance the observable characteristics between the treatment and comparison groups, the average differences in these characteristics are tested between the groups after the application of weights derived from the propensity scores for the comparison group.

The average values of the co-variables of the beneficiary and the non-beneficiary groups differ when only sample weights are applied, getting much closer when inverted propensity score weights are added. The gains, clear in Kernel densities of the p-score, become greater with the removal of households with a p-score higher than 0.95 and lower than 0.03.

As such, we decided to perform population trimming, by removing the households in the tail of the distribution, notably the ones with high p-scores, where the weights reach high figures. And, as little information is lost with a high weight, the improvement in the balancing of co-variables supports the use of the technique. At the same time, a significant set of non-beneficiary households with very low probability of being benefited are removed. The beneficiary households that are discarded because they were at the lower end of the p-score tail are very small in number. Effectively, a little over 47,000 with p-scores higher than 0.95 were removed, of which 14,000 were non-beneficiary, and only 7000 were beneficiaries with a p-score lower than 0.03. These households accounted for 0.9 per cent of permanent private households. On the other hand, the discarded non-beneficiary with p-scores lower than 0.03 totalled about 1.3 million and accounted for one fifth of the households.

The focus of this work is to evaluate the effects of Bolsa Família on combinations of school and work for the population group composed of children and adolescents, in which there is a risk of decreasing school attendance linked to an increase in workforce participation. Figures 1 and 2 illustrate the behaviours of school attendance and the occupancy rate of the population between 10 and 18 years old, broken down by gender and place of residence (urban and rural). It is during the transition from the age of 15, or even 14, to 17 that the children leave school, and their participation in the workforce increases. Effectively, 94 per cent of 14-year-old children attended school, and 13 per cent had an occupation, which became 73 per cent and 40 per cent, respectively, at 17 years old. At 18 years old, half of the adolescents are out of school, with 53 per cent taking part in the labour market.

Therefore, it was decided that children and adolescents aged 14–18 and 15–17 would be chosen as 'cohorts' for the population set, since the latter refers to the correct ages for middle school, and the former focuses on the moment where there is a change in the allocation of time between school and work. The graphs also show that the movement of leaving school and entering the labour market has clear profiles, according to gender and place of residence.

We decided to evaluate the effects of Bolsa Família on 12 population groups, according to age, gender and place of residence. The first group are adolescents between 15 and 17 years of age, where most of the increase in school drop-out behaviour and in work rates is concentrated. The second group is the magnification of the former, with adolescents from 14 to 18 years old. Finally, the third group are children and adolescents between 10 and 18 years old. The first two groups include gender and place of residence together, while the third considers gender and place of residence separately.

The dependent variables are the four possible combinations between school and work: only studying, studying and working, only working, neither studying nor working. Estimates on four outcomes are derived through the application of a multinomial logit regression. The same p-score estimations of participation in the programme were used, adding the age and colour of the child and modifying the variables of household income per capita and the number of children and adolescents, while removing the income, and the child or the adolescent who was the object of the regression. There is no doubt that the incorporation of municipal data can improve the strength of the estimations.

FIGURE 1

School Attendance of Children and Young Adults between 11 and 18 Years old, according to Gender and Place of Residence

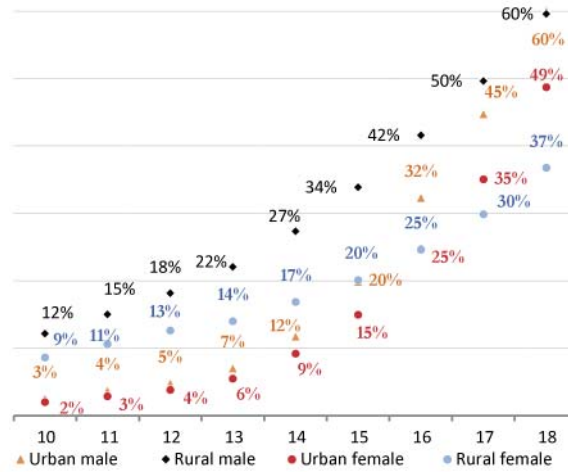
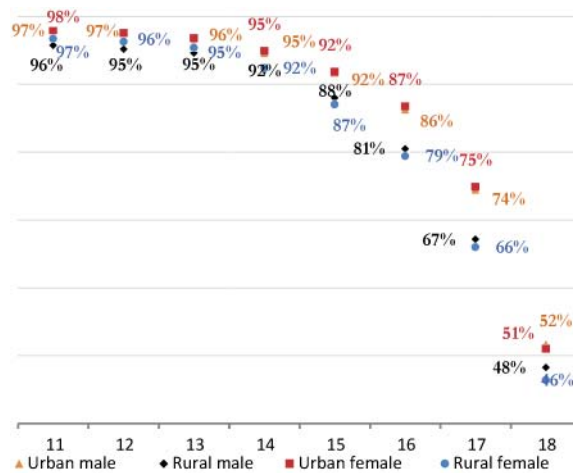


FIGURE 2

Occupation Rate of Children and Young Adults between 11 and 18 Years old, according to Gender and Place of Residence



Furthermore, the bivariate probit model for studying and working was also used, with the application of the weighted propensity score, for girls and boys from 15 to 17 years old living in cities and in rural environments. The same set of explanatory variables as the multinomial logit model was used.

In the estimation of the parameters of the multinomial logit and bivariate probit models, the variance and co-variance matrices employed take into account that the standard mistakes can be correlated intra-group or, in this case, intra-household. In other words, the observations

about children and adolescents are independent between families, but not necessarily within these families. Accordingly, the regressions were estimated by applying the sample weights and the inverted propensity scores and considering that the probability estimation of participating in Bolsa Família was conducted at the level of households (i.e. the cluster).

It is worth returning to some of the results shown by Figures 1 and 2 and other descriptive statistics to shed light on the analysis of the estimated effects of the programme in the allocation of time between school and work. The most pronounced decrease in school attendance is observed in rural girls, which is not reflected in a parallel increase in labour participation, accounting for the smallest group of people who work among 15–17-year-olds.

A significant decrease in school attendance can also be seen differently, however, with an increase in the participation in the workforce of boys living in cities. The proportion of those who attend school decreases from 92 per cent at 14 years old to 67 per cent and 48 per cent at 17 and 18 years old, respectively. Participation in the workforce increases from 12 per cent at 14 years old to 45 per cent and 60 per cent at 17 and 18 years old, respectively. Furthermore, this is the population group according to gender and place of residence that has the lowest proportion of those who do not study or work at 17 years old, at 10 per cent.

Among rural boys, relatively elevated levels of participation in the workforce can be observed, with over one fifth of 13-year-olds working, and one third of 15-year-olds — in other words, a 12 percentage point increase. On the other hand, school attendance decreases from 95 per cent at 13 years old to 88 per cent at 15 years old. Indeed, what we notice is a very sharp decline in school attendance between 15 and 17 years old, when one third of children are out of school. The increased participation in the workforce is not as pronounced as with youth living in cities, but almost all of the growth is concentrated among those who only work, given that the share of those who study and work remains at around 30 per cent. We conclude that, among rural boys, there is a clear substitution movement between school and work, which can point to greater effects of Bolsa Família on this population subgroup.

At 17 years old, 70 per cent of urban girls who work also study, which is the highest share of all groups according to gender and location (i.e. rural/urban). Among urban boys who work, two thirds also studied. At 18 years old, these proportions fall to 43 per cent and 45 per cent, respectively, reflecting the higher level of participation of girls in the workforce.

Between the ages of 11 and 14, school attendance in rural environments does not show any distinction by gender, which is maintained in the following age group, even though at the end, as previously mentioned, more girls find themselves out of school. In the urban environment, there are only very slight differences by gender in all ages. Universal school education until 12 or 13 years old is observed, with an emphasis on the attendance rate of girls, systematically falling after 15 years old. It appears, therefore, that the decreasing school attendance of young people between 14 and 18 years old differs between rural and urban environments, with little difference by gender.

As for the labour market, differentiation by gender is clear, and also seen in urban and rural segmentation. For household status, it is interesting to note the closeness of the rates of rural and urban boys who work. While 12 per cent of 14-year-old city boys worked in comparison to over one quarter of those living in rural settings, at 17 years old the rates increase to 45 per cent and 50 per cent, respectively. At 18 years old, both rates reach 60 per cent.

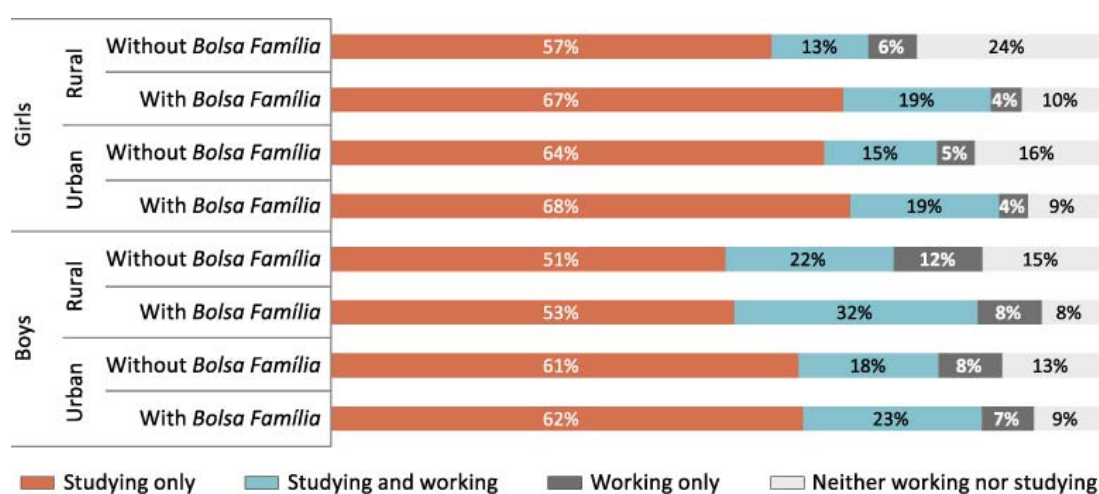
5 RESULTS

The estimations of the effects of Bolsa Família on the combination of school and work among young people between 15 and 17 years old, as well as children and adolescents between 10 and 18 years old and 14 and 18 years old, show that Bolsa Família beneficiaries have a higher likelihood of studying than non-beneficiaries, the difference being more pronounced when combined with work. Counterbalancing this main finding, a smaller probability of not studying can be observed, and is more pronounced when there is no working involved. These results concur with several of the studies covered above, such as Ravallion and Wodon (2000) and Cacciamali, Tatei and Batista (2010), but diverge from studies about Bolsa Escola in Brazil and those developed by Cedeplar and IFPRI for the Brazilian government.⁷

Figure 3 shows the predicted distribution of beneficiary and non-beneficiary children between 15 and 17 years old, according to the combination of school and work, resulting from the multinomial logit using propensity scores with weights lower than 0.03 and over 0.95. It is in this age group, as previously mentioned, that the most significant changes occur in rates of school attendance and participation in the workforce. This finding is very strong when looking at differences between urban boys' and girls' entry into the labour market. Among urban girls, Bolsa Família increases the likelihood of school attendance by 8 percentage points, with similar increases in studying only and studying in combination with work. Among urban boys, nearly all of the additional difference in the likelihood of studying, of 6 percentage points, is due to the greater proportion of those who study and work. This indicates that Bolsa Família manages to maintain the rate at a high level — strictly speaking, at about 5 percentage points higher than non-beneficiaries.

FIGURE 3

Predicted Distribution of Beneficiary and Non-beneficiary Populations of Bolsa Família aged 15 and 17 years, according to the Combination of School and/or Work, by Gender and Household Status — Brazil, 2010



The estimates call into question the occurrence of the substitution effect between school and work following Bolsa Família transfers, since there is no major discrepancy in the proportion of those who only work between beneficiaries and non-beneficiaries. The differences are concentrated in the beneficiaries' greater likelihood of studying and working, counterbalanced, almost fully, by the greater likelihood of non-beneficiaries not studying or working. It is then necessary to question whether the policies to expand school days, towards full-time or part-time school days in the final years of primary and middle school would lead to a decrease in school attendance, because of the impossibility of combining studying and working, in particular among Bolsa Família beneficiaries. If receipt of Bolsa Família transfers has implied increased school attendance in this age group, by increasing the proportion of those who combine school and work, would this effect not be mitigated if schools no longer operated in shifts, but on a full-time basis?

For girls between 15 and 17 years old who reside in rural areas, it is possible to observe a significant difference in the distribution between the combinations of school and work between beneficiaries and non-beneficiaries, particularly in the proportion of those who only study. In the case of rural boys, what stands out is the difference between beneficiaries and non-beneficiaries of those who only work, which was not observed in the other population groups, along with the high likelihood — about one third — of studying and working among beneficiaries. This is probably due to the presence of Bolsa Família's substitution effect between school and work in this population group.

Table 2 shows the predicted distribution for the combination of school and work in the age groups of 15–17 years old and 14–18 years old, by gender and place of residence, in association, and from 10–18 years old by gender and place of residence, in isolation. The results for the population between 14 and 18 years old are very similar to those observed for those between 15 and 17 years old, which are also shown in Figure 3 and have been analysed previously. Thus, there is a positive effect on school attendance, mostly arising from the combination of work and school and the lower likelihood that the children and adolescents will not study or work. This gain is larger among residents of rural areas, with the school attendance of non-beneficiaries between 15 and 17 years of age 15 and 23 percentage points higher than those of beneficiary boys and girls, respectively. Furthermore, among girls, the effects of higher education are greater in urban settings, where beneficiaries show a school attendance rate 10 percentage points higher than non-beneficiaries, while for boys the difference is 7 percentage points.

The results of the bivariate probit model presented in Table 3 meet the interpretation of the estimations of the multinomial model. It is possible to observe two marginal effects of Bolsa Família: the increase in the likelihood of studying and working, and the decrease in the likelihood of not studying or working. We must, however, stress the impact of Bolsa Família on the likelihood of the combination of only working in rural environments, especially for boys. In other words, once again the results point to the existence of the substitution effect in rural areas, especially for boys. Among rural boys, the rate of school attendance is much lower than among other gender and location subpopulations, and this positive result points to the need to treat the issue of public service provision, notably in education and health, with the incorporation of municipal data. In the available municipal data, there are good proxies for municipal labour markets — it is important to strive for a good representation of labour demand.

TABLE 2

Predicted Distribution for the Age Groups of Beneficiary and Non-beneficiary Children and Adolescents of Bolsa Família, Following the Combination of School and/or Work, by Gender and Household Status — Brazil, 2010

Population group			With Bolsa Família				Without Bolsa Família			
			Only studies	Studies and works	Only works	Does not study or work	Only studies	Studies and works	Only works	Does not study or work
15 to 17 years old	Male	Urban	61.5%	23.3%	6.8%	8.5%	60.8%	18.2%	8.3%	12.6%
		Rural	52.5%	31.7%	8.3%	7.5%	51.4%	21.9%	11.6%	15.2%
	Female	Urban	67.6%	19.4%	3.7%	9.3%	64.2%	14.7%	4.9%	16.2%
		Rural	66.7%	19.2%	4.0%	10.1%	57.3%	12.6%	6.3%	23.7%
14 to 18 years old	Male	Urban	63.0%	21.6%	6.8%	8.6%	62.0%	17.0%	7.7%	13.3%
		Rural	52.9%	30.9%	8.4%	7.8%	51.7%	21.4%	11.2%	15.7%
	Female	Urban	68.6%	17.8%	3.9%	9.7%	65.2%	14.0%	4.6%	16.2%
		Rural	66.4%	18.8%	4.2%	10.6%	58.0%	12.5%	6.1%	23.4%
10 to 18 years old	Male		79.5%	14.1%	2.0%	4.5%	77.6%	11.0%	2.6%	8.8%
	Female		84.1%	10.5%	1.0%	4.4%	81.0%	8.3%	1.4%	9.3%
	Urban		85.3%	9.2%	1.2%	4.4%	83.1%	7.5%	1.5%	8.0%
	Rural		73.9%	19.4%	2.1%	4.7%	70.7%	13.7%	3.2%	12.4%

TABLE 3

Marginal Effect of Bolsa Família on the Combinations of School and Work, according to Age Group, Gender and Place of Residence — Brazil, 2010

Age group	Gender		Boys				Girls			
	works studies	Place of residence	Urban		Rural		Urban		Rural	
			Yes	No	Yes	No	Yes	No	Yes	No
15 to 17 years	Yes		4.9%	1.2%	9.9%	1.7%	4.9%	3.5%	7.0%	9.4%
	No		-1.5%	-4.6%	-3.5%	-8.1%	-1.3%	-7.1%	-2.7%	-13.6%
14 to 18 years	Yes		4.9%	1.3%	9.9%	1.8%	4.5%	3.3%	6.9%	8.4%
	No		-1.4%	-4.8%	-3.4%	-8.3%	-1.1%	-6.6%	-2.4%	-12.9%

One can affirm, therefore, that the programme increases school attendance for adolescents between 15 and 17 years old. At the same time, however, it considerably amplifies their entry into the workforce, through the option of combining work and school. In reality, this finding shows that the programme prevents work from taking the place of school, without, however, causing a substitution effect on work by school. Furthermore, the results show the programme's positive effect of reducing the likelihood that children and adolescents will not study or work. In rural environments, where school attendance rates are well below — and the participation in the labour market well above — urban rates, it is possible to see a more pronounced decrease in the likelihood of children and adolescents only working, which seems to reflect the success of the programme by substituting only working with studying, in isolation or in conjunction with work.

It is worth noting, in this regard, the differences between beneficiaries and non-beneficiaries among those who work and also go to school. About 80 per cent of the beneficiary population between 15 and 17 years old go to school, compared to 70 per cent of non-beneficiaries. This difference is more pronounced in rural areas.

6 FINAL CONSIDERATIONS

Our results question the idea that the Bolsa Família programme presents a substitution effect between child labour and school attendance. As demonstrated in the analysis, the aggregate effect of the transfer is to increase **both** school attendance and participation in the workforce. Instead of a substitution effect, whereby the likelihood of only studying or only working increases as a result of the programme, the results from the multinomial logit show that what changes is the higher likelihood of studying and working in conjunction, and the decrease in the likelihood of not studying and not working as a result of participation in the programme. The impact is most noticeable for adolescents between the ages of 15 and 17. In urban areas this dynamic is quite evident, with a difference in school attendance among beneficiaries due to the greater likelihood of studying and working.

In rural settings, changes can be observed in the decline in the proportion of those who only work and the increase in school attendance, with an increasing likelihood of only studying. Additionally, in rural areas, where school attendance rates are well below the average, and participation in the labour market well above urban labour activity, it is possible to see a more pronounced decrease in the likelihood of children and adolescents only working, which seems to reflect the success of the programme by substituting only working with studying, in isolation or in conjunction with work. To put it simply, the results point to the existence of a substitution effect in rural areas, especially for boys. An additional finding of our study related to our focus on the substitution of school for work versus combinations effects shows that participation in the programme reduces the likelihood of not being in school and not working (i.e. being idle). Across every population subgroup in Table 2, the effect of participation in Bolsa Família seems to reduce idleness among the beneficiary population compared to non-recipients. This finding complements what we have said thus far about combinations of work and school that increase through participation in the programme.

The difference by gender is very clear, with the programme having positive effects among girls, with relatively pronounced decreases in the proportion of those who do not study or work and increased growth in school attendance. This effect is concentrated notably among the residents of cities, among those who study and work.

In this way, one can verify an incremental jump in school attendance due, in great part, to the increased likelihood of studying and working, which is due to the potential to combine studying and work, as well as leisure. It is interesting, in this case, when we look to Ravaillon and Wodon (2000), when they state that there is no clarity, in theoretical terms, as to whether a reduction in the price of schooling generated by greater income would imply the reduction of child labour. The extra time demanded by school may very well replace children's leisure time. For this reason, the substitution effects between school and leisure, as well as between school and household chores, can be strong enough that the decline in child labour only happens at a high cost (benefit value) if there were a desire to meet the objective of avoiding the poverty trap for following generations. In conclusion, to meet the conditions of Bolsa Família, families must see school attendance as a priority, seeking to allocate the time dedicated to work, household chores and leisure to this new requirement.

REFERENCES

- Araujo, G.S., R. Ribeiro and H.D. Neder (2010). 'Impactos do Programa Bolsa Família sobre o Trabalho de Crianças e Adolescentes Residentes na Área Urbana em 2006', *Economia*, Vol. 11, No. 4, December.
- Attanasio, O., E. Fitzsimmons, A. Gómez, D. López, C. Meghir and A. Mesnard (2006). 'Child Education and Work Choices in the Presence of a Conditional Cash Transfer Programme in Rural Colombia', *Working Paper*, No. W06/01. London, Institute for Fiscal Studies.
- Bourguignon, F., F.H.G. Ferreira and P.G. Leite (2003). 'Conditional Cash Transfers, Schooling, and Child Labor: Micro-Simulating Brazil's Bolsa Escola Programme', *World Bank Economic Review*, 17(2).
- de Brauw, A., D.O. Gilligan, J. Hoddinott and S. Roy (2012). *The Impact of Bolsa Família on Child, Maternal, and Household Welfare*. Washington, DC, International Food Policy Research Institute.
- Brazil, Subchefia para Assuntos Jurídicos da Casa Civil da Presidência da República (2003). *Exposição de Motivos da Medida Provisória 132* of 20 October 2003. Brasília, Subchefia para Assuntos Jurídicos da Casa Civil da Presidência da República, <http://www.planalto.gov.br/ccivil_03/Exm/2003/EM47-CCIVIL-03.htm> (accessed 4 December 2013).
- Cacciamali, M.C., F. Tatei and N.F. Batista (2010). 'Impactos do programa Bosla Família Federal sobre o trabalho infantil e a frequência escolar', *Revista de Economia Contemporânea*, Vol. 14, No. 2, May/August.
- Cardoso, E. and A.P. Souza (2004). 'The impact of cash transfers on child labour and school attendance in Brazil', *Working Paper*, No. 04-W07, Nashville, Department of Economics, Vanderbilt University.
- CEDEPLAR/UFMG (Centro de Desenvolvimento e Planejamento Regional – Universidade Federal de Minas Gerais) (2006). *Projeto de Avaliação do Impacto do Programa Bolsa Família — Relatório analítico final*. Belo Horizonte, CEDEPLAR/UFMG.
- CEDEPLAR/UFMG (Centro de Desenvolvimento e Planejamento Regional – Universidade Federal de Minas Gerais) and SAGI/MDS (Secretaria de Avaliação e Gestão da Informação – Ministério do Desenvolvimento Social e Combate à Fome) (2007). *Avaliação de Impacto do Programa Bolsa Família — sumário executivo*. Belo Horizonte, CEDEPLAR/UFMG.
- Duryea, S. and A. Morrison (2004). 'The Effect of Conditional Transfers on School Performance and Child Labor: Evidence from an Ex-Post Impact Evaluation in Costa Rica', *Working Paper*, No. 505. Washington, DC, Inter-American Development Bank, <http://www.iadb.org/document.cfm?id=788323&pubDetail=1&wt_docType=Working%20Papers&wt_docnum=788323&wt_language=en&wt_department=RES&lang=en> (accessed 4 December 2013).
- Edmonds, E.V. and N. Schady (2008). 'Poverty alleviation and child labor', *Policy Research Working Paper Series*, No. 4702. Washington, DC, World Bank.
- Ferro, A.R. and A.C. Nicollela (2007). 'The impact of conditional cash transfer programs on household work decisions in Brazil', IZA/World Bank Conference on Employment and Development, Institute for the Study of Labour (IZA), Bonn, 8–9 June 2007, <www.iza.org/conference_files/worldb2007/ferro_a3468.pdf> (accessed 4 December 2013).

- Ferro, A.R., A.L. Kassouf and D. Levison (2010). 'The impact of conditional cash transfer programmes on household work decisions in Brazil' in R.K.Q. Akee, E.V. Edmonds and K. Tatsiramos (eds), *Child Labour and the Transition Between School and Work. Research in Labour Economics*, Vol. 13. Bradford, Emerald Group Publishing Limited.
- Glewwe, P. and P. Olinto (2004). *Evaluating the Impact of Conditional Cash Transfers on Schooling: an Experimental Analysis of Honduras' PRAF Programme*. Minneapolis, MN, Department of Applied Economics, University of Minnesota.
- Hirano, K., G.W. Imbens and G. Ridder (2003). 'Efficient Estimation of Average Treatment Effects Using the Estimated Propensity Score', *Econometrica*, 71: 1161–1189, doi: 10.1111/1468-0262.00442.
- Maluccio, J.A. and R. Flores (2005). 'Impact evaluation of a conditional cash transfer program: the Nicaraguan Red de Protección Social', *Research Reports*, No. 141. Washington, DC, International Food Policy Research Institute, <<http://ideas.repec.org/p/fpr/resrep/141.html>> (accessed 4 December 2013).
- Osório, R.G., S.S.D. Soares and P.H.G.F. de Souza (2011). 'Erradicar a pobreza extrema: um objetivo ao alcance do Brasil', *Texto para discussão*, No. 1619. Brasília, Ipea, <http://repositorio.ipea.gov.br/bitstream/11058/1501/1/td_1619.pdf> (accessed 4 December 2013).
- Pedrozo, E. (2007). 'Uma avaliação ex-ante dos impactos do Bolsa Família na redução do trabalho infantil', *Encontro Nacional de Economia*, No. 35. Recife, Anpec, <www.anpec.org.br/encontro2007/artigos/A07A002.pdf> (accessed 4 December 2013).
- Ravallion, M. and Q. Wodon (2000). 'Does Child Labour Displace Schooling? Evidence on Behavioural Responses to an Enrollment Subsidy', *The Economic Journal*, Vol. 110, No. 462, Conference Papers, March.
- Schady, N. and M.C. Araujo (2008). 'Cash Transfers, Conditions, and School Enrollment in Ecuador', *Economía* (Journal of the Latin American and Caribbean Economic Association), Vol. 8, No. 2, Spring.
- SAGI/MDS (Secretaria de Avaliação e Gestão da Informação – Ministério do Desenvolvimento Social e Combate à Fome) (2012). *Avaliação de Impacto do Programa Bolsa Família — 2ª rodada (AIBF II) — Sumário Executivo*. Brasília, SAGI/MDS.
- Skoufias, E. and S.W. Parker (2001). 'Conditional Cash Transfers and Their Impact on Child Work and Schooling: Evidence from PROGRESA Programme', *FCND Discussion Paper*, No. 123. Washington, DC, International Food Policy Research Institute.
- Souza, P.H.G.F. de and S.S.D. Soares (2011). 'O Benefício Infantil Universal: Uma Proposta de Unificação do Apoio Monetário à Infância', *Texto para discussão*, No. 1636. Brasília, Ipea.
- Souza, P.H.G.F. de, R.G. Osório and S.S.D. Soares (2011). 'Uma metodologia para simular o programa Bolsa Família', *Texto para discussão*, No. 1654. Brasília, Ipea.
- Souza, P.H.G.F. de (2010). 'Uma Metodologia para Decompor Diferenças entre dados Administrativos e Pesquisas Amostrais, com Aplicação para o Programa Bolsa Família e o Benefício de Prestação Continuada na PNAD', *Texto para discussão*, No. 1517. Brasília, Ipea.

NOTES

1. We use the term 'work' loosely to mean that the child has an occupation that may be profitable or not, linked to a family business or not.
2. The programmes Bolsa Escola and Bolsa Alimentação were quite similar to Bolsa Família, as they targeted poor populations, especially households with children, conditional on compliance to requirements related to human capital investment.
3. FFE provides rice to poor households conditional on children's attendance at primary school.
4. Because the programme benefited some of the lottery losers.
5. PRAF is a cash transfer programme conditional on school attendance and health care; it was implemented on an experimental basis.
6. The following description of the regression model using the weighted propensity score largely follows Brauw, Gilligan, Hoddinott and Roy (2012).
7. It should be emphasised that Ferro and Nicollela (2007) conclude that there is no reduction in the amount of time spent in the workforce, except for urban boys between 11 and 15 years old.



International Policy Centre for Inclusive Growth (IPC - IG)

United Nations Development Programme

SBS, Quadra 1, Bloco J, Ed. BNDES, 13º andar

70076-900 Brasília, DF - Brazil

Telephone: +55 61 2105 5000

E-mail: ipc@ipc-undp.org ▪ URL: www.ipc-undp.org