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Highlights

- The paper examines heterogeneity in outcomes from the Bolsa Família program
- Estimates of programme effects show no significant effects on adult labour force participation
- However, they show positive and significant effects on girls' school attendance.

Accepted Manuscript

## Heterogeneity in Bolsa Família outcomes

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### Abstract

The paper examines heterogeneity in programme outcomes from Bolsa Família, a flagship social assistance programme in Brazil reaching 14 million households. Following a review of existing evidence on mean impacts, the paper develops and estimates the first panel data quantile regression model of the distribution of Bolsa Família outcomes across municipalities. The quantile point estimates of programme effects show no significant effects on adult labour force participation but positive and significant effects on girls' school attendance. Girls' attendance effects are stronger in municipalities with lowest rates in the conditional distribution of school attendance.

### Keywords:

Social assistance, inclusive growth, Latin America, Brazil

### JEL Codes

9.003: [I3 - Welfare and Poverty](#)15.001: [O1 - Economic Development](#)15.002: [O2 - Development Planning and Policy](#)

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## Introduction

In the new century, Brazil managed a significant reduction in poverty, inequality, and social exclusion. During the first decade, the share of the Brazilian population in extreme poverty declined from 22 to 11 percent, while the Gini coefficient of per capita household income fell by 10 percent. Several studies estimate that while a large share of the reduction in poverty and inequality is a product of economic growth and improved labour markets, the emergence of large-scale social assistance institutions made an important contribution (Barros, Carvalho et al. 2007; Soares, Ribas et al. 2010). Among them, Bolsa Família, an antipoverty programme reaching 14 million households, including one third of all children in the country, has been particularly influential. Research into the effectiveness of Bolsa Família has produced a wealth of information on programme impacts (Campello and Neri 2013) but, with one exception discussed below, studies have so far focused on identifying and estimating mean effects. This paper examines the distribution of the outcomes across municipalities in Brazil.

The motivation behind focusing on heterogeneous programme effects is straightforward. The contribution of Bolsa Família, and other social assistance programmes, to the reduction of poverty and inequality will be better understood if we are able to assess the distribution of outcomes, as well as their mean. The paper contributes to the existing literature on the effectiveness of social assistance by focusing attention on the distribution of Bolsa Família outcomes, as regards labour supply and school attendance, across municipalities in Brazil. To address the associated methodological and data challenges, we develop and estimate a quantile regression model and apply it to household survey data across municipalities in

Brazil. Our analysis confirms that the heterogeneity of labour supply effects across municipalities are not statistically significant, but suggests there is significant heterogeneity in outcomes for girls school attendance across municipalities, with equalising effects.

The rest of the paper is organised as follows. Section 1 discusses the emergence of Bolsa Família, paying special attentions to its design and underlying conceptual framework. Section 2 reviews the literature on mean programme outcomes as identified in available impact evaluation studies. Section 3 develops an estimation approach to study the distribution of Bolsa Família outcomes and describes the data employed. Section 4 presents the main results on the distribution of labour supply and school attendance outcomes across municipalities in Brazil, and discusses their implications. A final section concludes.

#### 1. The emergence of Bolsa Família

The evolution of social assistance<sup>1</sup> in Brazil has been swift, but far from linear. The 1988 Constitution, following from 20 years of dictatorship, is the marker for the rapid expansion of social assistance programmes and policies in the years that followed. However, the policy instruments the Constitution supported, Previdência Social Rural and the Benefício de Prestação Continuada, were not especially innovative or farsighted. Their orientation was firmly rooted in conventional welfare policy, on a distinction between individuals with or without the ability to work (Jaccoud, Hadjab et al. 2009). They focused on old age poverty and on disability, but failed to address child poverty (Barros and Carvalho 2003); and

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<sup>1</sup> Social assistance describes tax-financed public programmes and policies addressing poverty and vulnerability.

Social insurance describes contributory schemes addressing life-cycle and work related contingencies.

Together, social assistance and social insurance are the main components of social protection (Barrientos 2013b)

favoured pure income transfers which replicated the 'compensatory' approach of golden age European social assistance. Bolsa Família developed instead out of municipal experimentation with Bolsa Escola, rooted in a mix of guaranteed income proposals, multidimensional perspectives on poverty, and education interventions.

The roots of Bolsa Família are in Bolsa Escola, a programme introduced in parallel in a handful of municipalities in 1995 as a means of addressing the impact of crises on poor households. Its intellectual origins can be traced to guaranteed income proposals and to interventions to ensure social investment and employment among households in poverty. Senator Eduardo Suplicy, the Workers Party's first elected Senator, introduced a bill in 1991 proposing to implement a negative income tax scheme. The proposal was approved in the Senate, but was never implemented. Jose Marcio Camargo, an influential academic with a strong reputation for research on poverty argued the guaranteed income was unlikely to have an impact on persistent poverty in Brazil if it was not linked to improvements in the productive capacity of households in poverty (Britto and Soares 2011). Linking transfers to improvements in children's education gave the guaranteed income idea considerable political traction (Melo 2007b, a).

The Constitution gave an enormous impetus to decentralisation. In Brazil, municipalities are federal entities, with considerable room for experimentation. Some municipalities began experimenting with guaranteed income schemes linked to children's schooling and other interventions. Bolsa Escola emerged from municipal activism on poverty reduction.<sup>2</sup> The experimental programmes soon began to be replicated in other municipalities. In 1997 the

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<sup>2</sup> There are several 'fathers' of Bolsa Escola, including Cristovão Buarque in Brasília and Magalhães Texeira in Campinas.

federal government offered financial incentives to municipalities to ease the adoption of Bolsa Escola.<sup>3</sup> Bolsa Escola became a federal programme in April 2001 under the responsibility of the Ministry of Education. Similar federal initiatives included the Programa de Erradicação do Trabalho Infantil (PETI) first introduced in 1996. Initially located in municipalities with high incidence of child labour in hazardous employment, the programme provided direct transfers to households as well as remedial education in after-school sessions. The programme was especially successful, in part because of the supplementary education provided (Brazilian Court of Audit 2003).<sup>4</sup>

The apparent success of Bolsa Escola and PETI, and especially their core idea of providing direct transfers to households in poverty, stimulated similar policy initiatives in other Ministries. The Ministry of Health introduced a Bolsa Alimentação in September 2001, aimed at expectant mothers and infants and with the objective of reducing malnutrition and infant mortality. In 2003, the Ministry of Mines and Energy began to implement a gas subsidy, Auxílio Gás, to compensate households in poverty for the phasing out of gas subsidies.<sup>5</sup>

The arrival to government of Lula in 2002 did not seem auspicious for this policy agenda at first. His campaign emphasised giving priority to the fight against hunger (Hall 2006). In

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<sup>3</sup> In 1998 60 municipalities had adopted the programme. Their number mushroomed to 1,115 by 2000.

<sup>4</sup> Both federal Bolsa Escola and PETI played a role in the social development strategy of Presidente Cardoso and his social policy advisor Vilmar Faria (Faria 2002).

<sup>5</sup> Melo (2007b) argues that political competition between the Workers Party and the Partido Socialista Democrático Brasileiro (PSDB), and among politicians within them, was a contributory factor in the emergence of the transfer programmes.



office, he created an Extraordinary Ministry for Zero Hunger, which floated a raft of new interventions, including a new family subsidy, the Cartão Alimentação, providing in-kind and cash transfers. Very soon, opposition from experts, policy makers and beneficiaries themselves led to a change in policy. The fact that Lula's transition programme had paid attention to the need to consolidate all transfer programmes facilitated a swift change in policy.<sup>6</sup> He announced the implementation of Bolsa Família as a single programme aiming to provide transfers to households in extreme poverty, and integrating all existing subsidy programmes, a process beginning in 2003. A new Ministry for Social Development and Zero Hunger was established to manage Bolsa Família in 2004.<sup>7</sup> Bolsa Família greatly expanded the coverage of Bolsa Escola and the other income transfer programmes. The number of households participating in Bolsa Família increased from 6.5 million in 2004 to 14 million in 2013. Table 1 provides a summary of Bolsa Família transfers.

[Table 1 about here]

## 2. Outcomes

This section provides a brief review of the main findings from studies on Bolsa Família outcomes. As noted above, this literature focuses largely on mean impacts. The next section reports on the distribution of outcomes across municipalities.

Bolsa Família consolidated existing transfer programmes, which might explain why it lacks a baseline. Evaluation surveys were only collected in 2005 (AIBF1) and 2009 (AIBF2), and the

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<sup>6</sup> We are grateful to one of the referees for pointing this out.

<sup>7</sup> Until 2004, social assistance was the responsibility of the Ministry of Labour and Social Assistance.

main results were placed in the public domain only in 2012 (de Brauw, Gilligan et al. 2012).<sup>8</sup>

The main findings include: improvements in children's weight-for-height and body mass; improvements in the incidence of immunisations; improvements in school attendance of around 4 percentage points, larger for girls and for the North-East (de Brauw, Gilligan et al. 2012; Januzzi and Pinto 2013). They also include improvements in progression and a reduction in grade repetition; delayed children's entry into the labour market by a year; increased pre-natal visits by participant expectant mothers (1.6 additional visits); improved influence of mothers in decisions over household budget and contraception. The analysis found no significant effects on labour supply, but it did note a reduction in formal sector hours by males and an increase in hours worked in the informal sector.

The vast majority of studies examining Bolsa Família outcomes rely on the analysis of cross-section data, from the national household survey Pesquisa Nacional por Amostra de Domicílios (PNAD) or the income and expenditure survey Pesquisa de Orçamentos Familiares (POF). The PNAD survey data lack direct identification of Bolsa Família beneficiaries, except for supplements in 2004 and 2006. For all other waves of the data, the identification of Bolsa Família participants is done through the unique monetary values reported under a question on residual income (Soares, Soares et al. 2006; Foguel and Paes

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<sup>8</sup> The impact evaluation report identifies three main comparison groups: comparison 1 (C1) compares new participants in 2009 versus non-participants in 2009; comparison 2 (C2) compares all new participants regardless of whether registered for CU in 2005 against non-participants in 2009 who had either registered for CU or received benefits in 2005 but no longer in 2009; comparison 3 (C3) compares all participants in 2009 against non-participants in 2009 who had either registered for CU or received benefits in 2005 but no longer in 2009 (same as in C2). The evaluation relies on difference in difference estimates from panel data.

de Barros 2008).<sup>9</sup> The POF survey does permit direct identification of Bolsa Família participants, but it is collected every five years.

Surprisingly perhaps, there are few studies assessing the impact of Bolsa Família on poverty. Soares et al (2010) estimate poverty and extreme poverty headcount rates with and without Bolsa Família transfers. This approach does not account for behavioural responses to the transfers. They establish that, in the absence of Bolsa Família transfers, headcount rates would have been significantly higher. For the decade 1999 to 2009 their estimates suggest that Bolsa Família and its component programmes were responsible for one sixth of the reduction in poverty (2 percentage points of a period poverty reduction from 26% to 14%) and around one third of the reduction in extreme poverty (1.6 percentage points of a period fall from 9.9% to 4.8%). Their disaggregated findings emphasise the contribution of Bolsa Família to protecting the income of lowest income household from the variations in economic activity.

The potential contribution of Bolsa Família to the recent reduction of income inequality has been examined in some detail (Soares, Soares et al. 2006; Barros, Carvalho et al. 2007; Soares, Ribas et al. 2010; Soares, de Souza et al. 2010; Hoffmann 2013). Soares, de Souza, Osório et al. (2010) find that Bolsa Família accounted for 16% of the 10% decline in the Gini coefficient measure of inequality in the decade 1999-2009, and Benefício de Prestação Continuada accounts for a further 14% so that the programmes combined account for just below one third of the reduction in household income inequality. Hoffmann (2013) confirms this finding for the 2001-2011 period. These findings are intriguing because Bolsa Família transfers account for a fraction of one percent of GDP. Bolsa Família's inequality reducing

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<sup>9</sup> For a detailed discussion of all data issues, see Soares et al (2006).

power is explained by the fact that transfers are concentrated on households at the bottom of the income distribution (Barros, Carvalho et al. 2007; Soares, de Souza et al. 2010).

Some studies have focused on the impact of Bolsa Família on schooling and health, which are directly targeted by the conditions in the design of the programme. Magalhães and Lima (2013) review the findings from impact evaluation studies on the impact of the programme on basic education; while Craveiro and Ximenes (2013) do the same for health. In addition, Glewwe and Kassouf (2012) used a school census panel data for 1998-2005 to examine the effects from the expansion of Bolsa Escola in 2001 as a natural experiment. They find that Bolsa Escola raised enrolments by 5.5% in Grades 1-4 and by 6.5% in Grades 5-8. They also find a reduction in dropout rates and improvements in grade progression among Bolsa Escola/Bolsa Família participants. They simulate the longer term effects of the programme on the productive capacity of participant children and suggest that an 11% rise in labour earnings associated with a predicted additional 1.5 years of schooling is greater than the costs of the programme. In this simulation, Bolsa Escola/Bolsa Família paid for themselves in terms of improved productivity. A study on the combined impact of the Family Health programme and Bolsa Família on child morbidity and mortality at the municipal level finds positive and substantial effects (Rosella, Aquino et al. 2013).

Finally, the impact of Bolsa Família on the labour supply of participants has been studied extensively. Oliveira and Soares (2012) summarise this literature. For the population as a whole, studies find a reduction in child labour consistent with a rise in school attendance (Ferro, Kassouf et al. 2010). Few studies find significant effects of the programme on adult labour at the extensive margin (Foguel and Paes de Barros 2008). Teixeira (2010) finds a small increase in the labour force participation of women, but no effect for men. These

studies find small but significant effects at the intensive margin depending on the data and econometric model employed. Disaggregating the effects by gender and region often leads to clearer and stronger findings. Ribas and Soares (2011) find stronger effects in urban areas, especially metropolitan areas, including a stronger reduction of labour force participation by women of around 4.4 percentage points, and an increase in hours of work in informal employment by males. The latter findings is likely to reflect the influence of the income test at the margins of eligibility (Firpo, Pieri et al. 2013). The important fact to keep in mind is that labour force participation rates among adults in households eligible for, or participating in, Bolsa Família are high, at least as high as for the population as a whole (Castro, Sátyro et al. 2010).

### 3. Methods and data

With few exceptions, the outcome estimates reviewed in the last section focused on mean effects of participation in Bolsa Família. There is scarce information on the distribution of these outcomes. In view of the fact that the selection of participants in Bolsa Família, and other social assistance programmes, is naturally skewed towards municipalities with higher incidence of households in poverty, it is important to pay attention to the distribution of outcomes spatially. Variation in implementation capacity across municipalities is also likely to influence outcomes. The main question for this section is to establish whether programme outcomes vary across municipalities.

In the programme evaluation literature there are two main approaches to examining the heterogeneity in outcomes. The first is to estimate mean outcomes for sub-samples of the data, say rural-urban or male-female. A second approach is to explore the conditional distribution of outcomes with a quantile regression approach. A handful of studies have

applied the first approach in the context of Brazil (Teixeira 2010; Ribas and Soares 2011).

Their findings indicate the presence of significant heterogeneity in Bolsa Família outcomes, labour supply effects in particular. To our knowledge, this is the first study for Brazil applying the second approach, although quantile treatment effects have been estimated for human development income transfer programmes elsewhere in Latin America (Djebbari and Smith 2008; Dammert 2009).

We estimate Bolsa Família effects at the municipal level. In the absence of nationally representative panel data for Brazil, several studies have developed identification strategies for estimation of Bolsa Família effects at the municipality level (Foguel and Paes de Barros 2008; Ribas and Soares 2011; Rosella, Aquino et al. 2013). This approach has notable advantages: it can take account of indirect effects of the programme within municipalities; it can control for time-invariant conditions at the municipality level; and it can partially address the issue of assignment endogeneity. While selection of specific households to participate in Bolsa Família depends on their per capita household income, and therefore cannot be considered to be fully exogenous to the response variables under analysis, the assignment of programme places at the municipal level depends mainly on the pre-programme poverty level of the municipality, as described in Ribas and Soares (2011). At municipal level, programme assignment can be argued to be exogenous with respect to contemporaneous response variables. These studies map out a reliable strategy for exploring heterogeneity in outcome distribution with cross-section household survey data.

We use annual data from PNAD for the period 2003 to 2009 to identify outcomes, and 2001 for pre-programme baseline variables. Brazil has over 5000 municipalities, with 817 sampled in PNAD. The PNAD sample of municipalities is fixed for an entire decade following the

decennial Census. Because our analysis focuses on variables aggregated at the municipal level, we selected a set of 273 municipalities with populations ranging from 17 thousand to 10 million.<sup>10</sup> The mean population of the set was 330 thousand inhabitants and its median population was 169 thousand. Pooling over seven years, our working dataset has 1,911 municipal-level observations.

We consider programme outcomes controlling for a set of covariates that are expected to affect these outcomes. Specifically, we consider how outcomes  $y_{m,t}$  respond to

$x_{m,t} = [BF_{m,t}, XO_{m,0}]$ , where  $m$  indexes municipalities,  $t$  indexes time (year),  $BF$  stands for the fraction of households who receive Bolsa Família transfers in a particular municipality  $m$  in year  $t$ ,  $XO$  stands for pre-programme observables including poverty and other covariates.

<sup>10</sup> Our analysis focuses on variables aggregated at the municipal level. These municipalities are chosen with probability equal to one in the process of PNAD sample selection, and cover 52.6 percent of the total population of Brazil. See

[http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2009/sintese\\_notas\\_tecnicas.pdf](http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2009/sintese_notas_tecnicas.pdf). We selected the set of (273) municipalities that are denominated self-representative in the sample.

Strictly speaking, a municipality is denominated self-representative if its population exceeds 80 percent of the population of the stratum established for the Unidade de Federacao in the last Census. These municipalities have a significantly larger size than the rest, which allow us to obtain mean estimates at municipal level with higher statistical precision, adding reliability to the subsequent quantile regression estimates. They also tend to remain in the sample even after a new Census is conducted, allowing for the possibility of updating the data for the same panel of municipalities and conducting a follow-up research in the future. The results for the full dataset, not included in the paper, are in line with the results for our working dataset. They show no significant program effect in the distribution of labour supply outcomes, and show heterogeneity in female school attendance programme effects, with significantly stronger effects on the lowest quantiles.

The latter are not followed over time to avoid over-controlling and hence miss-identifying the programme effects on relevant response variables.

We focus on programme outcomes for two response variables: adult labour participation rate for 18-60 years olds ( $LA_{m,t}$ ) and regular school attendance for 6-15 years olds separately for girls and boys ( $SF_{m,t}$ ,  $SM_{m,t}$ ). The selection of these outcome variables is advantageous in two respects, they provide core information on programme effects and they have been examined by previous studies therefore enabling comparison of the estimates.

Selected summary statistics on our response variables and on Bolsa Familia incidence are available in Table 2. School attendance is high in Brazil, providing the programme with the challenge of handling the difficult cases rather than simply picking low-hanging fruit. In the median municipality, female school attendance is 97.7 percent and male school attendance 96.7 percent. There is variation across the sampled municipalities. Female school attendance ranges from 91.6 percent in the .1 quantile to 100 percent in the .9 quantile of municipalities. Male school attendance ranges from 91.6 percent to 100 percent attendance at the same quantiles. The incidence of Bolsa Familia ranges from 1.1 to 20.9 percent. The figures show a rise in Bolsa Familia incidence over time, the unweighted mean among municipalities increasing from 9.1 percent (2003-2006) to 9.7 percent (2007-2009) which is consistent with the program expansion at national level.

[Table 2 about here]



## Econometric Model

The seminal study of Bitler et al (2005) for the USA and the study of Dammert (2009) for conditional transfers in Nicaragua showed that quantile regressions are able to uncover significant heterogeneity in programme effects often missed by standard regressions focusing on the mean.

In identifying a suitable approach to estimation we followed Abrevaya and Dahl (2008). They developed and estimated a short panel quantile regression model to study the heterogeneous effects of birth inputs into birth weight, an approach that was elaborated further by Bache et al (2008).<sup>11</sup> This model extends the correlated random effects model of Chamberlain (1984) to a quantile regression setting. It takes account of the presence of unobservables at the unit level, municipalities in our case, by using the panel data structure.

As explained by Bache et al (2008), the correlated random effects model uses information from the repeated observations to attenuate identification issues due to correlation between time-invariant unobservables  $c_m$  and observed covariates  $x_{m,t}$ . In our case, we used the repeated observations of programme incidence in the individual municipalities to condition the results for unobservable characteristics that are not fully captured in the pre-programme observable characteristics, but that can be plausibly correlated with the observed incidence of the programme in given years.

Under the, potentially strong, assumptions that (i) fixed effects are additively separable; and (ii) covariates are strictly exogenous, Abrevaya and Dahl's econometric model delivers consistent estimates for a large sample of individuals observed during a finite number of

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<sup>11</sup> For a recent application see Gonzalez (2012).

periods. Their model is also able to control for fixed effects at the level of individual observations, municipalities in our case. The model is particularly suitable for investigating changes in the distribution of the outcome (Powell 2013).<sup>12</sup>

Following Abrevaya and Dahl, we regress

$$Q_{\tau}(y_{mt}|x_m) = x'_{mt}\beta_{\tau} + \psi_{\tau}^t + x'_{m1}\lambda_{\tau}^1 + \dots + x'_{mT}\lambda_{\tau}^T, \quad (1)$$

where  $Q_{\tau}(y_{mt}|x_m)$  are the conditional quantiles of the response variable  $y_{mt}$ ,  $x'_{mt}$  is a row vector of covariates of municipalities  $m$  at time  $t$ ,  $\beta_{\tau}$  denotes a time-invariant effect column vector by which the covariates effect the conditional quantiles of the observables above and beyond the effects that work through the unobservables. The  $\beta_{\tau}$  associated with  $BF$  is our main focus of interest.  $\psi_{\tau}^t$  is a location shift in the conditional quantiles and the last generic term  $x'_{mt}\lambda_{\tau}^t$  captures the effects of the unobservables into the conditional quantiles at  $t$ , with the unobservables being a linear projection onto the observables (Chamberlain 1982). In contrast to conventional panel data analysis, in Abrevaya and Dahl's model there is no differencing of the observed variables either from their lagged values or from the average over time (time de-meaning). In contrast to difference-in-difference models, this model can exploit information from the full period under consideration.

Abrevaya and Dahl (2008) propose estimating a reduced form model, as in the following system of equations:

$$Q_{\tau}(y_{m1}|x_m) = \psi_{\tau}^1 + x'_{m1}\beta_{\tau} + x'_{m1}\lambda_{\tau}^1 + x'_{m2}\lambda_{\tau}^2 + \dots + x'_{mT}\lambda_{\tau}^T$$

<sup>12</sup> We also considered the unconditional quantiles model introduced by Fortin and Firpo (2009) but, following Powell (2013), we found this model is less useful in the presence of fixed effects and a short panel of observations.

$$Q_{\tau}(y_{m2}|x_m) = \psi_{\tau}^2 + x'_{m2}\beta_{\tau} + x'_{m1}\lambda_{\tau}^1 + x'_{m2}\lambda_{\tau}^2 + \dots + x'_{mT}\lambda_{\tau}^T$$

...

$$Q_{\tau}(y_{mT}|x_m) = \psi_{\tau}^T + x'_{mT}\beta_{\tau} + x'_{m1}\lambda_{\tau}^1 + x'_{m2}\lambda_{\tau}^2 + \dots + x'_{mT}\lambda_{\tau}^T \quad (2)$$

Based upon the equalities above, we ran a pooled linear quantile regression in which the observations corresponding to specific municipalities are stacked together. In particular, a quantile regression for the  $\tau^{\text{th}}$  quantile is ran using:

$$\begin{bmatrix} y_{1,1} \\ y_{1,2} \\ \dots \\ y_{1,T} \\ y_{2,1} \\ y_{2,2} \\ \dots \\ y_{2,T} \\ \dots \\ y_{M,1} \\ y_{M,2} \\ \dots \\ y_{M,T} \end{bmatrix} \text{ and } \begin{bmatrix} 1 & 0 & \dots & 0 & x'_{1,1} & x'_{1,1} & x'_{1,2} & \dots & x'_{1,T} \\ 1 & 1 & \dots & 0 & x'_{1,2} & x'_{1,1} & x'_{1,2} & \dots & x'_{1,T} \\ 1 & 0 & \dots & 0 & \dots & \dots & \dots & \dots & \dots \\ 1 & 0 & \dots & 1 & x'_{1,T} & x'_{1,1} & x'_{1,2} & \dots & x'_{1,T} \\ 1 & 0 & \dots & 0 & x'_{2,1} & x'_{2,1} & x'_{2,2} & \dots & x'_{2,T} \\ 1 & 1 & \dots & 0 & x'_{2,2} & x'_{2,1} & x'_{2,2} & \dots & x'_{2,T} \\ 1 & 0 & \dots & 0 & \dots & \dots & \dots & \dots & \dots \\ 1 & 0 & \dots & 1 & x'_{2,T} & x'_{2,1} & x'_{2,2} & \dots & x'_{2,T} \\ \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots \\ 1 & 0 & \dots & 0 & x'_{M,1} & x'_{M,1} & x'_{M,2} & \dots & x'_{M,T} \\ 1 & 1 & \dots & 0 & x'_{M,2} & x'_{M,1} & x'_{M,2} & \dots & x'_{M,T} \\ 1 & 0 & \dots & 0 & \dots & \dots & \dots & \dots & \dots \\ 1 & 0 & \dots & 1 & x'_{M,T} & x'_{M,1} & x'_{M,2} & \dots & x'_{M,T} \end{bmatrix} \quad (3)$$

as the left-side and right-side variables, respectively, with M being the number of municipalities in our sample (273). This pooled regression directly estimates

$\psi_{\tau}^1, \psi_{\tau}^2 - \psi_{\tau}^1, \dots, \psi_{\tau}^T - \psi_{\tau}^1, \beta_{\tau}, \lambda_{\tau}^1, \lambda_{\tau}^2, \dots, \lambda_{\tau}^T$ . The difference  $\psi_{\tau}^t - \psi_{\tau}^1$  represents the "time effect".

The model estimated is:

$$Q_{\tau}(y_{mct}|x_m) = \beta_{\tau}BF_{mct} + \delta_{\tau}^v bvjabs_{\tau}BF_{mct} + \sum_{d=2}^5 \delta_{\tau}^d DEV_{m0}^d BF_{mct} + controls + \psi_{\tau}^t + x'_{m1}\lambda_{\tau}^1 + \dots + x'_{mT}\lambda_{\tau}^T \quad (1')$$

This is estimated for the period  $t = \{2003, 2004, \dots, 2009\}$ , which for convenience we refer to as  $t = \{1, 2, \dots, 7\}$ .  $BF$  is the share of households participating in Bolsa Família. In 2004 and 2006 this is computed based on direct responses to a survey question whether any individual in the household is receiving Bolsa Família. For the other years, we follow the methodology developed by Foguel and Barros (2010), identifying participants by inspecting unique values reported for a survey question on other income.<sup>13</sup> As the level of Bolsa Família transfers changed in 2007, we updated the Foguel and Barros code to take account of the increases in the basic and variable transfers. The code was again adjusted for 2008 and 2009 to incorporate subsequent changes in the value of the transfers. To take account of the implementation in 2008 of a variable transfer component (the Benefício Variable Jovem) targeted on 16-17 years olds we include as a dummy ( $bvjabs$ ) interacted with the meme incidence variable  $BF$ . To take account of pre-programme socio-economic conditions at the municipal level, we interact  $BF$  with municipal gdp per capita arranged into five categories approximating quintiles ( $DEV^d$ , with  $d = 1, \dots, 5$ ).<sup>14</sup>

Regarding controls ( $XO_{m,t}$ ), they include pre-programme (2001) poverty and baseline education and other socioeconomic characteristics aggregated at the municipal level.<sup>15</sup>

PNAD expansion factors are applied in the municipal-level aggregation.<sup>16</sup> As a data

<sup>13</sup> This algorithm also includes participants in the transfer programmes consolidated into Bolsa Família.

<sup>14</sup> We omitted  $DEV^1$  in the estimation.

<sup>15</sup> They are described in Table A1 of Appendix 1.

<sup>16</sup> The Stata code used for the aggregation and the subsequent regression analysis is available from the authors.

validation check, we constructed national-level variable aggregates and compared them with national indicators generated from PNAD by IBGE.

We calculate the estimated coefficients for quantiles .05<sup>th</sup> to .95<sup>th</sup>, in .05<sup>th</sup> steps. It should be noted that, in this framework, inference (confidence intervals and hypothesis tests) relies on the bootstrapped distribution of estimates. The standard asymptotic-variance formula and the standard bootstrap approach, which are both based upon independent observations, are not appropriate because there is dependence between the observations of specific municipalities (Koenker and Bassett 1978).<sup>17</sup> Instead, a bootstrap sample was created by repeatedly drawing, with replacement, from the sample of municipalities. The draws continue until the desired bootstrap sample size is reached, 500 in this case. The pooled quantile estimator is then computed, together with the original estimator's variance matrix adjusted for the empirical variance matrix of the bootstrap estimates. Bootstrap percentile (90% and 95%) confidence envelopes for the parameters are constructed and graphed.<sup>18</sup>

<sup>17</sup> Ignoring the correlation among observations, due to repeated measures and also possibly State clustering, leads to over(under)-estimation of the p-values of within (between)- effects, making type II (I) errors more probable. Hence, the sign of the effect on the variance cannot be stated a priori.

<sup>18</sup> We extend the code to generate a variance-covariance matrix for the estimated coefficients on Bolsa Família, and then test the hypothesis of equality of relevant betas, against relevant hypothesis (1-tail tests). We estimate a t-Statistic with  $t = \frac{\hat{\beta}_1 - \hat{\beta}_2}{\text{se}(\hat{\beta}_1 - \hat{\beta}_2)}$ , and  $\text{Var}(\beta_1 - \beta_2) = \text{Var}(\beta_1) + \text{Var}(\beta_2) - 2\text{Cov}(\beta_1, \beta_2)$ , the elements of which we get from the variance-covariance matrix. Given the large sample at work, the t-statistic ( $t_{n-k-1}$ ) approaches the standard Normal, against which we compare the results of our statistic, searching for p-values.

#### 4. Results

In Figure 1 we report on the estimated quantile effects of changes in the municipal coverage of Bolsa Família on the distribution of labour force participation rates for adults. The results suggest that Bolsa Família is not associated with changes of statistical significance in labour force participation among adults. This is valid for the entire conditional distribution of municipalities and is independent of the confidence envelope employed (90% or above). In quintiles two to four of the distribution of municipalities, the programme actually increases labour participation (Table A2). These results are consistent with previous work by Ribas and Soares (2011) and others, who find that the aggregate average effect of Bolsa Família on adult labour supply participation is not statistically significant and is positive and significant in some areas of Brazil. The introduction of the Benefício Variable Jovem component does not change this result. The results also suggest that, *ceteris paribus*, there is no significant correlation between labour force participation rates and pre-programme poverty.<sup>19</sup>

[Figure 1 about here]

We also examined the distribution of school attendance outcomes across municipalities. We find positive effects of the programme on the school attendance of girls aged 6 to 15, but significance varies across quantiles. As shown in Figure 2, the effect of the programme is not only positive but also statistically significant, at the ten percent level of significance, in municipalities up to quantile .40 of girls' school attendance. For the municipalities above this point in the distribution, the effect is positive but not statistically different from zero.<sup>20</sup>

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<sup>19</sup> Table A2 in Appendix 1 provides a more detailed report on the estimated parameters.

<sup>20</sup> The detailed results are in Table A3 in Appendix 1.

[Figure 2 about here]

A formal test of the statistical significance of the difference between quantile point estimates of Bolsa Família effects on female school attendance rejects the null hypothesis of equality even at one percent level of significance. This is reported in Table 3. The p-values for the test of significance of the correlated random effects are also included and they reject the null of lack of significance. These results suggest that unobservables affecting female school attendance are captured, in part, by repeated observations on the programme incidence, and that cross-section results not accounting for them could lead to a significant bias in the estimation of programme effects.<sup>21</sup>

[Table 3 about here]

The distribution of girls' attendance outcomes has a global maximum at quantile .05. Given the high levels of school attendance at the baseline, these effects are not small. In terms of quantile effects, the results suggest that in the median municipality each percentage point increase in the incidence of the programme at the conditional distribution of school attendance leads to a 0.03 percentage point increase in girls' school attendance, an effect that increases to a statistically significant 0.13 when we consider a municipality in conditional quantile .05. For the municipalities at global maximum, it would require less than eight ( $0.13^{-1}$ ) percentage point increase in programme coverage to raise female school attendance by a percentage point.

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<sup>21</sup> The technical details on the tests, based on Abrevaya and Dahl (2008), are in Appendix 2.

The quantile effects on boys' school attendance are shown in Figure 3.<sup>22</sup> They are significant at the ten percent level across the best part of the distribution. The quantile estimates for boys are relatively smaller, and heterogeneity is less pronounced, than for their female counterparts. A test of equality of marginal effects across quantiles, with a p-value close to one as shown in Table 3, means we cannot reject the null hypothesis of equality. For comparison, we tested for the null hypothesis for the correlated random effects. The null hypothesis of lack of significance is not rejected (with a p-value of 0.27).

[Figure 3 about here]

In conclusion, the quantile point estimates of adult labour force participation effects are positive for both the lower and higher quantiles, but not significantly different from zero across the distribution. This is in line with the findings from the literature focused on mean impact. The quantile regression results demonstrate the presence of heterogeneity in the school attendance outcomes of Bolsa Família across a panel of municipalities. In terms of girls' school attendance, the quantile estimates suggest that municipalities with lower school attendance show the strongest positive effects of the programme. The distribution of quantile effects for boys' school attendance shows less heterogeneity. These results are also in line with the literature focused on mean effects, for example the results reported in de Brauw, Gilligan et al (2014). Our results on girls' school attendance suggest that Bolsa Família not only contributes to a rising central-tendency of school attendance, from a very high baseline, but that in addition the programme has worked to reduce differential outcomes across municipalities. This finding suggests that the outcomes from Bolsa Família

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<sup>22</sup> Table A4 in Appendix 1 shows detailed results.



on girls' school attendance are equalising, as improvements are skewed towards municipalities with lower baseline school attendance.

#### Conclusions

There is a substantive and growing literature studying the outcomes of antipoverty transfer programmes emerging in low- and middle-income countries. With few exceptions, studies focus on mean effects. Where sample selection has been employed to investigate the distribution of outcomes, studies indicate a significant measure of heterogeneity. Assessing the effectiveness of social assistance would recommend consideration of both mean outcomes and their distribution across implementation units. The paper has taken steps to address this issue in the context of Brazil's Bolsa Família.

The paper began by tracing the emergence of Bolsa Família, and its main design features. It also provided a summary of findings from the available literature on Bolsa Família mean outcomes. Bolsa Família has been effective in reducing poverty and, perhaps against all expectations, inequality. It has also contributed to improvements in human development, through their contribution to universalising basic education and primary health care. In addition it has had some success in achieving more specific outcomes relating to child development: immunisation, nutrition, reduction in mortality and child labour, and increased school enrolments and attendance. The weight of evidence from the relevant studies conclude that Bolsa Família, and other social assistance programmes, reduce labour force participation among children and older adults, but have insignificant labour supply effects among adults of working age. This literature focuses largely on mean effects.

There is a significant knowledge gap associated with the distribution of these outcomes. To throw light on the distribution of outcomes, the paper developed a short panel quantile

regression model in which the panel structure is employed to take account for the presence of unobservables at the municipality level, estimating this model with household survey data from PNAD for the years 2003 and 2009, with 2001 as the baseline.

The analysis focused on adult labour force participation and school attendance outcomes across municipalities. The findings on adult labour force participation fail to find a significant Bolsa Família effect on adult labour force participation across the entire conditional distribution of municipalities. This result is in line with the weight of studies focused on mean effects. By contrast, the findings on girls' school attendance indicate statistically significant heterogeneity in Bolsa Família outcomes. The distribution of quantile estimates of these outcomes, across a panel of municipalities, peaks in the bottom quantiles, indicating that municipalities with low girls' school attendance rates benefited the most from Bolsa Família effects. This suggests that, in addition to raising mean school attendance, Bolsa Família helps equalise outcomes across municipalities.

The findings in the paper, together with those emerging from the handful of similar studies on the distribution of outcomes (Dammert 2009, Ribas and Soares 2011), maps out an important research agenda. Further research is needed to throw light on the distribution of outcomes from antipoverty transfer programmes.

Notes

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Table 1. Bolsa Família All values are for July 2014 (US\$ 2013 PPP 1= R\$1.61)	
	Bolsa Família
Target population	Households in extreme poverty and households in moderate poverty with children
Eligibility	Households with per capita income $\leq$ R\$77 (US\$48) and households with children with per capita income $\leq$ R\$154 (US\$96)
Monthly benefits	Basic transfers=R\$77 (US\$48). Variable transfer=R\$35 (US\$22) per child (0-15) up to five; R\$ 42 (US\$26) for each youth (16-17) up to two; R\$35 (US\$22) if expectant mothers; R\$35 (US\$22) if children 0-6 months. Households with per capita income $>$ R\$77 and $\leq$ R\$154 receive child transfers only From 2012, the Benefício de Superação da Extrema Pobreza provides a 'top up' to households with incomes below R\$77 <u>after</u> transfers
Reach	14 million households
Budget as % GDP	0.6
Agencies responsible	Ministério de Desenvolvimento Social Caixa Econômica Federal
Source: Barrientos (2013a), updated July 2014.	

Table 2. Summary statistics for municipalities in Brazil 2003-2009

	Female school attendance (%)	Male school attendance (%)	Bolsa Família incidence (%)	Pre-program poverty rate (%)
(Unconditional) Quantiles – Working Dataset				
.1	91.6	91.6	1.1	7.5
.25	94.7	94.6	3.3	11.8
.5	97.7	97.1	7.0	18.5
.75	100.0	100.0	13.1	29.5
.9	100.0	100.0	20.9	39.2
(Unconditional) Quantiles – Full Dataset				
.1	90.9	90.0	1.9	8.8
.25	94.4	93.7	5.2	15.0
.5	97.4	96.7	12.0	26.6
.75	100.0	100.0	23.8	43.5
.9	100.0	100.0	36.9	56.3
Unweighted Municipal Mean – Working Dataset				
2003-2006	96.4	96.3	9.1	21.7
2007-2009	97.2	96.8	9.7	
2003-2009	96.7	96.5	9.4	
Unweighted Municipal Mean – Full Dataset				
2003-2006	96.0	95.4	15.4	30.0
2007-2009	97.1	96.6	16.5	
2003-2009	96.5	95.9	15.9	

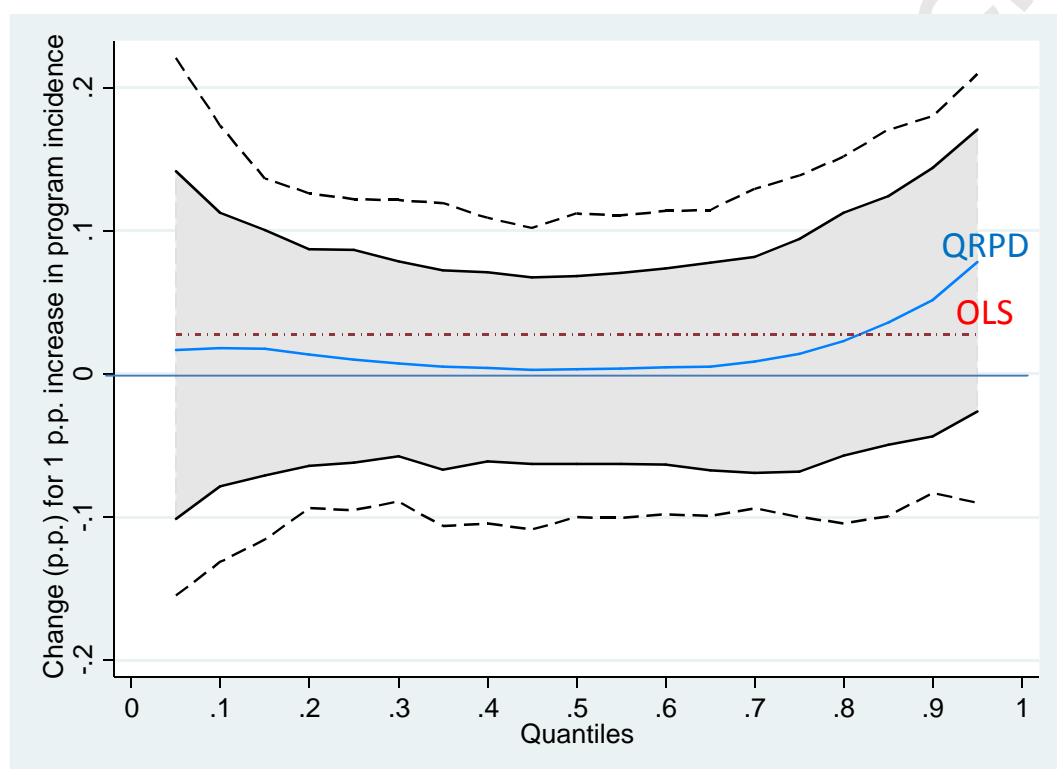
Source: Authors' elaboration based on PNAD dataset.

Table 3. p-values for tests of marginal-effect equality of Bolsa Família effects across quantiles and correlated random effects

Response variable	Marginal-effect equality test	Correlated random effects test
Girls school assistance	0 [6.13E – 14]	0 [8.52E – 64]
Boys school assistance	1.00	0.27
Adult labour supply	1.00	1.00

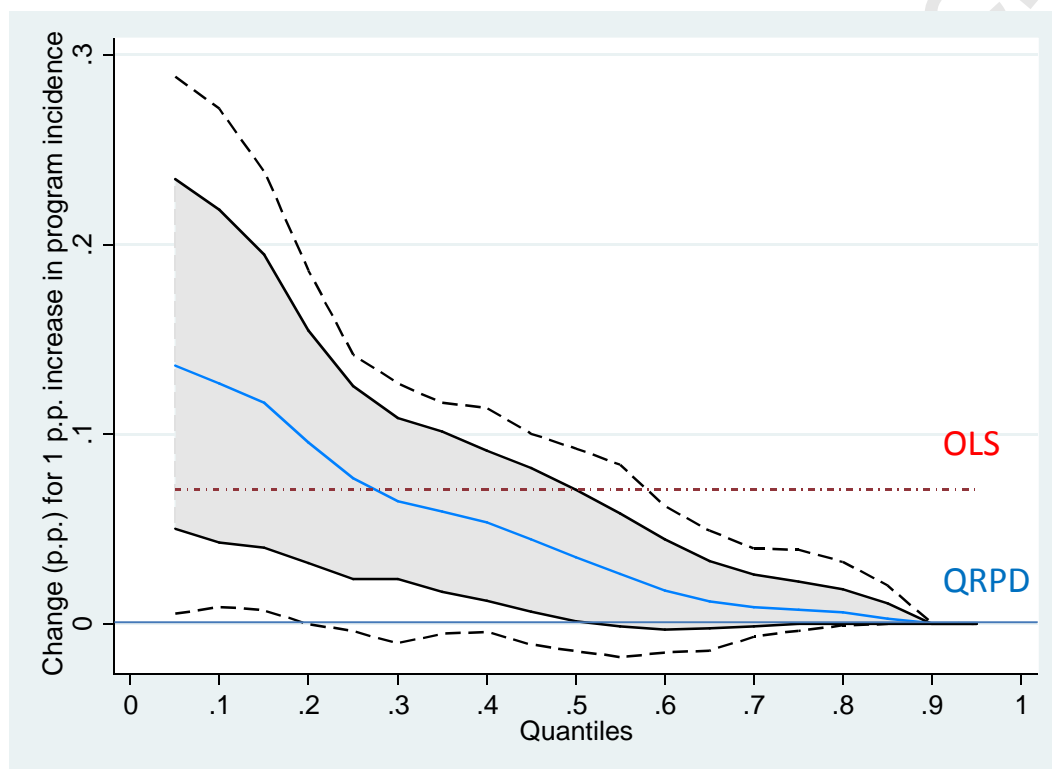
Note: p-values are reported for the null hypothesis of equality of marginal effects and lack of significance of correlated random effects for nineteen quantiles .05,.10,...,.95. Results are based upon 500 bootstrap replications.

Figure 1. The distribution of Bolsa Familia effects on adult labour force participation rate across quantiles of a panel of municipalities 2003-2009



Source: Authors' quantile regression panel data and OLS regressions. For quantile regressions, point estimates and bootstrapped confidence intervals at 90% and 95% are included. All specifications include all regressors, including per capita income, adult school level, employment structure, household head characteristics, other individual characteristics, dwelling characteristics, geographical area, as well as unobservable accounting characteristics. The sample size is 1,911 self-representative municipal observations given by 7 observations for each of 273 self-representative municipalities.

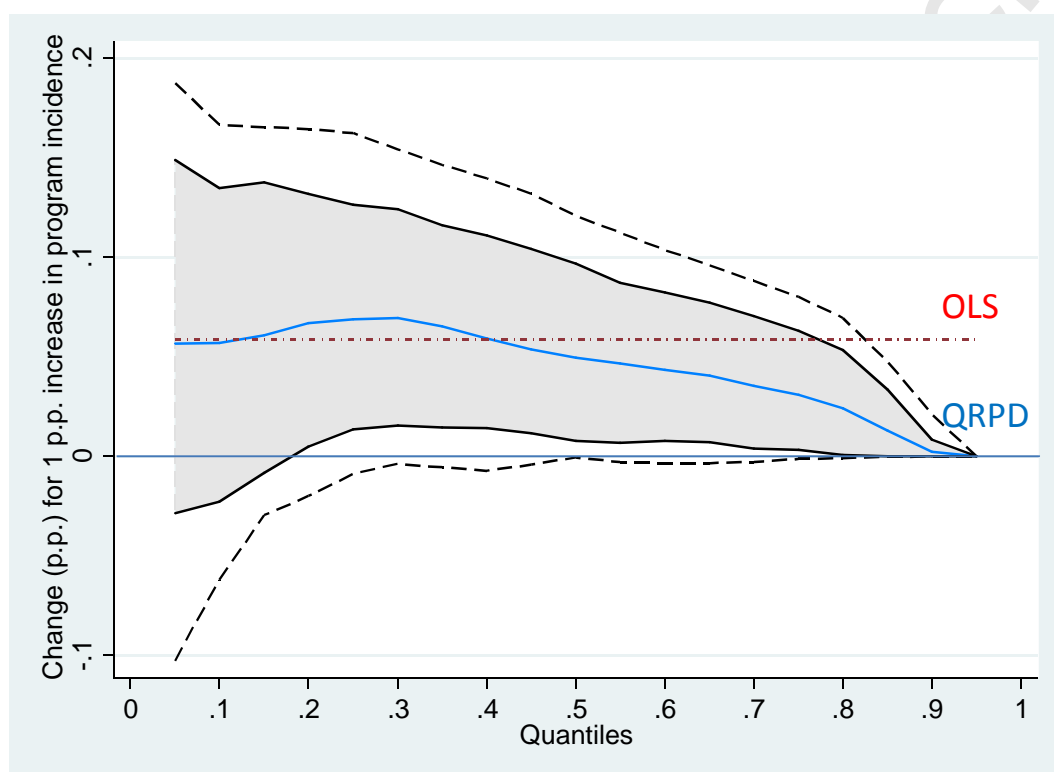
Figure 2. The distribution of Bolsa Familia effects on school attendance rates of girls 6-15 years old across quantiles of a panel of municipalities 2003-2009



Source: Authors' quantile regression panel data and OLS regressions. For quantile regressions, point estimates and bootstrapped confidence intervals at 90% and 95% are included. All specifications include all regressors, including per capita income, adult school level, employment structure, household head characteristics, other individual characteristics, dwelling characteristics, geographical area, as well as unobservable accounting characteristics. The sample size is 1,911 self-representative municipal observations given by 7 observations for each of 273 self-representative municipalities.



Figure 3. The distribution of Bolsa Família effects on school attendance rates of boys 6-15 years old across quantiles of a panel of municipalities 2003-2009



Source: Authors' quantile regression panel data and OLS regressions. For quantile regressions, point estimates and bootstrapped confidence intervals at 90% and 95% are included. All specifications include all regressors, including per capita income, adult school level, employment structure, household head characteristics, other individual characteristics, dwelling characteristics, geographical area, as well as unobservable accounting characteristics. The sample size is 1,911 self-representative municipal observations given by 7 observations for each of 273 self-representative municipalities.

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## References

Abrevaya, J. and C. Dahl (2008). The Effects of Birth Inputs on Birthweight. *Journal of Business and Economic Statistics*, 26, (4), 379-397.

Bache, S. H., Dahl, C. M., and Kristensen, J. T. (2008). Headlights on tobacco road to low birthweight outcomes. Evidence from a battery of quantile regression estimators and a heterogenous panel. CREATES Research Paper No. 2008-20. Aarhus: University of Aarhus.

Barrientos, A. (2013a). The Rise of Social Assistance in Brazil, *Development and Change*, 44, (4), 887-910.

Barrientos, A. (2013b). *Social Assistance in Developing Countries*, Cambridge: Cambridge University Press.

Barros, R. P. d. and M. d. Carvalho (2003). *Desafios para a Política Social Brasileira*, Discussion Paper 985, Rio de Janeiro: IPEA.

Barros, R. P. d.; M. d. Carvalho and S. Franco (2007). O papel das transferências públicas na queda recente da desigualdade de renda brasileira, in R. Paes de Barros; M. N. Foguel and G. Ulysea (Eds.), *Desigualdade de Renda no Brasil: Um análise de queda recente* (pp. 41-86). Brasilia: IPEA.

Bitler, M. P.; J. B. Gelbach and H. W. Hoynes (2005). What mean impacts miss: Distributional effects of welfare reform experiments, *American Economic Review*, 96, (4), 1313-1327.

Brazilian Court of Audit (2003). TCU Evaluation of the Child Labor Eradication Programme, Brasilia:

SEPROG.

Britto, T., and F. V. Soares (2011). Bolsa Família and the Citizen's Basic Income: A Misstep?. Working Paper No. 77. Brasilia: International Policy Centre for Inclusive Growth.

Castro, J. A. d.; N. Sátyro; J. A. Ribeiro and F. V. Soares (2010). Desafios para a inclusão produtiva das famílias vulneráveis: Uma análise exploratória, Texto para Discussão 1486, Brasilia: IPEA.

Chamberlain, G. (1982). Multivariate regression models for panel data, *Journal of Econometrics*, 18, 5-46.

Cortez Reis, M. and J. M. Camargo (2007). Rendimientos domiciliários com aposentadorias e pensões e as decisões dos jovens quanto à educação e a participação na força de trabalho, *Pesquisa e planejamento economico*, 37, (2), 221-246.

Craveiro, C. B. A. and D. d. A. Ximenes (2013). Dez anos do Programa Bolsa Família: desafios e perspectivas para a universalização da educação básica no Brasil, in T. Campello and M. C. Neri (Eds.), *Programa Bolsa Família: Uma década de inclusão e cidadania*, (pp. 109-124). Brasilia: IPEA.

Dammert, A. C. (2009). Heterogeneous impacts of conditional cash transfer programmes: Evidence from Nicaragua, *Economic Development and Cultural Change*, 58, (1), 53-83.

de Brauw, A.; D. Gilligan; J. Hoddinott and S. Roy (2014). The Impact of Bolsa Família on Schooling. Girls' Advantage Increases and Older Children Gain, Report, Washington DC: IFPRI Discussion Paper, 1319.

de Brauw, A.; D. O. Gilligan; J. Hoddinott and S. Roy (2012). The Impact of Bolsa Família on Child, Maternal, and Household Welfare, Report, Washington DC: International Food Policy Research Institute.

Djebbari, H. and J. Smith (2008). Heterogeneous impacts in PROGRESA, *Journal of Econometrics*, 145, 64-80.

Faría, V. (2002). Institutional reform and government coordination in Brazil's social protection policy, *CEPAL Review*, 77, 7-24.

Firpo, S.; R. Pieri; E. Pedroso and A. Portela Fernandes (2013). Evidence of eligibility manipulation for conditional cash transfer programs, Working Paper C-Micro 26, Sao Paulo: FGV Sao Paulo School of Economics.

Foguel, M. N. and R. Paes de Barros (2008). The effects of conditional cash transfer programmes on adult labour supply: An empirical analysis using a times series cross section sample of Brazilian municipalities, Mimeo, Rio de Janeiro: IPEA.

Fortin, N. M. and S. Firpo (2009). Unconditional quantile regressions, *Econometrica*, 77, (3), 953-973.

Glewwe, P. and A. L. Kassouf (2012). The impact of Bolsa Escola/Bolsa Família conditional cash transfer program on enrollment, dropout rates and grade promotion in Brazil, *Journal of Development Economics*, 97, 505-517.

Gonzalez, F. (2012), Does microfinance have an impact? Three quantitative approaches in rural areas of Bangladesh and Andhra-Pradesh, Mimeo, Brighton: University of Sussex.

Hall, A. (2006). From Fome Zero to Bolsa Família: Social policies and poverty alleviation under Lula, *Journal of Latin American Studies*, 38, (4), 689-709.

Hoffmann, R. (2013). Transferências de renda e desigualdade no Brasil (1995-2011), in T. Campello and M. C. Neri (Eds.), *Programa Bolsa Família: Uma década de inclusão e cidadania*, (pp. 207-216). Brasília: IPEA.

Jaccoud, L.; P. D. E.-M. Hadjab and J. R. Chaibub (2009). Assistência social e segurança alimentar: Entre novas trajetórias, velhas agendas e recentes desafios (1988-2008), in *Diretoria de Estudos e Políticas Sociais (Ed.) Políticas sociais: Acompanhamento e análise 17*, (pp. 175-250). Brasília: IPEA.

Januzzi, P. d. M. and A. R. Pinto (2013). Bolsa Família e seus impactos nas condições de vida da população brasileira: Uma síntese dos principais achados da pesquisa de avaliação de impacto do Bolsa Família II, in T. Campello and M. C. Neri (Eds.), *Programa Bolsa Família: Uma década de inclusão e cidadania*, (pp. 179-192). Brasília: IPEA.

Koenker, R. and G. Bassett (1978). Regression Quantiles, *Econometrica*, 46, (1), 33-50.

Magalhães Júnior, H. M.; P. C. Jaime and A. M. Cavalcante de Lima (2013), O papel do setor saúde no Programa Bolsa Família: Histórico, resultados e desafios para o Sistema Unico de Saúde, in T. Campello and M. C. Neri (Eds.), *Programa Bolsa Família: Uma década de inclusão e cidadania*, (pp. 93-108). Brasília: IPEA.

Melo, M. A. (2007a), Political competition can be positive: embedding cash transfer programs in Brazil, in A. Bebbington and W. McCourt (Eds.), *Statecraft in the South*, (pp. 30-51). Basingstoke: Palgrave,.

Melo, M. A. (2007b), Unexpected successes, unanticipated failures, social policy from Cardoso to Lula, in T. Power and P. Kigstone (Eds.), *Democratic Brazil Revisited*, (pp. 161-184). Pittsburgh, PA: University of Pittsburgh Press.

Oliveira, L. F. B. d. and S. S. D. Soares (2012). O que se sabe sobre os efeitos das transferencias de renda sobre a oferta de trabalho Texto para Discussão 1738, Rio de Janeiro: IPEA.

Powell, D. (2013). Quantile regression for panel data with exogenous or endogenous regressors and a nonseparable disturbance, Mimeo, Santa Monica: RAND.

Ribas, R. P. and F. V. Soares (2011). Is the effect of conditional transfers on labour supply negligible everywhere?, Mimeo, Urbana-Champaign: University of Illinois.

Rosella, D.; R. Aquino; C. A. T. Santos; R. Paes-Sousa and M. L. Barreto (2013). Effect of a conditional cash transfer programme on childhood mortality: a nationwide analysis of Brazilian municipalities, *The Lancet*, 382, 57-64.

Soares, F. V.; R. P. Ribas and R. G. Osório (2010). Evaluating the Impact of Bolsa Família, *Latin American Research Review*, 45, (2), 173-190.

Soares, F. V.; S. Soares; M. Medeiros and R. G. Osório (2006). Cash transfer programmes in Brazil: impacts on inequality and poverty, Brasilia: International Poverty Centre.

Soares, S.; P. H. F. de Souza; R. G. Osório and F. G. Silveira (2010). Os impactos do benefício do Programa Bolsa Família sobre a desigualdade e a pobreza in J. A. d. Castro and L. Modesto (Eds.), Bolsa Família 2003-2010: avanços e desafios, (pp. 25-52). Brasília: IPEA.

Teixeira, C. G. (2010). A heterogeneity analysis of the Bolsa Familia Programme effect on men and women's work supply, Working Paper 61, Brasília: International Policy Centre for Inclusive Growth.

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