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**Bolsa Família and formal employment:
evidence from Brazilian municipalities**

Dissertação de Mestrado

Dissertation presented to the Programa de Pós-graduação em
Economia da PUC-Rio in partial fulfillment of the requirements
for the degree of Mestre em Economia.

Advisor : Prof. Pedro Carvalho Loureiro de Souza
Co-advisor: Prof. Eduardo Zilberman

Rio de Janeiro
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To my family and friends.

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Abstract

Consonni, Pietro Scodiero; Souza, Pedro Carvalho Loureiro de (Advisor); Zilberman, Eduardo (Co-Advisor). **Bolsa Família and formal employment: evidence from Brazilian municipalities.** Rio de Janeiro, 2018. 79p. Dissertação de mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

In this paper we study the impact of Bolsa Família's CCTs on the number of formal jobs at the municipality level. We find a highly heterogeneous effect across municipalities. Previous works on this topic considered only the effect on the average municipality. We show evidence that the program's effect can be five times higher on the poorest municipalities, corresponding to 1% increase in formal jobs for a 10% increase in the number of beneficiaries. To accomplish so, we combine administrative data on the program enrollment with data on the universe of formal jobs. This allows us to overcome the problem of measurement error in the treatment variable. Robustness checks indicate that the effect remains significant after controlling for health, educational, climatic shocks, financial and political factors.

Keywords

Bolsa Família; Formal Employment; Heterogeneity; Brazilian Municipalities;

Resumo

Consonni, Pietro Scodiero; Souza, Pedro Carvalho Loureiro de; Zilberman, Eduardo. **Bolsa Família e emprego formal: evidências de municípios brasileiros**. Rio de Janeiro, 2018. 79p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Este trabalho estuda o impacto das transferências condicionais de renda do Bolsa Família sobre a quantidade de empregados formais no nível do município. Encontramos um efeito altamente heterogêneo no nível municipal. Trabalhos anteriores sobre o tema consideraram apenas o efeito médio do programa. Mostramos evidências de que o efeito do programa pode chegar a cinco vezes seu valor médio em municípios com menos renda, o que corresponde a um aumento em 1% de empregados formais para um aumento em 10% na quantidade de beneficiários. Para tal, combinamos dados administrativos de participação no programa com dados sobre o universo de empregos formais. Isso nos permite evitar a questão do erro de medida na variável de tratamento. Testes de robustez indicam que o efeito permanece significativo após controlarmos por variáveis associadas à saúde, educação, choques climáticos e fatores financeiros e políticos.

Palavras-chave

Bolsa Família; Emprego Formal; Heterogeneidade; Municípios Brasileiros;

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1

Introduction

Conditional Cash Transfer Programs (CCTs) are widely used around the world (17). These programs aim to reduce poverty and social disparities and they act at two fronts: alleviating income constraints and breaking intergenerational transmission of poverty through educational requirements. There is substantial evidence on the positive impact of several CCT programs implemented around the world on education ((29), (20), (?)) and health ((18), (25), (?)). We focus on the Bolsa Família program (PBF) in Brazil, currently the world's largest CCT program, which costs approximately 0.5% of national GDP and reaches over 13 million households, a fifth of the country's population. Our objective is to provide new evidence about the impact of cash transfers on formal employment in Brazil. As argued by (30), the success of these programs in alleviating income inequality depends on the extent to which it affects incentive to work.

In this paper, we study the effect of direct income transfers from Bolsa Família on local activity measured by the variation of formal jobs at the municipal level. We show evidence that the effect is highly heterogeneous across municipalities according to social demographic characteristics. Suppose that the federal government expands by 10% the number of program's beneficiaries. On the average municipality, the coefficients indicate an increase of 0.2% in formal jobs. If the municipality is poor, however, this represent an expansion of 1% on employment. The effect is higher for municipalities in the North and Northeast regions, where the same program expansion indicates an increase of 0.9% and 0.7% in formal employment, respectively, and for municipalities with high densities of beneficiaries, where the increase is 0.7%. Our results point that the effect is also heterogeneous according to workers and firms characteristics. Our point estimates for female employment are higher than for male employment in all cases analyzed, albeit insignificant. We also show evidence that the effect is significantly higher in firms in the third sector (services and trade) and in the public sector.

Previous work on the program have focused on the labor effect of the program at the average municipality and did not consider heterogeneities of the effect other than related to gender. We thus contribute to that literature by considering its heterogeneities according to municipalities social demographic characteristics and employment categories. For instance, (14) analyze the program's effect, measured by the proportion of beneficiaries, on the rate of participation on labor market for men and women. They use a time-series of cross-sectional data from National Household Sample Survey (PNAD) at municipal level between 2001 and 2005. They find that an expansion of 10% in the number of beneficiaries indicate an increase of 0.1% on labor participation for both genders. (34) studies the program's impact on labor supply of mothers receiving Bolsa Família's benefits. The final effect depends on how income and substitution effects work simultaneously. Although the program generates a negative wealth effect on mothers' working decisions, she argues that the net effect is positive. This is due to a higher substitution effect arising from the reduction of childcare activities and, as a consequence, from the rise in mother's available time.

By considering the effect of the average municipality, previous works in the literature found a small positive effect of Bolsa Família program on labor participation. We corroborate their finding. Yet, we show that for a subsample of the municipalities — poor, in the North and Northeast regions, with high densities of beneficiaries or low densities of formal employment —, this effect can be much larger in magnitude. We show evidence of a highly heterogeneous program effect across municipalities. Overall, this finding indicates that for the described areas, the program can have a positive significant effect on formal employment. In Section 2, we review mechanisms that interplay the relation between the program and labor variables.

We build a panel with administrative data, between years 2004 and 2016, from the Ministry of Social Development (MDS), containing information about the program's resources allocation, and from *Relação Anual de Informações Sociais* (RAIS), on the universe of formal working relations in Brazil. Using MDS data allows us to overcome the problem of measurement error on the treatment intensity variable which, in previous work, was identified from participants' self reports. In addition, RAIS provides us with detailed information on labor relations, allowing us to conduct an heterogeneity analysis on our estimates. We decompose our dependent variable according to workers' gender and firms' sector to encompass the programs effects on activity.

We explore the variation of the number of beneficiary families across municipalities over time to estimate the program's effect on formal working relations. Since the program was implemented non-randomly, it might be correlated to non-observables that determine labor markets and correlate with the number of beneficiaries at that the municipal level. Our goal is to shed light on the heterogeneity of program's effect. By doing that at municipal level, we want to calculate the value of the program's liquid impact including the spillover effects that may not be captured at individual level. To do so, we apply a fixed effect with state-specific time trend approach on our administrative panel data.

The remainder of this article is organized as follows. In section 2, we describe the program's background. Section 3 contains a description of the data and the methodological strategies applied in this work. In section 4, we present the baseline results and analyze the heterogeneity of program's impact. Robustness exercises are presented in section 5, followed by the conclusion.

2

Background of Bolsa Família program

In this section, we present a background of the program. We start describing the program's institutional design, followed by a brief review of the literature on the effects of CCT programs on activity. Finally, we present a discussion about elements that play a role in linking transfers and labor market activity.

2.1

Institutional Design

Created in 2003, Bolsa Família is a federal conditional income transfer program with the objective of reducing poverty and breaking its intergenerational transmission. The program was developed through the unification of pre-existing conditional and unconditional social policies such as the Bolsa Escola, Bolsa Alimentação, Cartão Alimentação and Ajuda Gás.¹

The program target Brazilian families in a state of poverty and extreme poverty, selected by the Ministry of Social Development (MDS). To receive the benefit, families must register in an Unified Register for Social Programs (CADUNICO). From this record, MDS grants the benefit directly to eligible individuals to the program conditional on the fulfillment of some conditionalities.

The program grants the so-called basic benefit (R\$70 in 2015) unconditionally to families living in extreme poverty, which in 2015 included families with per capita family income below R\$ 85 per month. Families in poverty are granted other variable benefits, which are accumulated by families in extreme poverty. The two main ones are: the *Benefício Variável*, paid to families with pregnant women and/or children aged 0 to 15 years; and the *Benefício Variável Jovem*, paid since 2008 to families with 16 or 17 year olds. These sort of benefits correspond to transfers of R\$32 and R\$38, respectively, and are limited to five and two per family depending on the number of individuals who meet the eligibility characteristics.

¹For more detailed information on Bolsa Família background, Soares (2012) makes a historical description of PBF's institutional design and implementation, and it discusses various program impact assessments on inequality, poverty, schooling and nutrition outcomes.

The program's health conditionalities require growth monitoring, maintenance of the vaccination schedule for children under 7 years of age, and regular pre and post-natal visits at maternity health centers. Educational requirements include the enrollment of all children between the ages of 6 and 15 and a minimum attendance of 85% in classes. Registration for 16 and 17 year olds is also required, but the minimum school attendance required is 75%. Variable benefits are paid to families by December of the year in which the child reaches 15 or 17 years.

The program is funded with federal government resources and operated jointly by the municipal and federal governments. The resources allocated to each municipality are defined by the federal government based on estimates of the number of poor families. In turn, municipalities are responsible for family registration, eligibility verification and decisions about school enrollment (33). The transfers to the families are made by the Ministry of Social Development directly to the family accounts, accessed through a debit card.

2.1.1

Impacts of CCTs programs: mechanisms and the literature

In this section, we argue that CCT effects have, in principle, an ambiguous sign on employment since it can create positive and negative incentives on individuals' supply labor. We then review the empirical literature and find that most studies on this topic find a significant, albeit small, effect of CCT on labor participation.

There two factors that play a role in determining labor supply in the model at the individual level. The first is the interaction of income and substitution effects. If leisure is a normal good, an increase in the individual's disposable income would imply greater consumption of leisure and, consequently, less available time for other activities. By consuming more leisure, its shadow price increases, reducing the opportunity cost of labor. The second arises when transfers act as taxation to work: an individual will be discouraged from working if she understands that the income increase from work affects her eligibility status. Mechanisms through which income transfers could encourage labor supply are mentioned by (5). The first is the poverty trap alleviation, which allows for minimum conditions to individuals engage in productive activities (11). The second reason is the alleviation of credit restrictions capable of stimulating beneficiaries to start or expand their own ventures (19).

From the family point of view, the program's impact on labor supply depends on the extent to which transfers' income and substitution effects act on the time allocation of its members. As many programs condition the benefit to the child's school attendance, in families with school-aged children, this leads to an increase in the relative value of attending school in relation to other activities (leisure and work). The consequence is ambiguous and depends on how adults allocate the time endowment that arises from the decrease of childcare activities. If, on the one hand, this novel suggest that the program could exert in principle both positive and negative effects on labor decisions, on the other, the empirical literature has found its impact to be insignificant.

Among the studies that examine the program's impact at individual level, (13) estimates the effect of the Brazilian CCT program on both the participation rate and the number of hours worked by male and female adults in urban and rural areas. Their estimates on the participation rate are small in magnitude and statistically insignificant for both males and females in urban and rural areas. As for the estimates on hours worked, the results show negative effect for males in both areas and females in rural areas, and a positive impact for urban women. (26) use neighborhood level data from PNAD, taking the proportion of beneficiaries households as treatment in a generalized propensity score model and estimating difference-in-difference impacts. They find that the program has no significant effect on labor force participation or unemployment on average. However, they show evidence that the program causes a significant decrease in formal-sector participation and a significant increase in informal-sector participation in urban areas, of about 2 percent points, which would imply a shift from formal to informal sector. On the other hand, (6) investigate the program's impact on the labor market composition between formal and informal sectors by applying a fuzzy RDD strategy to the PNAD 2006 data and argue that the program does not have an impact on individual labor choices. (34) employs matching methods with different control groups to estimate the impact of CCTs on labor supply of beneficiary Brazilian mothers. She argues that, although the program generates a negative wealth effect on mothers' working decisions, the net effect is positive due to a higher substitution effect arising from the reduction of children's labor supply and from the rise in mother's available time. Finally, (9) uses data from a series of interviews with Bolsa Família beneficiaries in 2005 and 2009 conducted by the MDS to evaluate the program's impact on individual labor outcomes. They apply a propensity score matching to calculate the average treatment on treated effect and find no significant impact on labor force participation or hours worked, although they find evidence of a shift from formal to informal

labor driven by urban households.

At the municipality level, the study of the effects of Bolsa Família program on labor outcomes requires some considerations about its differences in relation to the individual level. Besides factors that are relevant to analyze how the program affects individual decision making, at more aggregate levels, different spillover effects play an important role in defining the its final direction. These effects arise from the different paths transfers follow within the municipality. Therefore it is important to consider how beneficiaries allocate their benefits and, in our case, how they flow within the municipality. For instance, beneficiaries can have particular consumption habits, they can invest the money in personal ventures - since it also alleviates credit constraints (19) - or they can lend their transfers to relatives in need (4). These different ways of allocating the transfers create heterogeneities on the impact they have on the local labor markets. We differ our work from the literature by taken these heterogeneities into consideration.

To the best of our knowledge there are just two studies on the matter at the municipal level. (7) develops a panel quantile regression model of the distribution of Bolsa Família outcomes across municipalities using PNAD data between 2003 and 2009, in order to examine heterogeneities in program's outcomes. Their point estimates show no significant effects on adult labor force participation. (14) analyze the program's effect, measured by the proportion of beneficiaries, on the participation rate on labor market and on the average number of hours worked for men and women. They use a time-series of cross-sectional data from National Household Sample Survey (PNAD) at municipal level between 2001 and 2005. The chosen empirical approach was to apply five different non-experimental methods on the data: OLS, Random and Fixed Effects, First Differences and GMM. They find a significant, albeit small, impact on male labor market participation rate and insignificant impact for other interest groups.

In Brazil, most studies evaluating the Bolsa Familia program rely on the analysis of cross-sectional data from PNAD (National Household Sample Survey). Except for supplements in 2004 and 2006, this survey data lacks a direct question about the program participation to identify potential Bolsa Família beneficiaries. Works on the subject identify beneficiaries through unique monetary values from the benefit reported under a question on residual income. This indirect approach using the unique values strategy on a self-reported questionnaire naturally generates a measurement error on the treatment variable, since beneficiaries may make mistakes in completing it. Besides this, at municipal level PNAD's data is not representative nor identify

municipalities. This imposes an additional measurement error on works at this level and also prevents them from exploring heterogeneities of the program's impact. By using MDS data identified at municipal level, we are able to overcome this measurement issue and we contribute to the literature by exploring heterogeneities of the effect across municipalities.

Concerning works studying the relation of labor supply outcomes and CCT programs outside Brazil, (5) re-analyze data from seven randomized controlled trials of government-run cash transfer programs in six developing countries throughout the world, and find no systematic evidence that cash transfer programs discourage work. Evidence suggest that programs in Mexico ((?), (30), (31), (32)), Honduras ((15), (20)), Morocco (8), Philippines (?), Indonesia (35) and Nicaragua (?) have no effects on overall working probability and little to no effects on hours worked. Among the studies that found significant effect, the evidence documented suggest the existence of shifts on the type of work done, rather than the total amount of work. (15) find a small switch to within-house work due to the PRAF program in Honduras. (31) identify a switch from agricultural to non-agricultural work for the PAL program in Mexico. Besides these, some studies on non-experimentally implemented programs ((1), (16)) also find evidence of a shift from formal to informal work.

3

Data and Empirical Strategy

In the Bolsa Família's literature, the task of estimating its transfers effects is especially challenging. Since the program was implemented non-experimentally, we require some strong conditions to estimate its causal effect on labor outcomes. The identification of our coefficient depends on the assumption of orthogonality between our treatment variable and the error term. Our goal will be to investigate its impact by estimating and encompassing the link between the variables of interest.

3.1

Data

The main data sources used are the *Relação Anual de Informações Sociais* (RAIS) and the Ministry of Social Development (MDS) database, which have administrative data on the universe of formal labor relations and the allocation of Bolsa Família program's resources, respectively. The combination of RAIS and MDS data gives us some advantages in comparison to previous works which use data from PNAD (National Household Sample Survey).

The MDS administrative data contains information on the number of beneficiary families, and the amount transferred to each municipality by Bolsa Família. The data is available from 2004, the program's start year, until 2016. Most works on Bolsa Família make use of PNAD and identify beneficiaries through unique values reported under a question on residual income. This indirect approach using the unique values strategy on a self-reported questionnaire naturally generates a measurement error on the treatment variable, since beneficiaries may make mistakes in completing it. Besides this, PNAD does not identify municipalities and it is not representative at the municipality level. Our administrative data allows to overcome these measurement error issues on the explanatory variable since it reflects the actual amount of beneficiaries for each Brazilian municipality and also explore municipalities' heterogeneities since it identifies them.

The RAIS dataset contains information on pairings between firms and workers in Brazil, including public administration. Every year, companies with tax registration in the country must submit the list of all labor relations established by them at any time in the previous year. This registration granted to the Ministry of Labor and Employment is required by law and its noncompliance by the company is subject to a fine. Therefore, RAIS registers the universe of labor contracts in Brazil, containing diverse information on both parties involved, among them: age, gender, schooling, contracted hours, compensation, sector, establishment size, reason for dismissal and, since 2002, contracts start and end dates. In this range of variables, we make use of aggregate data by municipality on the amount of formal links broken down by worker's gender and firm's sector between 2004 and 2016. To the best of our knowledge, this is the first work on Bolsa Família which uses this data source, which allows to contemplate the universe of formal workers in the country, besides a fine discrimination of labor relation characteristics. The possibility of a more representative municipality analysis granted by RAIS data come at the cost of absence of information about the informal sector. This imposes a drawback to our study of program's effect on formal labor relations since, by using this data, we are not able to analyze the effect over informal employment.

Finally, in addition to these, more variables were collected to test for alternative channels through which the program could correlate with labor market outcomes at the municipal level: (i) the municipal population obtained from the estimates produced by IBGE (Brazilian Institute of Geography and Statistics); (ii) an indicator variable for the municipal coverage of the Family Health program per year from the Ministry of Health, through its Basic Attention Department ('Departamento de Atenção Básica'); (iii) the municipalities child mortality rate and (iv) the proportion of births whose mothers had less than 4 years of schooling, both extracted from Datasus database; (v) the volume of rains, obtained from (22), with which we constructed a variable indicating if the municipality annual volume of rains is less than one standard deviation from its historical average, as in (28); (vi) the amount of credit granted by BNDES (National Development Bank) broken down by the financed project's municipality of destination; (vii) the active mayor's party from data provided by the TSE (Supreme Electoral Court), based on the Transparency Law, with which we constructed an indicator variable for the coincidence with the active president's party.

3.2

Methodology

Different linear regression specifications are used to investigate the conditional cash transfer program effect on labor at municipal level. In all specifications, the dependent variable is the (log of the) amount of formal employment and the independent variable is the (log of the) number of beneficiary families.

The initial specification used as baseline throughout this work is presented below. Consider the following equation for the municipality $j = 1, \dots, J$ in year $t = 2004 \dots 2016$:

$$\log(y_{jt}) = \alpha_j + \beta \cdot \log(X_{jt}) + \gamma \cdot \log(pop_{jt}) + \epsilon_{jt} \quad (1)$$

where y_{jt} represents the activity variable measured by the number of formal employment contracts in municipality j at time t , X is the number of beneficiary families and α_j is a fixed-effect term to control for possible time-invariant non-observable factors within municipality j .

Instead of taking logs of the number of beneficiaries per capita, we opt for the more flexible specification with the log of the population, denoted by pop_{jt} , as a control. Finally, ϵ_{jt} is a zero-mean error term, taken as uncorrelated between municipalities from different states and correlated within the same state and hence clustered at state level.

The identification of β , our parameter of interest, relies on the assumption of orthogonality between our independent variable and the error term. This assumption requires the absence of time-variant non-observables correlated simultaneously to our dependent and independent variables. In an ideal scenario, this means all time-variant non-observable factors affecting both the amount of Bolsa Família beneficiaries and formal employees in a given municipality were included in our specification. As both of these variables are highly correlated with social-demographic factors, the chosen strategy to mitigate the noise was to estimate progressively restrictive specifications with different kinds of time trends and control variables. This method imposes the cost of reducing our dependent variable variation. In section 5, we test for alternative channels in order to substantiate that our results are not driven by omitted factors.

Our second specification includes indicator variables for each year of the sample, which allows us to control by time-variant non-observed variables common to all municipalities. The third specification includes a linear state-specific time trend, allowing to capture a common linear trend to municipalities within the same state. On the fourth specification, presented below, we include a non-linear state-year time trend, denoted by the term η_{kt} . This allows us to

capture a non-linear trend common to all municipalities within the same state, denoted by the k index, a considerably more restrictive specification than the previous ones.

$$\log(y_{jkt}) = \alpha_{jk} + \eta_{kt} + \beta \cdot \log(X_{jkt}) + \gamma \cdot \log(\text{pop}_{jkt}) + \epsilon_{jkt} \quad (2)$$

The identification of our parameter of interest now relies on a similar orthogonality assumption to the aforementioned one, requiring the absence of non-observable variables correlated simultaneously to our dependent and independent variables. Nevertheless, different from the previous case, we now allow for the presence of some time-variant non-observable variables according to the different time trends included.

Using the latter, the most restrictive specification with state-specific time trend, we estimate heterogeneous effects of the variable of interest according to municipalities demographic characteristics. Our objective is to show evidence that the program's impact can be highly heterogeneous among municipalities because of spillover effects it generates. In this regard, we constructed five sets of indicator variables able to capture municipalities demographic characteristics in different ways. The first set indicates the Brazilian region of the municipality, while the next four indicate the fifth of the following distribution in which the municipality is located according to the following variables: (i) the density of program's beneficiaries; (ii) the density of formal jobs; (iii) per capita income; and (iv) population. We averaged our variable values between 2004 and 2016 to determinate these distribution. The specification used is shown as follows:

$$\log(y_{jkt}) = \alpha_{jk} + \eta_{kt} + \sum_{m=Q1}^{Q5} \beta_m \cdot 1_{jkt}^m \cdot \log(X_{jkt}) + \gamma \cdot \log(\text{pop}_{jkt}) + \epsilon_{jkt} \quad (3)$$

where 1_{jkt}^m represents the each one of the five sets of dummy variables indicating the fifth of distributions mentioned above and η_{kt} is the nonlinear trend associated with the state k . The orthogonality assumption here is the absence of time-variant non-observable variables correlated simultaneously to our dependent and independent variables, except for those varying in municipalities within the same state.

Finally, to explore how non-observable factors correlated both with our dependent and independent variables can affect our estimates, we add controls, denoted by E_{jkt} , to the previous specification. Our objective here is to encompass how the chosen dimensions are capable of interfere in our estimates of interest.

$$\begin{aligned}
\log(y_{jkt}) = & \alpha_{jk} + \eta_{kt} + \sum_{m=Q_1}^{Q_5} \beta_m \cdot 1_{jkt}^m \cdot \log(X_{jkt}) + \gamma \cdot \log(pop_{jkt}) \\
& + \theta_0 \cdot E_{jkt} + \sum_{m=Q_1}^{Q_5} \theta_m \cdot 1_{jkt}^m \cdot \log(X_{jkt}) \cdot E_{jkt} + \epsilon_{jkt}
\end{aligned} \tag{4}$$

In all models, standard errors were clustered at the state level and were calculated through the standard sandwich estimator to account for heteroskedasticity.

4 Results

4.1 Baseline Results

In Table 10.1, we present coefficients regarding our baseline specifications. The first column refers to the equation (1), and the following ones refer to variations on equation (2). The sequence was chosen in an attempt to order specifications according to their degree of constraint: in the first specification only municipality fixed effects are included; with then year dummies, state linear trend and state-year trend in the second, third and fourth columns, respectively. The coefficient of interest is associated to the number of beneficiary families' effect on the overall formal employment within the municipality.

All point estimates shown in the table are positive and significant at the 1% level. The elasticity obtained from our less restrictive exercises - with no time trend - is 0.239, while from our most restrictive - with state-year dummies - is 0.024. The last exercise implies that a 10% increase in the number of beneficiary families is correlated to a 0.24% increase in the amount of formal employment within the municipality. The results seem to corroborate the idea of a potential positive effect on local activity. The hypothesis underlying the estimation of a causal relationship between our variables is the orthogonality assumption. It requires the absence of time-variant non-observables correlated simultaneously to our dependent and independent variables. By using progressively restrictive specifications with different time trends, our goal is to guarantee this hypothesis - by controlling for potential non-observable factors at state and country level varying through time - regarding that by doing this it is possible to extract a part of the variation from our dependent variable related to the effect of interest. We chose the last specification with state-year dummies to continue our exercises in order to analyze the effect's heterogeneities.

4.2

Effects according to social demographic characteristics

In this section, we present our estimates of the program's impact on local activity according to demographic heterogeneities. To do so, we make use of an interaction between the program's treatment variable with five sets of indicator variables accessing municipalities demographic characteristics. The first set indicates the municipality's region¹ and the following ones indicate the fifth in which the municipality is according to the following distributions: (i) density of beneficiaries, (ii) density of formal employees, (iii) per capita income and (iv) population. By creating these indicator variables at municipality level, we access some social demographic characteristics. Our goal is to show that the effect is heterogeneous across units according to the measures proposed. The intuition here is that, as poorer municipalities have higher concentrations of beneficiaries, spillover equilibrium effects would be potentially higher on them, amplifying program's impact. The calculated coefficients for each set of dummies are presented on each columns of Table 10.2 and summarized on Figure 9.2 where bars represent the interval confidence at a 5% level built around the point estimates for each independent variable.

The first column of Table 10.2 shows the average estimates by Brazilian regions. The overall estimates are significant at a 1% level for the North, Northeast and South regions, in which only the latter is negative. The greater impact in absolute values happens in the North and Northeast, regions that concentrate a great number of program's beneficiaries. The elasticity calculated for these two regions indicates that a 10% increase in the number of beneficiary families is correlated on average with an increase of 0.93% and 0.70% of formal employment in this group of municipalities. This indicates an effect of 3 to 4 times greater in comparison to the average effect calculated in the fourth column of Table 10.1.

In the second column of Table 10.2, we present the estimates for the program's impact according to its intensity in each municipality measured by density of beneficiary families in the population. It is possible to observe that point estimates are higher for municipalities with more beneficiaries. The estimates for the third, fourth and fifth fifths are all positive and significant at 1%. The elasticity calculated for the last fifth indicates that an increase of 10% of beneficiaries is correlated with a 0.75% increase in formal employment in these municipalities, three times the baseline effect.

¹In this case, dummies D1 through D5 indicate if the municipality is located in regions North, Northeast, Southeast, South and Center-West, respectively.

In the third column of Table 10.2, we present the impact estimates according to the concentration of formal jobs in each municipality measured by the ratio of jobs to the population. Only the estimate for the first fifth, indicating municipalities with the lowest densities of formal employment, is positive and significant at a 1% level. It shows out a positive correlation with the variables of interest, where an increase of 10% of the former is associated with an increase of 1.31% of the latter, approximately five times the average effect initially estimated.

In the fourth column of Table 10.2, we present the estimates for the program's affect according to the distribution of par capita income among the municipalities. Once again it is possible to notice that point estimates are higher for municipalities in the lower ends of income distribution, although only the estimate for the first fifth is positive and significant at a 1% level. It indicates that a 10% expansion of the program is correlated with a 0.9% increase in formal employment in municipalities located in the first fifth of per capita income distribution.

Finally, we present the estimates for the program's affect according to the distribution of municipal population in the last column of Table 10.2. Only the estimates for the third and fourth fifths are significant at a 1% level for the estimation with overall employment. They indicate that a 10% expansion of the program is correlated with a 0.57% and 0.44% increase in filled job vacancies in municipalities located in those fifths of municipal population distribution.

To investigate whether the impact is different among genders, we repeat each specification using overall employment filled by either men or women as dependent variables. We summarize results from Tables 10.3, 10.4, 10.5, 10.6 and 10.7 on Figure 9.3 where bars represent the interval confidence at a 1% level built around the point estimates for each independent variable for either male and female. We also add to the figure a dot as reference for the estimate values for overall employment. It is possible to see from the figure that point estimates are higher for women in comparison to men and overall estimates in all cases analyzed, though we are not able to say that they are statistically different.

In general, these results show evidence that the program's effect is highly heterogeneous across municipalities and it can reach until five times its baseline estimates in the poorest ones. Our estimates suggest that, on these municipalities, a 10% expansion in the program is associated with an increase of 1% on formal employment. This suggest that, due to potential spillover effects, Bolsa Familia could have different impacts on municipalities that concentrate a large number of beneficiaries or have underdeveloped labor

markets, where the marginal return of the program on employment is greater. In terms of policy, these heterogeneities can point to potentially more efficient implementation methods. For instance, to associate the grant of the benefit to an economic stimulus to municipalities with less developed labor markets in order to magnify its effect on employment. The results also suggest that the estimated effect would be greater for women than for men, potentially because they would be more favored in terms of time allocation as argued by (34).

4.3

Effect heterogeneities according to sector

In this section, we attempt to encompass the effect found so far by exploring one of its heterogeneities and taking advantage of RAIS high refinement data. To do so, we perform regressions conditioning our dependent variable on some dimensions instead of using the overall amount of formal employment in the municipality. We condition our aggregate employment variable according to firms' sector and size, and workers' compensation and schooling. For each decomposition on the dependent variable, we reproduce previous econometric exercises including the five sets of social demographic indicator variables. We present the results in tables and summarize it on figures where bars represent the interval confidence at a 1% level built around the point estimates and dots correspond to the estimate for overall employment, added as reference.

The estimates for our dependent variable conditioned on firms' sector are shown on Tables 10.8, 10.9 and 10.10, and are summarized on Figure 9.4. We condition formal employment according to firm' sector by discriminating it in four categories. They are: first sector, for agricultural and land related activities; second sector, for industrial activities; third sector, for services; and public sector. Results in Figure 9.4 suggest that in general the effect is significant for employment in the third and public sectors and insignificant in the first and second sectors. In first sector, estimates are positive and significant only for the Center-West. In third and public sector, on the other hand, point estimates are positive and significant in municipalities located in the North and Northeast regions; with the highest density of beneficiaries; with the lowest density of formal employment; and with lowest levels of income distribution. In general, the point estimates for employment in the public sector are higher than the overall ones, while those for the third sector are smaller.

The results in this section suggest that the program's effect on labor activity on working relations can be also heterogeneous according to firms' characteristics. They indicate that the effect on working relations is significant on firms in the third and public sectors. For instance, point estimates suggest

that, on municipalities with low densities of formal employment, a 10% expansion in the program is associated with an increase of 0.75% on employment in third sector. One possible explanation for this effect can be the expansion in the demand for services, following the increase in overall income brought by the program. If we also take into consideration that the effect for women was bigger than for men, one could suggest also that these new matches employer-employee occurs with jobs preferentially filled by the first group. In terms of policy, these results also point to potentially more efficient implementation methods.²

4.4

Mapping the heterogeneity

In this section, we perform an exercise to illustrate quantitatively the program's impact on formal employment. In particular, we explore the impact of a 10% expansion on program's beneficiaries on employment across municipalities. Our goal is to substantiate the argument that the program's effect on employment is highly heterogeneous. To do this, we perform a regression including the five sets of indicator variables previously created to estimate the predicted impact considering all social demographic heterogeneities proposed, according to the following specification:

$$\log(y_{jkt}) = \alpha_{jk} + \eta_{kt} + \gamma \cdot \log(pop_{jkt}) + \sum_{v=V1}^{V5} \sum_{m=Q1}^{Q4} \beta_m \cdot 1_{jkt}^{vm} \cdot \log(X_{jkt}) + \epsilon_{jkt} \quad (5)$$

Results are presented on Figure 9.8 and 9.9. Our exercise points that, on average, a 10% program's expansion on Brazilian municipalities is associated to an increase of 0.2% on employment. The maximum predicted impact happens in Araçás (BA), Dom Basílio (BA) and Lavandeira (TO). On these municipalities, a program expansion of 10% in beneficiaries is associated with an increase of 2.1% on formal employment. On the other hand, the minimum impact happens in Guaratube (PR), Laranjeiras do Sul (PR), Bagé (RS) and Santiago (RS). For the same expansion in the program, estimates point to a decrease of 0.7% on formal work relations on these municipalities. The figure shows that the effect is heterogeneous according to Brazilian regions. In general, results show that the program's impact on employment for municipalities in South and Southeast regions is negative, while for municipalities in the North and Northeast regions are positive. This fact has an interesting implication in terms of policy: the program's implementation could be done non-uniformly across regions in order to mitigate potential undesired effects.

²A further analysis on the heterogeneities of program's effect according to firms' characteristics is presented on the Appendix.

5 Robustness Analysis

The validity of our estimations depends on the assumption of orthogonality between our independent variable and the error term, that is, the absence of time-variant non-observables correlated simultaneously to our dependent and independent variables. On our more restrictive specifications, in which we include state-year trends, we allow for the presence of non-observables varying in time common to municipalities within the same state. In an ideal scenario, we would have included in our specification all relevant time-variant non-observables affecting both the amount of Bolsa Família beneficiaries and formal employees. As both of these variables are highly correlated with social-demographic factors, this hypothesis is unlikely to be met. In this section, we seek to explore some possible channels that affect the municipality's activity level simultaneously to the program. We add control variables, as described in equation (4), to the five heterogeneous regression specifications, in order to substantiate that our results are not driven by these specific omitted factors. We test for following channels that could jointly affect the program amount of beneficiaries and local labor markets: health, education, climatic shocks, financial flows and political influence, taking advantages of variables already employed in the literature.

We present our results on Tables 10.20 through 10.25, where we control for the variables associated to the channels mentioned. We summarize those results on Figures 9.10 through 9.15, where bars represent the interval confidence at a 1% level built around the point estimates and dots, added as reference, corresponds to the baseline estimates for overall employment. Overall, despite minor variations on the absolute values, our coefficients of interest do not seem to be significantly altered by the inclusion of these control variables, suggesting some degree of robustness in relation to them.¹

¹The complete robustness analysis of program's effect is presented on the Appendix.

This work examines the impact of conditional cash transfers on formal employment. We address this question at the municipal level in the context of Bolsa Família in Brazil. We explore the variation of beneficiary families on the number of formal relations considering social demographic characteristics. By looking at an aggregate level, we are able to capture potential spillover effects from program on non-beneficiaries, impossible at individual level. We apply a panel approach on combined administrative data on program enrollment (MDS) and the universe of formal working relations in Brazil (RAIS) between years 2004 and 2016. By doing this, we were able to overcome the measurement error in the independent variable, related to the use of PNAD survey which collects data that is not representative at municipal level, commonly adopted in the literature on this subject. Different from most studies on the outcomes of antipoverty transfer programs that focus on mean effects, we assess the impacts of interest on both mean outcomes and conditional on social demographic dimensions to investigate the effect of interest heterogeneity. Results were obtained separately for males and females and also for employment conditioned on some dimensions in order to assess the its heterogeneities.

The elasticity estimated for the average effect on municipalities is 0.024, corroborating findings in the literature suggesting that transfers would have an insignificant average effect on labor outcomes. Yet, by considering social demographics characteristics, we show that for a subsample of municipalities - poor, in the North and Northeast regions, with high densities of beneficiaries or low densities of formal employment - this effect can be much larger in magnitude. We estimate coefficients five times higher than baseline results for this subset of municipalities. This corroborate the idea that the program can have a highly heterogeneous effect across municipalities when social demographic dimensions are considered.

RAIS data provides us refined data on employments in municipalities, according to firms' sector and workers' gender. Our point estimates for the program's impact on employment are slightly higher for women in comparison to men in all cases analyzed, although we are not able to say that they are statistically different. By considering firms' characteristics, we show evidence

that the effect on employment is heterogeneous according to firms' sector. Our estimates show that the effect is particularly higher for firms in the third and public sector.

Finally, to substantiate our argument, we perform a quantitative exercise to assess the impact of a 10% expansion of program's beneficiaries on formal employment by considering all social demographic dimensions previously considered. Our results point that the average effect of this expansion in municipalities is, in fact, close to zero. Nevertheless, predicted values for this expansion on municipalities vary from -1.1% to 2.2%. This corroborates the argument on the higher heterogeneity of program's effect on employment.

To substantiate that our results are not driven by omitted factors, we perform robustness checks. We show evidence that the assessed effect on employment does not remarkably change when educational, health, political, climatic and financial variables are considered.

Our findings have important implications in terms of policies. We show the magnitude of effect's heterogeneity through some simple measures of social demographic characteristics. Through this, it is possible to think about different implementation methods or associated measures in order to optimize program's impact by mitigating potential undesired effects.

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Appendix A - Heterogeneities: Conditioning effects on employment according to sector, size, compensation and education

In this section, we attempt to encompass the effect found so far by exploring some of its heterogeneities and taking advantage of RAIS high refinement data. To do so, we perform regressions conditioning our dependent variable on some dimensions instead of using the overall amount of formal employment in the municipality. We condition our aggregate employment variable according to firms' sector and size, and workers' compensation and schooling. For each decomposition on the dependent variable, we reproduce previous econometric exercises including the five sets of social demographic indicator variables. We present the results in tables and summarize it on figures where bars represent the interval confidence at a 1% level built around the point estimates and dots correspond to the estimate for overall employment, added as reference.

The estimates for our dependent variables conditioned on firms' sector are shown on Tables 10.8, 10.9 and 10.10, and are summarized on Figure 9.4. We condition formal employment according to firm' sector by discriminating it in four categories. They are: first sector, for agricultural and land related activities; second sector, for industrial activities; third sector, for services; and public sector. Results in Figure 9.4 suggest that in general the effect is significant for employment in the third and public sectors and insignificant in the first and second sectors. In first sector, estimates are positive and significant only for the Center-West. In third and public sector, on the other hand, point estimates are positive and significant in municipalities located in the North and Northeast regions; with the highest density of beneficiaries; with the lowest density of formal employment; and with lowest levels of income distribution. In general, the point estimates for employment in the public sector are higher than the overall ones, while those for the third sector are smaller.

The estimates for our dependent variables conditioned on firms' size are shown on Tables 10.11, 10.12 and 10.13, and are summarized on Figure 9.5. We condition formal employment according to firm' size by discriminating it in four categories. They are: size 1, for firms with less than 10 workers; size 2, for firms employing between 10 and 50 workers; size 3, for firms employing between 50 and

250 workers, and size 4, for firms employing more than 250 workers. Results in Figure 9.5 suggest that in general the effect is significant on employment in firms in the first and fourth categories and insignificant in the second and third ones. Point estimates for significant categories are positive and significant in municipalities located in the Center-West and Southeast regions; with the highest density of beneficiaries; with the lowest density of formal employment; and with the lowest level of income distribution. In general, the point estimates for employment in the bigger firms are higher than the overall ones, while those for the smaller firms are smaller.

The estimates for our dependent variables conditioned on workers' compensation are shown on Tables 10.14, 10.15 and 10.16, and are summarized on Figure 9.6. We condition formal employment according to workers' compensation by discriminating it in four categories. They are: range 1, for employees earning less than 1.5 reais per hour; range 2, for employees earning between 1.5 and 4 reais per hour; range 3, for employees earning between 4 and 10 reais per hour, and range 4, for employees earning more than 10 reais per hour. Results shown on Figure 9.6 suggest that in general the effect previous captured is significant for the categories 1, 2 and 3 and insignificant for category 4. Point estimates for the significant categories of employment are positive and significant in municipalities located in the North and Northeast regions; where the density of beneficiaries is higher; where the density of formal employees is smaller; and where per capita income is smaller.

The estimates for our dependent variables conditioned by workers' schooling are shown on Tables 10.17, 10.18 and 10.19, and are summarized on Figure 9.7. We condition formal employment according to workers' schooling by discriminating it in four categories. They are: level 1, for employees with incomplete primary education; level 2, for employees with incomplete junior high school; level 3, for employees with incomplete high school; and level 4, for employees complete high school or more. Results shown on Figure 9.7 suggest that in general the effect on employment previous captured is significant in all groups for the same subset of municipalities pointed in the previous paragraph.

The results in this section suggest that the program's effect on labor activity on working relations is also heterogeneous according to firms' and workers' characteristics. They indicate that the effect on working relations is significant on firms in the third and public sector and in the smallest and biggest categories of size. For instance, estimates point that, on municipalities with underdeveloped of formal markets, a 10% expansion in the program is associated with an increase of 3.8% on employment in firms with more than 250 workers. In terms of policy, these results also point to potentially more efficient implementation methods.

The validity of our estimations depends on the assumption of orthogonality between our independent variable and the error term, that is, the absence of time-variant non-observables correlated simultaneously to our dependent and independent variables. On our more restrictive specifications, in which we include state-year trends, we allow for the presence of non-observables varying in time common to municipalities within the same state. In an ideal scenario, we would have included in our specification all relevant time-variant non-observables affecting both the amount of Bolsa Família beneficiaries and formal employees. As both of these variables are highly correlated with social-demographic factors, this hypothesis is unlikely to be met. In this section, we seek to explore some possible channels that affect the municipality's activity level simultaneously to the program. We add control variables, as described in equation (4), to the five heterogeneous regression specifications, in order to substantiate that our results are not driven by these specific omitted factors. We test for following channels that could jointly affect the program amount of beneficiaries and local labor markets: health, education, climatic shocks, financial flows, political influence.

As documented by (27), the improvement of regional health indicators can have a positive impact on labor outcomes, by improving individual capacity to work. It is thus possible that health is positively correlated with labor market and negatively with PBF, which would underestimate the baseline effect in absence of this control. On Tables 10.20 and 10.21, we show results including as control an indicator variable for the presence of Saúde da Família - a program created by the federal government to improve national health indicators - and a variable that measures the municipalities' child mortality, respectively. We summarize those results on Figures 9.10 and 9.11, where bars represent the interval confidence at a 1% level built around the point estimates and dots, added as reference, corresponds to the baseline estimates for overall employment. On Table 10.20, the calculated F statistics indicate that there is no gain in explanatory power with the inclusion of these new terms to the model, at a 1% level. Nevertheless, on Figure 9.10, it is possible to notice that the estimates for variables of interest are higher than reference values. On the other hand, the calculated F statistic on Table 10.21 indicate that the included variables are jointly significant at a 5% level. Despite

this, estimates for our variables of interest change very little by this inclusion.

We use the proportion of births in which the mother had less than 4 years of study as a proxy for education in order to control schooling non-observables. The municipality educational level correlates to our dependent variable in the extent to which it determinates overall labor productivity and therefore the speed that work relations are made. By the other side, the municipality educational level is correlated to the Bolsa Família impact on the municipality, since the program conditions the benefit on income, a variable highly correlated to educational stock. On Table 10.22, we show results including this variable as control in our specification. We summarize these results on Figure 9.12, where bars represent the interval confidence at a 1% level built around the point estimates and dots corresponds to the baseline estimates for overall employment. The calculated F statistics indicate that the included variables are jointly significant at a 1% level. Results shown on Table 10.22 point that this addition generates a negative liquid effect on the estimates for our variables of interest, even though point estimates are higher when looked apart.

A relevant part of municipalities whose beneficiaries concentrations in relation to the population overcome 50% are located in the Brazilian semi-arid region. This factor makes them very sensitive to climatic variations, especially to fluctuations in precipitations volume. (28) present evidence that such oscillations have positive impacts on local health and labor outcomes. By the other side, it can correlate to the program because families can be dependent of familiar agriculture and their application to the program can depend on food they can cultivate. On Table 10.23, we show results including as control an indicator variable it indicates periods in which rainfall volume was lower than one standard deviation of its historical average. We summarize those results on Figure 9.13, where bars represent the interval confidence at a 1% level built around the point estimates and dots corresponds to the baseline estimates for overall employment. From the figure, it is possible to see that the inclusion made has little effects on estimates for our variables of interest. Moreover, the calculated F statistic indicates that there is no gain in explanatory power, at a 1% level, with the inclusion of these new terms to the model.

To address for potential non-observables arising from other monetary flows directed to municipalities, we include a variable for the amount of BNDES (Banco Nacional do Desenvolvimento) transfers to the municipality. Since the flows are monetary and are directed to specific projects in the municipality, they might correlate with both our dependent and independent variables. The results are presented on Table 10.24 and summarized on Figure 9.14, where bars represent the interval confidence at a 1% level built around the point estimates and dots

corresponds to the baseline estimates for overall employment. The calculated F statistic indicates that the included variables are jointly significant at a 1% level. Results shown on Table 10.24 point that this addition generates a negative liquid effect on the estimates for our variables of interest, since all interaction terms are negative and significant.

To account for potential political influence, we add a variable indicating the party coincidence between municipal and federal administrations. The idea here is an attempt to control for biased political decisions capable of affecting simultaneously the employment level and the program's resource allocation within the municipality. The results are presented on Table 10.25 and summarized on Figure 9.15, where bars represent the interval confidence at a 1% level built around the point estimates and dots corresponds to the baseline estimates for overall employment. The calculated F statistic indicates that there is no gain in explanatory power, at a 1% level, with the inclusion of these new terms to the model. Also, from the figure, it is possible to see that the inclusion made has little effects on estimates for our variables of interest.

Figure 9.1: Bolsa Família beneficiaries density - Municipalities with densities bigger than 50%

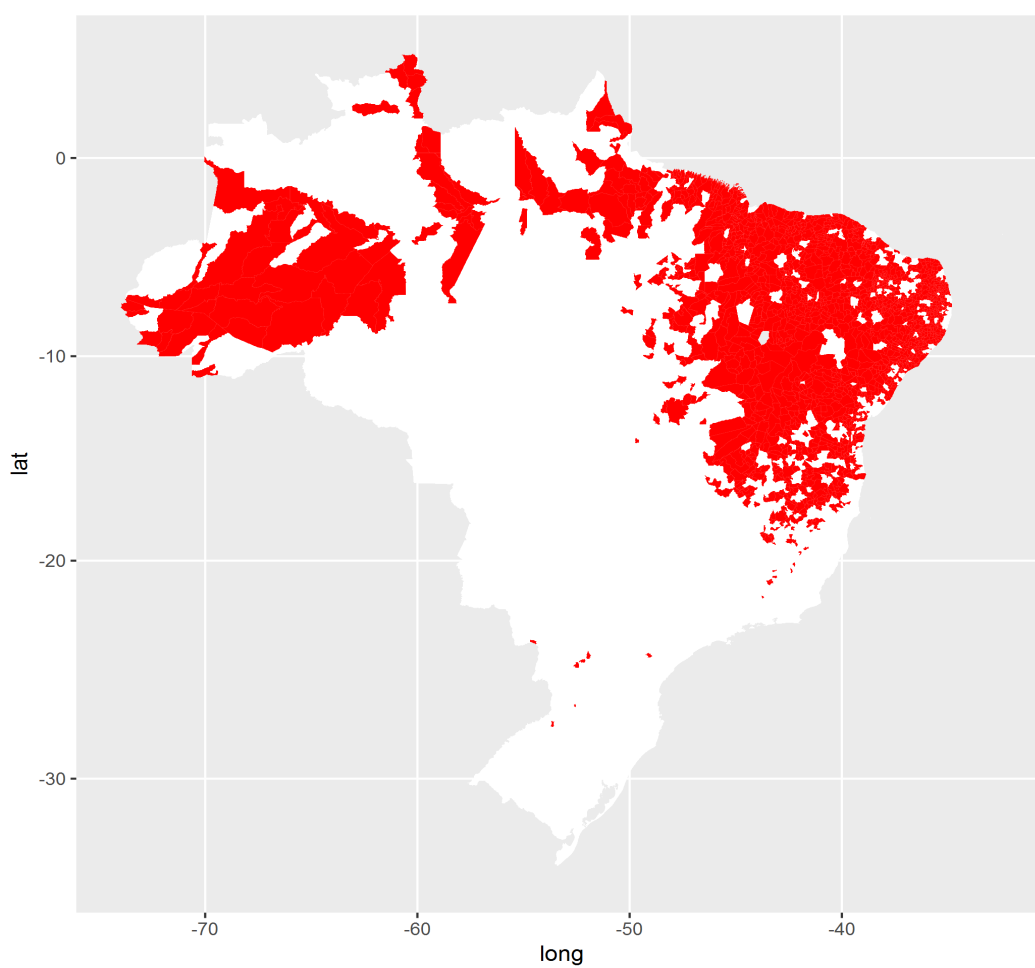
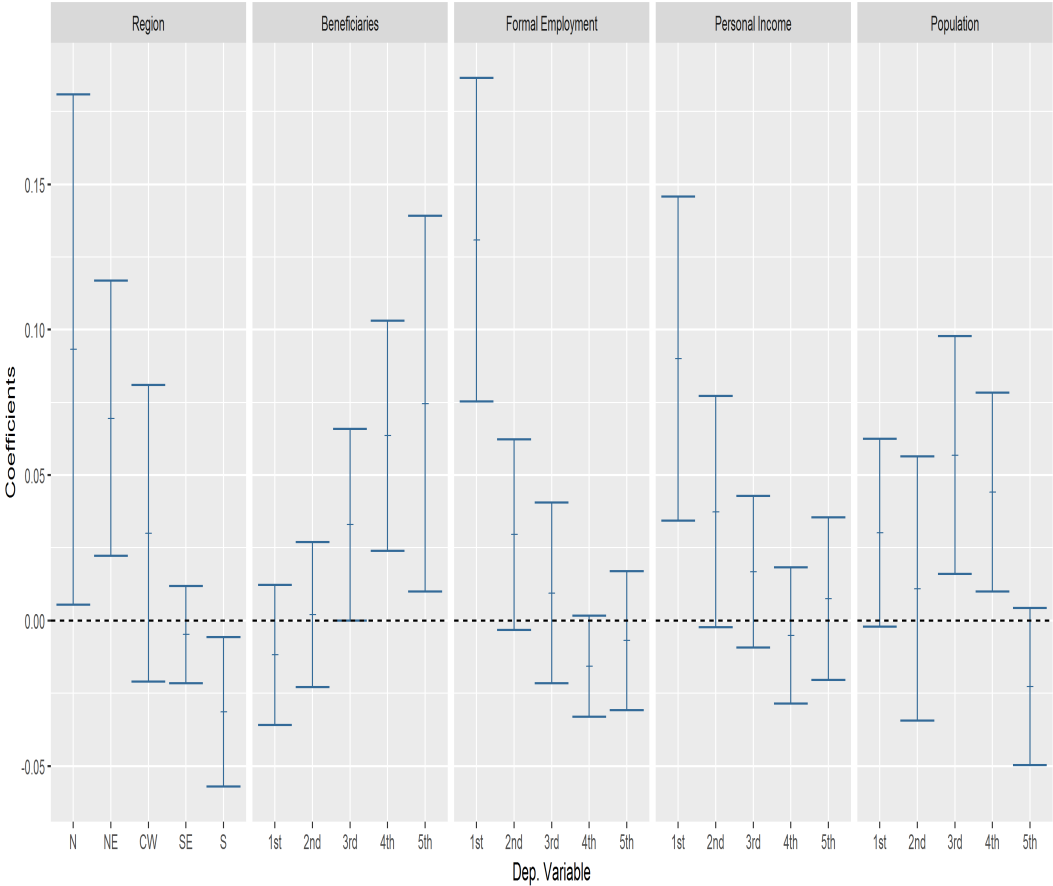
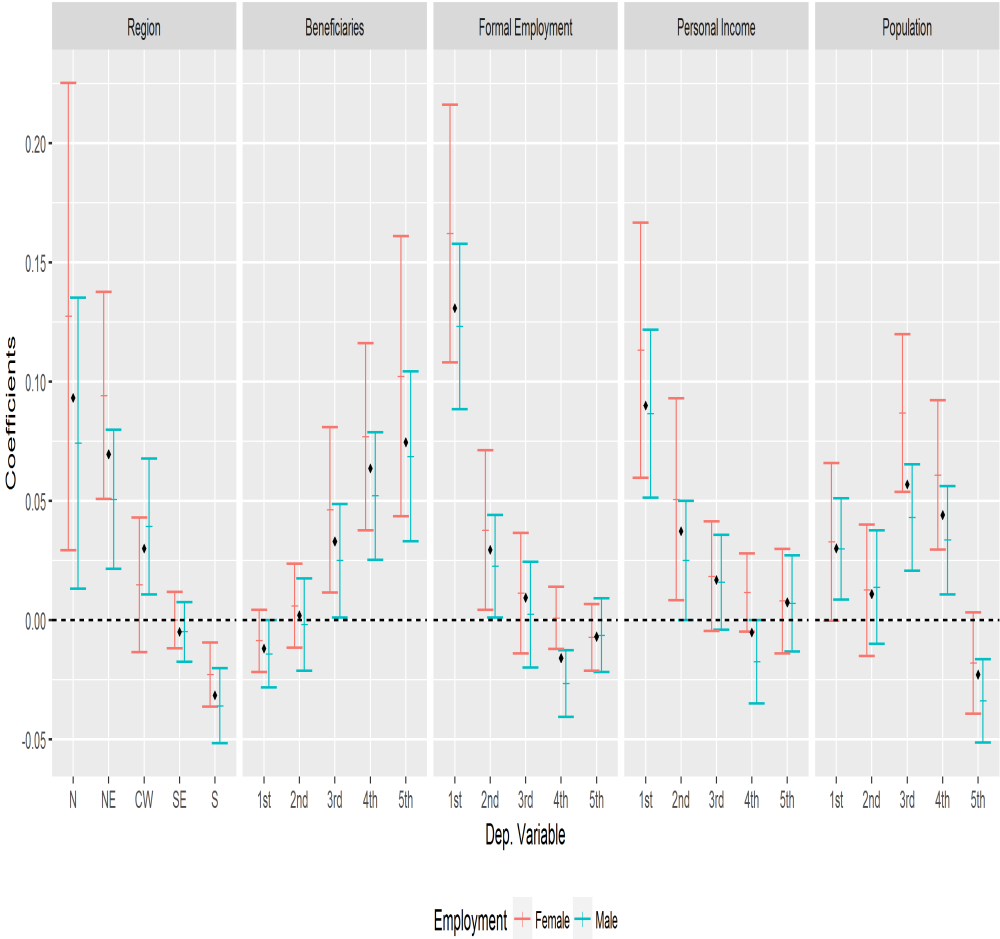


Figure 9.2: Employment and Bolsa Família



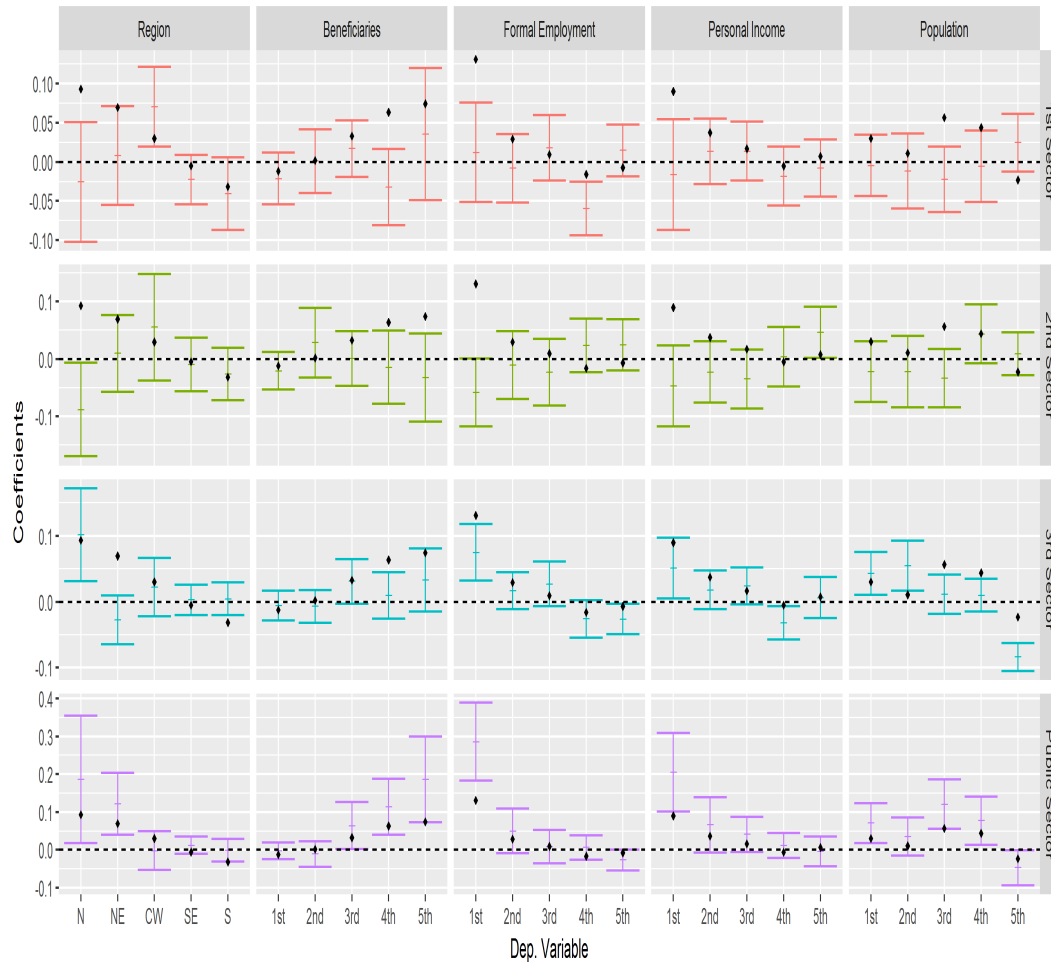
Note: The figure illustrates estimates on the coefficient of program intensity on formal employment reported on table 10.1 and specified in equation (3) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Bars represent the interval confidence at a 5% level built around the point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.3: Employment and Bolsa Família by gender



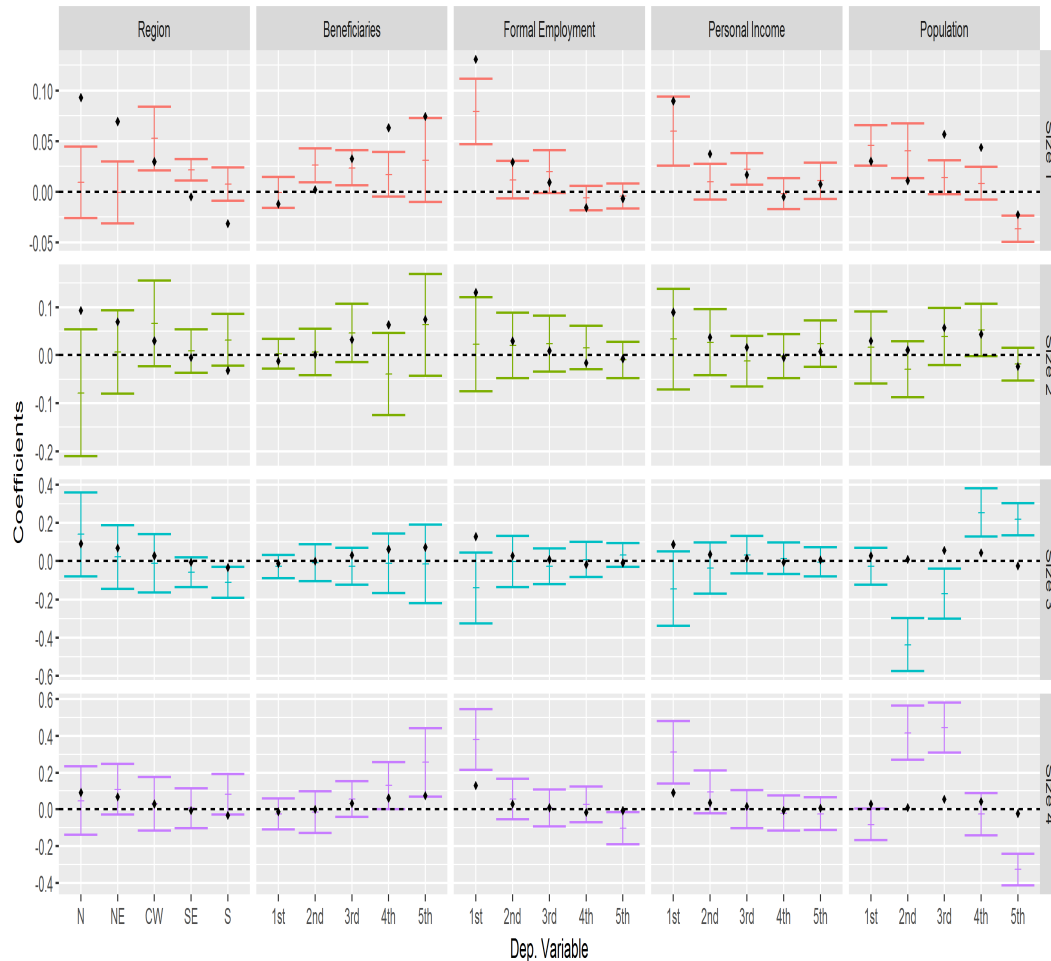
Note: The figure illustrates estimates on the coefficient of program intensity on formal employment reported on tables 10.3 through 10.7 and specified in equation (3) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.4: Employment by firms' sector and Bolsa Família



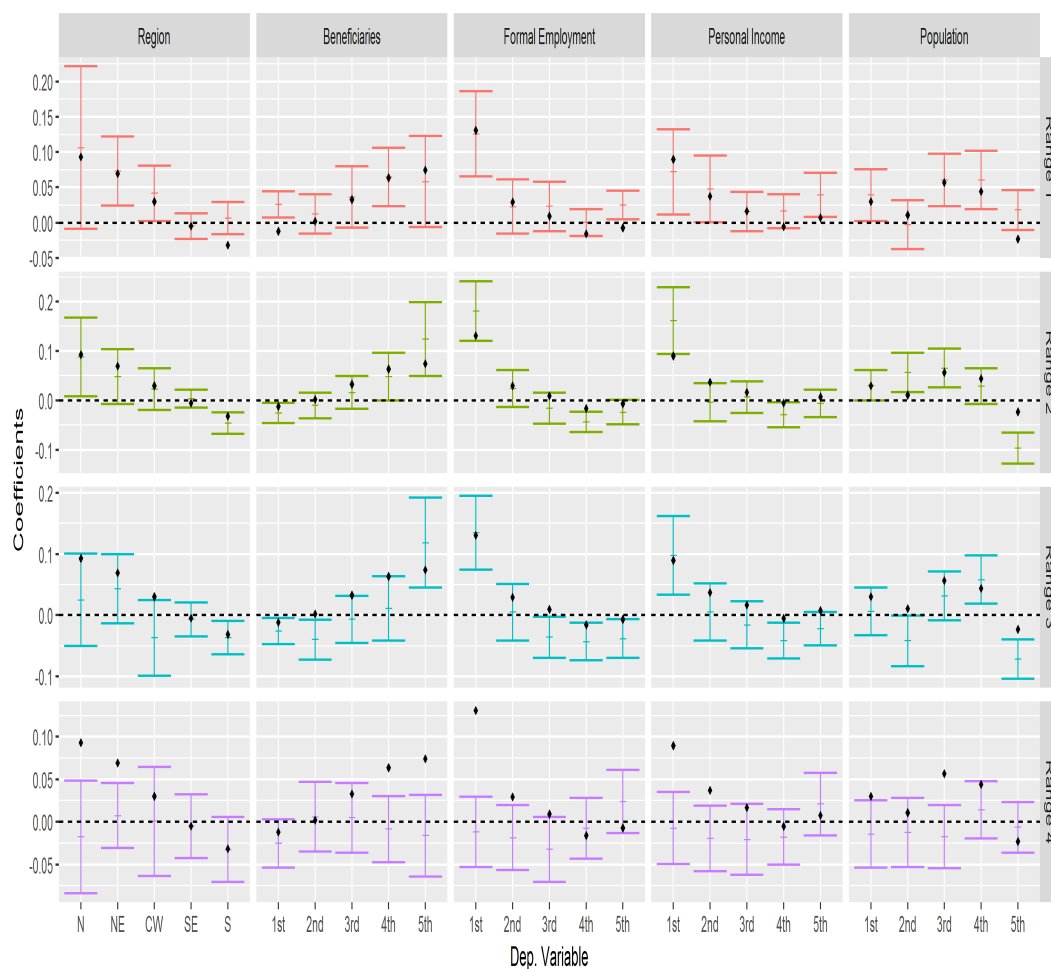
Note: The figure illustrates estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 10.8 through 10.10 and specified in equation (3) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Lines 1 through 4 report coefficients associated to different dependent variables: employees in the 1st sector, employees in the 2nd sector, employees in the 3rd sector and employees in the public sector. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.5: Employment by firms' size and Bolsa Família



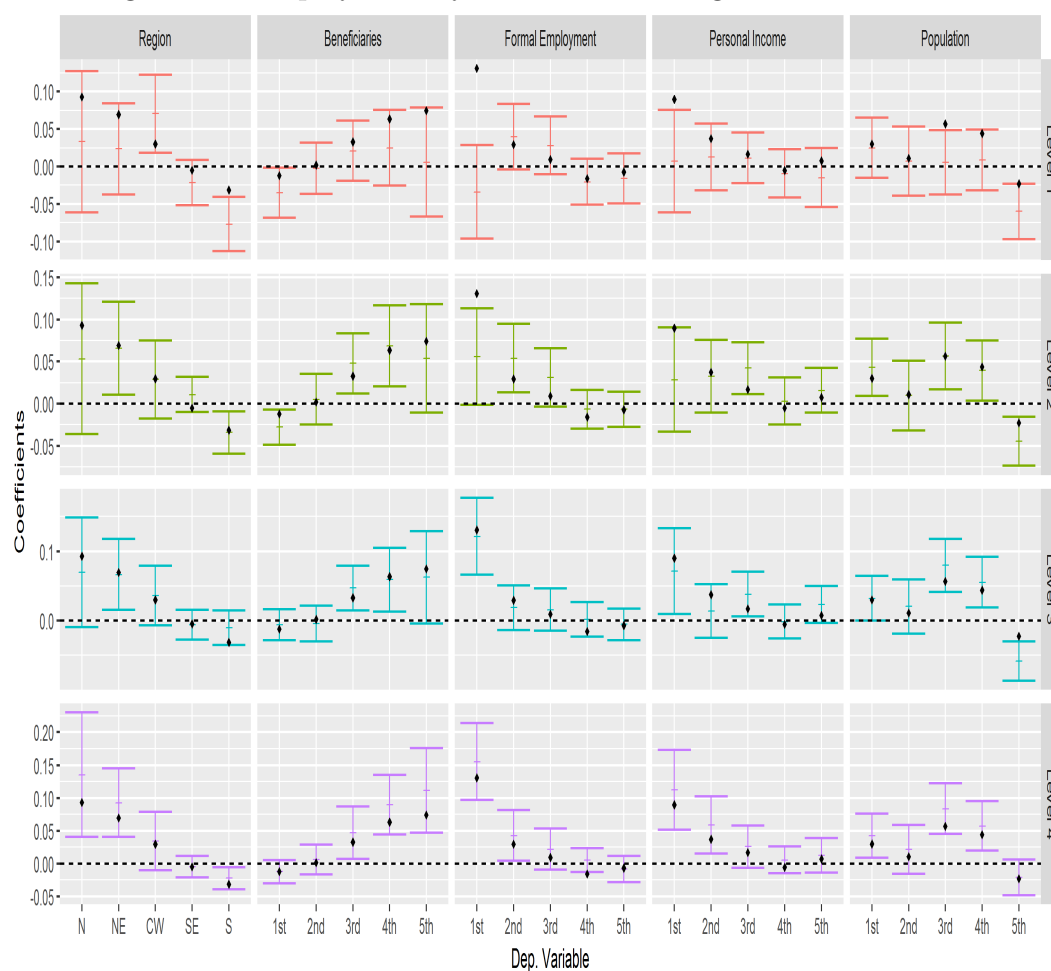
Note: The figure illustrates estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 10.11 through 10.13 and specified in equation (3) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Lines 1 through 4 report coefficients associated to different dependent variables: employees in firms employing less than 10 workers, employees in firms employing between 10 and 50 workers, employees in firms employing between 50 and 250 workers and employees in firms employing more than 250 workers. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.6: Employment by workers' remuneration and Bolsa Família



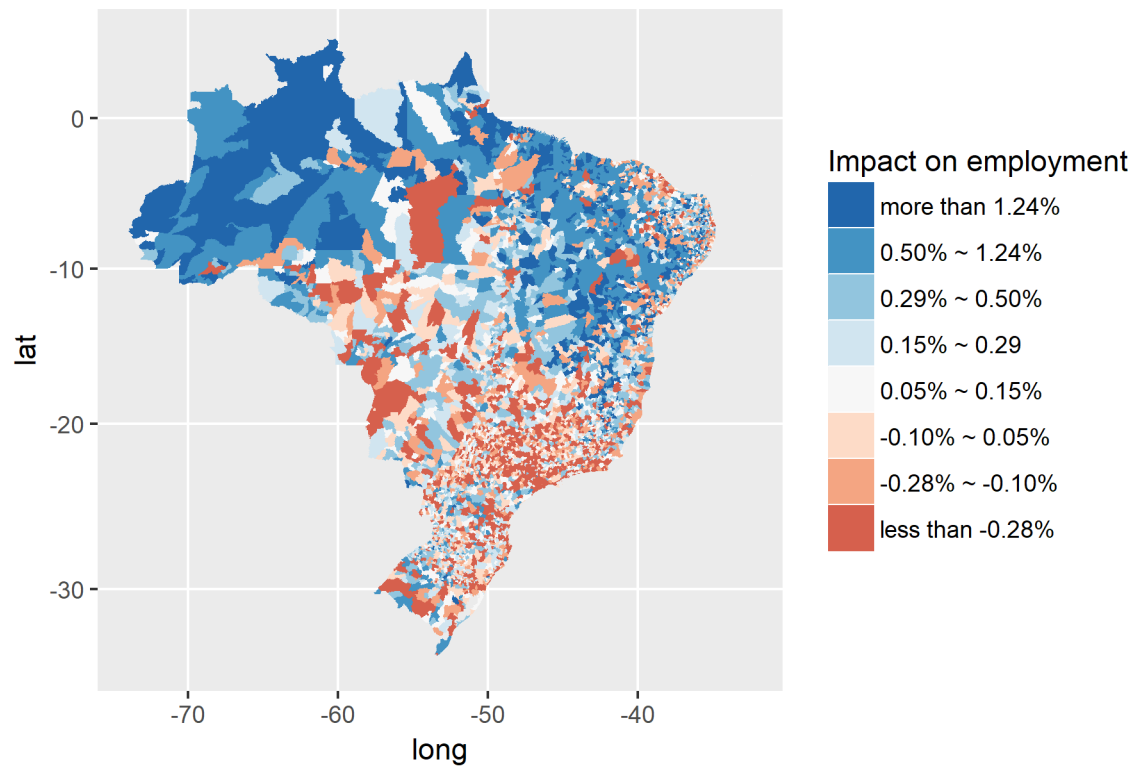
Note: The figure illustrates estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 10.14 through 10.16 and specified in equation (3) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Lines 1 through 4 report coefficients associated to different dependent variables: employees earning less than 1.5 reais per hour, employees earning between 1.5 and 4 reais per hour, employees earning between 4 and 10 reais per hour and employees earning more than 10 reais per hour. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.7: Employment by workers' schooling and Bolsa Família



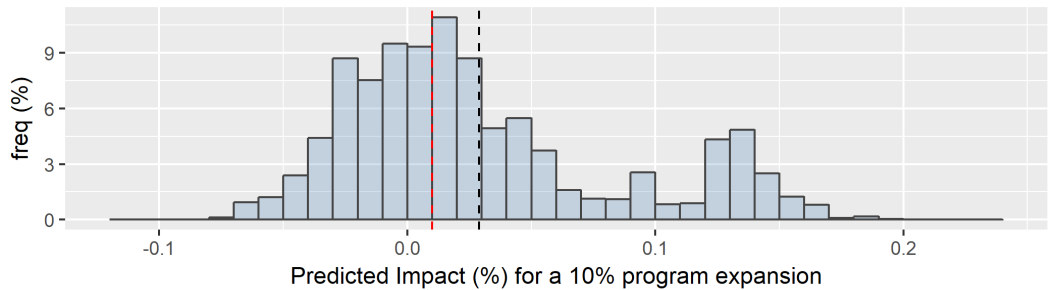
Note: The figure illustrates estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 10.17 through 10.19 and specified in equation (3) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Lines 1 through 4 report coefficients associated to different dependent variables: employees with incomplete primary education, employees with incomplete junior high school, employees with incomplete high school and employees complete high school or more. Observations are at municipal level. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.8: Quantitative exercise for a 10% expansion in program’s beneficiaries



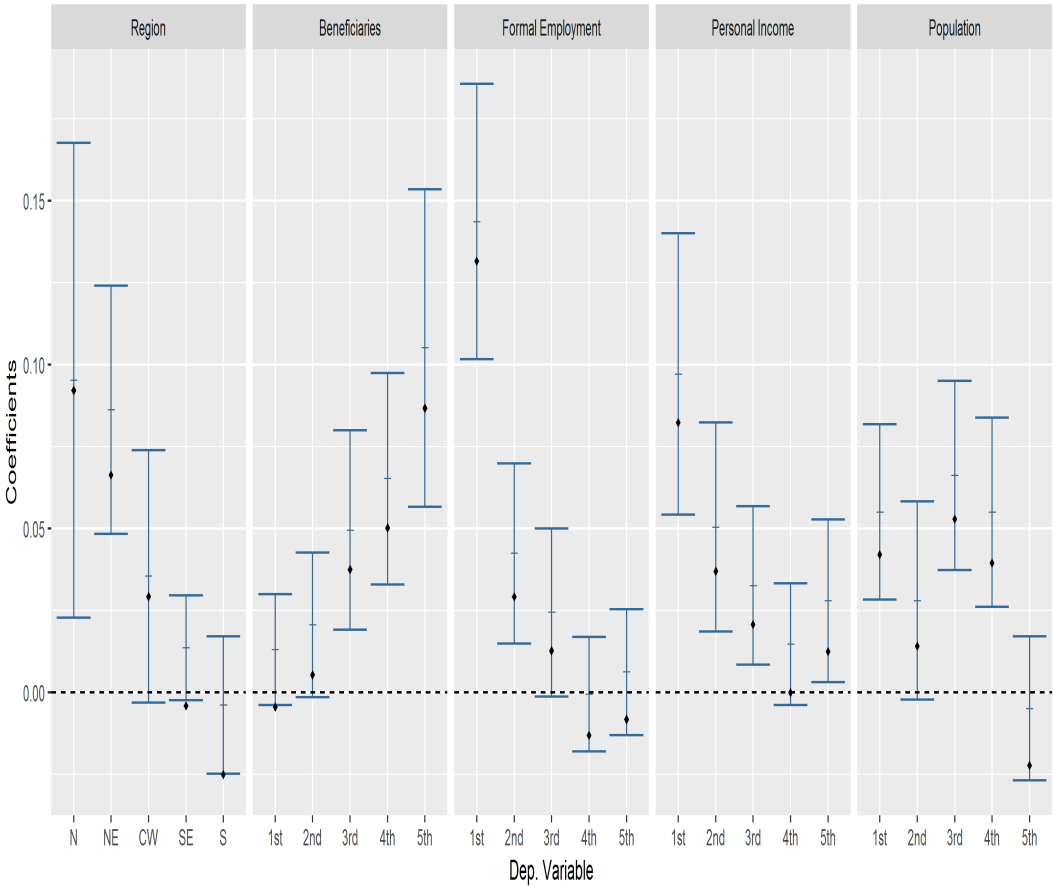
Note: The figure illustrates the quantitative exercise performed in Section 4.4. On the map, each municipality is colored according to the predicted impact of an increase of 10% on program’s beneficiaries would generate.

Figure 9.9: Distribution of the predicted impact on employment of a 10% expansion in Bolsa Família program



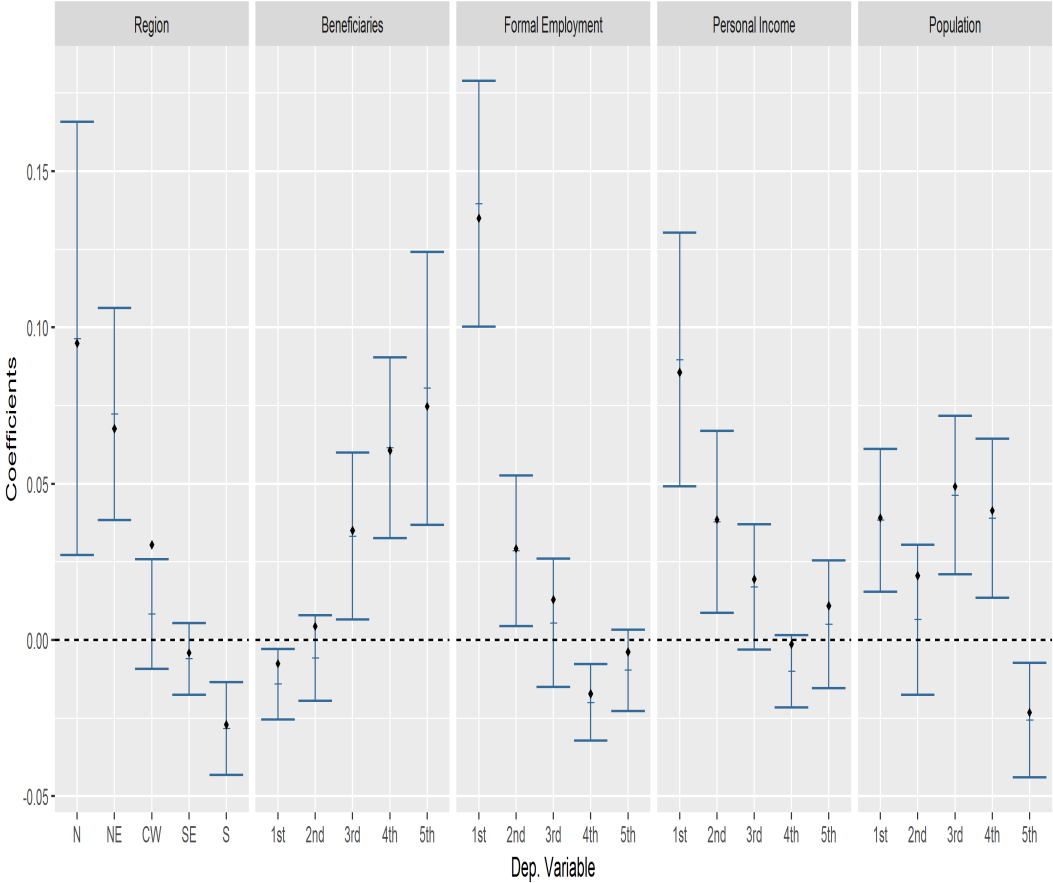
Note: The histogram illustrates the distribution of impacts illustrated in Figure 9.8. We estimate the predicted effect on employment of a 10% expansion in program’s beneficiaries. The dashed lines points the mean of the distribution (black) and estimated impact on Foguel e Barros (2010).

Figure 9.10: Heterogeneous regressions including Saúde da Família variable



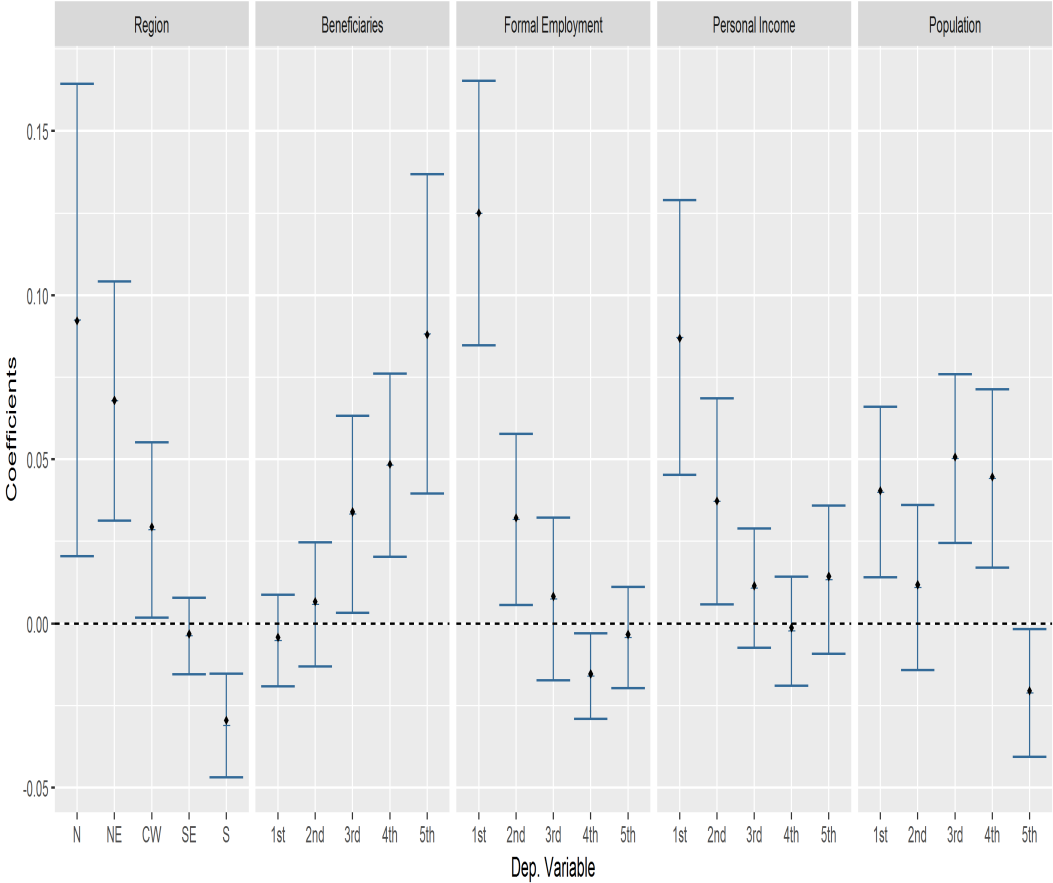
Note: The figure illustrates estimates of the coefficient of program intensity and its interaction with a dummy indicating the presence of Saúde da Família on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 9.10 and specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.11: Heterogeneous regressions including child mortality variable



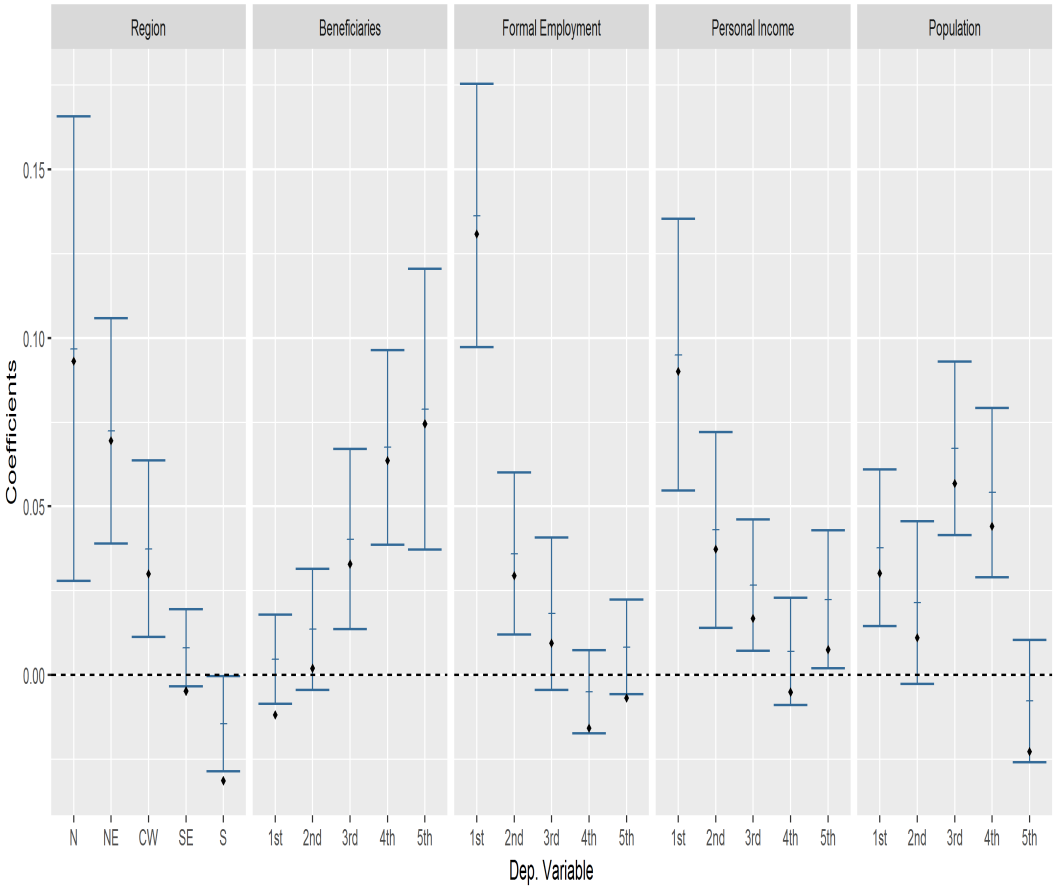
Note: The figure illustrates estimates of the coefficient of program intensity and its interaction with the proportion of infant mortality on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 9.11 and specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.13: Heterogeneous regressions including climatic shock variable



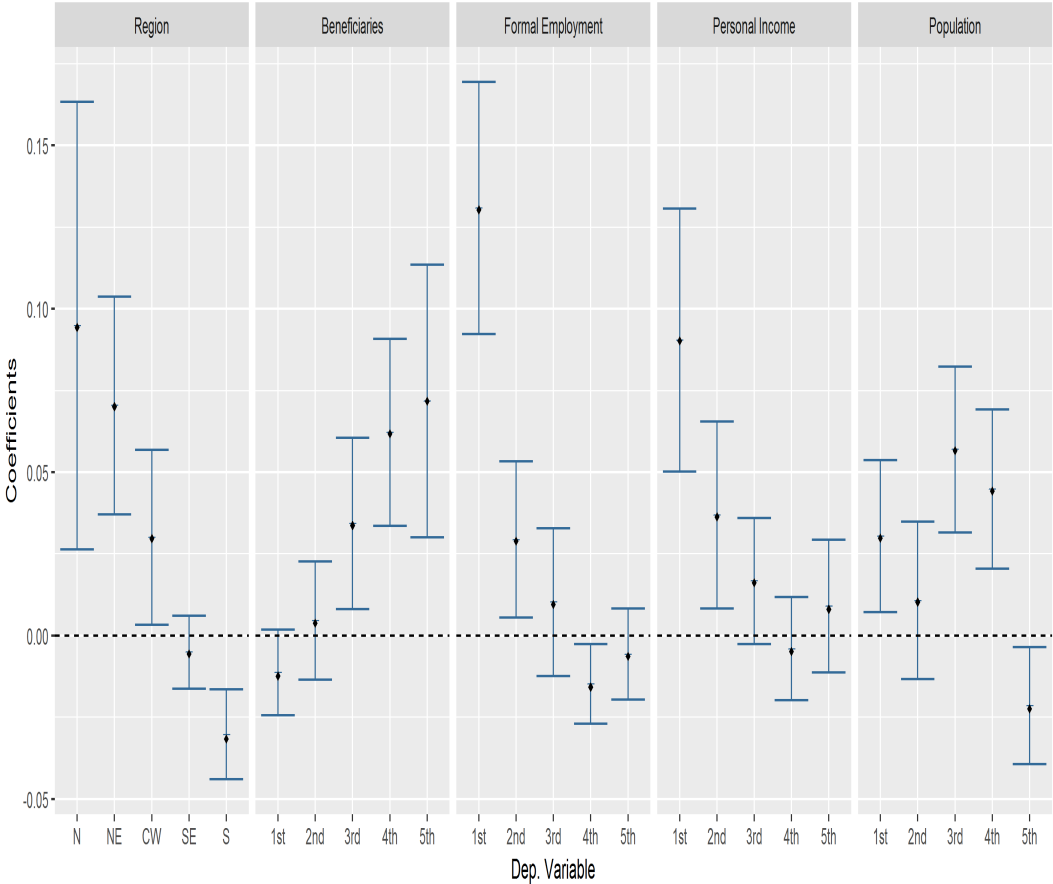
Note: The figure illustrates estimates of the coefficient of program intensity and its interaction with a dummy indicating the shock in yearly precipitation on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 9.13 and specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.14: Heterogeneous regressions including financial flow variable



Note: The figure illustrates estimates of the coefficient of program intensity and its interaction with the amount of loans granted by BNDES on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 9.14 and specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Figure 9.15: Heterogeneous regressions including political interference variable



Note: The figure illustrates estimates of the coefficient of program intensity and its interaction with a dummy indicating the coincidence between the mayor and the president parties on formal employment according to beneficiaries and formal employment concentration distribution reported on tables 9.15 and specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. Bars represent the interval confidence at a 5% level built around male and female point estimates and dots corresponding to the estimate for overall employment are added as reference. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

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Tables Appendix

Table 10.1: Employment and Bolsa Família

	Log(employ.)			
	(1)	(2)	(3)	(4)
Log(ben. fam.)	.239*** (.015)	.068*** (.011)	.104*** (.009)	.024* (.010)
Log(pop.)	.898*** (.058)	.325*** (.042)	.201*** (.038)	.243*** (.043)
Fixed effects	Y	Y	Y	Y
Dummy: Year	N	Y	N	N
State Linear Trend	N	N	Y	N
Dummy: Year x State	N	N	N	Y
Observations	72,304	72,304	72,304	72,304
R ²	.959	.967	.969	.973
Adjusted R ²	.956	.964	.966	.967
Residual Std. Error	.313	.282	.275	.269

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity on formal employment.

In the first column, we estimate equation (1) using OLS. We add year dummies in the second column, linear state trends on the third and a state x year trend on the fourth, as specified in equation (2). Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities fixed effects and the logarithm of its population as control.

Table 10.2: Heterogeneous regressions

	Log(employ.)				
	Region	Qts. Benefic.	Qts. Employ.	Qts. Pers. Inc.	Population
Log(fam.)*D1	.093** (.034)	-.012 (.007)	.131*** (.019)	.090*** (.020)	.030** (.012)
Log(fam.)*D2	.070*** (.017)	.002 (.009)	.030* (.012)	.037** (.014)	.011 (.012)
Log(fam.)*D3	-.005 (.006)	.033* (.013)	.009 (.011)	.017 (.010)	.057*** (.013)
Log(fam.)*D4	-.031*** (.007)	.064*** (.014)	-.016** (.006)	-.005 (.008)	.044*** (.012)
Log(fam.)*D5	.030* (.013)	.075*** (.021)	-.007 (.007)	.008 (.010)	-.023* (.009)
Log(pop.)	.237*** (.026)	.247*** (.026)	.243*** (.026)	.242*** (.026)	.242*** (.026)
Fixed effects	Y	Y	Y	Y	Y
Dummy: Year	N	N	N	N	N
State Linear Trend	N	N	N	N	N
Dummy: Year x State	Y	Y	Y	Y	Y
Observations	72,304	72,304	72,304	72,304	72,304
R ²	.973	.973	.973	.973	.973
Adjusted R ²	.967	.967	.967	.967	.967
Residual Std. Error	.269	.269	.269	.269	.269

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity on formal employment as specified in equation (3) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.3: Employment and Bolsa Família per Brazilian Regions

	Log(employ.)		
	Overall	Men	Women
Log(ben. fam.)*D1(1= North)	.093* (.044)	.074 (.040)	.127* (.058)
Log(ben. fam.)*D2(1= Northeast)	.070** (.024)	.051* (.021)	.094*** (.028)
Log(ben. fam.)*D3(1= Southeast)	-.005 (.008)	-.005 (.010)	-.00004 (.009)
Log(ben. fam.)*D4(1= South)	-.031* (.013)	-.036** (.014)	-.023 (.014)
Log(ben. fam.)*D5(1= Middle-West)	.030 (.025)	.039 (.026)	.015 (.025)
Log(pop.)	.237*** (.043)	.220*** (.041)	.282*** (.050)
Fixed effects	Y	Y	Y
Dummy: Year	N	N	N
State Linear Trend	N	N	N
Dummy: Year x State	Y	Y	Y
Observations	72,304	72,304	72,304
R ²	.973	.976	.957
Adjusted R ²	.967	.972	.948
Residual Std. Error	.269	.266	.330

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment for each one of Brazilian regions as in equation (3) using OLS. The variables D1 through

D5 are dummies associated to the following regions respectively: North, Northeast

Southeast, South and Mid-West. Column 1 through 3 report coefficient associated to different dependent variables: the overall amount of formal jobs and the amount of formal jobs filled either by men or women. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.4: Employment and Bolsa Família per concentration of beneficiaries

	Log(employ.)		
	Overall	Men	Women
Log(ben. fam.)*D1(1= 1st fifth)	-.012 (.012)	-.014 (.013)	-.009 (.012)
Log(ben. fam.)*D2(1= 2nd fifth)	.002 (.012)	-.002 (.014)	.006 (.012)
Log(ben. fam.)*D3(1= 3rd fifth)	.033* (.016)	.025 (.015)	.046* (.023)
Log(ben. fam.)*D4(1= 4th fifth)	.064** (.020)	.052** (.020)	.077** (.024)
Log(ben. fam.)*D5(1= 5th fifth)	.075* (.032)	.069* (.027)	.102* (.045)
Log(pop.)	.247*** (.043)	.230*** (.041)	.295*** (.050)
Fixed effects	Y	Y	Y
Dummy: Year	N	N	N
State Linear Trend	N	N	N
Dummy: Year x State	Y	Y	Y
Observations	72,304	72,304	72,304
R ²	.973	.976	.957
Adjusted R ²	.967	.972	.948
Residual Std. Error	.269	.266	.330

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to the beneficiaries concentration distribution as in equation (3) using OLS. The concentration is measured through the ratio of beneficiaries to the overall population. The variables D1 through D5 are dummies associated to the fifths of the distribution. Column 1 through 3 report coefficient associated to different dependent variables: the overall amount of formal jobs and the amount of formal jobs filled either by men or women. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.5: Employment and Bolsa Família per concentration of formal jobs

	Log(employ.)		
	Overall	Men	Women
Log(ben. fam.)*D1(1= 1st fifth)	.131*** (.028)	.123*** (.025)	.162*** (.036)
Log(ben. fam.)*D2(1= 2nd fifth)	.030 (.016)	.023 (.015)	.038 (.024)
Log(ben. fam.)*D3(1= 3rd fifth)	.009 (.016)	.002 (.016)	.011 (.017)
Log(ben. fam.)*D4(1= 4th fifth)	-.016 (.009)	-.027** (.010)	.001 (.009)
Log(ben. fam.)*D5(1= 5th fifth)	-.007 (.012)	-.006 (.013)	-.007 (.011)
Log(pop.)	.243*** (.043)	.225*** (.041)	.291*** (.049)
Fixed effects	Y	Y	Y
Dummy: Year	N	N	N
State Linear Trend	N	N	N
Dummy: Year x State	Y	Y	Y
Observations	72,304	72,304	72,304
R ²	.973	.977	.957
Adjusted R ²	.967	.972	.948
Residual Std. Error	.269	.265	.330

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to the formal jobs concentration distribution as in equation (3) using OLS. The concentration is measured through the ratio of formal jobs to the overall population. The variables D1 through D5 are dummies associated to the fifths of the distribution. Column

1 through 3 report coefficient associated to different dependent variables: the overall amount of formal jobs and the amount of formal jobs filled either by men or women.

Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.6: Employment and Bolsa Família per income distribution

	Log(employ.)		
	Overall	Men	Women
Log(ben. fam.)*D1(1= 1st fifth)	.090** (.028)	.087*** (.025)	.113** (.036)
Log(ben. fam.)*D2(1= 2nd fifth)	.037 (.020)	.025 (.018)	.051 (.027)
Log(ben. fam.)*D3(1= 3rd fifth)	.017 (.013)	.016 (.014)	.018 (.015)
Log(ben. fam.)*D4(1= 4th fifth)	-.005 (.012)	-.018 (.013)	.011 (.012)
Log(ben. fam.)*D5(1= 5th fifth)	.008 (.014)	.007 (.015)	.008 (.014)
Log(pop.)	.242*** (.043)	.224*** (.041)	.289*** (.050)
Fixed effects	Y	Y	Y
Dummy: Year	N	N	N
State Linear Trend	N	N	N
Dummy: Year x State	Y	Y	Y
Observations	72,304	72,304	72,304
R ²	.973	.976	.957
Adjusted R ²	.967	.972	.948
Residual Std. Error	.269	.266	.330

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to income distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the fifths of the distribution. Column 1 through 3 report coefficient associated to different dependent variables: the overall amount of formal jobs and the amount of formal jobs filled either by men or women. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.7: Employment and Bolsa Família per population

	Log(employ.)		
	Overall	Men	Women
Log(ben. fam.)*D1(1= 1st fifth)	.030 (.016)	.030 (.016)	.033 (.022)
Log(ben. fam.)*D2(1= 2nd fifth)	.011 (.023)	.014 (.023)	.012 (.023)
Log(ben. fam.)*D3(1= 3rd fifth)	.057** (.020)	.043* (.019)	.087*** (.026)
Log(ben. fam.)*D4(1= 4th fifth)	.044** (.017)	.033* (.016)	.061** (.021)
Log(ben. fam.)*D5(1= 5th fifth)	-.023 (.013)	-.034* (.013)	-.018 (.016)
Log(pop.)	.242*** (.043)	.225*** (.041)	.289*** (.050)
Fixed effects	Y	Y	Y
Dummy: Year	N	N	N
State Linear Trend	N	N	N
Dummy: Year x State	Y	Y	Y
Observations	72,304	72,304	72,304
R ²	.973	.976	.957
Adjusted R ²	.967	.972	.948
Residual Std. Error	.269	.266	.330

Note: *p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to demographic distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the fifths of the distribution. Column 1 through 3 report coefficient associated to different dependent variables: the overall amount of formal jobs and the amount of formal jobs filled either by men or women. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.8: Employment by firms' sector and Bolsa Familia

	Log(employ.)				
	Overall	1st Sector	2nd Sector	3rd Sector	Public Sector
Panel A: Heterogeneity by region					
Log(ben. fam.)*D1(1= North)	.093*** (0.000)	-.026*** (0.000)	-.088*** (0.000)	.102*** (0.000)	.186*** (0.000)
Log(ben. fam.)*D2(1= Northeast)	.070*** (0.000)	.008*** (0.000)	.009*** (0.000)	-.027*** (0.000)	.122*** (0.000)
Log(ben. fam.)*D3(1= South)	-.005*** (0.000)	-.023*** (0.000)	-.010*** (0.000)	.003*** (0.000)	.012*** (0.000)
Log(ben. fam.)*D4(1= Southeast)	-.031*** (0.000)	-.040*** (0.000)	-.026*** (0.000)	.004*** (0.000)	-.001*** (0.000)
Log(ben. fam.)*D5(1= Center-West)	.030*** (0.000)	.071*** (0.000)	.055*** (0.000)	.022*** (0.000)	-.002*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment for each one of Brazilian regions as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the following regions respectively: North, Northeast, Southeast, South and Mid-West. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees in the 1st sector, employees in the 2nd sector, employees in the 3rd sector and employees in the public sector. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.9: Employment by firms' sector and Bolsa Familia

	Log(employ.)				
	Overall	1st Sector	2nd Sector	3rd Sector	Public Sector
Panel A: Heterogeneity by beneficiaries concentration					
Log(ben. fam.)*D1(1= 1st fifth)	-.012*** (0.000)	-.021*** (0.000)	-.021*** (0.000)	-.006*** (0.000)	-.002*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.002*** (0.000)	.001*** (0.000)	.028*** (0.000)	-.007*** (0.000)	-.011*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.033*** (0.000)	.017*** (0.000)	.0003*** (0.000)	.031*** (0.000)	.064*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.064*** (0.000)	-.032*** (0.000)	-.015*** (0.000)	.010*** (0.000)	.114*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.075*** (0.000)	.035*** (0.000)	-.033*** (0.000)	.033*** (0.000)	.186*** (0.000)
Panel B: Heterogeneity by formal employment concentration					
Log(ben. fam.)*D1(1= 1st fifth)	.131*** (0.000)	.012*** (0.000)	-.058*** (0.000)	.075*** (0.000)	.286*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.030*** (0.000)	-.008*** (0.000)	-.011*** (0.000)	.017*** (0.000)	.050*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.009*** (0.000)	.018*** (0.000)	-.023*** (0.000)	.027*** (0.000)	.008*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.016*** (0.000)	-.059*** (0.000)	.023*** (0.000)	-.026*** (0.000)	.006*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.007*** (0.000)	.015*** (0.000)	.024*** (0.000)	-.026*** (0.000)	-.026*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees in the 1st sector, employees in the 2nd sector, employees in the 3rd sector and employees in the public sector. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.10: Employment by firms' sector and Bolsa Familia

	Log(employ.)				
	Overall	1st Sector	2nd Sector	3rd Sector	Public Sector
Panel A: Heterogeneity by per capita income					
Log(ben. fam.)*D1(1= 1st fifth)	.090*** (0.000)	-.016*** (0.000)	-.048*** (0.000)	.051*** (0.000)	.206*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.037*** (0.000)	.014*** (0.000)	-.023*** (0.000)	.018*** (0.000)	.066*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.017*** (0.000)	.014*** (0.000)	-.035*** (0.000)	.024*** (0.000)	.041*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.005*** (0.000)	-.018*** (0.000)	.004*** (0.000)	-.032*** (0.000)	.011*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.008*** (0.000)	-.008*** (0.000)	.046*** (0.000)	.006*** (0.000)	-.004*** (0.000)
Panel B: Heterogeneity by population					
Log(ben. fam.)*D1(1= 1st fifth)	.030*** (0.000)	-.004*** (0.000)	-.022*** (0.000)	.043*** (0.000)	.071*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.011*** (0.000)	-.012*** (0.000)	-.023*** (0.000)	.054*** (0.000)	.035*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.057*** (0.000)	-.022*** (0.000)	-.034*** (0.000)	.012*** (0.000)	.121*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.044*** (0.000)	-.006*** (0.000)	.044*** (0.000)	.010*** (0.000)	.077*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.023*** (0.000)	.025*** (0.000)	.009*** (0.000)	-.084*** (0.000)	-.047*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to income and demographic distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees in the 1st sector, employees in the 2nd sector, employees in the 3rd sector and employees in the public sector. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.11: Employment by firms' size and Bolsa Familia

	Log(employ.)				
	Overall	Size 1	Size 2	Size 3	Size 4
Panel A: Heterogeneity by region					
Log(ben. fam.)*D1(1= North)	.093*** (0.000)	.009*** (0.000)	-.078*** (0.000)	.141*** (0.000)	.048*** (0.000)
Log(ben. fam.)*D2(1= Northeast)	.070*** (0.000)	-.001*** (0.000)	.007*** (0.000)	.023*** (0.000)	.109*** (0.000)
Log(ben. fam.)*D3(1= South)	-.005*** (0.000)	.021*** (0.000)	.009*** (0.000)	-.057*** (0.000)	.006*** (0.000)
Log(ben. fam.)*D4(1= Southeast)	-.031*** (0.000)	.007*** (0.000)	.032*** (0.000)	-.112*** (0.000)	.081*** (0.000)
Log(ben. fam.)*D5(1= Center-West)	.030*** (0.000)	.053*** (0.000)	.066*** (0.000)	-.010*** (0.000)	.029*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment for each one of Brazilian regions as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the following regions respectively: North, Northeast, Southeast, South and Mid-West. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees in firms employing less than 10 workers, employees in firms employing between 10 and 50 workers, employees in firms employing between 50 and 250 workers and employees in firms employing more than 250 workers. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.12: Employment by firms' size and Bolsa Familia

	Log(employ.)				
	Overall	Size 1	Size 2	Size 3	Size 4
Panel A: Heterogeneity by beneficiaries concentration					
Log(ben. fam.)*D1(1= 1st fifth)	-.012*** (0.000)	-.001*** (0.000)	.003*** (0.000)	-.028*** (0.000)	-.025*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.002*** (0.000)	.026*** (0.000)	.007*** (0.000)	-.008*** (0.000)	-.015*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.033*** (0.000)	.024*** (0.000)	.046*** (0.000)	-.027*** (0.000)	.056*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.064*** (0.000)	.017*** (0.000)	-.039*** (0.000)	-.012*** (0.000)	.129*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.075*** (0.000)	.031*** (0.000)	.063*** (0.000)	-.013*** (0.000)	.256*** (0.000)
Panel B: Heterogeneity by formal employment concentration					
Log(ben. fam.)*D1(1= 1st fifth)	.131*** (0.000)	.079*** (0.000)	.022*** (0.000)	-.140*** (0.000)	.380*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.030*** (0.000)	.012*** (0.000)	.020*** (0.000)	-.001*** (0.000)	.055*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.009*** (0.000)	.020*** (0.000)	.024*** (0.000)	-.026*** (0.000)	.006*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.016*** (0.000)	-.006*** (0.000)	.016*** (0.000)	.009*** (0.000)	.026*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.007*** (0.000)	-.004*** (0.000)	-.010*** (0.000)	.032*** (0.000)	-.103*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees in firms employing less than 10 workers, employees in firms employing between 10 and 50 workers, employees in firms employing between 50 and 250 workers and employees in firms employing more than 250 workers. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.13: Employment by firms' size and Bolsa Familia

	Log(employ.)				
	Overall	Size 1	Size 2	Size 3	Size 4
Panel A: Heterogeneity by per capita income					
Log(ben. fam.)*D1(1= 1st fifth)	.090*** (0.000)	.060*** (0.000)	.033*** (0.000)	-.144*** (0.000)	.312*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.037*** (0.000)	.010*** (0.000)	.027*** (0.000)	-.036*** (0.000)	.095*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.017*** (0.000)	.022*** (0.000)	-.013*** (0.000)	.034*** (0.000)	-.0003*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.005*** (0.000)	-.002*** (0.000)	-.002*** (0.000)	.015*** (0.000)	-.021*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.008*** (0.000)	.011*** (0.000)	.024*** (0.000)	-.003*** (0.000)	-.024*** (0.000)
Panel B: Heterogeneity by population					
Log(ben. fam.)*D1(1= 1st fifth)	.030*** (0.000)	.046*** (0.000)	.016*** (0.000)	-.027*** (0.000)	-.083*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.011*** (0.000)	.041*** (0.000)	-.029*** (0.000)	-.437*** (0.000)	.417*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.057*** (0.000)	.014*** (0.000)	.039*** (0.000)	-.170*** (0.000)	.445*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.044*** (0.000)	.008*** (0.000)	.053*** (0.000)	.255*** (0.000)	-.026*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.023*** (0.000)	-.037*** (0.000)	-.018*** (0.000)	.221*** (0.000)	-.327*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to income and demographic distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees in firms employing less than 10 workers, employees in firms employing between 10 and 50 workers, employees in firms employing between 50 and 250 workers and employees in firms employing more than 250 workers. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.14: Employment by workers' remuneration and Bolsa Familia

	Log(employ.)				
	Overall	Range 1	Range 2	Range 3	Range 4
Panel A: Heterogeneity by region					
Log(ben. fam.)*D1(1= North)	.093*** (0.000)	.106*** (0.000)	.088*** (0.000)	.025*** (0.000)	-.018*** (0.000)
Log(ben. fam.)*D2(1= Northeast)	.070*** (0.000)	.073*** (0.000)	.048*** (0.000)	.043*** (0.000)	.007*** (0.000)
Log(ben. fam.)*D3(1= South)	-.005*** (0.000)	-.005*** (0.000)	.003*** (0.000)	-.007*** (0.000)	-.005*** (0.000)
Log(ben. fam.)*D4(1= Southeast)	-.031*** (0.000)	.007*** (0.000)	-.047*** (0.000)	-.037*** (0.000)	-.033*** (0.000)
Log(ben. fam.)*D5(1= Center-West)	.030*** (0.000)	.041*** (0.000)	.023*** (0.000)	-.037*** (0.000)	.001*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment for each one of Brazilian regions as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the following regions respectively: North, Northeast, Southeast, South and Mid-West. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees earning less than 1.5 reais per hour, employees earning between 1.5 and 4 reais per hour, employees earning between 4 and 10 reais per hour and employees earning more than 10 reais per hour. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.15: Employment by workers' remuneration and Bolsa Familia

	Log(employ.)				
	Overall	Range 1	Range 2	Range 3	Range 4
Panel A: Heterogeneity by beneficiaries concentration					
Log(ben. fam.)*D1(1= 1st fifth)	-.012*** (0.000)	.026*** (0.000)	-.025*** (0.000)	-.026*** (0.000)	-.025*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.002*** (0.000)	.013*** (0.000)	-.011*** (0.000)	-.040*** (0.000)	.006*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.033*** (0.000)	.036*** (0.000)	.016*** (0.000)	-.007*** (0.000)	.005*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.064*** (0.000)	.065*** (0.000)	.048*** (0.000)	.011*** (0.000)	-.009*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.075*** (0.000)	.058*** (0.000)	.124*** (0.000)	.118*** (0.000)	-.016*** (0.000)
Panel B: Heterogeneity by formal employment concentration					
Log(ben. fam.)*D1(1= 1st fifth)	.131*** (0.000)	.126*** (0.000)	.181*** (0.000)	.135*** (0.000)	-.012*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.030*** (0.000)	.023*** (0.000)	.024*** (0.000)	.005*** (0.000)	-.019*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.009*** (0.000)	.023*** (0.000)	-.016*** (0.000)	-.036*** (0.000)	-.032*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.016*** (0.000)	.0001*** (0.000)	-.044*** (0.000)	-.043*** (0.000)	-.008*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.007*** (0.000)	.025*** (0.000)	-.024*** (0.000)	-.039*** (0.000)	.024*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees earning less than 1.5 reais per hour, employees earning between 1.5 and 4 reais per hour, employees earning between 4 and 10 reais per hour and employees earning more than 10 reais per hour. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.16: Employment by workers' remuneration and Bolsa Familia

	Log(employ.)				
	Overall	Range 1	Range 2	Range 3	Range 4
Panel A: Heterogeneity by per capita income					
Log(ben. fam.)*D1(1= 1st fifth)	.090*** (0.000)	.072*** (0.000)	.162*** (0.000)	.098*** (0.000)	-.007*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.037*** (0.000)	.048*** (0.000)	-.004*** (0.000)	.005*** (0.000)	-.020*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.017*** (0.000)	.016*** (0.000)	.007*** (0.000)	-.016*** (0.000)	-.021*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.005*** (0.000)	.016*** (0.000)	-.029*** (0.000)	-.041*** (0.000)	-.018*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.008*** (0.000)	.040*** (0.000)	-.006*** (0.000)	-.022*** (0.000)	.021*** (0.000)
Panel B: Heterogeneity by population					
Log(ben. fam.)*D1(1= 1st fifth)	.030*** (0.000)	.039*** (0.000)	.030*** (0.000)	.006*** (0.000)	-.014*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.011*** (0.000)	-.003*** (0.000)	.057*** (0.000)	-.042*** (0.000)	-.013*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.057*** (0.000)	.060*** (0.000)	.065*** (0.000)	.031*** (0.000)	-.018*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.044*** (0.000)	.060*** (0.000)	.029*** (0.000)	.058*** (0.000)	.014*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.023*** (0.000)	.018*** (0.000)	-.097*** (0.000)	-.072*** (0.000)	-.006*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to income and demographic distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees earning less than 1.5 reais per hour, employees earning between 1.5 and 4 reais per hour, employees earning between 4 and 10 reais per hour and employees earning more than 10 reais per hour. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.17: Employment by workers' schooling and Bolsa Familia

	Log(employ.)				
	Overall	Level 1	Level 2	Level 3	Level 4
Panel A: Heterogeneity by region					
Log(ben. fam.)*D1(1= North)	.093*** (0.000)	.033*** (0.000)	.053*** (0.000)	.070*** (0.000)	.135*** (0.000)
Log(ben. fam.)*D2(1= Northeast)	.070*** (0.000)	.024*** (0.000)	.066*** (0.000)	.066*** (0.000)	.093*** (0.000)
Log(ben. fam.)*D3(1= South)	-.005*** (0.000)	-.021*** (0.000)	.011*** (0.000)	-.007*** (0.000)	-.005*** (0.000)
Log(ben. fam.)*D4(1= Southeast)	-.031*** (0.000)	-.077*** (0.000)	-.034*** (0.000)	-.010*** (0.000)	-.022*** (0.000)
Log(ben. fam.)*D5(1= Center-West)	.030*** (0.000)	.071*** (0.000)	.029*** (0.000)	.036*** (0.000)	.035*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment for each one of Brazilian regions as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the following regions respectively: North, Northeast Southeast, South and Mid-West. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees with incomplete primary education, employees with incomplete junior high school, employees with incomplete high school and employees complete high school or more. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.18: Employment by workers' schooling and Bolsa Familia

	Log(employ.)				
	Overall	Level 1	Level 2	Level 3	Level 4
Panel A: Heterogeneity by beneficiaries concentration					
Log(ben. fam.)*D1(1= 1st fifth)	-.012*** (0.000)	-.035*** (0.000)	-.028*** (0.000)	-.006*** (0.000)	-.012*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.002*** (0.000)	-.003*** (0.000)	.005*** (0.000)	-.005*** (0.000)	.006*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.033*** (0.000)	.021*** (0.000)	.048*** (0.000)	.047*** (0.000)	.047*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.064*** (0.000)	.025*** (0.000)	.069*** (0.000)	.059*** (0.000)	.090*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.075*** (0.000)	.006*** (0.000)	.054*** (0.000)	.062*** (0.000)	.111*** (0.000)
Panel B: Heterogeneity by formal employment concentration					
Log(ben. fam.)*D1(1= 1st fifth)	.131*** (0.000)	-.034*** (0.000)	.056*** (0.000)	.121*** (0.000)	.155*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.030*** (0.000)	.040*** (0.000)	.054*** (0.000)	.019*** (0.000)	.043*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.009*** (0.000)	.028*** (0.000)	.031*** (0.000)	.016*** (0.000)	.022*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.016*** (0.000)	-.020*** (0.000)	-.007*** (0.000)	.002*** (0.000)	.005*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.007*** (0.000)	-.016*** (0.000)	-.007*** (0.000)	-.006*** (0.000)	-.008*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to beneficiaries and formal employment concentration distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees with incomplete primary education, employees with incomplete junior high school, employees with incomplete high school and employees complete high school or more. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.19: Employment by workers' schooling and Bolsa Familia

	Log(employ.)				
	Overall	Level 1	Level 2	Level 3	Level 4
Panel A: Heterogeneity by per capita income					
Log(ben. fam.)*D1(1= 1st fifth)	.090*** (0.000)	.007*** (0.000)	.029*** (0.000)	.071*** (0.000)	.112*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.037*** (0.000)	.013*** (0.000)	.033*** (0.000)	.014*** (0.000)	.059*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.017*** (0.000)	.011*** (0.000)	.042*** (0.000)	.038*** (0.000)	.026*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	-.005*** (0.000)	-.009*** (0.000)	.003*** (0.000)	-.001*** (0.000)	.006*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	.008*** (0.000)	-.015*** (0.000)	.016*** (0.000)	.023*** (0.000)	.012*** (0.000)
Panel B: Heterogeneity by population					
Log(ben. fam.)*D1(1= 1st fifth)	.030*** (0.000)	.025*** (0.000)	.043*** (0.000)	.032*** (0.000)	.042*** (0.000)
Log(ben. fam.)*D2(1= 2nd fifth)	.011*** (0.000)	.007*** (0.000)	.010*** (0.000)	.020*** (0.000)	.022*** (0.000)
Log(ben. fam.)*D3(1= 3rd fifth)	.057*** (0.000)	.006*** (0.000)	.057*** (0.000)	.080*** (0.000)	.084*** (0.000)
Log(ben. fam.)*D4(1= 4th fifth)	.044*** (0.000)	.009*** (0.000)	.040*** (0.000)	.055*** (0.000)	.058*** (0.000)
Log(ben. fam.)*D5(1= 5th fifth)	-.023*** (0.000)	-.060*** (0.000)	-.045*** (0.000)	-.058*** (0.000)	-.021*** (0.000)
Observations	72,304	72,304	72,304	72,304	72,304

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates of the coefficient of program intensity on formal employment according to income and demographic distribution as in equation (3) using OLS. The variables D1 through D5 are dummies associated to the distributions' fifths. Column 1 through 5 report coefficients associated to different dependent variables: overall employees in the economy, employees with incomplete primary education, employees with incomplete junior high school, employees with incomplete high school and employees complete high school or more. Observations are at municipal level. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control.

Table 10.20: Heterogeneous regressions including Saúde da Família variable

	Log(employ.)				
	Region	Qts. Benefic.	Qts. Employ.	Qts. Pers. Inc.	Pop.
Log(ben. fam.)*D1	.095* (.047)	.013 (.013)	.144*** (.030)	.097** (.030)	.055** (.019)
Log(ben. fam.)*D2	.086*** (.025)	.021 (.014)	.042* (.019)	.050* (.023)	.028 (.024)
Log(ben. fam.)*D3	.014 (.012)	.049* (.020)	.024 (.018)	.033 (.018)	.066** (.023)
Log(ben. fam.)*D4	-.004 (.016)	.065** (.024)	-.001 (.013)	.015 (.013)	.055** (.020)
Log(ben. fam.)*D5	.035 (.030)	.105** (.033)	.006 (.014)	.028 (.017)	-.005 (.016)
C = PSF	.150* (.067)	.155* (.066)	.140* (.067)	.149* (.067)	.137* (.066)
Log(ben. fam.)*D1*C	-.005 (.018)	-.002 (.018)	-.003 (.018)	-.001 (.018)	.001 (.018)
Log(ben. fam.)*D2*C	-.023 (.012)	-.023 (.012)	-.022 (.012)	-.021 (.012)	-.017 (.012)
Log(ben. fam.)*D3*C	-.023* (.010)	-.024* (.010)	-.022* (.011)	-.024* (.011)	-.022* (.010)
Log(ben. fam.)*D4*C	-.024* (.011)	-.026* (.011)	-.023* (.011)	-.025* (.011)	-.024* (.011)
Log(ben. fam.)*D5*C	-.009 (.020)	-.007 (.023)	.001 (.022)	-.005 (.022)	-.016 (.023)
Log(pop.)	.211*** (.048)	.219*** (.048)	.218*** (.048)	.214*** (.048)	.214*** (.048)
Fixed effects	Y	Y	Y	Y	Y
Dummy: Year	N	N	N	N	N
State Linear Trend	N	N	N	N	N
Dummy: Year x State	Y	Y	Y	Y	Y
F-test (controls)	0.308	0.203	0.25	0.209	0.263
Observations	61,185	61,185	61,185	61,185	61,185
R ²	.974	.974	.974	.974	.974
Adjusted R ²	.968	.968	.968	.968	.968
Residual Std. Error	.269	.269	.269	.269	.269

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity and its interaction with a dummy indicating the presence of Saúde da Família on formal employment as specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control. The F statistic is calculated in order to test the joint significance of estimates from all interactions terms added to the specification.

Table 10.21: Heterogeneous regressions including infant mortality variable

	Log(employ.)				
	Region	Qts. Benefic.	Qts. Employ.	Qts. Pers. Inc.	Pop.
Log(ben. fam.)*D1	.096* (.044)	-.014 (.010)	.140*** (.028)	.090** (.028)	.038* (.016)
Log(ben. fam.)*D2	.072** (.025)	-.006 (.010)	.029 (.017)	.038 (.020)	.007 (.020)
Log(ben. fam.)*D3	-.006 (.008)	.033* (.017)	.005 (.014)	.017 (.014)	.046* (.021)
Log(ben. fam.)*D4	-.028* (.013)	.061** (.020)	-.020* (.009)	-.010 (.008)	.039* (.018)
Log(ben. fam.)*D5	.008 (.012)	.081* (.033)	-.010 (.011)	.005 (.013)	-.026 (.014)
C = Child Mortality	-.189 (.154)	-.198 (.154)	-.191 (.154)	-.193 (.154)	-.201 (.155)
Log(ben. fam.)*D1*C	-.002 (.003)	-.0003 (.003)	-.001 (.003)	-.0003 (.003)	.00002 (.003)
Log(ben. fam.)*D2*C	-.001 (.002)	-.001 (.002)	-.001 (.002)	-.001 (.002)	-.0004 (.002)
Log(ben. fam.)*D3*C	.002* (.001)	.002* (.001)	.002* (.001)	.002* (.001)	.002* (.001)
Log(ben. fam.)*D4*C	.002* (.001)	.002 (.001)	.002 (.001)	.002 (.001)	.002 (.001)
Log(ben. fam.)*D5*C	.005** (.002)	.005** (.002)	.005** (.002)	.005** (.002)	.005** (.002)
Log(pop.)	.229*** (.045)	.239*** (.045)	.236*** (.044)	.234*** (.045)	.235*** (.045)
Fixed effects	Y	Y	Y	Y	Y
Dummy: Year	N	N	N	N	N
State Linear Trend	N	N	N	N	N
Dummy: Year x State	Y	Y	Y	Y	Y
F-test (controls)	0.008	0.015	0.01	0.023	0.054
Observations	66,624	66,624	66,624	66,624	66,624
R ²	.974	.974	.974	.974	.974
Adjusted R ²	.968	.968	.968	.968	.968
Residual Std. Error	.267	.267	.267	.267	.267

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity and its interaction with the proportion of infant mortality on formal employment as specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control. The F statistic is calculated in order to test the joint significance of estimates from all interactions terms added to the specification.

Table 10.22: Heterogeneous regressions including educational variable

	Log(employ.)				
	Region	Qts. Benefic.	Qts. Employ.	Qts. Pers. Inc.	Pop.
Log(ben. fam.)*D1	.109* (.045)	.016 (.015)	.145*** (.029)	.104*** (.029)	.056** (.019)
Log(ben. fam.)*D2	.082*** (.025)	.019 (.013)	.043* (.017)	.054* (.021)	.021 (.020)
Log(ben. fam.)*D3	.014 (.012)	.050** (.018)	.021 (.016)	.038* (.016)	.077*** (.022)
Log(ben. fam.)*D4	.003 (.017)	.077*** (.021)	.004 (.012)	.016 (.012)	.066*** (.019)
Log(ben. fam.)*D5	.029* (.014)	.088** (.033)	.013 (.015)	.033* (.017)	.010 (.016)
C = Mother's Education	.304*** (.088)	.330*** (.091)	.283** (.088)	.345*** (.091)	.377*** (.086)
Log(ben. fam.)*D1*C	-.059* (.026)	-.055* (.025)	-.049* (.025)	-.055* (.025)	-.058* (.025)
Log(ben. fam.)*D2*C	-.035* (.014)	-.037* (.015)	-.030* (.014)	-.039** (.015)	-.041** (.014)
Log(ben. fam.)*D3*C	-.035* (.014)	-.040** (.015)	-.033* (.014)	-.044** (.015)	-.049*** (.014)
Log(ben. fam.)*D4*C	-.051** (.016)	-.058*** (.017)	-.050** (.016)	-.062*** (.017)	-.070*** (.016)
Log(ben. fam.)*D5*C	-.040** (.015)	-.046** (.016)	-.035* (.016)	-.047** (.016)	-.055*** (.016)
Log(pop.)	.238*** (.043)	.246*** (.043)	.242*** (.043)	.241*** (.043)	.243*** (.043)
Fixed effects	Y	Y	Y	Y	Y
Dummy: Year	N	N	N	N	N
State Linear Trend	N	N	N	N	N
Dummy: Year x State	Y	Y	Y	Y	Y
F-test (controls)	0.001	0	0.001	0	0
Observations	72,294	72,294	72,294	72,294	72,294
R ²	.973	.973	.973	.973	.973
Adjusted R ²	.967	.967	.967	.967	.967
Residual Std. Error	.269	.269	.269	.269	.269

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity and its interaction with the proportion of births whose mothers had more than 4 years of education on formal employment as specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control. The F statistic is calculated in order to test the joint significance of estimates from all interactions terms added to the specification.

Table 10.23: Heterogeneous regressions including climatic shock variable

	Log(employ.)				
	Region	Qts. Benefic.	Qts. Employ.	Qts. Pers. Inc.	Pop.
Log(ben. fam.)*D1	.092* (.046)	-.005 (.012)	.125*** (.027)	.087** (.028)	.040* (.018)
Log(ben. fam.)*D2	.068** (.025)	.006 (.013)	.032 (.018)	.037 (.022)	.011 (.023)
Log(ben. fam.)*D3	-.004 (.009)	.033 (.018)	.007 (.017)	.011 (.013)	.050* (.021)
Log(ben. fam.)*D4	-.031* (.013)	.048* (.019)	-.016 (.009)	-.002 (.012)	.044* (.018)
Log(ben. fam.)*D5	.029 (.026)	.088** (.031)	-.004 (.012)	.013 (.015)	-.021 (.014)
C = Rain	-.036 (.031)	-.036 (.031)	-.034 (.031)	-.034 (.031)	-.035 (.031)
Log(ben. fam.)*D1*C	-.001 (.010)	-.0001 (.010)	-.001 (.010)	-.001 (.010)	.0003 (.010)
Log(ben. fam.)*D2*C	.006 (.004)	.007 (.004)	.006 (.004)	.006 (.004)	.006 (.004)
Log(ben. fam.)*D3*C	.006 (.004)	.006 (.004)	.006 (.004)	.006 (.004)	.006 (.004)
Log(ben. fam.)*D4*C	.007 (.004)	.007 (.004)	.006 (.004)	.007 (.004)	.006 (.004)
Log(ben. fam.)*D5*C	.011 (.007)	.011 (.007)	.011 (.007)	.011 (.007)	.011 (.007)
Log(pop.)	.199*** (.049)	.209*** (.049)	.208*** (.049)	.203*** (.049)	.203*** (.049)
Fixed effects	Y	Y	Y	Y	Y
Dummy: Year	N	N	N	N	N
State Linear Trend	N	N	N	N	N
Dummy: Year x State	Y	Y	Y	Y	Y
F-test (controls)	0.26	0.391	0.365	0.344	0.481
Observations	57,863	57,863	57,863	57,863	57,863
R ²	.973	.973	.973	.973	.973
Adjusted R ²	.966	.966	.967	.966	.966
Residual Std. Error	.268	.268	.268	.268	.268

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity and its interaction with a dummy indicating the shock in yearly precipitation on formal employment as specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control. The F statistic is calculated in order to test the joint significance of estimates from all interactions terms added to the specification.

Table 10.24: Nonlinear regressions including financial flow variable

	Log(employ.)				
	Region	Qts. Benefic.	Qts. Employ.	Qts. Pers. Inc.	Pop.
Log(ben. fam.)*D1	.097* (.044)	.005 (.012)	.136*** (.028)	.095*** (.028)	.038* (.016)
Log(ben. fam.)*D2	.072** (.024)	.014 (.012)	.036* (.017)	.043* (.020)	.021 (.023)
Log(ben. fam.)*D3	.008 (.009)	.040* (.017)	.018 (.016)	.027* (.013)	.067** (.021)
Log(ben. fam.)*D4	-.015 (.013)	.067*** (.020)	-.005 (.009)	.007 (.012)	.054** (.017)
Log(ben. fam.)*D5	.037 (.025)	.079* (.032)	.008 (.012)	.022 (.014)	-.008 (.014)
C = Log(BNDES' transfers)	.010*** (.001)	.011*** (.001)	.011*** (.001)	.011*** (.001)	.011*** (.001)
Log(ben. fam.)*D1*C	-.019*** (.003)	-.020*** (.003)	-.020*** (.003)	-.020*** (.003)	-.020*** (.003)
Log(ben. fam.)*D2*C	-.014*** (.002)	-.015*** (.002)	-.015*** (.002)	-.015*** (.002)	-.016*** (.002)
Log(ben. fam.)*D3*C	-.019*** (.002)	-.020*** (.002)	-.020*** (.002)	-.020*** (.003)	-.021*** (.003)
Log(ben. fam.)*D4*C	-.021*** (.003)	-.022*** (.003)	-.022*** (.003)	-.023*** (.003)	-.024*** (.003)
Log(ben. fam.)*D5*C	-.016*** (.003)	-.017*** (.003)	-.017*** (.003)	-.017*** (.003)	-.018*** (.003)
Log(pop.)	.236*** (.043)	.245*** (.043)	.241*** (.043)	.240*** (.043)	.240*** (.043)
Fixed effects	Y	Y	Y	Y	Y
Dummy: Year	N	N	N	N	N
State Linear Trend	N	N	N	N	N
Dummy: Year x State	Y	Y	Y	Y	Y
F-test (controls)	0	0	0	0	0
Observations	72,304	72,304	72,304	72,304	72,304
R ²	.973	.973	.973	.973	.973
Adjusted R ²	.967	.967	.968	.967	.967
Residual Std. Error	.269	.269	.268	.269	.269

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity and its interaction with the amount of loans granted by BNDES on formal employment as specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control. The F statistic is calculated in order to test the joint significance of estimates from all interactions terms added to the specification.

Table 10.25: Heterogeneous regressions including political interference variable

	Log(employ.)				
	Region	Qts. Benefic.	Qts. Employ.	Qts. Pers. Inc.	Pop.
Log(ben. fam.)*D1	.095* (.043)	-.011 (.012)	.131*** (.027)	.090** (.028)	.030 (.016)
Log(ben. fam.)*D2	.070** (.023)	.005 (.013)	.029 (.016)	.037 (.020)	.011 (.023)
Log(ben. fam.)*D3	-.005 (.008)	.034* (.016)	.010 (.016)	.017 (.013)	.057** (.020)
Log(ben. fam.)*D4	-.030* (.013)	.062** (.019)	-.015 (.009)	-.004 (.012)	.045** (.017)
Log(ben. fam.)*D5	.030 (.026)	.072* (.033)	-.006 (.012)	.009 (.014)	-.021 (.013)
C = Mayor's Party	.065 (.040)	.067 (.040)	.068 (.040)	.069 (.040)	.067 (.040)
Log(ben. fam.)*D1*C	-.009 (.006)	-.009 (.006)	-.010 (.006)	-.009 (.006)	-.009 (.006)
Log(ben. fam.)*D2*C	-.007 (.005)	-.007 (.005)	-.007 (.005)	-.008 (.005)	-.007 (.005)
Log(ben. fam.)*D3*C	-.008 (.005)	-.008 (.005)	-.008 (.005)	-.009 (.005)	-.008 (.005)
Log(ben. fam.)*D4*C	-.010 (.006)	-.011 (.006)	-.011 (.006)	-.011 (.006)	-.011 (.006)
Log(ben. fam.)*D5*C	-.010 (.007)	-.010 (.007)	-.010 (.007)	-.011 (.007)	-.010 (.007)
Log(pop.)	.239*** (.041)	.249*** (.041)	.246*** (.041)	.245*** (.041)	.245*** (.041)
Fixed effects	Y	Y	Y	Y	Y
Dummy: Year	N	N	N	N	N
State Linear Trend	N	N	N	N	N
Dummy: Year x State	Y	Y	Y	Y	Y
F-test (controls)	0.774	0.757	0.736	0.741	0.786
Observations	72,062	72,062	72,062	72,062	72,062
R ²	.973	.973	.973	.973	.973
Adjusted R ²	.967	.967	.967	.967	.967
Residual Std. Error	.268	.268	.268	.268	.268

Note:

*p<0.05; **p<0.01; ***p<0.001

This table reports estimates on the coefficient of program intensity and its interaction with a dummy indicating the coincidence between the mayor and the president parties on formal employment as specified in equation (4) using OLS. Each column refers to one of the five different sets of constructed indicator variables, which are listed on column names. Observations are at municipal level. The dependent variable is the total amount of registered workers in the municipality. Standard errors (reported in parenthesis) are clustered at state level. All regressions include municipalities and state x year fixed effects and the logarithm of its population as control. The F statistic is calculated in order to test the joint significance of estimates from all interactions terms added to the specification.