Conditional Cash Transfer, Labor Inspection and Child Labor in Brazil[☆]

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Abstract

Empirical studies concerning the determinants of child labor are widespread and consolidated in literature. However, most emphasize the role of individual or family-level factors. As contribution, we test the hypothesis that society-level factors also play key roles on the rate of child labor in Brazil. The main focus of this study is to investigate if the *Bolsa Família* conditional cash transfer and the Labor Inspection activities contributed to reduce the rate of child labor. Alongside, we verify the role of other important factors such as: poverty, unemployment, urbanization and proportion of children and adolescents enrolled in school. For this, we aggregate individual data from 2004–2009 and 2011–2014 PNAD to state level and adopted panel data models. Our empirical results do not permit to conclusively sustain the hypothesis that the *Bolsa Família* program and the Labor Inspection contributed to reduce child labor rate in Brazil.

Area 12 – Social Economics
Key words: *Bolsa Família*, Labor Inspection, determinants, dynamics.
JEL classifications: H53, J08, J13.

Resumo

Estudos empíricos sobre os determinantes do trabalho infantil são muito difundidos e consolidados na literatura. Contudo, a maioria ressalta o papel de fatores a nível individual ou familiar. Este artigo trabalho pretende contribuir para o debate, ao verificar a hipótese de que fatores agregados também desempenham papel importante na taxa de trabalho infantil no Brasil. O foco principal é investigar se o Programa Bolsa Família e a Inspeção de Trabalho contribuíram para reduzir a taxa de trabalho infantil. Concomitantemente, averígua-se o papel de outros fatores relevantes, tais como: pobreza, desemprego, urbanização e proporção de crianças e adolescentes matriculados em escola. Para isso, agregamos dados da PNAD de 2004 a 2009 e 2011 a 2014 para nível estadual e adotamos modelos de dados em painel. Nosso resultado empírico não permite sustentar de maneira conclusiva que o Programa Bolsa Família e a Inspeção de Trabalho contribuíram para reduzir a taxa de trabalho infantil no Brasil.

Àrea 12 – Economia Social
Palavras-chave: *Bolsa Família*, Inspeção de Trabalho, determinantes, dinâmica.
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1. Introduction

Article 60 of the Brazilian statute for children and adolescents, recognized in Law nº 8069 of the Federal Constitution, prohibits any labor activity to minors under the age of 16, except in the condition of apprenticeship as from the age of 14. Still in 2014, there are about 3,3 million child laborers between age 5 and 17 in Brazil (IBGE-PNAD, 2014). Specifically, about 2% of this total are between age 5 and 9, about 25% between age 10 and 14, and about 73% between age 15 and 17. Despite the remarkable achievements of the Brazilian government concerning the combat of child labor over time, these numbers are still alarming. Thus, the contribution of studies concerning the potential determinants of child labor continue vital.

Empirical studies concerning determinants of child labor is widespread in Brazilian literature. However, majority use individual data to investigate factors that lead children and adolescents to work. Such approach permits to account for the effect of individual and family specific factors such as, for example, skin color, gender, family income, parent's level of education, family structure, etc (Kassouf, 2001; Schwartzman and Schwartzman, 2001; Cacciamali and Tatei, 2008; Kassouf and Justus, 2010; Aquino et al., 2010). Nevertheless, these studies do not account for relevant macro-level determinants of child labor rate such as, for example, income inequality, urbanization, poverty and unemployment, etc.

The only empirical study which sought to explain the rate of child labor in Brazil is that of Ramalho and Mesquita (2013). These authors used a panel data of Brazilian states over the period of 2001 to 2009. Although the main objective of the study was to investigate the determinants of child labor rate in urban Brazilian states, greater attention was given to temporal dynamics and informality. Notwithstanding the contribution in these aspects, these authors omitted several relevant macro-level determinants of child labor rate such as urbanization, unemployment rate and the proportion of children enrolled in schools. Moreover, the only factor treated as endogenous during model specification was family income, leaving out the *Bolsa Família* program. This program is endogenous since participation in the program is conditioned to the nonexistence of child laborers in the family. Thus, the omission of relevant factors and the negligence of potential endogeneity makes estimates inconsistent.

Therefore, our contribution towards the study of Ramalho and Mesquita (2013) is that it controls additional macro-level factors which has been deemed relevant by theoretical studies. Moreover, on this course we measure the impact of governmental social programs in combating child labor. Furthermore, we account for endogeneity using appropriate methods.

In short, the main objective here is to investigate the effect of the *Bolsa Família* conditional cash transfer program (henceforth, PBF) and Labor Inspection on the rate of child labor among Brazilian states. Concerning this objective, we put forward the hypothesis that both measures contributed to reduce child labor rate from 2004 to 2014. On the one hand, the PBF program ease financial strain of poor families, conditioning them to enroll their children in school. On the other hand, the Labor Inspection withdraw children from work, gives them social assistance and also fines exploiters of the labor of children and adolescents.

As per structure, aside this introductory section, Section 2 presents a detailed review of previous evidences. Section 3 presents the data, empirical strategy and procedure. Section 4 provides the empirical results. Section 5 is conclusive.

2. Previous Evidences

As spotlight is on macro-level determinants[3], in this section we review the literature which treats the impacts of economic progress on child labor. As economic progress, we refer to the

[3]For details regarding micro-level causes, see Basu (1999), Hilowitz et al. (2004a), Kassouf (2002), Kassouf (2007) and ILO (2007).

levels of poverty, unemployment, economic growth and urbanization.

Poverty

Poverty has been overtly concurred, in most theoretical and empirical literature, to be the major determinant of the supply of child labor both at the micro and macro level. From the micro-level stance, many empirical studies (Basu and Van, 1998; Kassouf, 2001; Edmonds and Turk, 2002; Kassouf, 2002; Basu, 2003; Hilowitz et al., 2004a) defend that families send children to work only if adult's income does not cover the basic needs of the family. Thus, families in situation of poverty or extreme poverty are more likely to send children to work, since rich families do not depend on children's income for subsistence. From the macro-level angle, studies such as Galli (2001), Edmonds (2005), Edmonds and Pavcnik (2005) and Kambhampati and Rajan (2006) concluded that macroeconomic progress reduces child labor. This is because richer societies can offer more free and quality education, better health services and also adopt poverty reduction measures, compared to poorer societies. Moreover, richer societies have higher level of adult wage, which directly reduces micro-level poverty.

Inasmuch as poverty is widely accepted as a major cause of child labor, some studies (Barros et al., 1994; Ray, 2000; Rogers and Swinnerton, 2004; Kambhampati and Rajan, 2006; Dumas, 2007; Kassouf and Justus, 2010; Repórter Brasil, 2013; Sarkar and Sarkar, 2016) have questioned this relation. In short, these authors claim that the validity of the hypothesis of poverty as the major cause of child labor is doubtful. However, there is, yet, no consensus regarding the basis of such argument in literature. In Barros et al. (1994) and Ray (2000), no evidence was provided concerning the invalidity of the hypothesis. However, Bhalotra and Heady (2003) empirically defended, using Ghanaian and Pakistani data, the wealth paradox that children from families with larger farm size (*proxy* for family wealth in agrarian societies) are most likely to be child laborers compared to children from families with smaller farm size.

Similar evidence was found by Dumas (2007) and Kassouf and Justus (2010) who considered farm size a *proxy* for family wealth. On the one side, Dumas (2007) reinstated the wealth paradox, adding that the labor supply of minors is an aftermath of labor market imperfections in rural Burkina Faso. On the other side, Kassouf and Justus (2010) contributed to this motion, using Brazilian data, by indicating that the probability distribution of child labor in function of farm size is a parabola opening downwards. Thus, child labor increases with greater family farm size but reaches a specific maximum point from which it declines.

Level of Urbanization

According to previous studies, urbanization rate is also an important determinant of child labor. This is not only because of the difference in the level of poverty, but also due to peculiarities attached to the type of child labor concentrated in both rural and urban areas in terms of proportion, visibility and sectoral distribution. There is consensus in national and international literature that the rate of child labor is greater in rural areas. However, in Brazil, despite higher rates are observed in the rural areas, the number of children and adolescents who work is higher in the urban areas due to the high population density (Inaiá, 2008; Repórter Brasil, 2013; Kassouf, 2015).

Other factors which increase the labor force of children and adolescents in the urban area is the availability of better quality education, health services and greater economic opportunities. Such factors tend to encourage migration from rural to urban areas. It is, however, important to note that inasmuch as the conditions of an urbanized area apparently seem better, one has to take into account the effect of inequality and wage differences between skilled and unskilled workers. According to Barros et al. (1994), the socioeconomic condition of poor households or unskilled workers in the urban areas is more harsh compared to the same group in rural areas. Some plausible reasons for this are wage gap between skilled and unskilled labor, higher cost of living, more competitive labor markets, etc. (Ferreira-Batista and Cacciamali, 2012).

Sectorial Distribution

The activities in which children and adolescents are engaged vary significantly. However, there is consensus in literature that the agricultural sector is most responsible for the usage of this vulnerable labor force in Brazil (Kassouf, 2004). In the findings of this author, about 54.2% of the child laborers between age 5 and 15 were engaged in agricultural activities, especially in the rural areas. In descendant order of the sectoral participation of child laborers of the same age group, the agricultural sector was followed by the service and commercial sectors with 18.5% and 14.7%, respectively. In the same year, the industrial sector was responsible for the employment of about 7.2%, while the construction sector employed about 2.1% of child laborers.

According to Inaiá (2008) and the report published by Repórter Brasil (2013), aside the concentration of child labor in the agricultural sector, some of its features are quite worrisome. These features include high incidence of recruitment of child laborers between age 5–9, preference for boys, long working hours, work with sharp objects, exposure to toxic materials and intense solar radiation. Still, it is important to note that children and adolescents are employed by the family in numerous cases in the rural Brazilian areas. Generally, in such instance, child labor is conceived as positive to the development of a child and also as helping hand, form of socialization and heir training by the family (Marin et al., 2012).

DeGraff et al. (2016) focused their study on child laborers engaged in risky occupations which cause harm to their health, safety and morals. These authors chose their definition of "risky" following specifications of the ILO and the Brazilian Ministry of Labor and Employment. Specifically, the categories of risky occupations addressed in this study are domestic workers, street workers, construction workers and farm workers engaged in the cultivation of tobacco, coffee, sugar cane and manioc. Having that the ILO regulations and Brazilian Constituition prohibit risky work for individuals below age 18, these authors considered the age group between 10 and 17. General findings from this study point that most child laborers in risky working conditions are engaged in domestic services and hazardous farming, followed by the construction and street work. These authors also found that this ranking order is preserved in both rural and urban areas, however, there were relatively greater proportions in the former compared to the latter. As per gender distribution in these risky occupations, it was found that there is greater concentration of girls in hazardous occupations. Specifically, most of these girls are involved in domestic services, while boys are mostly involved in construction activities, hazardous farming and street work.

Unemployment

Very few studies have been carried out regarding the effect of economic growth and adult unemployment on child labor in Brazil. Empirical evidences from Edmonds (2005), using Vietnamese data, points that child labor reduces with economic growth, however, highlighting that such relationship is non-linear. In contradiction, Kambhampati and Rajan (2006) found empirical evidence, using data from India, that contrarily to conventional wisdom, increase in economic growth increases child labor as aftermath of the increase in the demand of cheaper labor by firms. The authors, however, noted that child labor is only reduced when growth is sustained sufficiently to outweigh increase in the demand of cheaper and unregulated labor. Abu-Ghallous (2012), using Palestinians data, concluded that increase in unemployment, which is also indicative of economic progress, leads to increase in the rate of child labor.

As for Brazil, Duryea et al. (2007) used Brazil's Monthly Employment Survey (PME, in Brazilian acronym) to analyze the impact of household economic shocks, especially unemployment, on schooling and employment of youths in metropolitan Brazil. The empirical strategy used was that of probit model and the database adopted covered about 100.000 children between age 10 and 16 from 1982 to 1999. The hypothesis alleged goes in line with that theoretically

posed by Basu (1999) and Galli (2001) that adult unemployment may lead to increase in child labor. The general estimation results provided statistically robust evidence which does not reject this hypothesis. Specifically, unemployment shocks to male household head in the metropolitan Brazil increases the likelihood of children between age 14 and 16 to enter the labor market. However, in a specific model where authors created an interaction variable between employment shocks and a dummy variable indicating children between age 10 and 14, statistically robust evidence was found concerning a negative relationship between adult unemployment and child labor. Although counterintuitive, such idea supports the observation made by Basu and Van (1998) concerning the possible ambiguous effect of adult unemployment on child labor.

Conditional Cash Transfer Program

There are variety of welfare programs adopted in Brazil to ease poor and extremely poor families of financial constraints. Similarly to other developing countries, one of these measures involve conditional direct cash or in-kind transfer.

One of the first conditional cash transfer (henceforth, CCT) programs – *Bolsa Escola* and *Renda Mínima*[4] – were created in the mid 1995s in the city of Campinas located in the state of São Paulo. These programs granted financial subsidy to poor parents, who were obliged to enroll their children in schools. In 1996, the Program for Elimination of Child Labor (PETI, in Brazilian acronym) was created due to the high proportion and stark situation of children in the labor market. Specifically, the PETI had the objective of withdrawing children and adolescents between age 7 and 15 from hazardous work and enroll them in schools (Soares and Sátyro, 2010). Aside enrollment in schools, the PETI program required children to participate in extracurricular sport, cultural, artistic and leisure activities in order to inhibit time allocation to work. Despite greater attention was given to children and adolescents, the PETI program also created job opportunities for families who earn less than half of the minimum salary in order to prevent such families to send children back to work.

In 2003, all the cash and in-kind transfer programs designed to reduce poverty were united form a single conditional cash transfer program – the *Bolsa Família* Program (henceforth, PBF), which has nationwide coverage. The participation of families in the PBF was conditioned to the level of income. Whereas, for continuity of participation, beneficiary families have to meet additional conditions concerning health care and enrollment and attendance of children in school. Therefore, one can suppose that the program seek to increase the human capital of poor families through education and health, which in turn yield better income distribution in the long run and also break poverty cycle.

In 2005, the PETI program was incorporated together with the PBF cash transfer for the sake of better management and to exploit the synergy between both programs. Despite the critics regarding the amalgamation of these welfare programs, numerous studies have pointed out that such action was imminent in order to optimize public resources, increase coverage and enhance accessibility of grants by eligible families. Albeit the main characteristics of the PETI program were maintained, the major objective of the PBF program is to reduce poverty.

In specific, the PBF program attends families which are below the poverty line[5], giving priority to families with pregnant women or children or adolescents under age 17. Regarding financial values, a fixed amount of R$77 (Brazilian currency) is transferred to extremely poor families irrespective of family structure. In addition, a variable amount between R$35 and R$175 is passed on to poor and extremely poor families depending on the family structure. Having that the PBF program only addresses families below the poverty line, the PETI pro-

[4]Schooling grant and Minimum Wage, respectively.

[5]In 2014, the poverty and extreme poverty line are set at R$154 ($1.90 per day) and R$77 ($0.95 per day) monthly per capita income, respectively.

gram was reconfigured to focus on families child laborers from families above the poverty line. However, the value transferred is expressively lower than that of the PBF program – R$ 25 per child to families who reside in rural or urban areas with less than 250 thousand inhabitants and R$ 40 per child to families who reside in urban areas with more than 250 thousand inhabitants[6].

Most empirical studies which sought the effect of CCT programs on child labor analyze its effect on the time allocation of children and adolescents. Findings from international studies such as Ravallion and Wodon (2000) and Maluccio and Flores (2005) point out that CCT programs produce positive effect on schooling and inverse effect on child labor. Attanasio et al. (2006) also, empirically, supported this finding affirming that CCT programs cause significant increase in time allocated to studies and also increases the school enrollment of children who are prone to enter the labor market early. However, studies such as Duryea and Morrison (2004) and Glewwe and Olinto (2004) fail to find effect of cash transfer programs on child labor.

In Brazil, there are still very few empirical studies which investigated the effect of the PBF program on child labor. Therefore, no consensus is reached yet.

Cardoso and Souza (2004), using 2000 census data and propensity score methods, analyzed the impact of the *Bolsa Escola* program[7] on child labor and school attendance. These authors found that the program had significant positive effect on school attendance for both boys and girls. However, the program was found shorthanded in the task of reducing child labor. In fact, the author observed that cash transfer were too small to persuade families to forgo income from child work. Instead, families preferred children to combine work and school. They also concluded that even if cash transfer could cover child's income parents and children may not be convinced to renounce extra income if the contribution of the child to family income is high.

Ferro and Kassouf (2005) used 2001 PNAD data to also verify if the *Bolsa Escola* had significant effect on child labor. Specifically, these authors opted for probit models to identify if the program influences the probability of a child to work or not, and adopted weighted least square methods to ascertain if the program, at least, reduces the weekly hours of work of children who are already in the labor market. Regarding working hours, Ferro and Kassouf (2005) found evidence that participation in the program reduces about 3 working hours of child laborers. However, these authors highlighted that such reduction has limited effect in the sense that it covers, mostly, children who do part-time work. This is because most children who engage in full term jobs have less incentive to participate in the program due to its modest values. Result concerning the probability of working pointed that children from families which participated in the program are more likely to work.

In line with findings in Ferro and Kassouf (2005), Ferro et al. (2010) used 2003 PNAD data to estimate probit models and propensity score matching approach. These authors concluded that the *Bolsa Escola* program reduces the probability of children from beneficiary families to work and increases the school enrollment of the same. However, no evidence was found concerning working hours or conciliation of work and schooling. Specifically, Ferro et al. (2010) pointed that the program reduces probability of working by 2 to 3 p.p. in the urban areas and 6 to 9 p.p. in rural areas.

Regarding the PBF program, Cacciamali et al. (2010) analyzed its impact on child labor and school attendance using 2004 PNAD data to estimate probit models. The estimates from these models indicated positive relationship between the PBF program and child labor, i.e, children from beneficiary families are more likely to work. These conclusion was sustained in models for urban and rural areas, and also in models for separate regions in Brazil. However, Cacciamali et al. (2010) found that the program was efficient in increasing school attendance of children and adolescents. These authors clarified that, different from the PETI program, the

[6]Current values as at August/2016.

[7]A CCT program which preceded and had similar objectives to that of the *Bolsa Família* program.

main objective of the PBF program is not to eliminate child labor but to reduce poverty.

Still on the effect of the PBF program, Araujo et al. (2010) sought empirical evidence regarding its role on child labor among beneficiaries who reside in Brazilian urban areas. The methodological strategy used to reach this objective was that of propensity score matching using 2006 PNAD data. Similarly to previous authors, Aquino et al. (2010) concluded that the PBF program was efficient in increasing the school attendance and enrollment of children and adolescents. However, the program presented shortcomings regarding the reduction of child labor. These authors also buttressed the role of household unobservables in the decision of child labor supply and participation in the PBF program. Also adopting propensity score matching method for 2011 PNAD data, Do Nascimento et al. (2016) concluded that participation in the PBF program has no significant effect neither on the probability of a child to work nor working hours. However, evidence was found that the sum transferred to families contribute to reduce the probability of child labor, likewise working hours.

Conclusively, these studies pointed that the participation in PBF program has no conspicuous effect on the probability of children and adolescents to work. However, most studies found its effect in reducing working hours. Such unsatisfactory effect of this program may be due to, firstly, the low elasticity of child labor to changes in poverty as pointed by Kassouf (2001), Schwartzman and Schwartzman (2001), Emerson and Souza (2003) and Cacciamali et al. (2010). It is also important to take into account that, as theoretically pointed out by Das and Deb (2006), the value transferred to families are relatively too low compared to the income of child laborers. Thus, extremely poor families are less motivated to participate in the program and those who opt to participate are less willing to withdraw children from work[8].

Labor Inspection

As aftermath of the dramatic increase in the number of children and adolescents working in the 1980s, the Brazilian government recognized child labor as a problem which deserves priority. One of the adopted measures was the Labor Inspection with focus on child labor. These Labor Inspection activities are conducted by the Secretariat of Labor Inspection (SIT), which is part of the Brazilian Ministry of Labor and Employment (MTE).

Concerning the inspection process, an annual plan is drawn by the Regional Superintendencies of Labor and Employment (SRTEs) based on the guidelines of the SIT. ThiS plan is sketched taking in account the reports of child labor, prioritizing the worst forms of child labor. Having planned, labor inspectors are responsible for the preventive actions and inspection activities. The preventive actions involve awareness-creation by publicizing the negative impacts of child labor through lectures, seminars, debates and campaigns to children, employers and families. Months after preventive actions labor inspectors conduct inspection activities, which involve visit of businesses or workplaces in urban and rural areas throughout the country (ILO/SIT, 2010).

During these visits, inspectors identify irregularities concerning child labor, fill out an examination form regarding the characteristics of the work exercised by the child, withdraw child from work and issue infraction reports regarding exploiter, which may lead to fining. In order to avoid return to work, children and adolescents are included in social welfare programs. In specific, children under the age of 14 are enrolled in cash transfer programs conditioned to school attendance and participation in social, educational and health care projects. Moreover, adolescents above the age of 14 are enrolled in apprenticeship programs, which offer technical training in workplaces with the intention of learning and not production. In addition, the SIT

[8]See detail regarding conciliation of work and schooling by children in Inaiá (2008) and its evolution in Kassouf (2015).

published data regarding the undertaken inspection activities in the Information System of Child Labor (SITI) since 2006.

The ILO/SIT (2010) report pointed out to positive results of the Labor Inspection in Brazil concerning the number of children which have been withdrawn from work. Still, this report added that the efficiency of the inspection activities should not be measured only take into account the number of children removed from work, but also by the awareness-creation. This is because the preventive actions undertaken by inspectors increased the visibility of child labor issues in the society, which impacted on the attitude of the media, governmental institutions, employers and families.

The only empirical study found regarding the effect of Labor Inspection on child labor till date[9] was that of Almeida (2015). Having that most inspection decisions are taken based on complaints filed regarding child labor, the estimation of the effect of Labor Inspection on child labor is subdue to underestimation and endogeneity. Therefore, this author adopted a two-step generalized minimum least squares method using data for 2000 and 2010 from census and SITI database. In the first stage estimation the distance between inspection agencies and firms and the number of labor inspectors were used as instruments in order to estimate number of inspections. Subsequently, the estimate for Labor Inspection was inserted as regressor in the second stage model, which was for child labor. As for year 2000 and 2010 data, it was found that 1% increase in the number of labor of inspection reduces the proportion of child laborers between age 10 and 17 in 0.22% and 0.26%, respectively. In absolute terms, the Labor Inspection accounted for the reduction of, approximately, 8,658 and 8,856 child laborers in year 2000 and 2010, respectively.

Based on the empirical literature presented in this section, it is possible to create insight of the signs and challenges expected from our modeling exercises. We expect an inverse relationship between poverty and child labor rate. However, previous studies point that the degree of such relationship is lower than expected. Reviewed studies indicate that child labor is lower in urban regions, i.e, we expect a negative relationship between urbanization and child labor rates. As to sectoral distribution, one expects to find higher rates of child labor in the agricultural sector compared to the service, trade and industrial sectors. As to unemployment rate, consensus was observed in empirical studies towards a positive sign, i.e, the increase in unemployment rate should lead to increase in the rate of child labor. Last but not the least, the signs expected from the main variables of interest, PBF and Labor Inspection, are negative. On the one hand, most empirical studies found that children from poor families who benefit from the PBF program have lesser probability of working compared to children from poor families who do not participate in the program. On the other hand, empirical evidence sustain the hypothesis that the Labor Inspection contributed to reduce child labor in Brazil.

The major challenge for the modeling exercise is endogeneity. The variables of interest PBF and Labor Inspection are suspected to be highly endogenous since they are governmental factors which are also determined by the level child labor. The empirical strategy adopted to circumvent this challenge will be detailed in the next section.

3. Methodology

3.1. Data

The main source of data used to reach the objective of this study is the PNAD conducted by the IBGE. Moreover, data concerning the *Bolsa Família* Program (abbreviated, PBF) and Labor Inspection were obtained from the Ministry for Social Development (MDS in Brazilian acronym) and Ministry of Labor and Employment (MTE in Brazilian acronym), respectively.

[9] October/2016.

Table 1: Summary statistics for panel data used for estimation

Variable	Description		Mean	Std. Dev.	Min	Max
`childlabor`	Percentage rate of child labor	overall	6.29	3.20	0.61	17.11
		between		2.48	1.12	11.68
		within		2.07	1.19	12.67
`childeduc`	Percentage of children and adolescents between age 5 and 15 enrolled in school	overall	92.24	3.26	80.97	97.60
		between		2.39	87.03	95.54
		within		2.25	85.69	98.84
`famincome`	Average family income per capita	overall	714.87	294.80	276.79	1,962.02
		between		273.90	408.05	1,624.42
		within		119.98	291.30	1,052.47
`mothereduc`	Average years of mothers' schooling	overall	7.68	1.15	4.85	10.59
		between		0.97	5.77	9.79
		within		0.64	6.01	9.02
`familysize`	Number of family members	overall	3.88	0.35	3.21	5.16
		between		0.32	3.41	4.56
		within		0.17	3.40	4.48
`PBF`	Per capita value transferred by the PBF to states in reais (Brazilian currency)	overall	88.25	68.43	5.41	317.43
		between		42.94	22.70	159.63
		within		53.86	−26.72	246.05
`inspect`	Number of Labor Inspections with focus on child labor	overall	176	250	1	1,510
		between		136	20	603
		within		−210	413	1083
`unemp`	Unemployment rate among economically active population	overall	5.89	2.36	1.69	15.06
		between		2.20	2.65	12.24
		within		0.99	1.19	8.71
`urban`	Urbanization rate in percentage	overall	80.23	9.32	58.25	98.21
		between		9.087	63.89	96.78
		within		2.63	72.46	85.85

Source: Prepared using data from PNAD.
Note: Number of observations is 270, except for the `inspect` variable which has 207 observations.

As we focus on the macro-level determinants of child labor and the effect of intra-national policies adopted by the Brazilian government to combat child labor, individual data from PNAD were aggregated to Brazilian state level. Therefore, both continuous and dummy variables were transformed in means and proportions computed using the weights or sample expansion factors provided by the IBGE in the data files. By aggregating data to state level and covering the period between 2004 and 2014 (without data for 2010), we create a panel data composed by 27 states over 10 years. Note that data concerning the Labor Inspection only covers the period between 2006 and 2014 and had missings for some states. Thus, instead of having 210 observations (27 states times 10 years), we ended up with the total of 207. However, the overall panel data is strongly balanced, even though with few gaps.

Table 1 presents the mean and standard deviation for variables that are considered for model specification. Note that the standard deviation is decomposed into between and within deviations. From this table, we observe that the former is greater than the latter for all variables. This implies that there is expressive heterogeneity among states.

The rate of child labor among individuals between age 5 and 15 during the period of 2004 to 2009 and 2011 to 2014 was about 6.29%. As per family variables, an average Brazilian family is comprised of, on average, 4 members and the level of education of mothers was approximately 8 years. During this same period, the average per capita family income was, approximately, R$ 715. Regarding the `childeduc` variable, it is quite impressive to observe that about 92% of children between age 5 and 15 were enrolled in school during the period in view[10]. The two

[10]To construct this variable, we took into account the minimum age for compulsory education and its respec-

variables of interest, `PBF` and `inspect`, indicate that the average per capita value transferred by the PBF is about 88 reais and that about 176 work inspections are conducted all over the states during the period of 2004–2009 and 2011–2014. We also observe that the unemployment rate during the referred period was at about 6%. It is quite important to recall that these statistics are only for general insight concerning the magnitude and scale of variables.

3.2. Econometric Procedures

In order to adequately model the macro-level determinants of child labor in Brazil we adopted a procedurally constructive strategy and present the results in Table 2. Note that the focus here is on estimates, but on the choice of model which best suits the objective of this study.

In terms of model specification, the response variable is the rate of child labor. Specifically, *child laborer is any individual between the age of 5 and 15 involved in any labor activity deemed formal or informal, domestic or non-domestic, temporary or permanent, paid or unpaid labor activities, except in condition of apprenticeship.* This variable is denoted as `childlabor`.

The group of regressors is composed of the: proportion of children and adolescents between age 5 and 15 enrolled in school (`childeduc`); average family income per capita (`famincome`); average years of mothers' schooling (`mothereduc`); average number of family members (`familysize`); per capita value transferred by the PBF program to states (`PBF`); number of Labor Inspections with focus on child labor (`inspect`)[11]; unemployment rate among economically active population (`unemp`); urbanization rate (`urban`): group dummy for years to control for time shocks (`years`), and lastly; control for long-run tendency of a time series effect of child labor (`trend`).

The starting point of the modeling exercise was the pooled regression

$$\texttt{childlabor}_{it} = \alpha + \mathbf{x}'_{it}\beta + u_{it} \quad \text{where} \quad u_{it} = \alpha_i - \alpha - \varepsilon_{it} \tag{1}$$

estimated by OLS method alike a cross-sectional model. $\texttt{childlabor}_{it}$ is a column vector of the response variable, $\mathbf{x}'_{it}$ is a matrix of $N \times K$ regressors which vary over time, t, and across state, i, and u_{it} is the idiosyncratic error term which consists of time-invariant factors (α_i) and time-variant omitted factors (ε_{it}). Similarly to the conventional OLS model, the Pooled OLS model also assumes exogeneity of regressors, $E(u_{it}|\mathbf{x}_{it}) = 0$, conditional homoskedasticity, $E(u_{it}^2|\mathbf{x}_{it}) = \sigma^2$, and conditionally uncorrelated observations, $E(u_{it}\, u_{jt}|\mathbf{x}_{it}\, \mathbf{x}_{jt}) = 0$, where $i \neq j$. The violation of the exogeneity assumption leads to inconsistency of β estimates, whereas the violation or relax of the last two assumptions makes the Pooled OLS model no longer fully efficient.

The results from this initial model is provided in column OLS of Table 2. The Breusch-Pagan test for heteroskedasticity on this model provided a valthe OLS model, all likely unobservable and omitted factors are incorporated with the error term, u_{it}, and are assumed uncorrelated with the regressors. However, in light of the heterogeneity among states, it is important to control for states' fixed effects. The reason for this is that factors such as cultural, ideological and social beliefs may sprout innate differences among states (Basu, 1999). Such control is not possible in the OLS models, so we resort to Fixed and Random Effect models (FE and RE, respectively). These models admit the presence of a time-invariant component in the error, thus permitting control of state time-invariant unobservables.

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tive changes over time.

[11]Due to unavailability of this focused inspection for years prior to 2006, little adjustments were made while modeling equations with this variable so as to avoid observation loss for other regressors

Table 2: Models from estimation procedures

Response variable: `childlabor`				
	OLS	RE	FE	GMM-I
`constant`	19.80***	18.97***	6.577	17.57***
	(2.055)	(2.959)	(4.096)	(2.691)
$\texttt{childlabor}_{t-1}$				0.154**
				(0.071)
`famincome`	−1.032***	−0.783**	0.559	−0.448
	(0.183)	(0.334)	(0.670)	(0.376)
`childeduc`	−2.689***	−2.068	−0.801	−0.924
	(1.011)	(1.299)	(1.382)	(1.353)
`familysize`	−0.817*	−0.827	−0.0693	−1.503*
	(0.480)	(0.821)	(0.795)	(0.823)
`urban`	−1.596***	−1.701***	−0.615	−1.563**
	(0.386)	(0.444)	(0.707)	(0.747)
`unemp`	−0.692***	−0.500***	−0.0485	−0.329**
	(0.078)	(0.108)	(0.144)	(0.140)
`mothereduc`	−0.674*	−0.983	−2.198	−1.548***
	(0.391)	(0.607)	(1.460)	(0.526)
`inspect`	−0.0594***	−0.0579***	−0.0452**	−0.0478*
	(0.016)	(0.020)	(0.022)	(0.025)
`PBF`	−0.161***	−0.159**	−0.254	−0.125**
	(0.054)	(0.065)	(0.159)	(0.060)
N	207	207	207	207
R^2	0.783		0.536	

Note: Standard errors in parentheses; ***, ** and * denote significance at 1%, 5% and 10%, respectively; All variables, both the response variable and its regressors, are logarithmized; The constant term is the average effect of state unobservables; N is the number of observations.

Despite the FE and RE models account for unobservables, the treatment given by both differ. As to the FE model, the unobserved effects, α_i, are eliminated by mean-differencing, since they are assumed to be time-invariant. Thus Eq. 1 is transformed in

$$(\texttt{childlabor}_{it} - \overline{\texttt{childlabor}}_i) = (\mathbf{x}_{it} - \bar{\mathbf{x}}_i)'\beta + (\varepsilon_{it} - \bar{\varepsilon}_{it}). \tag{2}$$

Compared to the OLS model, the consistency of β in the FE model requires a weaker assumption that $E(\varepsilon_{it}|\alpha_i, \mathbf{x}_{it}) = 0$. In other words, the time-invariant component, α_i, of the composite error, u_{it} is permitted to correlate with regressors.

An extended version of the FE model was provided in the Stata software, where Eq. 2 is written as follows

$$(\texttt{childlabor}_{it} - \overline{\texttt{childlabor}}_i + \overline{\overline{\texttt{childlabor}}}) = (\mathbf{x}_{it} - \bar{\mathbf{x}}_i + \bar{\bar{\mathbf{x}}})'\beta + (\varepsilon_{it} - \bar{\varepsilon}_{it} + \bar{\bar{\varepsilon}}) \tag{3}$$

whereby $\bar{\bar{\mathbf{y}}}$, $\bar{\bar{\mathbf{x}}}$ and $\bar{\bar{\varepsilon}}$ are grand mean of $\mathbf{y}_{it}$, $\mathbf{x}_{it}$ and ε_{it}, respectively. The advantage of this extension is that an intercept estimate and its respective level of significance are provided, which is the average of unobservables, α_i.

The Random Effect model (RE) is quite similar to the Fixed effect model (FE) in the sense that it admits and controls α_i. However, in the RE model α_i is assumed to be purely random and not permitted to correlate with regressors, i.e, $E(\varepsilon_{it}|\alpha_i\,\mathbf{x}_{it}) = E(\varepsilon_{it}|\mathbf{x}_{it}) = 0$. The results for both models are presented in columns FE-I and RE-I, respectively.

To statistically back up the abandon of the pooled OLS model, the F-test and the Breusch and Pagan Lagrange-multiplier test were carried out. The former tests between FE model and pooled OLS model, whilst the later tests between the RE model and pooled OLS model. With

a F-test value of 5.62 we reject the null hypothesis of the nonexistence of unobservable state time-invariant effects, α_i. Likewise, having a value of $\bar{\chi}^2 = 30.11$ for the Breusch and Pagan Lagrange-multiplier test, we reject the hypothesis that $\text{var}(\alpha_i) \neq 0$. This confirms that it is, indeed, important to control for time-invariant unobserved factors.

To choose between the FE and RE models, the Hausmann test was performed. With a test value of 36.52, we reject the null hypothesis of no correlation between regressors and state unobservables. Therefore, the RE model was abandoned for the FE model.

Ramalho and Mesquita (2013), using 2001–2009 PNAD data to estimate dynamic panel data models, affirmed the existence of temporal dynamics of child labor rate in Brazil. However, the models estimated till now do not permit the inclusion of lagged dependent variable as regressor. Following the steps of these authors, as per the control for temporal dynamic, we used the System Dynamic Panel-Data Estimator (henceforth, GMM). Thus, our dynamic model of order 1 in $\texttt{childlabor}_{it}$ is represented as

$$\texttt{childlabor}_{it} = \gamma_1 \texttt{childlabor}_{i,t-1} + \mathbf{x}'_{it}\beta + \alpha_i + \varepsilon_{it}, \quad t = 1, ..., T \text{ and } |\gamma| < 1 \tag{4}$$

Aside providing consistent estimates for γ_1 and β, the Arellano-Bond estimator accounts for endogenous regressors. In model 4, $\mathbf{x}_{it}$ can be treated as exogenous or endogenous. Exogenous regressors are those which are uncorrelated with ε_{it}, they require no special treatment and are used as instrument for themselves. As to endogenous regressors, $E(\mathbf{x}_{it}\,\varepsilon_{is}) \neq 0$ for $s \leq t$ and $E(\mathbf{x}_{it}\,\varepsilon_{is}) = 0$ for $s > t$. However, such variables can be instrumented using their lagged values. Moreover, due the moment condition that $E(\Delta \mathbf{y}_{1,\,t-1}\,\varepsilon_{it}) = 0$, the GMM also permits to use $\Delta\texttt{childlabor}_{1,\,t-1}$ as instrument (Arellano and Bover, 1995; Blundell and Bond, 1998). In this study, we use all possible lags of endogenous variables as instruments, but we limited lags of the response variable to the maximum of two. The reason for this is that, according to Cameron and Trivedi (2010), the use of too many instruments for GMM estimator may cause poor performance of asymptotic results.

The results obtained from the initial dynamic model are presented in column GMM-I of Table 2. The variables considered exogenous in this model are `unemp`, `familysize`, `mothereduc` and `urban`. The reason for this is that the decision of a child to work does not determine neither of these variables at state level. On the contrary, the variables which we consider as endogenous are `famincome`, `gini`, `childeduc`, `PBF` and `inspect`.

The `famincome` variable is suspected to be endogenous based on observation made by Psacharopoulos (1997) and Basu (1999) that in extremely poor families, children tend to be sole contributors to households income. In this sense, the endogeneity of the average per capita family income tends to be high if the child's income has significant weight in the family income. Despite the debate concerning the conciliation of work and schooling by a child, the simultaneous relationship between child labor and child education is in consensus in literature (Basu, 1999; Dessy and Pallage, 2001; Ranjan, 2001; Das and Deb, 2006). Therefore, the proportion of enrolled children is potentially endogenous. However, such endogeneity is reduced if most children conciliate schooling and work as observed by Kassouf (2002) and Kassouf (2015).

The government variables `PBF` and `inspect` are suspected to be highly endogenous. Specifically, the number of Labor Inspections conducted in a specific region depends on the number of complaints filed about the use of child labor in the region. Similarly, the amount of money transferred by the `PBF` to a certain region depends on the level of poverty of the region which, in turn, determines the number of children working.

Arellano and Bover (1995) instructed that ε_{it} must be serially uncorrelated in order to obtain consistent estimation of parameters. Formally, $\Delta\varepsilon_{it}$ are correlated with $\Delta\varepsilon_{i,\,t-1}$, since $Cov(\varepsilon_{it},\, \varepsilon_{i,\,t-1} = Cov(\varepsilon_{it} - \varepsilon_{i,\,t-1},\, \varepsilon_{i,\,t-1} - \varepsilon_{i,\,t-2}) = -Cov(\varepsilon_{i,\,t-1},\, \varepsilon_{i,\,t-1}) \neq 0$, however, $\Delta\varepsilon_{it}$ will not correlate with $\Delta\varepsilon_{i,\,t-k}$ for $k \geq 2$. Loosely speaking, the first-differenced errors, $\Delta\varepsilon_{it}$,

are correlated in the AR(1) but not in subsequent orders. The statistic test that verifies this assumption is the Arellano-Bond test. The null hypothesis of this test is that there is no autocorrelation in the first-differenced errors. Another test used to verify if the dynamic panel model is misspecified is the Sargan test of overidentifying restrictions. It is important to note that this test assumes that errors are independent and identically distributed (i.i.d), thus the Sargan test cannot be run on the heteroskedastic-robust errors.

The Sagan test of overidentifying restrictions was performed on the GMM-I model to verify if the instruments are valid. The model is considered overidentified because 189 instruments were used to estimate 10 parameters, hence there were 179 overidentifying restrictions. Having that the Sargan test assumes strict homogeneity of error, we apply this test on the regular standard errors of the model. The value of this test was 209.87 with a p-value of 0.057, implying that we do not reject the null hypothesis that overidentifying restrictions are valid at a level of 10%. Note that Arellano and Bond (1991) pointed that the Sargan test overrejects in the presence of heteroskedasticity. This might be the reason for the relatively low p-value, since there is clear evidence of heteroskedasticity as observed in previous models.

Subsequently, the Arellano-Bond test for zero autocorrelation in first-differenced errors was performed since the GMM estimator requires that ε_{it} to be serially uncorrelated. Therefore, we expect to reject the null hypothesis of no correlation at the first order but not at higher orders. The test value observed was $z = -3.57$ and p-value 0.004 at first order and $z = 0.92$ and p-value 0.3557 at second order. Hence, the null hypothesis that $Cov(\Delta\varepsilon_{it}, \Delta\varepsilon_{i,t-k}) = 0$ is rejected at a level of 1%, i.e, error ε_{it} is serially uncorrelated.

At this point, we conclude that the GMM estimator best fits the objective of this study. In short, it permits to account for time dynamics, unobservable time-invariant factors and also to control potential endogeneity caused by the loop of causality between the child labor rate and its determinants.

Henceforth, the model GMM-I will be regarded as our benchmark model and all empirical results will be based on this model and its variations.

4. Analysis of Empirical Results

The hypothesis which we analyze in this section is that *Bolsa Família* cash transfer program and the Labor Inspection activities contribute to reduce child labor rate in Brazil. To reach this objective, as detailed in Section 3, we opted for dynamic panel models which permitted to control the endogeneity of both governmental countermeasures.

In table 3, we present the benchmark model (GMM-I) from section 3.2 and two variations of itself. In model GMM-II, we included lagged values of the main variables of interest, `PBF` and `insect`, to verify if the effect of both governmental countermeasures transcends to subsequent periods. In the GMM-III model, we control for time shocks by including dummies for years (`years`) so as to isolate the effect of regressors from fixed effect of time in the rates of child labor.

We statistically verified the importance of such control by performing the Wald test for composite linear hypothesis. Having a test value of 44.25, we reject the null that all years coefficients are jointly equal to zero, therefore control for time fixed effects is necessary. Analogously, we tested the need to control for long-run tendency of time series (`trend`). The test value was 10.73, thus, such control is statistically important. Nevertheless, we proceed with empirical analysis by comparing results from this model with those from the benchmark model so as to emphasize the importance of such controls.

From the benchmark model, which has no control for time shocks and lagged values of the major variables of interest, `PBF` and `inspect`, we found empirical evidence which points that both governmental countermeasures contributed to reduce child labor. However, with these

Table 3: Results from benchmark models

Response variable: `childlabor`

	GMM-I	GMM-II	GMM-III
`constant`	17.57***	14.65***	7.281
	(2.691)	(3.094)	(4.435)
$\texttt{childlabor}_{t-1}$	0.154**	0.222**	0.231**
	(0.071)	(0.090)	(0.094)
`famincome`	−0.448	−0.409	0.526
	(0.376)	(0.378)	(0.568)
`childeduc`	−0.924	−1.920	−1.784
	(1.353)	(1.572)	(2.934)
`familysize`	−1.503*	−1.200*	−1.224
	(0.823)	(0.664)	(0.775)
`urban`	−1.563**	−1.224*	−1.223*
	(0.747)	(0.654)	(0.669)
`unemp`	−0.329**	−0.288*	−0.357**
	(0.140)	(0.162)	(0.157)
`mothereduc`	−1.548***	−1.378*	−1.360
	(0.526)	(0.750)	(0.836)
`inspect`	−0.0478*	−0.0371	−0.0254
	(0.025)	(0.026)	(0.027)
$\texttt{inspect}_{t-1}$		−0.0290	−0.000444
		(0.030)	(0.030)
`PBF`	−0.125**	−0.627*	0.229
	(0.060)	(0.343)	(0.398)
$\texttt{PBF}_{t-1}$		0.578*	0.236
		(0.322)	(0.359)
`year2007`			−0.0754
			(0.071)
`year2008`			−0.133
			(0.070)
`year2009`			−0.102
			(0.112)
`year2011`			−0.188*
			(0.098)
`year2012`			−0.332***
			(0.073)
`year2013`			−0.335***
			(0.076)
`trend`			−0.149***
			(0.046)
Number of observations	207	178	178

Note: Robust errors in parentheses; ***, ** and * denote significance at 1%, 5% and 10%, respectively; All variables, both the response variable and its regressors, are logarithmized; The constant term is the average effect of state unobservables

additional controls in model GMM-III, we notice that the effect found for theses variables turned not to be statistically significant. Similar observation were made for the controls for `familysize` and `mothereduc`. Thus, conclusion is drawn that in light of temporal shocks and long-run tendency of time series there is no clear-cut empirical evidence concerning the effect of neither the *Bolsa Família* conditional cash transfer program nor the Labor Inspection activities.

Similar results have been found in literature concerning the effect of conditional cash transfers in Brazil. For example, Cardoso and Souza (2004) and Ferro and Kassouf (2005) found no empirical effect of the *Bolsa Escola* program in reducing child labor, but found evidence concerning its effect on school attendance. Similarly, Aquino et al. (2010) and Do Nascimento et al. (2016) found no effect of the participation in the PBF program on the probability of children to work or not. However, the latter authors found that the sum transferred to families reduced the child labor, likewise working hours. Lastly, using the same estimation method as that which we used in this study, (Ramalho and Mesquita, 2013) also found no significant effect of the PBF. Nevertheless, we still argue that these authors omitted relevant controls and also did no treat the endogeneity of the PBF program.

It is important to recall that the main objective of the program is poverty and not child labor and also that the program has limitations concerning the coverage of child laborers since it only focuses on families below the poverty line.

As per Labor Inspection, we acknowledge that Almeida (2015) provided the first empirical evidence concerning the effect of inspection activities in reducing child labor. However, our results do not provide sufficient empirical evidence to support this hypothesis. Notwithstanding, we believe that the number of inspectors and inspection activities are still modest to account for the scale of child labor in Brazil.

Nevertheless, as suggested by ILO/SIT (2010), we do not limit our definition of efficiency to the outcomes and impacts of the Labor Inspection activities, but also recognize its unobservable impacts on child labor. Specifically, the Labor Inspection aims to reduce child labor through four channels: a) awareness creation, which prevents child labor in the first place; b) inspection which, directly reduces child labor; c) render of social assistance to withdrawn children, which prevent them to return to work and; d) fining of exploiters, which serves as penal measure to caught firms and warning to others.

According to numerous studies (See Kassouf (2002), Hilowitz et al. (2004b), Inaiá (2008), Aquino et al. (2010), Kassouf and Justus (2010), Marin et al. (2012) and ILO (2013), among many others), the level of urbanization plays a very important role in the determination of the rate of child labor. Specifically, evidence shows that most child laborers are found in the rural area, especially in the agricultural sector. The incidence of child labor is higher in rural areas mainly because of fewer inspections, high incidence of family agriculture and higher level of poverty compared to urban areas. The importance of this variable is reflected in the magnitude of its estimate. The coefficient indicates that the rate of child labor reduces in, approximately, 1.2% for every increase of 1% urbanization rate.

According to Inaiá (2008) and Marin et al. (2012), child labor in the rural area tends to be more hazardous because they involve the most invisible forms of child labor and are less passive of reduction through inspection, especially in family agriculture and domestic services. Marin et al. (2012) also affirmed that child labor is higher in many Brazilian rural regions because it is not considered as exploit, but as assistance, means of socialization and heir training. Note that, in such cases, child labor is not necessarily caused by poverty, but by a category of social norm which is referred to as *filial interactions* by López-Calva et al. (2002). Repórter Brasil (2013) concurs with Inaiá (2008) and Marin et al. (2012) regarding this, but added that child labor in the urban area is more visible, however the most difficult to eliminate.

Basu and Van (1998) and Galli (2001) theoretically demonstrated that child labor is positively related to adult unemployment in the sense that it reduces the level of family income and,

thus, may lead such household to send children to work. However, such relationship depends on the labor market structure and the degree of substitution between adult and child labor. In the case of an oligopsonic adult labor market, such relationship is observed, but Basu and Van (1998) informed that the relationship between adult wage and child labor may be ambiguous in a competitive labor market. Similarly, Galli (2001) pointed out that if child labor and unskilled adult labor are substitutes, a exogenous increase in child labor supply can lead to the increase in adult unemployment.

The estimate found for `unemp` indicates a negative relationship between the rate of child labor and adult unemployment, thus, not corroborating the theoretical relationship pointed by Galli (2001). However, the coefficient observed goes in line with the evidence in Duryea et al. (2007) for children between the age 10 and 14. A possible cause for this is that the `unemp` variable captured the effect of economic progress. In this way, one can interpret that the reduction of economic progress led to both adult and child unemployment. Nevertheless, we suggest further investigation of the effect of the effect of adult unemployment on child labor.

Finally, our results corroborate that found by Ramalho and Mesquita (2013) regarding the existence of temporal dependence of the rate of child labor, γ. Specifically, we observed a positive value of about 0.23. Similarly, these authors observed a positive sign and a value of about 0.29. In other words, despite the divergence of our model specification from that of these authors, we both conclude that the rate of child labor is dependent on itself over time. Specifically, about 23% of previous rate of child labor is disseminated to current rates. Therefore government policies to combat child labor may have time lagged effect on the rate of child labor.

5. Concluding Remarks

In this study, we investigated the determinants of child labor rate, however, paying special attention to the role of two governmental social programs – PBF cash transfer and Labor Inspection with focus on child labor. The hypotheses alleged was that both programs contribute to reduce the child labor rate in Brazil. On the one hand, we alleged this hypothesis concerning the *Bolsa Família* program because it relieves poor and extremely poor families of financial burdens and conditions beneficiary families to enroll children in school. On the other hand, the Labor Inspection is alleged to have mitigating effect on child labor because it assumes the role of withdrawing children from work so as to enroll them in school and give social assistance. Moreover, it fines exploiters of child labor and creates awareness in the society concerning magnitude and consequences of early work of children and adolescents.

These hypothesis were tested using dynamic panel models, which were estimated using 2004–2009 and 2011–2014 PNAD data aggregated by state. In light of time fixed effect, we did not find conclusive empirical evidence which permits to sustain the hypothesis that the PBF and Labor Inspection contributed to reduce child labor rate in Brazil.

Among all factors controlled in the empirical model, only that for urbanization rate showed elastic relationship with child labor rate. This indicate that adoption of regional policies that promotes urbanization may cause highly responsive mitigating effect on child labor rate. Moreover, urbanization sprouts other social benefits as per access to better health, education and infrastructural facilities, which in turn bolster overall economic growth. Despite these enticing benefits, it is noteworthy that urbanization policies have to take into account adverse effects such as increase in crime, unemployment, migration, poor living conditions, etc. Inclusively, such conditions may end up wheeling child labor to invisible and worst forms such as prostitution, drug trafficking and street trading and services.

Lastly, we found empirical evidence which corroborates previous literature concerning the intertemporal dependence of the rate of child labor in Brazil. Therefore, the effect of govern-

mental countermeasures against child labor in a period may be disseminated to subsequent periods.

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