Short and long-term effects of a Child Labor Ban: Appendix

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1 Differences from the recent Literature on Child Labor

Piza and Portela (2016a,b) employed a Difference-in-Differences and a Regression Discontinuity Design, respectively, to assess the impact of the increase in the minimum legal working age implemented in Brazil in 1998. Under these specifications, the authors found evidence of a four percentage point reduction in the incidence of paid labor among boys in urban areas, equivalent to a decrease of roughly one-third. Bargain and Boutin (2021) also employed a RDD to assess the impact of the same legislation. However, the authors did not find evidence of a sizable effect of the ban on child labor.

To understand the difference in the results, even though Piza and Portela (2016b) and Bargain and Boutin (2021) employed the same methodology and both authors worked on the 1999 wave of the Brazilian Household Survey (PNAD), we set up this appendix with the main assumptions, selected sample and dependent variables adopted by the three studies.[1]

We conclude that three factors drive the differences. First, the main dependent variable used by Bargain and Boutin (2021) is whether the children has a paid job or works in an unpaid

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[1]PNAD stands for *Pesquisa Nacional por Amostra de Domicílios*.

activity for their own family or others.[2] Piza and Portela (2016a,b) used paid work since 97 percent of 14-year-olds in unpaid activities were either members of the household in which they worked for or were workers for self-consumption.[3] It is unlikely that the ban would impact these children and therefore their inclusion could bias the results.

Second, Bargain and Boutin (2021) includes both urban and rural employment and both boys and girls. However, almost 80 percent of 14-year-olds who worked in rural areas were unpaid, and more than half of the girls in paid jobs in urban areas worked as housekeepers in the house of the employer, where enforcement of the law is much less likely.[4] On the other hand, Piza and Portela (2016a,b) restricted the sample to boys in urban areas.

Third, Bargain and Boutin (2021) excludes households in which the child is not indicated as the son or daughter of the individual listed as the head of the household and households in which the head is younger than 18 years old or older than 60 years old.[5] None of these exclusions were performed by Piza and Portela (2016a,b). As multigenerational households are common in Brazil (in 1999, 11.8 percent of all 14-year-olds are listed as neither the son nor daughter of the head of the household, and the majority of these kids are listed as "other relative"), these households should be retained in the sample.[6] See Table 1.

Considering a 3-month bandwidth, all the exclusions performed by Bargain and Boutin (2021) reduced the sample by 16%, which represents a significant number of children that were potentially impacted by the ban.[7]

In addition to that, Bargain and Boutin (2021) presents the results for 3 and 6-month bandwidths. Piza and Portela (2016b) includes 3, 5, and 9-months bandwidths, since up to a 9-month bandwidth, there are no significant differences between affected and unaffected cohorts with regards to adult's income, children's skin color, years of schooling, age and gender of the head

[2]Except children which the main occupation is the work in agriculture or construction for self-consumption (PNAD variables v9008 and v9029).

[3]PNAD, 1999. Among those children, 85.5% worked for their household and 14.5% were workers for self-consumption.

[4]PNAD, 1999.

[5]The replication package for Bargain and Boutin (2021) is available at: https://academic.oup.com/wber/article-abstract/35/1/234/5681375.

[6]PNAD, 1999.

[7]Bargain and Boutin (2021) sample for a 3-month bandwidth has 3,007 children. Without performing these exclusions, the sample has 3,579 children.

of the household, household size, and % of children living in urban areas.[8]

2 Variable's harmonization

Some PNAD variables used as controls by Bargain and Boutin (2021) are harmonized differently than the one performed by Piza and Portela (2016b). These variables are household income, number of household members, skin color, and years of schooling and age of the head of the household.

- For *years of schooling*, Bargain and Boutin (2021) based their calculation on whether the person is enrolled in school, level and grade enrolled, or the last degree finished. Piza and Portela (2016b) opted to work with the variable years of schooling available in 1999 wave of PNAD (variable v4703 of the questionnaire).

- For *household income*, Bargain and Boutin (2021) considered the sum of the wages of the head of the household and his/her spouse. Piza and Portela (2016b) opted to use the variable household income available in PNAD (variable v4721 of the questionnaire). Then, they calculated the adult's income which is the household income minus the sum of the wages of people younger than 18 years old. Piza and Portela (2016b) opted for this harmonization as there are other sources of income in the household (pensions, rents, or social programs), as well as income from other household members (other relatives or son/daughters with more than 18 years old).

- For *age of the head of the household*, Bargain and Boutin (2021) considered the difference in years between September 1^{st}, 1999, and date of birth. Since some adults do not have a date of birth available (for example, the person does not have a birth certificate), Piza and Portela (2016b) opted to work with the variable age available in PNAD (variable v8005 of the questionnaire). In these cases, the survey inputs the estimated age of the respondent.

- For *household size*, Bargain and Boutin (2021) considered all household members (including housekeepers and relatives of the housekeepers). Piza and Portela (2016b) opted to consider a member of the household the head, her/his spouse, their children, and other relatives.

[8] Considering the sample of boys and girls, in rural and urban areas. PNAD, 1999.

- For *skin color*, Bargain and Boutin (2021) defined the dummies: whites and pardos. For whites, for example, the variable assumes the value one if the person is white and 0, otherwise. The definition includes people that opted not to declare their skin color. Since we do not know whether the person that did not declare his/her color is white or not, Piza and Portela (2016b) choice for the dummy for whites is one if the person declared being white, 0 for blacks, pardos, indigenous or Asians, and missing for people that did not declare their skin color.

3 Results

In Table 1, we reproduce Bargain and Boutin (2021) results considering two main samples: the same one the authors used on their paper, that is, 14-year-olds that are son/daughter of the head of the household or his/her spouse; and households where the head is between 18 and 60 years old (***Bargain/Boutin sample***); and the sample that do not consider these exclusions (***Our sample***). We present the results for three groups: boys and girls in rural and urban areas (column "All"), boys and girls and urban areas (column "Urban"), and boys in urban areas (column "Boys, urban"). We considered 3, 6 and 9-month bandwidths.[9] The dependents variables are child labor (% of children in paid or unpaid work), following the same definition adopted by Bargain and Boutin (2021) and paid work.[10]

For a 9-month bandwidth, considering our PNAD sample, that is, without the exclusions suggested by Bargain and Boutin (2021), we found evidence of a 4.6 pp decrease in paid labor for boys in urban areas. The analysis also suggests a reduction of 4.1 pp of boys working in paid or unpaid work in urban areas. These results do not hold when we consider 3 or 6-month bandwidths or perform the sample exclusions adopted by Bargain and Boutin (2021).

[9]The estimate of -0.0159 for *Bargain/Boutin sample, variable child labor, 3-month bandwidth, and sample all (boys, girls in urban and rural areas)* is sightly different than the -0.0154 presented in Table 1 of Bargain and Boutin (2021) Paper, page 250. If we run the regressions on the data (*.dta*) shared by the authors in their replication package, we got the same estimate (-0.154). However, since we wanted to test additional specifications, we opted to setup the *.dta* dataset by running the Bargain and Boutin (2021) *do file 1.CleanDataset* which imports the PNAD microdata (available in *.txt* in Instituto Brasileiro de Geografia e Estatística, IBGE). The small difference is probably due to different versions of *.txt* files since sometimes IBGE updates the microdata available on their website.

[10]The running variable is the number of days between the date of birth and December 14, 1984. Standard errors clustered at the month of birth. All regressions are weighted by the sample weight of respondent (variable v4729 of the questionnaire), which is the variable available in PNAD without any transformations. Bargain and Boutin (2021) defined the regression weight as individual weight (variable v4729) divided by the sum of the individual weights. The results do not change using the sample weights as defined by Bargain and Boutin (2021).

To check whether the differences in the PNAD harmonization are playing an important role in the results, Table 2 shows the results of the parametric analysis in which the controls are defined according to Piza and Portela (2016b) harmonization. The results are very similar, suggesting that harmonization is not the main issue with regard to the differences in the results.

Table 3 shows the results of a regression in which the only control is the mother's years of schooling, the same strategy followed by Piza and Portela (2016b). Performing Bargain and Boutin (2021) sample exclusions, we do not find evidence of a reduction in child labor for any bandwidth. On the other hand, in the sample without exclusions, the decrease of paid labor among boys in urban areas still holds.

Therefore, without the sample exclusions performed, Bargain and Boutin (2021) would have found evidence of a decrease in paid child labor for boys in urban areas for a 9-month bandwidth.

A Tables

Table 1: RDD of the Child Labor Ban, 1999

Child Labor, 3-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	-0.0159	-0.0088	-0.0239	-0.0159	-0.0111	-0.0259
	0.0172	0.0174	0.0307	0.0218	0.0148	0.0382
Obs	3007	2375	1201	3579	2818	1400
R2	0.125	0.031	0.041	0.122	0.029	0.038
Child Labor, 6-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0124	0.0217	0.0171	0.0027	0.0102	-0.0028
	0.0181	0.0174	0.0282	0.0184	0.0138	0.0272
Obs	6081	4818	2446	7241	5715	2858
R2	0.125	0.029	0.046	0.123	0.027	0.044
Child Labor, 9-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0055	0.0014	-0.0189	-0.0061	-0.0123	-0.0412*
	0.0131	0.0119	0.0172	0.0133	0.01	0.0199
Obs	9229	7317	3689	11045	8735	4329
R2	0.12	0.029	0.043	0.117	0.025	0.039
Paid work, 3-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.012	-0.0014	0.0066	0.006	-0.0076	-0.0017
	0.0105	0.0095	0.0191	0.0118	0.0084	0.0245
Obs	3007	2375	1201	3579	2818	1400
R2	0.024	0.026	0.03	0.018	0.021	0.029
Paid work, 6-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0142	0.0162	-0.0097	0.0019	0.0061	-0.0245
	0.0103	0.013	0.0225	0.0085	0.0097	0.0226
Obs	6081	4818	2446	7241	5715	2858
R2	0.023	0.028	0.036	0.017	0.022	0.033
Paid work, 9-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0081	0.0001	-0.0275	-0.0042	-0.0125	-0.0460**
	0.0097	0.0112	0.0192	0.0078	0.0094	0.0202
Obs	9229	7317	3689	11045	8735	4329
R2	0.024	0.028	0.039	0.018	0.021	0.034

Pesquisa Nacional por Amostra de Domicílios (PNAD), 1999. ***, **, * Statistically significant at 1, 5 and 10 percent, respectively. Control variables: Brazilian region; years of schooling, age and gender of the head of the household; household size and income; children's color of the skin; and dummy for urban areas. Control variables harmonized according to the definitions employed by Bargain and Boutin (2021).

Table 2: RDD of the Child Labor Ban, 1999

Child Labor, 3-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	-0.018	-0.011	-0.0307	-0.0166	-0.008	-0.0312
	0.015	0.0226	0.0431	0.019	0.0169	0.0462
Obs	2929	2318	1169	3518	2769	1373
R2	0.129	0.038	0.052	0.127	0.035	0.05
Child Labor, 6-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0105	0.021	0.0135	0.0009	0.0109	-0.0079
	0.0166	0.0183	0.0296	0.0161	0.013	0.0278
Obs	5907	4691	2370	7095	5601	2797
R2	0.124	0.033	0.052	0.124	0.03	0.051
Child Labor, 9-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0036	0.0005	-0.0216	-0.0046	-0.0089	-0.0424**
	0.0129	0.013	0.0191	0.0118	0.0095	0.0201
Obs	8978	7129	3584	10837	8569	4249
R2	0.121	0.032	0.048	0.12	0.028	0.045
Paid work, 3-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.012	0.0006	0.0063	0.0036	0.0002	0.0018
	0.0091	0.0098	0.0265	0.009	0.0088	0.0313
Obs	2929	2318	1169	3518	2769	1373
R2	0.029	0.031	0.039	0.024	0.028	0.041
Paid work, 6-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0167	0.0215	-0.0038	0.0031	0.0112	-0.0237
	0.0104	0.014	0.0255	0.0085	0.0103	0.0262
Obs	5907	4691	2370	7095	5601	2797
R2	0.026	0.03	0.04	0.022	0.026	0.039
Paid work, 9-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0092	0.0013	-0.028	-0.0012	-0.0085	-0.0463*
	0.0098	0.0115	0.0212	0.0077	0.0094	0.0225
Obs	8978	7129	3584	10837	8569	4249
R2	0.028	0.031	0.043	0.023	0.026	0.04

Pesquisa Nacional por Amostra de Domicílios (PNAD), 1999. ***, **, * Statistically significant at 1, 5 and 10 percent, respectively. Control variables: Brazilian region; years of schooling, age and gender of the head of the household; household size and income; children's color of the skin; and dummy for urban areas. Control variables harmonized according our definitions.

Table 3: RDD of the Child Labor Ban, 1999

Child Labor, 3-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	-0.0102	-0.01	-0.0165	-0.0103	-0.0059	-0.0135
	0.0131	0.0192	0.0375	0.0136	0.0168	0.046
Obs	2942	2327	1179	3506	2766	1380
R2	0.06	0.026	0.032	0.051	0.021	0.028
Child Labor, 6-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0168	0.0218	0.0184	0.0082	0.0143	0.0013
	0.0175	0.0172	0.0301	0.0149	0.0127	0.0306
Obs	5953	4716	2393	7060	5563	2799
R2	0.052	0.025	0.031	0.047	0.021	0.028
Child Labor, 9-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0086	0.0002	-0.0199	-0.0028	-0.0086	-0.0391
	0.0119	0.0119	0.0202	0.0096	0.0097	0.0237
Obs	9021	7151	3611	10743	8480	4240
R2	0.053	0.027	0.035	0.047	0.023	0.032
Paid work, 3-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.013	-0.0007	0.0098	0.0038	-0.0001	0.0084
	0.0085	0.0096	0.0247	0.0058	0.0092	0.0308
Obs	2942	2327	1179	3506	2766	1380
R2	0.019	0.024	0.027	0.017	0.023	0.031
Paid work, 6-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0138	0.0156	-0.0113	-0.0003	0.0075	-0.0266
	0.0114	0.0135	0.0261	0.009	0.0093	0.0265
Obs	5953	4716	2393	7060	5563	2799
R2	0.016	0.021	0.022	0.014	0.02	0.023
Paid work, 9-month bandwidth						
	Bargain/Boutin sample			Our sample		
	All	Urban	Boys, urban	All	Urban	Boys, urban
	b/se	b/se	b/se	b/se	b/se	b/se
ITT	0.0073	-0.0019	-0.0315	-0.0052	-0.0108	-0.0472*
	0.0105	0.0115	0.0224	0.0079	0.0097	0.0236
Obs	9021	7151	3611	10743	8480	4240
R2	0.02	0.025	0.029	0.017	0.022	0.027

Pesquisa Nacional por Amostra de Domicílios (PNAD), 1999. ***, **, * Statistically significant at 1, 5 and 10 percent, respectively. Control variable: mother's years of schooling.

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