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### Socio-Economic Determinants of Juvenile Crime among Street Children and Teenagers in a Brazilian State

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#### Abstract

We investigate the determinants of juvenile crime among street children and teenagers in the Minas Gerais state (Brazil). Our dataset consists of 3.028 questionnaires applied to children and teenagers found on the streets of the 21 largest cities in the state. We have estimated a Logit model, which enabled us to identify the correlation between several variables and juvenile crime. The found results show that younger males attending school and that haven't been subject to violence themselves are less inclined to commit crime. Contrary to common belief, we found that conditional transfers and other government programs do not have a direct effect on reducing crime rates among children and teenagers living or working on the streets.

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## 1. INTRODUCTION

Juvenile crime is a serious issue around the world. In Brazil it is even more important, because it is often linked to the widespread use of child labor as means of increasing family income<sup>1</sup>, and because some children and teenagers may seek to obtain extra income through illegal activities. This is another undesirable consequence of child labor that, to the best of our knowledge, hasn't been fully exploited by the existing literature.

The economic approach to crime, developed notably by Becker (1968) and Ehrlich (1973), has been applied to several studies on juvenile crime<sup>2</sup>. This paper, however, takes use of a new dataset on child labor and crime to develop a better understanding of the issue<sup>3</sup>. The data comprises of 3.028 questionnaires applied in 2007 to street children and teenagers of the 21 largest cities in Minas Gerais state, Brazil. This allowed us to identify the main socio-economic determinants of juvenile crime among this particular population.

Our results suggest that younger males attending school and that haven't been subject to violence themselves are less likely to commit crime. On the other hand, our results found no direct role for conditional transfers and other government programs in reducing crime rates among street children and teenagers. Nonetheless, such programs may have an indirect effect, if they indeed help poor children to stay in school.

The rest of this paper is divided as follows. Section II discusses the theory behind juvenile crime and child labor. Section III presents the data and the methodology. Section IV discusses the results. Finally, section V concludes.

## II. THEORY AND SOME HYPOTHESES

The literature on child labor has shown that most working children live in rural areas, so as recent waves of urbanization, economic development and greater access to education have been followed by a decrease in child labor around the world (UNICEF, 2009; Basu, 1999; Basu, 2003; Psacharopoulos, 1997). Similarly, in Brazil child labor has been falling for the last 60 years (see Emerson & Souza, 2002). However, this has not been enough to end child labor in urban areas. Hence, the existence of street children and teenagers working in the major Brazilian cities remain an alarming social issue (Cardoso & Souza, 2003).

It is known that most working children do not "live" on the streets (World Bank, 2001, p. 33), and regardless of the time spent on the streets they have family ties, and usually sleep at their parent's houses. This has led to a distinction between "street children" – i.e. children living on the streets -, and children merely working on the streets, conducting activities such as selling food, shinning shoes, begging or committing crimes (ILO, 2002).

The economic approach to child labor has two basic hypotheses: the rationality of child labor and the role of the family. It is assumed that the decision of children and teenagers to work basically reflect the needs of the family. On the other hand, James, Jenks & Prout (2005) and

<sup>1</sup> See, e.g., Basu & Tzannatos (2003) for a discussion on the role of child labor income for families in Brazil.

<sup>2</sup> Mocan & Rees (2005) is an example of an empirical application of Becker and Ehrlich's work. The evidence suggests that just like adults, children and teenagers also respond to incentives. See Wikstrom & Sampson (2003) for a discussion on the causes of juvenile crime.

<sup>3</sup> Most of the studies on child labor in Brazil, such as Ponczek & Souza (2007), have not looked at the issue of legal versus illegal activities. Exceptions include Minayo (1990).

others have tried to recognize the children's capability of actually choosing whether or not to work, as well as which activities to engage on.

In this paper we seek to understand the socio-economic and familiar contexts in which a children that has opted to work (which is already an illegal act) gets to choose an activity that can be considered a crime<sup>4</sup>. In this sense, the international literature on juvenile crime allows us identify some hypotheses: (a) being a victim of violence in the past increases the likelihood of committing crimes; (b) education reduces the likelihood of committing crimes (Lochner & Moretti, 2004); (c) being part of social projects and receiving government transfers (such as *PETI* and *Bolsa Família* – both aimed at poor children) reduce the likelihood of committing crimes; (d) the relationship between crime and age is non-linear (have an inverted-U shape), i.e. it increases with age up to a point, and then starts to fall (Farrington, 1986); (e) social bounds are important deterrents of crime (Frey, 1997); (f) living in a household with many brothers and sisters increases the likelihood of committing crime. To test these hypotheses we use the methodology and data presented in the next section.

### III. DATA AND METHODOLOGY

This paper is based upon a survey research conducted in the 21 largest cities of Minas Gerais state, Brazil, in 2007<sup>5</sup>. The dataset consists of 3,028 questionnaires that were applied to children and teenagers (with up to 18 years old<sup>6</sup>) that were found living or working on the streets<sup>7</sup>. The questionnaire has 25 questions, covering individual characteristics, education, family, occupation on the streets, housing, health/violence and expectations towards life<sup>8</sup>. Descriptive statistics are shown in the appendix.

The first variable of interest is gender (“gender”) which is a dummy taking the value of 1 for males and 0 otherwise. We can observe that there are fewer women (17.4%) than men in the dataset, which is a well documented fact of street children's general characteristics. Another variable is age (“age”). The average age of those who responded the questionnaire is 12.57 years old.

The questionnaire asks what the children/teenager does for a living. We used this question to construct a dummy (“crime”) that takes the value of 1 when the answer as a criminal activity, such as selling drugs, prostitution, or stealing. Some 2.5% of the questionnaires have such answers.

Another important variable is if the children/teenager has been a victim of violence (“victim”). Some 12.3% of those who answered the questionnaire were victims of some sort of violence.

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<sup>4</sup> Some papers have looked at the determinants of juvenile crime, although not focusing on street children. These include Hope, Wilder & Watt (2003) who have suggested that juvenile crime rates decrease among pregnant teenagers that do not have an abortion. Moreover, Hall (2004) presents evidence on the importance of the family's economic situation in determining juvenile crime. In addition, Lochner & Moretti (2004) suggested that the investment in human capital can reduce crime rates among children and teenagers.

<sup>5</sup> For a thoroughly discussion of the research and its results, see Ferreira, Costa & Rais (2007). For another study that uses the same dataset, see Ferreira, Nogueira & Costa (2010).

<sup>6</sup> When estimating the model only questionnaires applied to children older than 7 were considered.

<sup>7</sup> Valid questionnaires represent 83.19% (2,519), whereas void questionnaires represent 16.81% (509).

<sup>8</sup> The questionnaire (in Portuguese) can be obtained from the authors upon request.

Regarding education, it was asked whether the children/teenager goes to school (school), in addition to its educational level (“educ”). A total of 63.5% of the children/teenagers were studying at the time they answered the questionnaire. Moreover, as expected the number of children going to school increases from 4 to 10 years of age, but it starts to fall at around 12 years old. The average number of years in school of those who answered the questionnaire is 2.7.

We also have information on participation in social projects (“social\_proj”) and income transfer programs (“cash\_transf”). Some 18% of the sample is involved in some sort of social project, and 37.1% receive federal aid (income transfers).

Finally, social bounds are proxied by two variables. The first one is a dummy measuring if the children/teenager lives with his/her mother (mother). It takes the value of 1 if so, and 0 otherwise. Some 66% of the children/teenagers in this sample live with their mothers. The second variable is if the teenager is a father/mother (sons). This is the case for only 2% of them. Finally, we have a variable regarding the number of people living in the household (“size\_house”). On average the households have 1.78 individuals.

We used a logit model for estimating the correlation between the variable crime and the socio-economic determinants. The White correction of the covariance matrix was used. The model was estimated using the software Stata 9.2.

#### IV. RESULTS

The baseline model results are shown in Table 1, which includes some diagnostic tests. The Wald statistic (with 10 degrees of freedom) indicates joint significance of the variables included in the model, and the (pseudo) R-squared de 0.17 is considered high for Logit models. To help interpreting the results we have also computed the odds ratio (“OR”) of the significant variables at the 90% confidence level.

The results confirm some of the hypotheses discussed in the previous section. The variables that have a negative and significant sign (at the 10% level) are gender, school and educ. These results suggest that young males that have been in school for more years and are still attending it, are less likely to commit crime. For e.g., *ceteris paribus*, a female is 2.49 times ( $=1/0.40226$ ) more likely to commit crime than males. This result could be explained by the fact that prostitution is a widespread activity for girls living on the streets. In addition, *ceteris paribus*, a children/teenager not attending school is 3.55 times ( $=1/0.28183$ ) more likely to commit crime.

The variables that have a positive sign are victim and age. This suggests that children/teenagers that are older and that have been victims of violence themselves are more likely to commit crime. For e.g., *ceteris paribus*, a children/teenager that was a victim of violence is 3.42 times more likely to commit crime.

**TABLE 1**  
**Dependent Variable: Prostitution, Stealing and Drug Deal**

Variable	Coefficient	Stand. Error (robust)	P-value	Odds Ratio (if P-value < 0.1)
victim	1.22846	0.30681	0.00	3.41596
gender	-0.91067	0.34074	0.01	0.40226
school	-1.26645	0.38635	0.00	0.28183
age	0.16989	0.07189	0.02	1.18518
size_house	-0.09355	0.22504	0.68	
social_proj	-0.00061	0.35741	1.00	
cash_transf	-0.08294	0.34167	0.81	
educ	-0.52362	0.29742	0.08	0.59237
mother	-0.63528	0.42655	0.14	
sons	0.03965	0.59842	0.95	
constante	-2.80319	1.01845	0.01	
Pseudo R2				
	0.17			
N.obs				
	2098			

The variables that were not statistically significant are *size\_house*, *social\_proj*, *cash\_transf*, *mother* and *sons*. This means that participating in social projects, receiving government aid (federal government income transfers) and having some social bonds, do not have a direct effect on juvenile crime behavior among sample street children/teenagers.

We must remember that the main social programs in Brazil against child labor (Bolsa Familia and PETI) are conditional money transfers to families rather than to the children and teenagers directly. It means that the programs affect the family income, via money transfers to an adult in charge. The problem is that these adults may use the money on goods and services that are not of primary need for the children. Perhaps, for the sample we are looking at (children and teenagers that work and/or live on the streets), additional conditions may be put in place, to ensure that the money reaches its final objectives. The families from which the children and teenagers we are dealing with in this paper are not well-functioning, most of them having problems of drug use among parents and brothers, extreme poverty and lack of formal education of its members.

**TABLE 2****Dependent Variable: Prostitution, Stealing and Drug Deal (age non linear effect)**

Variable	Coefficient	Stand. Error (robust)	P-value
victim	1.20735	0.30906	0.00
gender	-1.04063	0.35410	0.00
school	-1.30931	0.39004	0.00
age	2.89705	0.94339	0.00
age2	-0.10136	0.03510	0.00
size_house	-0.07009	0.23098	0.76
social_proj	-0.08623	0.36403	0.81
cash_transf	-0.10524	0.33934	0.76
educ	-0.65456	0.28712	0.02
mother	-0.66701	0.44198	0.13
sons	0.34327	0.60024	0.57
constante	-20.15814	6.30836	0.00
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Pseudo R2	0.19		
N.obs	2098		

With respect to the variable age an additional question is whether it has a non-linear effect (inverted-U) on juvenile crime. To address this issue we have also estimated a model in which age-squared is included (age2). Table 2 shows the results. They suggest that indeed there is a non-linear effect, wherein age increases crime rates up to a point, with reverse results after it.

This is a common finding within the criminological literature, like Farrington (1986). Most papers have found that indeed crime rates increase with age up to a point, falling thereafter. In our case, one possible hypothesis is that this is a response to the Brazilian legislation, which does not permit incarceration of people younger than 18 years of age. This may create an incentive for criminals to use teenagers old enough to carry out the criminal activity, but young enough not to be prosecuted.

## V. CONCLUDING REMARKS

This paper has sought to identify the main socio-economic characteristics associated to juvenile crime among street children and teenagers, using a dataset consisting of 3,028 questionnaires applied in the 21 largest cities of Minas Gerais state, Brazil.

The results show that access to education is of very importance to reduce crime behavior among street children and teenagers. In addition, human capital accumulation, as measured by years of schooling is also an important deterrent of juvenile crime. On the other hand, living in a dangerous environment, measured by the occurrence of violence against children and teenagers, seems to increase juvenile crime behavior. Age is also linked to crime, and the results suggests a non-linear effect, wherein crime rates increase with age up to a point, and then starts to fall. It is also worth-noting that crime is more spread more among females because of the use of prostitution as means of obtaining extra income.

Finally, our results do not find a significant role for social bonds (such as living with the mother, or having kids of their own) in reducing juvenile crime. In this same direction we have not found a significant relationship between crime and participation in social projects and federal government cash transfer programs. This is an unexpected result showing that the role of such programs is not direct in reducing crime rates among street children/teenagers.

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## APPENDIX

### Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
crime	2934	.0255624	.1578526	0	1
victim	2934	.1247444	.3304852	0	1
gender	2545	.83222	.3737442	0	1
school	2934	.6503067	.4769543	0	1
age	2306	12.96878	2.808552	6	17
size_house	2934	1.763122	1.162602	0	6
social_proj	2934	.1840491	.3875903	0	1
cash_transf	2934	.3694615	.4827413	0	1
educ	2185	2.724027	.6299124	1	9
mother	2934	.6523517	.4763048	0	1
sons	2934	.0207907	.1427074	0	1