The Effects of Punishment of Crime in Colombia on Deterrence, Incapacitation, and Human Capital Formation

Por: Arlen Guarín, Carlos Medina, Jorge Tamayo

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Arlen Guarín[*] Carlos Medina[**] Jorge Tamayo[***]
Banco de la República

Abstract

Based on individual data on the population of those arrested in Medellín, we assess whether the change in punishment at age 18, mandated by law, has a deterrent effect on arrests. No deterrent effect was found on index, violent or property crimes, but a deterrence effect was found on non-index crimes, specifically those related to drug consumption and trafficking. This implies an elasticity of arrests with respect to punishment that varies between -1.0 and -6.7 percent. The number of days that arrested individuals take to recidivate is 300, higher for index crimes if they are arrested right after, rather than before, reaching 18 years of age, in which case they are less likely to recidivate in any type of crime. The change in criminal penalties at 18 years of age does not explain future differences in human capital formation among the population that had been arrested immediately after versus immediately before reaching 18 years of age. There is no evidence that the longer length of time to recidivate on the part of individuals arrested for the first time immediately after reaching 18 implies future differences in human capital formation. This suggest that our estimated incapacitation effect would not be explained by the impossibility of the arrested population to recidivate due to their having been imprisoned, but rather by a specific deterrence effect resulting from the harsher experience while in prison of those arrested right after, rather than before, reaching 18.

JEL Codes: K42, H56, C21

Keywords: Crime, Deterrence, Regression Discontinuity

1. INTRODUCTION

As described in detail by Soares and Naritomi (2010), Latin American and Caribbean countries are plagued by high rates of crime. Colombia is among the most critical cases, and, as Medina, Posso, and Tamayo (2011) have found, Medellin has experienced one of the highest crime rates of Colombian cities in the last 30 years. The authors report a worrisome empirical regularity in the Medellín case related to the early age at which juveniles begin to engage in criminal activities. Specifically, they show how youths become engaged in criminal activities through the illicit drug trade.

Despite the high costs to young people in Latin American and the Caribbean, as well as in many developed economies, of engaging in illicit activities, moral and human rights concepts have influenced the design of much less punitive penalties for juveniles than for adults. In determining the severity of punishment to be assigned per type of crime and population, some key stakeholders have lacked the evidence to link the severity of punishment to the potential criminal's response to them, preventing socioeconomic considerations, bounded to agent's incentives, from been taken into account.

A large part of the considerations that take economic incentives into account are based on the ideas presented by Becker (1968) and are in line with the work of Lochner (2004) and Lee and McCrary (2009), among others. In short, they assume that at the moment when potential criminals decide whether to commit a crime, they weigh the costs and benefits, so that higher costs act as a deterrent to criminal activity. Individuals not

deterred from committing crimes, but arrested by authorities, incur high costs, such as the discomfort experienced during their time in prison and the limitations on attending school if they are of school age, or on the ability to earn money if they are older. Arrested individuals become incapacitated from committing crimes, but in addition, their experience in prison could also deter them from recidivating.

This study implements a similar approach to that used by Lee and McCrary (2005, 2009) and Levitt (1998), among others, examining the difference in the criminal legislation for juveniles and adults, to analyze whether the change in the magnitude of punishment at 18 deters individuals from committing further crimes once they reach 18 and prevents them from recidivating when imprisoned, and the extent to which more severe punishment affects human capital formation. We use individual data of all arrested people in the Medellin Metropolitan Area by type of crime, including homicide, theft, possession of weapons and drugs, and others.

The results show that the change in punishment at 18 has a significant deterrent effect among juveniles arrested for first time before they were 17 only for those who committed crimes related to drug consumption, reducing the arrest rate by approximately 65 percent at age 18. Among all arrested individuals, regardless of whether they were arrested before age 17, there are effects on drug consumption and trafficking, reducing arrests for drug consumption by around 30 percent and drug trafficking by 10 percent by age 18. We found no effect on violent and property index crimes. These effects are larger and significant when we consider individuals who reached 18 in the second half of the

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decade, when the higher punishment introduced for adults in 2005 was fully in effect. The results imply elasticities of arrests with respect to punishment between 1.4 and 2.6 percent for the whole set of arrested individuals, and between 3.3 and 5.9 percent for individuals who reached 18 in the second half of the decade.

When we assess likelihood to recidivate in the days after individuals have been arrested, we find that those arrested for committing index crimes immediately before reaching 18 years of age take on average 290 more days to recidivate than those arrested immediately after reaching 18, and 470 days more if they had committed crimes against property. The likelihood to recidivate between 30 and 120 days after committing a drug-related non-index crime is 15 percent lower for those who committed the crime immediately after reaching 18 than before.

When we compare human capital outcomes of previously arrested individuals to those of individuals who have never been arrested, we find that the former are between 6 and 17 percent less likely to attend formal education, and have between 0.65 and 0.85 fewer years of education. Nonetheless, we find that the change in criminal legislation at 18 years of age does not explain future differences in human capital formation among the arrested population that were arrested immediately after versus immediately before they reached 18 years of age. We do not find evidence that the longer lengths of time to recidivate of individuals arrested for the first time immediately after they reach 18 imply future differences in human capital formation. These results suggest that the standard incapacitation effect estimated in this study would not be explained so much by the

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impossibility of the arrested population to recidivate due to their having been imprisoned, but rather due to a specific deterrent effect resulting from the harsher experience while in prison of those arrested right after reaching 18 when compared to the experience of the population arrested right before reaching 18.

In the remainder of this paper, we describe the criminal legislation for juveniles in Colombia, the data used in the paper, the methodology, and the results, before proceeding to conclude.

2. JUVENILE JUSTICE SYSTEM

Law 1098 of 2006 establishes the Juvenile Justice Code. Its second part contains the Criminal Responsibility System for Adolescents and the procedures for juvenile offenders. Title I of the second part focuses on the Criminal Responsibility System for Adolescents, analyzed below.

The Criminal Responsibility System for Adolescents defines a set of principles, rules, procedures, specialized judicial authorities, and administrative bodies involved in the investigation and prosecution of crimes committed by juveniles between 14 and 18 years of age. The sanctions take a pedagogical approach, which differentiates them from the Criminal Responsibility System for Adults.

This law establishes that minors under 14 cannot be subject to judicial trials, found criminally responsible, or deprived of liberty through complaint or conviction of

having committed any punishable act. These conditions are the same for people between 14 and 18 years of age found to have mental or psychological disabilities. However, they are subject to preventive detention. For juvenile offenders under 14, only protection and restoration of their rights shall be applied and they will come under the educational and protection processes of the Colombian Family Welfare System.[1]

Juvenile offenders between 14 and 18 years old have the right to due process, to be presumed innocent until proven guilty. They have the right to legal representation and to remain silent, among others. In addition, the law assures that sentences of minors will not be registered in judicial records.

Sanctions imposed on juveniles include: warnings, rules of behavior, community service, assisted liberty, minimum-security institutions, and detention in a specialized care center.[2] Regardless of the sanction imposed, young people are required to attend school, and the verdict can be modified according to the adolescent's individual circumstances and needs.

Deprivation of liberty deserves special attention. It is understood as any form of confinement in a public or private institution from which juveniles are not allowed to leave at will. This sanction is assumed as a pedagogical measure linked to the National

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[1] The Colombian Family Welfare Institute, the government entity in charge of the system, defines the technical guidelines of programs to provide protection and restoration of rights.

[2] The criteria for defining the sanction are the nature and gravity of the crime, the age of the youth, the acceptance of charges, and non-compliance with sanctions among others.

Family Welfare System, only applying to minors 14 to 18 years of age at the time they committed the crime. Nevertheless, deprivation of liberty can only be applied to minors between 16 and 18 years of age who committed a crime with a minimum penalty of six years or more in prison according to the Penal Code (in this case, confinement will last from one to five years).

Deprivation of liberty applies to people aged 14 to 18 found guilty of intentional homicide, kidnapping, or extortion. In these cases, penalties vary from two to eight years in length. Moreover, if the individual reaches 18 while being held, he shall remain in the institution until he reaches the age of 21. However, the regulation establishes that special care centers should keep youths under 18 separated from adults.

Table 1 presents the penalties mandated by regulations for juveniles and adults. Column (1) reports the minimum and the maximum penalty for juvenile offenders. Law 1098 of 2006 defined minimum and maximum penalties; before its passage, there was no explicit punishment. The law established that the Criminal Responsibility System for Adolescents would be implemented gradually between 2007 and 2009, and in Medellin it took effect in April 2008. Column (2) presents the sentences in effect for adults until December 31, 2004 in the Penal Code (Law 599 of 2000). Sentences for adults are 400 percent longer than sentences for minors, and for drug-related crimes they are 700 percent longer. Column (3) presents the new sentences promulgated by Law 890 of 2004, which increased for all crimes except domestic violence, which was increased by Law 1236 of 2008 (Column 5). Law 890 of 2004 increased minimum sentences by 44 percent

on average and maximum sentences by 64 percent; the minimum and maximum sentences for other crimes increased by 27 and 40 percent on average, respectively.

With the increase in length of sentences for adults who commit crimes related to rape or involvement in prostitution in 2005, the minimum and maximum sentences for violent crimes for adults with respect to youths became 694 and 272 percent higher respectively, and in the "other crimes" category, the corresponding percentages were 1734 and 980 percent.

Despite the relatively high increases in severity of penalties, in practice, time actually served appears to be lagging far behind. Column (7) of Table 1 presents the average sentences served by prisoners until June 30, 2012, and the last column presents the ratio between Column (7) and Column (3), that is, the ratio between the average sentence served in Colombia until June 30, 2012, and the minimum sentence established by law. If prisoners were condemned to minimum sentences and received no reduction in their penalty, we would expect a ratio of 0.5, but Table 1 shows an average time served of 60 percent of that figure for violent crime, and 80 percent of that figure for other crimes. For violent crimes, the result would be explained if all prisoners received parole, a benefit recognized in Article 64 of the Colombian Penal Code, and which requires that a prisoner has served 60 percent of the sentence. Indeed, according to INPEC (2012), between January 2011 and April 2012, for each prisoner who served his full sentence, there are

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two or more prisoners who are freed on parole.[3] In Antioquia and Chocó, five or more

prisoners are paroled for every one prisoner who served out his sentence.[4]

Graph A1 of the Appendix presents the distribution of years served by prisoners

in jails in Colombia through June 30, 2012. The graph has three figures: Figure (i)

includes information on prisoners sentenced for a single crime, which in practice allow us

to estimate the severity of sentences without contamination from other offenses; Figure

(ii) shows the cases in which convicted people served their punishment for several

crimes, and Figure (iii) provides information about sentenced people in four groups: two

who committed violent crimes and two who committed other crimes, and both are

divided according to whether drugs were involved.

Graph A1.i shows that there are few convicted criminals who served more than

five years of their sentences in prison. In practice, this occurs to only a fraction of those

convicted of homicide, kidnapping, or terrorism. Additionally, in these cases the

observed proportion of those convicted who served more than five years of their sentence

is less than expected. For any of these cases we would expect that given the current

minimum sentencing laws, more than 50 percent would have served more than five years

for any cut off; however, the observed fraction is much lower. A similar conclusion is

implied by Graphs A1.ii and A1.iii. Rules have a lot to do with this result: before July

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[3] In the period under study, 8,353 prisoners were freed after full compliance, and 18,738 were freed on parole.

[4] In the period under study, in Antioquia and Chocó 539 prisoners were freed after serving their full sentences and 2,902 were freed on parole.

2012, Article 351 of Law 906 of 2004 (Colombia's Criminal Procedure Code) allowed up to a 50 percent reduction in sentences when the accused admits to the charges against him, and sentences can be further reduced for good behavior, study, or work. In July 2012, sentence reductions were increased up to 12.5 percent by the Supreme Court.

Although Raphael and Stoll (2004) show that in 1994, prisoners released in the preceding year accounted approximately 14 percent of homicides and 7 percent of property thefts in the United States, Kuziemko (2013) argues that eliminating parole in that country would be associated with a 10 percent increase in the prison population, and that simultaneously, crime would increase through higher recidivism. However, this result requires an institutional structure that rehabilitates criminals in prisons, which could be the case in the United States, but not necessarily in Colombia.

In summary, Colombian regulations heavily penalize violent crime and in practice, criminals arrested for these crimes receive longer sentences than those penalized for other crimes. However, in both cases, prisoners actually serve shorter sentences than those stipulated by law.

Table 1.
YEARS OF SENTENCE BY TYPE OF CRIME: ESTABLISHED BY LAW AND AVERAGE OBSERVED

Crime	Youths* Since Apr 1/08		Adults Until Dec 31/04 [i]		Since Jan 1/05 [ii]		Since Jul 23/08 [iii]		Since Jul 28/07 [iv]		Since Jun 24/11 [v]		Length of Average Sentence Paid [vi]	Sentence Paid/Minimum by Law at the Moment [vii]
	Mín	Máx	Mín	Máx	Mín	Máx	Mín	Máx	Mín	Máx	Mín	Máx		
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	(7)/(3)
Violent														
Homicide	2	8	13	25	17.33	37.5	17.33	37.5					3.1	0.24
Kidnapping	2	8	12	20	16	30	16	30					4.1	0.34
Extortion	2	8	12	16	16	24	16	24					1.9	0.16
Rape	2	8	8	15	10.67	22.5	**12.0**	**20.0**					2.1	0.26
Theft	0	0	2	6	2.67	9	2.67	9					1.5	0.55
Terrorism	1	5	10	15	20	37.5	20	37.5					2.8	0.28
Weapons	1	5	1	4	1.33	6	1.33	6	4	8	9	12	1.1	0.28
Involvement into Prostitution	2	8	2	4	2.67	6	**10.0**	**22**						
Simple Average	1.5	6.3	7.5	13.1	10.8	21.6	11.9	23.3	4.0	8.0	9.0	12.0	2.4	0.30
Average Increase in Sentences			400%	110%	44%	64%	144%	128%	200%	33%	125%	50%		
Average Increase in Sentences (Current Adults vs Youth)							**694%**	**272%**						
Other														
Traffick, Production or Carry of Drugs [viii]	1	5	8	20	10.67	30	10.67	30					1.7	0.30
Injury	0	0	1	3	1.33	4.5	1.33	4.5						
Conspiracy	0	0	3	6	4	9	4	9					1.5	0.36
Personal Injuries	0	0	1	5	1.33	7.5	1.33	7.5					1.4	1.08
Intrafamiliar Violence	0	0	1	3	1	3	1	3	4	8			1.4	0.34
Simple Average	0.2	1.0	2.8	7.4	3.7	10.8	3.7	10.8	4.0	8.0			1.5	0.40
Average Increase in Sentences			1300%	640%	27%	40%			300%	167%				
Average Increase in Sentences (Current Adults vs Youth)					1734%	980%	**1734%**	**980%**						
Total Simple Average	1.0	4.2	5.7	10.9	8.1	17.4	8.7	18.5	4.0	8.0	9.0	12.0	2.1	0.32
Average Increase in Sentences			431%	123%	36%	54%	144%	128%	250%	100%	125%	50%		
Average Increase in Sentences (Current Adults vs Youth)							**746%**	**292%**						

* Law 1098 of 2006 ordered its gradual implementation: it took place in Medellín on April the 1st, 2008, before that date there existed no explicit penalties for youths. Penalties from 2 to 8 years are only for youths 16 to 18 years old, penalties from one to five years are for youths 14 to 18. [i] Penal Code, Law 599 of 2000, [ii] Law 890 of 2004, [iii] Law 1142 of 2007, [iv] Law 1236 of 2008, [v] Law 1453 of 2011 (for juveniles, confinement in specialized attention centers used to be until they become 21, with this law it is established that confinement in these places will be until full compliance of the penalty), [vi] Average number of years of confinement of people condemned for a crime and that only committed that crime, based on the figures of the National Penal and Prison Institute (INPEC for its acronym in Spanish), as of June 30 of 2012. [vii] Minimum penalty of column (5) if it is less than 5 years, that of column (4) if it is less than 7.5 years, otherwise, that of column (3). [viii] The Penal Code establishes a lower penalty in cases in which drug quantity is below 1000 grams of marijuana or 100 grams of cocaine among others. For these, penalties would be between four and six years, and for the cases in which it is below 10000 grams of marijuana or 2000 grams of cocaine, for example, penalties would be between six and eight years. With Law 890 of 2004 they became between 5.33 and nine, and between eight and 12 years, respectively.

3. DATA

This study uses data from the census of people arrested between January 2002 and October 2012 for the Aburrá Valley Region (Valle de Aburrá).[5] The data comes from the judicial research unit of the Metropolitan Police of the Aburrá Valley Region (SIJIN). Given the nature of the data, which record the census of all individuals arrested, we are able to identify all those who were arrested and who reoffended during the period under analysis. The data contain information on the arrestee's current age (without date of birth), gender, highest level of education and degree, marital status, address, neighborhood where the arrest took place, date of arrest, criminal group (or gang) the individual belongs to, and type of crime.

The offenses reported in the dataset are described in Table 2. The table describes the types of crimes which are most comparable to those described by Lee and McCrary (2009) such as the index crimes, which are subdivided into violent and property crimes. Among the arrested individuals who are recorded in our dataset, 37 percent are grouped under index crimes, of which 30.5 percent are violent crimes and 6.5 percent are property crimes.[6] Among the non-index crimes, 46 percent are narcotics-related offenses and the

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[5] The municipalities comprising the Valle de Aburrá are Barbosa, Bello, Caldas, Copacabana, Envigado, La Estrella, Girardota, Itagui, Sabaneta, and Medellín. 3.6 million people live in the Valle de Aburrá, 66 percent of them in Medellín.

[6] Lee and McCrary (2009) consider the crimes that are classified by the FBI in the Uniform Crime Reports. They include, among violent crimes, murders, rapes, robberies, and aggravated assaults. Property crimes include burglary, larceny, car theft, and arson.

remaining 17 percent correspond to other offenses that are not related to narcotics. The incidence of drug-related crimes is 1.5 times higher for individuals under 18.

The distribution of criminals by type of offense and number of reoffenses is reported in Table 3. The table describes the type of crime (as reported in Table 2) and the number of crimes committed by those arrested. Each column includes the number of crimes per individual (one, two, three, and so on) during the period under analysis (July 2002 to October 2012). We do not consider the first half of 2002 in the analysis because it was highly under-reported.

Between July 2002 and October 2012, the *SIJIN* recorded 256,806 arrests in Medellín, corresponding to 198,333 individuals. The crime with the greatest number of reoffenses is related to narcotics, which accounts for the 46 percent of all arrests made between the second half of 2002 and October of 2012. This is followed by violent crimes, which account for 30 percent of crimes committed. Among those who were arrested, 17 percent reoffended at least once during the period analyzed, while 6 percent reoffended twice or more. If the American three strikes law had been in effect Medellín, the court would have convicted between 4071 criminals, who committed at least three violent crimes, and 12,513 criminals, who committed at least three crimes.[7]

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[7] In the United States, where the three strikes law is in effect, the law imposes sentences of at least 25 years of prison or the death sentence for those who committed at least three serious offenses. Among the offenses considered there is homicide, rape, among others. Similarly, the serious offenses correspond to kidnapping, armed robbery, arson, etc.

Table 2.

CLASSIFICATION OF CRIMES

	Group of Crime	Crime	Under 18		18 or Above		No Age Information		Total	
			N	%	N	%	N	%	N	%
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Index Crimes	*Violent*	Murder	456	1.0	5,520	2.6	13	3.1	6,006	2.3
		Rape	106	0.2	2,535	1.2	3	0.7	2,645	1.0
		Robbery	1,466	3.3	10,972	5.2	21	5.1	12,477	4.9
		Assault (Aggravated)	4,508	10.0	21,255	10.1	48	11.6	25,835	10.0
		Weapons	4,008	8.9	19,176	9.1	41	9.9	23,271	9.1
		Terrorism	127	0.3	1,496	0.7	1	0.2	1,655	0.6
		Kidnapping	55	0.1	1001	0.5	9	2.2	1,065	0.4
		Extortion	519	1.2	2,581	1.2	42	10.1	3,151	1.2
		Other [i]	239	0.5	1,903	0.9	5	1.2	2,149	0.8
		Subtotal	11,484	25.5	66,439	31.4	183	44.2	78,254	30.4
	Property	Burglary/Larceny	292	0.6	1,647	0.8	3	0.7	1,948	0.8
		Car Theft	1,167	2.6	5,065	2.4	10	2.4	6,250	2.4
		Daño en bien ajeno	511	1.1	7,432	3.5	6	1.4	7,958	3.1
		Other [ii]	27	0.1	522	0.2	2	0.5	553	0.2
		Subtotal	1,997	4.4	14,666	6.9	21	5.1	16,709	6.5
	Subtotal Index Crimes		**13,481**	**30.0**	**81,105**	**38.4**	**204**	**49.3**	**94,963**	**36.9**
Non-Index Crimes	*Other Related to Drugs*	Consumption	8,037	17.9	22,357	10.6	68	16.4	30,471	11.9
		Traffick	20,537	45.7	67,655	32.0	79	19.1	88,298	34.3
		Subtotal	28,574	63.6	90,012	42.6	147	35.5	118,769	46.2
	Other Not Related to Drugs	Intrafamiliar Violence	711	1.6	10,515	5.0	11	2.7	11,311	4.4
		Personal Injuries	734	1.6	7,057	3.3	23	5.6	7,836	3.0
		False Document	573	1.3	8207	3.9	11	2.7	8,791	3.4
		Author Property Rights	261	0.6	2856	1.4	2	0.5	3,119	1.2
		Fraud, Scam	31	0.1	1812	0.9	0	0.0	1,845	0.7
		Conspiracy	15	0.0	1983	0.9	3	0.7	2,003	0.8
		Receptación	187	0.4	2215	1.0	6	1.4	2,408	0.9
		Currency Falsification	111	0.2	801	0.4	0	0.0	912	0.4
		Food Provision to Chidren	5	0.0	847	0.4	2	0.5	854	0.3
		Other [iii]	271	0.6	4,028	1.9	5	1.2	4,306	1.7
		Subtotal	2,899	6.4	40,321	19.1	63	15.2	43,385	16.9
	Subtotal Non-Index Crimes		**31,473**	**70.0**	**130,333**	**61.6**	**210**	**50.7**	**162,154**	**63.1**
Total			**44,954**	**100**	**211,438**	**100**	**414**	**100**	**257,117**	**100**

Source: SIJIN, Metropolitan Police Aburrá Valley. (i) Includes forced displacement, forced disappearance, torture ... (ii) Theft of oil and its derivatives, theft of property that belongs to the nation's cultural heritage (iii) Includes the distribution of adulterated products, counterfeiting and breach of trust ...

The data on individuals arrested described above are cross-referenced with the information contained in the SISBEN surveys (2002, 2005, and 2009) of Valle de Aburrá in order to obtain demographic information for those individuals who have been arrested during the period under analysis. The SISBEN data comprise around 70 percent of the poorest people in Colombia and are collected to identify and classify individuals and families according to their living conditions with the aim of making them beneficiaries of

social programs. Given the nature of the data, we expect that most criminals are among the

70 percent of individuals contained in the SISBEN data.

Table 3.

NUMBER OF CRIMINALS PER NUMBER OF ARRESTS AND TYPES OF CRIMES COMMITTED

(2002-2012)

Type of Crime	Number of Arrests											
	1		2		3		4		5 or more		Total	
	N	%	N	%	N	%	N	%	N	%		
Violent	58,959	29.7	10,587	31.2	4,071	32.5	1,946	35.2	2,543	39.0	78,106	30.4
Property	13,787	6.9	1,856	5.5	582	4.6	225	4.1	234	3.6	16,684	6.5
Other Related to Drugs												
Consumption	23,483	11.8	4,371	12.9	1,486	11.9	572	10.3	550	8.4	30,462	11.8
Traffick	66,847	33.7	11,850	34.9	4,766	38.1	2,163	39.1	2,645	40.6	88,271	34.3
Other Not Related to Drugs	35,257	17.8	5,259	15.5	1,608	12.8	623	11.3	536	8.2	43,283	16.8
Total Jul/02-Jun/12	198,333	100	33,923	100	12,513	100	5,529	100	6,508	100	256,806	100
Violent	75.5		13.6		5.2		2.5		3.3		100.0	
Property	82.6		11.1		3.5		1.3		1.4		100.0	
Other Related to Drugs												
Consumption	77.1		14.3		4.9		1.9		1.8		100.0	
Traffick	75.7		13.4		5.4		2.5		3.0		100.0	
Other Not Related to Drugs	81.5		12.2		3.7		1.4		1.2		100.0	
Total	77.2		13.2		4.9		2.2		2.5		100.0	

Source: SIJIN, Medellin Metropolitan Police. Own Calculations. Types of crime are disaggregated in Table 1.

4. IDENTIFICATION STRATEGY AND RESULTS

To identify the impact of the punitiveness of the judicial system, we take into consideration

the fact that the severity of the sentences imposed on crimes changes at age 18, when the

juvenile justice system is replaced by the adult penal system for, thus changing the

incentives for young people to participate in criminal activities.

As described in Appendix 1, individuals between the ages of 16 and 18 can be imprisoned between one and five years when the crimes committed could have a sentence of six years in prison according to the Penal Code. Young people under the age of 18, would be imprisoned in specialized centers for young people (isolated from adult criminals). In the case of homicides, individuals over 18 could be imprisoned up to 40 years, while individuals under 18 could spend between two and eight years in the specialized center.

In this paper we estimate the effects of the change in the law on three different outcomes: (i) deterrent effect against committing crimes due to the increase in punishment, (ii) incapacitation to commit crimes implied by the sentence, and (iii) other socioeconomic outcomes, such as school attendance and labor force participation. In the following sections the identification strategy to estimate the effects on each of the variables mentioned above is described, and the findings are presented.

4.1 Deterrence

To estimate the effects of deterrence and incapacitation for individuals over 18 compared to those under 18, we use the methodology adopted by Lee and McCrary (2009). In the case of deterrence, we build a panel of young people between the ages of 17 and 19, and we estimate whether or not there exists a discontinuity in the probability of committing a crime when they reach the age of 18. The strategy assumes that the other determinants that affect the probability of being a criminal do not change around the age of 18, especially since it considers short periods of time (e.g., a week). Even though events such as getting married, graduating from high school, joining the army, starting a job, and others, could have an

effect on the probability that an individual will become a criminal, there are no apparent reasons why they should otherwise change abruptly upon turning 18 and, since those events do not necessarily take place at that exact age (for example, graduating from high school or joining the army), and in the event that those events occur at 18, such as the legal age to marry, they would have a second-order effect on the probability of becoming a criminal. Thus, crime should show up with a lag. It is also important to bear in mind that individual characteristics, predetermined before people reach the age of 18, are identical by construction before and after they reach 18 (Lee and Lemieux, 2010), which guarantees that individuals' characteristics are not a source of variation that could explain the changes observed in our outcomes of interest.

Appendix 1 describes all the changes in Colombian law that take place when individuals reach the age of 18. While individuals under 18 are prevented from engaging in prostitution and consuming drugs, tobacco, or alcohol, entering establishments that sell alcohol, marrying, and carrying weapons, among others, once they become 18, they are not only able to vote, but they are not monitored anymore for engaging in activities such as prostitution. Moreover, most minors who are arrested for drug consumption are not sent to prison but to a process of rehabilitation, in accordance with Article 60 of Law 1098 of 2006. Actually, although individuals in Medellín under the age of 18 that were arrested for drug trafficking or consumption were 63.6 percent of all arrested (Table 2). Of those

sentenced at the national level between March 2007 and August 2011, only 2 percent were for drug trafficking or consumption.[8]

Hence, the nature of the changes in the law around the age of 18, if anything, would be more likely to increase, rather than decrease, crime rates at 18. Therefore, any deterrent effect would be underestimated, since, according to Lee and Lemieux (2010), the estimated discontinuity should be interpreted as the combined effect of all the changes that take place around the age of 18. The changes in the law regarding the practice of prostitution or involvement in conflicts of armed groups, depenalization of the possession of minimum quantities of drugs, and carrying weapons, could increase the probability of committing a crime.[9]

Other changes, such as the right to vote, the right to marry and to working, would have a neutral effect on the probability that individuals become criminals once they reach the age of 18. To estimate the effect of changes in the law on the probability of being arrested, we use the weekly arrest records available for individuals between 17 and 19 years of age. To estimate whether the probability of being arrested changes discontinuously around the age of 18, we estimate the following linear model:

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[8] Individuals under 18 were mostly arrested for homicides (46 percent), assault (20 percent), extortion (13 percent), and rape or sexual crimes (8 percent). See Comisión de Evaluación del Sistema de Responsabilidad Penal para Adolescentes (2011), and Oportunidad Estratégica (2012).

[9] Mocan and Tekin (2003), Jofre-Bonet and Sindelar (2002), and Markowitz (2000b), report evidence of a causal relationship between drug consumption and crime; while Kraushaar and Alsop (1995), Markowitz (2000a, 2000b), Carpenter and Dobkin (2011), Cook and Durrance (2011), and Markowitz et al. (2012), report evidence of a causal relationship between alcohol and crime.

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$$Y_{it} = \alpha X_{it} + \beta D_{it} + u_{it} \qquad (1)$$

where $Y_{it} = 1$ if the individual i was arrested in week t, X_{it} is a vector of control variables for individual i in week t, which includes $(1, t, t^2, \ldots)$, where t is the number of weeks since the week the individual turned 18 ($t = 0$), and takes values in the interval $[-52, 52]$, and D_{it} is 1 if $t \geq 0$, zero otherwise. β is the parameter of interest that identifies the changes in the probability of being arrested when the individual reaches the age of 18, that i, when the applicable law changes.

To evaluate the effects of the main changes in normativity that took place on April 1, 2008 (Law 1098, 2006, affecting minors, i.e., those under 18), and January 1, 2005 (Law 890, 2004, affecting adults), we estimate the following specification:

$$Y_{it} = \alpha_X X_{it} + \alpha_a D_a + \alpha_m D_m + \beta D_{it} + \theta D_{it}{}^* D_a + \gamma D_{it}{}^* D_m + u_{it} \qquad (2)$$

where D_m is equal to 1 after April 1, 2008, and D_a is equal to 1 after January 1, 2005. The parameter of interest is β before January 1, 2005, $\beta + \theta$ for the law after January 1, 2005 and before April 1, 2008. Similarly, $\beta + \theta + \gamma$ is the effect of interest of the current law, that is, after April 1, 2008. We would expect $\beta < 0$, $\theta < 0$, and because Law 1098 implies an increase in the punishment of juveniles, we would expect $\gamma > 0$.

It must be noted, however, that Law 1098 had two different effects. First, it allowed 16-18 year olds to be tried in adult courts, thereby increasing the expected punishment for minors 16-18 years old. At the same time, Law 1098 increased the minimum age at which minors could be held responsible for crimes, moving the threshold from 12 to 14, which

had the effect of reducing the expected punishment for minors 12-14 years old. For the effects of the latter, see Ibáñez, Rodríguez, and Zarruk (2013).

As noted by Lee and McCrary (2009), and by Lee and Lemieux (2010), this approach is different from the one implied by the standard regression discontinuity design. In fact, the identification obtained here compares individuals before and after the age of 18, rather than different individuals on both sides of that cutoff age. In this context, the discontinuity in the density of the age at which individuals are arrested is the measure of deterrence, while under the standard regression discontinuity approach, this would be evidence against the validity of its assumptions.

Graph 1 uses only people arrested at least once before they turn 17 years old, to illustrate the probability of being arrested in each week between 17 and 19, as well as the change in this probability in the week before (week -1 in Graph) and in the week in which a person turns 18 (week 0 in Graph), as Lee and McCrary (2009) do. The first figure in the first row and column includes all people arrested for any crime, the figure in the second column includes people arrested for index crimes, and the third column comprises people arrested for non-index crimes. The first column of the second row shows people arrested for violent index crimes, the second column contains people arrested for property index crimes, and the third column for non-index drug-related crimes. Finally, the third row separates non-index drug-related crime into those related to consumption (first column) and trafficking (second column). The last figure includes non-index crime, non-drug-related.

The figures for all crimes, non-index crimes, and drug-related crimes show a discontinuous change around 18 years old; however, only the figure for non-index crimes related to drug consumption seems to indicate a statistically significant discontinuity.

Graph 1.

PROBABILITY OF BEING ARRESTED BY TYPE OF CRIME

PEOPLE ARRESTED BEFORE TURNING 17
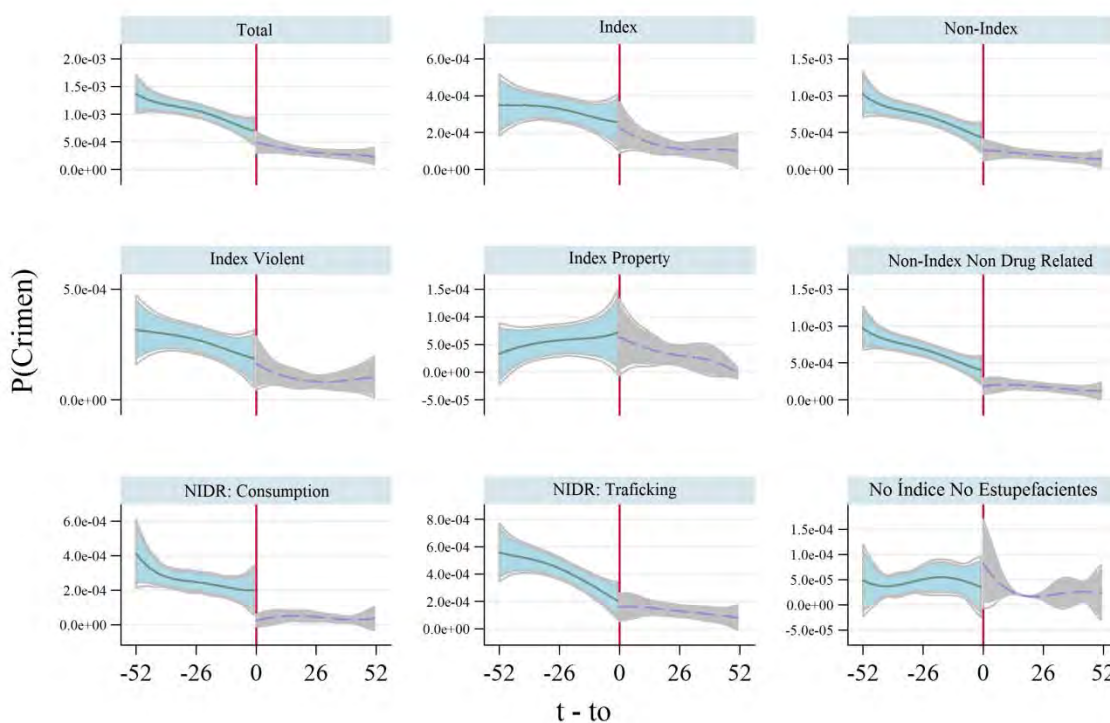
Source: SIJIN, Metropolitan Police of the Valle de Aburrá. t-t_0: week in which the individual was arrested (t) minus week in which he turned 18 years old (t_0). The estimation includes all people arrested from July 2002 to October 2012 who were arrested at least once before turning 17.

Graph 2 contains the same figures as Graph 1 but includes all people arrested from July 2002 to October 2012, without considering whether they were arrested before they turned

17. In this case, the figures for all crimes, non-index crimes, and drug-related crimes show large and statistically significant discontinuities around age 18.

Table 5 presents the β estimates of equation (1) multiplied by 52, that is, the magnitude of deterrence due to the change in legislation for people 18 or older.[10] The table presents the estimates of β for several sets of populations. All the estimates use data on the history of arrests of people between 17 and 19 years old who were arrested between July 2002 and October 2012. Overall, they include 8223 individuals who committed at least one crime before they turned 17 and who were arrested in this age range and period of time, and 43,107 individuals in this age range and period. The table shows the results in three horizontal panels. Panel **A** includes all people arrested at least once before they reached the age of 17; panel **B** includes all people arrested who matched with any SISBEN dataset of the state of Antioquia; and Panel **C** includes all arrested people who matched with any SISBEN dataset of the Valle de Aburrá and all non-arrested people who live in municipalities of the Valle de Aburrá on whom information is collected by SISBEN. The table shows, for each type of crime, a column with the average of the dependent variable for minors, that is, the probability of this population of being arrested, and the other column with the β estimates.

Each horizontal panel of results presents three different outcomes: (i) with elimination of arrested people, since the week after the one in which the arrest took place, under the assumption that arrested people remain prisoners and will not be arrested again (Lee and McCrary, 2009), (ii) with no elimination of arrested people, under the assumption

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[10] By multiplying the coefficient of equation (1) by 52, the value presented in table 5 measures the change in the annual probability of being arrested.

that they are quickly released and can be arrested again in the future, and (iii) eliminating arrested people, since the week after the one they were arrested, only if they are not matched to their SISBEN follow-up survey after their arrest date, under the assumption that arrested people who do not show up in the SISBEN follow-up survey remain arrested, and cannot possibly be considered to be arrested anymore.

Graph 2.

PROBABILITY OF BEING ARRESTED BY TYPE OF CRIME

ALL THOSE ARRESTED
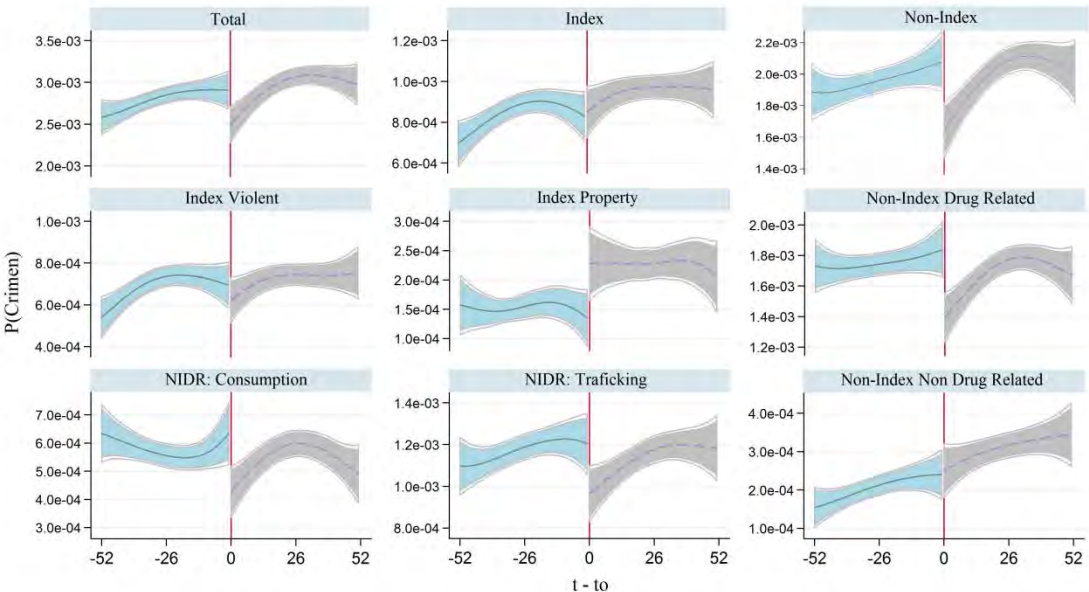
Source: SIJIN, Metropolitan Police of the Valle de Aburrá. t-t_0: week in which individuals were arrested (t) minus the week in which they turn 18 (t_0). Estimation includes all people arrested from July 2002 to October 2012.

The table shows that an average of 4.71 percent of people arrested for any crime before they turned 17 were arrested annually in the age range between 17 and 19 years old (Panel A, column 1). The deterrent effect of the change in the regulation at 18 is insignificant for the population in this panel, and it is represented in a β coefficient of -

0.0138, indicating a reduction of 29 percent in the probability of being arrested. This effect falls to 24 percent when arrested people are not eliminated and to 27 percent when people without SISBEN follow-up are eliminated.[11]

Among individuals arrested for any crime between July 2002 and October 2012 and who matched with the SISBEN dataset of Antioquia, an average of 15.02 percent were arrested annually when they were between 17 and 19 years of age (Panel B, column 1). The deterrent effect of the change in legislation at 18 was -0.0053, which represents a reduction of 4 percent in the probability of being arrested, although this result is statistically insignificant (column 2). The effect is 8 percent with no elimination of arrested individuals, and 6 percent if only people without SISBEN follow up are eliminated. Both are insignificant at the 5 percent level.

Finally, among people arrested for any crime between July 2002 and October 2012 and people who were not arrested in this time period and who matched with the SISBEN survey of Valle de Aburrá, an average of 0.76 percent were arrested annually while they were between 17 and 19 (Panel C column 1). The deterrent effect of the change in the regulations at 18 is similar to the one reported in Panel B. It represents a reduction of 4 percent (not significant) in the probability of being arrested. Its magnitude becomes 10 percent with no elimination of arrested people, and 8 percent if only people with no follow up in the SISBEN survey are eliminated; both are insignificant at 5 percent.

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[11] We also obtained results by including in the regression additional control variables taken from a SISBEN survey collected near 2002, such as gender, socioeconomic stratum, school attendance, earnings of the household head, number of children in the household, number of children under 18 in the household, number of adults above 64 years of age in the household, percentage of people in the household older than 17 who have secondary education, percentage of people in the household older than 6 with primary education, gender of the household head, whether the individual worked, and his years of education. We found very similar results.

Columns (3) and (4) of Table 5 present the means and coefficients obtained from estimating equation (1) for those who were arrested for committing index crimes. For such offenses, the coefficient is not significant in any of the cases. Columns (5) and (6) present the results for those who were arrested for committing non-index crimes. In these crimes, the coefficient is always negative and in most cases significant, showing a reduction in arrests due to the change in the regulations at 18 of 30 percent for people who had committed at least one crime before age 17, between 10 and 14 percent for those criminals matched with SISBEN of Antioquia, and between 12 and 16 percent for those arrested and not arrested who matched with SISBEN of Valle de Aburrá.

Columns (7) and (8) of Table 5 present the results for those who were arrested for committing violent index crimes. For such offenses, the coefficient is never significant, nor is it in the case of those arrested for committing property index crimes. Those results are presented in column (10).

Columns (11) and (12) present the results for those arrested for drug-related non-index crimes. For these offenses, the coefficient is always negative and in most cases significant, showing a reduction in arrests of around 30 percent for people who had committed at least one crime before age 17, between 13 and 17 percent for those criminals who matched with SISBEN of Antioquia, and between 19 and 26 percent for those arrested and not arrested who matched with the SISBEN of Valle de Aburrá.

Columns (13) and (14) present the results for those who were arrested for drug consumption-related non-index crimes. In this case, the coefficient is always negative and significant; arrest rates are reduced 62 to 69 percent for people who had committed at least

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one crime before age 17, between 26 and 31 percent for those criminals who matched with SISBEN of Antioquia, and between 29 and 36 for those arrested and not arrested who matched with SISBEN of Valle de Aburrá. It is important to bear in mind in this case that since individuals under the age of 18 are meant to be protected by the government from misbehaviors such as drug consumption, once they are arrested, they are enrolled in rehabilitation programs, and in a great many cases, they are not imprisoned for this crime.[12]

Columns (15) and (16) present the results for those who were arrested for drug trafficking-related non-index crimes. For such offenses, the coefficient is always negative but never significant for all populations. Finally, columns (17) and (18) present the results for those arrested for non-drug-related, non-index crimes. For such offenses, the coefficient is never significant.

Table 6 presents the results for the population that is observed in some SISBEN databases before turning 16, that is, for a younger population than that included in Table 5. To understand the differences between the populations considered in Tables 4 and 5, Table AXX illustrates the age composition of populations based on Panel B of the tables. Columns (1) and (2) of the table show the total number of people arrested between 2002 and 2012 (on which Table 5 is built), and their participation according to their age in July 2002. Columns (3) and (4) show the number of people arrested between 2002 and 2012 that were observed in a SISBEN survey before they turned 16 (on which Table 6 is built), and their participation according to age in July 2002. Finally, columns (5) and (6) show the number of people by age in 2002 who were included in Table 5 but not in Table 6. The

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[12] See Comisión de Evaluación del Sistema de Responsabilidad Penal para Adolescentes (2011), and Article 60, Law 1098 of 2006.

population of Table 6 is younger than that of Table 5 and, on average, includes people who turned 18 between 2009 and 2010, several years after Law 890 of 2004 took effect in 2005, while more than 30 percent of the population included in Table 5 turned 18 before 2005.

The results in Table 6 are similar to those presented in Table 5, with two differences: (i) all of the coefficients for total crimes, non-index crimes, and drug-related components are statistically significant, with the exception of drug trafficking by people who had committed a crime before the age of 17, and (ii) the magnitude of the percent change in the probability of committing a crime at age 18, implied by the estimated coefficients, is, in most cases, about twice that estimated in Table 5. The larger effects could be explained by the fact noted above, that this population was 18 years old, several years after the date that Law 890 of 2004 went into effect.

Table 4 presents some of the elasticities derived from the results described above. To calculate them, we use the probability of being arrested (column 1 of the table) and the deterrent effect estimate based on the coefficients reported in Tables 4 and 5, related to total crimes, index, index violent, non-index, and drug-related non-index, respectively (column 2 of the table). The calculation of these elasticities is obtained based on the increase in the minimum and maximum penalties registered at 18 years of age and reported in Table 1. Panel A of Table 4 presents the results using the universe of those arrested, based on which we obtain Table 5, and Panel B is calculated using the population from which we obtained the results in Table 6.

As follows from the previous reading of the results, the significance in the effects of the change in the regulations at 18 years of age of total crimes, non-index crimes, and drug-

related non-index crimes is mainly explained by the latter component, since there were no effects on either index crimes in general, or violent index crimes, in particular. Another aspect to consider is that the increase in penalties at 18 is between 1.8 and 2.6 times higher for the minimum penalties for each offense than for the maximum penalties, so that, when we take minimum penalties as expected, the resulting elasticities are smaller in terms of absolute value.

The elasticity of drug-related crimes with respect to the penalties would be between -1.4 and -2.6 percent for the universe of arrested (Panel A of Table 4) and between -3.3 and -5.9 percent for the population of Panel B of Table 4. These elasticities bound those reported by Lee and McCrary (2009), of -0.048 for Florida, based on their arrests between 1989 and 2002,

Since drug-related crimes had the most statistically significant effects from the change in penalties, this elasticity largely explains the non-index crimes elasticities (between -0.7 and -1.3 percent in Panel A, and between - 1.7 and -3.1 percent in Panel B), and total crimes elasticities (between -0.9 and -2.2 percent in Panel A, and between -2.6 and 6.7 percent in Panel B).

Table 4.

ELASTICITY OF CRIME WITH RESPECT TO PUNISHMENT

A. All Arrested Individuals

Crimes	Probability of Being Arrested[i]	Deterrence Effect[ii]		Increase in Penalties[iii]		Elasticities[iv]	
				Mínimum	Maximum	Mínimum	Maximum
	(1)	(2)		(3)	(4)	(5)	(6)
Total	0.1500	-0.0097		7.46	2.92	-0.009	-0.022
Index	0.0468	0.0031		6.94	2.72	0.010	0.024
Violent	0.0384	0.0015		6.94	2.72	0.006	0.014
Non Index	0.1031	-0.0128	**	17.34	9.80	-0.007	-0.013
Drugs Related	0.0906	-0.0139	**	10.67	6.00	**-0.014**	**-0.026**

B. Arrested Individuals with Information before They Turned 16 Years Old

Crimes	Probability of Being Arrested[i]	Deterrence Effect[ii]		Increase in Penalties[iii]		Elasticities[iv]	
				Mínimum	Maximum	Mínimum	Maximum
	(1)	(2)		(3)	(4)	(5)	(6)
Total	0.2135	-0.0421	***	7.46	2.92	-0.026	-0.067
Index	0.0605	0.0044		6.94	2.72	0.010	0.027
Violent	0.0523	0.0023		6.94	2.72	0.006	0.016
Non Index	0.153	-0.0464	***	17.34	9.80	-0.017	-0.031
Drugs Related	0.1337	-0.0473	***	10.67	6.00	**-0.033**	**-0.059**

[i] Average obtained based on information of inhabitants of *Valle de Aburrá* , and with elimination for those not matched in the following *Sisben* survey (third row of third panel and column 2 of each table of the deterrence results). [ii] Coefficie that measures the deterrence effect of the increase in penalties, obtained base on the information of the inhabitants of *Valle de Aburrá* , and with elimination for those that did not match in the following *Sisben* survey (third row of third panel and column 5 of each table of deterrence results). [iii] Penalties for adults in relation to penalties for juveniles, taken from Table 1. [iv] Minimum (in absolute value): [(2)/(1)]/(3); Maximum (in absolute value): [(2)/(1)]/(4). ** Significant coefficient at 5 per cent. *** Significant coefficient at 1 per cent.

Tables 6 and 7 present the θ coefficient estimated from equation (2), which captures the effect of the increase in penalties for adults which took place on January 1, 2005, for the total number of arrested, and for those with information before they turned 16 years old respectively. In Panels B and C of Table 7, for the whole set of observations and for all crimes except those against property, the coefficients are negative and significant, as expected as a result of a stronger policy of penalizing crimes committed by adults in relation to those committed by juveniles. In Table 8, the results are similar to those in Table

7, except that in the case of index crimes, especially violent index crimes, the coefficient for those who were arrested before 17 years of age is positive and significant. This result is the opposite of what would be expected and is due mainly to the fact that with the low incidence of index crimes and each of its components (about one percent), it becomes difficult to obtain a robust result, especially when a minimum number of observations is required around age 18, before and after January 2005.

Tables 9 and 10 show the γ coefficients obtained by estimating equation (2), which quantifies the differential effect of the enforcement of Law 1098 of 2006 in April 2008 on the arrest rate at around 18 years of age, in the case of Medellin. The introduction of this law changed a regulation that did not accuse people under 18 years of age of crimes, to one that makes them criminally and civilly liable, and specified the nature of the penalties for each of the offenses committed by teenagers between ages 16 and 18 and, in special cases, by teens between the ages of 14 and 18.[13] This change should have been assimilated by the population under 18 years of age as an increase in the severity of punishment, which leads to the expectation of a positive γ coefficient, that is, it would be expected that immediately after the enforcement of Law 1098, the arrests of people older than 18 would increase in relation to the arrests of teenagers committing all crimes except homicide, kidnapping, and sexual offenses, which were more severely punished by Law 1098 for young people 14 to just under 18, and aggravated assault, also more severely punished by the law for youths 16 and just under 18.

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[13] See section 165 of the Juvenile Code, Articles 169 and 187 of Law 1098 of 2006, and *Conpes* policy document number 3629 of 2009.

The table shows that for the population who committed a crime before the age of 17, no significant effect was found. Other results are usually positive and significant: there is a positive and significant coefficient for non-index crimes and their drug-related components, both consumption and trafficking, which implies an increase of over 35 percent in the probability of being arrested immediately after turning 18. There is no effect for non-drug-related non-index crimes. With respect to property index crimes, a negative coefficient is found, suggesting that punishment for this crime may also have become harsher as a result of the law. These results are consistent with those of Ibáñez, Rodríguez, and Zarruk (2013), who found relatively higher crime rates in cities with higher shares of population between 18 and 25 than between 14 and 17 in all crimes except homicides.

Finally, Figure 3 repeats the exercise presented in Figure 2, but in this case in order to assess whether there is also a discontinuity around 17 to 19 years of age, in falsification exercises. In neither case a discontinuity at these ages is recorded, which allows us to discard the possibility that factors other than differential treatment in adult and juvenile convictions motivate the discontinuous change in the arrest rate just with the change in age.

Table 11 presents the resulting coefficients from estimating equation (1), in which cutoffs are at 17 and 19 years of age instead of at 18. The estimated coefficients in the 17 years of age cutoff are not statistically significant. Panels B and C in the 19 years of age cutoff show significant but positive coefficient. Thus, it would be expected that the reasons that explain this positive discontinuity do not explain the negative discontinuity found around age 18.

Figure 3.

PROBABILITY OF BEING ARRESTED BY TYPE OF CRIME. ALL ARRESTED INDIVIDUALS
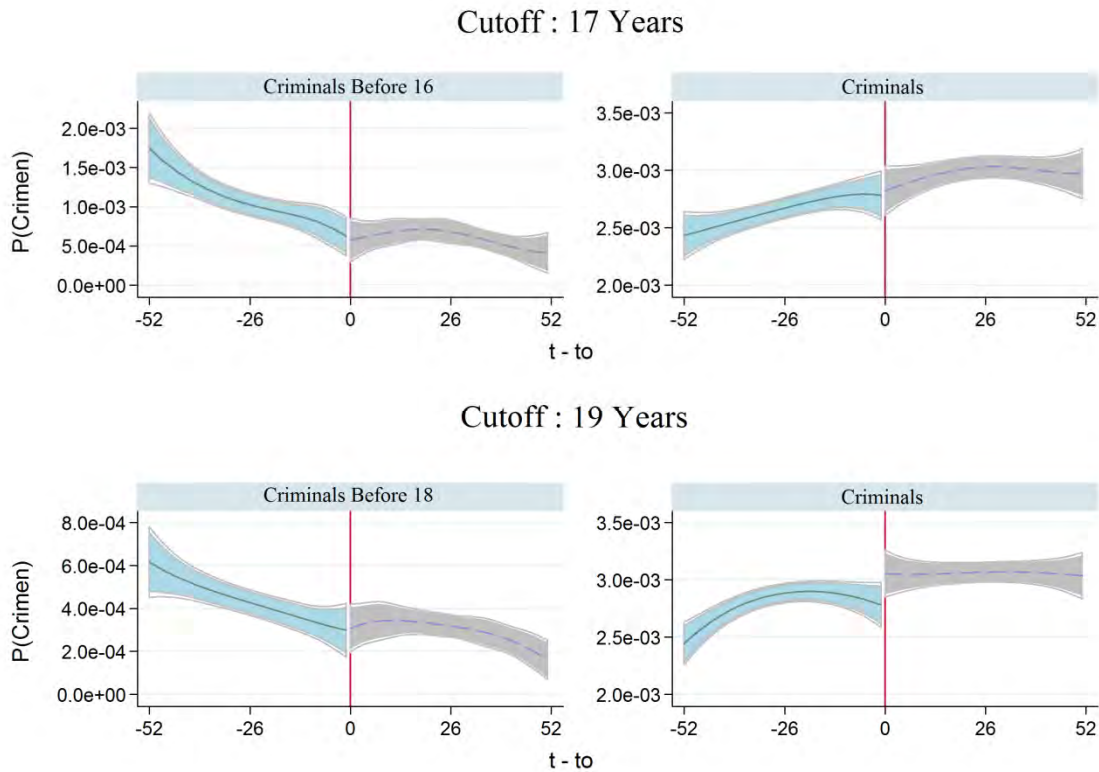
Source: SIJIN, Metropolitan Police of the Valle de Aburrá. $t\text{-}t_0$: week in which the person was arrested minus week in which he turned 18. All arrested individuals between July 2002 and October 2012.

The deterrence results in this section are in line with the findings of Levitt (1998) for the U.S. case. Levitt (1998) found a change in the crime rate associated with changing from a youth to an adult cohort. In the following year after the age 18, states with relatively strong adult penalties with respect to youth show a drop of at least 25 percent in the rate of violent crimes and 10-15 percent in theft-related crimes.

4.2 Incapacitation

To estimate the effect of the increase in the penalties that occur when young people turn 18 years old, on incapacitation to commit crimes again, we estimate the following equation

$$Y_i = \alpha X_i + \lambda D_{it} + a_1 t_i + a_2 t_i^2 + a_3 t_i^3 + u_{it} \qquad (3)$$

using in this case as the dependent variable, Y_{it}, the number of weeks that passed between the first crime committed after the person turns 17, and his second offense or the time in which he recidivates. In this case, D_{it} is a dummy variable equal to 1 if the person is arrested after turning 18, and $t_i \in (-52, 52)$, is the number of weeks between the moment the person i is arreste, and the date when he reaches 18 years of age. Finally, X_i is a vector of predetermined variables at the time of the arrest of individual i. That is, we estimate the differential effect that has the higher penalty in the time it takes a criminal to recidivate when he commits his first crime before age 18, compared to the time it takes when he commits his first crime after turning 18 years old. In this case, a positive λ implies that adults take longer to be re-arrested, which would be indirect evidence that the penalties imposed on adults who had committed their first crime immediately after turning 18 years old would have prevented them from relapsing more than the young people who committed their first crime immediately before turning 18.

This design, unlike the one implemented in the estimate of the deterrence effect, is framed in the standard regression discontinuity scheme. In this case, the variable that determines if the person is affected by the regulations for adults is the age at which the first crime after age 17 is committed, so that, $D_t = 1$ if that age is greater than or equal to 18 years of age; and the dependent variable is the number of weeks until committing the

second crime, or it could be a binary variable indicating whether the second arrest took place during the first month, or during the first two months, and so on. Note that in this case, the variable that determines whether the person is going to be subject to the juvenile or the adult legislation is the date at which the first crime was committed after reaching the age of 17. That date is endogenously determined by each individual, so there is room for the identification assumption (which requires no manipulation of the selection variable within the treatment) not to be met. The validity of our strategy depends on the fact that the possibility that people can manipulate the precise date of the offense is subject to issues beyond their control, which would introduce imprecision into the date on which they commit the crime, as suggested by Lee (2008), so that it does not violate the assumption that we have an experimental design around the age of 18.[14]

The following provides preliminary evidence that validates this assumption. Figure 4 shows the distribution of the age at which people have committed crimes are arrested between 17 and 19 years of age.[15] The figure in the first row and column includes the entire population arrested for any crime; the second column includes those arrested for index crimes, the third column for non-index crimes. The first column of the second row shows those arrested for violent index crimes, the second column for property index crimes, and the third column shows those for non-index drug-related crimes. Finally, the first column of

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[14] Hahn, Todd, and van der Klaauw (2001) present the two fundamental assumptions of this methodology: (i) $lim_{z \to z0-}E(D=1|\ z_i = z)$ y $lim_{z \to z0+}E(D=1\ |\ z_i = z)$ exist and are discontinuous; (ii) $E(X\ |\ z_i = z)$ is continuous at threshold $z = z_0$.; y (iii) $E(\beta\ |\ z_i = z)$ taken as a function of z, is continuous in z_0.

[15] No estimates are made based on the people who had committed at least one crime by the age of 17, and were arrested between 17 and 19 years of age, as Lee and McCrary (2009) do, because of the insufficient number of observations.

the third row disaggregates non-index drug-related crimes in consumption, and the second column in trafficking-related crimes. The last figure includes non-index, non-drug-related crimes.

While the figures show that the number of people arrested is higher among adults than among young people, they do not seem to show a discontinuity around the week in which they turn 18 years old in any of the cases in which there is sufficient density around that week.

Figure 4.

DENSITY OF THE AGE OF ARRESTED INDIVIDUALS BY TYPE OF CRIME

ARRESTED AT LEAST ONCE AFTER 17 AND AFTER 19 YEARS OF AGE
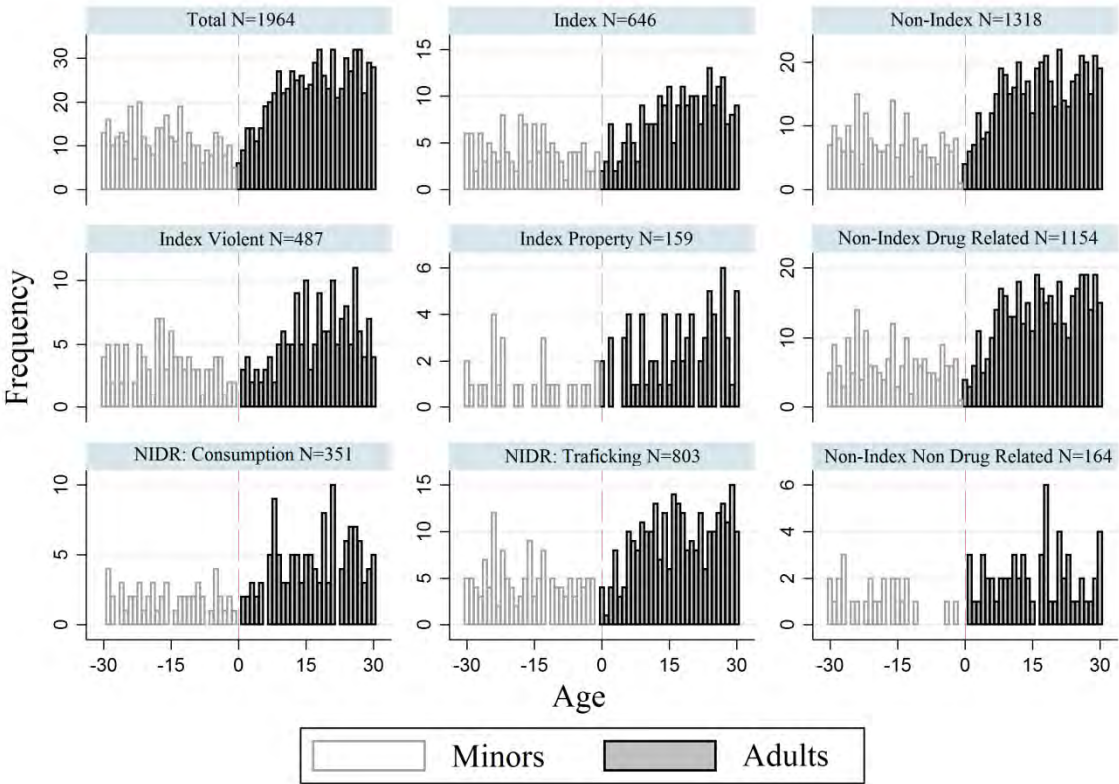
Source: SIJIN, Metropolitan Police of the Valle de Aburrá. Age of crime is the week in which the person was arrested minus week in which he reached 18 years of age. All arrested individuals between July, 2002 and

October, 2012, that were arrested at least once after reaching 17 and before reaching 19 years of age, and that after that arrest, they were arrested at least once more.

Figure 5 shows on the horizontal axis the age at which criminals committed their first crime after turning 17 years old. The age of the horizontal axis is the week in which that first crime was committed minus the week in which the criminal turned 18. That is, Week 0 is the week in which they turn 18 years old.

The vertical axis shows the nonparametric estimation of the number of days that people arrested for the first time in a specific week after turning 17 took to relapse. If those arrested after age 18 are sentenced to more severe penalties than those arrested before 18 years of age, then the former should take longer on average to relapse, under the assumption that they will not be able, or it will be harder, to commit crimes while they are serving their sentences.

In no case does the difference in the days before relapse seem statistically significant, although it is greater for those arrested immediately after turning 18 with respect to aggregate index crimes and each of its components, violent and property crimes.

Estimating equation (3) for each classification, only index and index property crimes have a statistically significant λ coefficient in the exercises without controls and controlling with covariates constant over time (Table 12).

For index crimes, people arrested immediately after turning 18 years old take on average 290 days longer to relapse than people arrested immediately before turning 18 years old, while the difference for property-related index crimes is 470 days.

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Figure 5.

Figure 5.

INCAPACITATION EFFECTS: NUMBER OF DAYS TO RECIDIVATE FOR INDIVIDUALS ARRESTED BETWEEN 17 AND 19 YEARS OF AGE
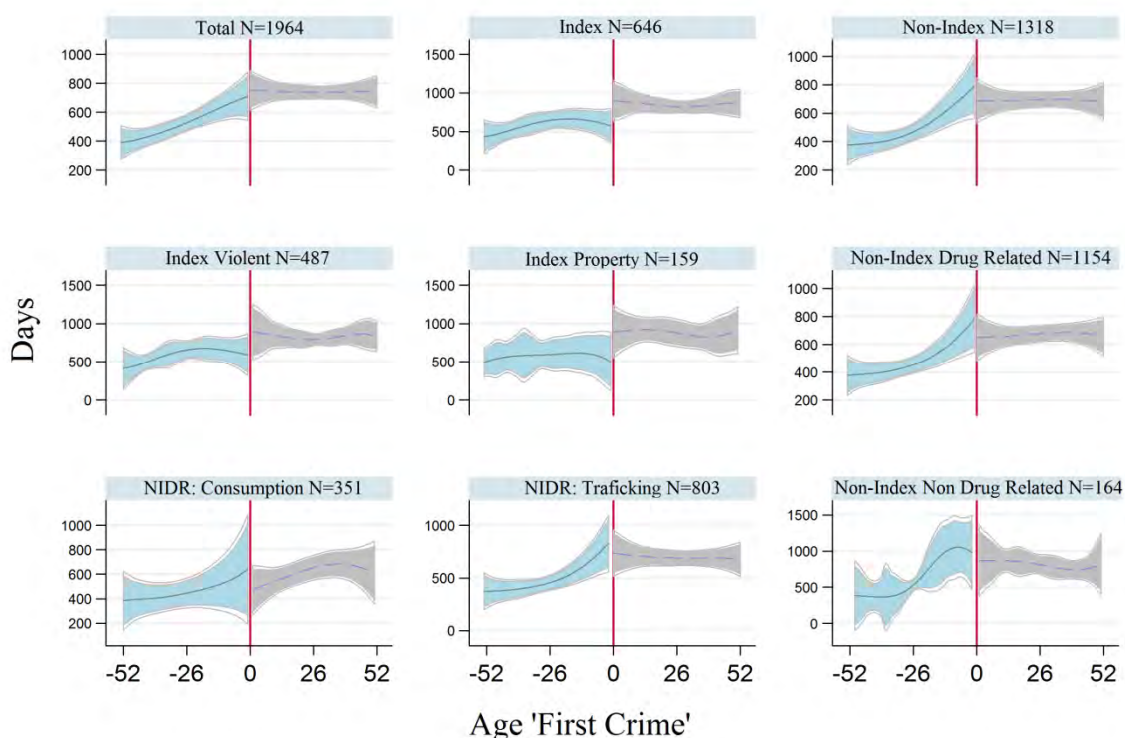
Figure 6 shows on the horizontal axis the number of days after the first arrest of the criminal after turning 17 years old, and the vertical axis shows the difference between the probability of having relapsed before that number of days between those who committed the first crime after 18 years, and those who committed their first crime before age 18. For some periods of *Total Crimes*, *Index* and *non-Index Crimes*, *Index property crimes*, the *non-Index drug related crimes* and in particular those related to drugs, a significant discontinuity is found, with the likelihood of relapsing being lower for those who were arrested after turning 18 years old.

For the average of all crimes—index crimes, non-index crimes, and non-index drug-related crimes—the likelihood of a relapse for those arrested after 18 years of age compared with those who were arrested before, is on average 15 percent lower 30 days after being arrested for the first time after turning 17 years old. The difference is greater in the case of property-related index crimes and non-index drug-related crimes: about 27 percent lower for the former and about 36 percent for the latter.

Figure 6.

DISCONTINUITY IN THE PROBABILITY TO RECIDIVATE IN A DETERMINED NUMBER OF DAYS AFTER THE FIRST CRIME COMMITTED AFTER TURNING 17 YEARS OF AGE*
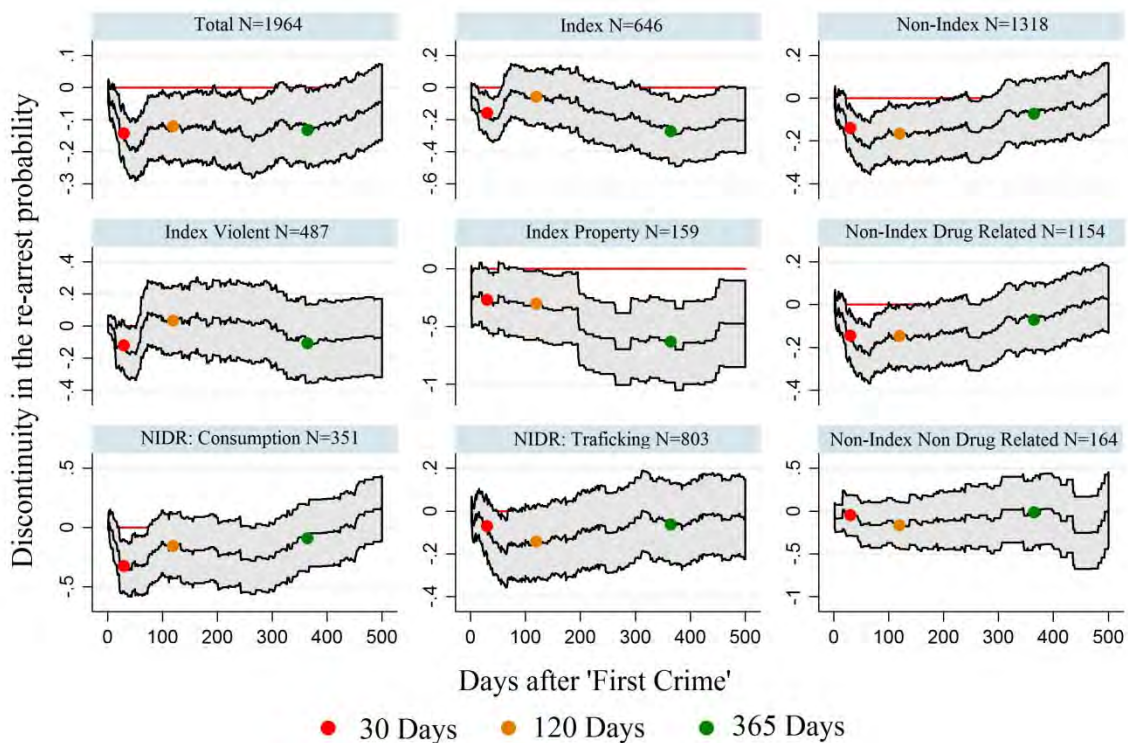
* Mean and confidence interval at 90 per cent level.

Even after 120 days following the arrest, the differences are still on average 15 percent lower in the case of the aggregate of crimes, non-index and non-index drug-related, and 30 percent lower for property crimes. In the case of non-index drug consumption-related crimes, the difference is significant at 10 percent.

4.3 Socioeconomic Costs

This section aims to quantify the effects of crime and the change in regulations on variables such as education, school attendance, and labor force participation. To do so, we first present the estimates of the effect of having been arrested on these variables, then we estimate the differential effect of being arrested before versus after the age of 18. Finally, a two-stage model is estimated to obtain the causal effect of having relapsed within a certain number of days on these outcomes.

4.3.1 Relationship between Being Arrested and Outcome Variables

As a first approximation to the costs of committing a crime, in this section we estimate the following equation, relating the fact that the individual was arrested on a date prior to the SISBEN 3 survey to the outcome variable of interest

$$Y_{it} = \alpha + \theta C_{it} + a_1 t_{S3} + a_2 t_{S3}^2 + a_3 t_{S3}^3 + \alpha_X X_{it} + \varepsilon_{it} \quad (4)$$

where Y_{it} is the outcome variable of interest, C_{it} is a dummy variable equal to 1 if individual i was arrested before the date of the survey SISBEN 3, t_{S3}, y X_{it} is a set of control variables that includes, for each person, gender, education level, socioeconomic stratum, school attendance, and labor force participation; and for each household head's income, number of children under six years, number of people over 60 years of age, number of children,

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percentage of people with elementary school completed, and gender of the household head. The coefficient of interest is θ, which catches the difference that having been arrested at any time before the date of the survey makes on the outcome. This coefficient gives an idea of the relationship between these two variables. However, it would be potentially biased by not having a strategy for identifying the causal relationship between being arrested and the outcome of interest. In the next section we will present an exercise aimed at identifying the effect that being arrested immediately before or after 18 years of age has on the outcome variables.

To calculate the effect of the discontinuity on a set of outcomes such as years of education and school attendance, among others, the population in the SISBEN 2 survey was used. Note that for those individuals that do not match with the SISBEN 3, there is no a survey date, t_{S3}. that at the time of collecting the information of the SISBEN survey, pollsters do an ordered scanning of all blocks similar to a census, and the people considered in this estimation were those who had matched to a prior SISBEN 2 survey. It is assumed that if this person had been surveyed in SISBEN 3, it would have been on the same date as their neighbors were surveyed in SISBEN 2. Based on this assumption, when an individual does not have a SISBEN 3 survey date, he is imputed to have been surveyed on the date on which the people in the block he belonged to at the time of the SISBEN 2 Survey were surveyed in SISBEN 3.

The results of estimating equation (4) are presented in Table 13. The table has two panels. Panel A considers the population of all people arrested who have matched with SISBEN 2, plus all the people that were not arrested but were surveyed in SISBEN 2. Panel B considers the population of all people arrested who have matched with SISBEN 2, plus

all the people that were not arrested but were surveyed in SISBEN 2, and that in both cases were matched with SISBEN 3.

The information in Panel A allows estimation of the effect of having been arrested on the likelihood of matching with SISBEN 3. It is assumed that people who do not match with SISBEN 3 have a zero in the other dependent variables considered in this case: school attendance and labor participation. The effect on education is not estimated for this population, because its value is not observed at the time of the SISBEN 3 survey.

The information in Panel B allows estimation of the effect of having been arrested on the educational level for the population that matches in both databases, SISBEN 2 and 3. It also allows estimation of the effect on school attendance and labor force participation.

Each panel presents the results of estimating equation (4) for different populations, which are described in the first column.

The first result included in Panel A of Table 13 is whether the individual matched to the SISBEN 3 survey. As several of those arrested are confined in prisons if adults or rehabilitation centers in the case of youth, incapacitation would be one of the reasons why adults in prisons would have a lower matching rate with SISBEN 3 than those who had already been matched to SISBEN 2.

The results in Table 13 show that in all cases, when the populations of individuals arrested and not arrested (rows *i*, *iii*, *v*, and *vii*) are considered, the fact of having been arrested implies a lower probability of matching with SISBEN 3 of between 14.2 and 28.5 percent, that is, between 22 and 42 percent of the average of the total population that matches. Even when these results are compared among criminals, we find that those who at

the moment of the SISBEN 3 survey had already committed a crime have a probability of matching between 11.5 and 16.8 percent lower, that is, between 21 and 33 percent of the average of criminals that match.

Figure 7 shows the estimated coefficient of row (*v*) and column (*iii*) of Table 13, in which the zero in the horizontal axis represents the result for the population between 19 and 20 years of age at the moment of the SISBEN 3 survey, and the other values are for the additional days over 20 years of age. That is, when the horizontal axis is 100, the age range of the SISBEN 3 population is between 19 and 20 years plus 100 days of age, and so on. As the figure illustrates, the likelihood of matching for those who have been arrested at some point between 17 and 19 years of age, and before the survey, begins at 26 percent lower that for those who are between 19 and 20 years at the moment of the SISBEN 3 survey, and it becomes less negative until reaching a range of ages in which the likelihood of matching with the SISBEN 3 is approximately 18 percent lower than for those who have been arrested between 17 and 19 years of age.

Table 13 also shows that those who are arrested before answering the SISBEN 3 survey are between 6 and 17 percent less likely to be attending school than those who have not been arrested (column *vi*, and rows *i*, *iii*, *v* and *vii* in panels A and B), when this difference is assessed among the criminals whether or not they matched to SISBEN 3 (column *vi*, and rows *ii*, *iv*, *vi* and *viii* in Panel A), we find a probability of school attendance between 1 and 7 percent lower for those who were arrested before the SISBEN 3 survey, while differences are much lower when that comparison is conditioned on the match with the SISBEN 3 survey (column *vi*, and rows *ii*, *iv*, *vi* and *viii* in panel B). Panel A also shows that those who are arrested have a lower labor force participation, and given

that the result does not hold once we condition on matching to the SISBEN 3 (Panel B), these results may be due to a large extent to the lack of matching to the SISBEN 3 because of the incapacitation effect. Lastly, those who were arrested before the SISBEN 3 have between 0.65 and 0.85 fewer years of education than those who were never arrested. This result could be an upper bound to the one that could have been obtained in PA if the educational level of all of its population were known at the moment the SISBEN 3 survey was collected (that is, we would expect that in Panel A, the educational level of individuals previously arrested would be relatively lower than that of those previously arrested and matched to SISBEN 3 in Panel B).

Figure 7.

EFFECT OF HAVING BEEN ARRESTED ON THE PROBABILITY TO MATCH WITH SISBEN 3 (θ)

4.3.2 Relationship between the Change in Penalties at 18 and the Outcome Variables

The discontinuity in criminal legislation around 18 years of age provides the framework to assess the impact of such a change on the set of outcome variables in the previous section, using a similar approach to the one we used to estimate the incapacitation effect, that is, using a regression discontinuity approach like the one used in equation (3).

The results of estimating equation (3) using as dependent variables the outcomes of the previous section are presented in Table 14, in which we include all the arrested individuals in the odd rows, and only those that were re-arrested in the even rows. The outcome variables are again the match of the arrested people with SISBEN 3, and that is why the table presents the estimated coefficients based on a population that was arrested since dates very near the SISBEN 3 survey (rows i and ii), and also as far as two years before it (rows iii and iv) in both panels.

We find no effect on the probability of matching the SISBEN 3 survey. This result is also illustrated in Figure 8, similarly constructed as Figure 7, and which illustrates the coefficient obtained in row (*iii*) and column (*iii*) of Table 14. The zero in the horizontal axis represents the result for people between 19 and 20 years of age at the moment the SISBEN 3 survey was collected, and the other values are obtained once additional days of age beyond age 20 are considered in the estimation of the probability of matching the survey.

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As the table shows, the likelihood of matching for people arrested at some point between ages 17 and 19, and before the survey, is in all cases not significantly different from zero.

This result suggests that although more severe punishment of adults has a significant incapacitation effect, it would be a very short-run effect, which may be significant during the first year after they reach 18 years of age but negligible afterwards. This result also suggests that the reason why individuals arrested immediately after reaching 18 take longer to recidivate than those arrested right before reaching 18, that is, the previously obtained result on incapacitation, would not be of the sort that acts through their having been imprisoned for longer periods, with the exception of their incapacitation during their first years after arrest, but rather a sort of specific deterrence, possibly originated by the uncomfortable experience they had while imprisoned. This possibility will be tested further in the next section, in which we will assess the effect of the length of time to recidivate on the outcome variables considered in this and the previous sections.[16]

Table 14 also shows that there is a negative effect of having been arrested immediately after turning 18 versus immediately before on the number of years of education when we consider row (*iv*), columns (*v*) and (*vi*) of Panels A and (less significant) B. There is also a negative effect on labor participation when we consider the

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[16] In this case, it is important to note that SIJIN has a procedure to record the information on juveniles that is different from the procedure followed to record the information on adults, since the former have additional confidentiality requirements. The differential treatment of information on juveniles led us to have better-quality information for adults than for juveniles. The implication for our identification strategy is that precisely around the cutoff, there is something other than the legislation that is also affecting our estimates, arguably biasing them upward.

estimate in row (*ii*) of columns (*xi*) and (*xii*) of Panel B. These effects are, nonetheless, far from constituting robust evidence of negative effects on the outcomes considered, since in most cases they are not significant, those significant are obtained with a small sample size, and additionally, they required strong assumptions: for education, in Panel A, since we cannot observe their educational level, we are assuming that those not matched have the same education they had in the baseline SISBEN survey; and for labor participation, the result of row (*ii*) in Panel B is not supported by the similar sample considered in row (*iv*).

Figure 8.

EFFECT OF THE CHANGE IN LEGISLATION AT AGE 18

ON THE LIKELIHOOD OF MATCHING SISBEN 3

Additional days to the range (19-20)

- - - - - Coefficient   Confidence Interval 90%
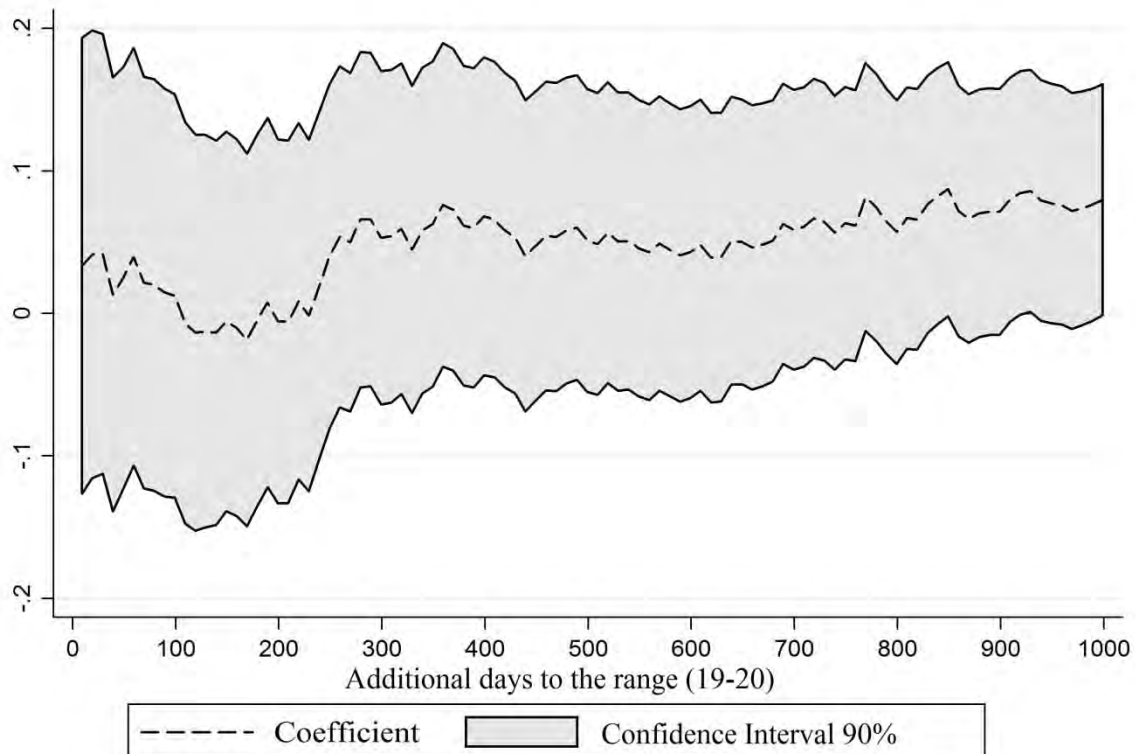
The lack of effects on these outcome variables adds to the evidence in the sense that possibly the reason why individuals arrested immediately after turning 18 take longer to recidivate than those arrested right before 18 may be more related to a specific deterrent effect, rather than the usual incapacitation effect. Even if adults have better possibilities of studying while in prison than imprisoned adolescents, it is unlikely that once adolescents gain their freedom, they would not take advantage of acquiring more years of education. On the other hand, their potentially both becoming free shortly would be consistent with their having similar outcomes, while the adults, who actually experienced a much tougher time in prison, would be more deterred from recidivating than the adolescents.

4.3.3 Effect of Time to Recidivate on Outcome Variables

In this section we again exploit the change in legislation when adolescents turn18 to assess how the longer lengths of time individuals who were arrested right after turning 18 take to recidivate compared with those arrested right before reaching 18 affect the outcome variables. If the reason why individuals arrested right after reaching 18 take longer to recidivate is because they are being imprisoned longer, that is, because they are physically prevented from recidivating, then they should register lower levels of human capital, and consequently, of labor force participation, than those that were arrested right before turning 18.

We seek to identify the effect of the number of days arrested people take to recidivate on the outcome variables, based on a fuzzy regression discontinuity design. That is, we interpret as the intervention the number of days to recidivate after the first arrest, and the knowledge that this number of days changes discontinuously at 18, and we proceed to

estimate the impact according to the procedure suggested by Hahn, Todd, and van der Klaauw (2001), van der Klaauw (2002), and van der Klaauw (2008), among others. Our case, in which we have a continuous treatment variable, is illustrated in Lee and Lemieux (2010), and in studies like the ones by Chen and Shapiro (2007), Carpenter and Dobkin (2009), Ludwig and Miller (2007), and Chen and van der Klaauw (2008), among others.

To estimate the effect of the number of days to recidivate on the outcome variables, we undertake a two-step procedure, where the first stage consists of the prediction of the number of days to recidivate for all the arrested individuals who were rearrested at some point, according to

$$N_{it} = a + \alpha D_{it} + a_1 t + a_2 t^2 + a_3 t^3 + \alpha_X X_{it} + \varepsilon_{it} \quad (5)$$

where N_{it} is the number of days someone arrested for first time the week t (between 17 and 19 years of age), takes to be rearrested, D_t is a dummy variable equal to 1 if the person was arrested for first time after reaching 18, and X_{it} are control variables taken from the SISBEN surveys collected before individuals reached 16 years of age.

Based on the predicted values of N_{it} for each person rearrested, we estimate the following equation:

$$Y_{it} = a_0 + \theta E(N_{it}|D_{it}, t, X_{it}) + a_1 t + a_2 t^2 + a_3 t^3 + X_{it}\beta + v_{it} \quad (6)$$

where Y_{it} is the outcome variable considered: years of education, school attendance, and labor participation.

Table 15 shows the θ coefficient from estimating equation (6). To obtain our estimates with the maximum possible number of available observations, columns (*i*) and

(*ii*) include all rearrested individuals unconditional on our having been able to obtain their control variables through their matching with the available SISBEN surveys, while columns (*iii*)-(*v*) include the rearrested that matched the SISBEN 3 survey, and thus, those for which we have their control variables. Estimated coefficients in columns (*ii*) and (*iv*) only differ in their population, the first with more than twice the number of observations as the second. Columns (*vi*)-(*x*) are similar to the previous, nonetheless, they additionally control for month of SISBEN 3 survey fixed effects.

The results in Table 15 show that the number of days elapsed between the first and the second arrest do not affect the outcomes considered in the table. This additional evidence is consistent with the possibility that the longer lengths of time to recidivate of people arrested immediately after reaching 18 might not be explained by the standard incapacitation effect, but rather by other factors, among which we could consider a specific deterrent effect of the first arrest, which might move them to avoid being rearrested.

5. CONCLUSIONS

Based on the census of individual data of arrested individuals in the Valle de Aburrá, we find that the discontinuous change in punishment that takes place at 18 years of age has a deterrence effect among those who were arrested for the first time before 17 years of age, which reduces the arrest rate at 18 by about 50 percent. This implies an elasticity of arrests with respect to punishment of between 1.0 and 6.7 percent depending on the population considered, and the penalty of reference used. We also find that the number of days that arrested individuals take to recidivate is 300 days more in the case of index crimes, if they

are arrested right after, rather than before, they reach 18 years of age, and that in these cases they are less likely to recidivate in any type of crime.

We present a preliminary quantification of the costs in terms of human capital formation, showing that arrested people show lower attendance rates and lower levels of educational attainment. Nonetheless, the change in criminal legislation at 18 years of age does not explain future differences in human capital formation among the arrested population that had been arrested immediately after versus immediately before they reach 18 years of age. We do not find evidence that the longer lengths of time to recidivate of individuals arrested for first time immediately after they reach 18 imply future differences in human capital formation. These results suggest that the standard incapacitation effect estimated in this study, would not be explained so much by the impossibility of the arrested population to recidivate for their having been imprisoned, but rather due to a specific deterrence effect resulting from the harsher experience while in prison of those arrested right after reaching 18, when compared to the experience of the population arrested right before reaching 18.

This result would also be a consequence of the fact that while Colombia's criminal legislation considers long sentences for criminals found guilty, in practice the actual penalties would be much shorter. People in prison pay a very high price in the brief period of time they remain imprisoned, among other things, due to the high degree of overcrowding in Colombian prisons, which deters prisoners, once they are freed, from

recidivating.[17] Juveniles also lack the required infrastructure, which according to Comisión de Evaluación del Sistema de Responsabilidad Penal para Adolescentes (2011), leads institutions to return youths that were sentenced to confinement to their families on parole. [18] This, in turn, increases the relative cost of being arrested and sentenced immediately after rather than before reaching 18: while under poor infrastructure, the former are sent to overcrowded prisons, while the latter are freed. Despite this, out of all individuals under the age of 18 that are arrested, 29 percent are sentenced, and out of those, 24 percent are sent to confinement, and 15 percent are sent to a minimum-security center.[19]

Much harsher conditions while in prison, combined with sentences actually much shorter than in developed economies, would be the reasons why the results implied by criminal legislation in Colombia are different from those found in developed economies with respect to incapacitation.

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[17] According to INPEC (2012), by April, 2012, Colombia's overall overcrowding rate was 41.8 percent. The region with the lowest overcrowding rate was Viejo Caldas with 29.4 percent, the one with the highest rate was Noroeste, with 71.7 percent.

[18] Article 162, Law 1098 of 2006.

[19] Minimum security center is the enrollment of minors sentenced into a program of mandatory specialized care during pre-established non-school schedules or on weekends. See Article 186, Law 1098 of 2006, and Oportunidad Estratégica (2012).

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Table 5.

DISCONTINUITY ESTIMATES OF DETERRENCE BY TYPE OF CRIME. ALL ARRESTED INDIVIDUALS

Group	Type		Any Crime Mean Before 18 (1)	Any Crime Coef. (2)	Index Mean Before 18 (3)	Index Coef. (4)	Non-Index Mean Before 18 (5)	Non-Index Coef. (6)	Violent Crime Mean Before 18 (7)	Violent Crime Coef. (8)	Property Crime Mean Before 18 (9)	Property Crime Coef. (10)	Non-Index Drug Related Mean Before 18 (11)	Non-Index Drug Related Coef. (12)	NIDR: Consumption Mean Before 18 (13)	NIDR: Consumption Coef. (14)	NIDR: Traficking Mean Before 18 (15)	NIDR: Traficking Coef. (16)	Non-Index, Non Drug Related Mean Before 18 (17)	Non-Index, Non Drug Related Coef. (18)	Obs.
A Group Criminals Before 17 ♦	Elimination	Coef.	0.0471	-0.0138	0.0140	-0.0035	0.0331	-0.0103	0.0120	-0.0025	0.0019	-0.0011	0.0299	-0.0079	0.0106	-0.0070	0.0193	-0.0009	0.0032	-0.0024	752,952
		d.e. - e.e.	(1.5636)	(0.0074)*	(0.852)	(0.0046)	(1.3114)	(0.0058)*	(0.7906)	(0.0041)	(0.3175)	(0.0021)	(1.2458)	(0.0054)	(0.7424)	(0.0033)**	(1.0006)	(0.0044)	(0.4099)	(0.0021)	8,223
	No elimination	Coef.	0.0544	-0.0132	0.0173	-0.0024	0.0372	-0.0108	0.0145	-0.0014	0.0028	-0.0010	0.0339	-0.0100	0.0124	-0.0077	0.0216	-0.0022	0.0033	-0.0009	783,850
		d.e. - e.e.	(1.6818)	(0.0081)*	(0.9474)	(0.0049)	(1.39)	(0.0064)*	(0.8681)	(0.0043)	(0.3797)	(0.0023)	(1.3274)	(0.0059)*	(0.8013)	(0.0035)**	(1.0584)	(0.0047)	(0.4128)	(0.0026)	8,223
	Elimination (i)	Coef.	0.0506	-0.0136	0.0151	-0.0027	0.0355	-0.0108	0.0126	-0.0016	0.0026	-0.0011	0.0322	-0.0098	0.0117	-0.0081	0.0205	-0.0017	0.0033	-0.0011	764,301
		d.e. - e.e.	(1.6216)	(0.008)*	(0.8866)	(0.0047)	(1.3582)	(0.0064)*	(0.808)	(0.0041)	(0.3651)	(0.0023)	(1.2929)	(0.0058)*	(0.7786)	(0.0035)**	(1.0324)	(0.0046)	(0.4162)	(0.0026)	8,223
B Criminals ♦♦	Elimination	Coef.	0.1502	-0.0053	0.0469	0.0053	0.1034	-0.0106	0.0386	0.0034	0.0083	0.0018	0.0906	-0.0114	0.0267	-0.0070	0.0639	-0.0043	0.0128	0.0008	3,426,043
		d.e. - e.e.	(2.7911)	(0.008)	(1.5605)	(0.0045)	(2.3162)	(0.0066)*	(1.4159)	(0.004)	(0.6566)	(0.002)	(2.1689)	(0.0061)*	(1.1785)	(0.0033)**	(1.8218)	(0.0051)	(0.8142)	(0.0025)	43,107
	No elimination	Coef.	0.1494	-0.0122	0.0465	0.0026	0.1029	-0.0148	0.0382	0.0012	0.0083	0.0014	0.0906	-0.0155	0.0273	-0.0085	0.0633	-0.0070	0.0123	0.0007	3,920,429
		d.e. - e.e.	(2.7834)	(0.0074)*	(1.5546)	(0.0041)	(2.3109)	(0.0061)**	(1.4089)	(0.0037)	(0.6576)	(0.0018)	(2.1686)	(0.0056)***	(1.1913)	(0.003)***	(1.813)	(0.0047)	(0.7999)	(0.0023)	43,107
	Elimination (i)	Coef.	0.1500	-0.0097	0.0468	0.0031	0.1031	-0.0128	0.0384	0.0015	0.0084	0.0016	0.0906	-0.0139	0.0269	-0.0076	0.0637	-0.0064	0.0126	0.0011	3,659,079
		d.e. - e.e.	(2.7884)	(0.0077)	(1.5597)	(0.0043)	(2.3135)	(0.0063)**	(1.4123)	(0.0039)	(0.6626)	(0.002)	(2.1683)	(0.0059)**	(1.1827)	(0.0031)***	(1.8182)	(0.0049)	(0.8082)	(0.0024)	43,107
C Matched to Sisben Medellín MA ♦♦♦	Elimination	Coef.	0.0076	-0.0003	0.0024	0.0003	0.0052	-0.0006	0.0020	0.0002	0.0004	0.0001	0.0045	-0.0006	0.0014	-0.0004	0.0032	-0.0002	0.0007	0.0000	62,062,089
		d.e. - e.e.	(0.6275)	(0.0004)	(0.352)	(0.0002)	(0.5195)	(0.0003)*	(0.3186)	(0.0002)	(0.1497)	(0.0001)	(0.4855)	(0.0003)*	(0.2668)	(0.0002)**	(0.4057)	(0.0003)	(0.1849)	(0.0001)	712,443
	No elimination	Coef.	0.0081	-0.0008	0.0025	0.0001	0.0055	-0.0009	0.0021	0.0000	0.0005	0.0001	0.0049	-0.0009	0.0015	-0.0005	0.0034	-0.0004	0.0007	0.0000	62,507,397
		d.e. - e.e.	(0.6478)	(0.0004)*	(0.3627)	(0.0002)	(0.5368)	(0.0004)***	(0.3281)	(0.0002)	(0.1545)	(0.0001)	(0.5029)	(0.0003)***	(0.2793)	(0.0002)***	(0.4182)	(0.0003)	(0.1878)	(0.0001)	712,443
	Elimination (i)	Coef.	0.0078	-0.0006	0.0025	0.0002	0.0053	-0.0008	0.0020	0.0001	0.0005	0.0001	0.0047	-0.0008	0.0014	-0.0005	0.0033	-0.0003	0.0007	0.0000	62,276,873
		d.e. - e.e.	(0.6369)	(0.0004)	(0.3576)	(0.0002)	(0.5271)	(0.0004)**	(0.3229)	(0.0002)	(0.1536)	(0.0001)	(0.4932)	(0.0003)**	(0.2722)	(0.0002)***	(0.4113)	(0.0003)	(0.1861)	(0.0001)	712,443

Source: SIJIN, Metropolitan Police of Valle de Aburrá. All estimates use information from total of catches between 17 and 19 years for those captured between July 2002 and October 2012; (i) Eliminating individuals Without a Sisben Follow up. ♦ Includes all persons who were captured at least once before 16 years. ♦♦ Includes all persons captured that matched with any database of the Sisben of Antioquia.. ♦♦♦ Includes all persons captured and not captured that matched with any database of Sisben Valle de Aburrá. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 6.

DISCONTINUITY ESTIMATES OF DETERRENCE BY TYPE OF CRIME.

ARRESTED INDIVIDUALS WITH INFORMATION BEFORE 16 YEARS OF AGE

	Group	Type		Any Crime		Index		Non-Index		Violent Crime		Property Crime		Non-Index Drug Related		NIDR: Consumption		NIDR: Traficking		Non-Index, Non Drug Related		Obs.
				Mean Before 18 (1)	Coef. (2)	Mean Before 18 (3)	Coef. (4)	Mean Before 18 (5)	Coef. (6)	Mean Before 18 (7)	Coef. (8)	Mean Before 18 (9)	Coef. (10)	Mean Before 18 (11)	Coef. (12)	Mean Before 18 (13)	Coef. (14)	Mean Before 18 (15)	Coef. (16)	Mean Before 18 (17)	Coef. (18)	
A	**Group Criminals Before 17**♦	Elimination	Coef.	0.0468	-0.0235	0.0138	-0.0042	0.0330	-0.0194	0.0124	-0.0056	0.0015	0.0014	0.0297	-0.0169	0.0100	-0.0107	0.0197	-0.0062	0.0033	-0.0025	516,904
			d.e. - e.e.	(1.5599)	(0.0086)***	(0.8479)	(0.0055)	(1.3096)	(0.0066)***	(0.8014)	(0.0051)	(0.2769)	(0.0022)	(1.2421)	(0.0064)***	(0.7195)	(0.004)***	(1.0127)	(0.005)	(0.4154)	(0.0016)	5,850
		No elimination	Coef.	0.0527	-0.0254	0.0167	-0.0041	0.0360	-0.0213	0.0144	-0.0053	0.0023	0.0012	0.0327	-0.0191	0.0110	-0.0115	0.0218	-0.0076	0.0032	-0.0021	537,545
			d.e. - e.e.	(1.6541)	(0.0091)***	(0.9322)	(0.0058)	(1.3668)	(0.0071)***	(0.8646)	(0.0054)	(0.3486)	(0.0021)	(1.3039)	(0.0069)***	(0.755)	(0.0042)***	(1.0633)	(0.0054)	(0.4102)	(0.0016)	5,850
		Elimination[(i)]	Coef.	0.0486	-0.0255	0.0145	-0.0042	0.0341	-0.0213	0.0125	-0.0052	0.0020	0.0010	0.0308	-0.0189	0.0104	-0.0122	0.0203	-0.0067	0.0033	-0.0024	521,681
			d.e. - e.e.	(1.5887)	(0.0089)***	(0.8677)	(0.0055)	(1.3311)	(0.007)***	(0.805)	(0.005)	(0.3238)	(0.0022)	(1.2651)	(0.0068)***	(0.7371)	(0.0043)***	(1.0285)	(0.0051)	(0.4142)	(0.0016)	5,850
B	**Criminals**♦♦	Elimination	Coef.	0.2159	-0.0390	0.0611	0.0066	0.1548	-0.0456	0.0529	0.0044	0.0082	0.0022	0.1350	-0.0462	0.0402	-0.0179	0.0948	-0.0283	0.0198	0.0006	1,251,214
			d.e. - e.e.	(3.3433)	(0.0153)**	(1.7807)	(0.008)	(2.833)	(0.013)***	(1.6573)	(0.0075)	(0.6519)	(0.003)	(2.646)	(0.012)***	(1.4454)	(0.0065)***	(2.218)	(0.0101)***	(1.0148)	(0.005)	15,548
		No elimination	Coef.	0.2080	-0.0458	0.0590	0.0023	0.1489	-0.0480	0.0510	0.0002	0.0080	0.0021	0.1305	-0.0480	0.0400	-0.0214	0.0904	-0.0267	0.0185	0.0000	1,503,599
			d.e. - e.e.	(3.282)	(0.0132)***	(1.7512)	(0.0068)	(2.7789)	(0.0113)***	(1.6284)	(0.0064)	(0.6448)	(0.0025)	(2.6015)	(0.0104)***	(1.4425)	(0.0057)***	(2.1666)	(0.0086)***	(0.9795)	(0.0043)	15,548
		Elimination[(i)]	Coef.	0.2135	-0.0421	0.0605	0.0044	0.1530	-0.0464	0.0523	0.0023	0.0082	0.0021	0.1337	-0.0473	0.0404	-0.0191	0.0933	-0.0282	0.0193	0.0009	1,324,844
			d.e. - e.e.	(3.3254)	(0.0145)***	(1.7732)	(0.0076)	(2.8164)	(0.0124)***	(1.6484)	(0.0071)	(0.6541)	(0.0028)	(2.6331)	(0.0114)***	(1.4481)	(0.0063)***	(2.2008)	(0.0096)***	(1.0022)	(0.0047)	15,548
C	**Matched to Sisben Medellín MA**♦♦♦	Elimination	Coef.	0.0074	-0.0014	0.0021	0.0002	0.0053	-0.0015	0.0018	0.0001	0.0003	0.0001	0.0046	-0.0015	0.0014	-0.0006	0.0032	-0.0009	0.0007	-0.0001	33,960,512
			d.e. - e.e.	(0.6212)	(0.0005)**	(0.3313)	(0.0003)	(0.5256)	(0.0004)***	(0.3089)	(0.0003)	(0.1198)	(0.0001)	(0.4898)	(0.0004)***	(0.2699)	(0.0002)***	(0.4087)	(0.0003)**	(0.1906)	(0.0002)	388,839
		No elimination	Coef.	0.0079	-0.0020	0.0022	0.0000	0.0056	-0.0020	0.0020	-0.0001	0.0003	0.0001	0.0049	-0.0019	0.0015	-0.0009	0.0034	-0.0010	0.0007	-0.0001	34,186,951
			d.e. - e.e.	(0.6406)	(0.0006)***	(0.3418)	(0.0003)	(0.5419)	(0.0005)***	(0.3186)	(0.0003)	(0.1238)	(0.0001)	(0.5062)	(0.0004)***	(0.2831)	(0.0002)***	(0.4196)	(0.0004)***	(0.1933)	(0.0002)	388,839
		Elimination[(i)]	Coef.	0.0076	-0.0016	0.0022	0.0001	0.0054	-0.0017	0.0019	0.0000	0.0003	0.0001	0.0047	-0.0016	0.0014	-0.0007	0.0033	-0.0009	0.0007	0.0000	34,028,662
			d.e. - e.e.	(0.627)	(0.0005)***	(0.3349)	(0.0003)	(0.5301)	(0.0005)***	(0.3118)	(0.0003)	(0.1222)	(0.0001)	(0.4946)	(0.0004)***	(0.2746)	(0.0002)***	(0.4114)	(0.0003)***	(0.1909)	(0.0002)	388,839

Source: SIJIN, Metropolitan Police of Valle de Aburrá. All estimates use information from total of catches between 17 and 19 years for those captured between July 2002 and October 2012 and the sample is restricted to people with information available before 16 years of age; [(i)] Elimina individuals Without a Sisben Follow up. ♦ Includes all persons who were captured at least once before 16 years. ♦♦ Includes all persons captured that matched with any database of the Sisben of Antioquia.. ♦♦♦ Includes all persons captured and not captured that matched with any database of Sisben Valle de Aburrá. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 7.

θ Estimate of Deterrence by Type of Crime. All Arrested Individuals

	Group	Type		Any Crime Mean Before 18 (1)	Any Crime Coef. (2)	Index Mean Before 18 (3)	Index Coef. (4)	Non-Index Mean Before 18 (5)	Non-Index Coef. (6)	Violent Crime Mean Before 18 (7)	Violent Crime Coef. (8)	Property Crime Mean Before 18 (9)	Property Crime Coef. (10)	Non-Index Drug Related Mean Before 18 (11)	Non-Index Drug Related Coef. (12)	NIDR: Consumption Mean Before 18 (13)	NIDR: Consumption Coef. (14)	NIDR: Traficking Mean Before 18 (15)	NIDR: Traficking Coef. (16)	Non-Index, Non Drug Related Mean Before 18 (17)	Non-Index, Non Drug Related Coef. (18)	Obs.
A	Group Criminals Before 17[♦]	Elimination	Coef.	0.0474	-0.0208	0.0140	0.0251	0.0334	-0.0460	0.0120	0.0115	0.0019	0.0136	0.0301	-0.0365	0.0106	-0.0107	0.0195	-0.0257	0.0033	-0.0095	752,952
			d.e. - e.e.	(1.5688)	(0.0364)	(0.8518)	(0.0172)	(1.3178)	(0.032)	(0.791)	(0.0162)	(0.316)	(0.0058)**	(1.2505)	(0.0287)	(0.7433)	(0.0147)	(1.0058)	(0.0247)	(0.4161)	(0.0138)	8,223
		No elimination	Coef.	0.0547	-0.0017	0.0173	0.0273	0.0374	-0.0290	0.0145	0.0235	0.0029	0.0037	0.0340	-0.0248	0.0123	-0.0090	0.0217	-0.0158	0.0034	-0.0042	783,850
			d.e. - e.e.	(1.6863)	(0.0354)	(0.9492)	(0.0188)	(1.3942)	(0.0293)	(0.8671)	(0.0166)	(0.3862)	(0.0137)	(1.33)	(0.0267)	(0.8011)	(0.0133)	(1.062)	(0.0231)	(0.4184)	(0.0124)	8,223
		Elimination[(i)]	Coef.	0.0510	-0.0117	0.0152	0.0176	0.0358	-0.0293	0.0126	0.0142	0.0027	0.0033	0.0323	-0.0246	0.0117	-0.0084	0.0207	-0.0163	0.0034	-0.0047	764,301
			d.e. - e.e.	(1.6275)	(0.0359)	(0.8895)	(0.0183)	(1.3633)	(0.0308)	(0.808)	(0.0158)	(0.3722)	(0.0144)	(1.2965)	(0.0281)	(0.7789)	(0.0139)	(1.0367)	(0.0244)	(0.422)	(0.013)	8,223
B	Criminals[♦♦]	Elimination	Coef.	0.1442	-0.0481	0.0493	-0.0082	0.0950	-0.0399	0.0394	-0.0106	0.0099	0.0024	0.0816	-0.0328	0.0226	-0.0106	0.0590	-0.0222	0.0134	-0.0071	3,426,043
			d.e. - e.e.	(2.7348)	(0.0066)***	(1.5996)	(0.004)**	(2.2204)	(0.0053)***	(1.4305)	(0.0035)***	(0.7163)	(0.0021)	(2.0582)	(0.0049)***	(1.0834)	(0.0026)***	(1.7507)	(0.0042)***	(0.8344)	(0.002)***	43,107
		No elimination	Coef.	0.1428	-0.0585	0.0487	-0.0111	0.0941	-0.0474	0.0389	-0.0126	0.0098	0.0015	0.0811	-0.0397	0.0229	-0.0145	0.0583	-0.0253	0.0130	-0.0077	3,920,429
			d.e. - e.e.	(2.7214)	(0.0063)***	(1.5906)	(0.0038)***	(2.2103)	(0.0051)***	(1.421)	(0.0033)***	(0.7153)	(0.0019)	(2.0524)	(0.0048)***	(1.0907)	(0.0025)***	(1.7394)	(0.004)***	(0.8215)	(0.0018)***	43,107
		Elimination[(i)]	Coef.	0.1435	-0.0538	0.0491	-0.0098	0.0944	-0.0440	0.0392	-0.0121	0.0100	0.0023	0.0811	-0.0364	0.0226	-0.0126	0.0586	-0.0238	0.0133	-0.0076	3,659,079
			d.e. - e.e.	(2.7279)	(0.0064)***	(1.5972)	(0.0039)**	(2.2135)	(0.0051)***	(1.4263)	(0.0034)***	(0.7194)	(0.002)	(2.0525)	(0.0048)***	(1.0828)	(0.0025)***	(1.7444)	(0.0041)***	(0.83)	(0.0019)***	43,107
C	Matched to Sisben Medellín MA[♦♦♦]	Elimination	Coef.	0.0078	-0.0040	0.0027	-0.0008	0.0051	-0.0031	0.0021	-0.0009	0.0006	0.0001	0.0044	-0.0025	0.0012	-0.0008	0.0031	-0.0017	0.0007	-0.0006	62,062,089
			d.e. - e.e.	(0.6369)	(0.0005)***	(0.3743)	(0.0003)***	(0.5154)	(0.0004)***	(0.3334)	(0.0002)***	(0.17)	(0.0001)	(0.4766)	(0.0003)***	(0.2533)	(0.0002)***	(0.4037)	(0.0003)***	(0.1961)	(0.0001)***	712,443
		No elimination	Coef.	0.0083	-0.0041	0.0029	-0.0008	0.0055	-0.0032	0.0023	-0.0010	0.0006	0.0001	0.0047	-0.0026	0.0013	-0.0009	0.0033	-0.0017	0.0008	-0.0006	62,507,397
			d.e. - e.e.	(0.6579)	(0.0005)***	(0.3862)	(0.0003)***	(0.5326)	(0.0004)***	(0.3439)	(0.0003)***	(0.1757)	(0.0002)	(0.4936)	(0.0004)***	(0.2648)	(0.0002)***	(0.4166)	(0.0003)***	(0.2)	(0.0001)***	712,443
		Elimination[(i)]	Coef.	0.0081	-0.0039	0.0028	-0.0008	0.0053	-0.0031	0.0022	-0.0010	0.0006	0.0002	0.0045	-0.0025	0.0013	-0.0008	0.0032	-0.0017	0.0008	-0.0006	62,276,873
			d.e. - e.e.	(0.6483)	(0.0005)***	(0.3816)	(0.0003)***	(0.5242)	(0.0004)***	(0.3394)	(0.0002)***	(0.1743)	(0.0002)	(0.485)	(0.0003)***	(0.2585)	(0.0002)***	(0.4104)	(0.0003)***	(0.1988)	(0.0001)***	712,443

Source: SIJIN, Metropolitan Police of Valle de Aburrá. All estimates use information from total of catches between 17 and 19 years for those captured between July 2002 and October 2012; [(i)] Eliminating individuals Without a Sisben Follow up. [♦] Includes all persons who were captured at least once before 16 years. [♦♦] Includes all persons captured that matched with any database of the Sisben of Antioquia.. [♦♦♦] Includes all persons captured and not captured that matched with any database of Sisben Valle de Aburrá. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 8.

θESTIMATE OF DETERRENCE BY TYPE OF CRIME. ARRESTED INDIVIDUALS WITH INFORMATION BEFORE 16 YEARS OF AGE

Group	Type		Any Crime		Index		Non-Index		Violent Crime		Property Crime		Non-Index Drug Related		NIDR: Consumption		NIDR: Traficking		Non-Index, Non Drug Related		Obs.
			Mean Before 18 (1)	Coef. (2)	Mean Before 18 (3)	Coef. (4)	Mean Before 18 (5)	Coef. (6)	Mean Before 18 (7)	Coef. (8)	Mean Before 18 (9)	Coef. (10)	Mean Before 18 (11)	Coef. (12)	Mean Before 18 (13)	Coef. (14)	Mean Before 18 (15)	Coef. (16)	Mean Before 18 (17)	Coef. (18)	
A Group Criminals Before 17♦	Elimination	Coef.	0.0469	-0.0017	0.0138	0.0591	0.0331	-0.0608	0.0123	0.0384	0.0015	0.0207	0.0298	-0.0596	0.0099	0.0075	0.0199	-0.0671	0.0033	-0.0012	516,904
		d.e. - e.e.	(1.5605)	(0.0674)	(0.8466)	(0.0258)**	(1.3113)	(0.0623)	(0.8002)	(0.0218)*	(0.2765)	(0.0138)	(1.244)	(0.0623)	(0.7184)	(0.0138)	(1.0158)	(0.0608)	(0.4148)	(0.001)	5,850
	No elimination	Coef.	0.0527	0.0190	0.0167	0.0759	0.0360	-0.0569	0.0143	0.0458	0.0023	0.0301	0.0328	-0.0560	0.0109	0.0041	0.0219	-0.0601	0.0032	-0.0009	537,545
		d.e. - e.e.	(1.654)	(0.0634)	(0.9306)	(0.0331)**	(1.3678)	(0.053)	(0.8631)	(0.0258)*	(0.348)	(0.0215)	(1.3052)	(0.053)	(0.7537)	(0.0133)	(1.0658)	(0.0513)	(0.4094)	(0.001)	5,850
	Elimination(i)	Coef.	0.0486	0.0107	0.0144	0.0692	0.0342	-0.0584	0.0124	0.0380	0.0020	0.0311	0.0309	-0.0575	0.0104	0.0060	0.0205	-0.0635	0.0033	-0.0010	521,681
		d.e. - e.e.	(1.5891)	(0.0671)	(0.8663)	(0.0306)**	(1.3326)	(0.0593)	(0.8037)	(0.0214)*	(0.3233)	(0.0222)	(1.2668)	(0.0592)	(0.7359)	(0.0137)	(1.0314)	(0.0577)	(0.4136)	(0.001)	5,850
B Criminals♦♦	Elimination	Coef.	0.2149	-0.0849	0.0618	-0.0101	0.1531	-0.0748	0.0532	-0.0118	0.0086	0.0017	0.1331	-0.0608	0.0394	-0.0199	0.0937	-0.0409	0.0200	-0.0139	1,251,214
		d.e. - e.e.	(3.3358)	(0.0237)***	(1.7917)	(0.0152)	(2.8171)	(0.0184)***	(1.663)	(0.0134)	(0.6674)	(0.0072)	(2.6275)	(0.0167)***	(1.4302)	(0.0083)**	(2.2058)	(0.0146)***	(1.0187)	(0.0076)*	15,548
	No elimination	Coef.	0.2063	-0.0820	0.0594	-0.0057	0.1469	-0.0763	0.0512	-0.0095	0.0083	0.0038	0.1283	-0.0630	0.0390	-0.0216	0.0893	-0.0414	0.0186	-0.0133	1,503,599
		d.e. - e.e.	(3.2692)	(0.0212)***	(1.7572)	(0.0132)	(2.7599)	(0.0169)***	(1.6302)	(0.0116)	(0.6566)	(0.0064)	(2.5795)	(0.0155)***	(1.4231)	(0.0074)***	(2.1531)	(0.0136)***	(0.984)	(0.0071)*	15,548
	Elimination(i)	Coef.	0.2122	-0.0839	0.0611	-0.0074	0.1510	-0.0765	0.0526	-0.0107	0.0086	0.0033	0.1315	-0.0608	0.0393	-0.0197	0.0921	-0.0411	0.0195	-0.0157	1,324,844
		d.e. - e.e.	(3.3148)	(0.0223)***	(1.7821)	(0.0141)	(2.7983)	(0.0175)***	(1.6527)	(0.0125)	(0.6675)	(0.0068)	(2.6115)	(0.0159)***	(1.4299)	(0.0077)**	(2.1869)	(0.014)***	(1.0078)	(0.0076)**	15,548
C Matched to Sisben Medellín MA♦♦♦	Elimination	Coef.	0.0074	-0.0030	0.0021	0.0005	0.0053	-0.0035	0.0018	0.0000	0.0003	0.0004	0.0046	-0.0031	0.0014	-0.0011	0.0032	-0.0019	0.0007	-0.0004	33,960,512
		d.e. - e.e.	(0.621)	(0.0011)***	(0.3333)	(0.0007)	(0.524)	(0.0009)***	(0.3099)	(0.0006)	(0.1226)	(0.0003)	(0.4879)	(0.0008)***	(0.2682)	(0.0004)***	(0.4075)	(0.0007)***	(0.1913)	(0.0003)	388,839
	No elimination	Coef.	0.0079	-0.0036	0.0023	0.0005	0.0056	-0.0041	0.0020	0.0000	0.0003	0.0005	0.0049	-0.0036	0.0015	-0.0013	0.0034	-0.0023	0.0007	-0.0005	34,186,951
		d.e. - e.e.	(0.6408)	(0.0012)***	(0.3437)	(0.0007)	(0.5408)	(0.0009)***	(0.3196)	(0.0006)	(0.1264)	(0.0003)	(0.5046)	(0.0009)***	(0.2811)	(0.0004)***	(0.4191)	(0.0007)***	(0.1946)	(0.0004)	388,839
	Elimination(i)	Coef.	0.0076	-0.0033	0.0022	0.0005	0.0054	-0.0038	0.0019	0.0000	0.0003	0.0005	0.0047	-0.0032	0.0014	-0.0011	0.0032	-0.0021	0.0007	-0.0006	34,028,662
		d.e. - e.e.	(0.6273)	(0.0011)***	(0.3371)	(0.0007)	(0.5291)	(0.0009)***	(0.3131)	(0.0006)	(0.1248)	(0.0003)	(0.4929)	(0.0008)***	(0.2727)	(0.0004)***	(0.4106)	(0.0007)***	(0.1923)	(0.0004)	388,839

Source: SIJIN, Metropolitan Police of Valle de Aburrá. All estimates use information from total of catches between 17 and 19 years for those captured between July 2002 and October 2012 and the sample is restricted to people with information available before 16 years of age; (i) Eliminating individuals Without a Sisben Follow up. ♦ Includes all persons who were captured at least once before 16 years. ♦♦ Includes all persons captured that matched with any database of the Sisben of Antioquia.. ♦♦♦ Includes all persons captured and not captured that matched with any database of Sisben Valle de Aburrá. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 9.

γ Estimate of Deterrence by Type of Crime. All Arrested Individuals

	Group	Type		Any Crime Mean Before 18 (1)	Any Crime Coef. (2)	Index Mean Before 18 (3)	Index Coef. (4)	Non-Index Mean Before 18 (5)	Non-Index Coef. (6)	Violent Crime Mean Before 18 (7)	Violent Crime Coef. (8)	Property Crime Mean Before 18 (9)	Property Crime Coef. (10)	Non-Index Drug Related Mean Before 18 (11)	Non-Index Drug Related Coef. (12)	NIDR: Consumption Mean Before 18 (13)	NIDR: Consumption Coef. (14)	NIDR: Traficking Mean Before 18 (15)	NIDR: Traficking Coef. (16)	Non-Index, Non Drug Related Mean Before 18 (17)	Non-Index, Non Drug Related Coef. (18)	Obs.
A	Group Criminals Before 17[♦]	Elimination	Coef.	0.0409	-0.0081	0.0121	-0.0007	0.0288	-0.0075	0.0102	0.0009	0.0020	-0.0015	0.0260	-0.0053	0.0089	0.0001	0.0171	-0.0053	0.0028	-0.0022	752,952
			d.e. - e.e.	(1.4582)	(0.006)	(0.7947)	(0.0033)	(1.2229)	(0.005)	(0.7266)	(0.003)	(0.3218)	(0.0014)	(1.1622)	(0.0048)	(0.6788)	(0.0027)	(0.9435)	(0.0039)	(0.3807)	(0.0015)	8,223
		No elimination	Coef.	0.0473	-0.0084	0.0150	-0.0018	0.0323	-0.0067	0.0122	0.0003	0.0028	-0.0021	0.0292	-0.0037	0.0103	0.0017	0.0189	-0.0054	0.0031	-0.0029	783,850
			d.e. - e.e.	(1.5678)	(0.007)	(0.884)	(0.0039)	(1.2952)	(0.0057)	(0.7976)	(0.0035)	(0.3812)	(0.0016)	(1.2318)	(0.0054)	(0.7321)	(0.0031)	(0.9908)	(0.0041)	(0.4004)	(0.0017)*	8,223
		Elimination[(i)]	Coef.	0.0445	-0.0090	0.0133	-0.0009	0.0311	-0.0081	0.0107	0.0007	0.0027	-0.0017	0.0280	-0.0047	0.0098	0.0008	0.0182	-0.0054	0.0031	-0.0034	764,301
			d.e. - e.e.	(1.52)	(0.0065)	(0.8331)	(0.0036)	(1.2716)	(0.0054)	(0.7458)	(0.0032)	(0.3712)	(0.0016)	(1.2058)	(0.0052)	(0.7144)	(0.003)	(0.9716)	(0.004)	(0.4041)	(0.0017)**	8,223
B	Criminals[♦♦]	Elimination	Coef.	0.1454	0.0275	0.0493	-0.0049	0.0960	0.0324	0.0383	0.0019	0.0111	-0.0069	0.0828	0.0291	0.0241	0.0071	0.0588	0.0219	0.0132	0.0034	3,426,043
			d.e. - e.e.	(2.7457)	(0.0083)***	(1.601)	(0.0045)	(2.2328)	(0.007)***	(1.4102)	(0.0041)	(0.7586)	(0.0018)***	(2.0738)	(0.0065)***	(1.1181)	(0.0035)**	(1.7473)	(0.0054)***	(0.8289)	(0.0027)	43,107
		No elimination	Coef.	0.1405	0.0128	0.0475	-0.0088	0.0929	0.0216	0.0367	-0.0022	0.0108	-0.0066	0.0804	0.0214	0.0237	0.0067	0.0567	0.0147	0.0125	0.0002	3,920,429
			d.e. - e.e.	(2.6989)	(0.0075)*	(1.5714)	(0.004)**	(2.1963)	(0.0063)***	(1.3819)	(0.0037)	(0.7485)	(0.0016)***	(2.0432)	(0.0059)***	(1.1104)	(0.0032)**	(1.7159)	(0.0049)***	(0.807)	(0.0023)	43,107
		Elimination[(i)]	Coef.	0.1426	0.0242	0.0484	-0.0049	0.0942	0.0291	0.0374	0.0017	0.0110	-0.0066	0.0813	0.0269	0.0237	0.0076	0.0576	0.0194	0.0129	0.0022	3,659,079
			d.e. - e.e.	(2.7195)	(0.008)***	(1.5863)	(0.0043)	(2.211)	(0.0067)***	(1.3938)	(0.0039)	(0.7579)	(0.0018)***	(2.0545)	(0.0062)***	(1.1094)	(0.0034)**	(1.73)	(0.0052)***	(0.8184)	(0.0025)	43,107
C	Matched to Sisben Medellín MA[♦♦♦]	Elimination	Coef.	0.0079	0.0023	0.0027	-0.0001	0.0052	0.0024	0.0021	0.0004	0.0006	-0.0004	0.0044	0.0022	0.0013	0.0007	0.0031	0.0015	0.0007	0.0001	62,062,089
			d.e. - e.e.	(0.641)	(0.0004)***	(0.376)	(0.0002)	(0.5191)	(0.0003)***	(0.329)	(0.0002)*	(0.182)	(0.0001)***	(0.4808)	(0.0003)***	(0.261)	(0.0002)***	(0.4038)	(0.0002)***	(0.1958)	(0.0001)	712,443
		No elimination	Coef.	0.0085	0.0024	0.0029	-0.0001	0.0056	0.0025	0.0022	0.0004	0.0007	-0.0005	0.0048	0.0024	0.0014	0.0008	0.0034	0.0016	0.0008	0.0001	62,507,397
			d.e. - e.e.	(0.6639)	(0.0004)***	(0.3889)	(0.0002)	(0.5382)	(0.0004)***	(0.3399)	(0.0002)*	(0.1888)	(0.0001)***	(0.4995)	(0.0003)***	(0.2731)	(0.0002)***	(0.4182)	(0.0003)***	(0.2004)	(0.0001)	712,443
		Elimination[(i)]	Coef.	0.0082	0.0021	0.0028	-0.0001	0.0054	0.0023	0.0022	0.0003	0.0007	-0.0005	0.0046	0.0022	0.0014	0.0007	0.0033	0.0015	0.0008	0.0001	62,276,873
			d.e. - e.e.	(0.6544)	(0.0004)***	(0.3842)	(0.0002)	(0.5298)	(0.0003)***	(0.3354)	(0.0002)*	(0.1874)	(0.0001)***	(0.491)	(0.0003)***	(0.2671)	(0.0002)***	(0.412)	(0.0003)***	(0.199)	(0.0001)	712,443

Source: SIJIN, Metropolitan Police of Valle de Aburrá. All estimates use information from total of catches between 17 and 19 years for those captured between July 2002 and October 2012; [(i)] Eliminating individuals Without a Sisben Follow up. [♦] Includes all persons who were captured at least once before 16 years. [♦♦] Includes all persons captured that matched with any database of the Sisben of Antioquia.. [♦♦♦] Includes all persons captured and not captured that matched with any database of Sisben Valle de Aburrá. [***] Significant at 1 percent, [**] Significant at 5 percent, [*] Significant at 10 percent.

Table 10.

γEstimate of Deterrence by Type of Crime.

Arrested Individuals with Information before 16 Years of Age

Group	Type		Any Crime Mean Before 18 (1)	Any Crime Coef. (2)	Index Mean Before 18 (3)	Index Coef. (4)	Non-Index Mean Before 18 (5)	Non-Index Coef. (6)	Violent Crime Mean Before 18 (7)	Violent Crime Coef. (8)	Property Crime Mean Before 18 (9)	Property Crime Coef. (10)	Non-Index Drug Related Mean Before 18 (11)	Non-Index Drug Related Coef. (12)	NIDR: Consumption Mean Before 18 (13)	NIDR: Consumption Coef. (14)	NIDR: Trafficking Mean Before 18 (15)	NIDR: Trafficking Coef. (16)	Non-Index, Non Drug Related Mean Before 18 (17)	Non-Index, Non Drug Related Coef. (18)	Obs.
A Group Criminals Before 17♦	Elimination	Coef.	0.0414	-0.0012	0.0122	-0.0002	0.0292	-0.0009	0.0106	0.0009	0.0016	-0.0011	0.0264	0.0015	0.0084	0.0013	0.0180	0.0002	0.0028	-0.0024	516,904
		d.e. - e.e.	(1.467)	(0.0073)	(0.7961)	(0.0039)	(1.2324)	(0.0062)	(0.7433)	(0.0035)	(0.2851)	(0.0019)	(1.1717)	(0.006)	(0.6624)	(0.003)	(0.9666)	(0.0052)	(0.3825)	(0.0015)*	5,850
	No elimination	Coef.	0.0466	-0.0006	0.0149	-0.0029	0.0317	0.0023	0.0125	0.0001	0.0024	-0.0030	0.0290	0.0042	0.0093	0.0041	0.0197	0.0000	0.0027	-0.0019	537,545
		d.e. - e.e.	(1.5562)	(0.0085)	(0.8795)	(0.0049)	(1.2842)	(0.0069)	(0.8046)	(0.0043)	(0.3554)	(0.0021)	(1.2277)	(0.0068)	(0.6939)	(0.0035)	(1.013)	(0.0056)	(0.377)	(0.0015)	5,850
	Elimination(i)	Coef.	0.0431	-0.0028	0.0129	-0.0020	0.0303	-0.0008	0.0107	0.0005	0.0022	-0.0025	0.0275	0.0016	0.0088	0.0023	0.0186	-0.0007	0.0028	-0.0024	521,681
		d.e. - e.e.	(1.497)	(0.0076)	(0.8182)	(0.0041)	(1.2539)	(0.0065)	(0.746)	(0.0035)	(0.3361)	(0.0021)	(1.1947)	(0.0064)	(0.6781)	(0.0032)	(0.9838)	(0.0053)	(0.3811)	(0.0015)*	5,850
B Criminals♦♦	Elimination	Coef.	0.2012	0.0454	0.0588	-0.0054	0.1424	0.0508	0.0495	0.0005	0.0093	-0.0059	0.1239	0.0481	0.0377	0.0142	0.0863	0.0339	0.0185	0.0027	1,251,214
		d.e. - e.e.	(3.2286)	(0.0122)***	(1.7482)	(0.0065)	(2.7175)	(0.0103)***	(1.6036)	(0.0059)	(0.6969)	(0.0028)**	(2.5357)	(0.0096)***	(1.3989)	(0.0054)***	(2.1165)	(0.008)***	(0.9794)	(0.0038)	15,548
	No elimination	Coef.	0.1884	0.0320	0.0550	-0.0081	0.1334	0.0402	0.0462	-0.0028	0.0087	-0.0053	0.1165	0.0406	0.0363	0.0149	0.0802	0.0257	0.0169	-0.0005	1,503,599
		d.e. - e.e.	(3.1239)	(0.0108)***	(1.6896)	(0.0057)	(2.6304)	(0.0092)***	(1.5495)	(0.0052)	(0.6743)	(0.0024)**	(2.4587)	(0.0086)***	(1.3734)	(0.0049)***	(2.0409)	(0.0069)***	(0.9367)	(0.0032)	15,548
	Elimination(i)	Coef.	0.1961	0.0414	0.0574	-0.0056	0.1387	0.0470	0.0482	0.0002	0.0092	-0.0059	0.1209	0.0450	0.0372	0.0130	0.0837	0.0321	0.0178	0.0020	1,324,844
		d.e. - e.e.	(3.1872)	(0.0116)***	(1.7267)	(0.0062)	(2.6819)	(0.0099)***	(1.5819)	(0.0056)	(0.6929)	(0.0026)**	(2.5043)	(0.0092)***	(1.3906)	(0.0052)**	(2.0842)	(0.0075)***	(0.9621)	(0.0036)	15,548
C Matched to Sisben Medellín MA♦♦♦	Elimination	Coef.	0.0072	0.0035	0.0021	0.0001	0.0051	0.0034	0.0018	0.0004	0.0003	-0.0003	0.0044	0.0033	0.0014	0.0010	0.0030	0.0023	0.0007	0.0001	33,960,512
		d.e. - e.e.	(0.611)	(0.0005)***	(0.3312)	(0.0003)	(0.5135)	(0.0004)***	(0.3035)	(0.0002)*	(0.1326)	(0.0001)**	(0.4778)	(0.0004)***	(0.2663)	(0.0002)***	(0.3967)	(0.0003)***	(0.1881)	(0.0001)	388,839
	No elimination	Coef.	0.0077	0.0039	0.0022	0.0001	0.0054	0.0037	0.0019	0.0005	0.0004	-0.0003	0.0047	0.0036	0.0015	0.0012	0.0032	0.0024	0.0007	0.0001	34,186,951
		d.e. - e.e.	(0.6308)	(0.0005)***	(0.3413)	(0.0003)	(0.5306)	(0.0005)***	(0.3129)	(0.0002)*	(0.1363)	(0.0001)***	(0.4947)	(0.0004)***	(0.2787)	(0.0002)***	(0.4088)	(0.0003)***	(0.1918)	(0.0002)	388,839
	Elimination(i)	Coef.	0.0073	0.0035	0.0022	0.0001	0.0052	0.0034	0.0018	0.0004	0.0004	-0.0003	0.0045	0.0033	0.0014	0.0010	0.0031	0.0023	0.0007	0.0001	34,028,662
		d.e. - e.e.	(0.6179)	(0.0005)***	(0.3352)	(0.0003)	(0.5191)	(0.0004)***	(0.3068)	(0.0002)*	(0.1351)	(0.0001)***	(0.4834)	(0.0004)***	(0.2712)	(0.0002)***	(0.4002)	(0.0003)***	(0.1892)	(0.0002)	388,839

Source: SIJIN, Metropolitan Police of Valle de Aburrá. All estimates use information from total of catches between 17 and 19 years for those captured between July 2002 and October 2012 and the sample is restricted to people with information available before 16 years of age; (i) Elim individuals Without a Sisben Follow up. ♦ Includes all persons who were captured at least once before 16 years. ♦♦ Includes all persons captured that matched with any database of the Sisben of Antioquia.. ♦♦♦ Includes all persons captured and not captured that matched with any database of Sisben Valle de Aburrá. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 11.
DISCONTINUITY ESTIMATES OF DETERRENCE AT 17 AND 19 YEARS OF AGE
ANNUAL PROBABILITY TO COMMIT ANY TYPE OF CRIME

Grupo Control	Tipo de Estimación		Cutoff at 17 Years[i]					Cutoff at 19 Years[ii]				
			All		With Information Before 15			All		With Information Before 17		
			Mean Before 18	Coef.	Mean Before 18	Coef.	Obs.	Mean Before 18	Coef.	Mean Before 18	Coef.	Obs.
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A — Group Criminals Before 16 (18)♦	Elimination	Coef.	0.0529	-0.0072	0.0545	0.0038	430,555	0.0219	0.0003	0.0149	0.0009	1,111,186
		d.e. - e.e.	(1.6577)	(0.0107)	(1.6821)	(0.0133)		(1.0661)	(0.0046)	(0.8794)	(0.0046)	
	No elimination	Coef.	0.0604	-0.0073	0.0626	0.0056	452,114	0.0235	0.0008	0.0163	0.0001	1,134,449
		d.e. - e.e.	(1.7713)	(0.0118)	(1.8028)	(0.0154)		(1.1055)	(0.0052)	(0.9213)	(0.0052)	
	Elimination[i]	Coef.	0.0562	-0.0070	0.0572	0.0064	439,835	0.0228	-0.0001	0.0152	0.0008	1,123,114
		d.e. - e.e.	(1.7088)	(0.0108)	(1.7242)	(0.0136)		(1.0882)	(0.0048)	(0.8893)	(0.0046)	
B — Criminals♦♦	Elimination	Coef.	0.1381	0.0016	0.2115	0.0165	3,113,435	0.1474	0.0192	0.1591	0.0345	3,706,455
		d.e. - e.e.	(2.6759)	(0.0084)	(3.3092)	(0.018)		(2.7642)	(0.0079)**	(2.8717)	(0.0128)***	
	No elimination	Coef.	0.1371	0.0041	0.2035	0.0189	3,535,099	0.1462	0.0140	0.1572	0.0262	4,232,321
		d.e. - e.e.	(2.6663)	(0.0078)	(3.2464)	(0.0158)		(2.7535)	(0.0074)*	(2.8549)	(0.0118)**	
	Elimination[i]	Coef.	0.1382	0.0012	0.2108	0.0139	3,305,232	0.1466	0.0151	0.1582	0.0294	3,992,673
		d.e. - e.e.	(2.6772)	(0.0081)	(3.304)	(0.0173)		(2.7572)	(0.0075)**	(2.8641)	(0.0123)**	
C — Matched to Sisben Medellín MA♦♦♦	Elimination	Coef.	0.0061	0.0000	0.0059	0.0004	62,454,501	0.0082	0.0012	0.0064	0.0015	61,551,070
		d.e. - e.e.	(0.5648)	(0.0004)	(0.5557)	(0.0005)		(0.6534)	(0.0005)***	(0.5766)	(0.0005)***	
	No elimination	Coef.	0.0065	0.0001	0.0063	0.0005	62,830,238	0.0087	0.0010	0.0068	0.0013	62,028,517
		d.e. - e.e.	(0.5807)	(0.0004)	(0.5728)	(0.0005)		(0.6726)	(0.0005)**	(0.5945)	(0.0006)**	
	Elimination[i]	Coef.	0.0063	0.0000	0.0061	0.0003	62,628,468	0.0085	0.0010	0.0065	0.0013	61,818,033
		d.e. - e.e.	(0.5732)	(0.0004)	(0.5639)	(0.0005)		(0.6635)	(0.0005)**	(0.5816)	(0.0005)**	

Source: SIJIN, Metropolitan Police of Valle de Aburrá. All estimates use information from those captured between July 2002 and October 2012; [i] Uses information from the total of catches between 16 and 18 years, ; [ii] Uses information from the total of catches between 18 and 20 years; ♦ Includes all persons who were captured at least once before 16 years for [i] and before 18 for [ii] . ♦♦ Includes all persons captured that matched with any database of the Sisben of Antioquia. ♦♦♦ Includes all persons captured and not captured that matched with any database of Sisben Valle de Aburrá. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 12.
λ DISCONTINUITY ESTIMATE OF INCAPACITATION BY TYPE OF CRIME

Tipo de Crimen		Mean Before 18		No Controls		With Controls	
		All	With Information Before 16	All	With Information Before 16	All	With Information Before 16
		(s.d.)	(s.d.)	(s.e.)	(s.e.)	(s.e.)	(s.e.)
		(1)	(2)	(3)	(4)	(5)	(6)
Any Crime	Coefficient	517.6	291.0	42.3	-54.7	40.9	-6.5
	s.d. - s.e.	(675.7)	(434.1)	(106.3)	(127.8)	(106.1)	(125.2)
	Observat.	645	271	1,964	626	1,964	626
Index Crime	Coefficient	603.6	351.5	296.9	-100.6	286.6	-171.3
	s.d. - s.e.	(723.1)	(448.4)	(179.4)*	(236.8)	(179)*	(249.3)
	Observat.	217	78	647	152	647	152
Non-Index Crime	Coefficient	474.0	266.6	-67.4	-23.8	-67.6	36.9
	s.d. - s.e.	(646.8)	(427)	(133)	(151.1)	(133)	(147.7)
	Observat.	428	193	1,317	474	1,317	474
Violent Crime	Coefficient	608.9	339.2	224.3	-100.1	211.4	-136.5
	s.d. - s.e.	(749.6)	(430.1)	(231.6)	(248.7)	(231.9)	(265.3)
	Observat.	172	66	488	131	488	131
Property Crime	Coefficient	583.3	419.2	474.7	-848.4	469.7	-721.7
	s.d. - s.e.	(618.3)	(555.5)	(271.2)*	(1094)	(272.3)*	(1588.7)
	Observat.	45	12	159	21	159	21
Non-Index Drug Related	Coefficient	459.4	265.3	-104.8	-7.4	-105.5	39.9
	s.d. - s.e.	(631)	(432.3)	(138.5)	(163.1)	(138.5)	(157.4)
	Observat.	393	179	1,154	427	1,154	427
NIDR: Consumption	Coefficient	443.6	347.6	-237.6	-26.2	-237.0	126.4
	s.d. - s.e.	(628.3)	(565.9)	(225.3)	(208.3)	(226.5)	(214.3)
	Observat.	119	62	351	163	351	163
NIDR: Traficking	Coefficient	466.3	221.7	-45.8	13.8	-48.3	64.2
	s.d. - s.e.	(633.2)	(336)	(173)	(237.9)	(172.9)	(230.3)
	Observat.	274	117	803	264	803	264
Non-Index, Non Drug Related	Coefficient	637.2	283.5	11.8	-175.9	10.0	8.2
	s.d. - s.e.	(796.2)	(364.2)	(443.6)	(341.6)	(446)	(421.7)
	Observat.	35	14	163	47	163	47

Table 13.
ESTIMATES OF THE EFFECT ON OUTCOME VARIABLES OF HAVING BEEN ARRESTED BEFORE THE SISBEN 3 SURVEY

Sample	Mean (i)	No Controls Coefficient (ii)	Coefficient with Controls (iii)	Mean (iv)	No Controls Coefficient (v)	Coefficient with Controls (vi)	Mean (vii)	No Controls Coefficient (viii)	Coefficient with Controls (ix)	Obs
A. Total Group										
	Match Probability			**School Attendance**			**Labor Participation**			
(i) People between (17,19) years at any time between 2002 and the Sisben 3 survey	0.658	-0.145	-0.142	0.162	-0.103	-0.062	0.291	-0.015	-0.079	254,096
	(0.474)	(0.005)***	(0.005)***	(0.369)	(0.002)***	(0.002)***	(0.454)	(0.004)***	(0.005)***	
(ii) Criminals in (i)	0.554	-0.134	-0.131	0.061	-0.023	-0.017	0.306	-0.073	-0.070	15,250
	(0.497)	(0.009)***	(0.009)***	(0.239)	(0.005)***	(0.005)***	(0.461)	(0.008)***	(0.008)***	
(iii) People in (i), considering only the crimes committed between (17,19) years	0.658	-0.193	-0.186	0.162	-0.107	-0.066	0.291	-0.033	-0.094	254,096
	(0.474)	(0.008)***	(0.008)***	(0.369)	(0.004)***	(0.004)***	(0.454)	(0.007)***	(0.007)***	
(iv) Criminals in (iii)	0.554	-0.117	-0.115	0.061	-0.012	-0.010	0.306	-0.054	-0.054	15,250
	(0.497)	(0.009)***	(0.009)***	(0.239)	(0.004)***	(0.004)**	(0.461)	(0.008)***	(0.008)***	
(v) People between (19,20) at the time of the Sisben 3 survey, considering only the crimes committed between (17,19) years	0.670	-0.285	-0.262	0.219	-0.167	-0.110	0.227	-0.046	-0.098	95,417
	(0.47)	(0.013)***	(0.013)***	(0.413)	(0.006)***	(0.007)***	(0.419)	(0.01)***	(0.01)***	
(vi) Criminals in (v)	0.510	-0.168	-0.164	0.078	-0.032	-0.028	0.234	-0.075	-0.076	4,770
	(0.5)	(0.016)***	(0.016)***	(0.268)	(0.008)***	(0.008)***	(0.423)	(0.013)***	(0.013)***	
(vii) People between (17,19) at the time of the Sisben 3 survey	0.692	-0.234	-0.225	0.401	-0.221	-0.167	0.078	0.009	-0.021	93,496
	(0.462)	(0.011)***	(0.011)***	(0.49)	(0.008)***	(0.009)***	(0.268)	(0.007)	(0.007)***	
(viii) Criminals in (vii)	0.522	-0.136	-0.130	0.217	-0.092	-0.067	0.101	-0.022	-0.025	3,584
	(0.5)	(0.017)***	(0.017)***	(0.412)	(0.014)***	(0.014)***	(0.302)	(0.01)**	(0.011)**	
B. Matched With Sisben 3										
	Years of Education			**School Attendance**			**Labor Participation**			
(i) People between (17,19) years at any time between 2002 and the Sisben 3 survey	9.754	-1.855	-0.650	0.246	-0.125	-0.068	0.442	0.089	-0.010	167,228
	(3.036)	(0.043)***	(0.033)***	(0.431)	(0.004)***	(0.004)***	(0.497)	(0.007)***	(0.007)	
(ii) Criminals in (i)	8.091	-0.376	-0.044	0.110	-0.010	-0.002	0.552	-0.007	-0.005	8,447
	(3.143)	(0.072)***	(0.053)	(0.313)	(0.007)	(0.007)	(0.497)	(0.011)	(0.011)	
(iii) People in (i), considering only the crimes committed between (17,19) years	9.754	-1.784	-0.643	0.246	-0.119	-0.062	0.442	0.103	0.004	167,228
	(3.036)	(0.074)***	(0.055)***	(0.431)	(0.007)***	(0.008)***	(0.497)	(0.011)***	(0.011)	
(iv) Criminals in (iii)	8.091	-0.128	-0.037	0.110	0.006	0.008	0.552	0.014	0.012	8,447
	(3.143)	(0.083)	(0.061)	(0.313)	(0.008)	(0.008)	(0.497)	(0.013)	(0.013)	
(v) People between (19,20) at the time of the Sisben 3 survey, considering only the crimes committed between (17,19) years	9.777	-1.840	-0.733	0.326	-0.187	-0.114	0.338	0.124	0.031	63,921
	(2.825)	(0.133)***	(0.106)***	(0.469)	(0.015)***	(0.016)***	(0.473)	(0.021)***	(0.022)	
(vi) Criminals in (v)	8.162	-0.273	-0.089	0.152	-0.014	-0.007	0.459	0.003	-0.004	2,432
	(3.063)	(0.151)*	(0.118)	(0.359)	(0.017)	(0.017)	(0.498)	(0.024)	(0.024)	
(vii) People between (17,19) at the time of the Sisben 3 survey	9.265	-1.840	-0.853	0.580	-0.202	-0.134	0.112	0.091	0.046	64,700
	(2.498)	(0.094)***	(0.077)***	(0.494)	(0.016)***	(0.015)***	(0.316)	(0.013)***	(0.013)***	
(viii) Criminals in (vii)	7.939	-0.944	-0.431	0.416	-0.081	-0.040	0.194	0.023	0.019	1,872
	(2.754)	(0.125)***	(0.107)***	(0.493)	(0.022)***	(0.022)*	(0.395)	(0.018)	(0.019)	

Source: SIJIN, Metropolitan Police of Valle de Aburrá; Sisben 2 y 3. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 14.

ESTIMATES OF THE EFFECT ON OUTCOME VARIABLES OF THE CHANGE IN LEGISLATION AT 18

Sample	Mean (i)	No Controls Coefficient (ii)	Coefficient with Controls (iii)	Mean (iv)	No Controls Coefficient (v)	Coefficient with Controls (vi)	Mean (vii)	No Controls Coefficient (viii)	Coefficient with Controls (ix)	Mean (x)	No Controls Coefficient (xi)	Coefficient with Controls (xii)	Obs
A. Total Group													
	Match Probability			**Years of Education**			**School Attendance**			**Labor Participation**			
(i) 17-19 at the time of the survey - crime before date of survey	0.462 (0.499)	0.03 (0.069)	0.029 (0.069)	7.659 (2.634)	0.002 (0.39)	-0.168 (0.348)	0.172 (0.378)	0.028 (0.048)	0.013 (0.047)	0.096 (0.294)	-0.007 (0.042)	-0.007 (0.043)	2,041
(ii) 17-19 at the time of the survey - crime before date of survey (Recidivists)	0.462 (0.499)	-0.092 (0.162)	-0.118 (0.166)	7.363 (2.646)	-0.424 (1.017)	-0.971 (0.884)	0.15 (0.358)	-0.006 (0.093)	-0.026 (0.099)	0.088 (0.283)	-0.004 (0.111)	-0.014 (0.11)	353
(iii) 17-19 at the time of the crime - (19,20) at the time of the survey	0.389 (0.488)	0.068 (0.069)	0.074 (0.069)	7.948 (3.078)	0.168 (0.793)	0.058 (0.627)	0.056 (0.231)	0.051 (0.032)	0.053 (0.033)*	0.178 (0.382)	-0.055 (0.05)	-0.05 (0.05)	1,384
(iv) 17-19 at the time of the crime - (19,20) at the time of the survey (Recidivists)	0.444 (0.498)	-0.082 (0.158)	-0.103 (0.159)	8.256 (2.768)	-1.607 (0.818)**	-1.492 (0.791)*	0.064 (0.246)	-0.076 (0.058)	-0.024 (0.066)	0.209 (0.407)	-0.14 (0.132)	-0.162 (0.131)	311
B. Matched With Sisben 3													
				Years of Education			**School Attendance**			**Labor Participation**			
(i) 17-19 at the time of the survey - crime before date of survey				7.475 (2.885)	0.665 (0.595)	-0.292 (0.464)	0.373 (0.484)	0.050 (0.093)	-0.011 (0.09)	0.207 (0.405)	-0.038 (0.084)	-0.028 (0.085)	943
(ii) 17-19 at the time of the survey - crime before date of survey (Recidivists)				7.948 (3.078)	0.168 (0.793)	0.058 (0.627)	0.145 (0.352)	0.122 (0.089)	0.126 (0.09)	0.456 (0.499)	-0.252 (0.12)**	-0.247 (0.119)**	539
(iii) 17-19 at the time of the crime - (19,20) at the time of the survey				6.988 (2.731)	0.051 (1.534)	-0.869 (1.206)	0.325 (0.47)	0.042 (0.18)	-0.023 (0.197)	0.19 (0.394)	0.019 (0.202)	0.055 (0.207)	163
(iv) 17-19 at the time of the crime - (19,20) at the time of the survey (Recidivists)				7.906 (2.91)	-2.264 (1.318)*	-1.296 (1.282)	0.145 (0.353)	-0.143 (0.129)	0.037 (0.152)	0.471 (0.501)	-0.226 (0.248)	-0.214 (0.263)	138

Source: SIJIN, Metropolitan Police of Valle de Aburrá; Sisben 2 y 3. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent.

Table 15.

EFFECT ON OUTCOME VARIABLES OF THE NUMBER OF DAYS TO RECIDIVATE

| Variable		Total Group		Group With Controls			Total Group		Group With Controls		
		Mean	Coefficient No Controls	Mean	Coefficient No Controls	Coefficient with Controls	Mean	Coefficient No Controls	Mean	Coefficient No Controls	Coefficient with Controls
Years of Education	*Coefficient*	7.420	0.000	7.460	0.039	-0.028	7.420	-0.005	7.460	0.025	-0.018
	s.d. - s.e.	(3.06)	(0.0138)	(3.025)	(0.0248)	(0.022)	(3.06)	(0.0135)	(3.025)	(0.0259)	(0.0222)
School Attendance	*Coefficient*	0.156	0.000	0.256	0.002	-0.002	0.156	0.000	0.256	0.001	-0.001
	s.d. - s.e.	(0.363)	(0.0014)	(0.437)	(0.0027)	(0.0028)	(0.363)	(0.0014)	(0.437)	(0.0028)	(0.0029)
Labor Participation	*Coefficient*	0.464	-0.004	0.337	-0.003	0.004	0.464	-0.003	0.337	-0.002	0.002
	s.d. - s.e.	(0.499)	(0.0021)*	(0.473)	(0.0035)	(0.0035)	(0.499)	(0.0021)*	(0.473)	(0.0035)	(0.0036)
Fixed Effects of the month of the survey		No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Observations		1,228		401			1,228		401		

Source: SIJIN, Metropolitan Police of Valle de Aburrá; Sisben 2 y 3. *** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent. Controls: Gender, Educational level, Stratum, School Attendance, Income, of the Head of Household Kids in the household, Over 60 years in the household, Minors in the household, Percentage of people with Elementary School completed in the household, gender of the head, Labor Participation.
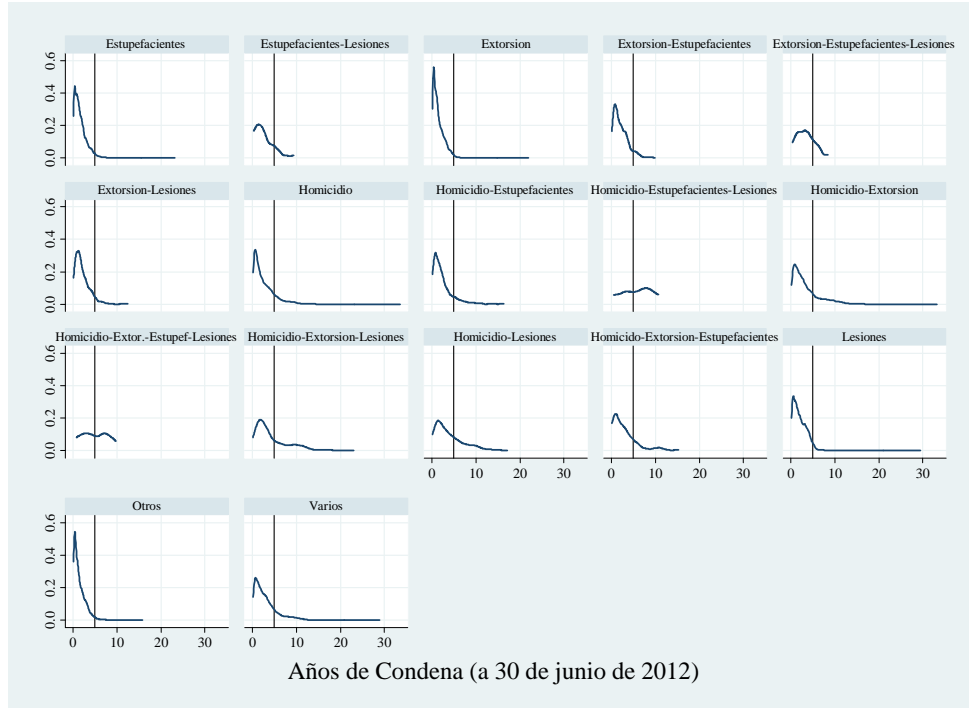
Figure A1.

DISTRIBUTION OF YEARS IN PRISON

(i) Inmates Condemned by a single crime
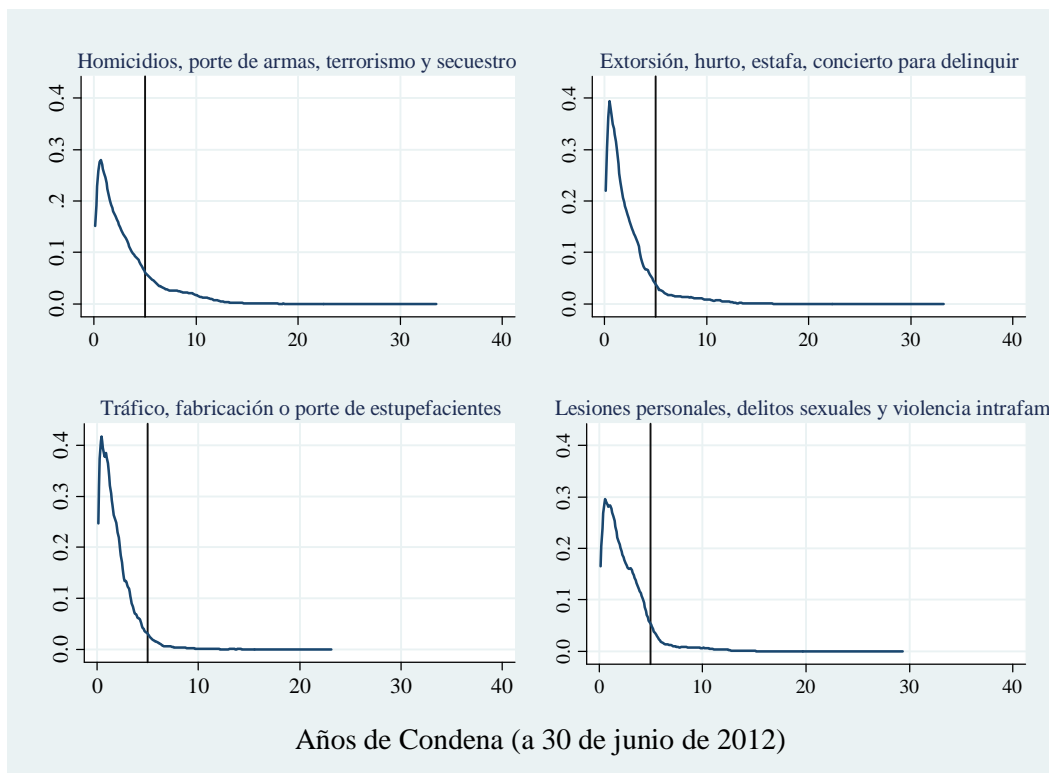

Años de Condena (a 30 de junio de 2012)
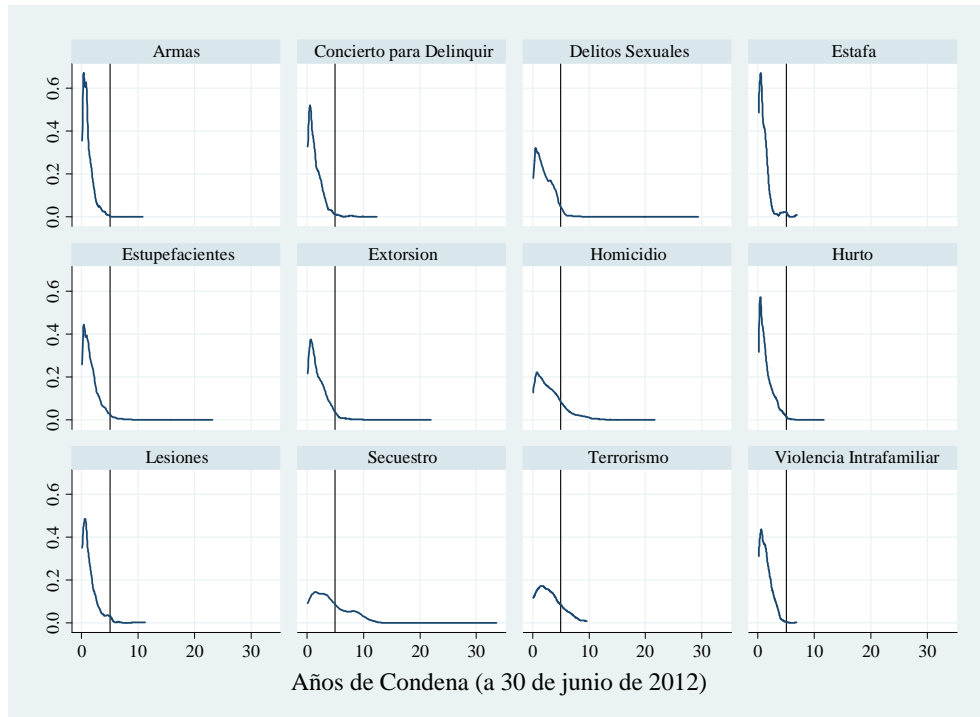
Fuente: Instituto Nacional Penitenciario y Carcelario, INPEC.

(ii) Inmates Condemned by One or More Crimes

Fuente: Instituto Nacional Penitenciario y Carcelario, INPEC.

(iii) Inmates Condemned by Groups of Crimes

Fuente: Instituto Nacional Penitenciario y Carcelario, INPEC.

Appendix 1.
Changes in Criminal Legislation at 18

Minors	Adults
Penalties	
Juvenile Justice Code establishes the sanctions that can be imposed on a minor (between 14 and 18 years) who commits a criminal activity, which have a protective, educational and restorative purpose. Penalties: reprimand, imposition of behavior rules (obligations or prohibitions), providing community service, probation, placement in semi-closed (joining a specialized program during non-school hours) and imprisonment.	Major penalties imposed on adult offenders are imprisonment, paying fines and deprivation of other rigths.
Privación de libertad: en un centro de atención especializado, menores separados de los adultos, aplicado a adolescentes mayores de 16 y menores de 18 años culpables por delitos cuya pena mínima en el Código Penal sea igual o superior a los 6 años de prisión, en este caso, la privación de la libertad tendrá una duración de mínimo 1 año y máximo 5.	Confinement can be in jails, prisons, prisons for women, prisons for members of the security forces, prisons house, rehabilitation establishments and other detention centers to be created in the prison system.
Children between 14 and 18 years guilty of murder, kidnapping, extortion and aggravated crimes against freedom, integrity and sexual training will be deprived of freedom in specialized centers for a period of 2-8 years. During the imprisonment the adolescent has the right to be admitted to a place near the residence of his parents and maintain communication with them, that the place has adequate sanitary conditions for the training of the young and to continue their education.	
Children Under 14 If a child under 14 commits an offense, they are applied actions for the restoration of his rights and is linked to different education and protection processes within the *family welfare* system.	
Prostitution	
According to Art. 20 of the Juvenile Justice Code, minors will be protected against rape, incitement, encouragement or constraint to prostitution, sexual exploitation, pornography or any other conduct that threatens their freedom, integrity and sexual training.	T-620/1995 Ruling of the Constitutional Court: It is an immoral but not illegal activity.
Drugs	
Article 20 of the Juvenile Justice Code states that children and adolescents will be protected against the use of tobacco, psychoactive drugs or alcohol. Youths under 18 arrested, are not sent to prison but to medical treatment.	According to the Constitutional Court ruling C-221 of 1994, personal dose was allowed until December 21st of 2009, then forbiden.
Marriage	
According to Art. 117 of the Civil Code, minors can not marry without parental permission. It is grounds for annulment of marriage where one or both spouses are under age 14.	Art. 116 of the Civil Code:Adults are free to marry.
Weapons Carrying	
Permits to possess and carry weapons require citizenship card (Law 1119/2006).	
Entrance to establishments whose purpose is the sale of liquor	
The Article 89 of the Juvenal Justice Code, which specifies the National Police and Juvenal Police functions to guarantee the rights of children and adolescents, in paragraph 4 states the obligation of these institutions to control and prevent the entry of children and adolescents to establishments whose purpose is the sale of liquor and cigarettes and enforce the ban on the sale of these products to minors, and for this purpose the section 18 allows the temporary closure of establishments that breach the numeral 4.	
Law 124 of 1994 prohibits the sale of liquor to minors.	

Table A1.

DISTRIBUTION OF ALL ARRESTED INDIVIDUALS BETWEEN 17 AND 19 YEARS,

WITH AND WITHOUT INFORMATION BEFORE 16 YEARS OF AGE

Age at July 2002	Total Population (in Table 4)		With Information Before 16 (in Table 5)		Without Information Before 16 (In Table 4 but not in Table 5)		Year in which Became 18
	N	%	N	%	N	%	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
6	203	0.5	201	1.3	2	0.0	2014
7	1,133	2.6	1,129	7.3	4	0.0	2013
8	1,690	3.9	1,484	9.5	206	0.7	2012
9	2,154	5.0	1,575	10.1	579	2.1	2011
10	2,874	6.7	2,124	13.7	750	2.7	2010
11	3,658	8.5	2,469	15.9	1,189	4.3	2009
12	4,100	9.5	2,494	16.0	1,606	5.8	2008
13	4,320	10.0	1,486	9.6	2,834	10.3	2007
14	4,516	10.5	1,086	7.0	3,430	12.4	2006
15	4,596	10.7	772	5.0	3,824	13.9	2005
16	4,711	10.9	434	2.8	4,277	15.5	2004
17	4,674	10.8	171	1.1	4,503	16.3	2003
18	4,478	10.4	123	0.8	4,355	15.8	2002
Total	**43,107**	**100**	**15,548**	**100**	**27,559**	**100**	