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Giulia Lotti

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Tough on Young Offenders: Harmful or Helpful?

By GIULIA LOTTI *

How harshly should society punish young lawbreakers? Through a fuzzy regression discontinuity design, I compare harsh and rehabilitative criminal incarceration practices. Young offenders sent to the more rehabilitative youth facilities become less likely to reoffend compared to offenders experiencing prison. On the contrary, offenders at the margin of being exposed to the harsher youth facilities are 27 percent more likely to recidivate in the nine years subsequent to their custody, and they are more likely to commit violent offences, thefts, burglaries and robberies. Keeping young offenders separate from their older peers in prison seems effective, but only in institutions not solely focused on punishment.

(*JEL* K42, Z13)

How tough societies should be on young criminal offenders has always been at the centre of a heated debate in history. Currently the answer is still unknown, and the evidence mixed.

On the one hand, tough policies and harsh sentences may have a *general deterrence effect* by discouraging people from embarking on criminal activity. Severe punishment could also have a *specific deterrence effect* by discouraging people who have already undertaken criminal activity from committing new crimes in the future (Galbiati et al., 2014).[1]

* Lotti: Inter-American Development Bank and CAGE Warwick, 1300 New York Avenue, Washington, DC 20577 (e-mail: glotti@iadb.org). I thank particularly Fabian Waldinger and Sascha O. Becker for their constant guidance in this project. I thank Clément de Chaisemartin, Mirko Draca, Victor Lavy, Rocco Macchiavello, Roland Rathelot, Marian Vidal-Fernandez, Chris Woodruff and seminar participants at the Warwick CAGE work in progress seminars, the Warwick PhD Conference, the Scottish Economic Society Conference and the Spring Meeting of Young Economists for useful comments. I am also indebted to Stephen Machin and Robin Naylor for their helpful suggestions. I gratefully acknowledge the financial support of the Royal Economic Society (RES) and I thank the Research, Development and Statistics Directorate of the UK Home Office for providing the data.

[1] The idea that punishment could have a deterrence effect is not recent, but goes back at least to the 18th century, with Beccaria (1764) and Jeremy Bentham (1789). In the 20th century Nobel laureate Gary Becker was the first economist to incorporate deterrence theory into a model of criminal behaviour. In *Crime and Punishment: An Economic Approach* (1968) he described individuals as rational actors choosing whether to commit crime through a comparison of benefits and costs; if the expected costs exceed the expected benefits, the offence will not be pursued. Measures that increase the expected costs, such as harsh punishment, will deter potential criminals from offending.

On the other hand, severe punishment may have instead a negative effect on offenders who are incarcerated, weakening their already fragile links with society, nourishing negative networks, and, as a result, increasing the likelihood of future criminal activity. Furthermore, keeping offenders in custody is expensive for society. In England and Wales for example, "the average annual overall cost of a prison place is now £36,259", but "46% of adults are reconvicted within one year of release" (Bromley Briefings, 2016). Hence, looking for ways in which taxpayers' resources can be spent effectively is important.

Quality evaluations are few. The main reason for this research gap is the difficulty in identifying a causal link between custody conditions and crime rates. In most cases, self-selection impedes establishing connections that are anything more meaningful than correlations: the most dangerous criminals are both more likely to be sentenced to harsher custody conditions and to reoffend in the future precisely because they are intrinsically more prone to criminal activity. Therefore, whether higher reoffending rates are driven by harsher custody conditions or by the offenders' higher propensity to recidivate cannot be distinguished.

The difficulty of identification is exacerbated by the challenges in gaining access to data on offenders at the micro level that are necessary to isolate a specific deterrence effect, and to determine the causal link between the harsh conditions of a custodial system and the offenders' propensity to be reconvicted. Moreover, the time span over which offenders are observed is usually short.

The findings from the literature are inconclusive. While some papers find evidence of deterrent effects (Katz, Levitt and Shustorovich, 2003; Hjalmarsson, 2009; Lee and McCrary, 2009), another stream of researchers finds the opposite, with some cases concluding that harsh treatment either has no effect (Chen and Shapiro, 2007) or increases the likelihood of recidivism (Drago and Galbiati, 2011; Aizer and Doyle, 2015), and some finding deterrent effects stemming from the more rehabilitative facilities (Mastrobuoni and Terlizzese, 2014). The evidence is mixed mainly due to the difference in punitive treatments, targeted populations and time windows in which offenders are observed: it is hard to draw conclusions from few and diverse studies. Moreover, while the literature has focused on either juveniles or adults, there is no study I am aware of that looks at how 20/21 years old respond to harsh detention conditions.

In this paper I investigate the outcomes of two quasi-natural experiments in incarceration practices that occurred in the 1980's in England and Wales. At the beginning of the decade, offenders younger than 21 who were given a custodial sentence were sent to youth custody and detention centres. At the time, youth custody centres and detention centres in Britain were managed as more punitive facilities than previously had been the case, and, thus, young offenders held there experienced a tougher regime than had been usual. Towards the end of

the decade, these tough regimes were abolished and turned into young offender institutions more oriented towards rehabilitation. This change allows me to evaluate the outcomes for young offenders under distinct scenarios, in which offenders experience incarceration in settings that are more punitive or more rehabilitative in nature.

To undertake the analysis, I first consider a sample of young offenders who appeared in court when 20/21 years old and were given a custodial sentence at the beginning of the decade, when these tough regimes were in place. The first sample includes all the offenders in England and Wales who were born in three randomly sampled weeks in 1963. In total they are 558 young offenders. I observe their criminal records until they are 30 years old. Through a fuzzy regression discontinuity design, I exploit the fact that young offenders who appeared in court when below 21 years old were sent to youth custody centres and detention centres, while young offenders who were 21 or older were sent to prison. Everything else being equal, the only reason why offenders were sent to one of the two different types of custody was the age at court appearance. To capture the effects of the different custodial treatments I exploit the plausibly exogenous variation in the age at which offenders appeared in court which, in turn, determined the type of custody the offender was sentenced to. I compare the future offences of these two groups and find that young offenders who were at the margin of being exposed to the harsher youth facilities are 27 percent more likely to recidivate in the nine years subsequent to their custody, they commit on average 3.7 offences more than offenders who experienced prison, and they are also brought to court on average 1.8 times more. The crimes committed by young offenders who were exposed to a harsher regime also appear to be more serious, as suggested by the fact that in the future they are sentenced more often to prison (even though the effect is not significantly different from zero). Moreover, their felonies are not minor, but major crimes, such as violent offences, thefts, burglaries and robberies.

Second, I analyse a cohort of young offenders who appeared in court when 20/21 at the end of the decade. This sample is formed by all the offenders born in four randomly sampled weeks in 1968. In this second group there are 297 young offenders. However, I can observe their future offences only for 2.5 years after their release from custody. Through a second fuzzy regression discontinuity design, I exploit the fact that young offenders who appeared in court when younger than 21 were sent to the new young offender institutions, while young offenders who were 21 or older were sent to adults' prisons. Once again, the choice of sentencing offenders to one of the two types of custody depended only on their age at court appearance. Thanks to the plausibly exogenous random variation in the age at court appearance I also compare the future outcomes of these two groups. I find that offenders who were sent to the more rehabilitative youth facilities are less likely to reoffend in the future when compared to offenders sent to prison, they commit fewer offences, and they are less

likely to be brought to court over a 2.5-year time period, even though all of these effects are not significantly different from zero. Moreover, offenders experiencing the rehabilitative regime are sentenced to custody again 1.5 times less than offenders experiencing prison (significant at 5%), and they are significantly less likely to commit burglaries and robberies.

While prisons do not change much across the decade, the regimes in the youth custody facilities do. This setup allows me to compare the effects of experiencing a milder/harsher custody on recidivism. I conclude that keeping young offenders separate from their older peers in prison is beneficial only if they are not kept in a solely punitive regime.

Our strategy relies on the exogenous variation in the offenders' age at court appearance, which guarantees for the continuity of the conditional expectation of counterfactual outcomes. The ability of agents (offenders, judges, police force) to partially or completely manipulate the age at court appearance would invalidate the identification strategy. If this was the case, I would observe a discontinuity in the density function of the age at court appearance around the threshold. I perform a McCrary test and show that there is no evidence of a discontinuity in the running variable (age at court appearance) around the cut-off in neither of the two cohorts.

Our results are robust to a series of other checks: different estimation techniques (parametric and non-parametric); adding control variables in the estimation; adopting different bandwidths, samples and time windows; testing for discontinuities around the cut-off in pre-treatment variables; testing for discontinuities at points different from the cut-off in the running variable.

The remainder of the paper is organized as follows: in Section I, the background of the quasi-natural experiment and the design are outlined. I describe the data in Section II. In Section III, I present the empirical strategy and the results. I conduct some robustness checks in Section IV and I conclude in Section V.

I. Background and Design

I will compare the effect of sending a young offender to prison rather than to one of the two types of youth facilities: either the tougher youth custody and detention centres or the educational young offender institutions (YOIs). Because the regimen in prisons did not change much in these years, the comparisons also allow me to say something about the difference between keeping young offenders in establishments oriented towards punishment (youth custody/detention centres) or towards rehabilitation (young offender institutions).

A. Youth Custody and Detention Centres

The desire to keep young offenders separate from their older peers in the prison environment gained traction at the beginning of the 20th century in England. The idea of focusing on education rather than punishment led to the birth of a new type of youth detention centre: the borstal, an institution initially meant to guard and rehabilitate young offenders.

In 1952 detention centres were also opened to "provide a sanction for those who could not be taught to respect the law by such milder measures as fines, probation and attendance centres, but for whom long-term residential training was not yet necessary or desirable…" (Walker, 1965).

In the first decades borstals appeared to be successful. Despite their initial success, across the years, borstals did not adapt to the new, more criminally sophisticated generations, and 70 percent of the offenders released from borstals were reconvicted within two years (Warder and Wilson, 1973). More generally, crime rates, particularly among youths, rose in the 1970s, and the public attitude toward young offenders became more concerned with punishment (Pyle and Deadman, 1994).

Hence, in 1979 the conservative party pushed for the implementation of a "short, sharp shock" on young offenders in detention centres. "The theory was that if a young man who was convicted of a first crime was given a short period of intense regimented activity from morning till night, with everything done 'at the double', the experience would give him such a shock that he would give up any idea of a life of crime" (Coyle, 2005). The life in detention centres during the "short, sharp shock" became tough, mainly as a result of the isolation it produced.[2]

In the same spirit, the 1982 Criminal Justice Act (CJA) abolished borstals and replaced them with youth custody centres. The name of the sentence was changed from "borstal training recommendation" to "youth custody order", reflecting "the view that containment is more appropriate than attempts to rehabilitate via 'training'". The 1982 CJA "for good or ill abandons the notions that young people are sent to penal establishments for treatment or rehabilitation" (Muncie, 1984). The institution of the "short, sharp shock" and the replacement of borstals with youth custody centres represented a shift from a welfare policy system targeting rehabilitation towards a justice and retributive system focused on tighter control (Muncie, 2005; Smith, 2007). Anecdotal evidence highlights the suffering that both

[2] "Two visits were permitted each month and new arrivals were entitled to a mere 30 minutes, increasing to 45 minutes and then to an hour […]. From this point (5:45 a.m.), prisoners were under a rule of silence, with commands shouted at them by prison officers. […] By 1pm the prisoners had changed their clothes three times, been inspected twice, marched everywhere and had remained in total silence. The routine continued throughout the day. At 8 p.m., following a lengthy period spent in isolation in their cells, prisoners were allowed 30 minutes' recreation. For five days each week prisoners were able to talk to each other for only 30 minutes daily. […] The rule of silence created an atmosphere of mental isolation. At weekends that mental isolation was consolidated by long periods of physical isolation. […] Lining the corridors, awaiting barked instructions, the sullen, pale-faced boys fixed their eyes on their jailers. It was a collective stare of silenced resentment" (Newburn, 2009).

these centres imposed on young offenders (Muncie 1984; Taylor et al 1979); "(the centres) were, if anything, more brutal jungles than the adult prisons" (Smith, 1984). The young custody centres were not imposing the "short, sharp shock", but life in these institutions was also tough:

> "If the rule of silence, heavy discipline and limited recreation created conditions of mental and physical isolation in the Detention Centre, the endemic verbal harassment and physical violence in the Young Offenders' Institution *(Youth Custody Centres)* created a climate of fear and aggression. 'Doing time' in either regime was about negotiating and handling punitive conditions created formally (institutionally) and informally (cultural)" (Newburn, 2009).

Magistrates were given the power to choose whether an offender below 21 was to be sent to youth custody or detention centres. However, they were not convinced about the new "short, sharp shock" regime in detention centres (Pilcher and Wagg, 2005), and they preferred to sentence young offenders to youth custody. This led to an increase in the number of young offenders in youth custody centres, and to a lower staff to prisoners' ratio, making the general conditions even more unbearable (Scanlan and Emmins, 1988).[3] In general during the "short, sharp shock" members of staff were often cited in the news for being violent against the offenders.[4]

It is in these years that the first quasi-natural experiment takes place. As the 1982 CJA stated, if an offender was to be punished with custody in England and Wales, he/she would have been sentenced to detention/youth custody centres if he/she was below 21 years old and to prison if he/she was 21 or older. Hence, the first comparison that I will make in this paper

[3] "Staff were so stretched that inmates were now regularly locked up for 23 hours a day, and control problems were rapidly reaching crisis proportions. […] Since the centres were established the number of assaults on staff had more than doubled and there were now five times as many attacks by inmates against other inmates. Violence, bullying, drug-taking, and solvent abuse were becoming regular features of the system" (The Guardian, May 1985).

[4] "The incident (*an officer who behaved violently towards a youth in custody, ed.*) is the latest in a series of disturbing episodes concerning alleged staff mistreatment of youths since the Government introduced the short, sharp shock regime, with its emphasis on discipline, parades and physical activity, at all 18 detention centres in England and Wales last year. […] It seems that assaults on young people in end have become institutionalised and are viewed by some staff as an intrinsic part of the 'short sharp shock'. […] we should not go along the road of cruelty in our prisons and turn out youths who were more aggressive when they came out of custody than they were when they went in" (The Guardian, November 1985). "Two dossiers containing fresh allegations of assaults by prison officers on youths at 'short sharp shock' detention centres are to be sent to Mr Douglas Hurd, the Home Secretary. They have been prepared by the National Association of Probation Officers and the Children's Legal Centre after several complaints from probation officers and social workers who have come into contact with boys who say they have been slapped and punched at Blantyre House in Kent and Haslar in Hampshire" (The Guardian, November 1986). "Boys (in custody) are alleged to have been punched for forgetting to say "sir", for not knowing their numbers before being given any, and for not running quickly enough. […] "We are talking about people being punched quite forcibly in the stomach, and being given quite hard slaps around the face. I have seen a boy whose lip had been split by a blow." […] The baton they were jumping over had been raised by the instructor just as they had estimated the height of it and had started the jump. They were clipped on the ankles, and the baton they were running under was deliberately lowered in the same way so that they were whacked on the back. […] As soon as he arrived, he said, he was subjected to racial abuse and slapped in the face with a ruler. A prison officer then punched him in the stomach and took off his belt and slapped him around his face with it" (The Guardian, April 1985).

will be between being sentenced to a normal adults' prison, and being sentenced to a youth custody/detention centre, where the government had decided to be more punitive.

At the time, adults' prisons were just as tough as usual. Inmates in prison, like offenders in youth custody, could be locked up for 23 hours per day, and there were very few intermittent opportunities to work, and "little or no access to educational facilities, recreation or association" (Her Majesty's Chief Inspector of Prisons for England and Wales, 1993).

The main differences that young offenders experienced in prison rather than in youth custody/detention centres were a) the exposure to older peers (from 21 years old onwards) and b) overcrowded cells. As Appendix Table A 1 shows, local prisons could hold up to 150 percent of the population that the facility was originally intended to allow.

B. Young Offender Institutions

Due to their failure[5], in 1988 the experiments under the "short, sharp shock" regime were abolished, and detention centres and youth custody centres were merged into young offender institutions (YOIs). The rules by which a young offender could be sentenced to a YOI rather than to a prison were the same in 1988 as in 1982: the offender needed to be below 21 when convicted of an imprisonable offence, and the court needed to be satisfied that he qualified for a custodial sentence (Scanlan and Emmins, 1988, p. 98).

These rules give me the opportunity for the second quasi-natural experiment.

It is relevant for the purpose of the study to highlight that the new institutions for young offenders were not meant to be tough anymore: at the end of the '80s there was a switch from a punitive system for young offenders towards a rehabilitative system (Coleman and Warren-Adamson, 1992; Muncie, 1990).

The first main differences between YOIs and prisons were that young offenders in prisons were exposed to a) older peers and to b) an overcrowded environment. At the end of the '80s local prisons could be filled with 150 percent of the certified normal accommodation (Appendix Table A 2), as it used to happen at the beginning of the decade. A further dissimilarity between prisons and YOIs was c) the new educational and rehabilitative target of the latter: the aim of young offender institutions was now "to help offenders to prepare for their return to the outside community" (HC Deb 06 June 1989). The target was to be met by "providing a programme of activities, including education, training and work designed to assist offenders to acquire or develop personal responsibility, self-discipline, physical fitness, interests and skills and to obtain suitable employment after release; fostering links between the offender and the outside community; co-operating with the services responsible for the offender's supervision after release" (CJA 1988, rule 3). Encouraged to maintain their

[5] Crime rates did not decrease, nor the propensity to recidivate of the criminals who experienced the short, sharp shock.

networks with the outside world, young offenders were entitled to send and to receive a letter once a week, and to receive a visit once in four weeks. Outside contacts with persons and agencies were also encouraged.

By contrast, the provision of educational or training opportunities was still low for inmates in prison.[6]

Towards the end of the decade the time during which inmates were confined in their cells diminished, but to a much larger extent in YOIs than in prisons. Among all offenders in custody, inmates in open YOIs were forced to stay in their cells for the fewest hours (42 percent of weekend hours, 40 percent on weekdays), while inmates in male local prisons were locked up in their dormitories for approximately 60 percent of their time (with peaks in London of even 83 percent during weekends)[7] (Her Majesty's Chief Inspector of Prisons for England and Wales, 1993).

The number of monitored activities provided in the establishments also differed. For example, 23 out of 35 male and female YOIs in England and Wales offered inmates the option of undertaking agricultural and horticultural work in the open air (HC Deb 30 November 1989, HC Deb 07 November 1991), and, more generally, the largest range of activities (12–15) was provided by YOIs. The most popular activities were usually either equally likely to be available in both prisons and YOIs or more likely to be offered and practiced in the latter (Appendix Table A 3)[8].

II. Data

Data provided by the Research, Development and Statistics Directorate of the Home Office allow for examination of a wide range of variables: gender; ethnicity[9]; the type and number of offences for which the transgressors appeared in court; the length of the sentence they were given; the disposal; whether or not they pleaded guilty; the type of proceedings (e.g. summoned by police, committed to Crown Court for trial, breach of probation order, etc.); and the date of birth (day, month and year).

I am able to access the offenders' crime records of the first (second) cohort since their birth year until 1993, which means until they are 30 (25) years old. I measure the age at which they commit their first offence to have an indication of their initial propensity to commit a crime.

[6] "[...] for many imprisonment results not only in a loss of liberty in stark conditions but also in the imposition of a regimented and unconstructive way of life. Meals are taken at close intervals during the day, opportunities for socialising can be few and far between, and evening activities and recreation, where they exist at all, are crammed into a few hours with nothing to occupy inmates after lock up. Employment, if it exists, can be soulless and unrelated to sentence and needs. In most cases very little is done to prepare prisoners for release and equip them for a life outside" (Her Majesty's Chief Inspector of Prisons for England and Wales, 1993).

[7] The study from the Report of a Review of Regimes in Prison Service Establishments in England and Wales is based on 64 prison establishments in England and Wales in 1991/2.

[8] There were few exceptions, mainly related to activities whose availability depended on whether the establishment had the necessary ground to host them (like Farms Party) or to Prison Service Industries and Farms (PSIF) activities, that were not necessarily good quality workshops (Her Majesty's Chief Inspector of Prisons for England and Wales, 1993).

[9] Unfortunately the variable describing the ethnicity of the offenders of the 1963 cohort has a high percentage of missing values.

I construct several outcome variables: the likelihood of being brought to court at least once in the future; the number of offences for which an individual is sent to court; the number of times the offender appears in court again[10]; and the number of sentences to prison. These outcomes refer to different time spans depending on the cohort considered. For the cohort born in 1963, the future time window in which offenders are observed is nine years (or four years after release).[11] Due to data constraints, I can observe the crime records of the offenders born in 1968 for a shorter time period. In order to maximize the time span after release in which I can observe the offenders born in 1968, I only consider the offenders who are sentenced to custody for one year or less, and I restrict the sample to offenders who turned 20/21 before June 1990.[12] This way I broaden the time window in which I observe the future offences of the second cohort to 2.5 years after release.

I can also observe the type of offences committed in the future: whether they are thefts, violent offences, sexual offences, burglaries/robberies, frauds, criminal damages, drug offences, minor offences or other offences. This way I can have a measure of both the quantity and quality of future crimes.

Our first (second) sample consists of all the offenders who were born in three (four) randomly sampled weeks [13] of 1963 (1968), and who were sent to either youth custody/detention centres (young offender institutions) or adults' prisons in England and Wales when they were 20/21 years old.

The Criminal Justice Act 1982 that established the rules for youth custody and detention centres was implemented on the 24th of May 1983. I therefore include in the first sample only offenders who were 20/21 years old after that date. In total there are 558 offenders.[14] Of them 315 offenders were sent to adults' prisons (treatment group), and 243 offenders were sent to youth custody/detention centres (control group). The Criminal Justice Act 1988,

[10] Please note that the number of offences for which an individual is brought to court is different from the number of times the individual is brought to court: an offender could be brought to court once for having committed multiple offences. For example, an individual who stole a car and, when escaping, broke a shop window will go to court once but he/she will be sentenced for two different offences.

[11] I reduce the time window in which I analyse the future criminal records of the offenders to nine years (instead of 10) so that the outcomes of the two groups of offenders are comparable: I could observe for 10 years the offenders in the sample who have been sentenced at age 20, but I cannot do the same with the offenders who are sentenced when 21. This is why I choose a time window of nine years to construct the outcome variables. Therefore, I measure the future offences of the offenders who are sentenced when 20 (looking at their outcomes when they are 21 to 29), and I compare them with the future offences of the offenders who are sentenced at 21 (looking at their outcomes when they are 22 to 30). Let us point out that in the nine-year time window I am also considering offenders with a sentence longer than one year, i.e. offenders who are still in custody in this period. However, as I will see later, the sentence length is balanced between offenders assigned to youth custody/detention centres, and offenders assigned to prison, meaning that the time spent in custody by offenders from the two groups is not significantly different, and consequently, should not affect the estimates. As a robustness check I will re-conduct the analysis by looking at the offences committed only in a time window where I can observe all the offenders after release. This time window will necessarily be shorter: four years. Results are perfectly in line with what is found over the nine-year period.

[12] I do it because I can observe offenders until December 1993, and if I limit the sample to offenders who turn 20/21 before June 1990, I can observe them for a longer time period. Otherwise, I would also observe offenders who turned 20/21 between July and December 1990, but I would examine their post-release behaviour for two years only.

[13] Dates for the 1963 cohort: 3rd-9th March, 28th September-4th October, 17th-23rd December. Dates for the 1968 cohort: 3rd-9th March, 28th September-4th October, 17th-23rd December and 19th-25th June for the 1968 cohort.

[14] I exclude from the 1963 cohort offenders who committed their first crime when they were younger than 14 years old. This way I get rid of the most dangerous criminals, who are more numerous in the control group and consequently might bias the results. In a robustness check, I will re-conduct the analysis in the full sample, including offenders who committed their first crime when younger than 14 years old.

which abolished youth custody/detention centres and established YOIs, was implemented on the 1st of October 1988. Following the same reasoning, I include in the sample offenders who appeared in court when 20/21 after that date. In total there are 297 offenders. Of them, 132 were sentenced to adults' prisons (treatment group), and 165 were sentenced to YOIs (control group).

Summary statistics of the observable characteristics of offenders from both cohorts are reported in Table 1. Most of the offenders born in 1963 (Panel A) are male (93.2 percent), and they appeared in court for the first time when they were almost 17 years old on average. Around 90 percent of them pleaded guilty when 20/21, and they were given a sentence of approximately 9.5 months on average. The offences were: burglaries (36.7 percent), violent offences (17 percent), and thefts of different kinds (30.5 percent). Most of the offenders born in 1968[15] (Panel B) are male (97.3 percent) and of White European ethnicity (58.1 percent). The offences committed by the 1968 cohort are also mainly burglaries (30.7 percent), violent offences (22.6 percent) and thefts (26.4 percent).

[Insert Table 1 Here]

A. Treatment-Control Comparisons: Balancing Tests

I rely on a standard regression discontinuity (RD) design assumption, specifically in this case that the assignment to treatment is not correlated to individuals' characteristics other than age. Therefore, I provide visual evidence of whether other covariates exhibit a jump around the threshold. As shown in Figure A 1, this is not the case for any of the available observable characteristics: gender, ethnicity, birth year (the members of the groups I compare are all born in the same year), month of birth (March, June[16], September/October, December), whether they pleaded guilty, the type of offence, the age at which they committed their first offence and the proceedings types. The absence of a jump in observable characteristics around the cut-off further supports the analysis.

III. Empirical Strategy and Results

A. Empirical Strategy

The 1963 and 1968 cohorts are analysed separately through a fuzzy RD design. It is a fuzzy RD because not all the offenders who should be sentenced to either prison or separate youth establishments are effectively sentenced to them. That is, 230 (160) offenders out of the 243 (164) who appeared in court when age 20 from the 1963 (1968) cohort were sent to youth

[15] I limit the sample of offenders born in 1968 to offenders who were given a custodial sentence of one year maximum, which makes summary statistics of the 1968 cohort slightly different compared to the 1963 cohort.
[16] June is available only for the 1968 cohort.

custody/detention centres (young offender institutions), and 297 (128) young offenders out of the 315 (132) who appeared in court when age 21 were sent to adults' prisons. This gives me the possibility of estimating the local average treatment effects (LATE) by two-stage least squares (2SLS), i.e. the causal effect on compliers defined as individuals whose treatment status changes as their age switches from just below 21 to just above. The following model illustrates how.

First stage equation:

$$D_i = \alpha + f_1(\tilde{x}_i) + \rho T_i + \eta_i \quad (1)$$

Second-stage equation:

$$Y_i = \alpha + f_2(\tilde{x}_i) + \gamma D_i + e_i \quad (2)$$

Where:

Y_i = the outcome for individual i, i.e. the likelihood to re-offend in the future, the number of crimes committed, the number of court appearances, the number of sentences to prison, the number of specific types of crime committed;

D_i = the treatment variable, equal to 1 if individual i is sentenced to an adults' prison, and 0 otherwise;

T_i = 1 if individual i is 21 years old or older, and 0 otherwise; it is used as instrument for D_i.

X_i = age of individual i when sentenced, centred so that it is 0 when the individual turns 21 years old, positive if the individual is sentenced when 21 years old or older, and negative when the individual is younger than 21 years old.[17]

The functional forms f_1 and f_2 need to be correctly specified.

Our main specification is estimated through a non-parametric approach, implementing a local linear regression constructed with a triangular kernel regression.[18] As Lee and Lemieux (2010) suggest, it is better not to rely on one method only, so I will also estimate equations (1) and (2) through a parametric approach. To allow for non-linearities, I use polynomials, but up to the second order only. I do not control for higher polynomials (third, fourth, etc.) of the forcing variable because it could lead to misleading results (see Gelman and Imbens, 2014). I also allow the treatment to have a different impact before and after the cut-off by including an interaction of the centred variable and the treatment variable. Finally, for a further robustness check, I also include in the parametric approach estimations control variables such as gender, month of birth, ethnicity, age at which the offender committed the

[17] The centred running variable is equal to 1 the day after the offender turns 21 and -1 the day before his 21st birthday.
[18] A triangular kernel is ideal for estimating effects at the boundary (Fan and Gijbels, 1996; Lee and Lemieux, 2014). Moreover, results (available upon request) are robust to using different kernels, like the uniform or Epanechnikov.

first offence, sentence length, plea, proceedings and type of offence when the offender was sentenced to youth custody/detention centres/young offender institutions or adults' prisons.

Non-compliers.— The assignment mechanism to penal institutions is not perfectly respected, which means that some offenders who should be sentenced to prison will be held in youth custody/detention centres/young offender institutions, and vice versa. Who are the non-complier offenders assigned to the incorrect treatment? By calculating the means of the available variables (exact age at court appearance, gender, ethnicity, month of birth, offence type, sentence length, plea) for compliers and non-compliers, I explore which characteristics correlate to the incorrect assignment. Overall, non-compliers are few and quite similar to compliers in observable characteristics.

Among the 249 offenders born in 1963 and 20 years old at the court appearance date, 19 (6.03 percent) are wrongly assigned to adult prisons but do not show any significant difference in observables with respect to offenders assigned to the legitimate treatment. Among the 309 offenders aged 21, 13 (5.35 percent) are wrongly assigned to youth custody/detention centres and they are more likely to have committed criminal damages when compared to compliers of the same age.

Among the 164 offenders born in 1968 and aged 20 at the court appearance date, 4 (2.44 percent) are wrongly assigned to adult prisons. Among the 133 offenders aged 21, 5 (3.76 percent) are wrongly assigned to young offender institutions and do not differ much from the ones correctly sentenced to adult prisons, apart from being more likely to have committed sexual offences.

As a summary, I estimate a linear probability model with the full set of control variables, where the dependent variable is being assigned to the wrong treatment (Appendix Table A 7). The results are in line with considering the covariate means separately, even though I also see that the offenders born in 1963 who are wrongly assigned to adult prisons (column 1) are more likely to have pleaded guilty and slightly less likely to have committed thefts or burglaries/robberies.

B. Results

For both the cohorts, the first stages are strong: the estimated coefficients in equation (1) are 0.761 for the 1963 cohort and 0.891 for the 1968 cohort (Table 2), very precisely estimated. I can visualize the strength of the first stages in Figure 1.

[Insert Figure 1 and Table 2 Here]

Prisons vs. harsher youth punishment.— Let me begin the treatment effects analysis by looking at the future offences of the 1963 cohort through the local linear regression (Table 3). In the first column I report the estimated treatment effect when the bandwidth is one year on both sides.[19] In column (2) I present the estimates with the bandwidth suggested by Ludwig and Miller (2007), in column (3) I restrict the bandwidth to ¾ of a year and in column (4) to half a year.

[Insert Table 3 here]

I find that young offenders at the margin of experiencing custody in prison are 27 percent less likely to re-offend than those who were exposed to a harsher treatment over a nine-year time span. The effect is significant and does not change even when I reduce the bandwidth around the cut-off from one year to the optimal bandwidth suggested by Ludwig and Miller (2007) or to ¾ of a year. The effect is no longer significantly different from zero at conventional significance levels only if I reduce the bandwidth to half a year. Hence, young offenders exposed to a harsher punishment are more likely to reoffend, and this is also reflected in the number of future offences they commit over the nine-year period: on average 3.7 offences more than their peers who were subject to less severe incarceration conditions. This is true across all different bandwidths. Not only young offenders who experienced the harsher treatment are more likely to be sentenced for more offences in the future, but they are also brought to court on average 1.8 times more. The two outcomes differ in magnitude because an offender can go to court once and be sentenced for more than one offence at the same court appearance.

I then investigate on the seriousness of the crimes committed in the nine subsequent years. Using the number of future sentences to prison as a proxy for severe crimes, I find that offenders who are at the margin of experiencing the tougher regime are more likely to be sentenced to prison in the future, but not significantly so. In Table 4, I examine the types of crimes committed, and I show that the overall effects I find are not driven by minor offences, but mainly by violent offences, thefts, burglaries and robberies. These differences between the two groups of young offenders are significant even when I restrict the bandwidth as previously detailed[20]. I find no significant differences in the number of future drug offences, or in the number of various other crimes (sexual offences, minor offences, motoring offences, frauds). There seems to be an effect on criminal damage too, but it vanishes when I restrict the bandwidth around the threshold.

[19] By this, I mean that I include in the sample young offenders who appear in court from the date of their 20th birthday up to young offenders who are sentenced the in their 22nd birthday, i.e. +/- 1 year from the threshold of 21.

[20] While in the first column I report the estimated treatment effect when the bandwidth is one year on both sides, in column (2) I present the estimates with the bandwidth suggested by Ludwig and Miller (2007), in column (3) I restrict the bandwidth to ¾ of a year and in column (4) to half a year.

[Insert Table 4 Here]

In summary, on the one side there are overcrowded prisons where offenders are exposed to older peers; on the other side there is a tougher than usual regime, with the main purpose to punish and shock offenders. The overall effects of the latter are more detrimental: offenders who are at the margin of being sentenced to youth custody/detention centres are more likely to re-offend in the future, to commit a greater number of offences and to commit offences that are more dangerous for society. Through this analysis I am not able yet to disentangle the mechanisms that are driving the results.

Prisons vs. softer youth punishment.—I now analyse the future offences of the 1968 cohort, comparing the young individuals who were sent to the usual adults' prisons to the ones assigned to YOIs. As I previously explained, I examine this cohort over a shorter period: 2.5 years after release. I will then re-conduct the analysis for the 1963 cohort limiting the time window to 2.5 years, and limiting the sample to offenders sentenced for one year or less. This way I can compare the results I obtain by analysing the 1963 and 1968 cohorts.

In **Error! Reference source not found.**, Panel B I can see a higher incidence of the number of future felonies, the number of subsequent court appearances, and the likelihood of reoffending among those at the margin of prison incarceration compared to those sent to other institutions. In each instance, the magnitude is greater, but not significant. The number of times that former prisoners are sentenced again to custody is positive and significantly different from zero, suggesting that the future offences they commit represent a greater danger for society. If I then consider the types of offences that they commit, I see that young offenders who experienced prison are more likely to commit burglaries and robberies. Let us keep in mind that these results are the opposite of what I found when the treatment for younger offenders was harsher, i.e. for the 1963 cohort, where it is the young offenders kept in youth custody and detention centres who become more dangerous instead. In order to make the comparison more adequate, I now repeat the analysis for the 1963 cohort restricting the sample to offenders sentenced for one year or less and limiting the time window in which I observe their offences to 2.5 years after release. Now that the time window is shorter, the number of future offences considered will necessarily be smaller, but I find that results go in the same direction as over the nine-year period. As shown in Table 5, Panel A, young offenders born in 1963 who were at the margin of being sentenced to prison rather than youth custody/detention centres, commit on average 1.4 fewer offences in the 2.5 years following release, they appear in court 0.7 times fewer, and they are 42 percent less likely to reoffend. Hence, it seems that even in the short term, young offenders who marginally experience the harsher treatment become more dangerous for society. All these estimates are significantly

different from zero and, as I highlighted before, they go in the opposite direction of what I find once the harsh treatment for young offenders is abolished.

[Insert Table 5 Here]

Moreover, similarly to what I found over the nine-year time window, this shorter time window still shows that violent offences and thefts constitute the types of crimes more often committed more often by offenders who experienced youth custody and detention centres (Table 6).

[Insert Table 6 Here]

In summary, being exposed to (harsher) youth custody/detention centres makes offenders more dangerous than being exposed to prisons; while being exposed to (less harsh) YOIs makes offenders less dangerous than being exposed to prisons. Given that prisons did not experience major changes over the '80s, and given that the differences in the age of peers and in overcrowding rates between prisons and establishments for youth did not change significantly over time, the findings seem to suggest that it is wise to keep young offenders away from prisons, but only if they are kept in institutions with a rehabilitative purpose. If instead, young offenders are kept separate from their older peers and far from an overcrowded environment, but with the aim of punishing them, their likelihood of reoffending in the future is exacerbated.

IV. Robustness Checks

I now verify whether the local treatment effects are robust to a series of checks.

First, I consider whether results are stable across alternative estimation methods: I find that they hold also when the analysis is carried out through a parametric approach up to a second-order polynomial (Table 7). Second, in the even columns of Table 7 I also add control variables as a further check: gender, sentence length, ethnicity, plea, proceedings, month of birth, type of offence[21] and age at which the offender committed the first offence. Estimated coefficients tend to appear slightly smaller in size when control variables are included, but they are not significantly different from the coefficients estimated without control variables. In Table 8 I show the different treatment effects by offence type, estimated through a parametric approach: effects go in the same direction as through the non-parametric.

[Insert Table 7- Table 8 Here]

[21] If the offender committed multiple offences when sentenced at 20/21, I consider the category of the most serious offence (i.e. the offence for which she was given the hardest penalty).

One could worry if there were a discontinuity in the distribution of the forcing variable (the age at which offenders go to court) at the threshold (21 years). This would suggest that people (judges, police, the offenders themselves) can manipulate the forcing variable around the threshold. For example, young offenders, knowing ex-ante the harsh conditions of youth custody and detention centres, could wait to commit their crimes until they turn 21 years old. Reassuringly, the McCrary test shows no manipulation of the assignment variable for either cohort (Figure 2).

[Insert Figure 2 Here]

Let us remember that in the analysis of the 1963 cohort I excluded offenders who committed their first offence when younger than 14. I proceeded this way because the age at which offenders committed their first offence was the only unbalanced covariate between treatment and control groups: young offenders who went to youth custody/detention centres were more likely to have committed their first offence when they were younger than their counterparts. I now re-conduct the analysis for the 1963 cohort with the full sample of offenders, including those who committed their first crime before turning 14 years old. The full sample includes 706 offenders in total. As I might have expected, the magnitude of the treatment effects in the full sample is slightly greater than in the main analysis (Table 9-Table 10): young offenders at the margin of experiencing a tougher punishment commit on average 4.6 offences more (3.7 in the original sample); they are brought to court 2.19 times more (1.81 in the original sample); they are sentenced to prison 2.03 times more (1.2 in the original sample); and they are 25 percent more likely to re-offend in the future (27 percent in the original sample). All of the treatment effects found are significantly different from zero and remain so even when the bandwidth around the threshold is reduced. Even when I analyse the type of offence committed (Table 10), I realize that young offenders who were at the margin of going to youth custody/detention centres are significantly more likely to commit thefts, violent offences, burglaries and robberies, as I found in the original sample.

[Insert Table 9-Table 10 Here]

In Section III, I analysed the future felonies of the 1963 cohort over the next nine years, even though over this time some offenders are not free from confinement, but kept in custody. If the sentence length for offenders in youth custody/detention centres and offenders in prisons were different, the main results I presented would be biased, as the number of free people facing the choice of committing (or not) new offences would be disproportionate. However, I have already seen that the sentence length is balanced, meaning that the time

spent in custody by offenders from the two groups is not significantly different, and consequently, will not affect the estimates. As a robustness check I re-conduct the analysis by looking at the offences committed only in a time window where I can observe all the offenders outside of custody. The time window that enables me to conduct this analysis is four years.[22] As I can see in Table 11, results are perfectly in line with what is found over the nine-year and 2.5-year periods: offenders at the margin of being exposed to prisons rather than to youth custody/detention centres commit 2.37 fewer offences in the four years following release (-1.4 in 2.5 years following release, -3.71 in nine years); they are 46.9 percent less likely to commit offences (-42.2 percent in 2.5 years, -27 percent in nine years); and they appear in court more than once less (-0.77 times in 2.5 years, -1.81 in nine years). If I then dig into the type of offences committed, I can see that they are mostly violent offences, thefts and, in this case, also criminal damage.

[Insert Table 11 Here]

We also need to bear in mind that the number of offences captured in the analysis underestimates the true level of re-offending because crimes are only partially detected, sanctioned and recorded. The estimated effects would be biased if there were a difference in how easy it is to detect, sanction and record the offences of the two groups. However, I do not have any reason to believe there was.

The first stage is very strong, but as a placebo test I also check if there are other jumps in the forcing variable. Following Imbens and Lemieux (2008) I only look at one side of the discontinuity, take the median of the forcing variable in that side and test for discontinuity. Reassuringly, I find none.

Because the identifying assumption is that offenders at 20 are comparable to offenders at 21, I need to consider the relationship between engaging in criminal activities and age, as crime commission seems to peak in the mid to late teens and then decline (Quetelet, 1831; Hansen, 1993; Bell et al., 2015). A decrease in the propensity to offend after a specific age threshold implies that individuals who decide to commit a crime when older may be different from younger offenders (e.g. offenders who commit a crime when older may be pushed by other factors such as lower self-control, more difficult labour market conditions, etc.). If so, comparing offenders who engaged in illegal activities at different stages of their lives could give biased results.

[22] The time window is four years because once I exclude two offenders who have been given a sentence of 60 months, the longest sentence I have in the sample is 48 months, i.e. four years. This means that offenders born at the latest in the sample (i.e. in December 1963) and who are sentenced to prison until they are still 21 (i.e. at the latest December 1985, some days before their 22nd birthday) for the maximum time (i.e. four years from December 1985) will be out of custody in December 1989. As I can observe offenders until December 1993, the time window is four years maximum.

To reduce this potential bias I restricted the sample to offenders who are no more than one year older/younger than 21 throughout the entire analysis. Moreover, for the first cohort of offenders the harsher treatment affects the younger, while for the second cohort it is the softer treatment that affects the younger. Hence, if the difference in the propensity to commit a crime between the older and younger offenders does not change across time, the bias introduced in the estimates for the two cohorts should be the same, and the direction of the treatment effects would be reliable. On the contrary, if the age-crime curve changes over time the estimates for the two cohorts might be biased in a different way, affecting the conclusions.

While Hirschi and Gottfredson (1983) claimed that the age-crime curve is invariant over different times, places, crime types, sexes, and so on (Farrington, 1983), subsequent research argued instead that age-crime profiles change in time (Hansen, 2003; Ulmer and Steffensmeier, 2014). Even though changes in the age-crime profiles can occur, it takes time for them to happen. For example, "in the United States, total arrests for all offenses in 1980 peaked at age 18; in 1933, at 19. Seemingly, there was little change in half a century. […] A comparison of the age distribution of criminality in contemporary England with that in the 1840s shows a major shift in modal age: in 1842-44 (before summary jurisdiction acts began to divert juvenile offenders from the regular criminal courts), the rate of involvement peaked at ages 20-25; in 1968, at 14-17" (Greenberg, 1985). For such a major shift to take place in England, 125 years were necessary. The second cohort analysed in the paper was born 5 years after the first: even if the modal age of the second distribution of offenders changed, it is reasonable to think that it would not change by much, and the same reasoning would apply to the entire age distribution. Indeed, when I consider not only the sample analysed in the paper, but the full cohorts of offenders born in selected weeks of 1963 and 1968, and I examine the number of court appearances by age for the types of crimes where I find a significant effect (Figure 4), I observe a similar trend: when offenders turn 21, they are less likely to be commit a crime, appear in court, and the same holds true for thefts, violent offences, and burglaries/robberies. Only the number of court appearances by age for criminal damage is not very smoothly distributed, and its trend temporarily reverses when offenders from the second cohort turn 21. Overall, offenders from both cohorts are more likely to offend when 20 rather than 21. The age at which the offenders commit an offence could be correlated to being more prone to offend. But, given that the tougher treatment is given to offenders who are 20 first and then to offenders who are 21 and that in both cases the ones exposed to the tougher regime become more likely to offend in the future, treatment effects do not seem to be driven by whether offenders were 20 or 21 when sent to custody.

[Insert Figure 4 Here]

V. Conclusion

I use a fuzzy regression discontinuity design to analyse two quasi-natural experiments in criminal sentence of 20- and 21-year-old offenders to compare the effects of incarceration practices that are harsher or more rehabilitative in nature. The work contributes to the literature and current public debate on the most effective type of punishment to reduce crime among young offenders and to protect the citizens' wellbeing.

I find evidence that keeping young offenders separate from their older fellows is efficient when I aim to reduce their future criminal activity. However, this is true only if the young offenders are housed in institutions that provide for their rehabilitation. Keeping young offenders in institutions with a sole punitive purpose proves to be counterproductive instead.

During the '80s, prisons in England and Wales do not experience major changes, while institutions where offenders younger than 21 are held separately from their older peers do: initially these institutions are meant to punish young offenders severely, but in 1988, they adopted a more rehabilitative orientation. I find that young offenders at the margin of being exposed to the temporarily tougher regime are 27 percent more likely to re-offend in the subsequent nine years; they commit on average 3.7 offences more; and they are brought to court 1.8 times more often than their counterpart in prison. The crimes that young offenders at the margin of being exposed to a harsher regime commit also appear to be more serious, as suggested by the fact that in the future they are sentenced more often to prison, even though the effect is not significantly different from zero. Moreover, their felonies are not minor, but major crimes, such as violent offences, thefts, burglaries and robberies. By the end of the decade punitive institutions for young offenders are abolished and substituted with more rehabilitative ones, which enables me to compare young offenders sentenced to the usual prison with young offenders sentenced to the separate educational institutions. In the 2.5 years after release, offenders held in the new educational facilities are sentenced to custody 1.5 times less than offenders kept in ordinary prisons; they are also significantly less likely to commit burglaries and robberies, suggesting that they become less of a threat for their society. They are also less likely to re-offend and they commit fewer crimes in the future, but the estimates of these effects are not significant.

Adults' prisons do not experience major changes over the decade. Moreover, the different exposure to overcrowding and to peers between prisons and establishments for younger offenders stay the same. The only difference between the two types of custody that varies over time is the change of target in institutions for young offenders, from a punitive one to a rehabilitative one. Hence, the results imply that being kept separately from more adult criminals is positive only if the purpose of the offender's custody is rehabilitative. If it is punitive, the lawbreaker becomes even more likely to reoffend in the future.

Our estimates hold to different robustness checks.

These results suggest that the experience of being held in punitive incarceration facilities can have negative long-term consequences on young offenders, and therefore on the entire society. The evidence is significant, with the caveat that treatment effects are locally identified at the point at which the probability of receiving treatment changes discontinuously, i.e. they relate to law breakers who are sentenced to custody when turning 21 years old. While being an interesting result per se, it cannot be generalized to juvenile or adult offenders, even though the results are in line with the literature that does not find evidence in favour of a specific deterrence effect for juveniles (Aizer and Doyle, 2015) and adult offenders (Chen and Shapiro, 2007; Drago and Galbiati, 2011; Mastrobuoni and Terlizzese, 2014).

Other two caveats need to be kept in mind for policy implications. First, I cannot infer anything about unreported crimes, which I know exist, but which I cannot measure by definition. If the number of unreported crimes was different between the groups I compare, the results would be biased, but I do not have any reason to believe so. Moreover, the aim of the paper is to test for the presence of a specific deterrence effect, but I cannot draw any conclusion on the general deterrence effect: I do not know how other individuals who did not experience youth custody, detention centres, young offender institutions or adults' prisons when 20/21 respond to the existence of these institutions.

Finally, more research on the mechanisms behind these effects would be beneficial for a better understanding of what are the drivers of the offenders' behaviour and tailor appropriate policy responses.

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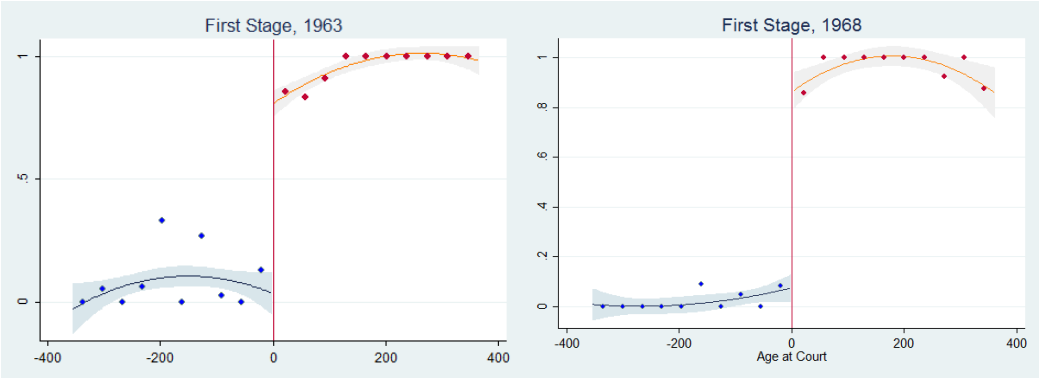
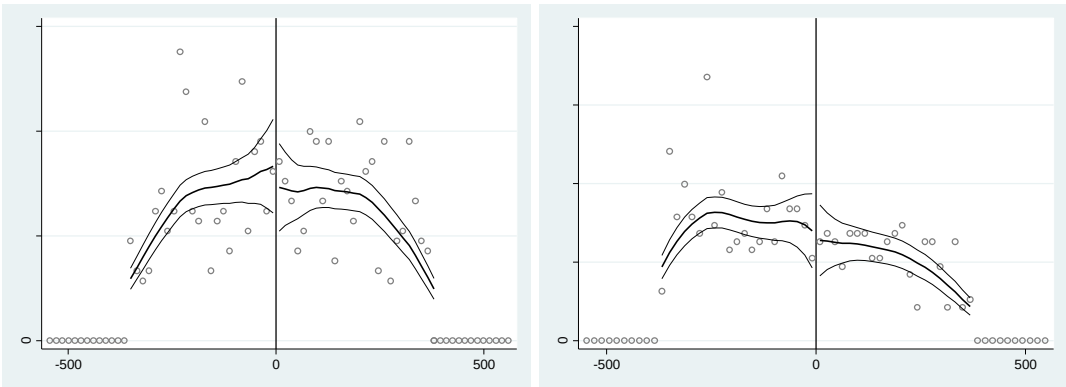
Figure 1. FIRST STAGE (20 BINS)



Notes: The figure above reports the first stages, i.e. how much of being sentenced to an adults' prison depends on actually being 21. The left (right) hand side refers to the 1963 (1968) cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes all the offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance. The 1968 sample includes all the offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance. On the x axis lies the running variable, age at court appearance, centred at 0 when age at court appearance is 21. Age at court appearance is positive (negative) when young offenders are older (younger) than 21. On the y axis the treatment dummy (equal to 1 when the offender is sentenced to prison) is plotted. The coloured areas represent the 90% confidence intervals around the separate lines of quadratic best fit plotted on the left and right hand side of the cut-off.

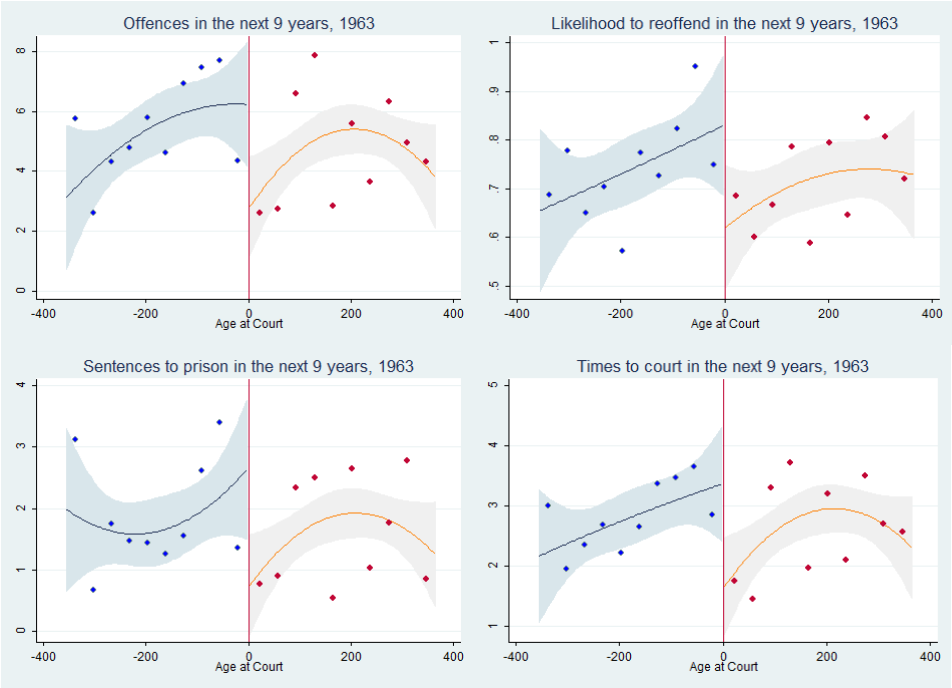
Figure 2. MCCRARY TEST



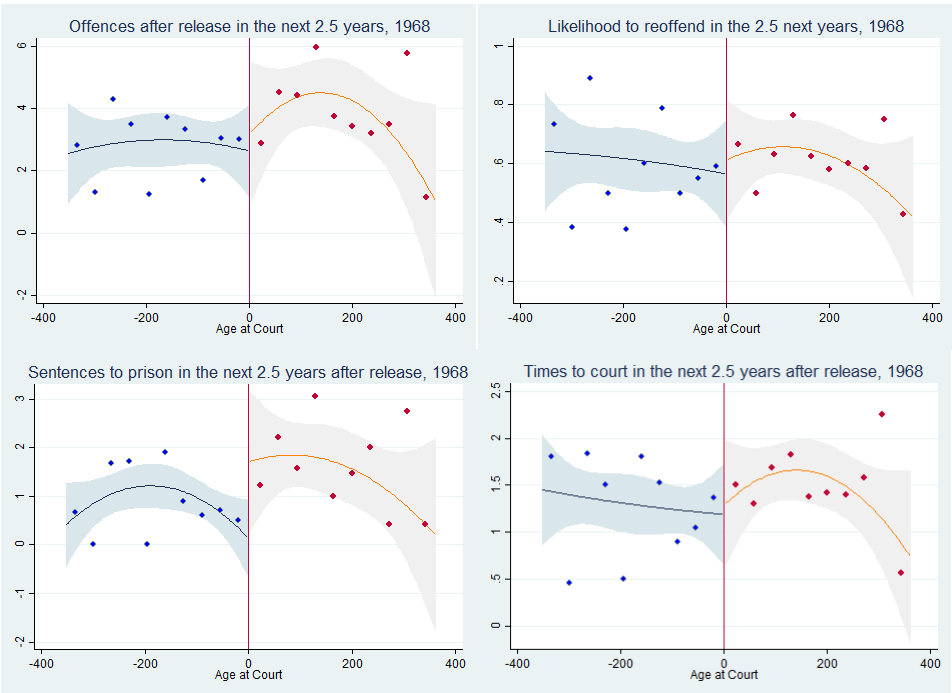
Notes: The figure above refers to the 1963 (Panel A) and 1968 (Panel B) cohorts of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes all the offenders who were sentenced to either youth custody/detention centres or adults' prisons when 20/21. The 1968 sample includes all the offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance. The McCrary test is "a test of manipulation related to the continuity of the running variable density function" (McCrary, 2008). On the x axis lies the running variable, age at court appearance, centred at 0 when the age at court appearance is 21. Age at court appearance is positive (negative) when young offenders are older (younger) than 21. On the y axis the density function of the running variable is plotted.

Figure 3. SECOND STAGE (20 BINS)

Panel A – 1963 Cohort

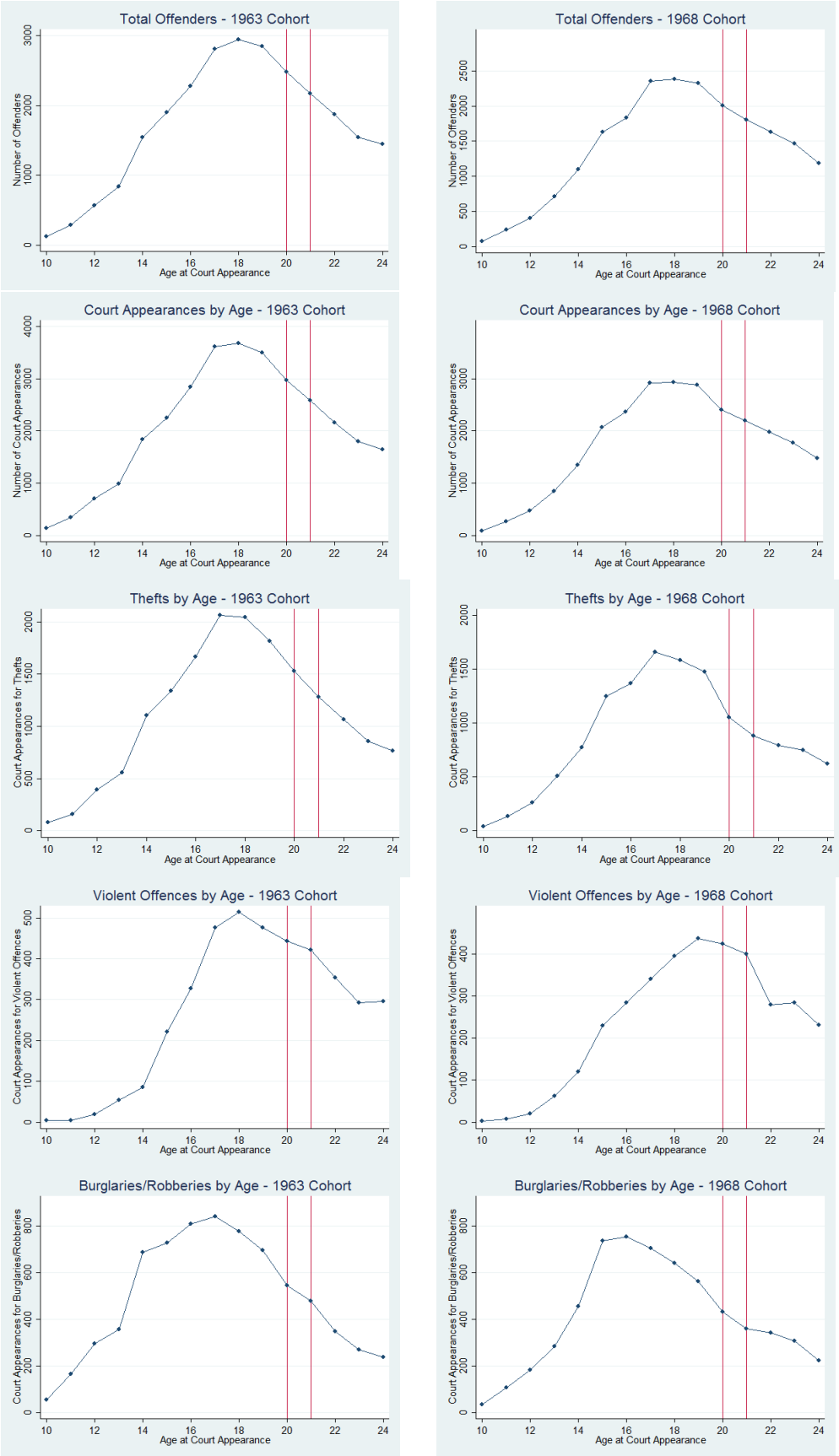


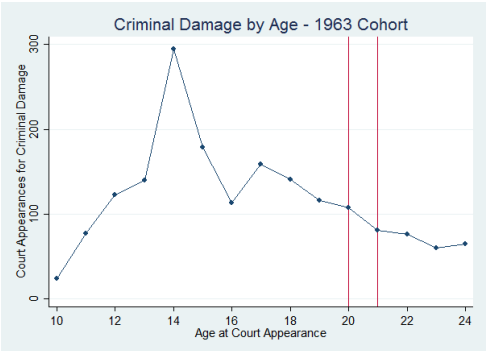
Panel B –1968 Cohort

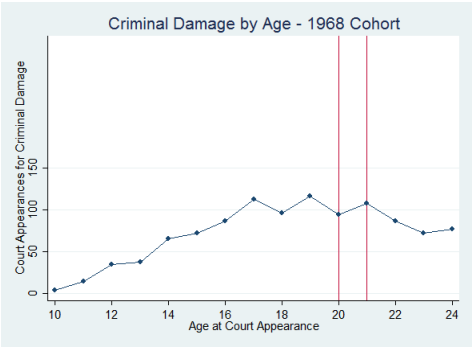


Notes: The figure above refers to the two samples from the 1963 (Panel A) and 1968 (Panel B) cohorts of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. On the x axis lies the variable age at court appearance, centred at 0 when age at court appearance is 21. Age at court appearance is positive (negative) when young offenders are older (younger) than 21. On the y axis the outcomes measured after release are represented: the number of future offences, the likelihood to reoffend, the number of sentences to prison and the times the offenders go to court again. The coloured areas represent the 90% confidence intervals around the quadratic of best fit. The time span over which outcomes are observed is nine (2.5) years after release for offenders born in 1963 (1968).

Figure 4. CRIME-AGE CURVE BY OFFENCE TYPE IN 1963 AND 1968 COHORTS







Notes: The figures above refer to the full 1963 (Panel A) and 1968 (Panel B) cohorts of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). On the y axis there is the number of court appearances by type of offence. On the x axis lies the variable age at court appearance.

Table 1. SUMMARY STATISTICS

	Mean	Sd	Min	Max
	(1)	(2)	(3)	(4)
Panel A. 1963 Cohort				
i. Offenders Characteristics				
Male	0.932	0.252	0	1
White European	0.237	0.425	0	1
Afro-Caribbean	0.027	0.162	0	1
Oriental	0.002	0.042	0	1
Arab	0.002	0.042	0	1
Born in March	0.513	0.500	0	1
Born in Sept/Oct	0.247	0.432	0	1
Born in December	0.240	0.428	0	1
Age at first court appearance	16.783	2.274	14	21
ii. Offence Characteristics				
Sentence length				
Sentence length (months)	9.528	9.793	0.467	60
Plea				
Plea: guilty	0.896	0.305	0	1
Proceedings				
Apprehension	0.294	0.456	0	1
Committed to High/Crown Court for trial	0.572	0.495	0	1
Offence				
Burglaries/Robberies	0.367	0.483	0	1
Thefts	0.305	0.461	0	1
Frauds	0.048	0.215	0	1
Violent Offences	0.170	0.376	0	1
Sexual Offences	0.011	0.103	0	1
Criminal Damage	0.011	0.103	0	1
Drug Offences	0.018	0.133	0	1
Motoring Offences	0.014	0.119	0	1
Minor Offences	0.029	0.167	0	1
Observations	558			

Table 1 (Continued): SUMMARY STATISTICS

	Mean (1)	Sd (2)	Min (3)	Max (4)
Panel B. 1968 Cohort				
i. Offenders Characteristics				
Male	0.973	0.162	0	1
White European	0.582	0.494	0	1
Dark European	0.000	0.000	0	0
Afro-Caribbean	0.024	0.152	0	1
Asian	0.010	0.100	0	1
Born in March	0.209	0.407	0	1
Born in June	0.263	0.441	0	1
Born in Sept/Oct	0.242	0.429	0	1
Born in December	0.286	0.453	0	1
Age at first court appearance	15.391	2.983	10	21
ii. Offence Characteristics				
Sentence length				
Sentence length (months)	5.932	3.579	0	12
Plea				
Plea: guilty	0.778	0.416	0	1
Proceedings				
Apprehension	0.286	0.453	0	1
Committed to High/Crown Court for trial	0.535	0.500	0	1
Offence				
Burglaries/Robberies	0.306	0.462	0	1
Thefts	0.259	0.439	0	1
Frauds	0.030	0.172	0	1
Violent Offences	0.229	0.421	0	1
Sexual Offences	0.007	0.082	0	1
Criminal Damage	0.007	0.082	0	1
Drug Offences	0.020	0.141	0	1
Motoring Offences	0.020	0.141	0	1
Minor Offences	0.067	0.251	0	1
Observations	297			

Notes: This table reports the summary statistics of the two samples from the 1963 and 1968 cohorts of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. In Panel A (B) the means, standard deviations, minima and maxima of the 1963 (1968) cohort of offenders' observable characteristics are reported, measured at the time the offenders were sentenced to either youth custody/detention centres (young offender institutions) or adults' prisons. If the offender was sentenced for multiple offences at the court appearance, the characteristics of the offence for which the sentence was longer are reported.

Table 2. FIRST STAGE - PARAMETRIC APPROACH

Independent Variable: Dummy=1 if Offender is 21 at Court Appearance

	1963 cohort		1968 cohort	
	(1)	(2)	(3)	(4)
Sentence to Adults' Prison	0.761***	0.748***	0.891***	0.862***
	(0.039)	(0.039)	(0.021)	(0.043)
Age at Court	0.000***	0.000***	0.000**	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Male		-0.038		-0.051
		(0.053)		(0.074)
Sentence Length		0.002		0.003
		(0.002)		(0.004)
Other Controls		X		X
Centered R^2	0.793	0.806	0.882	0.893
Uncentered R^2	0.910	0.916	0.935	0.941
Observations	558		297	

Notes: The table reports the first stages, i.e. how much of being sentenced to an adults' prison depends on actually being 21. Columns (1)-(2) refer to the sample from the 1963 cohort, which includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14; Columns (3)-(4) refer to the sample form the 1968 cohort, which includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. Robust standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. In Columns (2)-(4) control variables are included: gender, sentence length and other controls (ethnicity, plea, proceedings, month of birth, type of offence and age at which the offender committed the first offence).

Table 3. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES (IN THE NEXT NINE YEARS)

Independent Variable: Adults' Prison	365 days	Ludwig and Miller (2007)	274 days	183 days
	(1)	(2)	(3)	(5)
Likelihood to reoffend	-0.270**	-0.271**	-0.256*	-0.169
	(0.126)	(0.128)	(0.145)	(0.201)
Mean in Control Group	0.737			
Offences	-3.705***	-3.730***	-3.542**	-3.055*
	(1.330)	(1.339)	(1.395)	(1.755)
Mean in Control Group	5.243			
Times to court	-1.809***	-1.834***	-1.861**	-1.774*
	(0.681)	(0.690)	(0.748)	(0.983)
Mean in Control Group	2.749			
Sentences to prison	-1.201	-1.238	-1.255	-0.929
	(0.789)	(0.796)	(0.827)	(0.948)
Mean in Control Group	1.848			
Observations	558	542	457	288

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The time window over which the outcome variables are observed is nine years. Each set of rows corresponds to a different outcome variable: the likelihood to reoffend (a dummy equal to 1 if the offender commits at least 1 offence in the future time window), the number of offences the offender commits, the times he/she is brought to court and the times he/she is sentenced to prison again. The estimation is conducted through a local linear regression constructed with a triangular kernel regression. Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES BY TYPE OF OFFENCE (IN THE NEXT NINE YEARS)

Independent Variable: Adults' Prison	365 days	Ludwig and Miller (2007)	274 days	183 days
	(1)	(2)	(3)	(5)
Thefts	-1.183*	-1.079	-1.262**	-1.082
	(0.610)	(0.696)	(0.602)	(0.694)
Mean in Control Group	1.835			
Violent offences	-0.907**	-0.912**	-0.922**	-1.134*
	(0.390)	(0.398)	(0.454)	(0.620)
Mean in Control Group	0.613			
Sexual offences	-0.028	-0.029	-0.021	-0.011
	(0.048)	(0.048)	(0.041)	(0.012)
Mean in Control Group	0.041			
Burglaries/robberies	-0.563*	-0.577*	-0.562*	-0.315
	(0.316)	(0.318)	(0.332)	(0.434)
Mean in Control Group	0.716			
Minor offences	-0.415	-0.410	-0.348	-0.356
	(0.380)	(0.387)	(0.438)	(0.614)
Mean in Control Group	0.663			
Frauds	-0.191	-0.019	0.002	0.296
	(0.268)	(0.277)	(0.278)	(0.297)
Mean in Control Group	0.514			
Criminal Damage	-0.216**	-0.211**	-0.155	-0.101
	(0.095)	(0.096)	(0.104)	(0.132)
Mean in Control Group	0.144			
Drug offences	0.166	0.164	0.155	0.172
	(0.126)	(0.128)	(0.137)	(0.167)
Mean in Control Group	0.165			
Motoring Offences	-0.051	-0.054	-0.095	-0.160**
	(0.112)	(0.111)	(0.100)	(0.071)
Mean in Control Group	0.082			
Other offences† †	-0.421**	-0.418**	-0.430**	-0.448*
	(0.208)	(0.208)	(0.211)	(0.249)
Mean in Control Group	0.453			
Observations	558	542	457	288

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The time window over which the outcome variables are observed is nine years. Each set of rows corresponds to a different type of offence. The estimation is conducted through a local linear regression constructed with a triangular kernel regression. Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. † Other offences include mainly: failing to surrender to bail (65.63%), going equipped for stealing (20.79%) and other offences against the state or public order (6.55%).

Table 5. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES & VS. YOUNG OFFENDER INSTITUTIONS (IN THE 2.5 YEARS FOLLOWING RELEASE)

Independent Variable: Adults' Prison	365 days	Ludwig and Miller (2007)	274 days	183 days
	(1)	(2)	(3)	(5)
Panel A. 1963 Cohort				
Likelihood to reoffend	-0.422***	-0.428***	-0.442**	-0.357
	(0.154)	(0.158)	(0.182)	(0.251)
Mean in Control Group	0.573			
Offences	-1.398*	-1.392*	-1.246	-0.906
	(0.805)	(0.820)	(0.928)	(1.276)
Mean in Control Group	2.097			
Times to court	-0.770*	-0.774*	-0.755	-0.538
	(0.394)	(0.403)	(0.465)	(0.660)
Mean in Control Group	1.165			
Sentences to prison	-0.527	-0.536	-0.526	-0.428
	(0.484)	(0.493)	(0.557)	(0.768)
Mean in Control Group	0.694			
Observations	445	435	364	228
Panel B. 1968 Cohort				
Likelihood to reoffend	0.135	0.134	0.138	0.170
	(0.147)	(0.150)	(0.174)	(0.226)
Mean in Control Group	0.606			
Offences	1.232	1.191	1.026	0.181
	(1.177)	(1.203)	(1.362)	(1.779)
Mean in Control Group	2.855			
Times to court	0.412	0.401	0.446	0.330
	(0.433)	(0.443)	(0.506)	(0.642)
Mean in Control Group	1.303			
Sentences to prison	1.503**	1.519**	1.600*	1.528
	(0.729)	(0.743)	(0.823)	(1.112)
Mean in Control Group	0.879			
Observations	297	291	254	182

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort (Panel A) and the effects of experiencing prison rather than young offender institutions for the 1968 cohort (Panel B) of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. The time window over which the outcome variables are observed is 2.5 years following release from custody. Each set of rows corresponds to a different outcome variable: the likelihood to reoffend (a dummy equal to 1 if the offender commits at least 1 offence in the future time window), the number of offences the offender commits, the times he/she is brought to court and the times he/she is sentenced to prison again. The estimation is conducted through a local linear regression constructed with a triangular kernel regression. Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES & VS. YOUNG OFFENDER INSTITUTIONS BY TYPE OF OFFENCE (IN THE 2.5 YEARS FOLLOWING RELEASE)

Independent Variable: Adults' Prison	365 days	Ludwig and Miller (2007)	274 days	183 days
	(1)	(2)	(3)	(5)
Panel A. 1963 Cohort				
Burglaries and Robberies	0.154	0.262	0.277	0.550
	(0.273)	(0.322)	(0.330)	(0.494)
Mean in Control Group	0.316			
Thefts	-0.770**	-0.828**	-0.841**	-0.733
	(0.331)	(0.364)	(0.369)	(0.454)
Mean in Control Group	0.767			
Violent Offences	-0.649**	-0.650**	-0.640*	-0.779
	(0.308)	(0.315)	(0.369)	(0.543)
Mean in Control Group	0.301			
Observations	445	435	364	228
Panel B. 1968 Cohort				
Burglaries and Robberies	0.803*	0.801*	0.752	0.739
	(0.460)	(0.472)	(0.549)	(0.729)
Mean in Control Group	0.467			
Thefts	0.235	-0.022	-0.002	-0.640
	(0.456)	(0.506)	(0.501)	(0.690)
Mean in Control Group	1.055			
Violent Offences	-0.060	-0.061	-0.040	0.020
	(0.222)	(0.229)	(0.270)	(0.363)
Mean in Control Group	0.206			
Observations	297	291	254	182

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort (Panel A) and the effects of experiencing prison rather than young offender institutions for the 1968 cohort (Panel B) of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. The time window over which the outcome variables are observed is 2.5 years following release from custody. Each set of rows corresponds to a different type of offence. The estimation is conducted through a local linear regression constructed with a triangular kernel regression. Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES (IN THE NEXT NINE YEARS) - PARAMETRIC APPROACH

Independent Variable: Adults' Prison	(1)	(2)	(3)	(4)	(5)	(6)
Likelihood to reoffend	-0.244**	-0.164*	-0.248**	-0.173*	-0.265*	-0.226*
	(0.101)	(0.094)	(0.099)	(0.091)	(0.146)	(0.127)
Offences	-3.142**	-2.209*	-3.289**	-2.430*	-3.096*	-2.201
	(1.311)	(1.306)	(1.332)	(1.317)	(1.689)	(1.650)
Times to court	-1.460**	-1.097*	-1.481**	-1.169*	-1.754**	-1.476*
	(0.625)	(0.614)	(0.631)	(0.614)	(0.889)	(0.830)
Sentences to prison	-0.757	-0.273	-0.783	-0.303	-1.630*	-1.342
	(0.724)	(0.707)	(0.750)	(0.715)	(0.973)	(0.964)
Age at Court	X	X	X	X	X	X
Age*prison			X	X	X	X
Age^2*prison					X	X
Age at $Court^2$					X	X
Controls		X		X		X
Observations	558	557	558	557	558	557

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The time window over which the outcome variables are observed is nine years. Each set of rows corresponds to a different outcome variable: the likelihood to reoffend (a dummy equal to 1 if the offender commits at least 1 offence in the future time window), the number of offences the offender commits, the times he/she is brought to court and the times he/she is sentenced to prison again. The estimation is conducted through a parametric approach using a polynomial up to the second order. I also allow the treatment to have a different impact before and after the cut-off by including an interaction of the centred variable and the treatment variable (age at court*prison). Robust Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The control variables in the even Columns include gender, sentence length, ethnicity, plea, proceedings, month of birth, type of offence, age at which the offender committed the first offence.

Table 8. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES (IN THE NEXT NINE YEARS) BY OFFENCE TYPE - PARAMETRIC APPROACH

Independent Variable: Adults' Prison

	(1)	(2)	(3)	(4)	(5)	(6)
Thefts	-0.778	-0.124	-0.840	-0.204	-0.944	-0.367
	(0.626)	(0.628)	(0.635)	(0.632)	(0.692)	(0.688)
Violent offences	-0.818***	-0.892***	-0.843***	-0.927***	-0.918	-1.080*
	(0.304)	(0.322)	(0.323)	(0.335)	(0.561)	(0.563)
Sexual offences	-0.014	-0.014	-0.016	-0.010	-0.029	-0.010
	(0.050)	(0.052)	(0.053)	(0.053)	(0.054)	(0.059)
Burglary/robbery	-0.372	-0.219	-0.414	-0.279	-0.609	-0.480
	(0.340)	(0.348)	(0.341)	(0.346)	(0.379)	(0.372)
Minor offences	-0.385	-0.406	-0.453	-0.471	-0.419	-0.558
	(0.298)	(0.306)	(0.312)	(0.316)	(0.513)	(0.484)
Fraud	-0.385	-0.301	-0.383	-0.312	0.236	0.495
	(0.273)	(0.280)	(0.261)	(0.266)	(0.276)	(0.304)
Criminal damage	-0.249***	-0.255***	-0.259***	-0.257***	-0.103	-0.118
	(0.086)	(0.089)	(0.089)	(0.091)	(0.124)	(0.134)
Drug offences	0.182	0.218*	0.208*	0.229*	0.082	0.146
	(0.131)	(0.128)	(0.124)	(0.122)	(0.147)	(0.136)
Motoring offences	-0.001	-0.013	-0.017	-0.026	-0.067	-0.101
	(0.117)	(0.113)	(0.116)	(0.111)	(0.111)	(0.113)
Other offences†	-0.459**	-0.353	-0.411*	-0.322	-0.336	-0.141
	(0.226)	(0.254)	(0.222)	(0.249)	(0.260)	(0.286)
Age at Court	X	X	X	X	X	X
Age*prison			X	X	X	X
Age^2*prison					X	X
Age at $Court^2$					X	X
Controls		X		X		X
Observations	558	557	558	557	558	557

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The time window over which the outcome variables are observed is nine years. Each set of rows corresponds to a different type of offence. The estimation is conducted through a parametric approach using a polynomial up to the second order. I also allow the treatment to have a different impact before and after the cut-off by including an interaction of the centred variable and the treatment variable (age at court*prison). Robust Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The control variables in the even Columns include gender, sentence length, ethnicity, plea, proceedings, month of birth, type of offence, age at which the offender committed the first offence. † Other offences include mainly: failing to surrender to bail (65.63%), going equipped for stealing (20.79%) and other offences against the state or public order (6.55%).

Table 9. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES (IN THE NEXT NINE YEARS) - FULL SAMPLE

Independent Variable: Adults' Prison	365 days	Ludwig and Miller (2007)	274 days	183 days
	(1)	(2)	(3)	(5)
Likelihood to reoffend	-0.250**	-0.252**	-0.243*	-0.192
	(0.109)	(0.111)	(0.125)	(0.159)
Mean in Control Group	0.779			
Offences	-4.609***	-4.635***	-4.502***	-5.149***
	(1.343)	(1.354)	(1.431)	(1.838)
Mean in Control Group	6.000			
Times to court	-2.190***	-2.218***	-2.322***	-2.784***
	(0.668)	(0.676)	(0.733)	(0.934)
Mean in Control Group	3.061			
Sentences to prison	-2.029***	-2.053***	-1.989***	-1.963**
	(0.706)	(0.710)	(0.737)	(0.864)
Mean in Control Group	2.285			
Observations	706	690	578	382

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and as a robustness check I also include offenders who committed their first offence when younger than 14. The time window over which the outcome variables are observed is nine years. Each set of rows corresponds to a different outcome variable: the likelihood to reoffend (a dummy equal to 1 if the offender commits at least 1 offence in the future time window), the number of offences the offender commits, the times he/she is brought to court and the times he/she is sentenced to prison again. The estimation is conducted through a local linear regression constructed with a triangular kernel regression. Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES (IN THE NEXT NINE YEARS) BY OFFENCE TYPE - FULL SAMPLE

Independent Variable: Adults' Prison	365 days	Ludwig and Miller (2007)	274 days	183 days
	(1)	(2)	(3)	(5)
Thefts	-1.154*	-1.927**	-1.389**	-1.839**
	(0.627)	(0.927)	(0.665)	(0.856)
	2.043			
Violent offences	-1.176***	-1.164***	-1.060***	-1.166**
	(0.331)	(0.336)	(0.375)	(0.488)
	0.745			
Sexual offences	-0.022	-0.025	-0.036	-0.055*
	(0.040)	(0.039)	(0.036)	(0.032)
	0.034			
Burglaries/robberies	-1.004***	-1.012***	-0.987**	-0.889*
	(0.366)	(0.368)	(0.388)	(0.460)
	0.862			
Minor offences	-0.450	-0.436	-0.305	-0.339
	(0.299)	(0.304)	(0.333)	(0.422)
	0.779			
Frauds	-0.309	-0.298	-0.205	-0.137
	(0.259)	(0.262)	(0.282)	(0.345)
	0.607			
Criminal Damage	-0.160**	-0.153*	-0.076	-0.046
	(0.079)	(0.079)	(0.083)	(0.094)
	0.169			
Drug offences	0.169	0.165	0.138	0.116
	(0.107)	(0.108)	(0.117)	(0.144)
	0.175			
Motoring Offences	-0.061	-0.064	-0.112	-0.236**
	(0.103)	(0.102)	(0.099)	(0.106)
	0.092			
Other offences †	-0.511***	-0.514***	-0.542***	-0.605***
	(0.169)	(0.169)	(0.173)	(0.210)
	0.463			
Observations	706	690	578	382

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and as a robustness check I also include offenders who committed their first offence when younger than 14. The time window over which the outcome variables are observed is nine years. Each set of rows corresponds to a different type of offence. The estimation is conducted through a local linear regression constructed with a triangular kernel regression. Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. † Other offences include mainly: failing to surrender to bail (65.63%), going equipped for stealing (20.79%) and other offences against the state or public order (6.55%).

Table 11. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES (IN THE FOUR YEARS FOLLOWING RELEASE)

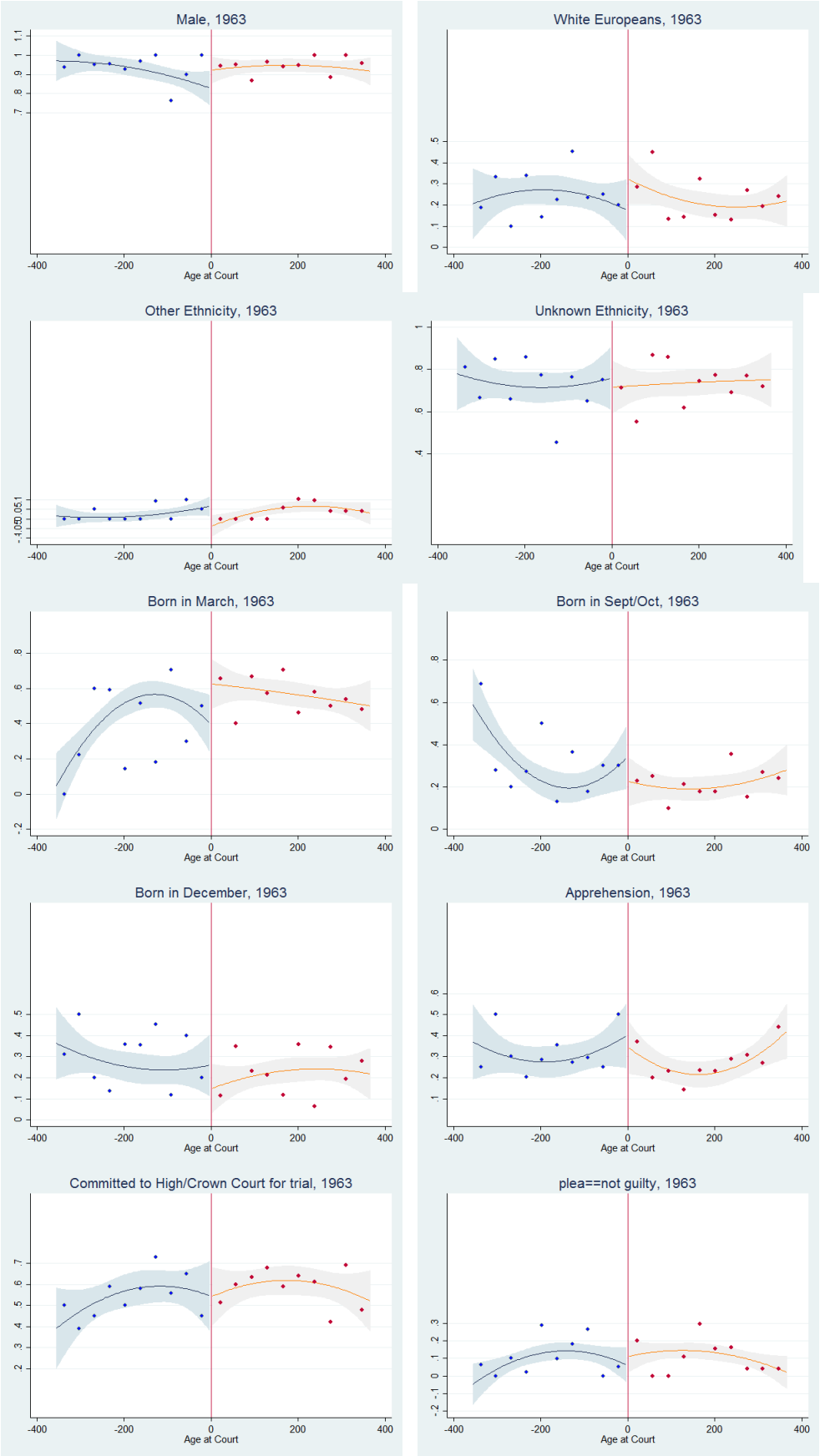
Independent Variable: Adults' Prison	365 days	Ludwig and Miller (2007)	274 days	183 days
	(1)	(2)	(3)	(5)
Likelihood to reoffend	-0.469***	-0.474***	-0.513***	-0.525***
	(0.128)	(0.130)	(0.147)	(0.202)
Mean in Control Group	0.672			
Offences	-2.365**	-2.371**	-2.341**	-2.073
	(0.960)	(0.971)	(1.038)	(1.343)
Mean in Control Group	3.021			
Times to court	-1.261***	-1.267***	-1.286***	-1.141*
	(0.424)	(0.430)	(0.476)	(0.650)
Mean in Control Group	1.656			
Sentences to prison	-0.663	-0.675	-0.641	-0.294
	(0.641)	(0.647)	(0.681)	(0.828)
Mean in Control Group	1.104			
Observations	555	539	454	286

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The time window over which the outcome variables are observed is four years after release. Each set of rows corresponds to a different outcome variable: the likelihood to reoffend (a dummy equal to 1 if the offender commits at least 1 offence in the future time window), the number of offences the offender commits, the times he/she is brought to court and the times he/she is sentenced to prison again. The estimation is conducted through a local linear regression constructed with a triangular kernel regression. Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

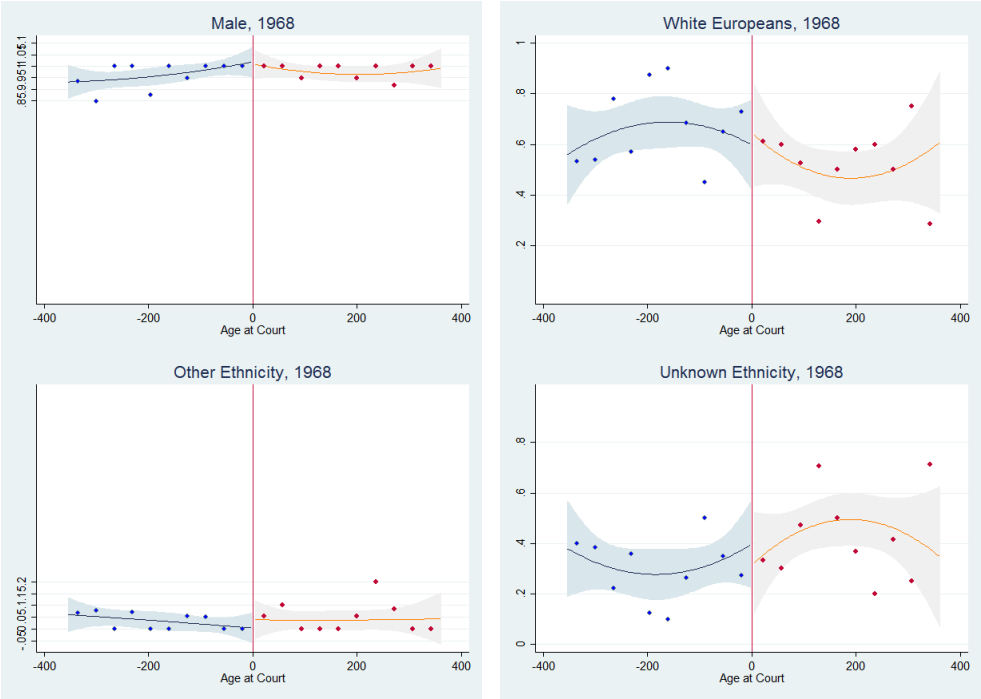
SUPPLEMENTAL ONLINE APPENDIX

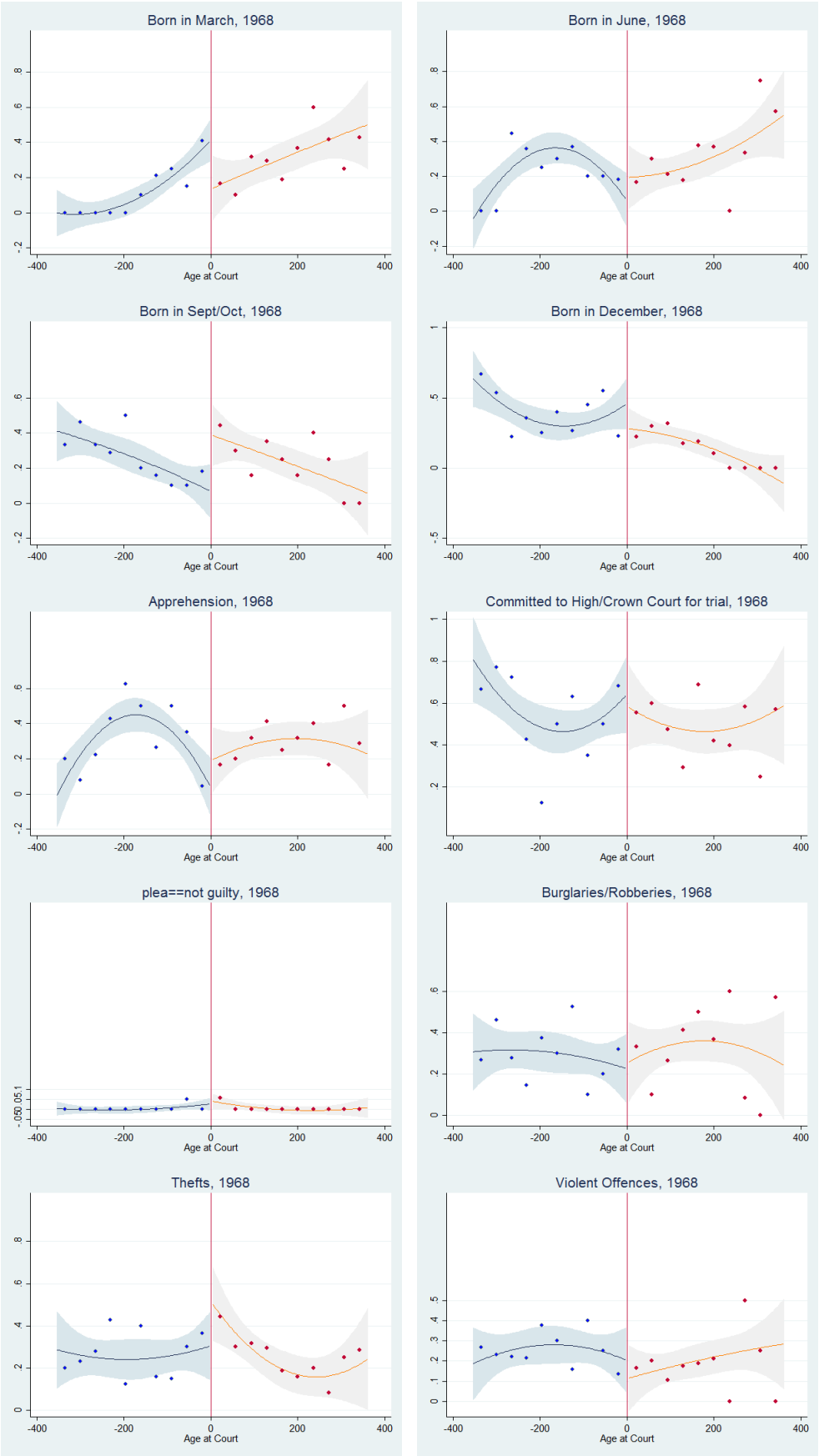
Figure A 1. PRE-TREATMENT VARIABLES (20 BINS)

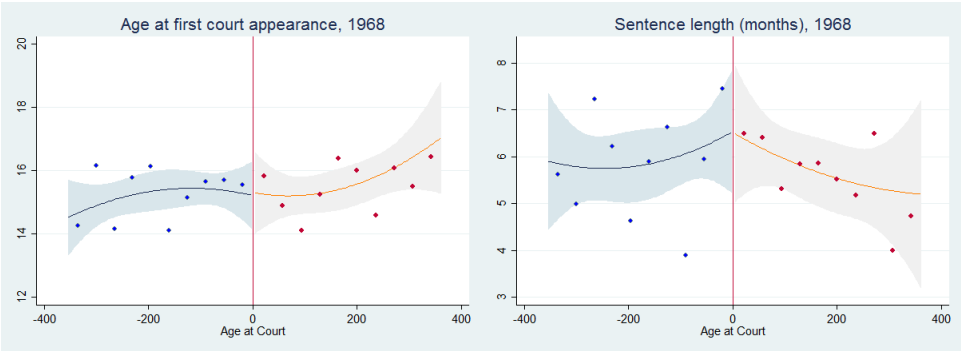
Panel A – 1963 cohort



Panel B – 1968 cohort




Born in March, 1968
Born in June, 1968
Born in Sept/Oct, 1968
Born in December, 1968
Apprehension, 1968
Committed to High/Crown Court for trial, 1968
plea==not guilty, 1968
Burglaries/Robberies, 1968
Thefts, 1968
Violent Offences, 1968
Age at Court
-400
-200
0
200
400



Notes: The figures above refer to the two samples from the 1963 (Panel A) and 1968 (Panel B) cohorts of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. On the x axis lies the variable age at court appearance, centred at 0 when age at court appearance is 21. Age at court appearance is positive (negative) when young offenders are older (younger) than 21. On the y axis there are the shares of pre-treatment characteristics: gender, month of birth, ethnicity, age at first court appearance, sentence length, proceedings type, plea and type of offence committed when 20/21 years old. The coloured areas represent the 90% confidence intervals around the separate lines of quadratic best fit plotted on the left and right hand side of the cut-off.

Appendix Table A 1. ANNUAL AVERAGE POPULATION IN PRISON DEPARTMENT ESTABLISHMENTS & CERTIFIED NORMAL ACCOMMODATION (CNA) ON 30 JUNE BY TYPE OF ESTABLISHMENT IN ENGLAND & WALES, 1983-1985

Type Of Establishment	1983		1984		1985	
	Average Pop.	CNA	Average Pop.	CNA	Average Pop.	CNA
Local Prisons	15,801	10,864	15,219	10,934	16,512	10,949
Open Prisons	3,104	3,246	2,971	3,281	3,194	3,406
Closed Training Prisons	12,368	11,690	12,096	11,821	13,050	12,669
Open Youth Custody Centres	1,425	1,557	1,390	1,613	1,351	1,496
Closed Youth Custody Centres	5,066	5,280	5,244	5,297	5,488	5,375
Senior Detention Centres	1,144	1,550	943	1,459	968	1,341

Notes: The table reports the annual average population in the prison department establishments relevant to the paper and their certified normal accommodation (CNA) on 30th of June in England and Wales in 1983-1985.

Source: Home Office Statistical bulletin, The Prison Population in 1986.

Appendix Table A 2. ANNUAL AVERAGE POPULATION IN PRISON DEPARTMENT ESTABLISHMENTS & CERTIFIED NORMAL ACCOMMODATION (CNA) ON 30 JUNE BY TYPE OF ESTABLISHMENT IN ENGLAND & WALES, 1988-1990

Type Of Establishment	1988		1989		1990	
	Average Pop.	CNA	Average Pop.	CNA	Average Pop.	CNA
Local Prisons	17,298	11,237	17,354	12,347	15,551	11,460
Open Prisons	3,141	3,312	3,252	3,700	3,187	3,496
Closed Training Prisons	15,525	16,090	16,543	17,086	16,651	17,073
Juvenile Young Offender Institutions	293	502	330	409	285	398
Short Sentence Young Offender Institutions	438	694	340	570	296	448
Other Open Young Offender Institutions	1,174	1,472	976	1,456	877	1,312
Other Closed Young Offender Institutions	5,102	5,361	4,863	5,191	4,232	4,711

Notes: The table reports the annual average population in the prison department establishments relevant to the paper and their certified normal accommodation (CNA) on 30th of June in England and Wales in 1988-1990. Young offender institutions were established in October 1988, hence their CNA in 1988 is measured on the 30th of December.

Source: Home Office Statistical bulletin, The Prison Population in 1992.

Appendix Table A 3. MONITORED ACTIVITIES OFFERED BY FUNCTIONAL GROUPS OF ESTABLISHMENTS, % OF GROUP OFFERING EACH ACTIVITY IN 1991/2

	Male Local (no London)	Male Dispersal	Male B Trainer (no London)	Male C Trainer	Male D Trainer	Female Local/Remand	Female Trainer	Closed YOI	Open YOI	Male Remand (no London)	London
Daytime Education	100	100	100	85	100	100	100	92	100	100	100
VT Courses	6	75	80	70	57	25	67	75	75	-	-
CIT Courses	18	50	80	70	71	25	-	75	100	-	-
Works Party	94	75	80	100	100	75	67	75	100	10	83
PSIF Workshops	88	100	80	92	86	75	33	58	25	10	67
Farms Party	12	-	40	54	71	25	33	33	50	-	-
Gardens Party	82	100	80	77	86	75	67	75	100	10	67
Kitchens	94	100	100	92	100	75	67	75	100	20	67
Other Domestic	100	100	100	100	100	100	100	100	100	100	100
Induction	29	75	100	77	86	25	67	75	100	30	-
Other (Specify)	88	50	100	92	86	75	100	83	75	70	33
All Other	88	100	100	92	100	75	67	92	100	30	83
PE	100	100	100	92	100	100	100	100	100	100	100
Evening Education	94	100	100	100	86	100	100	83	100	30	100
Chaplaincy	100	100	100	92	100	100	100	92	100	90	100

Notes: The table reports the percentage of functional groups of establishments offering each set of *monitored activities in 1991/2*. *VT* and *CIT courses* are generally courses of bricklaying, plumbing, electrical installation, painting and decorating, motor mechanics, etc. *Work parties* are groups that help the establishments to operate. *Prison Service Industries and Farms (PSIF)* are workshops ranging from sewing mailbags to highly technical (engineering/construction) work. *Gardens Party* and *Kitchens* "have a dual function in most establishments in that they serve both the institution and the inmate by offering training within the networking environment" (Her Majesty's Chief Inspector of Prisons for England and Wales, 1993). *Other domestic* activities indicate other work activities such as cleaning. *Induction* is "the process by which inmates are introduced to the establishment's routines, rules and, in most cases, opportunities" (Her Majesty's Chief Inspector of Prisons for England and Wales, 1993). *Other (specify)* activities are generally "parties, groups or individuals who are trusted to help prison staff run various parts of the establishment" (Her Majesty's Chief Inspector of Prisons for England and Wales, 1993). *All Other* occupations are pre-release courses. *PE* is physical education.

Source: Her Majesty's Chief Inspector of Prisons for England and Wales (1993), *Doing Time or Using Time, Report of a Review of Regimes in Prison Service Establishments in England and Wales*, London HMSO.

Appendix Table A 4. PROCEEDINGS CHARACTERISTICS IN MORE DETAIL

	Mean (1)	Sd (2)	Min (3)	Max (4)
Panel A. 1963 cohort				
Proceedings				
Apprehension	0.292	0.455	0	1
Summons by police	0.016	0.126	0	1
Committed for sentence - young offenders institution (over 6 months)	0.002	0.042	0	1
Committed for sentence for offences triable either way	0.032	0.177	0	1
Committed to High/Crown Court for trial on indictment	0.573	0.495	0	1
Committed to High/Crown Court for sentence for offences tried summarily	0.002	0.042	0	1
Appearance for sentence after deferment without further conviction	0.004	0.060	0	1
Notice of Transfer	0.004	0.060	0	1
Breach of an order for conditional discharge	0.002	0.042	0	1
Breach of requirements of probation order	0.002	0.042	0	1
Breach of requirements of probation order over 1 year and up to 2 years (dealt with for original offence)	0.007	0.084	0	1
Breach of requirements of probation order over 2 years (dealt with for original offence)	0.004	0.060	0	1
Breach of probation order for 6 months following the commission of a fresh offence	0.002	0.042	0	1
Breach of probation order with a term of over 1 year and up to 2 years following the commission of a fresh offence	0.007	0.084	0	1
Breach of requirements of community service order	0.002	0.042	0	1
Breach of requirements of community service order; order revoked (dealt with for original offence)	0.016	0.126	0	1
Breach of sentence of imprisonment suspended for 1 year, no supervision order ever in force Breach of fully suspended sentence of imprisonment	0.007	0.084	0	1
Breach of sentence of imprisonment suspended for over 1 year and up to 2 years, no supervision order ever in force	0.027	0.162	0	1
Observations	558			

	Mean	Sd	Min	Max
	(1)	(2)	(3)	(4)
Panel B. 1968 cohort				
Proceedings				
Summons by police	0.020	0.141	0	1
Summons other than by police	0.007	0.082	0	1
Committed for sentence for offences triable either way	0.054	0.227	0	1
Committed to High/Crown Court for trial on indictment	0.534	0.500	0	1
Committed to High/Crown Court for sentence for offences tried summarily	0.003	0.058	0	1
Breach of an order for conditional discharge	0.010	0.100	0	1
Breach of probation order for 6 months following the commission of a fresh offence	0.034	0.181	0	1
Breach of requirements of community service order	0.047	0.213	0	1
Breach of sentence of imprisonment suspended for 1 year, no supervision order ever in force	0.007	0.082	0	1
Breach of fully suspended sentence of imprisonment				
Summons by police	0.020	0.141	0	1
Summons other than by police	0.007	0.082	0	1
Committed for sentence for offences triable either way	0.054	0.227	0	1
Committed to High/Crown Court for trial on indictment	0.534	0.500	0	1
Committed to High/Crown Court for sentence for offences tried summarily	0.003	0.058	0	1
Breach of an order for conditional discharge	0.010	0.100	0	1
Breach of probation order for 6 months following the commission of a fresh offence	0.034	0.181	0	1
Breach of requirements of community service order	0.047	0.213	0	1
Breach of sentence of imprisonment suspended for 1 year, no supervision order ever in force	0.007	0.082	0	1
Breach of fully suspended sentence of imprisonment				
Summons by police	0.020	0.141	0	1
Summons other than by police	0.007	0.082	0	1
Committed for sentence - young offenders institution (over 6 months)	0.000	0.000	0	0
Committed for sentence for offences triable either way	0.054	0.227	0	1
Committed to High/Crown Court for trial on indictment	0.534	0.500	0	1
Committed to High/Crown Court for sentence for offences tried summarily	0.003	0.058	0	1
Breach of an order for conditional discharge	0.010	0.100	0	1
Breach of probation order for 6 months following the commission of a fresh offence	0.034	0.181	0	1
Breach of requirements of community service order	0.047	0.213	0	1
Breach of sentence of imprisonment suspended for 1 year, no supervision order ever in force	0.007	0.082	0	1
Breach of fully suspended sentence of imprisonment				
Committed to High/Crown Court for trial on indictment	0.534	0.500	0	1
Committed to High/Crown Court for sentence for offences tried summarily	0.003	0.058	0	1
Breach of an order for conditional discharge	0.010	0.100	0	1
Breach of probation order for 6 months following the commission of a fresh offence	0.034	0.181	0	1
Breach of requirements of community service order	0.047	0.213	0	1
Breach of sentence of imprisonment suspended for 1 year, no supervision order ever in force	0.007	0.082	0	1
Breach of fully suspended sentence of imprisonment				

	Mean (1)	Sd (2)	Min (3)	Max (4)
Panel B. 1968 cohort – continuation				
Proceedings				
Committed to High/Crown Court for trial on indictment	0.534	0.500	0	1
Committed to High/Crown Court for sentence for offences tried summarily	0.003	0.058	0	1
Breach of an order for conditional discharge	0.010	0.100	0	1
Breach of probation order for 6 months following the commission of a fresh offence	0.034	0.181	0	1
Breach of requirements of community service order	0.047	0.213	0	1
Breach of sentence of imprisonment suspended for 1 year, no supervision order ever in force	0.007	0.082	0	1
Breach of fully suspended sentence of imprisonment				
Committed to High/Crown Court for trial on indictment	0.534	0.500	0	1
Committed to High/Crown Court for sentence for offences tried summarily	0.003	0.058	0	1
Breach of an order for conditional discharge	0.010	0.100	0	1
Breach of probation order for 6 months following the commission of a fresh offence	0.034	0.181	0	1
Breach of requirements of community service order	0.047	0.213	0	1
Breach of sentence of imprisonment suspended for 1 year, no supervision order ever in force	0.007	0.082	0	1
Breach of fully suspended sentence of imprisonment				
Observations	296			

Notes: This table reports the means, standard deviations, minima and maxima of the detailed proceedings of the two samples from the 1963 (Panel A) and 1968 (Panel B) cohorts of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate) at the time the offenders were sentenced to either youth custody/detention centres/young offender institutions or adults' prisons. The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. If the offender was sentenced for multiple offences at the court appearance, the proceedings of the offence for which the sentence was longer are reported.

Appendix Table A 5. OFFENCE CHARACTERISTICS IN MORE DETAIL

	Mean	Sd	Min	Max
	(1)	(2)	(3)	(4)
Panel A. 1963 cohort				
Offence				
Manslaughter	0.002	0.042	0	1
Wounding and other acts endangering life (felonies)	0.014	0.119	0	1
Malicious wounding and other like offences (misdemeanours)	0.131	0.338	0	1
Assault	0.009	0.094	0	1
Rape	0.005	0.073	0	1
Indecent assault on a female	0.004	0.060	0	1
Unlawful sexual intercourse with girl under 16	0.002	0.042	0	1
Burglary in a dwelling (1979-)	0.158	0.365	0	1
Burglary, other than a dwelling	0.156	0.363	0	1
Going equipped for stealing	0.005	0.073	0	1
Robbery and assaults with intent to rob	0.054	0.226	0	1
Stealing in a dwelling other than from automatic machines and meters	0.002	0.042	0	1
Stealing by an employee (1976-)	0.004	0.060	0	1
Theft from vehicle	0.018	0.133	0	1
Stealing from shops and stalls (shoplifting) (1976-)	0.043	0.203	0	1
Stealing from automatic machines and meters (1976-)	0.009	0.094	0	1
Other stealings and unauthorised takings	0.115	0.319	0	1
Other frauds	0.038	0.190	0	1
Receiving/handling stolen goods	0.052	0.222	0	1
Arson	0.005	0.073	0	1
Other criminal Damage	0.005	0.073	0	1
Uttering or possessing counterfeit coin	0.011	0.103	0	1
Other offences (against the State and Public Order)	0.023	0.151	0	1
Perjury and false statements	0.002	0.042	0	1
Misuse of Drugs	0.020	0.139	0	1
Possession of firearms by persons previously convicted of crime	0.002	0.042	0	1
Bail Act 1976	0.005	0.073	0	1
Assault	0.014	0.119	0	1
Interference with a motor vehicle	0.004	0.060	0	1
Criminal and malicious damage	0.013	0.111	0	1
Non-patrial having only limited leave remains in United Kingdom beyond the time limit	0.002	0.042	0	1
Theft or unauthorised taking of motor vehicle	0.059	0.236	0	1
Dangerous driving	0.002	0.042	0	1
Driving licence offences	0.014	0.119	0	1
Observations	558			

	Mean (1)	Sd (2)	Min (3)	Max (4)
Panel B. 1968 cohort				
Offence				
Manslaughter	0.010	0.100	0	1
Wounding and other acts endangering life (felonies)	0.003	0.058	0	1
Malicious wounding and other like offences (misdemeanours)	0.186	0.390	0	1
Assault	0.003	0.058	0	1
Indecent assault on a female	0.003	0.058	0	1
Burglary in a dwelling (1979-)	0.145	0.353	0	1
Aggravated burglary in a dwelling	0.007	0.082	0	1
Burglary, other than a dwelling	0.145	0.353	0	1
Going equipped for stealing, etc.	0.007	0.082	0	1
Robbery and assaults with intent to rob	0.010	0.100	0	1
Blackmail	0.007	0.082	0	1
Kidnapping	0.003	0.058	0	1
Stealing in a dwelling other than from automatic machines and meters	0.007	0.082	0	1
Theft from vehicle	0.041	0.198	0	1
Stealing from shops and stalls (shoplifting) (1976-)	0.041	0.198	0	1
Stealing from automatic machines and meters (1976-)	0.003	0.058	0	1
Theft or unauthorised taking of motor vehicle	0.054	0.227	0	1
Other stealing and unauthorised takings	0.101	0.302	0	1
Other frauds	0.024	0.152	0	1
Receiving/handling stolen goods	0.017	0.129	0	1
Other criminal Damage	0.007	0.082	0	1
Uttering or possessing counterfeit coin	0.007	0.082	0	1
Violent disorder	0.014	0.116	0	1
Other offences (against the State and Public Order)	0.027	0.162	0	1
Perjury	0.003	0.058	0	1
Gross indecency with a child	0.003	0.058	0	1
Misuse of Drugs	0.020	0.141	0	1
Absconding from lawful custody	0.003	0.058	0	1
Bail Act 1976	0.010	0.100	0	1
Assault	0.027	0.162	0	1
Interference with a motor vehicle	0.007	0.082	0	1
Stealing and unauthorised taking	0.020	0.141	0	1
Criminal and malicious damage	0.003	0.058	0	1
Dangerous driving	0.020	0.141	0	1
Driving licence related offences	0.010	0.100	0	1
Observations	296			

Notes: This table reports the means, standard deviations, minima and maxima of the detailed offences of the two samples from the 1963 (Panel A) and 1968 (Panel B) cohorts of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate) at the time the offenders were sentenced to either youth custody/detention centres/young offender institutions or adults' prisons. The 1963 sample includes offenders who were sentenced either to youth custody/detention centres or to adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. If the offender was sentenced for multiple offences at the court appearance, the offence for which the sentence was longer is reported.

Appendix Table A 6. EFFECTS OF ADULTS' PRISON VS. YOUTH CUSTODY/DETENTION CENTRES & VS. YOUNG OFFENDER INSTITUTIONS BY TYPE OF OFFENCE (IN THE 2.5 YEARS FOLLOWING RELEASE) - PARAMETRIC APPROACH

Independent Variable: Adults' Prison	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: 1963 cohort						
Likelihood to reoffend	-0.346***	-0.354***	-0.356***	-0.363***	-0.521**	-0.522***
	(0.127)	(0.126)	(0.126)	(0.124)	(0.214)	(0.198)
Offences	-1.272*	-1.224*	-1.302**	-1.250*	-1.334	-1.113
	(0.676)	(0.708)	(0.658)	(0.699)	(1.004)	(1.011)
Times to court	-0.663**	-0.664**	-0.672**	-0.671**	-0.817	-0.824*
	(0.316)	(0.318)	(0.313)	(0.317)	(0.519)	(0.492)
Sentences to prison	-0.298	-0.404	-0.363	-0.457	-0.809	-0.697
	(0.427)	(0.457)	(0.415)	(0.448)	(0.623)	(0.642)
Age at Court	X	X	X	X	X	X
Age*prison			X	X	X	X
Age^2*prison					X	X
Age at $Court^2$					X	X
Controls		X		X		X
Observations	445	445	445	445	445	445
Panel B: 1968 cohort						
Likelihood to reoffend	0.147	0.169	0.154	0.157	0.130	0.207
	(0.118)	(0.115)	(0.120)	(0.116)	(0.205)	(0.205)
Offences	1.596	0.698	1.722	0.699	0.835	0.838
	(1.072)	(1.077)	(1.107)	(1.093)	(1.726)	(1.927)
Times to court	0.537	0.481	0.540	0.455	0.288	0.423
	(0.358)	(0.362)	(0.366)	(0.369)	(0.602)	(0.648)
Sentences to prison	1.399**	0.990	1.463**	1.080*	1.894*	1.998*
	(0.630)	(0.607)	(0.683)	(0.645)	(1.026)	(1.164)
Age at Court	X	X	X	X	X	X
Age*prison			X	X	X	X
Age^2*prison					X	X
Age at $Court^2$					X	X
Controls		X		X		X
Observations	297	297	297	297	297	297

Notes: The table reports the effects of experiencing prison rather than youth custody/detention centres for the 1963 cohort (Panel A) and the effects of experiencing prison rather than young offender institutions for the 1968 (Panel B) cohort of the Offenders Index Cohort Data (Home Office Research, Development and Statistics Directorate). The 1963 sample includes offenders who were sentenced to either youth custody/detention centres or adults' prisons when being age 20/21 at the date of court appearance and who committed their first offence when older than 14. The 1968 sample includes offenders who were sentenced to young offender institutions or adults' prisons when being age 20/21 at the date of court appearance, whose sentence was equal or shorter than one year and who committed an offence before June 1990. The time window over which the outcome variables are observed is 2.5 years following release from custody. Each set of rows corresponds to a different outcome variable: the likelihood to reoffend (a dummy equal to 1 if the offender commits at least 1 offence in the future time window), the number of offences the offender commits, the times he/she is brought to court and the times he/she is sentenced to prison again. The estimation is conducted through a parametric approach using a polynomial up to the second order. I also allow the treatment to have a different impact before and after the cut-off by including an interaction of the centred variable and the treatment variable (age at court*prison). Each Column corresponds to a different bandwidth selection: in Column (1) the bandwidth is 365 days; in Column (2) the bandwidth is the one suggested by Ludwig and Miller (2007); in Column (3) it is 274 days; in Column (4) it is 183 days. Robust Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The control variables in the even Columns include gender, sentence length, ethnicity, plea, proceedings, month of birth, type of offence, age at which the offender committed the first offence.

Appendix Table A 7. CORRELATES OF ASSIGNMENT TO TOO HARSH OR TOO LENIENT PUNISHMENTS

	1963 Cohort		1968 Cohort	
	(1)	(2)	(3)	(24)
	Non-compliers at 20	Non-compliers at 21	Non-compliers at 20	Non-compliers at 21
Age at Court (in days)	0.000	-0.000***	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Ethnicity: unknown	0.128	-0.053	0.032	0.092
	(0.126)	(0.199)	(0.086)	(0.148)
Ethnicity: White European	0.145	-0.035	0.020	0.033
	(0.129)	(0.199)	(0.084)	(0.146)
Ethnicity: Dark European	0.000	-0.046	0.000	0.000
	(.)	(0.206)	(.)	(.)
Ethnicity: Afro-Caribbean	0.000	0.000	0.000	-0.000
	(.)	(.)	(.)	(0.185)
Ethnicity: Asian	0.000	-0.065	-0.013	0.000
	(.)	(0.283)	(0.181)	(.)
Male	-0.031	0.061	0.012	0.068
	(0.068)	(0.049)	(0.074)	(0.123)
Born in March	-0.033	0.030	-0.043	0.000
	(0.044)	(0.029)	(0.048)	(.)
Born in June			-0.015	0.026
			(0.039)	(0.052)
Born in Sept/Oct	0.000	0.042	0.000	0.011
	(.)	(0.035)	(.)	(0.067)
Born in December	0.022	0.000	-0.004	-0.061
	(0.048)	(.)	(0.034)	(0.091)
Age at first court appearance	-0.008	-0.000	0.005	-0.000
	(0.009)	(0.006)	(0.005)	(0.006)
Sentence length (months)	0.003	-0.002	0.006	-0.001
	(0.002)	(0.001)	(0.004)	(0.005)
Plea Guilty	0.106*	0.034	0.069	0.019
	(0.063)	(0.039)	(0.164)	(0.060)
Burglaries/robberies	-0.033*	-0.002	0.002	0.001
	(0.019)	(0.013)	(0.013)	(0.016)
Thefts	-0.026*	0.006	0.014	-0.005
	(0.014)	(0.010)	(0.011)	(0.009)
Frauds	-0.022	-0.015	-0.021	-0.019
	(0.037)	(0.017)	(0.026)	(0.033)
Violent Offences	-0.024	-0.023	0.001	0.008
	(0.032)	(0.015)	(0.017)	(0.028)
Sexual Offences	0.038	-0.025	0.000	0.359***
	(0.116)	(0.083)	(.)	(0.121)
Criminal Damage	0.024	0.097**	0.018	-0.023
	(0.058)	(0.038)	(0.033)	(0.028)
Drugs	-0.025	0.027	0.035	0.105
	(0.052)	(0.035)	(0.028)	(0.071)
Motoring Offences	-0.031	-0.025	-0.031	-0.026
	(0.027)	(0.024)	(0.051)	(0.063)
Minor Offences	-0.034	-0.012	0.012	-0.005
	(0.054)	(0.023)	(0.019)	(0.014)
R-sqr overall	0.069	0.130	0.084	0.137
Observations	248	309	164	133

Notes: The table reports the results from running a linear probability model of being a non-complier against a set of covariates. Each Column refers to a different group of non-compliers: in Column (1) non-compliers are the offenders who were born in 1963 and when 20 were erroneously assigned to adult prisons; in Column (2) non-compliers are the offenders who were born in 1963 and when 21 were erroneously assigned to youth custody/detention centres; in Column (3) non-compliers are the offenders who were born in 1968 and when 20 were erroneously assigned to adult prisons; in Column (4) non-compliers are the offenders who were born in 1968 and when 21 were erroneously assigned to young offender institutions. Standard errors are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.