Bonds, suspended sentences and re-offending:
Does the length of the order matter?

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Executive summary

Aim: To examine the effectiveness of good behaviour bonds and suspended sentences in reducing re-offending.

Method: Propensity score matching was used to match offenders who received a court imposed bond of less than 24 months with offenders who received a court imposed bond of 24 months or more. These two matched groups were then compared on two re-offending outcomes; the likelihood of reoffending within three years of the index offence and the time to first new conviction. Propensity score matching was also used to match offenders who received a court imposed suspended sentence of less than 12 months with offenders who received a court imposed suspended sentence of 12 months or more. Again, the likelihood of reoffending and the time to first reconviction were compared for these matched groups. Re-offending comparisons between long and short bonds, and long and short suspended sentences were repeated separately for supervised and unsupervised orders.

Results: After adjusting for other factors, the probability of reconviction and the time to reconviction were lower for offenders placed on bonds 24 months or longer compared with offenders placed on shorter bonds. A significant effect of bond length on reoffending was apparent for both supervised and unsupervised orders. After adjusting for other factors, the probability of reconviction and the time to reconviction were also lower for offenders given long (12 month plus) suspended sentences compared with offenders given short suspended sentences. However, no significant effect of suspended sentence length was found when supervised and unsupervised suspended sentences were analysed separately.

Conclusion: This evidence suggests long bonds and long suspended sentences are more effective in reducing re-offending than short bonds and short suspended sentences.

Introduction

Good behaviour bonds and suspended sentences are the most widely used alternatives to prison in Australia. Last year, the Australian courts placed a total of 77,940 offenders on a good behaviour bond (56,000) or a fully suspended sentence (21,940). Taken together, these two types of sanction account for 15 per cent of all penalties imposed by Australian adult courts. Looked at another way, for every convicted offender given a prison sentence, between two and three are given a suspended sentence or placed on a good behaviour bond (unpublished data from Australian Bureau of Statistics, received 26th July 2012).

The conditions under which suspended sentences and good behaviour bonds can be imposed vary from State to State. Under the *NSW Crimes (Sentencing Procedure) Act (1999)*a court can impose a sentence of imprisonment if it is satisfied "having considered all possible alternatives, that no penalty other than imprisonment is appropriate". The court must then determine the length of the custodial sentence and decide how the custodial sentence should be served. If the term of imprisonment does not exceed two years, Section 12 of the Act allows the court to suspend the prison sentence and place the offender on a good behaviour bond when released from custody. In circumstances where imprisonment may not be appropriate, Section 9 of the Crimes (Sentencing Procedures) Act (1999) permits the court to make an order directing an offender to enter into a good behaviour bond for a specified term (not exceeding five years).

The consequences arising from a breach of a suspended prison sentence or a good behaviour bond can be severe. If the conditions attached to a suspended prison sentence are breached, the court can revoke the bond and order the original sentence of imprisonment to be served. If an offender fails to comply with the conditions of a good behaviour bond, the court may sentence the offender for the original offences as if the bond had never been made; this can include imposing a term of imprisonment. As such, these alternatives to full-time custody have considerable potential to deter further offending.

In 2010 over a half (54%) of the suspended sentences and about a third (32%) of the good behaviour bonds imposed by NSW Local Courts required some form of supervision (NSW Bureau of Crime Statistics and Research, 2011). The Probation and Parole Service provides various levels of support for offenders under their supervision. Offenders who are assessed to be at serious risk of re-offending may be required to participate in rehabilitation programs designed to reduce further offending, such as drug and alcohol treatment or education and training programs. Participation in these programs may also be a condition of the bond stipulated by the court. Suspended sentences and good behaviour bonds might therefore also be expected to have a rehabilitative effect on offenders.

Since suspended prison sentences were introduced in NSW in April 2000, their use has increased considerably. In the NSW Local Courts, the proportion of people receiving a suspended sentence increased from 1.7 per cent in 2000 to 5.0 per cent in 2010. In the NSW Higher Courts the proportion of people receiving a suspended sentence increased from 6.9 per cent in 2000 to 17.6 per cent in 2010. There has also been an increase in the use of good behaviour bonds in NSW Local Courts over this period, with the proportion of people placed on a good behaviour bond increasing from 13.8 per cent in 2000 to 19.8 per cent in 2010 (NSW Bureau of Crime Statistics and Research, 2001; 2011).

Past research

Considering their prevalence and growing popularity, one would expect the effectiveness of good behaviour bonds and suspended sentences in reducing re-offending to have been thoroughly explored. In fact research into this issue is fairly limited. Four Australian studies examining the effectiveness of good behaviour bonds and suspended sentences in reducing re-offending have been conducted to date.

A Tasmanian study conducted by Bartels (2009) followed up 588 offenders convicted in the Supreme Court of Tasmania for two years. She found that offenders who received full-time imprisonment had higher reconviction rates than offenders who received suspended sentences. Furthermore, this study found that offenders who received non-custodial orders (including good behaviour bonds) also had higher reconviction rates than offenders who received a suspended sentence. This result was equally apparent for offenders who served part of their suspended sentence in prison as it was for those who had their entire sentence suspended by the court, leading Bartels to conclude that "suspended sentences do in fact 'work'" (pp. 6, Bartels, 2009). However, re-offending rates in this study were compared across sentencing dispositions using a logistic regression approach. This method has been criticised for failing to adequately control for all variables influencing the outcome. Many of the factors influencing the type of penalty an offender receives can also affect re-offending (e.g. prior convictions). If these factors are omitted from regression models predicting re-offending rates or are not accurately measured then the deterrent effects attributed to penalties may in fact be due to characteristics of the individuals receiving those sanctions. This problem is known as 'omitted variable bias'.

The other Australian studies testing specific deterrent effects of suspended sentences and good behaviour bonds used a more rigorous methodology. They matched offenders on a large number of covariates related to sentencing outcome (e.g. prior convictions, etc.) and then compared individuals who were near identical in all respects except for the penalty they received from the court. This technique is known as propensity score matching and is considered a more effective method for dealing with omitted variable bias than simple regression.

The first of these matching studies compared the re-offending rates of offenders given a suspended sentence in 2000 with offenders given a supervised bond (Weatherburn & Bartels, 2008). After controlling for other factors, Weatherburn and Bartels found no difference between those receiving suspended sentences and those receiving supervised bonds in the time to new offence. The second study compared the re-offending rates of offenders given a suspended sentence between 2002 and 2004 with offenders who received a full-time custodial sentence. In this study, Lulham, Weatherburn and Bartels (2009) found that after matching the groups on key variables those given a prison sentence were significantly more likely to re-offend than those given a suspended sentence (at least for offenders who had not previously served a prison term). The third study compared the reconviction rates of 8,406 male offenders whom had been placed on an unsupervised good behaviour bond by the NSW Local Court with 4,432 male offenders whom had been placed on a supervised bond. After matching offenders on a large range of factors relevant to re-offending there was no significant difference between the two groups in risk of re-offending (Weatherburn & Trimboli, 2008).

The work of Weatherburn and his colleagues suggests that suspended sentences are as effective (if not more effective) in reducing re-offending than full-time imprisonment. On the other hand, it also suggests that suspended sentences are no more a deterrent to re-offending than good behaviour bonds and that supervision whilst on a good behaviour bond has little impact on recidivism risk.

An important limitation of these earlier studies is that they fail to take into account the length of suspended prison sentences and bonds when comparing re-offending rates. There is good reason to believe that longer suspended sentences and bonds may be more effective than shorter sentences in reducing the risk of further offending. From a rehabilitation perspective, short suspended sentences and bonds provide little incentive for offenders to seek treatment or support for the factors (e.g. drug use) that are responsible for their offending and little opportunity to consolidate the benefits of any treatment or social support that is sought. From a deterrence perspective, short suspended sentences and bonds reduce the number of occasions in which the threatened consequences for breaching a court order are able to influence offending decisions. This is particularly true for offenders who offend infrequently. A person who offends on average every six months, for example, is not likely to change their offending frequency if their suspended sentence or good behaviour bond is less than six months in duration.

If short suspended sentences and bonds are less effective in reducing re-offending than long sentences this may explain why previous research in this area has produced equivocal results. In the four studies described above, punishment was modelled as a dichotomous variable indicating whether or not a defendant received a suspended prison sentence, a bond or some other penalty. Most suspended sentences and bonds are, however, short in duration (typically 9 and 12 months or less, respectively). A dichotomous variable which compares types of penalties but ignores sentence length may therefore be insensitive to changes in the risk of re-offending resulting from longer sentences. Rather than comparing different penalty types, an alternative approach would be to compare risk of re-offending for groups given suspended sentences and bonds of varying lengths. To date no Australian research has done this.

The current study

Given that suspended prison sentences and good behaviour bonds are the main alternatives to full-time custody and that their use has increased over the last decade a thorough study of their effectiveness in reducing re-offending is warranted. While previous research has been conducted in this area, these earlier studies have failed to take into account the length of suspended sentences and bonds and therefore have used a measure which may not be sensitive enough to detect small changes in re-offending.

The aim of the current study is to fill this knowledge gap by examining whether offenders who receive long suspended sentences and long bonds are less likely to re-offend than offenders who receive short suspended sentences and short bonds, controlling for other relevant variables. If longer suspended sentences and bonds do reduce the risk of re-offending it is of interest to determine whether the primary mechanism involved is one of rehabilitation or deterrence. Offenders given a suspended sentence or a bond without any requirement for supervision are arguably less likely than offenders placed under supervision to receive treatment or some other form of rehabilitative support. If a reduction in the risk of re-offending is observed amongst offenders whom are placed under supervision, then the

mechanism producing the effect is likely to be one of rehabilitation. The current study also aims to investigate this issue.

Specifically, the current study was designed to address the following key research questions:

1. Are long bonds more effective than short bonds in reducing re-offending?
2. Does supervision make a difference to this effect?
3. Are long suspended sentences more effective than short suspended sentences in reducing re-offending?
4. Does supervision make a difference to this effect?
5. Are long bonds more effective than long suspended sentences in reducing re-offending
6. Does supervision make a difference to this effect?

The study was also designed to determine whether long suspended sentences or long bonds are more effective than prison in reducing re-offending and, if so, whether supervision made a difference to this result. For reasons explained in Appendix B, this issue was not pursued.

Method

The determination of sentence length is influenced by a range of factors. More experienced offenders (i.e. those convicted of more prior offences), for example, may receive longer suspended sentences and bonds than first time offenders. Or offenders who have previously been given a bond might be more likely to receive a longer bond on the next subsequent offending occasion. An assessment of the effect of sentence length on re-offending risk therefore needs to account for these systematic differences between groups. In the current study propensity score matching techniques were used to address this issue. In propensity score matching, individuals who receive a treatment (e.g. long bond or long suspended sentence) are matched with untreated individuals who are equally likely to receive the treatment, and outcomes (e.g. re-offending) are compared across these two groups.

Data source

Data for this study was extracted from the Bureau of Crime Statistic and Research's Re-offending Database (ROD; see Fitzgerald & Hua, 2006). This database contains records of all persons appearing before the NSW Local and Higher Courts charged with a criminal offence since 1994. It includes both information about the charge (e.g. offence type, concurrent offences, plea, outcome and penalty) and information about the offender (e.g. age, gender, last postcode, and race). Each court record is linked thus allowing individual offenders to be tracked over time.

To examine the effect of suspended sentences and good behaviour bonds on re-offending, three cohorts of offenders were identified from ROD and relevant data extracted. The first cohort consisted of all offenders who received a suspended sentence for their principal offence in the NSW Local Court between 2006 and 2008. The second cohort consisted of all offenders who received a good behaviour bond for their principal offence in the NSW Local Court between 2006 and 2008. The third cohort consisted of all offenders who received a full-time custodial sentence for their principal offence in the NSW Local Court between 2006 and 2008.

Note that only one record for each person appearing in NSW courts between 2006 and 2008 was included in these cohorts. If a person appeared more than once and was given the same penalty during the three-year period, the first appearance was selected as the index court appearance. The cut-off date for the study period was 31 December 2008. This allowed all offenders to be followed up for three years after their index court appearance.

Independent variable

The key independent variable of interest in this research was the length of suspended sentence or good behaviour bond issued at the index court appearance. A long good behaviour bond was defined as a supervised or unsupervised bond which was 24 months or longer in duration. A long suspended sentence was defined as a supervised or unsupervised suspended sentence which was 12 months or longer in duration. This definition was based on the distribution of the penalty value variable and the bivariate relationship between sentence length and likelihood of re-offending. The length of court-imposed good behaviour bonds and suspended sentences is not uniformly distributed but tends to grouped into discrete categories (i.e. 6, 9, 12, 18, 24, 36 months). The 24 month cut-off for long bonds and the 12 month cut-off for long suspended sentences represents the 75th and 70th percentiles of these distributions, respectively. Classification of offenders into these subgroups resulted in the largest unadjusted difference in re-offending likelihood when short and long order lengths were compared.[1]

Outcome variables

Re-offending was defined in this study as any proven offence committed within three years of the index court appearance. Two re-offending outcomes were used. The first was a categorical variable indicating whether or not a proven offence was committed within three years after the index court appearance. The second was time to first new proven offence. This equated to the number of days that elapsed between the offender receiving the suspended sentence or bond (i.e. index appearance date) and the date of the first subsequent proven offence. In cases where no offences were recorded during the observation period, the time between the index court appearance and the end of the three-year follow-up period was calculated. Time to first new offence was adjusted for any time spent in custody during the follow-up period.[2]

Explanatory variables

Demographic variables, as well as variables related to the defendant's index offence and prior offending history were included in the propensity score and re-offending models as explanatory variables. These explanatory variables are listed and described below. While the selection of these variables was necessarily restricted to those which are recorded in ROD, many of these covariates have been shown to be strong predictors of re-offending (e.g. Luke & Lind, 2002; Poletti & Vignaendra, 2005) and/or the magnitude of penalties imposed by NSW courts (e.g. MacKinnell, Poletti & Holmes, 2010; Weatherburn & Moffatt, 2011).

- Age – age at date of index appearance (in whole years)
- Gender – gender of defendant; coded as 0 = female and 1 = male
- SEIFA Index quartile – The Australian Bureau of Statistics' Socioeconomic Index for Area for the offender's postcode. SEIFA quartile 1 = most disadvantaged; SEIFA quartile 4 = least disadvantaged

- Remoteness – The Australian Bureau of Statistics' Area of Remoteness Index for the offender's postcode; coded 0 = inner metropolitan, 1 = inner regional, 2 = other (outer regional, remote and very remote)
- Year of finalisation of index offence – coded 0 = 2006, 1 = 2007, 2 = 2008
- Plea – plea issued by defendant for the principal offence at the index court appearance; coded 0 = not guilty and 1 = guilty
- Concurrent offences – number of proven concurrent charges at index court appearance (excluding principal offence); numeric variable ranging from 0 to 175
- Legal representation – whether or not the defendant was legally represented at the index court appearance; coded 0 = not legally represented and 1 = legally represented
- Bail - bail status of the defendant at the index court appearance; coded 0 = bail dispensed/granted and 1 = bail refused or defendant in custody for a prior offence
- Offence seriousness – an index of offence seriousness of the principal offence at index appearance based on the Median Sentence Ranking method developed by MacKinnell, Poletti and Holmes (2010); higher ranking indicates a more serious offence.
- Penalty type – the type of penalty at the index court appearance; coded 1 = full-time prison, 2 = suspended sentence with supervision, 3 = suspended sentence without supervision, 4 = bond with supervision and 5 = bond without supervision
- Counts – number of counts of principal offence at index court appearance; coded 0 = 1, 1 = 2, 2 = 3, 4 = 3+
- Offence type – whether the principal offence at the index court appearance was a(n)
    - Homicide or related offence (ANZSOC Division 01)
    - Act intended to cause injury (ANZSOC Division 02)
    - Sexual assault offence (ANZSOC Division 03)
    - Dangerous or negligent act endangering persons (ANZSOC Division 04)
    - Abduction, harassment or other offence against the person (ANZSOC Division 05)
    - Robbery or extortion offence (ANZSOC Division 06)
    - Burglary or break and enter offence (ANZSOC Division 07)
    - Theft offence (ANZSOC Division 08)
    - Fraud, deception or related offence (ANZSOC Division 09)
    - Illicit drug offence (ANZSOC Division 10)
    - Prohibited or regulated weapons or explosive offence (ANZSOC Division 11)
    - Property damage or environmental pollution offence (ANZSOC Division 12)
    - Public order offence (ANZSOC Division 13)
    - Low or special range Prescribed Concentration of Alcohol (PCA) offence (ANZSOC code 1431 and PCA below 0.08g/100mls)
    - Mid or high range PCA offence (ANZSOC code 1431 and PCA equal to or above 0.08g/100mls)
    - Other traffic and vehicle regulatory offence (ANZSOC Division 14 excluding code 1431)
    - Justice procedures offence (ANZSOC Division 15)
    - Other offences (ANZSOC Division 16)

- Prior court finalisations – number of finalised court appearances for a proven offence prior to the index court appearance (since 1994)

- Prior juvenile record – whether the defendant had appeared before the Children's Court or attended a Youth Justice Conference prior to the index court appearance; coded 0 = no and 1 = yes
- Prior penalty type – whether the defendant had received any of the following court imposed penalties prior to the index court appearance (coded 0 = no and 1 = yes)
    - Full-time prison sentence
    - Good behaviour bond
    - Suspended sentence
    - Periodic detention
- Prior offence type – whether the defendant had been found guilty of any of the following offences prior to the index court appearance (coded 0 = no and 1 = yes)
    - Property offence (ASOC2008 Division 07, 08 or 09)
    - Violence offence (ASOC2008 Division 01, 02, 03 or 06)
    - Drug offence (ASOC2008 Division 10)
    - PCA offence (ASOC2008 code 1431)
    - Driving offence (ASOC2008 Division 14, except for code 1431)
    - Breach of a court order (ASOC2008 Subdivision 151, 152 or 153, except for code 1511)

Propensity score methods

The psmatch2 module in STATA/IC was used to conduct the propensity score matching (Leuven & Sianesi 2003). This analysis involved several steps. Firstly, all the explanatory variables described above were regressed against a dichotomous variable indicating whether or not the offender received a long good behaviour bond or long suspended sentence for their principal offence at the index court appearance. Secondly, offenders given long bonds/suspended sentences (i.e. treated offenders) were matched with offenders given short bonds/suspended sentences (i.e. untreated offenders) based on the estimated probabilities derived from this model (i.e. propensity scores). One-to-one nearest neighbour matching with no replacement and a calliper of 0.05 was used here. This means that a treated offender was matched with the untreated offender who had the closest propensity score, provided that the propensity scores were within 0.05 units of each other. Because no replacement was specified, an untreated offender could be matched only once with a treated offender.[3]

Thirdly, the treated and control groups were compared in order to assess whether or not they differed significantly on any of the variables used to predict the propensity scores (this is known as the conditional independence assumption). The estimated standardised bias (SB; Rosenbaum & Rubin, 1985) was used for this purpose. For each covariate, the SB is defined as "the difference in the sample means of the treated and matched control subsamples as a percentage of the square root of the average of the sample variances in both groups" (pp. 15, Caliendo & Kopeinig, 2005). Standardising the difference in means in this way allows variables on different scales to be compared. If the SB has an absolute value less than 10 then this indicates a good balance across the treated and control groups with regard to the explanatory variable of interest (Apel & Sweeten, 2010). Two SBs are estimated for each covariate; one before matching (unadjusted SB) and one after matching (adjusted SB). If the matching procedure was successful we would expect to see the adjusted SBs for all the covariates in the propensity score model to have an absolute value of less than 10.

The final stage in the process was to estimate the treatment effect. Two methods were used to model re-offending outcomes for the matched sample. Firstly, logistic regression was used to

compare the likelihood of re-offending within three years of the index court appearance. Secondly, Cox Proportional Hazards regression was used to compare the time to first new offence. Both these re-offending outcomes were modelled without and with adjustment for other potential covariates. All explanatory variables described above were considered for inclusion in the adjusted re-offending models but only those which were significant at the 0.05 level were included in the final models. The treatment group variable was included in the final models (regardless of the associated p-value) in order to estimate treatment effects. The *vce(cluster)* option in Stata/IC was used in both estimation methods to account for the matched nature of the data.[4]

Results

Descriptive statistics

Table 1 summarises the differences between offenders who received a lengthy court order (good behaviour bond of 24 months or longer or a suspended sentence of 12 months or longer) and those given a short court order, in terms of demographic, index offence and prior offending characteristics (see Appendix A, Table A1 for the percentage of offenders in each category). Offenders who received a long bond for their index offence were more likely to be aged 40 years or more, to be male, reside in an area with less socio-economic disadvantage and reside in an inner metropolitan area compared with offenders who received short bonds. Offenders who received a long suspended sentence for their index offence were more likely to be aged 40 years or more, reside in an area with more socio-economic disadvantage and reside in outer regional or remote areas.

Many of the characteristics associated with the index offence were similar for both offenders given long bonds and offenders given long suspended sentences. At their index appearance, both offenders with long bonds and long suspended sentences were more likely to have concurrent offences, have their offence finalised in 2006, be legally represented, be charged with a fraud or driving offence, be charged with an offence with a higher Median Sentence Ranking, receive an order with supervision and have three or more offence counts compared with offenders given short bonds or short suspended sentences. The exception being that only offenders given a long suspended sentence were more likely to have burglary as their principal offence at the index court appearance and have bail dispensed with compared with offenders given a short suspended sentence.

Overall, offenders given long court orders also had less extensive prior offending histories. Offenders in the long bond and long suspended sentence groups had fewer prior court appearances, were less likely to have previously been found guilty of breaching a court order or previously found guilty of a drug, property or violence offence compared with offenders in the short bond or suspended sentence groups. Offenders who received long bonds were also less likely to have previously been imprisoned or to have a prior juvenile record compared with offenders who received short bonds, while offenders who received long suspended sentences were less likely to have previously received a good behaviour bond compared with offenders who received short suspended sentences. The exceptions are prior driving offences and prior suspended sentence. Offenders given long bonds were more likely to have a previous driving offence (including PCA) compared with offenders given short bonds, and offenders given long suspended sentences were more likely to have previously received a suspended sentence compared with offenders given short suspended sentences.

Table 1: Summary of demographic, index offence and prior offending characteristics for offenders given long bonds (n=13,877) and long suspended sentences (n=5,906) compared with offenders given short bonds (n=39,055) and short suspended sentences (n=9,223)

	Long Bonds (24 months or more)	Long suspended sentence (12 months or more)
Demographic Characteristics		
Age	More likely to be over 40 years	More likely to be over 40 years
Gender	More males	n.s.
SEIFA-quartiles	More from advantaged areas	More likely to be from disadvantaged areas
ARIA index	More likely to be from inner metro areas	More likely to be from outer regional/remote areas
Index Offence		
Year of finalisation	More likely to be finalised in 2006	More likely to be finalised in 2006
Plea	n.s.	n.s.
Concurrent offences	More concurrent offences	More concurrent offences
Legal Representation	More legally represented	More legally represented
Bail	n.s.	More have bail dispensed with
Principal offence type	More traffic and fraud	More burglary, fraud and traffic offences
Supervision order	More likely to have a bond with supervision	More likely to have suspended sentence with supervision
Median Sentence Ranking	More likely to have more serious offence	More likely to have more serious offence
Offence counts	More likely to have 3 or more offence counts	More likely to have 3 or more offence counts
Prior Offending		
Prior court appearances	Fewer prior court appearances	Fewer prior court appearances
Prior juvenile record	Less with a prior juvenile record	n.s.
Prior breach	Less with prior breach	Less with a prior breach
Prior prison	Less with prior prison	n.s.
Prior violence	Less with a prior violence offence	Less with a prior violence offence
Prior property	Less with prior property offence	Less with prior property
Prior PCA	More with prior PCA	n.s.
Prior drug	Less with prior drug offence	Less with prior drug offence
Prior driving	More with prior driving	Less with prior driving offence
Prior suspended sentence	n.s.	More with prior suspended sentence
Prior bond	n.s.	Less with prior bond
Prior periodic detention	n.s.	n.s.

n.s = no significant differences (at the 0.05 level) between the two groups on this covariate

Table 2 shows the percentage of offenders with a good behaviour bond (n = 52,932) who re-offended within three years of their index court appearance by the length of the bond imposed for their principal offence. The unadjusted mean number of days from the index appearance to first new offence for the bond group is also shown in Table 2. As seen here, there is a significant bivariate relationship between sentence length and both the likelihood of re-offending and the time to first new offence. Offenders who received long bonds were less likely to be reconvicted of an offence within three years of their index court appearance (Chi-

square=115.616; *p-value* <.001) and, on average, took longer to re-offend (mean = 782.9; Log Rank, Mantel-Cox = 120.195; *p-value* <.001) compared with offenders who received short bonds.

Table 2: Re-offending outcomes for short and long bond groups, unmatched (n=52,932)

	0 to 23 months	24+ months	p-value
Reoffended within 36 months			
per cent	47.8	42.5	<.001
Number of days to first new offence			
Mean	737.4	782.9	<.001

Table 3 presents the number and percentage of offenders with a suspended sentence (n = 15,129) who re-offended within three years of their index court appearance by the length of the suspended sentence imposed for the principal offence. The unadjusted mean number of days to first new offence for the suspended sentence group is also shown here. Again, there was a significant bivariate relationship between sentence length and the likelihood of re-offending. Offenders who received long suspended sentences (of 12 months or more) were less likely to be found guilty of a new offence within the three year follow-up period (Chi-square = 49.066; *p-value* <.001) and, on average, took longer to re-offend (mean = 704.1; Log Rank, Mantel-Cox = 58.439; *p-value* <.001) than offenders who received short suspended sentences.

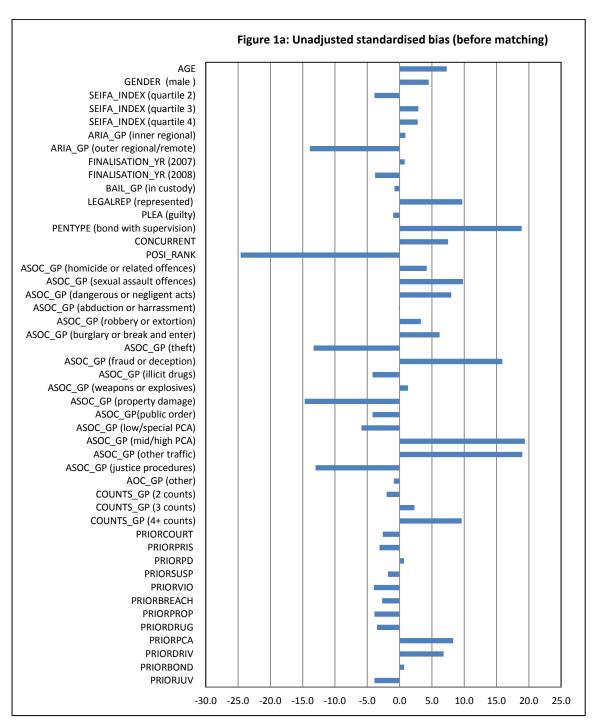**Table 3: Re-offending outcomes for short and long suspended sentence groups, unmatched (n=15,129)**

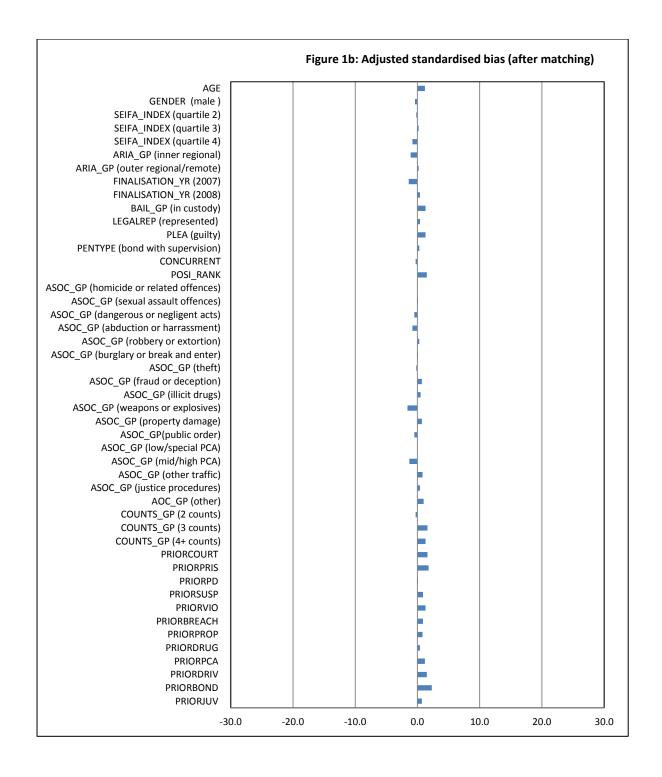|	0 to 11 months	12+ months	p-value
Reoffended within 36 months			
per cent	58.1	52.3	<.001
Number of days to first new offence			
mean	646.7	704.1	<.001

Propensity score matching: long versus short good behaviour bonds

Using propensity scores and one-to-one matching with no replacement, 13,325 offenders given long good behaviour bonds were matched with 13,325 offenders given short bonds. The propensity score model based on the unmatched sample (n = 51,096)[5] significantly predicted whether or not an offender received a bond of 24 months or more (pseudo R^2 = 0.061, Likelihood ratio chi-square *p-value* <.001). However, as expected, the model using the matched sample did not significantly predict group membership (pseudo R^2 = 0.001, Likelihood ratio chi-square *p-value* = 0.999). The conditional independence assumption was further assessed by examining the SB scores for the matched and unmatched samples.

Figure 1a and Figure 1b present the unadjusted and adjusted SB scores, respectively, for all the covariates included in the propensity score model. Put simply Figure 1a shows the percentage point difference between individuals on short and long bonds in relation to each of the control variables before matching, while Figure 1b shows the percentage point difference between individuals on short and long bonds in relation to each of the control variables after matching. Using the criterion of ISBI > 10, this figure shows that prior to matching a total of nine variables are unbalanced. SBs for these nine variables ranged from 19.4 (Principal offence type – mid or high range PCA) to -24.6 (Median sentence ranking for principal

offence). After matching, none of the covariates are unbalanced. The variable with the largest SB after matching was PRIORBOND and the SB for this variable is well below the balance threshold (SB = -2.3). These data provide good evidence that the treated and untreated groups are adequately matched on the observable covariates.

Figure 1a: Unadjusted standardised bias (before matching)

Figure 1b: Adjusted standardised bias (after matching)

AGE
GENDER (male)
SEIFA_INDEX (quartile 2)
SEIFA_INDEX (quartile 3)
SEIFA_INDEX (quartile 4)
ARIA_GP (inner regional)
ARIA_GP (outer regional/remote)
FINALISATION_YR (2007)
FINALISATION_YR (2008)
BAIL_GP (in custody)
LEGALREP (represented)
PLEA (guilty)
PENTYPE (bond with supervision)
CONCURRENT
POSI_RANK
ASOC_GP (homicide or related offences)
ASOC_GP (sexual assault offences)
ASOC_GP (dangerous or negligent acts)
ASOC_GP (abduction or harrassment)
ASOC_GP (robbery or extortion)
ASOC_GP (burglary or break and enter)
ASOC_GP (theft)
ASOC_GP (fraud or deception)
ASOC_GP (illicit drugs)
ASOC_GP (weapons or explosives)
ASOC_GP (property damage)
ASOC_GP(public order)
ASOC_GP (low/special PCA)
ASOC_GP (mid/high PCA)
ASOC_GP (other traffic)
ASOC_GP (justice procedures)
AOC_GP (other)
COUNTS_GP (2 counts)
COUNTS_GP (3 counts)
COUNTS_GP (4+ counts)
PRIORCOURT
PRIORPRIS
PRIORPD
PRIORSUSP
PRIORVIO
PRIORBREACH
PRIORPROP
PRIORDRUG
PRIORPCA
PRIORDRIV
PRIORBOND
PRIORJUV

-30.0   -20.0   -10.0   0.0   10.0   20.0   30.0

Re-offending: long versus short good behaviour bonds

Table 4 presents the results of the logistic regression and Cox regression modelling for the matched sample (n = 26,650). The odds ratios (with and without covariate adjustment) estimated from the logistic regression models are shown in the upper part of this table and can be interpreted as the probability of re-offending within 36 months of the index court appearance for offenders given long bonds compared with offenders given short bonds (i.e. the referent category). An odds ratio greater than one indicates that offenders given long bonds are more likely to re-offend and an odds ratio less than one indicates that offenders

given long bonds are less likely to re-offend. The hazard ratios (with and without covariate adjustment) estimated from the Cox regression models are shown in the lower part of Table 4 and can be interpreted as the probability of re-offending at any given point in time (i.e. the instantaneous risk of re-offending) for offenders given long bonds compared with offenders given short bonds (i.e. the referent category). A hazard ratio of more than one indicates that the instantaneous risk of re-offending is higher for offenders given long bonds and a hazard ratio less than one indicates that the instantaneous risk of re-offending is less for offenders given long bonds.

These analyses show that the significant relationship between sentence length and re-offending found for the unmatched sample was still apparent after offenders were matched using propensity score techniques. The unadjusted odds ratio associated with treatment group was 0.898 (95% Confidence Interval 0.856, 0.943) and significant (*p-value* <.001). This indicates that the odds of re-offending for treated offenders (i.e. those who received a long bond) were 10 per cent lower than the odds of re-offending for the untreated offenders (i.e. those who received a short bond). The hazard ratio associated with treatment group was 0.921 (95% Confidence Interval 0.888, 0.954) and was also significant (*p-value* <.001). This indicates that treated offenders were eight per cent less likely to re-offend at any given time compared with untreated offenders. Both the odds ratio and the hazard ratio associated with the treatment group variable remained significant even after adjusting for relevant covariates in the re-offending models (Odds Ratio[6] = 0.867, *p-value* < .001; Hazard Ratio[7] = 0.905, *p-value* < .001).[8]

Table 4: Re-offending outcomes for short and long bond groups, matched (n=26,650)[9]

Re-offending outcome	0 to 23 months	24+ months	p-value	95% CI[1]
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.898	<.001	0.856-0.943
Adjusted[2] odds ratio	1.00	0.867	<.001	0.822-0.914
Time to first new offence				
Unadjusted hazard ratio	1.00	0.921	<.001	0.888-0.954
Adjusted[2] hazard ratio	1.00	0.905	<.001	0.873-0.939

1 Standard errors have been adjusted to account for matched nature of the data
2 Adjusted for demographic, offence and prior offending variables

Propensity score matching: Supervised and unsupervised bonds

Further analyses were undertaken in order to examine whether supervision makes a difference to the effect of bond length on re-offending outcomes. For this analysis, two sub-samples of offenders were considered; (1) those who had received a court imposed good behaviour bond with a requirement for supervision and (2) those who had received a court imposed good behaviour bond without a requirement for supervision. Once again, offenders were matched using one-to-one nearest neighbour matching with no replacement, and the propensity score model predicting whether or not an offender received a long good behaviour bond (i.e. of 24 months or more) included all explanatory variables. If all covariates were balanced after matching offenders on their propensity scores, the likelihood of re-offending and the time to first new offence were estimated (with and without adjustment for covariates).

Matches were identified for a total of 5,075 offenders given long supervised bonds. The propensity score model based on the unmatched supervised bond sample (n = 16,265)

significantly predicted bond length (pseudo R^2 = 0.043, Likelihood ratio chi-square *p-value* <.001), but the model using the matched supervised bond sample did not (pseudo R^2 = 0.001, Likelihood ratio chi-square *p-value* > 0.999). Prior to matching, a total of nine variables had SBs above the balance threshold but after matching none of the covariates were unbalanced. Together these data indicate that the treated and untreated supervised bonds groups were adequately matched on the observable covariates.

Matches were identified for a total of 8,219 offenders given long unsupervised bonds. The propensity score model based on the unmatched unsupervised bond sample (n = 34,831) significantly predicted bond length (pseudo R^2 = 0.066, Likelihood ratio chi-square *p-value* <.001), but the model using the matched unsupervised bond sample did not (pseudo R^2 = 0.001, Likelihood ratio chi-square *p-value* > 0.999). Prior to matching a total of nine variables had SBs above the balance threshold but after matching none of the covariates were unbalanced; indicating that the matched samples were adequately balanced.

Re-offending: Supervised and unsupervised bonds

Table 5 presents the main outcomes from the re-offending analyses for the supervised and unsupervised bond groups after matching on propensity scores. For the offender group who received a court imposed bond with supervision, there was a significant effect of bond length on the likelihood of re-offending (Odds ratio 0.868; *p-value* < .001) and on the time to first new offence (Hazard Ratio 0.900; *p-value* <.001). This significant difference remained even after adjusting for covariates.[10] For matched offenders who received a court imposed bond without supervision there was also a significant effect of bond length on the time to first new offence (Hazard Ratio 0.930, *p-value* =0.003) and on the likelihood of re-offending (Odds Ratio 0.915; *p-value* = 0.005). This difference was significant with and without covariate adjustment.[11] These results indicate that both supervised and unsupervised offenders who received long bonds were less likely to re-offend and took longer, on average, to re-offend than offenders who received short bonds.

Table 5: Re-offending outcomes for short and long bond groups by type of order, matched
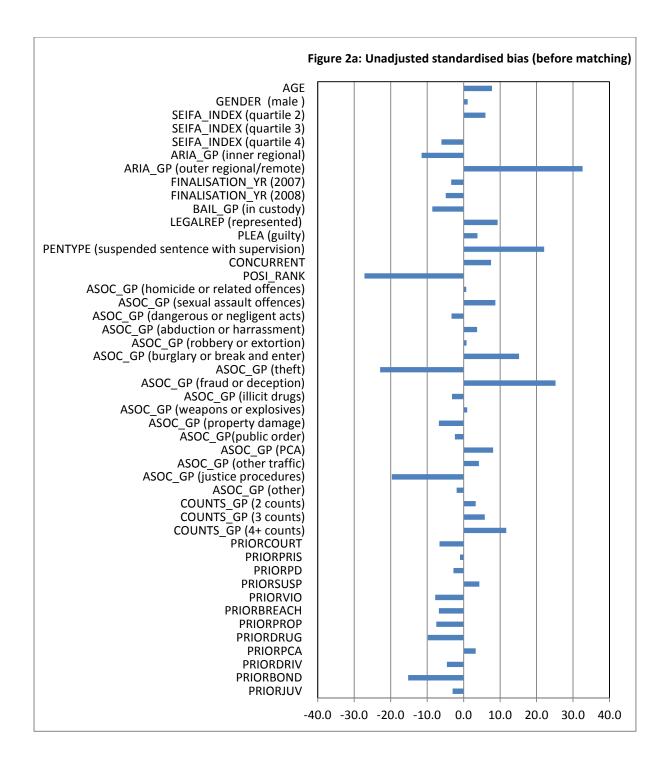
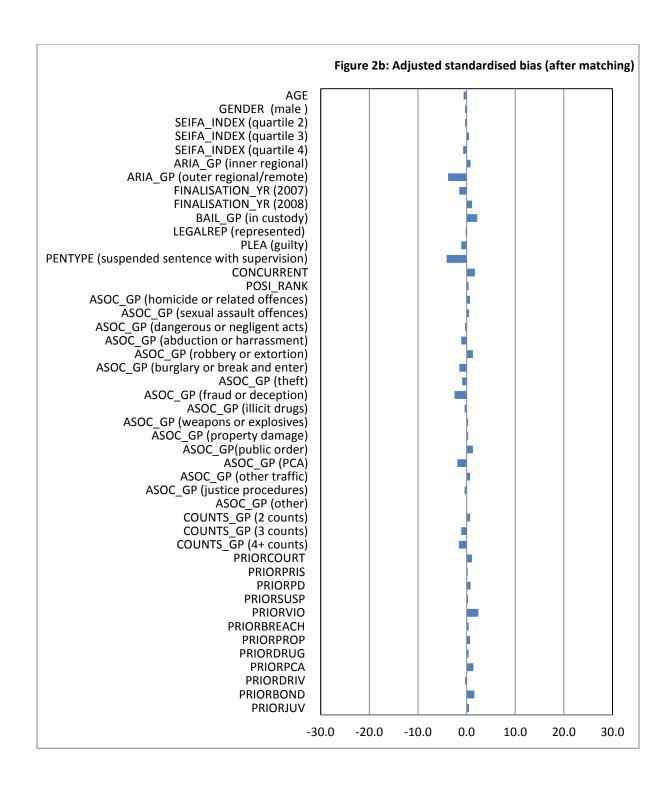|	0 to 23 months	24+ months	p-value	95% CI[1]
Bond with supervision (n=10,150)[2]				
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.868	<.001	0.804-0.936
Adjusted[3] odds ratio	1.00	0.834	<.001	0.766-0.907
Time to first new offence				
Unadjusted hazard ratio	1.00	0.900	<.001	0.853-0.949
Adjusted[3] hazard ratio	1.00	0.883	<.001	0.836-0.933
Bond without supervision (n=16,438)[2]				
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.915	0.005	0.859-0.973
Adjusted[3] odds ratio	1.00	0.902	0.003	0.842-0.966
Time to first new offence				
Unadjusted hazard ratio	1.00	0.930	0.003	0.886-0.976
Adjusted[3] hazard ratio	1.00	0.919	0.001	0.876-0.965

1 Standard errors have been adjusted to account for matched nature of the data.

2 Seventeen cases from the supervised bond sample and 5 cases from the unsupervised bond sample were dropped from the survival analysis because the time to first new offence was zero after adjusting for time spent in custody.

3 Adjusted for demographic, offence and prior offending variables

Propensity score matching: Long versus short suspended sentences

Using one-to-one matching with no replacement, 4,797 offenders given long suspended sentences were matched with 4,797 offenders given short suspended sentences.[12] The propensity score model based on the unmatched sample (n=14,235) significantly predicted whether or not an offender received a suspended sentence of 12 months or more (pseudo R^2 = 0.074, Likelihood ratio chi-square *p-value* = <.001). However, as expected, the model using the matched sample did not significantly predict group membership (pseudo R^2 = 0.002, Likelihood ratio chi-square *p-value* = 0.997).

Again the conditional independence assumption was assessed by examining the SB scores for the matched and unmatched samples. Figure 2a and Figure 2b present the unadjusted (before matching) and adjusted (after matching) SB scores for all the covariates included in the propensity score model. This figure shows that prior to matching a total of ten variables are unbalanced. SBs for these 10 variables ranged from 32.6 (Remoteness Index – outer regional/remote) to -27.2 (Median Sentence Ranking). After matching, however, none of the covariates are unbalanced. The variable with the largest SB after matching was SUPERVISION and the SB for this variable was well below the balance threshold (SB = -4.1). These data provide good evidence that the treated and untreated groups are adequately matched on all the observable covariates.

Figure 2a: Unadjusted standardised bias (before matching)

Figure 2b: Adjusted standardised bias (after matching)

Re-offending: Long versus short suspended sentences

Table 6 presents the results of the logistic regression and Cox regression modelling for the matched sample (n = 9,594). These analyses show that after matching offenders on their propensity scores, there was no significant effect of sentence length on the likelihood of re-offending (*p-value* = 0.236) or the time to first new offence *(p-value* = 0.096). There was, however, some evidence for a significant difference in re-offending between offenders given long and short suspended sentences after relevant covariates were adjusted for. Net of controls, offenders given long suspended sentences took, on average, longer to re-offend

(Hazard Ratio[13] = 0.919, *p-value* = 0.002)[14] and were less likely to re-offend within three years of their index offence (Odds Ratio[15] = 0.913, *p-value* = 0.047) compared with offenders given short suspended sentences.[16]

Table 6: Re-offending outcomes for short and long suspended sentence groups, matched (n=9,594)

Re-offending outcome	0 to 11 months	12+ months	p-value	95% CI[1]
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.953	0.236	0.880-1.032
Adjusted[2] odds ratio	1.00	0.913	0.047	0.835-0.999
Time to first new offence				
Unadjusted hazard ratio	1.00	0.956	0.096	0.906-1.008
Adjusted[2] hazard ratio	1.00	0.919	0.002	0.871-0.971

1 Standard errors have been adjusted to account for matched nature of the data
2 Adjusted for demographic, offence and prior offending variables

Propensity score matching: Supervised and unsupervised suspended sentences

Again, the effect of supervision on the relationship between sentence length and re-offending was examined for two sub-samples of offenders; (1) those who received a court imposed suspended sentence with a requirement for supervision and (2) those who received a court imposed suspended sentence without a requirement for supervision. Offenders from both sub-samples were matched using the propensity score techniques and the explanatory variables described in the methods section. If all covariates were balanced after matching offenders on their propensity scores, the likelihood of re-offending and the time to first new offence were compared (with and without adjustment for covariates) for offenders given suspended sentences of differing lengths.

Matches were identified for 2,791 offenders given long supervised suspended sentences. The propensity score model based on the unmatched supervised suspended sentence sample (n = 7,559) significantly predicted bond length (pseudo R^2 = 0.060, Likelihood ratio chi-square *p-value* <.001), but the model using the matched supervised suspended sentence sample did not (pseudo R^2 = 0.003, Likelihood ratio chi-square *p-value* = 0.999). Prior to matching a total of seven variables had SBs above the balance threshold but after matching none of the covariates were unbalanced. Together these data indicate that the treated and untreated supervised bonds groups were adequately matched on the observable covariates.

Matches were identified for a total of 1,967 offenders given long unsupervised suspended sentences. The propensity score model based on the unmatched unsupervised suspended sentence sample (n = 6,676) significantly predicted sentence length (pseudo R^2 = 0.086, Likelihood ratio chi-square *p-value* < .001), but the model using the matched unsupervised suspended sentence sample did not (pseudo R^2 = 0.002, Likelihood ratio chi-square *p-value* > .999). Prior to matching a total of 16 variables had SBs above the balance threshold but after matching none of the covariates were unbalanced; indicating that the matched samples were adequately balanced.

Re-offending: Supervised and unsupervised suspended sentences

Table 7 presents the main outcomes from the re-offending analyses for the supervised and unsupervised suspended sentence groups after matching on propensity scores. For the offender group who received a suspended sentence with supervision, there was no significant effect of sentence length on the likelihood of re-offending (*p-value* = 0.335) or on the time to first new offence (*p-value* = 0.292), with or without adjustment for covariates.[17] For matched offenders who received a suspended sentence without supervision there was also no significant effect of sentence length on the likelihood of re-offending within three years of the index offence (*p-value* = 0.479) or on the time to new offence (*p-value* = 0.443), with or without adjustment for other covariates.[18]

Table 7: Re-offending outcomes for short and long suspended sentence groups by type of order, matched

	0 to 23 months	24+ months	p-value	95% CI[1]
Suspended sentence with supervision (n=5,582)[2]				
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.950	0.335	0.855-1.055
Adjusted[3] odds ratio	1.00	0.927	0.204	0.825, 1.042
Time to first new offence				
Unadjusted hazard ratio	1.00	0.964	0.292	0.902-1.032
Adjusted[3] hazard ratio	1.00	0.946	0.116	0.884, 1.014
Suspended sentence without supervision (n=3,934)[2]				
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.956	0.479	0.848-1.082
Adjusted[3] odds ratio	1.00	0.906	0.166	0.787-1.042
Time to first new offence				
Unadjusted hazard ratio	1.00	0.967	0.443	0.886-1.054
Adjusted[3] hazard ratio	1.00	0.928	0.102	0.849-1.015

1 Standard errors have been adjusted to account for matched nature of the data
2 Twenty-one cases from the supervised suspended sentence sample and 7 cases from the unsupervised suspended sentence sample were dropped from the survival analysis because the time to first new offence was zero after adjusting for time spent in custody.
3 Adjusted for demographic, offence and prior offending variables

Long bonds v long suspended sentences

Given the significant effect of sentence length on re-offending for both the bond and suspended sentence groups, further analyses were undertaken to investigate whether long suspended sentences are more effective than long bonds in reducing re-offending. Only offenders given a long suspended sentence (defined as 12 months or more) or long bond (defined as 24 months or more) were included in this analysis. If an offender received more than one penalty type during the study period, and therefore appeared in more than one cohort, the first appearance was selected for inclusion in the analysis.

Table 8 shows the number and percentage of offenders given a long bond (n = 13,640) or a long suspended sentence (n = 5,000) who re-offended within three years of their index court appearance. The unadjusted mean number of days to first new offence for each penalty group

is also shown here. There was a significant bivariate relationship between penalty type and the likelihood of re-offending. Offenders who received long bonds were less likely to be found guilty of a new offence within the three year follow-up period (Chi-square = 89.470; *p-value* <.001) and, on average, took longer to re-offend (Log Rank, Mantel-Cox = 95.495; *p-value* <.001) than offenders who received long suspended sentences.

Table 8: re-offending outcomes for long bonds and long suspended sentence groups, unmatched (n=18,640)

	Long bonds	Long suspended sentences	p-value
Reoffended within 36 months			
per cent	42.1	49.8	<.001
Number of days to first new offence			
Mean	786.4	724.8	<.001

To address systematic differences between the two groups, offenders given long suspended sentences were matched with offenders given long bonds using one-to-one nearest neighbour matching with no replacement. Propensity scores were calculated by regressing all explanatory variables against a dichotomous variable indicating whether or not the offender received a long suspended sentence for their principal offence at the index court appearance. If all covariates were balanced after matching offenders on their propensity scores, the likelihood of re-offending and the time to first new offence were estimated (with and without adjustment for covariates).

A total of 4,047 offenders given long suspended sentences were matched with 4,047 offenders given long bonds. The propensity score model based on the unmatched sample (n = 17,904) significantly predicted whether or not the offender received a long suspended sentence (pseudo R^2 = 0.169, Likelihood ratio chi-square *p-value* <.001), but the model using the matched sample did not (pseudo R^2 = 0.002, Likelihood ratio chi-square *p-value* > 0.999). Prior to matching a total of 26 variables had SBs above the balance threshold but after matching none of the covariates were unbalanced. Together these data indicate that the treated group (offenders with long suspended sentences) and untreated group (offenders with long bonds) were adequately matched on the observable covariates.

Table 9 presents the main outcomes from the re-offending analyses for the long suspended sentence and long bond groups after matching on propensity scores. After matching, there were no significant differences between the long suspended sentence and long bond groups in the likelihood of re-offending within three years of the index appearance (*p-value* = 0.113) or the time to first offence (*p-value* = 0.062),[19] with and without adjustment for covariates.[20,21]

Table 9: Re-offending outcomes for long bonds and long suspended sentence groups, matched (n=8,094)

Re-offending outcome	Long bonds	Long suspended sentences	p-value	95% CI[1]
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.934	0.113	0.858-1.016
Adjusted[2] odds ratio	1.00	0.913	0.061	0.830-1.004
Time to first new offence				
Unadjusted hazard ratio	1.00	0.944	0.062	0.889-1.003

Adjusted[2] hazard ratio	1.00	0.941	0.054	0.885-1.001

1 Standard errors have been adjusted to account for matched nature of the data
2 Adjusted for demographic, offence and prior offending variables

Further analyses were undertaken to examine whether long suspended sentences are more effective than long bonds if a supervision order is in place. Again, propensity score matching using one-to-one nearest neighbour matching with no replacement was applied. All explanatory variables were included in the propensity score model. After matching no covariates had SBs above the balance threshold. Table 10 presents the main outcomes from the re-offending analyses for the supervised and unsupervised long bonds and long suspended sentence groups after matching on propensity scores. For both the supervised and unsupervised cohorts, there were no significant differences between the bond and suspended sentence groups in the likelihood of re-offending or the time to first new offence, with and without adjustment for covariates.[22,23]

Table 10: Re-offending outcomes for long bonds and long suspended sentence groups by type of order, matched

	Long Bonds	Long suspended sentences	p-value	95% CI[1]
With supervision (n=4,380)[2]				
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.929	0.221	0.826-1.045
Adjusted[3] odds ratio	1.00	0.946	0.410	0.830-1.079
Time to first new offence				
Unadjusted hazard ratio	1.00	0.935	0.106	0.863-1.014
Adjusted[3] hazard ratio	1.00	0.948	0.204	0.872-1.030
Without supervision (n=3,556)[2]				
Reoffended within 36 months				
Unadjusted odds ratio	1.00	0.946	0.422	0.827-1.083
Adjusted[3] odds ratio	1.00	0.913	0.251	0.781-1.067
Time to first new offence				
Unadjusted hazard ratio	1.00	0.952	0.338	0.860-1.053
Adjusted[3] hazard ratio	1.00	0.949	0.319	0.856-1.052

1 Standard errors have been adjusted to account for matched nature of the data
2 Fifteen cases from the supervised sample and 2 cases from the unsupervised sample were dropped from the survival analysis because the time to first new offence was zero after adjusting for time spent in custody.
3 Adjusted for demographic, offence and prior offending variables

Discussion

The main aim of the current study was to examine the effect of order length on re-offending among offenders placed on good behaviour bonds and suspended sentences. A secondary aim was to determine whether supervision moderated the effects of order length. The specific questions of interest were:

1. Are long bonds more effective than short bonds in reducing re-offending?
2. Does supervision make a difference to this effect?

3. Are long suspended sentences more effective than short suspended sentences in reducing re-offending?
4. Does supervision make a difference to this effect?
5. Are long bonds more effective than long suspended sentences in reducing re-offending
6. Does supervision make a difference to this effect?

The evidence presented in this report shows that after adjustment for other factors, the probability of reconviction and the time to reconviction in the three year period following imposition of a bond were lower for those on bonds 24 months and longer. Supervision made no difference to this result inasmuch as both the time to the next conviction and the probability of reconviction were lower both for those on long supervised bonds and those on long unsupervised bonds.

After adjustment for other factors, the probability of reconviction and the time to reconviction were also lower for those on long (12 month plus) suspended sentences. However no significant effect of sentence length was observed when separate analyses were conducted for suspended sentences with supervision and suspended sentences without supervision. This is probably a result of reduced statistical power. The number of matched cases involving suspended sentences with and without supervision was substantially smaller than the number of matched cases involving bonds with and without supervision. Given that the effect of sentence length was comparatively small when supervised and unsupervised suspended sentences were combined into one analysis (cf. Table 6 and Table 7), it is not surprising that the effect disappeared altogether when the two types of suspended sentence were analysed separately.

The comparison of long bonds with long suspended sentences produced very weak evidence that offenders on long suspended sentences are less likely to be reconvicted and took longer to be reconvicted than similar offenders placed on long bonds. The p-values did not reach the conventional level of statistical significance but both adjusted comparisons were close to significant (see Table 9: Odds Ratio = 0.913, *p-value* = 0.061, Hazard Ratio = 0.941, *p-value* = 0.054). Given the sample on which these comparisons are based (n = 8,094) was very large, it seems unlikely that further increases in sample size would render these comparisons significant.

Taken overall, these findings support the hypothesis that offenders placed on long (24 month plus) bonds or long (12 month plus) suspended sentences are less likely to re-offend than offenders placed on short bonds or short suspended sentences. There are, as always, a number of caveats surrounding this conclusion. The first and most important point to note is that, although we have controlled for a large number of factors known to influence bond/suspended sentence length and reconviction, it is always possible some omitted variable is responsible for the observed relationship between length and re-offending. This seems unlikely but it cannot be ruled out. Our model, for example, does not include controls for an offender's level of support in the community or the extent of their remorse. Either or both of these factors may influence penalty choice and/or risk of re-offending.

There are only three ways to conduct a stronger test of the effect of long bonds and long suspended sentences on risk of re-offending. The first is to conduct a randomised trial in which a large group of offenders are randomly allocated to short and long bonds/suspended

sentences. Such a study would seem unlikely to gain ethical approval as it would involve subjecting offenders to different sanctions solely on the basis of chance.

The second possibility is to find a variable that influences penalty selection but has no direct effect on risk of re-offending. This would permit the use of two-stage least squares analysis and other similar techniques that control for both omitted and observable factors. The challenge here lies in finding such a variable. It is hard to think of a factor that influences penalty choice but has no effect on re-offending other than through the penalty. The one variable that might meet this requirement is magistrate/judge severity. If judicial officers differ in their proclivity to impose long bonds or suspended sentences and if that proclivity is unrelated to re-offending other than by way of its effect on the penalty received, it may be possible to conduct a more stringent test of the hypothesis that long bonds and long suspended sentences reduce the risk of re-offending.

The third possibility is to change the law so as to permit longer bonds and suspended sentences. If such a change resulted in longer bonds and suspended sentences it would create the conditions for a natural experiment. In other words, it would make it possible to examine rates of re-offending before and after the change while controlling for any differences in the characteristics of offenders receiving bonds and suspended sentences before and after the change.

A change in sentencing law for this purpose might be considered unlikely but there are other justifications for reform in this area. As the NSW Law Reform Commission recently pointed out (NSW Law Reform Commission, 2012), at present in NSW a court cannot impose a short suspended sentence in conjunction with a long Section 12 good behaviour bond (the bond imposed when a prison sentence is suspended). This constraint has been the subject of judicial criticism (pp. 15, NSW Law Reform Commission, 2012). Indeed, in a 2011 survey of judicial officers carried out by the NSW Sentencing Council, 62 per cent of those surveyed were in favour of increasing the maximum length of a Section 12 bond. Eighty-two per cent were in favour of changing the law so that a Section 12 bond of greater length than a suspended sentence could be imposed (pp. 15, NSW Law Reform Commission, 2012).

Notes

1. A stronger bivariate relationship between penalty length and re-offending likelihood was found for the alternative classification of 25 months or more for long bonds and 13 months or more for long suspended sentences. However, the number of offenders falling within each of these subgroups was not sufficient to apply the proposed analytical techniques.

2. Offenders were excluded from the analysis if they had no time in the community to re-offend. This resulted in 12 offenders from the bond sample being excluded, 8 offenders from the suspended sentence sample being excluded and 309 offenders from the prison sample being excluded.

3. Given that the distribution of the propensity scores was similar for the treated and untreated groups, matching without replacement was considered the best option to use in this analysis (Apel & Sweeten 2010). Cases were randomly sorted prior to matching. To test the sensitivity of the analysis, a common trim of 5 per cent was also

applied as a criterion in the propensity score matching but made little difference to the final outcomes.

4. Another propensity score technique known as Inverse Probability of Treatment weighting was also used to estimate treatment effects. For this analysis the *pweight* option in STATA/IC was used. The weighting applied to the treatment group (i.e. offenders given a long bond or long suspended sentence) was the inverse of the propensity score predicting treatment. The weighting applied to the control group (i.e. offenders given a short bond or short suspended sentence) was the inverse of one minus the propensity score predicting treatment. A weighting was calculated for all offenders in the sample (not just those which could be matched) and included in the re-offending analysis. The results from this 'weighted' analysis are also noted in relevant sections of the report.

5. Note that 1,840 offenders given bonds were excluded from the analysis because of missing data on one or more of the following explanatory variables; postcode, principal offence median sentence ranking, legal representation and age. Most of these cases had missing postcode information (1,531). Excluding the variables based on postcode information (i.e. SEIFA and ARIA) from the propensity score model did not substantially impact the findings for the re-offending analysis. These variables were therefore retained in the final model.

6. The following variables were included as controls in the final logistic regression model; age, gender, prior court appearances, prior periodic detention, prior violence offence, prior breach, prior property offence, prior drug offence, prior driving offence, prior bond, prior juvenile offence, year of finalisation, bail status, legal representation, supervision, concurrent offences, MSR rank and principal offence type.

7. The following variables were included as controls in the final Cox regression model; age, gender, prior court appearances, prior prison, prior periodic detention, prior violence offence, prior breach, prior property offence, prior drug offence, prior driving offence, prior bond, year of finalisation, bail status, legal representation, supervision, concurrent offences, MSR rank and principal offence type.

8. Supplementary analyses using Inverse Probability of Treatment Weighting produced an equivalent pattern of findings with significant effects of bond length on both the likelihood of re-offending and the time to re-offend, with and without adjustment for other covariates.

9. Note that 25 cases were dropped from the survival analysis because the time to first new offence was zero after adjusting for time spent in custody during the follow up period. Therefore the total number of observations upon which the hazard ratios are based is 26,625.

10. The following variables were included as controls in the final logistic regression model; age, prior court appearances, prior violence offence, prior property offence, prior driving offence, prior bond, year of finalisation, bail, median sentence ranking, concurrent offences and principal offence type. The following variables were included as controls in the final Cox regression model; age, prior court appearances, prior prison, prior violence offence, prior property offence, prior driving offence, prior bond, year of finalisation, bail group, median sentence ranking, concurrent offences and principal offence type.

11. The following variables were included as controls in the final logistic regression model; age, gender, SEIFA index, prior court appearances, prior violence offence, prior property offence, prior drug offence, prior driving offence, prior juvenile, prior bond, year of finalisation, bail, legal representation, median sentence ranking, concurrent offences and principal offence type. The following variables were included as controls in the final Cox regression model; age, gender, SEIFA index, prior court appearances, prior prison, prior violence offence, prior property offence, prior drug offence, prior driving offence, prior bond, year of finalisation, bail, legal representation, median sentence ranking, concurrent offences and principal offence type.

12. Note that 894 offenders given suspended sentences were excluded from the analysis because of missing data on one or more of the following explanatory variables; postcode, principal offence median sentence ranking, legal representation and age. Most of these cases had missing postcode information (n=635). Excluding the variables based on postcode information (i.e. SEIFA and ARIA) from the propensity score model did not change the direction of the effect but the adjusted odds ratio was no longer significant.

13. Note that 31 cases were dropped from the survival analysis because time to first new offence was zero after adjusting for time spent in custody. Therefore the total number of observations upon which the hazard ratios are based is 9,563.

14. The following variables were included as controls in the final Cox regression model; age, gender, prior court appearances, prior prison, prior violence offence, prior breach, prior property offence, prior driving offence, prior bond, year of finalisation, bail group, median sentence ranking, concurrent offences and principal offence type.

15. The following variables were included as controls in the final logistic regression model; age, gender, prior court appearances, prior prison, prior violence offence, prior property offence, prior driving offence, prior bond, year of finalisation, bail group, median sentence ranking, concurrent offences and principal offence type.

16. Supplementary analyses using Inverse Probability of Treatment Weighting found a similar pattern of results. There was a significant effect of suspended sentence length on both the likelihood of re-offending and the time to re-offend, but only after adjusting for other covariates.

17. The following variables were included as controls in the final logistic regression model; age, gender, prior court appearances, prior prison, prior violence offence, prior juvenile, prior bond, year of finalisation, bail, median sentence ranking, concurrent offences and principal offence type. The following variables were included as controls in the final Cox regression model; age, gender, prior court appearances, prior prison, prior violence offence, prior breach, prior property offence, prior bond, year of finalisation, bail group, concurrent offences and principal offence type.

18. The following variables were included as controls in the final logistic regression model; age, prior court appearances, prior violence offence, prior pca, prior driving, prior bond, median sentence ranking, concurrent offences and principal offence type. The following variables were included as controls in the final Cox regression model; age, prior court appearances, prior violence offence, prior property offence, prior

driving, prior bond, bail group, median sentence ranking, concurrent offences and principal offence type.

19. Note that 15 cases were dropped from the survival analysis because time to first new offence was zero after adjusting for time spent in custody. Therefore the total number of observations upon which the hazard ratios are based is 8,079.

20. The following variables were included as controls in the final logistic regression model; age, gender, prior court appearances, prior violence offence, prior property, prior pca, prior driving, prior bond, year of finalisation, bail status, legal representation, concurrent offences and principal offence type. The following variables were included as controls in the final Cox regression model; age, gender, prior court appearances, prior violence offence, prior property, prior prison, prior driving, prior bond, year of finalisation, bail status, legal representation, median sentence ranking, concurrent offences and principal offence type.

21. Supplementary analyses using Inverse Probability of Treatment Weighting found no significant difference between the long suspended sentence and long bond groups in terms of the likelihood of re-offending or the time to re-offend, with and without adjustment for other covariates.

22. For the supervised sample, the following variables were included as controls in the final logistic regression model; age, prior court appearances, prior property, prior driving, prior juvenile, bail status, concurrent offences, median sentence ranking, offence counts and principal offence type. The following variables were included as controls in the final Cox regression model; age, gender, prior court appearances, prior prison, prior property, prior driving, prior bond, bail status, concurrent offences, median sentence ranking, offence counts and principal offence type.

23. For the unsupervised sample, the following variables were included as controls in the final logistic regression model; age, prior court appearances, prior property, prior driving, legal representation, concurrent offences, median sentence ranking and principal offence type. The following variables were included as controls in the final Cox regression model; age, prior court appearances, prior property, prior driving, legal representation, concurrent offences, median sentence ranking and principal offence type.

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APPENDIX A

Table A1: Demographic, index offence and prior offending characteristics by length of order and order type

Variable	Bonds (n=52,932)		Suspended sentences (n=15,129)	
	< 24 months	24+ months	< 12 months	12+ months
Demographic characteristics				
AGE (mean (SD))	32.7 (11.2)	33.5 (11.5)	33.3 (10.5)	34.2 (10.9)
GENDER (% male)	79.1	80.9	82.6	83.0
SEIFA_INDEX (% quartile 1)	32.2	31.9	36.1	35.2
SEIFA_INDEX (% quartile 2)	32.6	30.8	32.4	35.1
SEIFA_INDEX (% quartile 3)	20.9	22.0	19.8	19.8
SEIFA_INDEX (% quartile 4)	14.3	15.3	11.7	9.8
ARIA_GP (% inner metro)	56.1	61.5	56.8	46.2
ARIA_GP (% inner regional)	18.3	18.7	19.4	14.9
ARIA_GP (% outer regional/remote/very remote)	25.7	19.9	23.8	38.8
Index offence Characteristics				
FINALISATION_YR (2006)	33.4	34.6	32.7	36.7
FINALISATION_YR (2007)	33.7	34.2	32.2	30.5
FINALISATION_YR (2008)	32.9	31.3	35.1	32.8
BAIL_GP (% in custody)	4.5	4.5	13.7	11.3
LEGALREP (% legally represented)	76.9	80.8	88.3	91.1
PLEA (% guilty)	87.9	87.4	86.2	87.3
PENTYPE (% with supervision)	29.3	38.5	48.3	59.2
CONCURRENT (mean (SD))	0.8 (1.3)	0.9 (1.9)	1.4 (2.0)	1.6 (2.1)
POSI_RANK (mean (SD))	71.7 (23.2)	66.0 (23.0)	65.3 (25.4)	58.7 (24.0)
ASOC_GP (% homicide or related offences)	0.0	0.2	0.1	0.1
ASOC_GP (% acts intended to cause injury)	35.6	27.2	23.7	23.7
ASOC_GP (% sexual assault offences)	0.4	1.3	1.1	2.3
ASOC_GP (% dangerous or negligent acts)	2.4	3.8	2.4	2.0
ASOC_GP (% abduction or harassment)	1.1	1.1	1.0	1.5
ASOC_GP (% robbery or extortion)	0.0	0.1	0.2	0.3
ASOC_GP (% burglary or break and enter)	1.3	2.1	2.5	5.5
ASOC_GP (% theft)	8.6	5.2	10.5	4.6
ASOC_GP (% fraud or deception)	4.1	7.8	4.0	10.3
ASOC_GP (% illicit drugs)	4.6	3.8	4.5	3.9
ASOC_GP (% weapons or explosives)	0.7	0.7	0.6	0.6
ASOC_GP (% property damage)	4.9	2.2	2.0	1.1
ASOC_GP (% public order)	3.7	3.0	2.9	2.5
ASOC_GP (% PCA)	12.1	18.3	8.3	10.5
ASOC_GP (% other traffic)	9.3	15.5	19.0	21.2

ASOC_GP (% justice procedures)	10.7	7.3	16.9	9.7
ASOC_GP (% other)	0.5	0.4	0.3	0.3
COUNTS_GP (% 1 count)	94.3	93.4	93.7	90.9
COUNTS_GP (% 2 counts)	4.2	3.7	4.4	5.1
COUNTS_GP (% 3 counts)	0.8	1.0	1.0	1.6
COUNTS_GP (% 4+ counts)	0.7	1.8	1.0	2.4
Prior offending characteristics				
PRIORCOURT (mean (SD))	3.3 (4.5)	3.2 (4.1)	6.2 (5.7)	5.8 (5.6)
PRIORPRIS (% yes)	12.4	11.4	28.0	27.5
PRIORPD (% yes)	3.8	3.9	8.5	7.8
PRIORSUSP (% yes)	9.1	8.6	16.7	18.4
PRIORVIO (% yes)	31.2	29.5	51.6	47.4
PRIORBREACH (% yes)	16.4	15.5	35.2	31.7
PRIORPROP (% yes)	28.4	26.7	48.4	44.8
PRIORDRUG (% yes)	18.3	17.1	31.3	26.9
PRIORPCA (% yes)	26.7	30.5	37.0	38.5
PRIORDRIV (% yes)	34.1	37.5	56.4	54.4
PRIORBOND (% yes)	33.6	34.0	66.8	59.3
PRIORJUV (% yes)	14.4	13.0	20.6	19.3

Table A2: Propensity score model predicting bond length, and relevant covariate balance diagnostics

Table A2 below presents the logistic regression model predicting whether or not an offender received a good behaviour bond of 24 months or more for their principal offence at the index court appearance. The model indicates that offenders who receive long bonds are more likely to be older, male and reside in the inner metropolitan area. Offenders who had their offence finalised in 2006, who plead not guilty, are legally represented, have concurrent offences, more counts of their principal offence and are given a supervised order are also more likely to have a long good behaviour bond imposed by the court. With regard to offence type, the model showed that long bonds were more likely to be imposed for the following offences when compared to the referent offence category (i.e. acts intended to cause injury); homicide and related offences, sexual assault, dangerous or negligent acts, robbery, burglary, fraud, illicit drugs, prohibited weapons or explosives offences, mid or high range PCA, other driving offences and 'other offences'. Long bonds were also more likely to be imposed for more serious offences (i.e. offences with a higher Median Sentence Ranking), net of controls. The only prior offending variables which were found to be significant predictors of the length of a good behaviour bond were prior bond and prior driving offence. That is, offenders who have previously been the recipient of a court imposed bond or who have previously been found guilty of a driving offence (excluding PCA) are more likely to receive a good behaviour bond of 24 months or more.

Variable	Logit model of bond length			Balance diagnostics: standardised bias (SB)	
	Coefficient	S.E.	p-value	Before matching	After matching
Demographic characteristics					
AGE	0.006	0.001	<.001	7.3	1.2
GENDER (male vs. female)	0.187	0.027	<.001	4.5	-0.4
SEIFA_INDEX (quartile 2 vs. quartile 1)	-0.006	0.027	0.834	-3.9	-0.2
SEIFA_INDEX (quartile 3 vs. quartile 1)	0.026	0.029	0.371	2.9	0.2
SEIFA_INDEX (quartile 4 vs. quartile 1)	-0.056	0.033	0.096	2.8	-0.8
ARIA_GP (inner regional vs. inner metro)	-0.109	0.029	<.001	0.9	-1.1
ARIA_GP (outer regional/remote vs. inner metro)	-0.423	0.028	<.001	-13.9	0.2
Index offence Characteristics					
FINALISATION_YR (2007 vs. 2006)	-0.018	0.025	0.466	0.8	-1.4
FINALISATION_YR (2008 vs. 2006)	-0.105	0.026	<.001	-3.8	0.4
BAIL_GP (in custody vs. bail granted)	-0.033	0.054	0.539	-0.8	1.3
LEGALREP (represented vs. not represented)	0.258	0.027	<.001	9.7	0.4
PLEA (guilty vs. not guilty)	-0.137	0.032	<.001	-1.0	1.3
PENTYPE (bond with supervision vs. bond without supervision)	0.530	0.023	<.001	18.9	0.3
CONCURRENT	0.042	0.008	<.001	7.5	-0.3
POSI_RANK	-0.012	0.001	<.001	-24.6	1.5
ASOC_GP (homicide or related offences vs. assault)	1.328	0.319	<.001	4.2	0.0
ASOC_GP (sexual assault offences vs. assault)	0.822	0.119	<.001	9.8	0.1
ASOC_GP (dangerous or negligent acts vs. assault)	1.037	0.062	<.001	8.0	-0.5
ASOC_GP (abduction or harassment vs. assault)	0.090	0.098	0.360	-0.1	-0.8
ASOC_GP (robbery or extortion vs. assault)	0.989	0.363	0.006	3.3	0.3
ASOC_GP (burglary or break and enter vs. assault)	0.414	0.083	<.001	6.2	0.1
ASOC_GP (theft vs. assault)	-0.041	0.049	0.397	-13.3	-0.2
ASOC_GP (fraud or deception vs. assault)	0.587	0.052	<.001	15.9	0.7
ASOC_GP (illicit drugs vs. assault)	0.226	0.056	<.001	-4.2	0.5
ASOC_GP (weapons or explosives vs. assault)	0.712	0.123	<.001	1.3	-1.6
ASOC_GP (property damage vs. assault)	-0.175	0.068	0.010	-14.7	0.7
ASOC_GP(public order vs. assault)	0.076	0.062	0.219	-4.2	-0.5
ASOC_GP (low/special PCA vs. assault)	-0.385	0.179	0.031	-5.9	0.0
ASOC_GP (mid/high PCA vs. assault)	0.961	0.035	<.001	19.4	-1.3
ASOC_GP (other traffic vs. assault)	1.067	0.037	<.001	19.0	0.8
ASOC_GP (justice procedures vs. assault)	-0.102	0.043	0.016	-13.0	0.4
ASOC_GP (other vs. assault)	0.472	0.162	0.004	-0.9	1.0
COUNTS_GP (2 counts vs. 1 count)	0.099	0.055	0.073	-2.0	-0.3
COUNTS_GP (3 counts vs. 1 count)	0.269	0.108	0.013	2.3	1.6
COUNTS_GP (4+ counts vs. 1 count)	0.743	0.098	<.001	9.6	1.3
Prior offending characteristics					
PRIORCOURT	-0.006	0.005	0.170	-2.6	1.6
PRIORPRIS (yes vs. no)	-0.018	0.043	0.682	-3.1	1.8

Variable	Coefficient	S.E.	p-value	Before matching	After matching
PRIORPD (yes vs. no)	0.051	0.057	0.374	0.7	0.1
PRIORSUSP (yes vs. no)	0.019	0.042	0.657	-1.8	0.9
PRIORVIO (yes vs. no)	0.025	0.029	0.393	-4.0	1.3
PRIORBREACH (yes vs. no)	0.013	0.036	0.714	-2.7	0.9
PRIORPROP (yes vs. no)	-0.059	0.031	0.054	-3.9	0.8
PRIORDRUG (yes vs. no)	-0.045	0.032	0.164	-3.5	0.4
PRIORPCA (yes vs. no)	0.033	0.025	0.190	8.3	1.2
PRIORDRIV (yes vs. no)	0.085	0.026	0.001	6.8	1.5
PRIORBOND (yes vs. no)	0.159	0.031	<.001	0.7	2.3
PRIORJUV (yes vs. no)	-0.024	0.036	0.502	-3.9	0.7

Table A3: Propensity score model predicting suspended sentence length, and relevant covariate balance diagnostics

Table A3 presents the logistic regression model predicting whether or not an offender received a long suspended sentence for their principal offence at the index court appearance. This model shows that offenders who receive long suspended sentences are more likely to be older, male and to reside in outer regional or remote areas. Offenders who are legally represented, who have their offence finalised in 2006, have concurrent offences, have more counts of their principal offence, who are granted bail and are given a supervised order are also more likely to have a long suspended sentence imposed by the court. With regard to offence type, the model showed that long suspended sentences were more likely to be imposed for the following offences when compared to the referent offence category (i.e. acts intended to cause injury); sexual assault, burglary, fraud, prohibited weapons or explosives offences, and other driving offences.[1] The model also indicates that long suspended sentences are more likely to be imposed for more serious offences (i.e. offences with a higher Median Sentence Ranking). Prior prison, prior suspended sentence, prior bond and prior drug offence were significant predictors of the length of a suspended sentence, net of controls. Offenders who have previously received a full-time prison sentence or been the recipient of a court imposed suspended sentence are more likely to receive a suspended sentence of 12 months or more at their index court appearance. Meanwhile, offenders who had previously received a bond or had a prior proven drug offence are less likely to receive a suspended sentence of 12 months or more.

Variable	Logit model of suspended sentence length			Balance diagnostics: standardised bias (SB)	
	Coefficient	S.E.	p-value	Before matching	After matching
Demographic characteristics					
AGE	0.005	0.002	0.008	7.8	-0.6
GENDER (male vs. female)	0.131	0.051	0.010	1.1	-0.3
SEIFA_INDEX (quartile 2 vs. quartile 1)	0.031	0.045	0.486	6.0	-0.3
SEIFA_INDEX (quartile 3 vs. quartile 1)	0.061	0.051	0.233	0.0	0.5
SEIFA_INDEX (quartile 4 vs. quartile 1)	-0.005	0.065	0.940	-6.1	-0.7
ARIA_GP (inner regional vs. inner metro)	-0.089	0.053	0.095	-11.5	0.8

ARIA_GP (outer regional/remote vs. inner metro)	0.661	0.045	<.001	32.6	-3.8
Index offence Characteristics					
FINALISATION_YR (2007 vs. 2006)	-0.193	0.045	<.001	-3.4	-1.5
FINALISATION_YR (2008 vs. 2006)	-0.202	0.044	<.001	-4.9	1.1
BAIL_GP (in custody vs. bail granted)	-0.155	0.059	0.008	-8.6	2.2
LEGALREP (represented vs. not represented)	0.171	0.061	0.005	9.3	-0.2
PLEA (guilty vs. not guilty)	0.012	0.056	0.835	3.8	-1.1
PENTYPE (with supervision vs. without supervision)	0.485	0.038	<.001	22.1	-4.1
CONCURRENT	0.039	0.010	<.001	7.5	1.7
POSI_RANK	-0.009	0.001	<.001	-27.2	0.4
ASOC_GP (homicide or related offences vs. assault)	0.193	0.618	0.754	0.7	0.7
ASOC_GP (sexual assault offences vs. assault)	0.367	0.151	0.015	8.7	0.5
ASOC_GP (dangerous or negligent acts vs. assault)	0.062	0.132	0.640	-3.3	-0.3
ASOC_GP (abduction or harassment vs. assault)	0.289	0.162	0.074	3.7	-1.1
ASOC_GP (robbery or extortion vs. assault)	0.176	0.352	0.617	0.8	1.3
ASOC_GP (burglary or break and enter vs. assault)	0.619	0.101	<.001	15.2	-1.5
ASOC_GP (theft vs. assault)	-0.480	0.087	<.001	-22.9	-0.9
ASOC_GP (fraud or deception vs. assault)	0.871	0.090	<.001	25.2	-2.5
ASOC_GP (illicit drugs vs. assault)	-0.204	0.098	0.037	-3.2	-0.4
ASOC_GP (weapons or explosives vs. assault)	0.448	0.228	0.049	1.0	0.3
ASOC_GP (property damage vs. assault)	-0.267	0.156	0.087	-6.8	0.3
ASOC_GP(public order vs. assault)	-0.075	0.115	0.516	-2.4	1.3
ASOC_GP (PCA vs. assault)	0.437	0.076	<.001	8.1	-1.9
ASOC_GP (other traffic vs. assault)	0.433	0.063	<.001	4.2	0.7
ASOC_GP (justice procedures vs. assault)	-0.397	0.066	<.001	-19.7	-0.4
ASOC_GP (other vs. assault)	0.054	0.346	0.876	-1.9	0.0
COUNTS_GP (2 counts vs. 1 count)	0.166	0.088	0.060	3.3	0.7
COUNTS_GP (3 counts vs. 1 count)	0.371	0.167	0.026	5.8	-1.1
COUNTS_GP (4+ counts vs. 1 count)	0.618	0.159	<.001	11.7	-1.6
Prior offending characteristics					
PRIORCOURT	0.007	0.006	0.223	-6.6	1.1
PRIORPRIS (yes vs. no)	0.125	0.054	0.020	-1.0	0.2
PRIORPD (yes vs. no)	0.044	0.069	0.527	-2.8	0.8
PRIORSUSP (yes vs. no)	0.222	0.053	<.001	4.3	0.3
PRIORVIO (yes vs. no)	-0.057	0.046	0.220	-7.8	2.4
PRIORBREACH (yes vs. no)	-0.026	0.048	0.584	-6.8	0.4
PRIORPROP (yes vs. no)	-0.001	0.047	0.982	-7.5	0.7
PRIORDRUG (yes vs. no)	-0.134	0.046	0.004	-9.8	0.4
PRIORPCA (yes vs. no)	0.008	0.042	0.844	3.3	1.4
PRIORDRIV (yes vs. no)	-0.014	0.044	0.758	-4.6	-0.3
PRIORBOND (yes vs. no)	-0.186	0.048	<.001	-15.2	1.6
PRIORJUV (yes vs. no)	-0.021	0.055	0.706	-3.0	0.5

APPENDIX B

Prison sentences v long bonds and suspended sentences

Two further aims of this research were to examine whether (1) long bonds are more effective than prison in reducing re-offending and (2) long suspended sentences are more effective than prison in reducing re-offending. For the first analysis, offenders who received a full-time custodial sentence at the index court appearance were matched, using propensity scores and one-to-one nearest neighbour matching with no replacement, with offenders who received a long bond (24 months or more). For the second analysis, offenders who received a long suspended sentence (12 months or more) at their index court appearance were matched, using propensity scores and one-to-one nearest neighbour matching with no replacement, with offenders who received a full-time custodial sentence. All explanatory variables were included in the propensity score models. Where an offender received more than one penalty type during the study period, the first appearance was selected as the index court appearance.[2] Time to first new offence is the only re-offending outcome used in this analysis because it adjusts for time spent in custody.

Table B1 shows the unadjusted mean number of days to first new offence for the prison group (n = 12,615) compared with the long bond group (n = 13,629). Table B2 shows the unadjusted mean number of days to first new offence for the long suspended sentence group (n = 5,906) compared with the prison group (n = 14,941). There was a significant bivariate relationship between penalty type and re-offending for both cohort comparisons. Offenders who received long bonds took, on average, longer to re-offend (mean = 789.1 days; Log Rank, Mantel-Cox = 95.495; *p-value* <.001) than offenders who received a full-time custodial sentence and offenders who received long suspended sentences took, on average, longer to re-offend (mean = 702.3 days; Log Rank, Mantel-Cox = 2599.69; *p-value* <.001) than offenders who received a full-time custodial sentence.

Table B1: re-offending outcomes for prison and long bond groups, unmatched (n=26,244)

	Long bonds	Prison	p-value
Number of days to first new offence			
Mean	789.1	460.9	<.001

Table B2: Re-offending outcomes for prison and long suspended sentence groups, unmatched (n=20,847)

	Prison	Long suspended sentences	p-value
Number of days to first new offence			
Mean	456.9	702.3	<.001

A key concept in propensity score matching is common support. Common support is said to exist when the propensity score distributions of the treatment and control groups overlap. Only observations that fall within this defined region are used to estimate average treatment effects. If there is little or no overlap in the distributions of the propensity scores, then the number of comparable matches is significantly reduced and valid causal inferences cannot be drawn from the data. Figure B1 shows the distribution of the propensity scores for the prison

(treated) and long bond (untreated) groups. As seen here there is little overlap (on support) between the distributions of the two groups. The prison group has much higher average propensity scores and the long bond group has much lower average propensity scores, indicating that matching is not feasible in this instance. Therefore the matching and re-offending analyses comparing these two cohorts of offenders were not undertaken.

Figure B1: Distribution of propensity scores for the prison and long bond unmatched samples
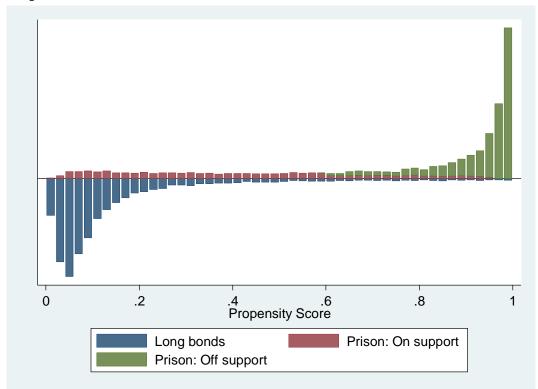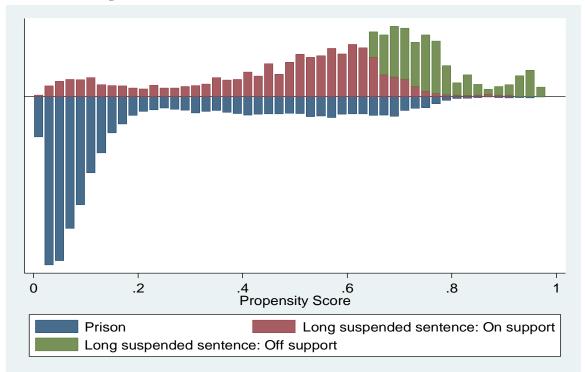

Figure B2 shows the distribution of the propensity scores for the long suspended sentence (treated) and prison (untreated) groups. While the distribution is still somewhat skewed, there appears to be sufficient overlap for propensity score methods to be applied.

Figure B2: Distribution of propensity scores for the prison and long suspended sentence unmatched samples

Using one-to-one nearest neighbour matching without replacement, a total of 3,532 offenders given long suspended sentences were matched with 3,532 offenders given a full-time custodial sentence, based on their propensity scores. The propensity score model for the unmatched sample (n = 15,844) significantly predicted whether or not the offender received a long suspended sentence (pseudo R^2 = 0.297, Likelihood ratio chi-square *p-value* <.001), but the model using the matched sample did not (pseudo R^2 = 0.006, Likelihood ratio chi-square *p-value* = 0.105). Prior to matching a total of 28 variables had SBs above the balance threshold but after matching all SBs were below 7.6. Together this suggests that the treated (offenders with long suspended sentences) and untreated (offenders given a custodial sentence) groups were adequately matched.

Table B3 presents the main outcomes from the re-offending analysis for the long suspended sentence and prison groups, after matching on propensity scores. After matching offenders, the group difference in time to first new offence remained significant, but only after adjusting for relevant covariates. Net of controls, offenders given prison sentences appear to have re-offended more quickly, on average, than offenders given long suspended sentences (Hazard Ratio[3] = 0.925, *p-value* = 0.013).[4] Given the limited overlap in the propensity score distribution, however, this result should be treated with caution.

Table B3: Re-offending outcomes for prison and long suspended sentence groups, matched (n=7,064)

Re-offending outcome	Prison	Long suspended sentences	p-value	95% CI[1]
Time to first new offence				
Unadjusted hazard ratio	1.00	0.972	0.340	0.916, 1.031
Adjusted[2] hazard ratio	1.00	0.926	0.013	0.871, 0.984

1 Standard errors have been adjusted to account for matched nature of the data
2 Adjusted for demographic, offence and prior offending variables

APPENDIX NOTES

1. Only four offenders in the suspended sentence group had a special or low range PCA offence recorded as their principal offence. Given this small number, the special/low range offence group was combined with the mid/high range offence group for the propensity score analyses.

2. Offenders in the prison sample were excluded if they had 1096 days of free time during the follow-up period and they were granted bail at their index appearance. This group of offenders are unlikely to have served any time in custody for the index offence, possibly because they successfully appealed the penalty imposed at the index appearance.

3. 42 cases were dropped from the survival analysis because time to first new offence was zero after adjusting for time spent in custody. Therefore the total number of observations upon which the hazard ratios are based is 7,022.

4. The following variables were included as controls in the final Cox regression model; age, prior court appearances, prior prison, prior violence offence, prior property offence, prior driving offence, prior bond, year of finalisation, bail group, median sentence ranking, concurrent offences, principal offence type and offence counts.