The effect of suspended sentences on imprisonment

Patricia Menéndez and Don Weatherburn

Aim: *To see whether the introduction of suspended sentences reduced the number of offenders receiving a full-time sentence of imprisonment*

Method: *The number of persons receiving a prison sentence was regressed against the number receiving a suspended sentence while controlling for changes in the total number of proven offenders and the monthly variability using multiple linear regression with ARIMA errors. The data set used for the analysis consisted of the monthly number of persons imprisoned, persons given a suspended sentence and proven offenders from January 2002 to December 2013.*

Results: *Every 10 additional offenders given suspended sentences was associated with an extra 3-4 offenders sent to prison.*

Conclusion: *Although suspended sentences were introduced as an alternative to prison, they appear to have had the opposite effect.*

Introduction

Suspended sentences were introduced in NSW in April 2000. They proved extremely popular. Between 2000 and 2013, the number of suspended sentences imposed by adult courts in NSW rose by more than 180 per cent (from 1,849 to 5,224) (see Figure 1). Under s.12 of the Crimes (Sentencing Procedure) Act (1999), suspended sentences of imprisonment should only be imposed where a sentence of full-time imprisonment would normally be appropriate. Other things being equal, then, we would expect an increase in the use of suspended sentences to be accompanied by a reduction in the use of full-time imprisonment.

In an earlier report in this series, McInnis and Jones (2010) found that the increase in the use of suspended sentences had not been accompanied by a reduction in the rate of imprisonment. Instead, it had been accompanied by a reduction in the use of other non-custodial penalties, most notably community service orders (CSOs). Over the period between 1999 and 2008, the percentage of CSOs imposed in the Local Courts fell from 20.4 per cent to 11.5 per cent. In the year prior to the introduction of suspended sentences, CSOs accounted for 9.1 per cent of all penalties imposed by the Higher Criminal Courts. By 2008,

Figure 1. Time series for the total number of proven offenders (PO), total number receiving a sentence of imprisonment (FTP) and total number given suspended sentence (SS)
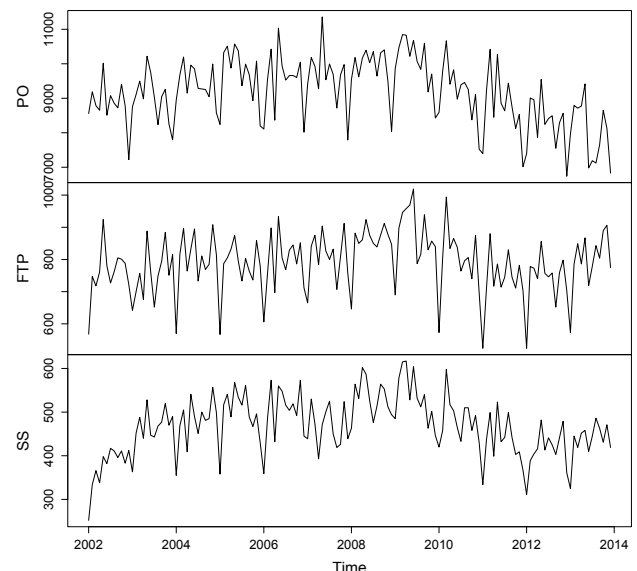
the use of CSOs by the NSW Higher Criminal Courts had all but ceased.

In discussing their findings, McInnis and Jones (2010) raised the possibility that the increased use of suspended sentences, far from reducing the use of imprisonment, might actually increase it. As they put it:

> "This imposition of suspended custodial sanctions on offenders who would otherwise have received a non-custodial sanction has potentially serious implications for imprisonment rates over the longer term. The risk of imprisonment is probably higher for breaching the conditions of a suspended sentence than it is for breaching a good behaviour bond or a CSO. One unintentional consequence of increasing the use of suspended sentences is that a greater number of offenders may be drawn into the prison population." (McInnis & Jones 2010, p. 4)

The purpose of this brief is to see whether the concerns expressed by McInnis and Jones (2010) have been realised. Specifically, we report the results of a study designed to test the hypothesis that the introduction of suspended sentences has contributed to a growth in the number of convicted offenders receiving a sentence of imprisonment.

Method

Data

Data for the study consisted of monthly counts between 2002 and 2013 of (a) the total number of people convicted in NSW Local, District and Supreme (Higher Criminal) Courts, hereafter referred to as the number of proven offenders (b) the number receiving a suspended sentence and (c) the number receiving a full-time sentence of imprisonment. January 2002 was chosen as the start point for analysis because, although suspended sentences were introduced in April 2000, the monthly number imposed remained quite low through 2000 and 2001. Note that we count a person as a proven offender if one or more offences are proved against them, even if no conviction is recorded and the offender placed on a bond.

Analysis

The question we seek to address is whether the number of sentences of full-time imprisonment increased in response to the growth in the number of suspended sentences. In examining this question we need to control for the total number of proven offenders because an increase in this number could drive up both the number of persons receiving suspended sentences and the number receiving a sentence of full-time imprisonment. We also need to control for seasonal variation in the number of proven offenders and the number of suspended CSOs. To meet these concerns, we model the relationship between the monthly number of persons receiving a sentence of full-time imprisonment against the number receiving a suspended sentence, while controlling for the monthly number of proven offenders and seasonal variation in both the number of proven offenders and the number

receiving a suspended sentence. To deal with the problem of autocorrelation so often found in time series analysis, and to avoid problems of spurious regression relationships, we test our hypothesis using multiple linear regression with ARIMA errors (Box, Jenkins, Reinsel 2013). Our model of the number of offenders imprisoned is therefore given by:

$$y_t = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + d_1 I_1 + \ldots d_{11} I_{11} + \eta_t \quad (1)$$
$$\eta_t \sim ARIMA(0,1,1) \quad (2)$$

where:

x_1 = the number of suspended sentences;

x_2 = the total number of persons sentenced;

I_i = monthly dummies i=1, … ,11; and

η_t = an ARIMA error term to capture autocorrelation in the series.

Our interest lies in the sign and magnitude of β_1, which measures the effect of suspended sentences on the number of persons imprisoned. If increasing the number of suspended sentences has the effect of decreasing the imprisonment rate, we expect the sign to be negative. Although equations (1) and (2) identify the model being tested, because the series being analysed were not stationary, the model was estimated in differences.

The contemporaneous relationship between the number of sentences of full-time imprisonment, the suspended sentences and the total number of proven offenders in the model was investigated via the cross-correlation function. Checking of model assumptions was carried out by looking at the residuals of the fitted model. The independence of the residuals was checked by examining their autocorrelation and partial autocorrelation functions, and by using the Ljung-Box test (Ljung and Box, 1978) based on the first 24 autocorrelations (H_0: Residuals are independent). The normality assumption for the residuals was tested using the Shapiro-Wilk test (Shapiro and Wilk, 1965) (H_0: Residuals are normally distributed). The significance level for all tests in this analysis was set at α = 0.05.

Results

Before presenting the results of the analysis it is useful to examine trends in the variables examined in the study. Figure 1 shows time series plots of the number of persons receiving a full-time sentence of imprisonment, the number receiving a suspended sentence and the number of proven offenders. All three series show a rising trend between 2002 and around 2009 and a falling trend until 2012. At this point, the total number sentenced continues to fall but the number given a prison sentence or a suspended sentence rises again.

Figure 2 presents scatterplots of the relationship between first differenced series for the dependent and independent variables. The terms PO, FTP and SS refer, respectively, to the total number of proven offenders, the total number receiving a sentence of imprisonment and the total number given a suspended sentence. Each panel shows a scatterplot in which the y-axis is the change in the variable listed in the same row

Figure 2. Pairs plot exhibiting the relationships for the first differenced time series between PO, FTP and SS
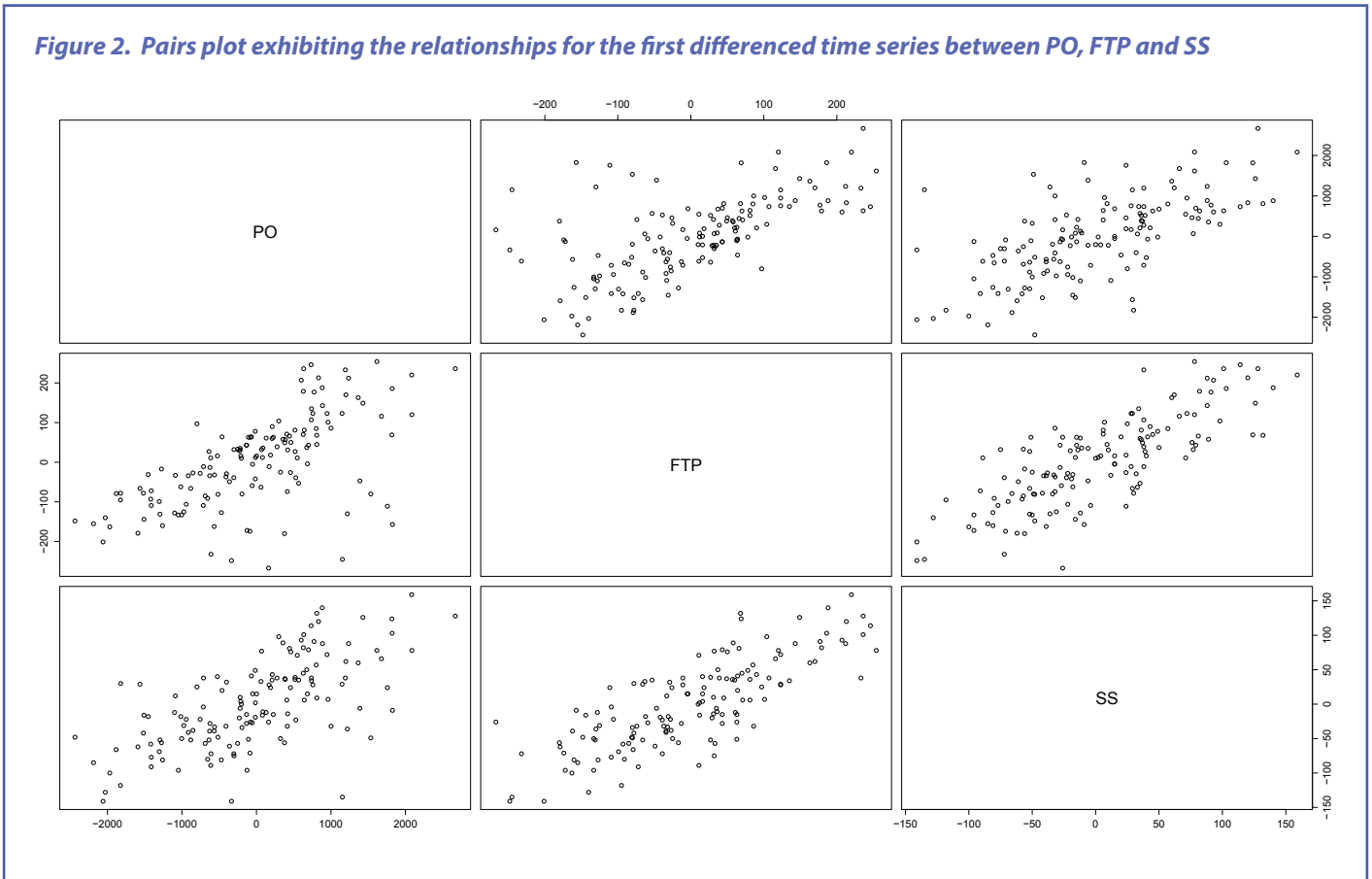
and the x-axis is the change in the variable listed in the same column. The middle scatterplot on the top row, for example, plots the change in the total number of proven offenders against the change in the number given a prison sentence. The panel to the right plots the total number of proven offenders against the number given a suspended sentence. The panel on the right hand side of the middle row plots the number given a prison sentence against the number given a suspended sentence.

There are two key points to note about the scatterplots. The first is that, as the total number of proven offenders increases, so too does the number receiving a prison sentence. This underscores the need to control for the total number of proven offenders. The second is that, as the number given a suspended sentence increases, the number given prison sentence rises also. In order to further investigate the relationship between the total number receiving a sentence of imprisonment (FTP) with the total number of proven offenders (PO) and the total number given a suspended sentence (SS), we study the cross-correlations between the series. To avoid spurious relationships due to the non-stationarity nature of the series, we calculated the cross-correlations (at different lags) between the pre-whitened time series for FTP, PO and SS.

The cross-correlations results confirm a very strong contemporaneous relationship between the variables. The contemporaneous (significant) cross-correlation values (i.e. the cross-correlation values at lag 0) were 0.55 for FTP and PO, and 0.52 for FTP and SS. This provides prima facie evidence that the rise in suspended sentences has brought with it a rise in the number entering prison.

Residual checks for the fitted model are shown in Figure 3. The residuals of the fitted model fulfilled the assumptions of independence, as shown by the ACF and PACF in the figure, and as confirmed by the Box-Ljung test p-value of 0.93. As noted earlier, the normality assumption was checked via the Shapiro-Wilk test. The test gave a p-value of 0.2, indicating that the

Table 1. Results for the multiple linear regression with ARIMA errors for modelling FTP

Estimates	Coefficients	SD	t-statistics	p-values (2 sided test)
SS	0.36	0.10	3.71	0.00
PO	0.05	0.01	6.71	0.00
Jan	-184.13	16.87	-10.92	0.00
Feb	-76.83	18.60	-4.13	0.00
Mar	-39.49	19.65	-2.01	0.05
Apr	-57.50	16.99	-3.38	0.00
May	-30.67	21.53	-1.42	0.16
Jun	-42.81	17.52	-2.44	0.02
Jul	-92.42	17.15	-5.39	0.00
Aug	-47.63	16.76	-2.84	0.01
Sep	-55.55	16.57	-3.35	0.00
Oct	-39.11	16.50	-2.37	0.02
Nov	-12.59	16.61	-0.76	0.45
ma1	-0.72	0.06	-11.32	0.00

loglikelihood = 716.76

AIC = 1463.52

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Figure 3. ACF, PACF, histogram and Normal QQ-plots for the residuals of the fitted multivariate ARIMA regression model
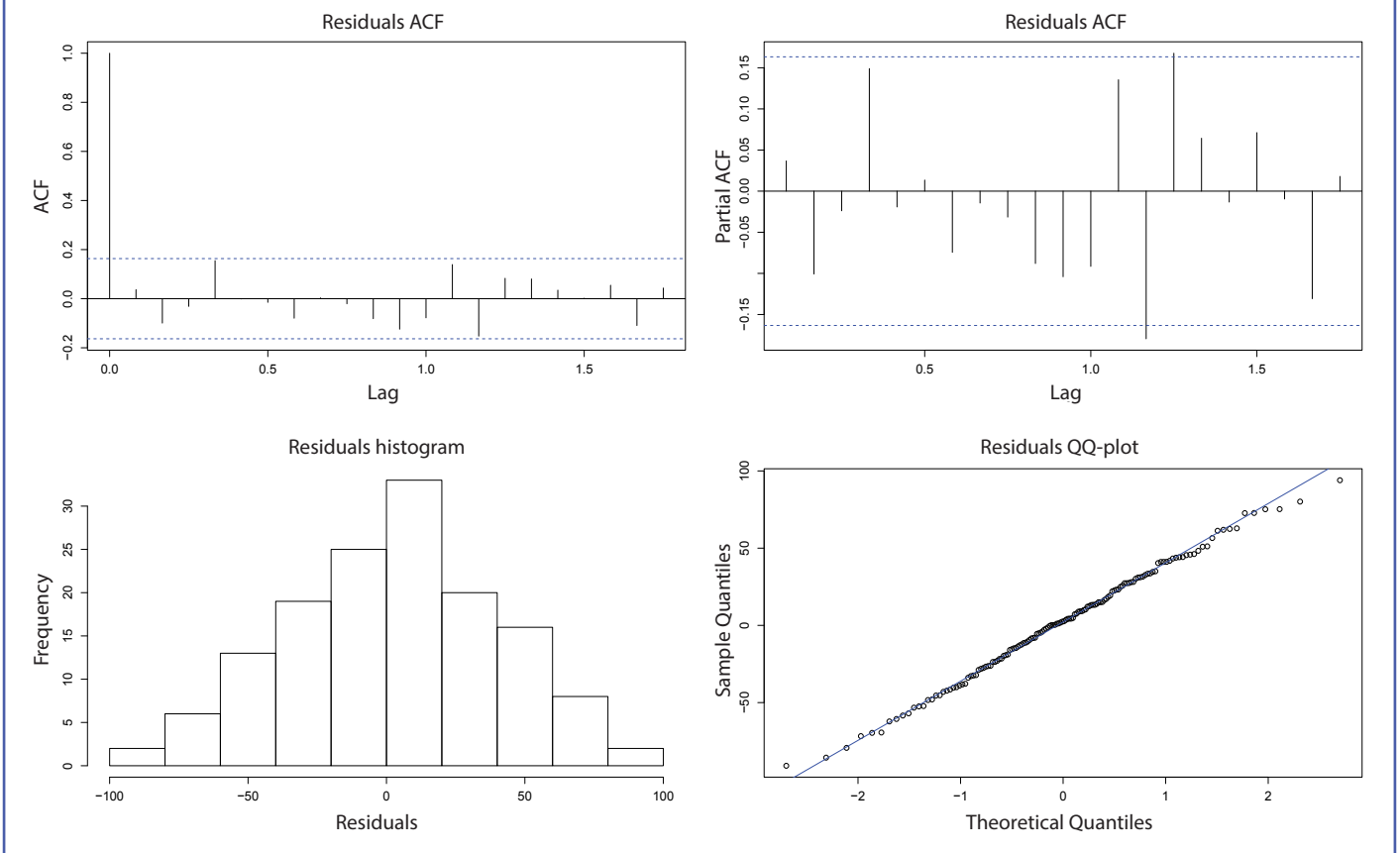
assumption was met. The normality of the residuals can be also seen in the residuals histogram and Normal QQ-plots (which compare the theoretical quantiles of the Normal distribution with the quantiles of the residuals).

Table 1 presents the results of our regression analysis which assesses the relationships between the total number receiving a sentence of imprisonment (FTP) with the total number of proven offenders (PO) and the total number given a suspended sentence (SS).

The coefficient measuring the effect of suspended sentences (SS) on imprisonments is positive, significant and large. It tells us that, for every 10 additional persons given a suspended sentence, approximately 3.6 receive a full-time sentence of imprisonment. The variable measuring the effect of the total number of proven offenders on the number going to prison is also (as one would expect) positive and significant. Its effects, however, are much weaker; with every 20 additional proven offenders resulting in just one additional person being sent to prison. The negative coefficients on the monthly dummies indicate that the number receiving a prison sentence is significantly higher in December than it is in any other month except November, where the difference does not reach statistical significance.

Discussion

The suspended sentence has been described by some as a 'Sword of Damocles' (Bartels 2007) that offers the promise of deterrence without the costs associated with actually imprisoning an offender. Research (Weatherburn & Bartels 2008) has shown that suspended sentences are no more effective in reducing the risk of re-offending than good behaviour bonds. Many, however, still regard suspended sentences as a useful alternative to prison. Some even argue that their abolition would result in a dramatic increase in the rate of imprisonment.

Gelb (2013), for example, has argued that abolishing wholly suspended sentences in Victoria would add approximately 5,500 people to the corrections population, including both prison and community corrections. While Gelb acknowledges that most offenders currently receiving suspended sentences in Victoria would not, if the sanction were abolished, end up receiving prison sentences, she notes that some proportion will inevitably end up in prison. Given the social and financial costs of imprisonment, Gelb suggests that suspended sentences be retained to provide a 'full complement of sentencing tools' to magistrates.

The fact that suspended sentences are being imposed on offenders who would not otherwise have gone to prison was what led McInnis and Jones (2010) to express concern about their potential effects on the prison population. The present study lends weight to their concerns. Our findings suggest that, far from reducing the rate of imprisonment, suspended sentences have increased it. This suggests that one way of reducing the rate of imprisonment is to abolish or curtail the use of suspended sentences in favour of sanctions (e.g. community service orders) that, if breached, do not automatically result in imprisonment.

As with all regression analyses, our conclusion regarding the effect of suspended sentences on the rate of imprisonment is subject to a number of caveats. The most important of these is the assumption that we have not omitted any factor that might have induced a correlation between suspended sentences and imprisonment. One factor that might appear to breach this assumption is a change in the seriousness of offending. A general increase in the seriousness of offending (even without any increase in the total number of proven offenders) would cause both the number of persons given suspended sentences and the number of persons given a prison sentence to increase. This would create the spurious impression that the former was causing the latter.

Fortunately, the current study is not vulnerable to this problem. It will be recalled that, rather than analyse the relationship between suspended sentences, proven offenders and imprisonment in levels (i.e. using the raw time series of each), we analysed the series in differences so that they were stationary. This had the effect of removing the trend from each series, leaving only the month to month variation for analysis. Removal of the trend in our dependent and independent variables would have removed the effect of any general increase in the seriousness of offending.

References

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