NSW Bureau of Crime Statistics and Research

Crime and Justice Statistics

Bureau Brief

April 2001

OPERATION AND CRIME REVIEW PANELS: THEIR IMPACT ON BREAK AND ENTER

Marilyn Chilvers and Don Weatherburn

In January 1998 the NSW Police Service introduced a new crime fighting strategy, modelled on the New York 'Compstat' process. The strategy involves a series of 'Operation and Crime Review Panels' (OCRs) in which senior police provide Local Area and Regional Commanders with information on crime trends and patterns in their local area and ask them to devise various tactics and strategies to reduce crime. At a later point in time the same commanders return to the OCR panels and their performance in reducing crime is reviewed by senior management. This paper examines the impact of Operation and Crime Review Panels on the recorded rate of break and enter in New South Wales. The results strongly suggest but do not prove that OCR panels have been effective in reducing the incidence of break and enter.

BACKGROUND

In the mid 1990s New South Wales began to experience a rapid growth in most major categories of recorded crime. Between 1995 and 1997, assaults rose 39 per cent, robberies rose 65 per cent, household break-ins rose 30 per cent and motor vehicle thefts rose 18 per cent (Doak 2000). These increases generated considerable public concern, especially as they were much more pronounced in New South Wales than in any other Australian State (Australian Bureau of Statistics 1998; 1996). Public concern about crime in New South Wales was further exacerbated by the fact that a Royal Commission of Inquiry during the second half of the 1990s had revealed evidence of police corruption in New South Wales (Wood 1997).

In January 1998, the NSW Police Service introduced a local version of the well known New York 'Compstat' process, known as Operation and Crime Review (OCR) panels. These panels involved periodic meetings between senior police management and Local Area (LA) commanders. At these meetings senior police confront commanders with data on the latest crime trends in their patrol and highlight crime hotspots. Commanders are asked to provide an account of the strategies they are employing to reduce crime and, where necessary, enjoined to develop more effective strategies. At subsequent meetings, the strategies they employed to reduce crime were reviewed in the light of fresh evidence about trends in and the spatial distribution of crime in their area.

While the OCR management process was modelled on the New York Compstat process, New South Wales police were not encouraged to pursue 'zero tolerance' policing[1]. Three strategies were strongly emphasised by senior police management. Firstly, police were urged to focus their resources and operations on 'hot times and hot places'. Secondly, they were encouraged to conduct frequent searches for illegal weapons among those suspected of carrying them in public places. Finally, they have been urged to employ all available legal avenues to effect the arrest of known repeat offenders. To facilitate this last strategy, LA commanders were given lists of residents in their area who had three or more convictions or an outstanding first instance warrant and/or who were thought by police intelligence analysts to be criminally active. These people then became the focus of local criminal investigation teams.

Perhaps because of the large number of outstanding warrants and the fact that arresting people on outstanding warrants comes naturally to police, the strategy of targeting repeat offenders proved particularly popular. Complete information is not available but in the two years following introduction of the OCR process, the number of offenders appearing in the NSW Local Courts who had some kind of prior criminal record increased by almost 30 per cent per annum (NSW Bureau of Crime Statistics and Research 2000). This change produced a substantial increase in the prison population. In the 12 months June 1998 to June 1999 the NSW prison population rose 13 per cent, following a five year period during which it had been quite stable (Lind, Chilvers & Weatherburn 2001).

In the two years following the introduction of OCR panels police recorded no increase in any category of crime. However, several major categories of crime showed substantial decreases. Reports of robbery with a firearm fell by 24 per cent, robbery with a weapon other than a firearm fell by 20 per cent, home break-ins fell by 10 per cent, motor vehicle theft fell by 11 per cent, indecent assault fell by 16 per cent and sexual assault fell by 10 per cent (Doak 2001). The changes were not uniformly reflected in other States (Australian Bureau of Statistics 2000). Not surprisingly, therefore, NSW police argued that they were responsible for producing the dramatic turnaround in crime (Darcy 1999).

For obvious reasons the coincidence of OCR panels and falling crime rates cannot be taken as unequivocal evidence of their success. A number of studies have found evidence that property crime rates are strongly influenced by economic factors such as gross domestic product and unemployment (Field 1999; Belknap 1989; Chiricos 1987; Deadman & Pyle 1997; Fagan and Freeman 1999; Kapuscinski, Braithwaite & Chapman 1998; Pyle & Deadman 1994). During the second half of the 1990s Australia experienced a combination of strong economic growth and falling unemployment. It is possible, then, that the shift in crime trends observed to occur with the introduction of OCR panels was the result of these conditions rather than the result of a change in policing.

The present study was designed to provide a more rigorous assessment of the effect of the introduction of OCR panels on NSW property crime. Specifically, we sought to test the effect of OCRs on crime, controlling for a range of economic and social variables which might have otherwise explained the downward trend in crime observed after their introduction. Before describing the study in detail, however, it will be useful to conduct a brief review of the research literature on targeted arrest policies and crime.

PREVIOUS RESEARCH

Most studies of the effect of arrest on crime have examined the general relationship between general arrest and crime rates; working on the assumption that the higher the arrest rate the greater the perceived risk of apprehension. Early studies overwhelmingly favoured the view that higher arrest rates produce lower crime rates (Logan 1975; Blumstein, Cohen & Nagin 1978) but the results of more recent and more rigorous studies, however, have generally been mixed (see Nagin 1998 for a full review). Some show evidence that arrest has a suppression effect on crime (Wilson & Borland 1978; Marvell & Moody 1996; Sampson & Cohen 1988) but others show no effect at all (e.g. Chamlin 1988).

As Farrell, Chenery and Pease (1998) point out, there are good reasons for expecting arrest to be more effective in controlling crime when it is targeted at certain locations or individuals. Firstly, a small number of places have been found to account for a disproportionate amount of crime (eg. Sherman, Gartin & Buerger 1989). Secondly, a small number of offenders have been found to account for a disproportionate number of offences (eg. Farrington 1992). Thirdly, frequent offenders are often the most persistent offenders (Wolfgang and Collins 1979). Fourthly, repeat offenders often commit a wide variety of different crimes (Farrington 1992). The last three considerations suggest that the incapacitation of repeat offenders could exert a substantial (even if only transient) suppression effect on many different kinds of crime.

Randomised experiments have shown targeted arrest policies to be effective, at least in some circumstances, in reducing the incidence of domestic violence (Sherman & Berk 1992) and in controlling illicit drug markets (Weisburd & Green 1995; Sherman and Rogan 1995). There is also some evidence that police patrols targeted at crime 'hotspots' can be effective in reducing crime (Koper 1995; Sherman & Weisburd 1995). These interventions, however, do not necessarily involve the deliberate use of arrest to reduce crime or the deliberate targeting of repeat offenders for arrest. Indeed, despite the theoretical promise of targeted arrest policies directed at repeat offenders, only one study appears to have examined the effect of targeting repeat offenders on crime. Most studies have examined more intermediate outcomes.

Martin and Sherman (1986), for example, conducted an experiment designed to evaluate a repeat offender project (named ROP) carried out by the Metropolitan Police Department of Washington D.C. The objective of ROP was to identify and apprehend active recidivists. To achieve this objective the police involved

in the study created a special unit whose specific task was to draw up lists of potential targets and then attempt to gather evidence which would warrant their arrest and prosecution. The experimental design required ROP officers to randomly divide their list of potential targets into two groups, one of which became their focus of interest while the other (control) were designated off-limits to ROP officers but could be investigated, arrested and prosecuted by any other police.

Despite some difficulties with the random assignment, the results of the study provided moderately strong evidence that ROP increased the likelihood of arrest of targeted repeat offenders. More importantly, ROP-initiated arrests were shown to be more likely than control group arrests to result in prosecution and conviction as felonies. Furthermore, those convicted were found to be more likely to receive a prison sentence and, if sentenced to prison, were more likely to receive a longer prison term. Against these findings, ROP was found to significantly lower the arrest productivity of officers involved in the project, primarily because police involved in the program generally effected fewer arrests for public order offences. This last result may, of course, have been a positive outcome.

Martin and Sherman's (1986) findings were replicated by Abrahamse, Ebener, Greenwood, Fitzgerald and Kosin (1991). As part of the study, police in Phoenix drew up lists of potential arrest targets using information on their suspected current criminal activity, prior criminal record, lifestyle and substance use. A targeting committee vetted these lists and drew up a master list of suspects each of which was then randomly allocated into a treatment or the control group. As in the Washington D.C. experiment, those targeted for arrest (i.e. ROP arrests) were limited to the ROP team. The control group, on the other hand, were off-limits to that team but able to be arrested by any other police. Unlike the Washington D.C. experiment, prosecutors and probation officers were explicitly drawn into the experiment through the close sharing of information on suspects and their backgrounds.

Abrahamse et al found that ROP targets were somewhat more likely to be convicted than their control group counterparts but, if convicted, were substantially more likely to receive a prison sentence and, if sent to prison, generally received much longer prison terms. They also obtained evidence that ROP targets were less likely to be granted pre-trial release (i.e. bail) although the difference was not statistically significant.

The findings obtained by Martin and Sherman (1986) and Abrahamse et al (1991) are important because they demonstrate the feasibility of significantly increasing the arrest rate of repeat offenders. They also provide evidence which would lead one to expect an incapacitation effect. The critical issue, however, is whether targeting repeat offenders can be shown to reduce crime. Only one reported study appears to have examined this issue.

Farrell, Chenery and Pease (1998) evaluated a UK program designed to reduce the incidence of burglary in an area known as Boggart Hill, part of the Killingbeck area of Leeds. In that study, as in the present one, police were provided with a list of suspects who were either known burglars (i.e. had a prior record), were thought to be prolific offenders, were currently 'at large' and were known or suspected to be currently active in undertaking burglaries. The initial phase of the intervention involved targeting this groups of offenders for arrest. During a second, 'consolidation' phase in the study, various target hardening measures were introduced to reduce the risk of repeat victimisation.

The study results indicated that the burglary rate in Boggart Hill, following the initial phase of the study, dropped by 62 per cent. Burglary rates also fell across neighbouring areas but not by anywhere near as much (41 per cent in one area, 18 per cent in another). Farrell et al also provide evidence that the drop in burglary in neighbouring areas might have been the result of arresting repeat offenders in Boggart Hill. They also provide evidence that the policy of targeting repeat burglary offenders in Boggart Hill did have a suppression effect on at least one other form of crime (vehicle theft) in the area but did not appear to produce any spatial displacement of crime to neighbouring areas.

THE PRESENT STUDY

Aim

The present study had two aims. The first was to assess whether the advent of OCR panels reduced crime in New South Wales. The second was to assess whether the policy of targeting repeat offenders exerted any effect, over and above that produced by OCR panels. Unlike the study by Farrell et al (1998) we were not in a position to conduct an experimental evaluation of the intervention strategy. It was simply introduced across the State as a whole, consequent upon the introduction of OCR panels. Thus while we are also interested in the effect of targeting repeat offenders on crime, those effects had to be assessed by conducting an interrupted time series analysis of police

crime trend data for offences which showed a significant downturn in the period immediately following the introduction of the OCR panel.

Variables

Although OCR panels and the policy of targeted arrest have been credited with producing a decrease in the incidence of offences in several categories in this study we only examine its effect on the incidence of break and enters. There are three reasons for this. Firstly, break and enters are the single most prevalent form of property crime in New South Wales. Secondly, although only about 80 per cent of home break-ins are reported to police, the police-recorded rate of break and enters is widely regarded as a good measure of trends in the actual incidence of the actual offence. Thirdly, a recently conducted special audit of police crime data for this offence provides ample basis for confidence that changes in the recorded rate of break and enters are not due to changes in police willingness to record them (Chilvers 2000).

The dependent variable in the analysis, then, was the monthly reported number of break and enters in the 48 months before the introduction of OCR panels and the 18 months after.

Three variables were employed to measure the effect of policing on crime. Two dummy variables were employed to measure the effect of OCRs on crime. he first indicating the point at which the OCR panels were introduced and the second indicating the point at which the second round of OCR panels commenced. The importance of this second round is that it could be seen as the first occasion in which the crime control strategies employed by LC commanders came in for significant criticism.

Ideally, we would have liked some direct measure of the rate at which repeat offenders were being arrested by police. It proved impossible to obtain this data from police and the available court data on the arrest of repeat offenders are very limited in scope in that they provide no indication of the nature or length of the criminal record of those being arrested.

To tap the effect of targeting repeat offences we therefore rely on the monthly number of people against whom the police prosecuted for an offence (either by way of an arrest, a summons or a court attendance notice).

As already noted, the choice of control variables is difficult because there is no consensus among researchers or theorists on the factors which influence temporal trends in crime. Past research, however, has highlighted the importance of variables measuring both the level of economic activity (Field 1999), and unemployment (Chiricos 1986; Kapuscinski, Braithwaite & Chapman 1998). Measures of economic activity are important because they tap the level of demand for goods in general and therefore the ease with which stolen goods can be sold. Measures of unemployment are important because they tap the extent to which people may be motivated to commit property crime. Given the strong role which illicit drug use plays in the commission of property crime (Blumstein, Cohen, Roth & Visher 1986) it would also seem prudent to control for its effects on aggregate crime trends.

In the light of these considerations, and given our desire to be as comprehensive as possible in our inclusion of control variables, we included four measures of the demand for consumer goods (monthly retail sales of goods in department stores; clothing, household goods and recreational goods), one general measure of economic activity (monthly numbers of new motor vehicle registrations), four measures of unemployment (monthly unemployment rate for all males, monthly unemployment rate for males aged 15-24, average monthly unemployment duration for all males, average monthly unemployment duration for males aged 15-24) and one measure of the size of the dependent heroin population (monthly admissions to methadone maintenance treatment). Data on the economic variables were obtained from the Australian Bureau of Statistics. Data on methadone admissions were kindly supplied by the National Drug and Alcohol Research Centre.

Method

In order to test the hypothesis that police activity had a significant downward influence on crime after the OCR process commenced, the statistical procedure of multiple regression modelling was used. The hypothesised linear relationship between crime and arrests is represented by equation (1) as follows:

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \ldots + \beta_p X_{pt} + \varepsilon_t \quad \ldots\ldots\ldots\ldots (1)$$

where

Y_t = the value of the dependent variable (break and enters) at time t,

Xi_t = the value of the ith predictor variable at time t

ε_t = the random error term

βi = constants

The validity of the linear regression model described by equation (1) depends on a number of assumptions about the random error terms in the equation: namely, that the errors are normally distributed, exhibit no serial correlation, have zero mean, and are homoscedastic.

The predictor variables in equation (1) include the measures of police activity of interest, and other control variables. These control variables, as noted earlier, represent other potential sources of influence on the aggregate crime rate, such as the unemployment rate and unemployment duration measures, proxies for movements in economic activity, and retail sales turnovers.

If the police activity variables are found to be statistically significant in the presence of these control variables, and the model assumptions are satisfied, then there is some evidence for attributing cause for the recent crime decrease in NSW, at least in part, to NSW Police.

RESULTS

As noted earlier, in January 1998, the OCR process was introduced by the NSW Police Service in response to rising crime rates. By July 1998, when the second round of OCR meetings was underway, the expectation that LA commanders would effect a decrease in local crime rates was clear. New policing strategies designed to achieve such a decrease were introduced, and when the subsequent crime turnaround was noted, NSW police claimed that their strategy had been a success. However, as coincidence does not imply causation, it is necessary to test for evidence of a measurable causal effect between police activity and the lower crime rates.

In order to test the effect of police activity on crime, the analysis described in this paper examines the relationship between the recorded number of break and enters (dwelling and non-dwelling), and the number of persons apprehended by police and brought to court ('arrests'). Figure 1 shows the monthly trend in break and enters compared with the trend in arrests over the five-and-a-half year period, from July 1994 to December 1999.

The two vertical lines in Figure 1 represent the commencement of the first and second rounds of OCRs in February and July 1998. From the graph, it is apparent that these two events also coincide with a change in the relationship between the crime and the arrest series. From July 1994 to January 1998, the two series increased together. The bivariate relationship between the two series for the 48 months to June 1998, as measured by the Pearson correlation coefficient, was positive and significant ($r = +0.669$, $p < 0.01$). From February 1998 through to the end of the series shown in Figure 1, however, the relationship between monthly break and enters, and arrests changed. While arrests continued to increase until mid-1999, the monthly number of break and enters decreased sharply over the same time period. The bivariate relationship between the two series for the final 18 months of the time period shown in Figure 1 was negative and significant ($r = -0.735$, $p < 0.01$). It is this change in the relationship between arrests and break and enters, after the commencement of the OCR process, that is modelled.

It was noted above that, in conjunction with the OCR process, NSW police began targeting repeat offenders. Information about the number of repeat offenders arrested is not readily available from the source of the arrests and crime data, the Computerised Operational Policing System (COPS). However, if repeat offenders

Figure 1: Monthly recorded break and enters, and arrests, NSW July 1994 to December 1999

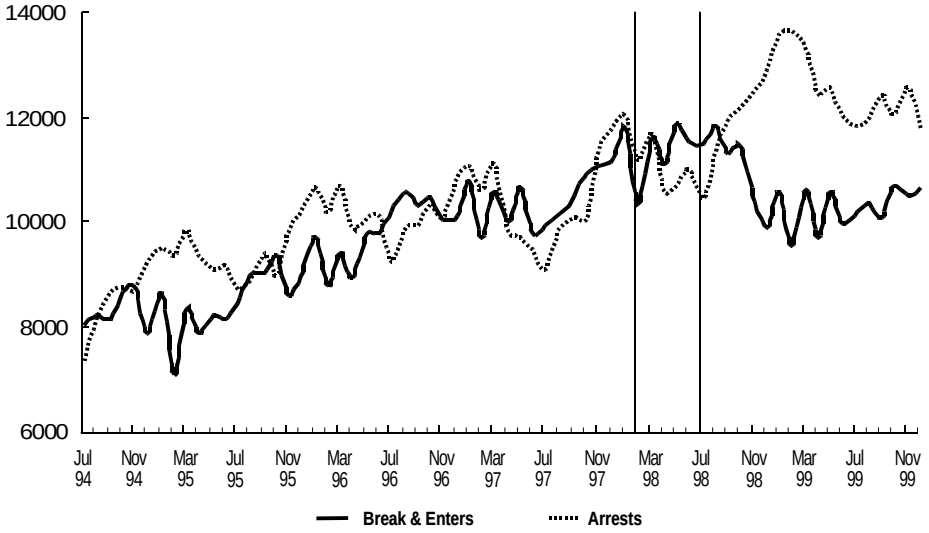


Figure 2: Monthly recorded break and enters, and Local Court finalisations for persons with prior record, NSW July 1994 to December 1999

were being arrested with increasing frequency, there should be an observable increase in the number of accused persons with prior records coming before the NSW Courts.

Figure 2 shows the break and enter recorded crime series graphed against the monthly numbers of repeat offenders whose cases were finalised in the NSW Local Courts between July 1994 and December 1999. Because the monthly counts are based on outputs from the Courts (finalisations) rather than inputs (such as registrations), there is a time lag of two to three months between when a person is arrested and when his or her case is finalised in the Local Court. Figure 2 provides evidence that there were more repeat offenders coming into the criminal justice system - in particular, through the Local Courts - from late 1998.

The model described above was fitted using a process of backward elimination to reduce the variables in the model from the full set of explanatory variables noted earlier to the final model shown in Table 1 below. Because there was a high degree of multicollinearity among the full predictor set (eg the unemployment variables were closely correlated), it was necessary to carefully monitor the impact of excluding variables on the parameter estimates of the variables retained in the model.

The final model, detailed in Table 1, was highly significant ($F=23.2$, $p<0.001$) compared with a model which just contained the seasonal (months) and control variables. In other words, the inclusion of policing variables significantly improved the predictive ability of the model.

Table 1: Regression results for model with dependent variable break and enter

Variable	*Parameter estimate (β)*	*Standard error*	*t-statistic*	*p-value*
Intercept	-11,169.2	3,371.4	-3.313	.002
OCR (July)	**10,727.6**	**1,944.3**	**5.517**	**.000**
Arrests	**1.0**	**0.16**	**6.442**	**.000**
Arrests * OCR	**-1.1**	**0.16**	**-6.809**	**.000**
Unemployment	400.4	151.4	2.644	.011
MV registrations	0.14	0.06	2.472	.017
Clothing sales	17.9	6.8	2.641	.011
Household goods sales	-8.6	3.6	-2.413	.020
Recreational goods sales	20.3	7.7	2.636	.011

The validity of the regression model depends on meeting the assumptions about the residual terms. Diagnostic tests on the residuals in the final model were performed and showed the error terms to be approximately normally distributed, and there was no evidence of heteroscedasticity. Furthermore, the autocorrelation and partial autocorrelation functions of the residuals were plotted and showed no evidence of serial correlation.

Table 1 lists each variable that was significant in the final regression model. The first two columns of figures show the parameter estimate (the σ coefficient) and its associated standard error. The third column shows the value of the test statistic to check the significance of the parameters, and the final column gives the p-value associated with the null hypothesis of a zero coefficient. The last two columns give some idea of the strength of the association between the dependent variable, monthly recorded break and enters, and each explanatory variable.

Of the five police activity variables initially entered into the model, only three are retained in the final model. The highlighted section of Table 1 shows the significance of the police activity variables. Most importantly, it shows that the dynamics of the relationship between break and enters and arrests changed after the second round of OCRs.

Firstly, it was hypothesised that arrests in one month would have an impact on the level of crime in the next month. Monthly arrests lagged by one month were included in the model. The arrests variable shows an overall positive relationship with crime. In other words, prior to the introduction of OCRs, for every extra arrest, an extra criminal incident is recorded. It appears that the two series, crime and arrests, move together (the issue of reciprocal causation is discussed in the Appendix).

Secondly, it was hypothesised that the OCR process, either at first or second round commencement, would have an effect on the level of crime. The variable representing the second round was found significant. (This is a dummy variable which takes the value zero before July 1998 and one thereafter.) In terms of equation (1), the significant OCR variable represents a change in the intercept of the hypothesised linear relationship between arrests and crime.

Finally, it was hypothesised that the OCR process affected the relationship between arrests and crime. To test this, interaction variables, representing additional terms for a changed arrest effect on crime after the first and second round commencement of OCRs, were included in the model. The interaction between the July 1998 OCR dummy variable and arrests lagged by one month was significant. The significance of this variable implies that the marginal relationship between crime and arrests changed after June 1998. From July 1998, there is a significant negative relationship between arrests and crime. In terms of equation (1), the significant interaction term represents a change in the slope of the linear relationship after June 1998.

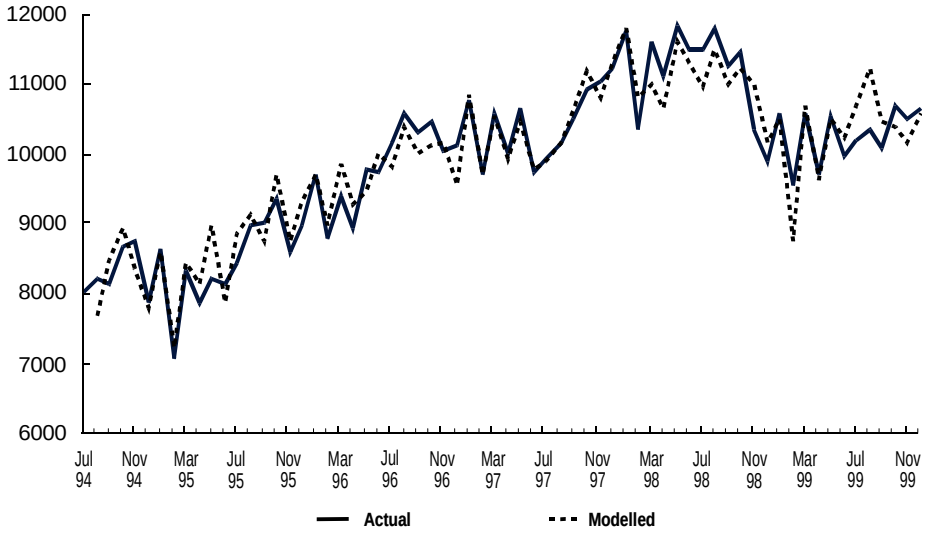
The control variables which are significant in the final model are the male unemployment rate, motor vehicle registrations and three retail sales variables: sales of clothing goods, household goods, and recreational goods. There were no multicollinearity problems with these variables.

From the significant economic variables, it appears that the level of male unemployment has a positive effect on break and enters; motor vehicle registrations also have a positive effect. The effect of different types of retail sales vary – a positive effect for clothing and recreational goods, negative for household goods. Although all of these variables were significant, caution is advised in interpreting the coefficients. As evidenced by the t-statistic, the relationship is not particularly strong and, as with any statistical inference method in such circumstances, a different data set could give rise to different results. Most importantly, though, the police activity variables retain significance in the presence of these control variables.

The strength of the modelled association is shown by the high R-squared of 0.91, denoting that altogether the modelled predictor variables explained more than 90 per cent of the variation in break and enters over the time period. More importantly, Figure 3 shows the close relationship between the actual and the modelled series. This graph compares the actual values of the dependent variable, break and enter, with the predicted values from the regression model. The predicted values very closely approximate the actual values. In particular, the model closely tracks the turning point in the series around mid-1998.

The final model shows that the overall relationship between arrests and crime is positive. Because the intervention at July 1998, and its interaction with arrests, was found to be significant, however, it can be concluded that the OCR process affected the relationship between arrests and crime. Furthermore, the model shows that the relationship between arrests and crime was negative from July 1998. Most importantly, these relationships were found while controlling for other potential confounding variables.

Figure 3: Monthly recorded break and enters, NSW actual and modelled, July 1994 to December 1999



CONCLUSION

What conclusions can be drawn from the foregoing analysis? There are four pieces of evidence which, on balance, support the conclusion that police were responsible for the fall in crime which occurred after the introduction of the OCR process.

Firstly, Figure 1 shows clearly that, while crime and arrests rose in tandem up until the introduction of OCRs, after their introduction, break and enters began to fall while arrests continued to rise. Secondly, Figure 2 is consistent with the police claim that the fall in break and enters resulted from the priority they began to assign to the arrest of repeat offenders. Thirdly, the significant coefficient in Table 1 for the interaction between arrest and OCR variables suggests that the change in crime which occurred after the advent of OCRs is attributable to policing rather than some other extraneous variable. Fourthly, Granger tests for causality (see Appendix) provide further grounds for confidence that the drop in crime was due to increased arrests rather than vice versa.

This said, the statistical analysis conducted to test the effect of the OCR process on crime is not entirely free from ambiguity. There are preferred econometric methods for the analysis of non-stationary[2] time series data (such as error correction models which take account of the cointegration between series) which have been recently developed, but which could not be applied to our data. The structural break (interruption) in our time series precludes the use of cointegration models, while the shortness of the post-OCR series and the presence of monthly seasonality does not allow for separate modelling of the latter time period. However, as the model diagnostics have shown that the underlying regression assumptions have been met, and the model fits the data well, the use of our intervention study technique is appropriate under the circumstances. It is desirable to undertake further analyses of longer time series which could incorporate the more sophisticated modelling techniques noted above.

Setting these methodological concerns to one side, there are a good many other questions which remain unanswered by the current study. Since persistent offenders tend to commit a wide variety of offences there is every reason to expect a strategy of targeting repeat offenders to reduce crimes other than break and enter. One question we need to address, then, is whether the relationship between arrest rates and break and enter observed in the current study is mirrored in the pattern for other offences. Research conducted by the Bureau over the last few months suggests that the OCR strategy of targeting repeat offenders did indeed produce a suppression effect on a range of different property crimes. These results of this research will be reported shortly.

Of course, the ultimate test of a crime control strategy is not whether it is effective in reducing crime but whether it is more cost-effective than the available alternatives. In addressing this issue we need to examine the size of any effect produced by the strategy of targeting repeat offenders and determine how long that effect can be expected to last. The size of the effect observed in the present study is fairly moderate. Essentially, for every 10 arrests we get one less break and enter. Given the cost of break and enter to the

community, such a result may be well worth the effort. Much depends, however, on whether the police strategy of targeting repeat offenders produces a significant but temporary suppression of crime or a durable long-term reduction.

Data on break and enter collected after this study indicate that the incidence of break and enter (dwelling) is now stable rather than falling. The incidence of break and enter (non-dwelling), however, has risen about eight per cent over the last two years, as has the incidence of steal from a motor vehicle and motor vehicle theft (NSW Recorded Crime Statistics 2001). These changes might seem to suggest that targeting repeat offenders only produced a temporary suppression of crime. Arrest rates, however, also declined during the year 2000. It is entirely possible, therefore, that the rise in break and enter now being observed is due to a fall in arrest rates rather than a failure of the strategy of targeting repeat offenders.

Further research is also needed to determine whether targeting repeat offenders reduces crime by means of deterrence or incapacitation. If the mechanism is one of deterrence, past studies suggest that the maximum benefits of the strategy will be apparent soon after its implementation and then tend to fade over time (Sherman 1992). If the mechanism is one of incapacitation, on the other hand, there is no reason to expect a fall-off in the efficacy of the strategy but its the effectiveness will depend upon the seriousness of the charges police lay against those whom they arrest and the quality of the evidence they have to support those charges. Conviction on minor charges or a high rate of acquittal among those arrested would both tend to reduce the incapacitative effect of the strategy because they would both tend to reduce the number of active offenders who receive a prison term.

Finally, it is important to weigh the benefits of the strategy of targeting repeat offenders against its potential risks and costs. The arrest rate of Aboriginal and Torres Strait Islander (ATSI) people is already five times higher than one would expect, given their numbers in the population (Baker 2001). Hunter and Borland (1999) have shown that the differences in rates of arrest between ATSI and non-ATSI people accounts for about 15 per cent of the difference in employment rates between the two groups. There is strong evidence suggesting that long-term unemployment among active offenders increases the depth of involvement in crime (Good, Pirog-Good, & Sickles, 1986). In some communities, then, targeting repeat offenders may have the effect of increasing crime over the longer term rather than reducing it.

ACKNOWLEDGEMENT

We would like to acknowledge the contribution of Professor Des Nicholls of the Australian National University, ACT who provided advice on the method of analysis.

NOTES

1 Several scholars nevertheless saw the introduction of OCR panels as tantamount or akin to the adoption of 'zero-tolerance policing'. As such, they argued, it represented a threat to civil liberties, had the potential to further inflame race hatred and was potentially inimical to the restoration of public confidence in the integrity of police (see: Dixon 1998; Cunneen 1999; Poynting 1999).

2 Loosely speaking, a time series is "non-stationary" when successive observations in the series are correlated.

REFERENCES

Abrahamse, A.F., Ebener, P.A., Greenwood, P.W., & Kosin, T.E., 1991, 'An experimental evaluation of the Phoenix repeat offender program', *Justice Quarterly*, vol. 8, no. 2, pp. 141-168.

Australian Bureau of Statistics 1996, *National Crime Statistics 1995*, Catalogue No. 4510.0, Canberra.

Australian Bureau of Statistics 1998, *Recorded Crime Australia 1997*, Catalogue No. 4510.0, Canberra.

Australian Bureau of Statistics 2000, *Recorded Crime Australia 1999*, Catalogue No. 4510.0, Canberra.

Baker, J. 2001, *The scope for reducing indigenous imprisonment rates*, Crime and Justice Bulletin 55, NSW Bureau of Crime Statistics and Research, Sydney.

Belknap, J. 1989, 'The economics-crime link', *Criminal Justice Abstracts*, March, pp. 140-157.

Blumstein, A., Cohen, J. & Nagin, D. 1978, *Deterrence and Incapacitation: Estimating the Effects of Criminal Sanctions on Crime Rates*, National Academy of Sciences, Washington D.C.

Blumstein, A., Cohen, J., Roth, J. A. & Visher, C. A. (eds) 1986, *Criminal Careers and Career Criminals*, vol. 1, National Academy Press, Washington DC.

Chamblin, M.B. 1988, Crime and arrests: An autoregressive integrated moving average (ARIMA) approach, Journal of Quantitative Criminology, vol. 4, no. 3, pp. 247-258.

Chilvers, M. 2000, *Validation of NSW Police Crime Statistics: A Regional Analysis*, NSW Bureau of Crime Statistics and Research, Sydney.

Chiricos, T. 1987, 'Rates of crime and unemployment: An analysis of aggregate research evidence', *Social Problems*, vol. 34, no. 2, pp. 187-212.

Cunneen, C. 1999, Zero tolerance policing and the experience of New York City, *Current Issues in Criminal Justice*, vol. 10, no. 3, pp. 299-313.

Darcy, D. 1999, Zero tolerance-not quite the influence on New South Wales policing some would have you believe, *Current Issues in Criminal Justice*, vol. 10, no. 3, pp. 290-298.

Deadman, D. & Pyle, D. 1997, 'Forecasting recorded property crime using a time series econometric model, British Journal of Criminology, vol. 37, no. 3, pp. 437-445.

Dixon, D. 1998, 'Broken Windows, Zero Tolerance, and the New York Miracle', *Current Issues in Criminal Justice*, vol. 10, no. 1, pp. 96-106.

Doak, P. 2001, *New South Wales Recorded Crime Statistics 2000*, NSW Bureau of Crime Statistics and Research, Sydney.

Doak, P. 2000, *Key Trends in Crime and Justice New South Wales 1999*, NSW Bureau of Crime Statistics and Research, Sydney.

Fagan, J. & Freeman, R.B. 1999, 'Crime and Work' in *Crime and Justice: A Review of Research*, ed. M. Tonry, vol. 25, The University of Chicago Press, Chicago, pp. 225-290.

Farrell, G., Chenery, S., & Pease, K. 1998, *Consolidating police crackdowns: findings from an anti-burglary project*, Police Research Series, Paper 113, Home Office Research, Development and Statistics Directorate, London.

Farrington, D.P. 1992, 'Criminal Career Research in the United Kingdom', *British Journal of Criminology*, 32, 4, pp. 521-536.

Field, S. 1999, *Trends in crime revisited*, Home Office Research Study, no. 195, HMSO, London.

Good, D.H., Pirog-Good, M.A. and Sickles, R.C. 1986, 'An analysis of youth crime and employment patterns', *Journal of Quantitative Criminology*, vol. 2, pp. 219-236.

Hunter, B. & Borland, J. 1999, *The effect of arrest on indigenous employment prospects*, Crime and Justice Bulletin 45, NSW Bureau of Crime Statistics and Research, Sydney.

Kapuscinski, C.A., Braithwaite, J. & Chapman, B. 1998, 'Unemployment and crime: Toward resolving the paradox', *Journal of Quantitative Criminology*, vol. 14, no. 3, pp. 215-241.

Koop, G., 2000, *Analysis of Economic Data*, John Wiley & Sons Ltd, London. UK.

Koper, C.S. 1995, 'Just enough police presence: reducing crime and disorderly behaviour by optimising patrol time in crime hot spots', *Justice Quarterly*, vol. 12, no. 4, pp. 649-672.

Lind, B., Chilvers, M., & Weatherburn, D. 2001, *Simulating the New South Wales Criminal Justice System*, NSW Bureau of Crime Statistics and Research, Sydney.

Logan, C.H. 1975, 'Arrest rates and deterrence', *Social Science Quarterly*, vol. 56, no. 1, pp. 376-389.

Marvel, T.B. & Moody, C. E., 1996, 'Specification problems, police levels and crime rates', *Criminology*, vol. 34, no. 4, pp. 609-646.

Martin, S.E. & Sherman, L.W. 1986, 'Selective apprehension: a police strategy for repeat offenders', *Criminology*, vol. 24, no. 1, pp. 155-173.

Nagin, D. S. 1998, 'Criminal deterrence research at the outset of the 21st century', in *Crime and Justice: An Annual Review of Research*, vol. 23, M. Tonry (ed.), the University of Chicago Press, Chicago. pp. 1-42.

New South Wales Bureau of Crime Statistics and Research, 2000, *NSW Criminal Court Statistics 1999*, unpublished data, NSW Bureau of Crime Statistics and Research, Sydney.

New South Wales Bureau of Crime Statistics and Research, 2001, *NSW Recorded Crime Statistics 2000*, NSW Bureau of Crime Statistics and Research, Sydney.

Poynting, S. 1999, When 'Zero Tolerance' looks like racial intolerance: 'Lebanese Youth Gangs', Discrimination and Resistance, *Current Issues in Criminal Justice*, vol. 11, no. 1, pp. 74-78.

Pyle, D.J. & Deadman, D.F. 1994, 'Crime and the business cycle in post-war Britain, *British Journal of Criminology*, vol. 34, no. 3, pp. 339-357.

Sampson, Robert, J. & Cohen, J. 1988, 'Deterrent effects of police on crime: A replication and theoretical extension', *Law and Society Review*, vol. 22, pp. 163-189.

Sherman, L.W., 1992, 'Attacking Crime: Policing and Crime Control', *Crime and Justice: An Annual Review of Research*, vol. 15, M. Tonry & N. Morris (eds.), the University of Chicago Press, Chicago. pp. 159-230.

Sherman, L.W., Gartin, P.R., & Buerger, M.E., 1989, 'Hot spots of predatory crime: routine activities and the criminology of place', *Criminology*, vol. 27, no. 1, pp. 27-55.

Sherman, L.W. & Berk, R.A. 1992, 'The specific deterrent effects of arrest for domestic assault', *American sociological review*, vol. 49, pp. 261-272.

Sherman, L.W. & Weisburd, D. 1995, 'General deterrent effects of police patrol in crime 'hot spots': a randomised controlled trial', *Justice Quarterly*, vol. 12, no. 4, pp. 625-648.

Sherman, L.W. & Rogan, D.P. 1995, 'Deterrent effects of police raids on crack houses: a randomised

controlled experiment;' *Justice Quarterly*, vol. 12, no. 4, pp. 755-781.

Weisburd, D. & Green, L. 1995, 'Policing drug hot spots: the Jersey City drug market analysis experiment', *Justice Quarterly*, vol. 12, no. 4, pp. 711-735.

Wilson, J.Q., & Borland, B. 1978, 'The effect of the police on crime', *Law and Society Review*, vol. 12, no. 3, pp. 3-26.

Wolfgang, M. & Collins, J.J. 1979, *Offender careers and restraint: probabilities and policy implications*, Final report, Philadelphia.

Wood, J.R.T. 1997, *Royal Commission into the NSW Police Service*, NSW Government, Sydney.

APPENDIX

Reciprocal causation

The change in the direction of the relationship between arrests and crime as shown by the regression model above may be looked at more closely. The results in Table 1 showed that there was a positive influence of arrests on crime overall, and then a negative effect after the OCR process. These relationships are examined more closely by testing the causal relationships using a Granger test which helps evaluate the extent of any explanatory power of a predictor variable in the presence of lagged values of the dependent variable (Koop 2000).

Two sets of tests are performed on the two separate time periods. The first test checks whether lagged arrests explain crime (in the presence of lagged crime), and the second test examines the effect of lagged crime on arrests in the presence of lagged arrests. The tests are performed separately for the pre and post OCR periods, due to the hypothesised changed relationship between crime and arrests as a result of the OCR process.

Table 1a show the results of Granger causality tests over the two periods. As noted earlier the bivariate correlation between crime and arrests was positive before July 1998. Figure 1 showed that the two series moved together. In order to test if lagged arrests exerted a positive influence on crime, crime is regressed on both lagged crime and lagged arrests. If lagged arrests are significant predictors in the presence of significant lagged crime, then arrests 'Granger cause' crime in this time period. In fact, in the period to June 1998, the lagged arrest variable was not significant. However, in the second test, when arrests were regressed on lagged arrests and lagged crime, the lagged crime variable was significant. That is, before July 1998, crime had a positive effect on arrests - explaining the positive correlation.

After the OCR process commenced, the relationship is very different. Table 1a shows that there is a negative correlation between crime and arrests and when tested, there is a negative explanatory effect of arrests on crime (in the presence of lagged crime). There was no corresponding explanatory effect of crime on arrests. These results confirm the regression findings shown in Table 1.

Table 1a: Bivariate relationship between arrests and crime, and Granger test results

July 1994 to June 1998		***July 1998 to December 1999***	
Pearson correlation	r = + 0.669	Pearson correlation	r = - 0.735
Crime = f (lagged crime, ***lagged arrests****)*		*Crime = f (lagged crime,* ***lagged arrests)***	
Explanatory variable	**p-value**	**Explanatory variable**	**p-value**
Crime (lag 1)	0.026	Crime (lag 1)	0.720
Crime (lag 2)	0.000	Crime (lag 2)	0.029
Arrests (lag 1)	0.909	Arrests (lag 1)	0.038
Arrests = f (lagged arrests, ***lagged crime****)*		*Arrests = f (lagged arrests,* ***lagged crime****)*	
Explanatory variable	**p-value**	**Explanatory variable**	**p-value**
Arrests (lag 1)	0.000	Arrests (lag 1)	0.003
Crime (lag 1)	0.262	Crime (lag 1)	0.773
Crime (lag 2)	0.002	Crime (lag 2)	0.619