Do fewer guns lead to less crime? Evidence from Australia

Benjamin Taylor [a], Jing Li [b,*,1]

[a] Harvard Law School, 1563 Massachusetts Avenue, Cambridge, MA 02138, United States
[b] Department of Economics, 800 E. High Street, Miami University, Oxford, OH 45056, United States

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ABSTRACT

The 1996 National Firearms Agreement (NFA) in Australia introduced strict gun control laws and facilitated the buyback of over 650,000 firearms. While several studies have investigated the effect of the NFA on firearm deaths, none has looked at its impact on crimes. In this paper we adopt the difference-in-difference identification approach to examine the impacts of the NFA on crimes. We find that one and two years after the NFA was enacted, there were significant decreases in armed robbery and attempted murder relative to sexual assault, with weaker evidence in relation to unarmed robbery.

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1. National Firearms Agreement (NFA)

On April 28, 1996, Martin Bryant, a middle-aged psychologically disturbed man, killed 35 people in Port Arthur, Tasmania using a semiautomatic Armalite rifle and an SKS assault rifle. In an immediate response to the tragedy, the Australian Parliament enacted the National Firearms Agreement (NFA) and urged the eight Australian states – New South Wales, Victoria, Queensland, South Australia, West Australia, Tasmania, Northern Territory, and Australian Capital Territory to further tighten gun restrictions.[2] Between 1996 and 1997 the states heeded this plea from Parliament and enacted uniform gun control laws that prohibited the ownership, possession, and sale of automatic and semiautomatic weapons, limited handguns to target shooters with at least six months of target shooting experience, and strengthened requirements for licensing, registration, and safe storage of firearms.

Through the NFA, the Australian national government implemented a federally financed gun buyback and imposed a ban on the importation of semi-automatic firearms. By late 1997 over 650,000 guns were bought back and destroyed; this decrease, accompanied by the states' bans on firearms, reduced the number of guns in private hands by 20%, and gun owning households by nearly 50%.[3]

2. Empirical literature

Since Australia uniformly restricted gun ownership, and experienced no radical changes outside of its regulatory environment of guns, it has become the perfect case study to observe the effects of gun restrictions on criminal acts. In the literature there appears to be a consensus that the legislation decreased suicide rates significantly, yet there is debate concerning its effect on homicide.[4] Chapman et al. (2006) find that the NFA led to an accelerated decline in annual total gun deaths, but Baker and McPhedran (2006) discover that the effect of the NFA on gun related deaths was negligible. Later Leigh and Neil (2010) utilize panel data and show the NFA had an effect on firearm homicides, without affecting non-firearm death rates.

Note that previous studies have focused on the impact that the legislation had on deaths, with relatively little effort going to examine the effect on crime. As a result, these studies provide an

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* Corresponding author.
   E-mail addresses: btaylor@jd17.law.harvard.edu (B. Taylor),
lij14@miamioh.edu (J. Li).

[2] Explanation of abbreviations and variables are given in Table 1.

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[3] A more detailed description of the Port Arthur massacre and the NFA can be found in other sources such as Buchanan (2013).

[4] For instance Leigh and Neil (2010) estimates that the NFA decreased suicide rates by 74%.

incomplete evaluation of the NFA. This research attempts to make a contribution to the literature by filling that gap. In particular, we try to find the empirical evidence for the effect of the NFA on four crimes – armed robbery, attempted murder, sexual assault, and unarmed robbery. But first, it is instructive to compare two conflicting views about the effectiveness or ineffectiveness of the NFA.

3. Two views about gun restrictions

In general, opponents of strict gun laws argue that said laws will be ineffective because unlawful citizens will still be able to obtain firearms via a black market. If true, then gun restrictions will only take guns out of the hands of law abiding citizens, ultimately making potential victims become less risky targets. For example, Lott and Mustard (1997) predict when criminals contemplate robbery or assault, they consider the probability that victims will protect themselves using their own guns. By banning guns, the risk of lethal retaliation is minimized, so the potential cost of performing a criminal act is decreased, especially when the aggressor has a gun, but the victim does not. This, in a sense, establishes that allowing certain people to own guns legally creates a positive externality by making it harder for criminals to know if the victim is armed before they strike, increasing the criminal's expected costs for committing crimes.

Proponents of strict gun laws think differently. While a black market may still exist, the ready availability of high-powered weapons is effectively altered. This alteration is a powerful tool in that it makes guns harder to obtain, which may dissuade petty criminals from using a weapon in their criminal act, or deter them from committing a criminal act in general. Marvell (2001) adds further support for this argument that gun bans decrease criminal gun ownership, by showing that they increase the expected cost of possessing a weapon: potential confiscation of the weapon, possible sanctions applied by juvenile officers, and the chance of being convicted and sentenced in a court of law make gun ownership relatively more expensive. As gun legislation becomes stricter, the cost of gun – possession will only increase due to the increased likelihood of sanctions or being sentenced in a court of law. Assuming that the probability that one will possess a gun is directly related to the cost of owning a gun, the increase in gun bans should greatly decrease gun ownership. If the decision to commit a crime is partially determined by the probability that the crime will be successful, and the probability of success is a function of weapon choice – guns pose a more severe threat to the victim, so the success of a crime is more likely – the reduction in gun ownership by criminals could make various crimes occur less frequently.

Our empirical findings will provide statistical evidences, and therefore shed more light on this debate.

4. Data

The data used in this paper come from annual state yearbooks and recorded crime reports of the Australian Bureau of Statistics. The recorded crime reports, which span from 1993 to 2010, comprise the number of sexual assault, attempted murder, armed robbery, and unarmed robbery incidents reported to the police in each calendar year. The definitions of these crimes, according to the Australian Standard Offence Classification (ASOC), are as follows: a sexual assault is a physical contact of a nature directed toward another person where that person does not give consent, gives consent as a result of intimidation or fraud, or consent is proscribed; an attempted murder is an attempted unlawful killing of another person where there is either the intent to kill, or the intent to cause grievous bodily harm with the knowledge that it was probable that

Table 1
Explanations of variables.

Variable	Explanation
Time-varying controls	
Population	State population
Youth	(Population of youth (15–24))/population $\times 100$
Police	(Number of sworn police officers)/population $\times 100$
Prisoner	(Number of prisoners)/population $\times 100$
Unemployment	Unemployment rate (%)
Treatment	
Armed robbery	(Number of armed robberies)/population $\times 10,000$
Attempted murder	(Number of attempted murders)/population $\times 10,000$
Control	
Sexual assault	(Number of sexual assaults)/population $\times 10,000$
Unarmed robbery	(Number of unarmed robberies)/population $\times 10,000$
Independent variables	
D_{98}	=0 before 1998 and =1 after 1998
D_{99}	=0 before 1999 and =1 after 1999
$D_{\text{treatment}}$	=0 for sexual assault and unarmed robbery and =1 for armed robbery and attempted murder

death or grievous bodily harm would occur but where death did not actually occur; and an (un)armed robbery is an unlawful taking of property with the intent to permanently deprive the owner of the property, from the immediate possession, control, custody or care of a person, accompanied by the use, and/or threatened use of immediate force or violence.

Even though victimization data before 1993 are available, we do not use them in this paper due to the inconsistency of the data. The pre-1993 data were collected via an annual household survey that asked citizens if they had ever been victimized. Considering that these data came from a household survey, rather than police reports, and the survey did not specify the year in which the crimes occurred, they are not as informative as, and are inconsistent with, the recorded crime report.

The dependent variables are the crime rates, expressed as the number of crimes per 10,000 people. Following the literature (see Marvell, 2001; Raphael and Winter-Ebmer, 2001 for instance) the confounding factors we have controlled for include (1) the annual unemployment rate in each state, which serves as the proxy for economy; (2) the number of sworn police officers at the end of each calendar year divided by the state population, which measures the size of law enforcement; (3) the number of prisoners divided by the state population; and (4) the percentage of youth population with ages 15–24. Table 1 provides detailed explanation of each variable.

Fig. 1 plots the time series of standardized crime rates of armed robbery (denoted by triangle) and sexual assault (denoted by circle) in each state and the whole country, with a vertical line representing the year 1997. There is no strong indication that the two crime rates diverged in the years prior to 1997. However, after 1997 we see noticeable divergence in most states. For instance, in the populous New South Wales, there seems to be an upward trend in the sexual assault, whereas the trend for the armed robbery was inverted after 1997.

Fig. 1 also indicates that the NFA may have lagged effect. In most states the turning point in the armed robbery trend did not occur until one or two years after 1997. In light of this, Table 2 compares average crime rates in the whole sample, and before and after 1999. For the armed robbery the average rate is 2.988 before 1999 and 3.069 after 1999, and the difference is statistically insignificant (standard error = 0.280 is in parentheses). By contrast, there is a significant and positive difference before and after 1999 for the sexual assault, indicating that the upward trend for the sexual assault had not been stopped.

Overall, Fig. 1 and Table 2 motivate the difference-in-difference identification strategy.