

Concealed Carry Laws: Violent Crime Deterrent or Stimulant?

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Abstract

Over the past 30 years, a number of U.S. states have relaxed concealed carry laws. An argument for this shift in statutes is the claim that such laws deter criminals who fear their potential victims will be armed. Using state-level data from 1981 to 2012 within a difference-in-difference framework, I investigate the effect of shall-issue concealed carry laws on violent crime rates. I find the passage of such laws is associated with a statistically significant 7 percent increase in violent crime. I illustrate this effect with 14 states that adopted right-to-carry laws between 1994 and 1996. Because concealed carry permit holders tend to be law abiding, I conclude that a general rise in gun culture that comes with concealed carry laws is likely to contribute to higher violent crime rates.

Introduction

In the back-and-forth of gun control debate in the United States, one trend has emerged over the past three decades: more and more states have relaxed restrictions on concealed carry laws. In 1984, 16 states forbade the practice of carrying a concealed weapon in public (“No-issue” concealed carry) with just four states maintaining “shall-issue” or unrestricted status. Thirty years later, 41 states have adopted shall-issue or unrestricted concealed carry laws while there are no longer any states with a no-issue designation.

“No-issue” states do not allow any private citizens to carry a concealed firearm in public. The designation with the most variety is “may-issue,” which requires a specific reason for citizens to request a permit, and unspecified self-defense is typically not considered “good cause.” The now-most prevalent label among states is “shall-issue,” which requires permits to be granted to all applicants who meet the state’s specific criteria. The distinction between may-issue and shall-issue is not always clear due to the varying levels of restrictiveness by may-issue states. The important distinction is whether a permit application requires that “good cause,” in which case the state is may-issue. Some may-issue states are extremely restrictive and arbitrary while others are looser in their granting of permits. The final category is “unrestricted” states, which do not require a permit to carry a concealed weapon in public.

Since shall-issue states make concealed carry permits available to most Americans and unrestricted states are still uncommon, I looked at whether states were restrictive (no-issue or may-issue) or non-restrictive (shall-issue or unrestricted). For the remainder of the paper, when I refer to the number of states that are shall-issue, my meaning is “at least” shall-issue, i.e. shall-issue or unrestricted states as opposed to may-issue or no-issue. When Illinois moved

from no-issue to shall-issue in 2013, there were no longer any bans on concealed weapons in a U.S. state for the first time since the early 19th century. The trend continues, as Kansas decided on April 3, 2015 to move from shall-issue to unrestricted.

Beyond Second Amendment rights, proponents of concealed carry laws argue that they serve as deterrents to violent crime. The argument is that criminals may be less likely to attack someone if they think the potential victim is carrying a concealed firearm. However, others argue that relaxing gun restrictions will only lead to more gun violence as weapons become more prevalent in public. Although both of these arguments are logical, which one is correct is ultimately an empirical question.

The numerical evidence in favor of concealed carry laws comes from lowered rates of violent crime in years following the adoption of shall-issue or unrestricted status. According to the NRA, Alaska, Arizona, and Wyoming have seen declining murder rates since signing unrestricted concealed carry laws. Chicago has similarly had a drop in violent crime since Illinois' 2013 switch to shall-issue. Of course, violent crime has been trending downwards in the United States since the early 1990s. The U.S. violent crime rate in 2012 was the country's lowest since 1970 and represented a 44 percent drop from 1991. It is possible that the crime reduction in states that loosened concealed carry laws merely reflected the secular trend in crime that would have occurred without this legal reform.

In this paper I will examine the effect of concealed carry laws on violent crime rates in the U.S. In contrast to the state-specific time series evidence outlined above that may be contaminated by secular trends, I utilize state-level data on crime between 1981 and 2012 within a difference-in-difference framework that exploits the variation in timing of such laws as

a way to control for secular trends. I use violent crime as the outcome of interest – as opposed to rates for more particular crimes such as murder– because having a concealed weapon should deter all types of assaults, not merely attempted murders or gun attacks. Violent crime rates also provide significantly greater incidence rates which should increase the precision of the estimates. For example, in 2013 there were 20 states with fewer than 100 murders. Therefore, likely impact of shall issue laws (such as reducing murders by 10 a year) are not outside the year-to-year fluctuations in such data.

History

For this study I examined data from 1981 to 2012, the time period in which the majority of states became shall-issue. In 1980 Indiana became just the fourth shall-issue state, joining New Hampshire, Vermont, and Washington. South Dakota, Maine, and North Dakota joined those four in 1985-'86. Florida's high-profile shift to shall-issue sparked a massive national trend from 1989 to 1996 when 21 states followed suit. Twelve more states moved to shall-issue as well in the 21st century, bringing the total to 41 – obviously a huge difference from the three lone states before 1980. Table 1 shows the year in which states moved to shall-issue.

It is not exactly clear what sparked this massive 30-year shift. The U.S. violent crime rate surged upwards from 1987 to 1992 and remained at high levels until the late '90s. The decade after 1987 was the period with the largest increase in shall-issue laws. It is possible that the conjunction of NRA lobbying and general concern over the rising violent crime rate changed people's mindsets about how to protect themselves. The 1987 Florida law may have been the impetus. With speculation over widespread increases of gun crime, the perception after the

implementation of the law was that no such repercussions had occurred. Interestingly, Florida still experienced a 9 percent growth in violent crime from 1987 to 1988, compared to less than 5 percent growth in the entire United States.

Table 1

State	Year State Moved to Shall-Issue	State	Year State Moved to Shall-Issue
Vermont	< 1980	Virginia	1995
New Hampshire	< 1980	Kentucky	1996
Washington	< 1980	Louisiana	1996
Indiana	1980	South Carolina	1996
Maine	1985	Michigan	2001
North Dakota	1985	Colorado	2003
South Dakota	1986	Minnesota	2003
Florida	1987	Missouri	2003
Georgia	1989	Ohio	2003
Oregon	1989	New Mexico	2004
Pennsylvania	1989	Kansas	2006
West Virginia	1989	Nebraska	2006
Idaho	1990	Iowa	2010
Mississippi	1991	Wisconsin	2011
Montana	1991	Alabama	2013
Alaska	1994	Illinois	2013
Arizona	1994	California	Never
Tennessee	1994	Connecticut	Never
Wyoming	1994	Delaware	Never
Arkansas	1995	Hawaii	Never
Nevada	1995	Maryland	Never
North Carolina	1995	Massachusetts	Never
Oklahoma	1995	New Jersey	Never
Texas	1995	New York	Never
Utah	1995	Rhode Island	Never

The general decrease in violent crime in the U.S. after the early '90s might have instigated a copycat approach from the states that had not yet moved to shall-issue. Instead of looking at measures like police force increases and drug-related crime drops, perhaps legislatures and the public looked at the general fact that the crime rate fell in the '90s after adopting shall-issue laws.

Regardless of the reasons, the general trend has undoubtedly been toward right-to-carry laws across the United States. It's not just moving to shall-issue, either. Figure 1, courtesy of *The Washington Post*, shows how there has been a general and significant trend toward the looser end of the concealed carry spectrum.

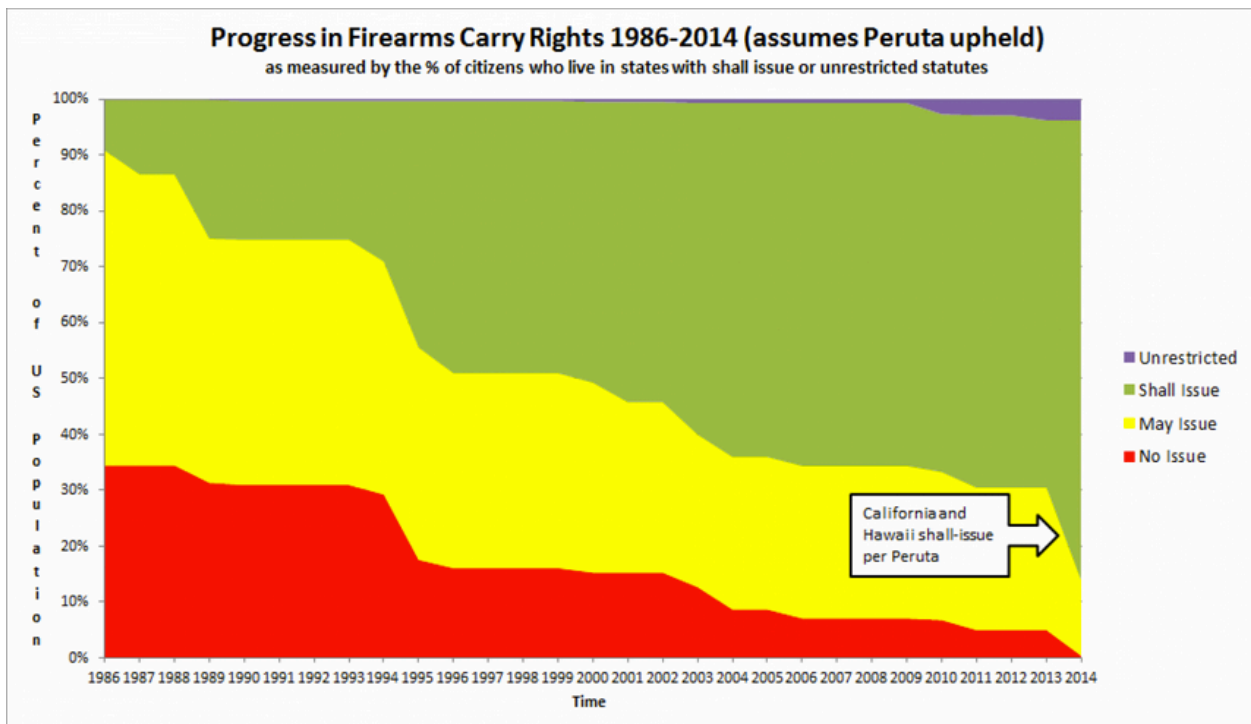


Fig. 1.

Source: The Washington Post

Presumably that trend indicates that state governments, politicians and populations believe that either right-to-carry laws lower violent crime or that the laws have such a minimal impact that the freedom to carry a concealed weapon in public is worth the potential violent crime effects.

In this paper I will attempt to either substantiate or refute these perceptions about concealed carry laws and violent crime by attempting to measure their true correlation through difference-in-difference models.

Literature Review

For the most part, studies into the connection between violent crime and concealed carry laws have produced mixed results, mostly due to differing methods and data sets. For instance, in 2014 the Crime Prevention Research Center looked at how violent crime and murder rates are related to a state's volume of concealed carry permits. Looking at post-2007 data, the researchers showed that as the number of permits has significantly risen, violent crime and murder have decreased. They also determined that the six states with the most lenient concealed carry laws have significantly less crime than the six toughest. But, as they say in the article, "this is a much too simplistic of an approach. Despite their common use, simple cross-sectional comparisons can be very misleading. There are many factors that vary across places that explain differences in crime rates." They used a regression that had "a great deal of measurement error and should only be taken as suggestive" and found a one-point increase in the percent of population with a permit was associated with a 1.4 percent drop in the murder rate.

In 1998 John Lott, who conducted the Crime Prevention Research Center study (and is the center's president), published the book *More Guns, Less Crime*, which claimed that shall-issue states see a drop in crime after the laws are passed. A study by the National Research Council of the National Academies found that the data used by Lott was too inconclusive to make definitive statements on policy. In 2003 a report by the Center for Disease Control found that studies examining links between violent crime and shall-issue laws were not reliable, stating, "A review of the data revealed critical problems, including misclassification of laws, unreliable county-level crime data, and failure to use appropriate denominators for the available numerator crime data. Methodological problems, such as failure to adjust for autocorrelation in time series data, were also evident. Results across studies were inconsistent or conceptually implausible. Therefore, evidence was insufficient to determine the effect of shall issue laws on violent outcomes."

A 2014 study by Abhay Aneja, John J. Donohue III, and Alexandria Zhang examined data from 1979 to 2010, finding a more positive correlation between right-to-carry laws and violent crime. Researchers say opposing findings were due to the small period of research that typically did not extend into the 21st century. By expanding the data to 2010, Aneja et. al found that there was an especially significant increase in aggravated assaults in right-to-carry states by about 8 percent.

In addition to studies about links with violent crime, there have been salient reports about other aspects of right-to-carry laws. Gun advocate Howard Nemerov found that permit holders in Michigan were significantly more law-abiding than the general public, saying, "Even when applying to most stringent criteria to Michigan's Concealed Pistol Licensees and the most

lax criteria to the non-licensee population, calculations show that if the non-CPL population been as law-abiding as the CPL population, there would have been over a 90% decrease in the number of incidents of the seven FBI major crimes alone.” However, the Violence Policy Center found that 722 people were killed by concealed carry holders since 2007, including 28 mass shootings.

Overall, studies have clearly been mixed. Adding to the problem is the potential bias in each of the sources. Lott and Nemerov are both pro-gun advocates, and the Violence Policy Center’s stated goal is to show the negative ramifications of concealed carry laws. Pro-gun and anti-gun outlets pick up on the studies that suit them without examining the pitfalls or even the cautions of the researchers themselves.

Opponents claim that the other side does not look at the right data sets or a long enough period. I will try to remedy this by using a larger period than any other study: 1981 to 2012, the largest amount of time allowed by the data sets of the FBI and National Cancer Institute. With state-level data over 32 years, running a fixed-effects regression should provide more conclusive data than the studies that had much variation and relied instead on secular changes in the crime rate.

Method

Using crime data from Uniform Crime Reporting Statistics from the Federal Bureau of Investigation and population statistics from the Federal Reserve Bank of St. Louis and the National Cancer Institute, I examined the effect of having a non-restrictive concealed carry law (shall-issue or unrestricted) on violent crime rates in various states. The FBI provides violent

crime rates and property crime rates for every state during every year of my period of study (1981-2012). The Federal Reserve Bank gives per capita income and unemployment rate for each state in the years of the study period. The National Cancer Institute rounded out the data with black population proportion and proportion of the population aged 20-24.

My main regression uses fixed effects for year and state and accounts for control variables while using a simple dummy variable for shall-issue laws. This creates a difference-in-difference model across 50 states comparing violent crime before and after the implementation of shall-issue laws. While I cannot present visual evidence with this model, the sheer amount of data from all 50 states over the entire 32-year period gives substantial evidence that is difficult to discount. It also is able to incorporate significant controls into the regression to provide less biased data. The following equation shows this regression as a fixed-effects model:

$$\ln(y_{it}) = \alpha_i + \beta_1 \delta_{it} + \beta_2 X_{it} + \mu_i + \theta_t + u_{it}$$

The variable i represents the states, 1-50 alphabetically, while t , labeled 1-32 represents the years 1981 through 2012. y_{it} is the violent crime rate for each state i and year t . δ_{it} is 1 if state i has a shall-issue law for each year t . X_{it} represents the different control variables, which include the natural log of unemployment rate, per capita income, proportion of black population, and proportion of the population aged 20-24. μ_i is the fixed-effect variable for states and θ_t is the same for time. u_{it} is the error term. Table 2 provides the sample means for all the variables, including the different components of violent crime rate.

Using logarithms for each non-dummy variable, of course, provides percentage-change differences for the regression. The controls account for many factors that traditionally factor into violent crime rates: unemployment, income, race, and age.

Table 2. Sample means of variables.

Variable	Sample Mean
Violent crime rate	551.71*
Unemployment rate	6.424
Real per capita income	37654.60
Proportion of black population	0.1275
Proportion of population aged 20-24	0.0747
Murder rate	6.892*
Forcible rape rate	34.24*
Robbery rate	182.11*
Aggravated assault rape	328.45*

*per 100,000 people

In another piece of evidence, the 14 states that adopted shall-issue laws from 1994 to 1996 provide a great before/after comparison by having a large number of states adopt the same law in a short time span. I looked at violent crime rates for these 14 states up to 2000, as well as the 21 states that did not have a shall-issue law before the 21st century. This provides visual evidence for the two groups' trends. Because property rates should be relatively unaffected by laws affecting weapons in public, I compared the respective crime rates for both groups.

Both the before/after comparison and the regression will provide substantive data that sheds light on the connection between right-to-carry laws and violent crime. While the regression will be specific in producing a quantitative correlation between the two, the comparison between the shall-issue and the restrictive states before and after the 1990s will visualize the effect that concealed carry laws have on crime.

Results

The regression, as shown in Table 3, determined that shall-issue laws were correlated with a 7.0 percent increase in violent crime rates, significant below the .001 level. With an R-squared value of 0.9172 (0.9126 adjusted), these five variables provide a rather significant estimate for violent crime rates, and right-to-carry laws only add to the picture. With a standard error below 0.02, that 7.0 percent increase associated with shall-issue laws is difficult to discount.

Table 3 also displays the breakdown of the correlation with each aspect of violent crime: murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault. Interestingly, right-to-carry laws had negligible effects on the murder rate, but statistically significant effects on rapes, robberies, and aggravated assaults.

Table 3. Difference-in-difference estimates of impact of right-to-carry laws on ln(violent crime rate).

Variable	Violent Crime	Murder	Forcible Rape	Robbery	Aggravated Assault
Right-to-carry law	0.0699 (0.016)	-0.0086 (0.020)	0.0782 (0.016)	0.0708 (0.019)	0.0410 (0.019)
Log of unemployment rate	-0.2157 (0.029)	-0.0189 (0.037)	-0.1691 (0.029)	-0.0613 (0.034)	-0.2731 (0.035)
Log of per capita income	0.1247 (0.116)	1.0611 (0.148)	0.3151 (0.119)	0.5338 (0.136)	0.0072 (0.142)
Log of black population percentage	0.3666 (0.027)	0.2302 (0.034)	0.5678 (0.028)	0.2065 (0.032)	0.3122 (0.033)
Log of percentage aged 20-24	0.4231 (0.079)	0.2336 (0.101)	0.5232 (0.081)	-0.0406 (0.093)	0.5593 (0.097)
Multiple R ² (full model)	0.9172	0.8934	0.7976	0.9522	0.8846

With the exception of per capita income, all variables in the regression had incredibly small p-values, indicating that they are all extremely highly correlated with violent crime. For right-to-carry laws, a 7 percent increase in violent crime with such a small standard error provides very strong evidence for such laws resulting in an increase in violent crime. If the variable estimate were in the range of 1 or 2 percent, that could signify insignificance, but this result is rather damning for proponents of right-to-carry laws.

Proponents of right-to-carry laws typically point to declining murder rates as an example of their benefits. Those rates are typically part of the secular decline in murder rates across the United States over the past couple decades, but it seems right-to-carry laws are not linked to an

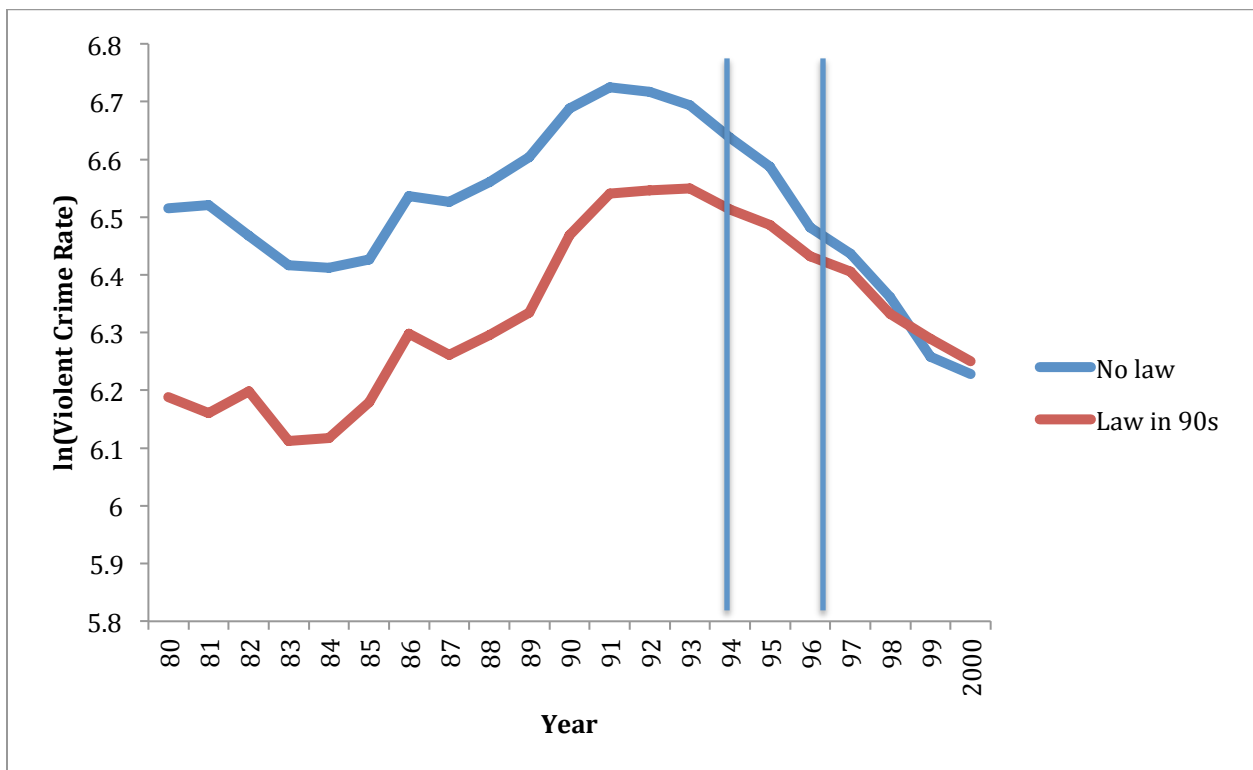


Fig. 2. Log of weighted average of violent crime rate for 14 states that implemented shall-issue law from 1994-1996 and 21 states with no law before 2000.

increase in murders like they are in other types of violent crimes. It seems shall-issue states see most significant increases in forcible rapes and robberies.

The before/after comparison illustrates the regression's significance with visual data. Figure 2 shows the weighted average of violent crime for the two groups of states I previously mentioned: the 14 states that adopted shall-issue laws from 1994-1996 and the 21 states that did not have such a law before 2000.

From 1980 to 1994, the states without a shall-issue law before 2000 had violent crime rates that were 20-30 percent higher than states that would eventually implement such a law from 1994-1996. However, after 1994, when those states started to add that law, the two groups' violent crime rates began to converge, with no-law states falling behind the other group in 1999, despite that previous significant gap.

This graph conveys a significant amount of information: first of all, the NRA assertion that crime rates fall after the implementation of right-to-carry laws is technically correct. States that added a shall-issue law in the 1990s experienced a significant drop in violent crime afterwards. However, the secular trend across the country shows an even more significant drop to the point where the 20-30 percent gap in crime disappeared. This difference-in-difference graph provides a good picture of how right-to-carry laws have affected violent crime rates. Although the rates fell after the laws, there is a clear upward effect brought on by the move to shall-issue.

Figure 3 helps support this narrative with property crime rates from 1986 to 2000, which should be less affected by a move to shall-issue concealed carry laws. Property crimes

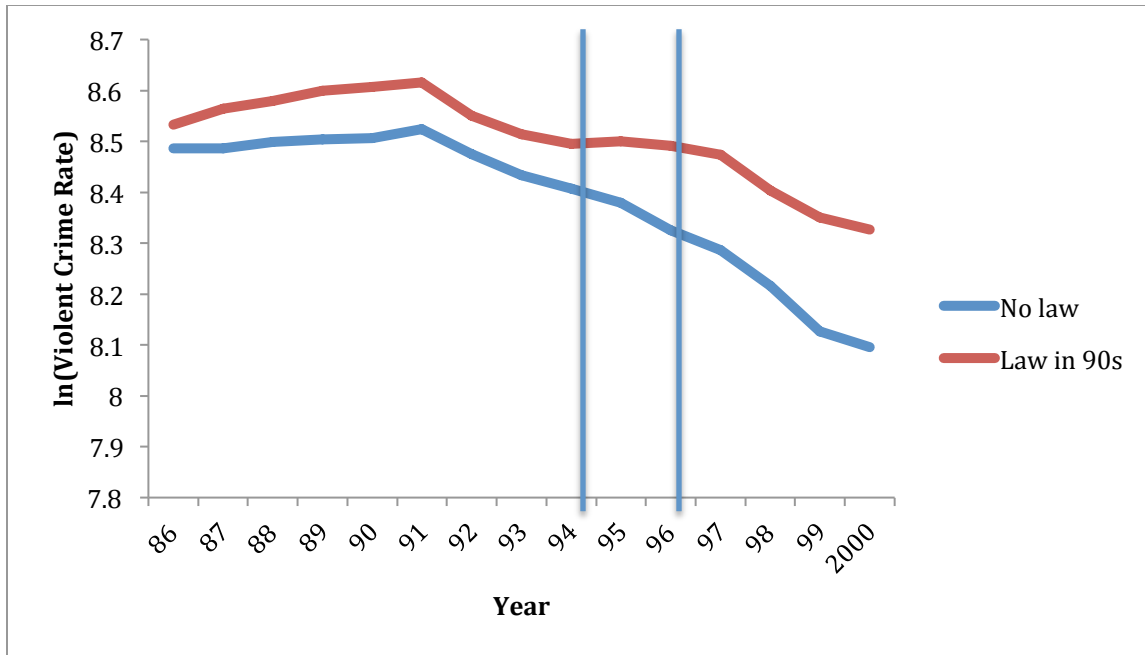


Fig. 3. Log of weighted average of property crime rate for 14 states that implemented shall-issue law from 1994-1996 and 21 states with no law before 2000.

include burglary, larceny, theft, and vandalism. Robbery is included in violent crimes because it includes force or threat of force to an individual.

There could be reasons for property crimes being positively affected by right-to-carry laws: more people carry guns and therefore feel more secure in committing crimes. There is also the case for a substitution effect between property and violent crime rates as enforcement for one changes. However, because concealed firearms are far less likely to be necessary to perpetrate property crimes than violent crimes, we would expect the effect of right-to-carry laws to be less prominent on property crime rates.

Although Figure 3 shows a divergence in the two groups of states, the difference is clearly not as pronounced as in Figure 2. The shift in property crime rates is around 0.1-0.15 in natural logs, or about 10-15 percent. That change is about half of the change from Figure 2,

which was closer to 20-30 percent. These two graphs indicate that right-to-carry laws have a significant upward effect on violent crime rates.

This contrast is important because it helps remove controls that would affect both property crime and violent crime: increased police force, tougher sentencing, changes in income, etc. If the reason for the relative increase in violent crime in the shall-issue states was unrelated to the actual shall-issue law, we would see similar increases in property crime. However, we clearly see a more significant shift in violent crime than in property crime.

Conclusions

Overall, the data is highly indicative of shall-issue right-to-carry laws causing a significant increase in violent crime rates. From the regression, we can quantify this effect as being around 7.0 percent; to put that in perspective, 7 percent of violent crimes in the United States in 2012 would have been more than 85,000 cases. That is a significant number, but it also puts to rest hysteria over rampant increases in crime brought about by people carry concealed weapons. However, it is also rather detrimental to right-to-carry proponents who argue that shall-issue states see decreased crime. According to the data, the truth resides in the middle: right-to-carry laws do not cause extreme surges in crime, but there is enough of an increase that it is difficult to justify them on the basis of their benefit as a deterrent.

The deterrent argument certainly sounds valid on its face, but people often overestimate the role of deterrents for criminals. Many violent criminals constantly live under the shadow of death and incarceration regardless of gun laws. Even in no-issue states, people who commit violent crimes decide that the benefits of the crime outweigh the potential costs:

that they could be arrested or physically harmed during the act of the crime. It is likely that what most risk-averse people consider deterrents do not significantly alter the mindset of criminals.

According to the Crime Prevention Research Center, 11.1 million Americans had concealed carry permits in 2014, or about 3.5 percent of the population. When people commit violent crimes, they do so with the possibility that the potential victim can cause problems for the assailant: e.g. an undercover police officer, a well-connected politician, or a person with a weapon. Based on the data, it is likely the 3.5 percent of the population with permission to carry a concealed weapon does not alter this equation for criminals enough to act as a

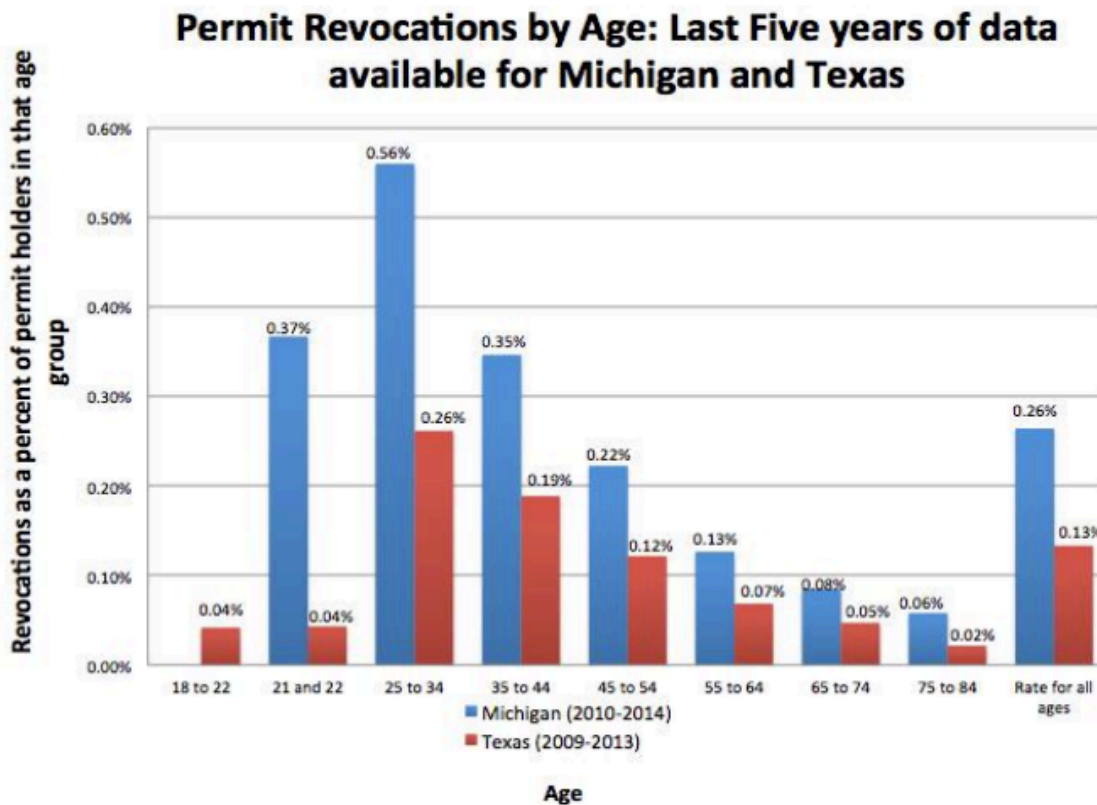


Fig. 4.
 Source: Crime Prevention Research Center.

deterrent for crime. Even if concealed carry laws do act as a deterrent, the data signifies that there is a much more powerful effect of the laws in the opposite direction to cause the 7 percent increase in violent crime. So what causes this increase?

Right-to-carry advocates point out the low rate of revocation among concealed carry permit holders as evidence against crime. According to the Crime Prevention Research Center, revocation rates are consistently below 1 percent, as shown by Figure 4. So it appears permit holders do not commit enough crimes to account for the 7 percent increase in violent crime.

So if right-to-carry laws cause an increase in violent crime, but those who obtain permits generally do not commit the crimes, where does the crime spike come from? Certainly, some of them may come from people with permits who commit crimes without being convicted, but that is unlikely to make such a significant impact. Readers are free to make their own conclusions, but accounting for the data from the regression rates and very low revocation rates, it is reasonable to assume that right-to-carry laws have residual effects beyond those who receive permits.

If concealed carry permits increase, it is likely that gun sales increase and the overall percentage of those with guns increases. It is possible that the laws themselves create a culture of gun ownership that results in more violent crime, even if those who carry concealed weapons do not commit the crimes. According to the Pew Research Center, 48 percent of American gun owners have guns because of personal protection, up from 26 percent in 1999. This jump coincides with the rise in concealed carry permits in the United States. Americans are more and more concerned with personal protection and are turning to guns in increasing numbers.

The regression only indicates a correlation between right-to-carry laws and violent crime, so it is certainly plausible that there are underlying gun culture motives that drive both trends and that such laws do not cause violent crime. Whether right-to-carry laws drive this culture or are a byproduct of it is uncertain, but Figure 2's indication of a radical, sudden shift between shall-issue and may-issue states suggests a causal effect for the laws. If the laws were the product of a crime-causing gun culture, it is likely that we would see the shift sooner than 1994 when the laws were enacted. Instead, the dramatic convergence in gun rates occurs at the time of the laws' implementations. This signifies a causal effect between right-to-carry laws and violent crime.

The lack of effect on murder rates is especially interesting because those are the types of crimes that presumably involve guns frequently. With that data, the conclusion is that murderers are unaffected by either looser restrictions on concealed weapons or their residual effects. Upon consideration, this is not remarkably surprising since the majority of murderers likely have a previous offense that would preclude them from obtaining a concealed weapon permit. As for an increased gun culture that may come with right-to-carry laws, it is likely that murder is such an extreme crime that weapons restrictions are a relatively negligible problem for murderers to circumvent. If one is compelled to complete a murder, the prevalence of guns does not matter.

However, once again, the reader is permitted to make conclusions based on the data I have presented. Based on the data, it is difficult to discount a significant link between right-to-carry laws and violent crime. The causes of the link are more difficult to single out, but the

“more guns, less crime” tagline does not seem to hold water when it comes to concealed carry laws and violent crime rates over the past 35 years.

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