

Lott and Mustard Revisited

Robert Petit

May 2022

1 Introduction

The question of concealed carry permits and their effect on crimes has long been an extremely controversial topic. Lott and Mustard (1997) is an extremely important analysis of these permits but, since it's original publishing in 1997 research design has become far more adept at determining causal factors.

By re-analyzing this data with newer, more thorough methods, we can investigate more closely the findings of the original paper and determine what, if any, effect these laws have on crime.

2 Background and Theory

Crime deterrence as a whole is a more-than controversial subject in the modern day; the concept of being "tough on crime" is commonplace in modern media and politics and comes in many forms, from increasing police presence and prison sentences to denying civil liberties and services in perpetuity. The goal is to drive the cost of crime so high that it becomes rare that a rational person would *ever* choose to engage in illicit activity. "Shall-issue" laws are another step in this direction; these are state-level laws that ensure any person who is legal and meets some basic eligibility requirements be issued a permit for carrying a concealed weapon.

The theory here is quite simple: more armed victims *should* mean a higher expected cost of committing a crime and, subsequently, a lower number of crimes committed. This carries the obvious restrictions that we would only expect this change in crimes where the victim is aware and present at the time the crime is committed, such as assault and robbery, and smaller or no changes when the victim is not present or aware, while the crime is being committed, such as auto theft.

Table 1: Shall-Issue Law Rollouts by State

State	Rollout
Alabama	Pre-1977
Connecticut	Pre-1977
Indiana	Pre-1977
New Hampshire	Pre-1977
North Dakota	Pre-1977
South Dakota	Pre-1977
Vermont	Pre-1977
Washington	Pre-1977
Florida	1987
Virginia	1988
Georgia	1989
Maine	1989
Oregon	1989
Pennsylvania	1989
West Virginia	1989
Idaho	1990
Mississippi	1990
Montana	1991

Shall-issue laws were a hot-bed political topic starting in 1976 and, from 1987 to 1991 ¹ there were several of these laws passed. Prior to this wave of laws (and the start of our data) there were eight states that already had these laws in effect. These laws were very similar to one another in that they functionally removed the ability for any lower-than-state level official to restrict the issuance of a gun permit. There is some heterogeneity among the effect of these laws within each state, since some officials were more restrictive than others, but across each state this resulted in greater access to concealed carry permits issuance.

We will use several models to determine the effect of these laws on crimes; our goal here is to determine the average treatment effect on the treated groups. The model most similar to the approach of Lott and Mustard (1997) [5] is the two-way fixed effect model but this estimator is known to have some unfavorable properties. To handle this, we will also investigate the Bacon decomposition [4] for the two-way fixed effect model. Implement the Callaway and Sant’anna estimator [1] and the Sun and Abraham event study to get a more contemporary idea of the effects.

3 Data

Here we are working with the state level data from the National Research Council’s review of firearms and gun violence, provided by Peter Donohue [3]. This data covers the yearly crimes for violent crimes

¹The years for each law come from Lott and Mustard (1997) [5] and Cramer and Kopel (1995) [2]. The only discrepancy between the two sources is that of Oregon, which Lott and Mustard list as 1990 whereas Cramer and Kopel cite the law as 1989. This may be due to the timing of the law, later analysis does not seem consequentially sensitive to this shift in any case.

and property crimes in all fifty states from 1977 to 2006. The violent crimes subdivided into murder, rape, assault and the property crimes are subdivided into robbery, auto theft, burglary, and larceny.

Table 2: Summary Statistics for Statewide Yearly Crimes and Crime Rates

Variable	N. Obs	Mean	Std. Dev
Crime Counts			
Violent Crimes	1941	27066.81	41920.33
Property Crimes	1941	211212.22	262156.25
Murder	1941	382.63	529.34
Rape	1941	1631.25	2054.90
Assault	1941	15421.66	23517.30
Robbery	1941	9631.27	17207.33
Auto Theft	1941	23714.54	37503.03
Burglary	1941	54414.24	72421.71
Larceny	1941	133083.69	157018.36
Crime Rates			
Violent Crime Rate	1941	458.85	309.28
Property Crime Rate	1941	4168.46	1256.21
Murder Rate	1941	7.25	6.80
Rape Rate	1941	32.33	14.52
Assault Rate	1941	270.80	167.23
Robbery Rate	1941	148.48	160.60
Auto Theft Rate	1941	404.60	234.87
Burglary Rate	1941	1046.53	429.72
Larceny Rate	1941	2717.34	788.57

4 Empirical Models

4.1 Two-Way Fixed Effects

4.2 Bacon Decomposition

4.3 Callaway and Sant'Anna

4.4 Event Study

5 Conclusion

To Self Only Bring up:

- State-wide variation biasing *against* findings
- baker_cs.R has the CS estimator reference

Table 3: Aggregate Group ATTs

Group	Aggregate ATT	SE
1977	-6969.74	3139.42
1987	18177.69	1345.91
1988	2460.28	1543.74
1989	1665.33	2524.69
1990	2383.97	2455.67
1991	6747.73	3142.71

- `cs_event.R` has the Event Study reference

References

- [1] Brantly Callaway and Pedro H.C. Sant'Anna. Difference-in-differences with multiple time periods. *Journal of Econometrics*, 225(2):200–230, 2021. Themed Issue: Treatment Effect 1.
- [2] David B. Cramer, Clayton E. Kopel. Shall issue: The new wave of concealed handgun permit laws. *Tennessee Law Review*, 62:679, 1994-1995.
- [3] John Donohue. The impact of right-to-carry laws and the nrc report: Lessons for the empirical evaluation of law and policy.
- [4] Andrew Goodman-Bacon. Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277, 2021. Themed Issue: Treatment Effect 1.
- [5] John R. Lott Jr. and David B. Mustard. Crime, deterrence, and right-to-carry concealed handguns. *The Journal of Legal Studies*, 26(1):1–68, 1997.