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Analysis of States Gun Control Restrictions

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ANALYSIS OF STATES GUN CONTROL RESTRICTIONS

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Analysis of Gun Control Restrictions

Xiaofeng Cheng

(Abstract)

This thesis analyzes the policy effects of several state gun control restrictions in the United States. The study employs the data of gun related crimes and gun control restrictions from Statistical Abstract of Criminal Justice Handbook through five years (from 1995 to 2000). Although many scholars have studied previously gun control policy effects on crimes, they always focus on the total violence level and ignore to compare the policy effects of different gun control laws. The present study examines intensively gun related crimes and compares several gun control policies.

Pooled data is employed to access the effects of gun control restrictions, and it is another advancement based on previous studies, which always use cross-sectional or time series designs. These findings partially reject the previous conclusions that gun control laws have no effects on violence and for gun related homicides and robberies; several gun control restrictions like registration, license, and waiting period show some significant policy effects. Contrary to the past study, the permit to purchase, which has been regarded as the most efficient law, produces no significant policy effects. Sale report to police and certain firearm prohibited also have no significant effects. Among control variables, race and urban population exert the obvious influences on the gun violence, and specifically, the density of population affects the gun related homicides and high school graduates affects the gun related robberies. Implications of these findings and potential for future research are discussed.

Chapter One

Introduction

Gun and Violence

The United States has one of the highest rates of violent crime in the world and a large proportion of this violence is gun-related. According to the U. S. Department of Justice, gun violence comprises the largest volume of violence in the United States. For instance, in 1995, about 68% of homicides involved guns, and 60.3 % of them involved handguns; in 1996, 34,040 people died from gunfire in the United States, and of these deaths, approximately 41 percent resulted from homicide; moreover, for every fatal shooting, there are at least three nonfatal shootings (Shay et al, 1999).

Because of the threat of gun violence, gun control has become an important issue in the field of criminal justice. A large volume of literature on gun control policy has been published in a variety of journals. There exist some substantial disagreements on the relationships between gun availability and violence across these studies. Some scholars argue that the relationship between guns and violence is coincidental, while others argue for a direct relationship.

Wolfgang' s substitution hypothesis, for example, reasoned that purposeful offenders might *substitute* firearms for other lethal weapons when committing violent crimes. Further, he argued that the use of firearms involves culture factors such as the population's familiarity with firearms (1958:79-83). Other scholars, however, have challenged the substitution hypotheses and emphasized the substantial role of firearms in crimes of violence. There are numerous explanations of the relationship between firearm use and other outcomes in violent encounters.

For instance, Berkowitz (1967) proposed the weapon effect hypothesis. This hypothesis states that the sight of a weapon could trigger aggression from angered persons, due to the learned association between weapons and aggressive behavior. Thus, angry people exposed to weapons like guns will behave more aggressively than those not exposed to this stimulus. Other researchers propose an explanation called the objective dangerousness pattern (Cook 1982). This thesis states that gun attacks have a higher probability of lethality and more serious injuries than knife attacks with similar circumstances. Several studies indicate that crimes committed with guns that result in injuries cause three to four times higher death rates than those with knives (Kleck 1997, 229-230). Furthermore, the availability of a gun can facilitate attacks by less powerful aggressors against stronger victims while simultaneously enhancing the attacking range and the "safety" of the aggressor (Cook 1982). Zirming's (1968) *ambiguous motives thesis* states that in a substantial portion of gun homicides offenders are ambiguously or weakly motivated, and that gun availability is the primary factor that coverts an assault situation into a homicide. Scholars who support this view reason that the decreased accessibility of firearms will lead to a decline in gun violence and homicides. In effect, these explanations share the common assumption that offender background and

motivation impact the use and choice of weapons and the outcome of violent encounters (Block 1977, 32-33).

Some studies, however, also indicate that under certain circumstances the presence of guns can inhibit violence. Victims with access to firearms, for example, may be empowered to resist lethal threats, thus, deterring or terminating gun-related crimes of violence (Kleck 1997). Lott and Mustard's (1997) study of the relationship between relaxed gun-carry permit laws, gun availability, and levels of violent crime support this contention.

Regardless of the specific theoretical argument researchers employ, all previous research emphasizes a relationship between gun availability and violence. It should be clear, however, that not everyone agrees on the direction of this relationship. Some researchers argue that gun availability increases rates of violent crime (Zimring 1968), while others believe that gun availability can reduce levels of violent crime (Kleck 1997). One of the common problems across both kinds of explanations involves the development of a valid measure of gun availability, a concept that remains in dispute among criminologists (Cook 1982; Kleck 1984; 1991). As Gary Kleck, a leading researcher in the area of gun control research, noted (personal communication), there is no valid measure of gun availability, and researchers have to rely on various, inaccurate estimates. Recently, Gary Kleck (1993; 1997) conducted a comprehensive study of the relationships between gun availability and gun violence using multiple indirect indicators of gun availability. He found that general gun availability had no significantly positive effect on violence except when predicting the total suicide rate. His findings were inconsistent with past research. He proposed that gun ownership levels among "high risk subsets of the population" rather than general gun availability might increase violent crimes. Further, he suggested that the possession and use of guns for defensive reasons among non-criminals could have violence reducing effects.

My Research Proposal

Hypotheses

On basis of Kleck's proposal, the present research hypothesizes that gun control restrictions reduce gun-related violence by increasing the obstacles of access to guns for potential criminals, such as prolonging the wait period for purchasing a gun, or adding additional requirements to acquire a gun. Although gun availability serves as the theoretical link between gun controls and gun-related violence, a valid measurement of gun ownership over time is not available (Kleck 2002, unpublished paper). Therefore, the present study avoids any attempt to measure gun availability. As a result, it is assumed that gun control restrictions reduce gun violence by reducing gun availability among potential offenders.

The present study focuses on a comparison of the effects of various forms of gun controls on the level of four different gun-related crimes. Previous research has tended to limit analysis to one specific form of gun control and/or one specific form of criminal

violence. Hence, extant research has failed to assess the potential breadth of gun control effects. Expanding the analysis to many forms of gun controls and their effects on four different gun-related crimes expands the breadth and scope of our level of knowledge on this issue.

Handgun Violence

The present study focuses on handguns because they are both inexpensive and easily concealed; furthermore, they constitute the main choice of weapons among criminals in the U.S. (Shay et al , 1999), and handgun violence comprises the majority of firearms violence (Shay et al , 1999). For example, in 1996, 100 % of gun-related rapes, 96.4 % of gun-related robberies, 81.6% of gun-related assaults, and approximately 90% of gun-related homicides were committed with handguns (Shay et al , 1999). In addition, the bulk of U.S. gun control legislation has historically been concerned with handguns.

The present study involves four types of handgun-related violence: homicides, robberies, assaults, and an aggregate measure of these three handgun-related offenses. Most previous studies have used a general measure of crime as the dependent variable, under the argument gun controls should reduce the level of all crime (Kleck 1997), but the findings from these studies are mixed and inconsistent. I suggest that handgun laws should only impact the level of crime committed with handguns, just as drug laws are expected to influence the level of drug crimes, but not all crimes.

Gun Control Restrictions

I selected seven different forms of gun controls that focus on handgun restrictions and that vary across states and over time. These restrictions have been widely applied and are the most important gun controls in the United States (Department of the Treasury Bureau of Alcohol, Tobacco and Firearms 2002). They include:

(1) Handgun waiting period which requires persons who want to acquire a handgun to allow several days or weeks for an investigation that allows an assessment of the individual's background. This rule was designed to assess whether an individual has potentially dangerous background factors that would make gun ownership a threat to public safety. This rule is often connected with the handgun permit to purchase rule.

(2) Handgun license or permit to purchase; when persons want to acquire a handgun, they must have first procure a permit from the local police. The application for a permit often includes the applicant's name, address, sex, height, weight, date of birth, place of birth, Social Security number, and information regarding the applicant's mental health history. Permits also tend to require the fingerprinting and photographing of the applicant, and may also include a background check of the person' criminal record.

(3) Handgun registration requires every person who possesses a handgun to register it within a prescribed period with a police department. Registration information includes the following information: Dealers license, name of the manufacturer

and importer, model, type of action, caliber or gauge, serial number, and source from which receipt was obtained, including the name and address of the prior registrant.

(4) Mandatory record of sale restrictions requires that certain firearms sales records must be reported to a police department. Specific requirements vary from state to state.

(5) License or identification card; generally, a firearm owner's identification card is issued by the state or local police and contains the applicant's name, residence, date of birth, sex, physical description, recent photograph and such other personal identifying information as may be required by the Director. Each firearm owner's identification card has an expiration date, and must be renewed.

(6) Firearm prohibitions ban the ownership of certain forms of firearms and/or ammunition. These prohibitions vary across the states. For example, some local jurisdictions in Ohio restrict "assault weapons." Illinois prohibits the sale of any "unsafe handgun." Hawaii restricts "assault pistols." Maryland prohibits several small, low-caliber, inexpensive handguns and "assault pistols."

Of the laws reviewed above, handgun waiting periods and handgun license or permit to purchase requirements have received the most attention in other studies and show some deterrent policy effects on crime (Kleck 1993; Cook 1979). The current study hypothesizes that as the number and form of these handgun restrictions increase, gun-related crimes of violence decrease. Additionally, because these six control restrictions have different legislative targets, they may have differential influences across different types of violent crimes. Prohibition of certain firearms and mandatory sales records reported to police include firearms other than handguns, so they can only exert limited influences on handgun violence. Identification cards and handgun licenses and registration serve to control access to firearms and provide police information about gun owners and guns. They introduce costly obstacles to owning handguns and assist law enforcement in their investigations of gun violence. Thus, these two forms of gun control are expected to be marginally effective in reducing handgun-related criminal violence. Handgun permits to purchase and handgun waiting times limit the acquisition and transfer of guns. These are typically regarded as very strict laws with especially salient anticipated effects on gun violence because they greatly reduce the probability of the potential offender owning a gun. However, it is possible that an underground market or illegal trade in guns might weaken the effects of these policies.

Chapter Two

Literature Review

This thesis examines the relationship between several different gun control laws and the use of guns to commit three violent crimes--murder, robbery and assault-- across U.S. states over a five year time period. This chapter reviews relevant studies concerning the relationship between gun use and violent crimes.

Guns and Violence

This section reviews empirical studies linking the use of guns to violent crimes, especially murder, robbery and assault. Researchers have forwarded different hypotheses concerning the effects of how gun control laws may impact specific crime types.

Guns and Homicides

Firearm-related homicides comprise a major part of the homicides in the U.S. Numerous studies indicate that the gun homicide rate in the U.S. has typically been the highest in the world. Bakal (1966), for example, compared the U.S.'s and other nations' gun homicide rates for 1964 (Wright et al. 1983, 2). These data are found in table 2.1Table 2.1 the comparison of gun homicides between the U.S. and other nations in 1964

Adapted from Wright et al (1983)

Countries	U.S.	Japan	Britain	Canada	Belgium	Denmark	Sweden
Total homicide	9250	1469	309	266	53	23	86
Percentage of Gun homicide	5088 55%	(37) 24%	(29) 9%	(92) 35%	(9) 17%	(6) 26%	(5) 6%

Recently, more comprehensive international gun control data also show the same results (Wendy and Cukier 1998). The United States has relatively few gun control laws, the highest gun ownership (except for Finland), and the highest level of gun homicides and suicides among 15 developed countries. These data are shown in table 2.2

Several studies note that weapon lethality may impact the relationship between guns and homicides in the U. S.. Researchers assume that guns make the killing process easier and more impersonally with less sustained efforts, compared to knives or personal strength. Cook concluded, "gun attacks have a higher probability of killing the victim

than knife attacks in otherwise similar circumstance" (1982; 249). Zirming (1968) calculated that the death rate of gun attacks was about five times higher than knife attacks, while some other studies also indicate that the gun and knife wounding death rates were about four to one (Ryzoff et al. 1966; Block 1977).

Table 2.2 International Firearms Regulations, Access and Deaths

Countries	Licensing of owners?	Registration of all firearms?	Other	Households with firearms	Gun homicide (per million)	Gun suicide (per million)
Japan	Yes	Yes	Prohibits handguns with few exceptions	0.6%	0.3	0.36
Netherlands	Yes	Yes		1.9%	2.7	2.8
United Kingdom	Yes	Yes	Prohibits handguns	4.0%	1.3	3.3
Northern Ireland	Yes	Yes		8.4%	35.5	11.8
Germany	Yes	Yes		8.9%	2.1	12.3
Spain	Yes	Yes	Some handguns and rifles are prohibited	13.1%	1.9	5.5
Australia	Yes	All guns in 5 of 8 states until 1997 when national standards began	Banned semi--automatics unless good reason is shown	16.0%	5.6	23.8
Belgium	Yes	Yes	Some rifles are prohibited	16.6%	8.7	24.5
New Zealand	Yes	Handguns only, stopped registering rifles and shotguns in 1983 and have proposed reintroducing it		20.0%	2.2	24.5
France	Yes	Yes, except for selected sporting rifles		22.6%	5.5	49.3
CANADA	Acquisition only, possession starts in 1998	Handguns only, all guns as of 1998	Fully automatic, converted and semi --automatic assault weapons and some handguns are banned	26.0%	6.0	33.5
Switzerland	Acquisition for some	For some firearms		27.2%	4.6	57.4
Norway	Yes	Unknown		32.0%	3.6	38.7
USA	In some states	Handguns in some states	Some weapons in some states	41.0%	62.4	72.3
Finland	Yes	Yes	No prohibitions	50.0%	8.7	57.8

However, it is hard to compare the lethality of these different weapons because the mechanism of these weapons is obviously different, although guns can cover a relatively longer distance (Kleck 1997; 227), and enable physically or intellectually weaker individuals to overpower others (Seitz, 1972). Further, previous weapon lethality comparisons are also been based on different definitions of stab or knife wounds. For example, Zimring (1968) compared a set of handgun attacks with knife wounding. Kates (1979: 18) and Wright et al. (1983,199), however, both pointed out that Zimring had lumped the serious attacks by heavy, long-bladed knives with the trivial scratches by pen knives and even forks. This criticism casts doubt on Zimring's conclusions. Some medical studies, using more restricted definitions, have found much lower ratios (from 1.17 to 1.26, Wilson and Sherman 1961,643; to 2:1, Curtis 1974).

Another important issue in the discussion of gun homicide is the users' lethal intent. Even scholars with strongly pro-control sentiments concede that on average those with more lethal intentions and greater willingness to harm others are more likely to choose dangerous weapons like guns, rather than knives (Zirming 1968). Cook agreed, and noted that "the task determines the tool" and "the offenders' weapon choice is a good indicator of intention" (1982, 248). Kleck (1997) provided a contradictory, though unusual example involving stab wounds inflicted by Intifada against Jews in Israel during the 1987- 1994 period. These data revealed that 25.3% of stab wounds inflicted by Palestinians against Jews were fatal (Kleck 1997, 228). This high fatality rate may, however, be mediated by attacker motives. Further, Wright and Rossi (1986) also pointed out that more serious violent offenders are more inclined to carry guns and use them.

In reality, it is also difficult to separate completely the weapon effect and the attackers' willingness to employ a lethal weapon. Wolfgang's weapon substitution hypotheses (1958) posit the "single minded killer theory." In this view, the offenders' intent determines the choice of weapon; willful murderers will select more lethal weapons like firearms, when available. However, the theory can only explain a small proportion of homicide cases. In most homicides, it is logically impossible to measure whether the attackers who choose guns over other weapons are more lethally minded persons. As Cook (1983) states, there is a problem of inter-subjectivity in Wolfgang' hypotheses, which also examines the mental states of the offenders before their action. Two difficulties are unavoidable:

(1) Mental states are difficult to assess even in the best circumstance; and
(2) In real cases, the offenders or their attorneys suppress information on prior intentions.

Due to these shortcomings of single-minded killer theory, some scholars continue to look for alternative explanations. Zimring (1968) argued that there is virtually no correspondence between intentions and outcomes, and suggested the "ambitious intention" hypothesis----" a significant proportion of homicides result from a less deliberate and determined intention"(1968, 721-722). Further he asserted, " Most homicide is not the result of a single-minded intention to kill at any cost (1972, 97)

However, Zimring' ambiguous intentions hypothesis has also received severe criticism. In his study of 1968, Zimring thought that killers and victims knew each other. Kleck argued that there is no evidence or reasons to believe the fights among the associated persons are less likely to involve an ambiguous intention to kill than in fights among strangers (1997, 234). On the contrary, the empirical evidence shows that persons who know each other are more likely to commit the single-minded homicides (Wright 1990). In addition, Zimring found that most killings result from altercations but his definition of altercation is inaccurate (Cook 1982, 261-262). Following criticism of Zimring's "ambitious intention" hypotheses, Kleck suggested another conception involving "emotional . . . strength and persistence of aggressive drive" to explain the motivation of gun killers (1997, 233). This hypothesis emphasizes that at the moment of the attack the killer often has a strong drive to seriously hurt the victims until s/he is satisfied.

Along with the ambiguous intentions hypothesis, another called "Average Joe" reasons that most killers who come from law-abiding citizens lose their tempers and killed persons only because guns were available. This view has also been criticized on the same grounds as Zimring's thesis (Keck 1997, 236)

No study provides persuasive evidence to support any of the theories on the relationship between guns and the motivations for homicides. Current evidence supports a rather ambiguous statement: people who kill using guns have more intention to do so. In this situation, the weapon of choice in homicides can be better explained by classic rational choice hypotheses. Cook's (1982) study supports such a rationality argument by linking the victims' vulnerability (i.e. physical size and strength) to an offender's choice of weapons, and illustrates that offenders pay attention to the probability of a successful attack because guns can increase the attacker's power to commit a homicide.

Guns and Robberies

Robbery is "the unlawful taking away of personal property from a person by violence or by threat of violence that causes fear" (Merriam-Webster's Dictionary of Law 2002). Robbery is regarded as both a property crime and a crime of violence. Robbery is particularly fear inspiring because it often involves an unprovoked surprise attack from strangers. Generally, robbery is divided into non-fatal-robbery and robbery-murders. Robbery-murders are defined as a type of homicide (Cook 1987, 365). Thus, the following discussion will focus on non-fatal-robberies, which are more likely to involve the use of guns.

In most cases, the motivation for robbery is to pursue economic gains and the robber's task is to overcome the victims' resistance through intimidation or force. A variety of techniques are used including the display of guns. Guns are often the most effective weapons enhancing the robber's power and stimulating fear in the victims because guns can help offenders threaten victims lethally from a distance. In reality, possession of a gun obviously increases the probability that the potential offenders commit robberies successfully, particularly when they pursue commercial robbery (i.e.,

bank and store robberies). Skogan (1978) found a strong correlation between commercial robbery and the use of guns.

Cook (1976; 1980) proposed the "strategic choice" hypothesis to explain gun-related robbery. The core of this hypothesis is that robbers decide who and how to rob. For robbery, the use of a gun might not reflect a robber's lethal intentions but his/her expectations of intimidating the victims more successfully. Empirical studies show that injury in gun robberies is less likely than in other forms of robbery because victims who face more lethality are more inclined to comply and less inclined to resist. Cook 's (1976) data show that 6.2% of all robbery victims were injured to the extent that they needed medical attention, while the proportion among victims robbed by guns is only 2.8%. Several other studies also support this finding (Cook and Nagin 1979; Conklin 1972; Block 1977).

Kleck drew the following conclusions on the impact of guns on robbery (1997, 237):

(1) Gun ownership has no net effect on total robbery but it may positively affect the rate of gun-robberies (Cook 1979; see also McDowall 1986 and Kleck and Patterson 1993).
(2) Injuries are more common in non-gun robberies than gun robberies because victims of gun robberies are less likely than victims of non-gun robberies to resist the robbers (Cook and Nagin 1979; Kleck and Delone 1993).
(3) Murder of the victims is more likely in gun robberies than non-gun robberies (Cook 1987) but it is unclear whether the lethality of guns or the gun users are responsible for the pattern.
(4) The use of a gun enables robbers to pursue more lucrative commercial targets rather than more vulnerable ones like women, children etc. As such, reducing gun availability might cause robbers to switch to weaker targets, which, in turn, may produce more injury and death (Hindelang 1976; Southwick 1996).
(5) Robbers armed with guns are more likely to complete their crimes because the guns reduce the victims' resistance.

Kleck (1997, 239) reasoned that effective gun control policies should increase the difficulty robbers have in obtaining the property of victims and might reduce robber-murder cases. At the same time, effective gun control policies should also increase the robbery injury rate and shift the burden to more vulnerable victims without any effect on the total number of robberies.

Guns and Assaults

Assaults are "the unlawful intentional infliction, or attempted or threatened infliction, of injury upon the person of another" (Criminal Justice Today Glossary, 2002). They occupy the major part of violent crimes. In 1997, about 62.5% of violent crimes were aggravated assaults; however, the use of guns is less popular in assaults than in robberies or homicides; in 1997, only 20% of assaults were committed by the use of firearms, while

67.5% of homicide and 39.7% of robberies were committed with firearms (Maguire, et al. 2001). Thus, fewer studies specifically discuss the relationship between firearms and assaults.

Some scholars consider that most violent offenders want to avoid killing, and that killing often is a spontaneous response to the victims' resistance (Wolfgang 1982, 258). Generally, a gun with higher lethality is not an appropriate weapon for an assaulter who wants to control his attack in terms of the scope of injury. This implies a high degree of rationality among assault offenders. As a result, it seems plausible to assume that gun-control laws would have their greatest impact on the suppression of gun-related assaults. The sole research on assault and gun availability, however, found no effects of gun prevalence on either assaults or armed assaults (Kleck 1993).

Because assault offenders' intentions are to inflict injury, gun-related assaults might lead to more serious injuries than observed among gun-related robbery. Assaults, however, are more likely to be spontaneous rather than planned. Thus, it seems reasonable to also suggest that gun-related assaults would be the least likely form of gun crimes to be affected by gun control. Actually as noted earlier, only 20 % of assaults are committed using a gun. A homicide is three times as likely, while a robbery is twice as likely as an assault to be committed with a gun. In other words, because gun assaults are proportionally rare in comparison to other gun crimes, gun control laws would be expected to have less of an effect on those crimes. However, it should be noted that assaults occur much more frequently than homicides. While the percent of homicides committed with guns is high compared to the number of assaults committed with guns, the overall number of homicides is low compared to the overall number of assaults. Assuming that there were an average number of each of these offenses recorded by police (about 20,00 homicides and 80,000 assaults), there would be more than 12 times as many gun-related assaults compared to gun-related homicides in a given year.

The discussion above on the relationship between guns and violence leads to the following two general conclusions. First, guns have different functions across the three kinds of crimes (murder, robbery, assault). Second, gun control laws are expected to have different effects across these different crimes.

Gun Control Effects on Violent Crimes

The United States has one of the highest rates of gun ownership in the world but there are also fewer restrictive laws on gun ownership in the U.S. than in other countries (see Table 2.1 and 2.2). This section provides a general description of gun control legislation in the U.S. This discussion is divided into three parts. First, a brief overview of federal legislation affecting guns is presented. Second, some important gun regulations imposed by states are reviewed. Third, the specific gun control regulations measured in the previous research are examined.

Gun Control Laws

In the Bill of Rights, the Second Amendment states, "a well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear arms, shall not be infringed." There are numerous disputes about whether gun controls laws are against the right to bear arms as stated in the Constitution. However, in *U.S. V. Miller*, 307 U.S. 174 (1939) the Supreme Court upheld a federal law criminalizing the shipment of a sawed-off shotgun in interstate commerce. Further, In *Lewis v. United States*, 445 U.S. 55 (1980), the Court ruled that restrictions contained in the Gun Control Act of 1968 prohibiting felons from owning firearms were constitutional by a "rational basis" standard. Basically these cases reflect a positive attitude of the Supreme Court toward gun control. A series of cases in the states court also confirm the constitutionality of gun control laws. Other Supreme Court cases also speak to this issue. For example, in *Alkinson, 291 N.W.2d 396 (Minn. 1980) the* Supreme Court, held whatever the scope of any common-law or constitutional right to bear arms, it is not absolute and does not guarantee to individuals the right to carry loaded weapons abroad at all times and in all circumstances. In *Arnold v. Cleveland* 616 *N.E.2d 163 (1993)* Justice Douglas held that municipal ordinance prohibiting possession and sale of "assault weapons" was constitutional and reasonable exercise of police power.

Federal regulations of firearms began to appear in 1915, when a bill to ban interstate commerce in handguns was proposed. This bill, however, was not a gun control law in the strict sense. In 1919, a federal act involving a 10% manufactures' excise tax on firearms passed, is regarded as the initial gun control law, and began a series of efforts to control gun ownership.

During the 1920s, a number of gun control bills regulating the interstate commerce of guns were proposed. In 1927, the first federal gun control law prohibiting the mailing of concealable firearms was enacted. In Roosevelt's New Deal era, the first serious discussion on federal firearms regulations arose because of the national fear of gangsters. The discussion resulted in two pieces of legislations: the National Firearms Act of 1934, which involves some rare guns used by gangster like machine guns, sawed-off shot guns and silencers, and the Federal Firearms Act of 1938, which required a federal license for interstate commerce in guns and forbids the gun transactions among the potential criminal class of society. The two Acts became the precursors of the famous Gun Control Act of 1968.

The Gun Control Act of 1968 was the first federal law to deal with firearms in a comprehensive manner. The major goals of the legislation is to:

1. Eliminate the interstate traffic in firearms, especially between the states with different gun control restrictions; and
2. Define some classes in society as ineligible for illegal purchasing firearms (criminals); and
3. Prohibit the importation of all surplus military firearms and all other weapons except for sporting purposes.

The core rule in the GCA of 1968 requires that gun dealers, manufacturers, importers, or collectors be licensed. The Gun Control Act of 1968 is not without its shortcomings. First, this act only applies to public transactions between a gun dealer and his or her customer. This act does not restrict private firearms sales except to outlaw the sale or transfer of certain type of weapons. The second problem is one of enforcement. In the U.S. there are a large number of gun dealers, and thousands of gun transfers occur on a daily basis. In contrast, the federal enforcement staff assigned to regulate and investigate these transfers is extremely small. In short, the GCA of 1968 is less effective partly because it was due to the dilemma between amounts of transfers and limited enforcement staff.

Another federal law is the Brady Handgun Violence Prevention Act, which was passed in1993 and signed by President Clinton. It requires a waiting period of five working days between purchase and delivery of a handgun with a background check on the buyer. However, it only applies to federal licensed dealers (focusing on interstate transfer) and covers handguns in those states without similar background check requirements under their state laws.

The Brady Act also has several shortcomings: it does not cover non-dealer transactions and the potential offenders can evade the law by purchasing handguns through unlicensed sellers. However, Kleck points out that the Brady Law still has had some effects on gun crimes although these effects have not reached the expectations of many scholars (1997, 378).

State Regulations

State and local regulations have a prolonged history, which dates back to the colonial times. In 1692, the province of Massachusetts passed the Statute of Northampton, the first gun control law to prohibit carrying a weapon in public (Bakel, 1966). However, because of the demand of American resistance to the British, gun control was not popular at that time.

It was not until 1800s that states began to reconsider laws prohibiting guns. Between 1813 and 1837, Kentucky, Indiana, Arkansas and Georgia passed laws prohibiting the carrying or wearing of concealed weapons, but these early laws only applied to gun carrying. The first law requiring purchasers to obtain permission to own a gun was the Sullivan Law, enacted in New York in 1911. This law, which was widely criticized for imposing on the right to bear arms, had some positive effects on public safety.

Today, the range and restriction of gun control has greatly increased. Wright et al. (1983) provides a simple overview of state gun laws, dividing these laws into several types: dealer controls; acquisition and transfer controls; possession controls; provisions for place and manner of carrying; penalties for the use of firearms in crime; and bans on certain firearms.

Dealer controls include licensing and the recording and reporting of firearm sales. Firearm dealers are required to report sales information including the description of the firearms, serial number and purchaser information.

Acquisition and transfer controls contain the license or permit to purchase and application to purchase a gun. The license or permit to purchase is regarded as a very restrictive rule, which requires the purchaser to apply for a permit at the local police department, filling out a form with information on address and criminal records, and including fingerprinting and photographs of the applicant. The police often will conduct a background investigation to verify the information on the application form. Some cities even require the proper purpose to buy a gun. A waiting period is often required before the issuing of the permit to allow verification of information and a background check.

The application to purchase is similar to the permit to purchase, with the exception that the purchase form is completed by the dealer and then forwarded to the police department. Generally, applications to purchase are less restrictive than licensing or permitting and require no application fee.

Possession controls include registration and license to possess. Registration is used to screen the weapon when the police officer checks the registrant's background. License to possess refers to the requirement of license or Identification Card issued to the firearms owners.

Provisions for place and manner of carrying regulate the carrying of handguns. Most states have such restrictions, though these restrictions vary widely across jurisdictions.

Penalties for use of firearms in crimes refer to enhanced sentences for criminals convicted of carrying or using a gun while committing a crime. These rules increase the severity of sentences provide to criminal in an effort to deter the gun related crimes

Bans on certain firearms are found in some states like California, Connecticut, New Jersey, New York, which restrict "assault weapons." For example, California prohibits the sale of any "unsafe handgun;" Hawaii restricts "assault pistols;" Minnesota prohibits several small, low-caliber, inexpensive handguns and "assault pistols."

The following summarizes state-level gun control laws for the fifty U.S. states and the District of Columbia for the year 2000. The summary was constructed from information available in the Sourcebook of Criminal Justice Statistics (Maguire, et al. 2001).

1. Almost every state has the NICS instant background check, the concealed carrying law and hunter protection laws.
2. Most of states have range protections laws (range protection laws protect firearm ranges from nuisance and noise control actions intended to prevent a range's operation).

3. 26 states require that a record of sale be sent to police. These states contain about 38.9% of the U.S. population.
4. 12 states have a waiting period for handgun sales. They contain about 36% of the U.S. population.
5. The 13 states that require the license or permit for handgun purchase contain about 53% of the U. S. population.
6. Only four states (Hawaii, Michigan, New York and District of Columbia) require handgun registration.
7. Five states (Illinois, Massachusetts, New Jersey, New York, District of Columbia) require license and identification card for handguns.
8. Ten states, covering 56.7% of the population, prohibit certain firearms.

The coverage of gun control restrictions across the states has greatly increased compared to Cook's previous estimations (1979; 1980). Moreover, the estimate of current coverage is conservative because it only employs state-level rather than city level data. Cities in some states without gun control restrictions sometimes institute their own restrictions, so that the percentage of the U.S. population covered by their restrictions may be higher than the estimates provided above.

Previous Studies in Gun Control Restrictions

Previous studies of gun control laws can be divided into two categories: time-series designs and cross-sectional designs. In the typical time-series design, monthly violent crime rate data within a jurisdiction are analyzed with ARIMA or regression-based time series methods to determine if there is a significant downward shift in the level of crime around the time a new gun law goes into effect. Most studies focus on the policy effect of a single form of restriction, like penalties for use of firearms in crime and provisions for place and manner of carrying. For example, Loftin et al (1983) applied an interrupted time-series design using monthly data to three geographically separated and demographically distinct Florida cities, Jacksonville, Miami and Tampa, to measure the impact of Florida's Felony Firearm Law (passed on October 1, 1975). Of the 18 crime series analyzed, there was little evidence that the introduction of the Florida gun law was followed by a systematic decline in violent gun crimes in these cities. However, in 1992 McDowell et al. reanalyzed the impact of this law employing a longer data series and additional cities. They found some significant policy effects on gun homicides that they attributed to announcement of the mandatory sentencing laws in Detroit, Jacksonville, Tampa, Miami, Philadelphia and Pittsburgh.

It should be noted that many time-series designs have partly supported the gun control policy (Deutsch 1981; Jones 1981; Pierce and Bowers 1981; McPheters et al. 1984; Loftin et al. 1991; McDowall et al. 1992). However, Britt et al. (1996) criticized the shortcomings in time-series designs. They illustrated these deficiencies by repeating the study of Loftin et al. (1991) in an alternative test of the law's impact. They emphasized three problems for the time-series designs:

1. Inappropriate selection of control series. Many previous interrupted time series designs did not use control series or employ inappropriate control series, which led to incorrect conclusions. According to his investigation, more than half of the major studies use no control series, while for those studies which did use control series, the underlying logic for their selection are not explicit. For example, Loftin et al. (1991) studied the impact of gun laws in select DC metropolitan and suburban areas with different violence rates and demographic characters.

2. Model specification errors in terms of both the timing of the intervention and the expected change pattern (gradually or permanently). Even ARIMA experts have difficulty specifying a model, which almost is an art rather than a science

3. Most researchers arbitrarily decided the time series on the basis of data availability. In the traditional perspective, analysts choose the longest data series and use all available time points. They ignore whether their findings will vary if a series with a different length was used.

Kleck (1997) also criticized the univariate interrupted time series studies and considers their finding as unacceptable, because: (1) they can not establish, *ceteris paribus* conditions (i.e. they fail to control for other variables that can affect violence rates so as to make sure that observed differences in violence rates truly are attributable to differences in gun laws rather than other extraneous variables that threaten validity); (2) they have not established a close correspondence between the time of violence levels change and the time of laws implementing so that they cannot rule out competing explanations on the change of crime rates. Finally, comparisons across control jurisdictions and non-gun violence rates depend on some unpractical and inaccurate assumptions (see, for examples, Pierce and Bowers 1981; Loftin and McDowall 1983; Loftin et al. 1991).

The application of cross-sectional designs in gun control research dates to Krug's Wisconsin's study in 1967. Krug (1967) measured the statistical hypotheses that states with firearms licensing laws have lower crime rates than states not having such laws. He compared the means of three violent crimes (homicide, robbery, and aggravate assault) between the 36 states with licensing law and other states without licensing laws. No significant differences were found. Snyder (1969) compared the average homicide and crime rates from the states with the most restrictive and least restrictive gun laws. He also found no statistically significant differences. However, there were several problems in these studies: (1) their statistical methods are crude; (2) the research designs do not rule out other interventions effects; (3) they mix gun crimes and non-gun crimes together, and expected gun control policy to reduce violent crimes whether or not they were commit using guns.

The best study among the early research was conducted by Geisel et al. (1969), which used a more advanced statistical method —multiple regressions-- to assess the impact of gun laws on crime levels. Geisel et al. combined eight states gun control restrictions into a gun control index. Meanwhile, recognizing other influences on crimes, they selected some demographic factors as independent variables: average per capita

income, median school year completed by adults, males per 100 females, police employees per 1000 residents, proportion black, population density, median age, and licensed hunters per capita. His study finds no significant effect of the gun control index on the total homicide, assault and robbery rate, although some effects were noted when the gun control index is recorded into the dummy variable for each type of gun control law.

Another important cross-sectional study conducted by Murray (1975), used separate gun control restrictions as dummy variables rather than as an index. Seven gun control legislation variables were included: purchase permit, waiting period, report to police, retail license, minimum age, carry openly permit and carry concealed permit. Murray added the logged state population, percentage of unemployed, percentage below the poverty line, and percentage of interstate migrant population into the equation as independent variables. Murray did not, however, distinguished gun related crimes from non-gun crimes and simply uses the total homicide, robbery, and assault rates as dependent variables. Stepwise regression was employed. The results indicated no statistically significant impacts of gun control laws on crime.

Cook (1979) conducted a cross-sectional study of gun related robbery. Although he only measured one type of gun control law, he distinguished the gun robbery rate from the non-gun robbery rate. He found little effect of state regulation and attributes the reasons to the quality of the state's attempt to implement the law.

Sommers (1980) used the multiple regressions to measure two gun control laws: concealment and purchased license. His study points out that the license has a significant effect on the murder rate, but no effects on robberies and assaults. Concealment provision has no effects for any crime. He still did not distinguish the gun violence rates and non-gun violence rates.

Kleck and Patterson (1993) conducted one of the most comprehensive cross-sectional analyses of gun control. Their study accesses systematically the effects of gun control law on violent crime rates for 170 US cities with a population of over 100,000 in 1980. Dependent variables included homicides, robberies, and assaults. They measure both total violent crime rates and gun-related violent crimes rates and employ 19 gun control laws specified in state and city ordinances. The models were estimated by a two-stage least squares procedure. They found that certain gun control policies have a significant negative effect on total violent crimes or gun violence. The strongest support for gun control laws included: prohibiting the mentally ill from possessing guns reduced the total and gun homicide rates; bans on handgun sales deterred total robbery and gun robbery rates; gun dealer licenses reduced gun assaults, total robberies and gun robberies. Weaker effects were found for the following relationships: prohibiting drunk persons from possessing firearms reduced total assaults; additional penalties for gun crimes deter red gun homicide rates, total robber rates and gun robbery rates; mandatory penalties for illegally carrying guns reduced total robbery and gun robbery; Saturday-night special ban reduced gun homicide rates and gun assault rates. Their findings indicated that the laws with the weakest effects were: gun registration (reduced the total homicide rates and gun

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homicide rates); gun purchase permit (reduced the total homicide rates rather than gun homicide rates); prohibiting the possession of guns by criminals (reduced gun robbery rates and gun assault rates); and a *de facto* ban on handgun possession (reduced gun robbery). Waiting periods, which is favored by states, had no effect on any form of criminal violence.

However, there are still some shortcomings in their study: (1) they did not focus their analysis on gun-related crime, and instead hypothesize that the gun control laws should lower the total crime rate; (2) they failed to assess the effects of each individual gun control restriction on crime -- some laws, for example, may have multiple effects, while others may have single or interactive effects; (3) the simple cross sectional design only describes a single point in time and cannot contain the dynamic information as time series designs permit; (4) the city level data excluded cities with a population below 100,000 which includes half of the population of the U.S., so that the analysis is likely to be biased.

Additionally, several scholars have conducted cross-national studies to compare the effectiveness of gun control policy among different nations. Some of them support gun control (Catherline and Deborah 1989; Archer and Gartner 1984). These studies, however, fail to control for many of the factors that differentiate nations, as Kleck (1997) pointed out. Many analyses arbitrarily attribute the differences in rates of violence across nations to differences in gun control restrictions. It is notable that some foreign scholars also conduct studies on gun control policies, but their findings are mixed. Gary and Richard' study (1992) in Canada found no significant effects of a gun registration law, while Jenny's study in Australia (2000) supported the policy effect of license and registration.

Conclusion

In conclusion, there are several shortcomings in previous studies: (1) most focus on total crime rates rather than gun-related crimes as the dependent variable. Gun control laws, however, should affect the level of crime committed with guns, and not necessarily the entire rate of criminal offending. (2) The research methods in most of studies are inaccurate or unsuitable whether the cross-sectional designs or univariate time-series designs. Most researchers ignore the use of pooled data necessary to examine to examine the relationships between gun legislation and crime across both time and space. (3) Previous studies have fail to offered detailed comparisons of the different policy effects of different type of gun controls on varied different kinds of violence committed with guns.

The next chapter examines some theoretical assumptions that explain the expected relationship between gun control legislation and rates of violent gun offenses. This discussion highlights the theory of rational choice, and how offender choices are impacted by external constraints that add to the cost of illegal behavior.

Chapter Three

Analysis of Gun Control Policy Effects

As the Chapter Two pointed out, there are many hypotheses concerning how gun
control policies affect gun availability and/or gun-related crime. No one explanation is
preferred for describing the impact of gun control legislation on crime. This chapter
employs the traditional rational choice theory to explain this relationship.

The Overview of Rational Choice Theory

The mechanism by which gun control laws might affect crimes is complicated. Most
previous studies have, however, assumed a simple mechanism, namely that gun control
policy affects crime by controlling gun availability. In contrast, Kleck (1993) pointed out
that gun control legislation was not related to general gun availability. He assumed that
gun control might only affect the gun owning potential of the criminal population.

At the most basic level, the effect of the gun control policy on potential criminals
can be explained by rational choice theory. Rational choice theory is an expansion of the
concept of deterrence and based on the concept of expected utility in economic theory
(Akers 1999, 23-25). The expected utility principle states that people make rational
decisions based on the extent to which they expect a choice to maximize their profits or
benefits and minimize the costs or loss. For the six gun control laws discussed above, the
expected effects are as follows: (1) handgun-waiting time increases the time cost for the
offender to buy the gun, thus blocking some offenders from purchasing a handgun. Hand-
gun waiting periods may also inhibit those with criminal records or other
disqualifications from seeking out legal guns, perhaps increasing the difficulty of finding
a gun, and increasing the cost of purchasing a gun. (2) Handgun licenses or permits to
purchase obviously restrict some potential offenders through background checks and
force them to buy guns with a higher price and risk in underground markets. (3) Handgun
registration, record of sale sent to police, and license or identification cards each prolongs
the gun-buying procedure and helps to connect gun to owners with criminal records.
These restrictions also increase the amount of energy and time potential gun owners must
invest, and the certainty of police investigation. (4) Firearm prohibitions or bans severely
restrict the selling of some weapons.

Undoubtedly, these six rules increase the costs of buying guns. Rules such as
background checks, waiting periods, and purchasing permits, further are especially costly
potential offenders with criminal records. However, even though gun control laws
increase the cost of gun buying, one still cannot reason that these laws will have the same
effects on gun use and crime rates. According to rational choice theory, expected utility
can be different from one criminal to the next, which leads to different responses to gun
laws. Thus, it is possible that these gun laws have different effects on potential criminals
engaging in different crime types.

Criminals who pursue robberies have clear monetary or instrumental goals. In general, there are two types of robberies: street robbery and commercial robbery. The expected utility for street robbery is limited. When gun buying cost are increased through gun control legislation, street robbers may substitute other cheap weapons and change targets to include weaker victims like women, and aged persons. Thus, gun control laws should have the effect of reducing the gun-related robbery rate. These laws, however, are not expected to decrease the general robbery rate. For commercial robberies with more lucrative goals, the substitution is less likely to occur because expected income is highly profitable and cannot be replaced easily by other crimes (for an alternative argument see Moody, 1995, who argues that gun control laws can lead to a substitution effect that will increase rates of other crimes). In economic terms, the "elasticity" of the commercial robbery is lower, so the gun control laws are uncertain to switch the robbers to less lucrative victims.

With regard to gun-related assaults, gun controls laws should to reduce brawls with guns. Generally, few of the assaulters plan a fight and most brawls happen because of occasional and spontaneous conflicts. Since gun control laws increase the cost of possessing and carrying guns and restrict gun availability, these gun control laws should also reduce gun-related assaults and the injury level of assaults, although they might have no apparent affects on the total number of overall assaults

The impacts of gun control laws on homicide are more complicated. As Moody (1995) pointed out, when guns are used, intentional murders are often successful, robbery- murders are more likely, and the consequences of assaults are more deadly. Special circumstances are in effect in these cases. Owning a gun reduces the offender's fear of the victim. Gun control legislation may even make it more difficult for law-abiding citizens to acquire guns, further decreasing the offender's fear of the victim. At the same time, gun control legislation increases the cost of buying guns to potential offenders. Therefore, gun control laws may even increase homicides in some special circumstances. Of course, contemporary gun control laws mainly focus on keeping guns out of "bad guys" hands without denying access to the "good guys" by checking the buyer's background. As some scholars stated, the line is hard to draw and illegal transfers exist.

In the case of intentional homicides, the effects of gun control laws are limited because these laws only bring limited costs to offenders. However, the effects of gun control laws are valuable for reducing murders committed by the offenders without a murderous intention, because they lower the probability of possessing a gun by increasing the cost of obtaining a gun. Thus, occasional murders, like robbery murders and fatal assaults, will likely decrease. Although persons are not always rational during homicides, assaults, and robberies, they can be rational when deciding whether to own a gun. The effects of gun control laws act to increase the cost of gun ownership in general, reducing gun availability and decreasing escalated use of force in robberies by offenders and accidental homicide outcomes.

Economical Model of Rational Choice Theory in Gun Control Policy

Previous discussion of the function of gun control laws on homicide, assault and robbery rates makes it clear that the use of a gun can effectively increases the possibility of an offender's success and reduce possible resistance from victims. Gun control policy can also restrict access to guns by increasing the potential offenders' cost to possess a gun. Thus, from rational choice theory, the utility expected from committing an offense can be explained by adding a measure of gun control policy into the Becker's (1968) well-known economic model of criminal behavior.

$$EU = pU(Y - g - f) + (1 - p) U(Y)$$

Where EU is expected utility, Y is the benefit, g is the cost of gun control, f is monetary equivalent of punishment; and p is the possibility of conviction. Given this, an offense occurs where

$$\partial EU / \partial g = -pU(Y - g - f) < 0$$

Including the cost of gun control legislation, the supply function of offenses is changed from:

$$O = O(P. F, U) \text{ (Becker, 1968)}$$

to:

$$O = O(P, F, G, U1), \partial O / \partial P < 0, \partial O / \partial F < 0 \text{ and } \partial O / \partial g < 0$$

Where O refers to the number of the offenders, P is the possibility of conviction, F is the severity of punishment, G is gun control, and U1 includes all other possible factors.

McDonald (1999) constructed two complicated economic models similar to the formula above to analyze the effects of gun control laws on gun violence. In both, the gun control measures make crimes more costly to commit. Thus, based on the assumption that society consists of rational persons (including offenders), increasing the cost of gun possession through gun control legislation is expected to reduce gun-related violence. Where gun control restrictions decrease gun possession, deter offenders from employing guns, or make targets less attractive, levels of gun-related violence should be reduced.

Chapter Four

Methodology

Methods

Most previous studies use cross-section or time series designs. Only Marvell and Moody's research (1995) used pooled data and design, which is regarded as a particularly appropriate quasi-experiment research. Pooled data combines information "necessary to deal with both the inter-temporal dynamics and the individuality of the entities being investigated" (Dielman 1989, 3). It provides more degrees of freedom and permits one to evaluate many separate legal changes. Lambert argued that pooled data were well adapted for legal impact studies (Lambert 1966; Dielman 1989). One advantaged of pooled data is that it allows one to control for missing variables that cause differences between the states and yearly changes in the nation. Pooled data also increases the number of data points available for statistical estimations through multiplying the cross-sectional data points and time series data points, thus increasing the accuracy (reliability) of the estimations (Lambert 1966). Another advantage of pooled data is their incorporation of variables measured over time. The inclusion of variables measured over time is a necessary element of studies endeavoring to make causal connections between dependent and independent variables, though the inclusion of such variables alone is insufficient to establish causality. The main advantage of pooled data is still that it can capture variation across different units in space, as well as variation that emerge over time. This approach is particularly useful for data with limited time series and modest size samples (Sayers 1989).

Marvell and Moody 's (1995) pooled data research only involves enhanced prison term for felonies committed with guns, rather than the effects of gun control restrictions. Thus, the current research will be the first to apply the pooled cross-sectional data to examine the specific policy effects of gun control restrictions.

The data employed in this study were measured across both time and space. The space is made up of the boundaries of the 50 states; the time is demarcated by a five year time period. To avoid confusion, it may be useful to think of the data employed in this study as panel data; that is, as repeated measures taken over a short period of time or over a few discrete measurement periods. It should also be noted that the short-time period pooled data used here is unlikely to generate the degree of measurement errors found in long term-time series data (e.g., autocorrelated error terms; trend in measures). If discovered, however, these measurement issues will be addressed.

Dependent Variables

The data used to construct the dependent variables come from the Sourcebook of Criminal Justice Statistics and includes the percentage of four types of crimes committed by guns: firearm-related violent crimes, handgun-related homicide, handgun-related robbery and handgun-related assaults. These proportions are state level data, which

covers 48 states and Washington, D.C. from 1995 to 1999. Hawaii and Alaska were excluded from the analysis. Summary statistics for the crime data can be found in Table 4.1 (see below).

Control Variables

Based on a review of previous studies, the present study includes a set of control variables believed to influence the relationship between gun laws and gun-related violent crime rates. Previous studies generally reasoned that the relative size of population, age structure, race, economic factors, and education level significantly affect levels of violence (Murray 1975; Kleck 1993; Moody 1995; Augustine 1995). Thus we select density per square mile, urban population high school graduates, percentage of below poverty line, per capita income, unemployment percent, the ratio of black to white, and the population aging between 17-34 year olds as control variables for the present study. All these variables were collected from the Statistical Abstracts of the United States issued by the Census Bureau. Statistics for these variables are presented in Table 4.2.

Table 4.1: Summary Statistics, Gun-Related Murders, Robberies and Assaults, 1995-1999.

		% of assaults with firearms	% of robberies by handguns	% Homicides by Handguns	% firearm related violent crimes
N	Valid	237	237	219	223
	Missing	8	8	26	22
Mean		19.9806	38.3932	46.2256	24.836
S. E. Mean		.49823	.72086	.95454	.5555
Median		19.8000	39.5000	47.6000	25.100
Mode		16.80	40.60	25.00	19.4
Skewness		-.024	-.300	-.609	-.066
S.E. Skewness		.158	.158	.164	.163
Kurtosis		-.565	-.126	-.072	.232
S.E. Kurtosis		.315	.315	.327	.324
Sum		4735.40	9099.20	10123.40	5538.4

A. Multiple modes exist. The sma llest value is shown

Table 4.2: Statistics for Independent Variables

Statistics

		density per square mile	high school grads (1000s)	urban pop, 1000	% below poverty	Per capita income	Percent Unemployed	black/white ratio	17-34 year olds
N	Valid	245	245	147	245	245	245	245	245
	Missing	0	0	98	0	0	0	0	0
Mean		379.273	47.953	4382.22	16.662	24652.84	4.7327	.1700	28.4212
Std. Error of Mean		84.3098	3.1461	463.435	4.0786	305.003	.07914	.01809	.15940
Median		85.500	34.400	3050.00	11.900	24163.00	4.6000	.0916	28.4150
Mode		6.0	5.9	275	11.2	20185	5.10	.00	31.87
Skewness		5.921	2.483	2.818	15.566	-.149	.601	4.570	-.342
Std. Error of Skewness		.156	.156	.200	.156	.156	.156	.156	.156
Kurtosis		34.529	7.759	9.833	243.177	3.528	.546	24.774	8.741
Std. Error of Kurtosis		.310	.310	.397	.310	.310	.310	.310	.310
Sum		92921.8	11748.6	644187	4082.2	6039945	1159.50	41.65	6963.20

A. Multiple modes exist. The smallest value is shown

The Measure of Gun Control Laws

Six types of gun laws -- handgun waiting time, handgun license or permit to purchase, handgun registration, record of sale sent to police, license or identification card, and certain firearm prohibited – were selected from the Sourcebook to measure various dimensions of gun control laws. These gun laws are coded into dummy variables. If the state has each of the laws, it will be coded 1;otherwise, it will be coded 0.

Meanwhile, the six laws also are ranked according to its restriction levels. It is obvious that waiting period is the least restrictive because it does not prohibit gun ownership in itself. The requirement that a record of sale be sent to police ranked as the second least restrictive. License law requirements were ranked as the third least restrictive; the handgun registration ranked fourth; permit to purchase ranks fifth; certain firearm prohibited, which constitutes a complete ban on owning specific firearms, ranked as the most restrictive law. Coding the variable in this way allows an assessment of the relationship between restrictive levels and gun crime rates by type across states.

Interestingly, during the five years being investigated (1995 to 1999), gun control restrictions changed very little across states. Only six states changed any of these laws during this period. Two states added one restriction while four states removed one restriction. Most of the gun control law changes involved the addition or deletion of waiting period requirements.

Statistical Methods

The current study will use a constant coefficient model in the pooled designs because during the five years. During the period of study, the 50 districts that were analyzed had no significant legal changes related to gun controls. According to Sayers (1989) the assumptions of the constant coefficient model are as follows: " the relationship between the explanatory variables and the dependent variables is the same for all cross-sections and time points," and "these contaminating effects are random to all cross-sections and are indeed captured in the error" (p. 25). Both of these conditions are satisfied by the data. Therefore, the current study assumes that the relationships between gun control laws, control variables and gun violence are constant during the five years through the fifty main districts, and in the analysis. OLS regression will be applied to the data. Because of the simplicity of the model, autoregression and heteroscedasticity will be tested in later analyses.

Chapter Five

Findings

This chapter analyzes the effects of gun control laws on gun violence employing OLS regression techniques. The effects of the six gun control variables (handgun waiting time, handgun license or permit to purchase, handgun registration, record of sale sent to police, license or identification card, and certain firearm prohibited) are regressed on four different dependent variables: (1) total firearm-related crimes; (2) handgun-related homicides; (3) firearm-related robberies and; (4) firearm-related assaults[1].

The findings are presented in five parts. First, I present the descriptive statistics for this study. The next four sections examine the OLS regression models for each of the dependent variables independently.

Descriptive Statistics

Table 5.1 reports the bivariate correlation between the variables in this study. Consistent with Kleck's study (1993), the control variables have moderate to low correlations with the gun control variables. Most of the correlations are less than 0.4. These low-level zero-order correlations indicated that muticollinearity should not have a detrimental impact on OLS estimates. To further address the possible deleterious effect of multicollinearity, variance inflation factors (VIFs) were estimated for each independent variable in each of the OLS models estimated. The majority of these were below 4, indicating that multicollinearity did not have any major impact on OLS estimates, and that the estimates should be considered unbiased by multicollinearity.

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[1] As the above noted, 100 % of rapes committed with guns, 96.4 % of robberies with guns, 81.6% of assaults with guns and about 90% homicide with gun were committed using handguns, so the present study treats the total firearm related crimes, firearm related robberies, and firearm related assaults as handgun crimes.

Table 5.1   Zero-Order Correlations by All Variables

	X1	X2	X3	X4	X5	X6	X7	X8	Y1	Y2	Y3	Y4	X9	X10	X11	X12	X13	X14
X1	1.00																	
X2	-.095	1.00																
X3	.007	.086	1.00															
X4	.412*	.178*	.051	1.00														
X5	.369*	.158*	.026	-.10	1.00													
X6	.582*	.069	.044	.215*	.367*	1.00												
X7	-.455*	-.133*	.004	-.389*	-.231*	-.392*	1.00											
X8	.327*	.455*	.054	.679*	.117	-.306*	.363*	1.00										
Y1	-.077	.28	.37*	-.229*	.312*	.563*	.030	.068	1.00									
Y2	-.043	.34*	.097	.046	.325*	.52*	-.101	.354*	.545*	1.00								
Y3	-0.38	.144*	.26*	-.151*	.131*	.513*	-.001	.137	.760*	.505*	1.00							
Y4	-.117	.039	.386*	-.383*	.270*	.315*	.155*	-.069	.862*	.397*	.622*	1.00						
X9	.044	.241*	.012	.333*	-.002	-.057	-.096	.394*	-.058	.211*	-.039	-.138*	1.00					
X10	.332*	.30*	.108	.402*	-.098	.183*	-.186*	.271*	-.103	-.102	-.111	-.106	.178*	1.00				
X11	.525*	.50*	-.003	.319*	.289*	.427*	-.274*	.268*	.029	-.077	-.001	-.030	-.129*	.459*	1.00			
X12	.221*	.206*	.048	.407*	-.062	.116	-.230 *	.338*	-.168*	.10	-.167*	-.224*	.465*	.454*	.252*	1.00		
X13	.384*	.209*	.200*	.469*	.175*	.224*	.266*	.402*	-.175*	.032	-.19*	-.240*	.044	.578*	.385*	.318*	1.00	
X14	.334*	.257*	.129*	.459*	.145*	.381*	-.226*	.416*	.043	.292*	.036	-.104	.399*	.306*	.099	.363*	.317	1.000

X1: density per square mile; X2: high school graduates; X3: percentage of below poverty line; X4: per capita income; X5: unemployment percent; X6: the percentage of black; X7: the population aging between 17-23 year olds; X8: percentage of urban population: Y1: percentage of firearm related violent crimes; Y2: percentage of homicides by handgun; Y3: percentage of robberies by firearms; Y4: percentage of assaults with firearms; X9: handgun waiting period in days; X10 license or permit to purchase; X11: registration; X12: record of sale to police; X13: license or identification card; X14: certain firearms prohibited.

* P > .05

Gun Related Crimes OLS Estimates

Table 5.2: Full Theoretical Model Predicting All Gun-Related Crimes, U.S., 1995-1999.

(1) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.714	.510	.451	6.155	1.384

(2) ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4567.745	14	326.267	8.613	.000
	Residual	4394.058	116	37.880		
	Total	8961.803	130			

Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	7.732	11.318		.683	.496		
	high school grads (1000s)	-7.006E-03	.014	-.044	-.498	.620	.550	1.818
	% below poverty	.113	.243	.047	.466	.642	.411	2.435
	per capita income	-3.347E-04	.000	-.168	-1.245	.216	.231	4.329
	unemployment percent	1.442	.786	.180	1.835	.069	.438	2.281
	handgun waiting period	-9.942E-02	.277	-.039	-.359	.720	.352	2.839
	license or permit to purchase	4.668	1.923	.240	2.427	.017	.433	2.311
	registration	-4.555	3.422	-.115	-1.331	.186	.565	1.770
	record of sale to police	-1.078	1.420	-.065	-.759	.449	.574	1.742
	license or ID card	-7.427	3.427	-.238	-2.168	.032	.349	2.863
	Certain firearms prohibited s	-.461	1.936	-.021	-.238	.812	.552	1.811
	% crime prone pop 17-23	.258	.311	.060	.831	.408	.810	1.235
	% black	.440	.066	.521	6.625	.000	.683	1.464
	PURBAN	.139	.046	.342	3.052	.003	.337	2.963
	density per square mile	-7.551E-03	.004	-.229	-1.868	.064	.281	3.559

a. Dependent Variable: % firearm related violent crimes

Table 5.2 reports OLS parameter estimates of the effects of six gun control laws on firearm related crimes for the full theoretical model. In this model, R- Square is .51, which means that the model fit the data fairly well. Among the six gun control laws, the license or permit to purchase has a significant but positive effect on gun violence, which is contrary to most previous studies (Murray 1979; Kleck 1993). Consistent with the results of previous research, license or identification card has a negative and significant effect on gun violence. No significant effects for the other gun laws were found.

Among the control variables, the black/white population ratio and percentage of urban population have a strong positive influence on gun violence, which means that more urbanization and more black population have significantly higher rates of gun violence. In this model, I also substituted the percentage of crime prone population from age 17 to 34 and the ratio of black to white for crime prone population 17-24 and percent black, respectively. Neither substitution altered the outcome. In addition, handgun waiting period was recoded from a count variable (number of days in the waiting period) into a dummy variable (0 = no waiting period; 1 = waiting period). Substituting this variable also produced no significant effect. (Note: This same procedure was followed for the remaining regressions, and produced no significant effects in any of the models tested).

A number of the variables included within the full theoretical model failed to predict the distribution of all-gun related crimes. The insignificant variables were removed from the OLS estimate one at a time, and the OLS reestimated after each deletion in an effort to produce the best fitting, most efficient model. The best fitting, most efficient model is found by removing the least significant variable from the OLS estimate, reestimating the model, removing the least significant variable, and so on, until either all insignificant variable are removed or the R^2 drops (rather than increases). This same procedure was employed to create reduced form models for each of the theoretical models estimated.

Table 5.3 Reduced Theoretical Models Predicting All Gun-Related Crimes, U.S., 1995-1999.

(1) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.710	.503	.466	6.065	1.390

(2) ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	4511.536	9	501.282	13.630	.000
	Residual	4450.267	121	36.779		
	Total	8961.803	130			

Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	17.766	6.409		2.772	.006		
	per capita income	-4.478E-04	.000	-.225	-1.934	.055	.302	3.308
	Unemployment percent	1.369	.633	.171	2.165	.032	.657	1.522
	License or permit to purchase	4.452	1.765	.229	2.523	.013	.499	2.004
	Registration	-3.927	3.035	-.099	-1.294	.198	.698	1.434
	record of sale to police	-1.611	1.253	-.097	-1.286	.201	.715	1.398
	license or ID card	-6.730	2.888	-.216	-2.330	.021	.477	2.095
	% black	.436	.059	.517	7.381	.000	.838	1.194
	PURBAN	.127	.041	.311	3.121	.002	.413	2.424
	density per square mile	-7.615E-03	.004	-.231	-2.136	.035	.351	2.849

   Table 5.3 reports the results for the reduced model for all gun crimes. The results are similar to those obtained with the full theoretical model: permit to purchase is positive and significant while license is negative and significant. The percentage of black and percentage of urban population remained significant. Among control variables, unemployment achieved significance (p = .05 level) in the reduce model, while it was insignificant in the full model.

   In both the full model and reduced model the Durbin-Watson statistic is in the inconclusive range (less than 1.384) indicating a potential for inefficient model estimation. An effort to correct the problem of serial autocorrelation (first differencing) in the violent gun crime model caused enhanced autocorrelation.

Gun-Related Homicide OLS Estimates

Tables 5.4 and 5.5 present findings for the OLS estimates for the full-theoretical model and reduced form models predicting gun-related homicides. Because the results of the full theoretical and reduced form model are very similar, these results are discussed simultaneously.

In these models, the Durbin-Watson coefficient is within acceptable limits, meaning that the estimates were not affected by autocorrelation of error terms. The reduced model has a better R-square than the full theoretical model, indicating greater predictive efficiency with fewer independent variables. These results shows that among gun law variables, only registration was a statistically significant predictor of gun homicides, producing a negative effect on gun relate homicides. Kleck (1993) also found that registration has a significant and negative effect on gun related homicide. Handgun-waiting period produced a significant, positive impact in the reduced form model, while it has no statistically significant impact in the full theoretical model for gun-related homicides. Previous studies have not discovered an effect for handgun waiting period on homicides.

For control variables, unemployment, percentage of urban population and percentage black had a positive, significant effect on gun related homicides . The variable density per square mile produced a significantly negative effect on the gun related homicides.

Gun-Related Robbery OLS Estimates

Tables 5.6 and 5.7 contain OLS estimates for gun-related robberies. Because the results are similar, findings for both the full model and reduced model are also discussed simultaneously.

Table 5.6 and 5.7 report the gun law effects on the gun related robbery rate. Initial OLS estimates indicated that gun-related robbery models were impacted by autocorrelation, with Durbin-Watson statistics in the unacceptable range. To correct for autocorrelation, a difference model was created. This was accomplished by lagging the gun-related robbery rate and adding it to the OLS as an independent variable. Following this procedure, the Durbin Watson statistic no longer indicated the presence of auto-correlated error terms.

The R-squares for the robbery models were above .80. In the full model, only permit to purchase had a positive and significant effect on gun related robbery. However, in the reduced model, handgun waiting period, registration, and identification card produced negative and significant effects. The results are contrary to previous studies of the effect of gun laws on crime (Kleck 1993). It is notable that permit to purchase, which has been regarded as an efficient gun control law in previous studies, appears to increase gun related robberies. This relationship, however, may simply indicate that states with

higher robbery rates attempt to address this problem by instituting gun permit requirements.

Table 5.4 Full Theoretical Model Predicting Gun-Related Homicides, U.S., 1995-1999.

(1) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.686	.471	.407	10.6701	1.632

(2) ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11737.800	14	838.414	7.364	.000
	Residual	13206.648	116	113.850		
	Total	24944.448	130			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	16.040	19.148		.838	.404		
	density per square mile	-1.505E-02	.007	-.273	-2.239	.027	.308	3.247
	high school grads (1000s)	2.993E-02	.024	.113	1.235	.219	.548	1.826
	% below poverty	6.631E-03	.012	.042	.569	.570	.848	1.179
	per capita income	-2.234E-04	.000	-.067	-.485	.628	.239	4.187
	unemployment percent	2.127	1.289	.155	1.651	.101	.517	1.935
	handgun waiting period	.857	.474	.204	1.807	.073	.360	2.779
	license or permit to purchase	-4.473	3.446	-.141	-1.298	.197	.388	2.575
	registration	-12.611	5.909	-.191	-2.134	.035	.570	1.756
	record of sale to police	3.211	2.464	.116	1.303	.195	.573	1.746
	license or ID card	6.434	5.628	.134	1.143	.255	.330	3.033
	Certain firearms prohibited	-.704	3.304	-.020	-.213	.832	.532	1.880
	% crime prone pop 17-23	.205	.537	.029	.382	.703	.817	1.224
	% black	.632	.113	.447	5.614	.000	.719	1.390
	PURBAN	.208	.077	.308	2.705	.008	.353	2.837

A. Dependent Variable: % Homicides by Handguns

Table 5.5 Reduced Theoretical Model Predicting Gun-Related Homicides, U.S., 1995-1999.

(1) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.679	.460	.420	10.5469	1.604

(2) ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11484.707	9	1276.079	11.472	.000
	Residual	13459.741	121	111.238		
	Total	24944.448	130			

Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	11.975	6.614		1.811	.073		
	density per square mile	-2.021E-02	.006	-.366	-3.582	.000	.427	2.340
	unemployment percent	2.714	1.085	.198	2.503	.014	.713	1.403
	license or permit to purchase	-4.587	3.393	-.144	-1.352	.179	.391	2.555
	registration	-12.285	5.390	-.186	-2.279	.024	.669	1.495
	record of sale to police	3.622	2.392	.131	1.514	.133	.594	1.684
	license or ID card	7.779	4.914	.163	1.583	.116	.423	2.366
	PURBAN	.231	.063	.342	3.685	.000	.519	1.926
	handgun waiting period in days	.880	.408	.209	2.158	.033	.475	2.104
	% black	.643	.101	.455	6.343	.000	.867	1.154

A. Dependent Variable: % Homicides by Handguns

For control variables, percentage of black and percentage of urban population were significant predictors of the gun-robbery rate. The coefficients for these variables, however, are very low. As expected, the lagged variable (the lag of the handgun robbery rate) is also a significant predictor.

Table 5.6 Full Theoretical Model Predicting Gun-Related Robberies, U.S., 1995-1999.

(With lagged robbery with gun rate to correct for autocorrelation)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.925	.855	.837	4.3182	2.271

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13536.821	15	902.455	48.397	.000
	Residual	2293.559	123	18.647		
	Total	15830.380	138			

Model		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	8.552	7.921		1.080	.282		
	density per square mile	-1.271E-04	.001	-.015	-.223	.824	.270	3.707
	high school grads (1000s)	-9.717E-04	.010	-.005	-.102	.919	.573	1.745
	% below poverty	1.139E-02	.167	.004	.068	.946	.377	2.653
	per capita income	-2.088E-04	.000	-.085	-1.099	.274	.196	5.103
	unemployment percent	-.444	.533	-.047	-.834	.406	.372	2.691
	handgun waiting period	-.236	.186	-.071	-1.271	.206	.381	2.627
	license or permit to purchase	2.830	1.355	.114	2.088	.039	.395	2.531
	registration	-3.143	2.371	-.072	-1.326	.187	.394	2.537
	record of sale to police	-.759	.977	-.036	-.777	.439	.562	1.779
	license or ID card	-4.171	2.216	-.114	-1.882	.062	.322	3.103
	Certain firearms prohibited	9.264E-02	1.352	.003	.069	.945	.498	2.009
	% crime prone pop 17-23	8.646E-02	.215	.016	.401	.689	.703	1.423
	% black	.123	.060	.139	2.062	.041	.259	3.861
	PURBAN	6.782E-02	.031	.129	2.170	.032	.333	3.000
	ROBHLAC	.775	.052	.789	14.927	.000	.421	2.374

A. Dependent Variable: percent of robberies by handguns

Table 5.7 Reduced Theoretical Model Predicting Gun-Related Robberies, U.S., 1995-1999.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.923	.851	.844	4.2363	2.232

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.		Tolerance	VIF
	Regression	13479.405	7	1925.629	107.299	.000			
	Residual	2350.975	131	17.946					
	Total	15830.380	138						
Model		B	Std. Error	Beta				Tolerance	VIF
1	(Constant)	3.742	1.948		1.921	.057			
	handgun waiting period	-.368	.146	-.110	-2.526	.013		.597	1.676
	license or permit to purchase	2.945	1.161	.119	2.536	.012		.518	1.929
	registration	-4.361	1.975	-.101	-2.208	.029		.547	1.829
	license or ID card	-5.561	1.908	-.152	-2.914	.004		.418	2.390
	% black	9.428E-02	.044	.107	2.163	.032		.468	2.139
	PURBAN	4.590E-02	.023	.087	1.973	.051		.579	1.728
	ROBHLAC	.800	.046	.815	17.444	.000		.519	1.927

A. Dependent Variable: percent of robberies by handguns

Gun-Related Assault Rates

Tables 5.8 contain the results for OLS estimates for gun-related assaults. Because the gun-related assault estimated yielded no significant results, there was no need to estimate a reduced form model.

As we expected in the discussion of gun laws, no laws had a significant effects on gun related assaults. In fact, the sole significant variable is high school graduates with positive effects.

Table 5.8 Full Theoretical Model Predicting Gun-Related Assaults, U.S., 1995-1999.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.931	.868	.813	11040.6584	1.726

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27162365579.222	14	1940168969.944	15.917	.000
	Residual	4144468681.186	34	121896137.682		
	Total	31306834260.408	48			

Model		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	43149.131	47071.964		.917	.366		
	density per square mile	-1.651	2.444	-.078	-.675	.504	.292	3.424
	High school grads (1000s)	391.910	40.296	.814	9.726	.000	.556	1.797
	% below poverty	1326.646	953.793	.168	1.391	.173	.267	3.750
	per capita income	-.949	.941	-.162	-1.009	.320	.150	6.650
	unemployment percent	-2924.425	2821.668	-.114	-1.036	.307	.322	3.105
	Handgun waiting period	1378.686	816.789	.171	1.688	.101	.380	2.628
	license or permit to purchase	-4665.396	5954.203	-.079	-.784	.439	.379	2.635
	Registration	8284.211	10287.874	.079	.805	.426	.409	2.445
	record of sale to police	-3003.252	4354.896	-.059	-.690	.495	.525	1.905
	license or identification card	11133.189	9135.658	.133	1.219	.231	.325	3.074
	Certain firearms prohibited	3092.920	6468.169	.047	.478	.636	.397	2.522
	% crime prone pop 17-23	-1755.113	1618.387	-.097	-1.084	.286	.490	2.042
	% black	32.426	228.927	.015	.142	.888	.333	3.002
	PURBAN	142.892	141.963	.118	1.007	.321	.285	3.511

A Dependent Variable: # assaults

Other Models Estimated

In addition, I also recoded the gun law variables into an index. The indexed gun control variable was created by coding each separate gun law as being absent (0) or present (1), and adding the results for each state. The maximum value for this variable is 6 (a state has all 6 gun laws in effect) while the minimum is 0 (the state has no gun laws in effect. Consistent with Geisel's (1969) study, the index of gun control laws had no effect on any of the gun-related crime estimates.

Gun-laws were also recoded into a weighted index. The weight assigned to each gun law reflected the relative seriousness of the gun law as a form of gun control. The weights assigned were as follows: record of sale (1); waiting period (2); ID card (3); registration (4); license/permit (5); firearm prohibited (6). Theoretically, the maximum value for any state on this variable is 21 (6+5+4+3+2+1 = 21), while the minimal value in a state with no gun control laws is zero. The weighted index allows for greater variability of the gun control measure than the dummy coded, additive gun control measure described in the previous paragraph.

The weighted gun law index also did not produce significant effects in any of the four gun-crime model. This is probably because different laws have policy effects on different crimes. Furthermore, the effects of specific laws may occur in opposite directions, which cancel out the empirical impact of some specific laws, yielding a statistically insignificant net impact of gun control laws on gun-crimes.

Summary

The separate OLS analyses produced no consistent statistical impact. The OLS models revealed that each of the six-gun laws has some policy effects on specific gun crimes. Handgun waiting period, for example, had a statistically significant, positive impact on gun related homicides and a significant, negative impact on gun-related robberies. The registration law seems to have a more popular policy effect. My results indicate that permit to purchase effects seem to have been overestimated in previous studies. Sale record-reported to police and certain firearm-prohibited have no policy effects for any of the crimes examined. No gun control policy has an effect across all of the gun related crimes examined here.

Among the control variables, the percentage of black and percentage of urban population were always significant, with the exception of the gun related assaults estimates. Education, unemployment and density per square mile sometimes can produce significant effects for specific crimes.

Chapter Six

Discussion

Using cross-sectional and time-series research designs, previous studies of the effect of gun control laws have generally failed to discover statistically significant gun control effects. In contrast, the present study found several statistically significant gun control effects. The difference between the findings in previous research and those of the present study are related to one primary distinction between these studies: the operationalization of the dependent variable. The majority of previous research examined the impact of gun laws on the total crime rate. In the present study, however, gun control laws were hypothesized as having an effect only on gun-related crimes rather than all crimes. Thus, for each crime type, the dependent variable measured only those crimes committed with the use of a gun. The present study also corrects the deficiencies in the previous studies by employing pooled data. These differences in methodology produced several significant findings.

First, consistent with previous studies, several gun control laws, such as prohibitions of certain firearms and mandatory record of sale to police, failed to produce the expected policy effect on each type of gun crime. Second, it is interesting that most previous studies provide evidence that permit to purchase reduces gun related crimes (Kleck, 1997). However, in the present study, this law is positively correlated with total firearm-related crimes and gun-related robberies. Third, handgun waiting period, handgun registration, and identification card produced gun-crime reductions that were consistent with those found in previous studies (Kleck, 1993; Murry, 1979).

Several statistically significant effects were found for the control variables.

(1) The percentage of urban population and percentage of blacks exerted an important influence on gun-related homicides and robberies.

(2) For gun related robberies, the percent of high school graduates was the sole significant factor.

(3) The percentage of high school graduates were related to an increase in gun related assaults.

(4) Unemployment increased gun related homicides. This relationship is easily explained. As previous research suggests, unemployed persons may be more motivated to engage in acts of violence, or less committed to the social order. In either case, people who may be more "angry" are more likely to resort to homicides (Bernard 1990).

(5) Population density was found to reduce the gun-homicide rate. It is possible that density increases the number of available guardians (Cohen and Felson 1979), thus reducing the use of guns in densely populated areas, or making it easier for victims to get help.

(6) Interestingly, in contrast to previous research (Cohen and Land 2001), the percent of young males aged (17-23) (i.e., the crime prone population) exerted no effect on the rate of gun related crimes in any of the equations estimated.

Important Findings

For each of the gun-related crimes, the gun control restrictions studied had different effects. This finding, which is unique to the current study, can be summarized as follows:

(1)   For total gun related crimes, identification card had a negative effect but the permit to purchase had a positive effect.

(2)   For gun related homicides, handgun registration had deterrent effects, however, gun waiting period had a weak positive effect.

(3)   For gun related robberies, handgun waiting period, registration, and identification card produced negative and significant effects but permit to purchase still had a positive effect.

(4)   For gun related assaults, none of the gun laws produced any effects.

From these findings, handgun waiting period and registration appear to have broader influences than other forms of gun control. Although in some states, registration and waiting period are connected, and both are required, they sometimes exert contrasting effects on crime.

The findings indicated that the requirement of an identification card seemed to increase the cost of committing robberies. This requirement, however, appeared to have no cost impact on other gun crimes. The effect of identification cards appears to be related to crimes that have a "rational" component. Homicides, for example, involve more irrational behavior and requiring an ID-card is unlikely to deter the potential homicide offender. In contrast, robberies are more likely to be planned events. ID cards may force robbers to employ other kinds of weapons to carry out their crimes (Kleck 1997).

The present study finds that permit to purchase has a positive effect on gun-related robberies and aggregated gun-related crimes. My explanation is that the states with more gun crimes are more inclined to pass such gun control laws. Gun related robberies are fear inducing. Citizens in states with higher robbery rates may demand the passage of stricter gun laws. The permit to purchase is often regarded as the best choice because previous studies have been support its effect.

Shortcomings of the Present Research

Of course, there are still several shortcomings in the present studies.

(1) This study provided an advance over previous studies by using pooled data. However, the period of time over which the data could be pooled was limited.

Consequentially, more advanced analytic techniques such as time series could not be employed. In the future, it is desirable to be able to employ time series techniques to assess the intervention effect of gun control laws.

(2) The present study was limited to state level data. State level data may omit several variables important to measuring the effect of gun control laws. For example, Kleck (1993) pointed out that gun control laws may be implemented and thus have their greatest effect at the local level.

(3) The present study only assessed the effects of a limited set of gun control laws. There are many different types of gun control laws. These laws may vary from one locale to the next. These local laws may have more important gun control effects in specific states.

Future Research

In the future study, I hope that more advanced statistical method, longer time series data can be employed and more gun control restrictions can be measured and compared.

Certain firearms prohibited and mandatory sale record reported to police should be examined further in the future, because the present study mainly examines the handgun crimes, so that the measurement on this restriction lacks of persuasion.

Gun availability has been regarded as the most important variable by which gun control laws affect gun violence. However, the present study found no satisfactory means of measuring gun availability. Even previous studies, which had tried to measure gun ownership level, note that this measure has poor validity (Kleck 2002). This presents a dilemma. Obviously, if researchers want to explain the complicated mechanism linking gun control laws and crime, it is necessary to discuss the relationship between gun control and gun availability. Unfortunately, a suitable measure of gun availability over time and place is currently nonexistent. In an email exchange, gun-control researcher, Gary Kleck (2002) noted that some indirect measures of gun levels are available for limited areas, but only for cross-sectional analysis. A valid measure of gun availability in longitudinal data is still unattainable at the present time. This raises an interesting observation about the gun control literature. Since its inception, gun control research has been hinged on the connection between gun control, gun availability and levels of crime. During this entire period of investigation, however, no suitable source of measuring gun availability has emerged. Interestingly, significant scholarly literature that draws conclusions concerning the effectiveness of gun control legislation has grown dramatically at the same time that one of the core concepts – gun availability – cannot be measured.

Like previous studies, therefore, the present study has had to assume that gun control is related to crime through gun availability without measuring gun availability. This missing measure makes it difficult to offer firm policies about gun control. Nevertheless, the following suggestion offers some suggestive policies based on an assumption that the ability to measure gun availability would not alter the outcome of the present research.

Policy Implications

The policy implications of this study are important although exploratory:

(1) Handgun registration should be an efficient way for several kinds of gun crimes to be diminished. This law exerts an obviously significant effect that reduces gun related homicides and robberies.
(2) For the states with more gun related robberies, handgun waiting period and identification card should be applied, as the present study indicates, because they also exert a significant deterrent effect on these crimes.
(3) The impact of handgun permit to purchase on crime seems to have been overemphasized in past research. However, previous studies examined the aggregate rates of crime and not gun-specific crimes. The findings from the present analysis indicate that handgun permits are not an effective mechanism for reducing gun related crime.
(4) Handgun waiting periods have contradictory effects. For gun related homicides, we also should not rely too much on the efficiency of handgun waiting periods, because it is positively correlated with the gun homicides. Handgun waiting period, however, has an opposite effect on gun related robberies. This contradiction seems to create a policy dilemma. However, there are many more robberies than homicides, and some homicides are the result of gun use during the commission of a robbery. Therefore, the costs of a handgun-waiting period (increased homicide rates) seem to be more than balanced by the reduction in robberies.
(5) The present findings indicate that urban population and the ratio of black are significantly highly correlated with gun violence. Given the assumption that gun availability and crime are linked, we can assume that gun policies will be looked upon more favorably in urban areas and in minority communities.

Conclusion

The present study employed pooled data to produce some important findings that differed from those found in previous studies. Although part of the discussion still requires further tests, the findings on comparing the policy effects of gun control laws on different gun related violence seem to be enlightening for future gun control studies.

As everyone knows, the United States has the highest gun related crime rates in the world. Gun control laws have been one important and disputable issue in criminal justice policy in the U.S. However, studies in the field are still unpersuasive, whether they argue for gun controls or against gun controls. The present study only takes a small step on the basis of the previous studies. By overcoming shortcomings in previous studies and advancing data quality in the current study or future study, more significant studies will be formulated and the policy analysis of gun control laws will make more efficient use of limited criminal justice source and save more lives in the future.

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