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Does Concealed Handgun Carry Make Campus Safer? A Panel Data Analysis of Crime on College and University Campuses

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Does Concealed Handgun Carry Make Campus Safer? A Panel Data Analysis of Crime on College and University Campuses

by

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Dedication

For Joe, and the 33,562 others in the United States who died from firearm-related injuries in 2012.

“It does not matter whether we believe that guns kill people or that people kill people with guns—the result is the same: a public health crisis” –Annals of Internal Medicine

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Abstract

Does Concealed Handgun Carry Make Campus Safer? A Panel Data Analysis of Crime on College and University Campuses

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The purpose of this report is to recommend and test an empirical strategy for assessing the impact that concealed carry policies have on crime at college and university campuses. I use panel data obtained from the Department of Education for all crimes reported on four-year, undergraduate, federal financial aid-receiving institutions between 2001 and 2014 to model the impact of campus carry legislation. Differences in legislation across states, time, and school types allow for estimation of a triple difference regression model. Results of OLS estimations show that campus carry has no significant observable association with crime rates of aggravated assault, sexual assault, robbery, burglary, and motor theft committed on campus at the 95% confidence interval. These results are robust to a number of different assumptions, including time lag and negative binomial modeling approaches. However, true effects may be difficult to determine precisely as model estimations present large standard errors. Notably, my analysis does not attempt to control for variables that may also influence campus crime rates, such as local economic conditions, gun ownership rates, or rates of concealed carrying on campus. This analysis is therefore only a starting point for further research and the results contained here should be considered preliminary. At most, my analysis may throw partisan narratives surrounding campus carry into some measure of doubt. In particular, results fail to

demonstrate a measurable deterrent effect theorized by campus carry advocates, or a criminal enabling effect theorized by opponents of the policy. Regardless of crime changes, I suggest that policymakers considering this controversial measure should also weigh how concealed carrying policies may influence a variety of other variables, including student suicides – a full understanding of which requires considerable caution and further research.

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Chapter 1: Introduction

THE LARGER LANDSCAPE OF CAMPUS CARRY

According to the National Conference of State Legislatures (NCSL), as of 2015, each U.S. state allowed private individuals who satisfy certain requirements to carry concealed handguns in most public spaces, provided they acquire a state-issued license.[1] Higher education institutions have traditionally been among the public areas where concealed handgun carry is prohibited.[2] This approach remains the dominant one across the United States.[3] As of 2015, 19 states explicitly banned concealed carry of handguns at colleges and universities, while another 23 states allowed the decision to be made at the institutional level.[4] Although there is a paucity of research surrounding the subject, higher education institutions allowed to regulate their own environments appear to have banned handgun carrying nearly universally.[5] As such, 42 states have implemented either *de jure* or *de facto* bans on the concealed carry of handguns on college and university campuses. Individuals found in possession of a handgun on campus property in these states have generally been subject to penalties such as fines and misdemeanor or felony convictions.[6]

Increasingly, however, gun laws have become de-regulated at the state level to allow for concealed handgun carry in higher education institutions, overturning the historical norms in these settings. From 2004 to 2015, eight states passed laws or issued court decisions that effectively allowed the concealed carry of firearms on college and university campuses, thereby implementing the policy colloquially known as "campus

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[1] "Guns on Campus: Overview," National Conference of State Legislatures, May 10, 2015, accessed December 5, 2015, http://www.ncsl.org/research/education/guns-on-campus-overview.aspx.
[2] "Concealed Weapons Permitting Policy Summary," Law Center to Prevent Gun Violence, accessed April 25, 2016, http://smartgunlaws.org/concealed-weapons-permitting-policy-summary/.
[3] "Guns in Schools Policy Summary," Law Center to Prevent Gun Violence, accessed March 14, 2016, http://smartgunlaws.org/guns-in-schools-policy-summary/.
[4] "Guns on Campus: Overview," National Conference of State Legislatures.
[5] Alan Schwarz, "A Bid for Guns on Campuses to Deter Rape," U.S. (The New York Times), February 19, 2015, http://www.nytimes.com/2015/02/19/us/in-bid-to-allow-guns-on-campus-weapons-are-linked-to-fighting-sexual-assault.html?_r=0.
[6] "Campus Carry: Frequently Asked Questions," University of Texas at San Antonio, n.d., accessed May 4, 2016, http://www.utsa.edu/campuscarry/faqs.html#q9.

carry."[7] Though policy effective dates are somewhat unclear in certain states, for ease of exposition they are generally the following: Utah (court action, effective 2006), Colorado (court action, effective 2010-2012), Oregon (court action, effective 2011), Mississippi (legislation, effective 2011), Wisconsin (legislation, effective 2011), Kansas (legislation, effective 2014), Idaho (legislation, effective 2014), and Texas (legislation, effective 2016).[8] Each state's approach to the policy possesses some level of uniqueness, but the general effect across these states is to allow the concealed carry of handguns on the campuses of public colleges and universities by concealed handgun license holders.[9] I turn to a more in-depth explanation of these policy changes in a subsequent section.

This trend of state-level policy change may continue. According to NCSL, at least 19 state legislatures attempted to pass campus carry laws in 2013, and 14 state legislatures attempted to do so in 2014.[10] A question of increasing importance to many higher education institutions is therefore whether and to what degree campus carry policies alter the safety of the campus environment.

The impact of campus carry policies within higher education settings has been hotly debated. Advocates for and against implementation of the policy have made strong claims about how introducing concealed handguns into the campus environment affects a number of variables, including crimes, suicides, accidents, incidents of intimidation and micro-aggression, and feelings of insecurity that may inhibit freedom of academic speech, among others.[11] Though these discussions are important, I emphasize that the substantive focus of my analysis is aimed specifically on the association of concealed carry and incidents of on-campus crime. The debate is wide in scope and there may (or

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[7] "Guns on Campus: Overview," National Conference of State Legislatures.

[8] Ibid. Also, note that I do not include Arkansas in my analysis, which allows only qualified university faculty to carry concealed weapons on public college and university campuses, according to Arkansas state law HB 1243. I also decline to include Florida and Kentucky, which allow concealed handguns only in locked vehicles on university property.

[9] Though Kansas, Oregon, and Wisconsin have uncertain or very strict approaches to the law – a point I elaborate on later in this report.

[10] "Guns on Campus: Overview," National Conference of State Legislatures.

[11] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*, 2015 https://utexas.app.box.com/CCWorkingGroup-FinalReport.

may not) be substantive impacts produced on any number of variables, but the analysis here focuses only on intentional crime committed on campus property, including aggravated assault, sexual assault, robbery, burglary, and motor theft.

A Debate on Gun Rights

At its most fundamental level, debates on campus carry invoke disagreements surrounding rights to firearms in general. Campus carry might therefore be seen as one facet of the nation's larger, ongoing effort to determine the extent of an individual's right to access firearms, particularly in public spaces. Advocates for and against campus carry have often taken arguments developed from this wider debate on handguns and applied them to the narrow context of college and university settings. As such, it is not that campus carry represents a unique discussion per se, but rather a focused version of the debate on gun rights and the public consequences of these gun rights. Though the goal of this report is not to discuss this wider debate over the association between handgun carry and crime at the general public level, it inevitably references and borrows from it – as both advocates and opponents of campus carry do as well.

Advocate's Perspective

The debate on the association between campus carry and crime might be simply represented by two competing intellectual perspectives: advocate and opponent. The perspective of the campus carry advocate argues, in part, that the constitutional right to bear a firearm should apply in all geographic settings, and that the traditional ban of handguns on campus is unwarranted.[12]

Beyond a discussion on individual rights, this perspective also suggests that expanding the number of spaces within which a handgun owner can take their weapon effectively protects them from potential criminal action through a *deterrent* effect. The

[12] "Students For Concealed Carry: About," Students For Concealed Carry, 2011, accessed May 4, 2016, http://concealedcampus.org/about/.

deterrent effect theorizes that when criminals must factor in the uncertainty of whether or not a potential victim is armed, they face a significant disincentive toward offensive action. The advocate suggests that by expanding this deterrent to higher education settings, criminal action might be stopped before it is ever committed in these areas.

One noted champion of this perspective is John Lott, who has argued that counties with "Shall-issue" laws (e.g. laws mandating that a state issue concealed handgun licenses for those who apply and meet minimum criteria) experience decreases in violent crime rates compared to areas without these laws.[13] Lott's work, which was the focus of an extensive evaluation by the National Research Council in 2004, has largely been refuted by academics on methodological grounds.[14] Nevertheless, his conclusions on the theory of deterrence have largely provided the intellectual foundation for the campus carry movement and continue to be invoked as justification for the policy in current debates.[15]

Proponents of this theory claim that the deterrence effect is also observable by recorded incidents of self-defense gun use. For example, the criminologist Gary Kleck has used survey data to argue that potential crime victims who are armed effectively stop or prevent millions of crimes each year, and therefore concealed carry should be extended to college and university campuses.[16] The Cato Institute – a libertarian think tank – has added support for Kleck's analysis, citing over 5,000 apparent news reports of self-defense gun use.[17] Though the methodological grounds upon which Kleck develops this

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[13] John R. Lott, *More Guns, Less Crime: Understanding Crime and Gun Control Laws, Third Edition*, 3rd ed. (Chicago: The University of Chicago Press, 2010).
[14] National Research Council, *Firearms and Violence: A Critical Review*, ed. Charles Wellford, John Pepper, and Carol Petrie (United States: National Academies Press, 2004), doi:10.17226/10881.
[15] John R Lott, "A Look at the Facts on Gun-Free Zones," *National Review*, April 25, 2016, http://www.nationalreview.com/article/425802/gun-free-zones-don't-save-lives-right-to-carry-laws-do.
[16] David Burnett and Cramer Clayton, *Tough Targets: When Criminals Face Armed Resistance From Criminals*, Cato Institute, 2012, http://object.cato.org/sites/cato.org/files/pubs/pdf/WP-Tough-Targets.pdf.
[17] Ibid.

claim have been disputed by public health researchers[18], his analysis remains an actively cited argument in ongoing campus carry debates.[19]

It may be worth noting that the arguments used by Lott and Kleck are structured at the societal level, and their application toward the campus environment has not been demonstrated as a valid extrapolation. In other words, Lott and Kleck have not attempted analyses on how concealed carry changes crime rates on campus specifically, but suggest – without empirical verification visible in the existing literature – that their studies at the societal level should still apply in a potentially different environment.

Notable advocacy groups such as Students for Concealed Carry endorse the deterrence perspective as well, further pointing to the lack of high-profile criminal incidents on campuses that allow concealed carry – such as those in Colorado in Utah – as proof of its existence.[20] In recent years, this argument has been adopted by conservative state legislators, who have made particularly strong support for the claim that allowing females to concealed carry on campus could serve to deter incidents of sexual assault.[21]

Deterrence theory aside, campus carry advocacy groups might still argue the merits of campus carry even in the event that the policy provides no measurable crime reduction. For example, Students for Concealed Carry claims that, no matter the likelihood of crime, past incidents of mass school shootings demonstrate that campus occupants should have the right to protect themselves by retaining access to handguns in both the classroom and general campus environment.[22] It is beyond the scope of this report to evaluate whether such a position is justified. But this line of argument demonstrates that the advocate perspective tends to enshrine individual rights, while

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[18] David Hemenway, "Survey Research and Self-Defense Gun Use: An Explanation of Extreme Overestimates," *The Journal of Criminal Law and Criminology* 87, no. 4 (1997), doi:10.2307/1144020.
[19] Ryan Ray, "Gun Bills Move Forward in Early Committee Action," *Florida Politics*, September 16, 2015, http://floridapolitics.com/archives/190411-gun-bills-move-forward-in-early-committee-action.
[20] *Common Arguments Against Campus Carry*, Students for Concealed Carry, 2011, http://concealedcampus.org/common-arguments/#1.
[21] Alan Schwarz, "A Bid for Guns on Campuses to Deter Rape."
[22] "Crime on College Campuses in the U.S," Students for Concealed Carry, 2011, accessed February 27, 2016, http://concealedcampus.org/campus-crime/.

declining more nuanced cost-benefit analyses that invoke the importance of public health considerations. This focus on individual rights typically reflects the advocate's association with conservative ideology.

OPPONENT'S PERSPECTIVE

On the other hand, the perspective of the campus carry opponent suggests that the impact of campus carry is not crime-reducing. According to this perspective, in the best case the policy is likely to have no observable impact on crime. These opponents suggest that campus carry policies likely have no impact on a factor that is more determinative of crime rates: the existing stock and availability of guns in society at large. Indeed, the policy might theoretically change the flow of legal handgun carrying to a limited extent, but the significance of these changes is likely to be dwarfed by American society's mostly unfettered access to a pre-existing supply of guns. Thus, according to opponents, to measure the impact of campus carry is to measure a policy without a truly discernible effect on crime, as limited changes in handgun carrying are not sufficient to produce observable impact on these larger undercurrents. In such an event, any observable correlation between campus carry and crime rates would point to a third, entirely separate factor responsible for the true change in crime.

Moreover, in the worst case, campus carry opponents fear that the policy may provide an enabling effect for criminality. In stark contrast to the advocate's perspective, opponents often contend that increasing access to handguns among students enables an attacker rather than providing defense for a victim. One argument made in this regard is that increasing student access to handguns may promote poor decision-making that results in incidents of sexual assault. The opponent group Campaign to Keep Guns Off Campus, for example, cites data showing that rates of sexual assault have increased on campus in Utah and Colorado – two campus carry states.[23] However, this data alone does

[23] "The Campaign to Keep Guns Off Campus' New Study Shows That on-Campus Crime Rates Have Increased in Two States Where Concealed Carry on Campus Is Allowed," Campaign to Keep Guns Off

not provide compelling evidence of the policy's impact. Rates of sexual assault have increased on campuses across the country, both in states where the policy is active and in those where it is not, in both public and private schools. Data discussed later in this report will corroborate this point.

In addition, opponents voice considerable anxiety about the potential impact of the policy on a number of other variables aside from crime. In particular, opponents of campus carry worry that liberalizing gun laws in college and university campuses introduces unnecessary risk in a variety of ways. Advocacy groups such as Students for Gun Free Schools[24] and Campaign to Keep Guns Off Campus[25] have alleged that expanding handgun carrying may increase the potential for incidents of student suicide, accidents, intimidation, untrained use of weapons, and vigilantism on campus, while failing to provide measurable crime reduction. Such groups often point to research conducted by David Hemenway, a public health scientist, that alleges a strong connection between student gun ownership on campus and risk-taking behavior, such as binge drinking.[26] Public health researchers like Hemenway also push back against the notion of the deterrence effect, claiming that no compelling empirical evidence exists to demonstrate it.[27]

Finally, opponents point to data showing that campus environments generally experience less crime than other areas, even before the advent of campus carry policies.[28] Calls for added security therefore misunderstand the reality that most campuses are

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Campus, March 17, 2015, accessed March 17, 2016, http://keepgunsoffcampus.org/blog/2015/03/17/the-campaign-to-keep-guns-off-campus-new-study-shows-that-on-campus-crime-rates-have-increased-in-two-states-where-concealed-carry-on-campus-is-allowed.

[24] *Why Our Campuses Are Safer Without Concealed Handguns*, Students for Gun Free Schools, 2008, http://www.studentsforgunfreeschools.org/SGFSWhyOurCampuses-Electronic.pdf.

[25] *Why Our Campuses Are Safer Without Concealed Handguns*, Campaign to Keep Guns Off Campus, 2015, http://keepgunsoffcampus.org/blog/category/resources/.

[26] Matthew Miller, David Hemenway, and Henry Wechsler, "Guns and Gun Threats at College," *Journal of American College Health* 51, no. 2 (September 2002), doi:10.1080/07448480209596331.

[27] David Hemenway and Sara J. Solnick, "The Epidemiology of Self-Defense Gun Use: Evidence from the National Crime Victimization Surveys 2007–2011," *Preventive Medicine* 79 (October 2015), doi:10.1016/j.ypmed.2015.03.029.

[28] Timothy C Hart, *Characteristics of Violent Crime Victims, 1995-2000 College Students*, Bureau of Justice Statistics, 2003, http://www.bjs.gov/content/pub/pdf/vvcs00.pdf.

comparatively safe locations, and the policy would merely serve as source of unnecessary risk to the public health. This perspectives is widely endorsed by members of the campus community, including college and university presidents[29], faculty[30], and students[31]. In a basic sense, these perspectives are generally associated with the progressive ideology, which tends to move away from discussions on individual rights in favor of community outcomes.

LIMITS OF INTERPRETING EMPIRICAL RESULTS

It is worth briefly qualifying the significance of my forthcoming analysis of campus carry and crime. Champions of both perspectives – with conservatives typically as advocates and progressives typically as opponents – might rightfully point to the issue of unknowable counterfactuals. For example, imagine the case that campus carry schools showed no crime reduction compared to non-campus carry schools. A conservative might continue advocating for the policy by responding that crime rates *would* have risen at campus carry schools if these institutions *had not* implemented the policy. On the other hand, imagine that campus carry schools did show crime reduction compared to their counterparts. A progressive might continue to decry the policy by responding that the legislation itself had nothing to do with change in crime rates. Rather, the legislation may have simply been a signal of broader cultural changes, the latter of which was the true determinant of decreased crime. It is worth noting that even observable changes in crime rates that align with policy change fail to demonstrate a causal nexus. Fortunately, though causality cannot be demonstrated with certainty, the influence of confounding factors

[29] James H. Price et al., "University Presidents' Perceptions and Practice Regarding the Carrying of Concealed Handguns on College Campuses," *Journal of American College Health* 62, no. 7 (September 16, 2014), doi:10.1080/07448481.2014.920336.

[30] Amy Thompson et al., "Faculty Perceptions and Practices Regarding Carrying Concealed Handguns on University Campuses," *Journal of Community Health* 38, no. 2 (October 23, 2012), doi:10.1007/s10900-012-9626-0.

[31] Ryan Patten, Matthew O. Thomas, and James C. Wada, "Packing Heat: Attitudes Regarding Concealed Weapons on College Campuses," *American Journal of Criminal Justice* 38, no. 4 (November 15, 2012), doi:10.1007/s12103-012-9191-1.

inherent to this discussion can be closely controlled for through regression analysis – one of the central features of this report.

In addition to the epistemological limitations noted above, potential policy implications of such a review should be qualified as well. In a very rudimentary sense, policymakers might be tempted to judge the merits of campus carry solely on its relationship with crime rates. However, I suggest that a framework for evaluating campus carry must be far more comprehensive than consideration of a single variable. An analysis on the impact of this controversial policy is thus germane in the context of current public policy, but it hardly ends the debate. Rather, it might be interpreted simply as a starting point that other analysts can expand and improve upon in the future.

Though a broad analytical framework should be used by policymakers when evaluating the merits of campus carry, I think the particular nexus between crime and concealed carry on campus is still worth exploring. This is especially true considering that the competing perspectives on campus carry discussed above have seemingly not been evaluated in an econometric context. Indeed, there have been many attempts throughout the literature to assess the impact of various gun policies on crime in the wider public domain, but there has been no systematic review of the specific impact campus carry policies produce on campus crime (or at least no such reviews have been made public). Therefore, my goal is to try to illuminate these competing intellectual perspectives by conducting a quasi-experimental assessment to determine whether campus carry policies are, in fact, associated with any discernible changes in crime rates on college and university campuses.

SUMMARIZING THE DISCUSSION AHEAD

In practice, campus carry is not a uniformly implemented policy. The eight states with some version of the practice used different mechanisms to implement it, and chose different on-the-ground approaches, with some states allowing more permissive handgun carrying than others. Moreover, to understand the broader policy landscape of campus

carry, the implementation of these measures should be framed within the context of a nationwide liberalizing of "right to carry" laws, which articulate how much authority a state government has to regulate handgun carrying. Together, these trends point to a gradual expansion of public spaces that permit handgun carrying and decreased state authority to refuse granting a license to carry.

Arguably, the push toward campus carry might be seen as originating from previous school shooting incidents. Indeed, the advent of groups lobbying in favor of the policy, such as Students for Concealed Carry, came immediately after the Virginia Tech tragedy.[32] As discussed above, competing perspectives have increasingly contended for dominance of this discussion since this tragedy, with conservatives typically as advocates of the policy and progressives as opponents. Conservatives have commonly asserted that the policy reduces crime through deterrence, while opponents have contended that the policy has no likely impact on crime or, worse, that it provides an enabling effect for criminals.

Laying the foundation for an empirical discussion is a noteworthy body of econometric literature focusing specifically on how concealed carry policies affect crime rates in the broader public domain, which I will explore briefly. I attempt to refine this discussion down to the campus level with my own empirical analysis. Fortunately, information pertaining to crimes on college and university campuses has been collected in a robust fashion after passage of the *Clery Act* in the early 1990s. I use campus-level crime data from 2001 to 2014 from the Department of Education, capturing the time period when campus carry policies were implemented. Differences in campus carry policies across states, school types, and time provides a natural experiment to observe the effect of the policy. I conduct this quasi-experiment by using regression analysis, including OLS and negative binomial modeling, with and without time lag effects.

Ultimately, the results from my model estimations cast doubt on partisan narratives suggesting that campus carry decreases crime through deterrence on the one

[32] "Students For Concealed Carry: About," Students For Concealed Carry, 2011, accessed May 4, 2016, http://concealedcampus.org/about/.

hand, or that it enables criminal activity on the other. However, these results are inseparable from critical assumptions I make in assigning treatment effects. These assumptions are made in an attempt to best reflect the on-the-ground realities of different states, but they are assumptions nonetheless. Furthermore, additional improvements must be made to my approach before definitive results can be obtained, as my models do not control for a number of variables that may also explain variations in crime rates. I discuss the results of my empirical analysis and its limitations in more detail later in this report.

As I have alluded to above, policymakers seeking a robust discussion on the merits of campus carry should look beyond a narrow focus on crime trends, regardless of the empirical results contained here. The wider body of public health literature has long suggested that handgun access is a risk factor for suicide within adolescent and young adult demographics. This should be considered within the campus carry decision framework, and those states choosing to implement the policy should build substantive protections of the public health within their approach, such as safe storage requirements, safe handgun carrying practices, and close monitoring of trends related to student suicides and handgun accidents.

Chapter 2: Policy Background

CAMPUS CRIME AND THE CLERY ACT

Any discussion on campus carry is intrinsically tied to a larger discussion on campus crime generally. As noted previously, campus environments are comparatively low-risk areas for crime, particularly violent crime. Student populations have historically been victimized by violent crime at lower rates than their non-student counterparts of the same age, and most crimes against students have occurred off campus.[33] Importantly, these trends were visible before the advent of campus carry policies. A 2003 Bureau of Justice Statistics (BJS) report noted that, from 1995 to 2000, college students experienced violent crimes at a rate of 68 per 1,000 persons, while non-students of the same age-range experienced violent crimes at a rate of 82 per 1,000 persons over this period.[34] Moreover, BJS noted in this report that eighty-five percent of crimes against students living on campus occurred off campus, and that ninety-five percent of crimes against students living off campus *also* occurred off campus.[35] Another 2014 BJS report noted that non-student females from age 18-24 were 1.2 times more likely than student females of the same age to experience sexual assault, though the report did not discuss on-campus / off-campus differences.[36]

Even in spite of their comparative safety, campus environments almost inevitably experience both violent and non-violent crimes. Prior to 1990, however, the federal government did not mandate that higher education institutions collect and report uniform crime statistics on their campuses. As such, no systematic data existed on crime within college and university settings. This changed following the rape and murder of Jeanne

[33] Timothy C Hart, *Characteristics of Violent Crime Victims.*
[34] Ibid.
[35] Ibid.
[36] Lynn Langton and Sofi Sinozich, *Rape and Sexual Assault Victimization Among College-Age Females*, 1995–2013, Bureau of Justice Statistics, 2014, http://www.bjs.gov/content/pub/pdf/rsavcaf9513.pdf.

Clery, a student at Lehigh University, in her dorm building in 1986.[37] In response to this tragedy and the nation's collective desire to begin monitoring campus crime, Congress passed the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act (Clery Act) in 1990.[38] The law, which remains in effect today, mandates that all college and universities receiving federal financial aid must report annual crime statistics to the Department of Education (ED). Crimes that occur both on and immediately around campus must be reported and the type of criminal incident must be specified as well. Institutions that violate that Clery Act by failing to report incidents receive substantial financial penalties: each crime incident that is not reported bears a fine of $35,000.[39] The extensive and uniform reporting produced by the Clery Act has opened up the possibility for systematic empirical evaluations of campus crime in ways that were not possible before the Act.

RIGHT TO CARRY LAWS

As mentioned above, trends in campus carry should be understood within the larger context of Right to Carry (RTC) laws. These laws refer to state policies that allow civilians to publicly carry handguns openly or concealed in public.[40] States with some version of RTC law typically grant a concealed handguns license to a properly vetted individual upon successful application through a state agency, thereby allowing the license holder to lawfully possess a handgun in public. In campus carry states, concealed handgun license holders can legally possess handguns on campuses of public colleges and universities (with some caveats discussed later), as long as these handguns are kept

[37] "Crime in Schools and Colleges: A Study of Offenders and Arrestees Reported via National Incident-Based Reporting System Data," Federal Bureau of Investigation, n.d., accessed April 24, 2016, https://www.fbi.gov/about-us/cjis/ucr/nibrs/crime-in-schools-and-colleges.
[38] Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act, 20 U.S.C. § 1092(f), 34 C.F.R. 668.46
[39] "Crime in Schools and Colleges", Federal Bureau of Investigation.
[40] U.S. Government Accountability Office, *GUN CONTROL States' Laws and Requirements for Concealed Carry Permits Vary Across the Nation Report to Congressional Requesters*, 2012, http://www.gao.gov/assets/600/592552.pdf.

concealed. The number of states with RTC laws has increased dramatically since the 1980s, effectively ushering in a nationwide expansion of public domains that allow handgun carrying. In 1986, sixteen states had "no-issue" policies; at the time, these states effectively disallowed any form of handgun carrying in public spaces.[41] By 2013, all fifty states had adopted some version of RTC laws. [42]

These laws vary in the discretion they give states to refuse licenses to applicants. According to the Law Center to Prevent Gun Violence, as of 2015, sixteen states had RTC laws described as "no discretion, shall-issue".[43] These states do not give the permitting agency any discretion to refuse licensure to an individual that completes an application and meets certain criteria. Another seventeen states had RTC laws described as "limited discretion, shall-issue" as of 2015. [44] These states can refuse licensure to qualifying individuals only in rare cases, such as when "law enforcement can produce a documented reason to believe the person is dangerous".[45] In other words, these individuals may have passed the minimum requirements to obtain a concealed carry permit, but the state retains the authority to refuse them a license. Another nine states had RTC laws described as "full discretion, may-issue" as of the same year.[46] These states possess the ability to refuse a qualifying applicant for any reason, and generally also require applicants to provide a specific and legitimate need for a concealed carry permit (e.g. for defense against a stalker) in addition to character references. The remaining eight states were unrestricted in their licensing requirements as of 2015.[47] Individuals in these remaining states can generally carry concealed handguns in public without first obtaining a license. These states do allow qualifying individuals to obtain a concealed handgun license, though again no license is required.

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[41] David Kopel, "Growth Chart of Right to Carry," The Washington Post, February 17, 2014, accessed December 1, 2015, https://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/02/17/growth-chart-of-right-to-carry/.
[42] "Guns on Campus: Overview," National Conference of State Legislatures.
[43] "Concealed Weapons Permitting Policy Summary," Law Center to Prevent Gun Violence.
[44] Ibid.
[45] Ibid.
[46] Ibid.
[47] Ibid.

There is some variation in the discretionary status of the RTC laws adopted by the eight current campus carry states. Five campus carry states were "shall-issue" throughout 2001 to 2014 (the entire time series considered in this report).[48] The remaining three states include Colorado, which transitioned from "may-issue" to "shall-issue" in 2003; Kansas, which transitioned from "no-issue" to "shall-issue" in 2007; and Wisconsin, which transitioned from "no-issue" to "shall-issue" in 2011.[49] As of 2014, Colorado, Utah, and Oregon allowed their permitting agencies limited discretion to refuse licensure to qualified applicants; Kansas, Idaho, Mississippi, Wisconsin, and Texas allowed no such discretion.[50]

POLITICAL DYNAMICS

The federal government has no regulations pertaining specifically to concealed handgun carry on college and university campuses, thereby allowing states to determine their own approaches. Only one state effectively mounted the political will to pass legislation compelling campus carry in public colleges and universities before 2007.[51] That state, Utah, passed amendments to state law in 2004 that prevented state public schools from banning concealed carry (though it struggled to enforce compliance from its resistant university system for several more years).[52]

The dynamic of the nation's discussion on gun rights in these settings changed significantly following the Virginia Tech mass shooting in 2007. Reacting to this tragedy, advocates for campus carry began mobilizing efforts to lobby for state-level implementation. Students for Concealed Carry, arguably the most notable of these post-Virginia Tech advocacy groups, began actively encouraging state legislators to consider campus carry as a policy mechanism to protect students from further violence. These lobbying efforts have generated considerable legislative success. Campus carry proposals

[48] "Concealed Weapons Permitting Policy Summary," Law Center to Prevent Gun Violence..
[49] Ibid.
[50] Ibid.
[51] Colorado passed the Concealed Carry Act in 2003, but did not begin *enforcing* on *campuses* until 2010.
[52] "Guns on Campus: Overview," National Conference of State Legislatures.

were introduced approximately seventy times from 2010 to 2015 in different state legislatures, with several measures becoming law, as discussed below.[53] With the exception of Utah, passage of campus carry policies may be therefore seen in part as a reaction to the movement that grew from the Virginia Tech tragedy.

As noted previously, enthusiasm for campus carry has not been reflected in the majority of the academic community. Several ideological rivals developed in response to the efforts of Students for Concealed Carry, including the Campaign to Keep Guns Off Campus and Students for Gun Free Schools. These opposing organizations also lobbied for their position at the state level in an attempt to stymie the increasing number of campus carry measures. Other policy groups weighed in on the issues, including members of campus law enforcement. For example, in March 2008, the International Association of Campus Law Enforcement Administrators (IACLEA) drafted a report partially in response to increasing calls from policymakers advocating for passage of campus carry laws. In its report, the IACLEA refused to endorse campus carry as a means of improving campus safety[54], saying that it did not believe concealed carry made campus safer[55]. Indeed, this report largely disapproved of the policy, and "[urged] public policy makers to proceed with extreme caution in dealing with proposals to allow college students to carry concealed weapons on campus."[56]

SPECIFICS ON STATE LEGISLATIVE AND JUDICIAL APPROACHES

From 2004 to 2015, eight states took either legislative or court action to prevent their higher education institutions from banning concealed carry on campus. These campus carry policies were implemented at different points in time and through different

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[53] "State Legislation Updates from the Campaign to Keep Guns Off Campus," The Campaign to Keep Guns Off Campus, accessed April 24, 2016, http://keepgunsoffcampus.org/state-battles/.
[54] Gary J Margolis et al., *Overview of the Virginia Tech Tragedy and Implications for Campus Safety the IACLEA Blueprint for Safer Campuses IACLEA Special Review Task Force*, International Association of Campus Law Enforcement Administrators, 2008, http://www.iaclea.org/visitors/PDFs/VT-taskforce-report_Virginia-Tech.pdf.
[55] Ibid.
[56] Ibid.

Table 1. Campus Carry Details by State

	State Legislation (year passed)	State Court Action (year decided)	Policy Effective Year	Notes on implementation	State RTC Law
UT	Amendments to state law (2004)	*University of Utah v. Mark L. Shurtleff, Utah Attorney General* (2006)	2006	Very unrestrictive	"Shall-issue" throughout 2001 - 2014
CO	Concealed Handgun Act of 2003	*Students for Concealed Carry v. Regents of the University of Colorado* (2010)	2003 - 2012	Mostly unrestrictive	"May-issue" to "Shall-issue" in 2003
OR	N/A	*Oregon Firearms Education v. Board of Higher Education* (2011)	2011	OR Higher Ed Board voted in 2012 to ban most guns on campus, unclear implementation	"Shall-issue" throughout 2001 - 2014
MS	HB 506 (2011)	N/A	2011	Mostly unrestrictive, with "enhanced permit"	"Shall-issue" throughout 2001 - 2014
WI	SB 93 (2011)	N/A	2011	Banned in most campus buildings with signage opt-outs written into law	"No issue" to "shall issue" in 2011
KS	HB 2052 (2013)	N/A	2014	Four year opt-out waivers written into law, used by all campuses	"No issue" to "shall issue" in 2007
ID	SB 1254 (2014)	N/A	2014	Mostly unrestrictive, with "enhanced permit"	"Shall-issue" throughout 2001 - 2014
TX	SB 11 (2015)	N/A	2016	To be determined by each campus, UT-Austin will allow carry inside classrooms	"Shall-issue" throughout 2001 - 2014

policy mechanisms (See Table 1). Though the specifics of each legislative or judicial approach were different, these policy changes have all had the effect of compelling public colleges and universities within the states to allow concealed handgun carry by properly licensed individuals. The timing and nature of each campus carry policy are an important consideration for the empirical work in this report, making a discussion on these details relevant.

In 2004, Utah became the first state to pass legislation allowing concealed handguns on campuses.[57] Amendments to state law passed that year mandated that higher education settings be subject to the same concealed carry regulations applicable throughout the state, and that colleges and universities therefore lacked the authority to ban concealed carrying.[58] However, higher education institutions originally refused compliance with the law, ultimately challenging it in the state supreme court. In 2006, the state supreme court upheld the law in *University of Utah vs. Shurtleff*, and ordered that public campuses in the state were required to allow concealed carrying.[59] According to Students for Concealed Carry, public colleges and universities officially began allowing concealed handgun carrying in the fall semester of 2006.[60] Utah public colleges and universities, as a result, allow permissive concealed carry for qualifying individuals. The UT-Austin Campus Carry Working Group – a body of students, faculty, and community members responsible for devising a campus carry implementation strategy in Texas' flagship university – notes the only restriction allowed in these campuses is the creation of a single carve-out (e.g. gun-free) zone. In an official report to UT-Austin, the Working Group noted that: "Utah allows each public university to establish one secure area as a hearing room and to create a rule that allows dormitory residents to request only

[57] "Utah Only State to Allow Guns at College," NBC News, April 28, 2007, accessed October 10, 2015, http://www.nbcnews.com/id/18355953/ns/us_news-life/t/utah-only-state-allow-guns-college/#.VxBkTjArLIV.
[58] "Guns on Campus: Overview," National Conference of State Legislatures.
[59] (2006) University of Utah v. Shurtleff, http://www.utcourts.gov/opinions/supopin/UnivofUtah090806.pdf.
[60] *Common Arguments Against Campus Carry*, Students for Concealed Carry.

roommates who are not licensed to carry a concealed firearm."[61] No other carrying restrictions appear to be allowed by the state's law.

In 2003, Colorado passed the Concealed Handgun Act of 2003 (CCA), expanding concealed carry privileges to "all areas of the state."[62] However, the Board of Regents of the University of Colorado (CU) System maintained that it had the authority to ban concealed handguns on public college grounds after passage of this law, and it continued to do so even after 2003.[63] However, in 2010, the Colorado Court of Appeals ruled (in *Students for Concealed Carry v. Regents of the University of Colorado*) that CU's ban on campus carry violated the CCA.[64] The CU System appealed this decision, and in 2012 the Supreme Court of Colorado ruled against the appeal. [65] The ruling on this appeal effectively removed a *de facto* ban on campus carry at CU campuses.[66] However, both the Cato Institute[67] and Students for Concealed Carry[68] note that Colorado State University allowed concealed carry starting the fall semester of 2003, and the remaining public colleges and universities in the state (aside from the CU system) allowed concealed carry starting the fall semester of 2010.[69] In any case, compared to Utah's approach, Colorado seems only slightly more restrictive of concealed carrying. According to the UT-Austin Campus Carry Working Group, CU-Boulder has continued

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[61] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*.

[62] Colorado State Senate Bill 03-024, 2003, http://www.leg.state.co.us/2003a/inetcbill.nsf/fsbillcont/D6D2AD9E8974917C87256C6B005D4177?Open&file=024_enr.pdf.

[63] Allie Grasgreen, "State Supreme Court Rules Colorado Regents Can't Ban Guns," *Inside Higher Ed*, March 6, 2012, accessed March 17, 2016, https://www.insidehighered.com/news/2012/03/06/state-supreme-court-rules-colorado-regents-cant-ban-guns.

[64] Regents of the University of Colorado v. Students for Concealed Carry on Campus, LLC. (2012) CO 17. No. 10SC344, https://www.courts.state.co.us/Courts/Court_of_Appeals/opinion/2010/09CA1230.pdf.

[65] Grasgreen,"Campus Gun Ban Struck Down."

[66] "Colorado Supreme Court Affirms That CU Students with Permits Can Carry Concealed Guns on Campus," The Denver Post, March 5, 2012, accessed March 17, 2016, http://www.denverpost.com/ci_20104814.

[67] David Burnett and Cramer Clayton, *Tough Targets.*

[68] *Common Arguments Against Campus Carry*, Students for Concealed Carry.

[69] It should be noted that there is still some measure of uncertainty on the exact dates that different campuses in Colorado implemented the policy.

to carve out areas that prohibit handguns, such as athletic stadiums and other performance venues, in spite of the state court's ruling.[70]

In 2011, Wisconsin introduced campus carry via legislation with SB 93, making the law effective in the same year.[71] However, the law included a provision that allows campuses to ban concealed carrying within campus buildings, as long as certain signage is posted at every building entrance and exist.[72] According to NCSL, as of 2015, every public college and university in Wisconsin appeared to be using this signage, effectively limiting campus carry to public grounds outside of buildings.[73]

In 2011, Mississippi passed campus carry via legislation with HB 506 in 2011, making the law effective on July 1, 2011.[74] When asked to clarify the law, Mississippi Attorney General Jim Hood released a memo in 2012 stating that concealed carriers also required an "enhanced" training permit in order to carry on college and university campuses.[75] Even so, according to the Campaign to Keep Guns Off Campus, state law remains somewhat unclear and some "public colleges and universities have banned firearms from dorms, event centers, and dining halls."[76]

In 2011, the Oregon Court of Appeals ruled (in *Oregon Firearms Education v. Board of Higher Education*) that a ban on campus carry in place at the University of Oregon System (OUS) violated state law.[77] In particular, the court ruled that OUS lacked

[70] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*.
[71] Wisconsin Senate Bill 93, 2011, https://docs.legis.wisconsin.gov/2011/related/proposals/sb93.
[72] Wisconsin Department of Justice, *WISCONSIN'S CARRYING CONCEALED WEAPON LAW QUESTIONS AND ANSWERS JUNE 1, 2013*, 2014, https://www.doj.state.wi.us/sites/default/files/dles/ccw/ccw-faq.pdf.
[73] "Guns on Campus: Overview," National Conference of State Legislatures.
[74] Mississippi House Bill No. 506, 2011, http://billstatus.ls.state.ms.us/documents/2011/pdf/HB/0500-0599/HB0506SG.pdf.
[75] Jim Hood, January 5, 2012.
[76] "Laws Concerning Concealed Firearms on Mississippi's Campuses," The Campaign to Keep Guns Off Campus, accessed March 17, 2016, http://www.armedcampuses.org/mississippi/.
[77] "Guns on Campus: Overview," National Conference of State Legislatures.

authority to implement such a ban, much like the court proceedings in Colorado.[78] Although the ruling was not appealed, in 2012 the Oregon State Board of Higher Education moved in spite of the ruling and "unanimously approved a policy banning guns from classrooms, buildings, dormitories, and events"[79]. The UT-Austin Campus Carry Working Group notes that "the state of the law in Oregon is not particularly clear."[80] It is worth noting that Umpqua Community College, which experienced a mass shooting in 2015, did not allow concealed handguns at the time of that tragic event[81].

In 2014, Kansas passed campus carry via legislation with HB 2052, making the effective date January 1, 2014.[82] However, a provision of the law allowed each institution to request waivers of exemption from the practice for up to four years. As of August 2013, affected campuses appeared to be using these waivers universally[83], and the UT-Austin Campus Carry Working Group suggested this continued to be the case in 2015.[84]

In 2014, Idaho passed campus carry via legislation with SB 1254, making the law effective on July 1, 2014.[85] Like Mississippi, Idaho law requires an "enhanced" permit in order to concealed carry on public colleges and universities.[86] The law also "prohibits handgun carrying in dormitories and residence halls and in public entertainment facilities

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[78] Bill Graves, "Oregon University System Will Not Appeal Court Decision Allowing Guns on Campus," *The Oregonian*, November 8, 2011, accessed March 17, 2016, http://www.oregonlive.com/education/index.ssf/2011/11/oregon_university_system_will_1.html.

[79] "Guns on Campus: Campus Action," National Conference of State Legislatures, 2016, accessed March 17, 2016, http://www.ncsl.org/research/education/guns-on-campus-campus-action.aspx.

[80] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*.

[81] Ibid.

[82] Kansas House Bill No. 2052, 2014, http://www.kslegislature.org/li_2014/b2013_14/measures/documents/hb2052_enrolled.pdf.

[83] "Laws Concerning Concealed Firearms on Kansas' Campuses," The Campaign to Keep Guns Off Campus, accessed March 17, 2016, http://www.armedcampuses.org/kansas/.

[84] University of Texas at Austin. *Campus Carry Policy Working Group: Final Report.*

[85] Idaho Senate Bill No. 1254, 2014, https://legislature.idaho.gov/legislation/2014/S1254.pdf.

[86] "Idaho: Concealed Carry Expansion and Youth Hunting Laws Effective Today*," National Rifle Association - Institute for Legislative Action*, July 1, 2014, https://www.nraila.org/articles/20140701/idaho-concealed-carry-expansion-and-youth-hunting-laws-effective-today.

that seat at least one thousand persons", according to the UT-Austin Campus Carry Working Group.[87]

With regard to Texas, it should be noted that the concealed carry of handguns has been legal on the actual *grounds* of public campuses since 1995, but not in other settings, such as buildings, dorms, event centers, and so forth.[88] This changed in 2015 when the Texas legislature passed SB11, setting the effective date for a more permissive campus carry in August 2016.[89] The legislation allows for each public college and university to devise its own implementation approach, as long as the creation of carve out areas does not amount to banning guns[90] across campus.[91] In its official report to UT-Austin President Gregory Fenves, the UT-Austin Campus Carry Working Group recommended designating certain areas, such as the majority of student housing and athletic events, off-limit to concealed carry.[92] The Working Group did not include classrooms in its list of off-limit areas, claiming that a ban in these locations would violate SB 11.[93] President Fenves officially endorsed these recommendations on February 17, 2016, publishing a policy document with twenty-five "statements" outlining the details of the implementation strategy.[94] The deliberative process is still under way for many other Texas public institutions as of the time of this writing.

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[87] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*.
[88] Ibid.
[89] Texas Senate Bill No. 11, 2015, http://www.capitol.state.tx.us/tlodocs/84R/billtext/pdf/SB00011I.pdf.
[90] Currently, it is somewhat unclear in Texas state law what exaclty would amount to this kind of "ban".
[91] Matthew Watkins and Kiah Collier, "Paxton: Universities Can't Ban Guns in Dorms, by Matthew Watkins and Kiah Collier," The Texas Tribune, December 21, 2015, accessed March 17, 2016, https://www.texastribune.org/2015/12/21/paxton-universities-cant-ban-guns-dorms/.
[92] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*
[93] Though it may be worth noting that every member of the Working Group thought "it would be best if guns were not allowed in classrooms."
[94] University of Texas at Austin, *Campus Carry Policies and Implementation Strategies*, 2016, https://utexas.app.box.com/campus-carry-report.

SIGNIFICANCE OF POLICY CHANGES

Passage of campus carry policies represent significant change in protocol for higher education institutions. Before the policy, individuals could not legally possess handguns in these settings, excluding qualified law enforcement officers. After implementation of the policy, campuses must allow for the legal carry of handguns by concealed handgun license holders, with the exception of the caveats discussed above.

In order to obtain a license, individuals must be above a certain age (typically 21), pass a criminal background check, receive a small amount of training from a certified instructor, and demonstrate minimal proficiency with a handgun.[95] After the effective dates of campus carry legislation, all active license holders are allowed to legally carry concealed handguns on certain parts of public college and university campuses - with the exception of Mississippi and Idaho, where an "enhanced" permit is also required. Thus, in Texas, all 937,419 license holders (as of December 2015) registered within the state could, in theory, carry concealed handguns throughout many portions of public campuses in the state, pending any last minute changes in implementation of the campus carry law - SB 11.[96] Individuals carrying handguns on campuses must keep the handgun hidden from the view of others, and may only lawfully display a handgun in response to an action that requires justifiable use of self-defense.

Notably, the actual prevalence of concealed carry on existing campus carry states is not well researched. The number of concealed carriers on campus is, based on current state laws, likely to be small as a percentage of an overall campus community. According to the Law Center to Prevent Gun Violence, all eight campus carry states require a concealed handgun licensee to be 21 years of age or older, meaning the entirety of a

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[95] U.S. Government Accountability Office, *GUN CONTROL.*

[96] Texas Department of Public Safety, *Concealed Handgun Licensing: Active License / Certified Instructor Counts As Of December 31, 2014*, 2015, *https*://www.txdps.state.tx.us/rsd/chl/reports/ActLicAndInstr/ActiveLicandInstr2014.pdf.

student body is not eligible to carry.[97] When the UT-Austin Campus Carry Working Group attempted to estimate the number of eligible concealed carriers in the university community, it noted that "less than one percent of [UT-Austin] students will have a license to carry a handgun."[98] This calculation was based on both the student age profile of the University and extrapolations of total statewide licensing rates to the college-aged demographic. The Working Group declined to estimate the percentage of faculty and staff with licenses at UT-Austin, but noted that this percentage was likely to be similarly low.[99] Of the campus members eligible to carry concealed in Texas, it is also unclear how many would actually be motivated to do so. The limited empirical research conducted on this subject has been unable to provide definitive estimations on the number of individuals likely to act on their concealed carry eligibility.[100]

In summary, as of the time of this report, campus carry policies have been passed in eight different states. These policies were enacted at different times and with differing on-the-ground implementation strategies. The policy of campus carry represents a significant departure from the historical norms applied within higher education settings, although these changes are unlikely to produce significant numbers of concealed carriers

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[97] "Concealed Weapons Permitting in Colorado," Law Center to Prevent Gun Violence, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-colorado/.
"Concealed Weapons Permitting in Kansas," Law Center to Prevent Gun Violence, 2010, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-kansas/.
"Concealed Weapons Permitting in Mississippi," Law Center to Prevent Gun Violence, 2010, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-mississippi/.
"Concealed Weapons Permitting in Idaho," Law Center to Prevent Gun Violence, 2010, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-idaho/.
"Concealed Weapons Permitting in Texas," Law Center to Prevent Gun Violence, 2010, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-texas/.
"Concealed Weapons Permitting in Oregon," Law Center to Prevent Gun Violence, 2010, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-oregon/.
"Concealed Weapons Permitting in Utah," Law Center to Prevent Gun Violence, 2010, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-utah/.
"Concealed Weapons Permitting in Wisconsin," Law Center to Prevent Gun Violence, 2010, accessed March 17, 2016, http://smartgunlaws.org/concealed-weapons-permitting-in-wisconsin/.
[98] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*.
[99] Ibid.
[100] J. A. Bouffard et al., "How Many More Guns? Estimating the Effect of Allowing Licensed Concealed Handguns on a College Campus," *Journal of Interpersonal Violence* 27, no. 2 (August 1, 2011), doi:10.1177/0886260511416478.

relative to total campus populations. Importantly, the question of whether low rates of concealed carry are capable of producing significant changes in campus crime rates is currently unanswered. To better introduce my approach to addressing this question, I briefly turn to a review of the existing literature on concealed carry and crime.

Chapter 3: Related Literature

The literature most closely related to this report focuses on the relationship between concealed carry policies and crime rates in the wider public domain. In particular, most researchers have attempted to assess the impact of right to carry (RTC) laws on rates of violent crime committed at the county-level.

In perhaps the most seminal analysis within this literature, John Lott's 1998 study examined FBI crime data on all 3,041 United States counties from 1977 to 1992, using regression techniques to model the impact of "shall-issue" RTC laws on rates of violent crime.[101] Lott reported in *More Guns, Less Crime* that adoption of "shall-issue" RTC laws were associated with "[reduction in] murders by 8.5%, rapes by 5%, aggravated assaults by 7%, and robbery by 3%."[102] Lott has since updated his analysis, adding data up to 2005 in his statistical models, and continues to report similar findings.[103]

Lott's analysis spurred significant controversy within the larger field of public policy and criminology. In 2004, The National Research Council (NRC) - convened by the National Academy of Sciences, Engineering, and Medicine - created a sixteen member expert panel to, among other firearm-related inquiries, review the credibility of Lott's statistical methods.[104] The panel concluded that, in spite of Lott's claims, "there is no credible evidence that 'right-to-carry' laws, which allow qualified adults to carry concealed handguns, either decrease or increase violent crime."[105] One member of the assembled review panel dissented, asserting that Lott's analysis was robust enough to demonstrate crime decreases in counties with RTC laws. Nevertheless, Lott's analyses

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[101] John R. Lott, *More Guns, Less Crime.*

[102] John R Lott, "More Guns, Less Violent Crime," *The Wall Street Journal*, August 28, 1996, accessed March 17, 2016, http://www.wsj.com/articles/SB841185795318576500.

[103] John R. Lott, *More Guns, Less Crime.*

[104] National Research Council, *Firearms and Violence*.

[105] "Data on Firearms and Violence Too Weak to Settle Policy Debates; Comprehensive Research Effort Needed," *National Academy of Sciences*, December 16, 2004, accessed March 18, 2016, http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=10881.

are widely considered to be debunked on the grounds of poor methodology within the academic community.

Lott's analysis generated considerable attention on the impact of concealed carrying. More recently, a 2014 working paper issued by the National Bureau of Economic Research (NBER) purported to show that "shall-issue" RTC laws were, in fact, actually associated with increases in violent crime.[106] In the study, Donahue, Zheng, and Aneja analyzed FBI data on county-level crime across the country from 1979 to 2010. Results of the study suggested that counties within RTC states observed increases in aggravated assault by eight percent compared to their non-RTC counterparts, while seeing no reductions in other types of violent crime. These results stand in direct contrast to those of Lott's analysis. The differences in these studies largely emanate from technical differences in methodology, which are beyond the purview of this report.

Another 2015 analysis conducted by the Texas A&M School of Public Health attempted to assess whether increases in issuance of concealed handgun licenses affected crime at the county level.[107] The study collected records on the number of licenses from 1998 to 2010 from 385 different counties across four states. Using time-lagged regression models, the study authors estimated the impact of licensing rates on murder, rape, robbery, aggravated assault, burglary, larceny, and motor vehicle theft in these counties over the 1998 to 2010 period. The results of the study showed no evidence that license issuance caused downstream impacts, either positive or negative, on the rate of crime committed within a county.

The reader should note that these analyses, which are largely representative of the pre-existing statistical modeling concerning concealed handguns over the past two decades, do not discuss campus carry specifically. Instead, they discuss the carrying of concealed handguns in public generally. The few studies that do attempt to examine the

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[106] A. Aneja, J. J. Donohue, and A. Zhang, "The Impact of Right-to-Carry Laws and the NRC Report: Lessons for the Empirical Evaluation of Law and Policy," *American Law and Economics Review* 13, no. 2 (September 1, 2011), doi:10.1093/aler/ahr009.

[107] Charles D. Phillips et al., "Concealed Handgun Licensing and Crime in Four States," *Journal of Criminology* 2015 (2015), doi:10.1155/2015/803742.

association between campus carry and crime are less robust than those discussed above. For example, a 2012 analysis conducted by the Cato Institute pointed to a correlation between the implementation of campus carry and decreased rates of crime at one Colorado public college.[108] On the other hand, a 2015 analysis conducted by The Campaign to Keep Guns Off Campus purported to show an increase in rates of sexual assaults on campuses in Utah and Colorado - states that have implemented campus carry in public colleges and universities.[109] Neither of these analyses, however, compared changes in crime rates relative to campuses without concealed carry policies or attempted to control for confounding influence through regression analysis. As such, the few efforts that have specifically focused on the impact of campus carry laws have apparently not progressed beyond partisan narratives merely pointing to correlations, and the dominant econometric literature has focused at a level beyond the campus.

I attempt to address the paucity of study on the association between campus carry and campus crime by examining historical crime data at the campus level across all states - with and without campus carry. I use ordinary least squares (OLS) and negative binomial regression techniques, with and without time lag specifications, to control for the influence of confounding factors. My report therefore asks the question: "Controlling for certain factors that may influence crime, how have crime rates on campus changed when states have implemented campus carry policies relative to those campuses that have not?" The competing intellectual perspectives discussed above have different theoretical expectations for such an analysis. The conservative perspective suggests that campus carry should decrease rates of crime through a deterrent effect. On the other hand, the progressive perspective suggests that the policy either has no true bearing on crime because other fundamental concepts (such as total supply and ease of access to firearms) are more determinative, or that it may actually increase crime by providing an enabling effect for criminals.

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[108] David Burnett and Cramer Clayton, *Tough Targets.*

[109] "The Campaign to Keep Guns Off Campus' New Study Shows That on-Campus Crime Rates Have Increased in Two States Where Concealed Carry on Campus Is Allowed," Campaign to Keep Guns Off Campus.

Chapter 4: Data

DATA SOURCE

A robust focus on the campus crime is made possible by the *Clery Act*, which dramatically improved the way campuses report crime to the federal government in the 1990s. According to the *Clery Act*, all higher education institutions receiving federal financial aid must disclose reported crime counts, measured on the calendar year, to the Department of Education (ED).[110] Thus, I obtain information on campus crime committed in all fifty states from 2001 to 2014 through records provided by the ED. Reported crimes include aggravated assault, forcible sexual assault[111], robbery, burglary, and motor vehicle theft.[112] The ED records denote reported crime committed on each campus in each state by crime type, providing the unit analysis of campus/state/year. The ED data also offer total campus enrollment in each year, allowing rate calculations for each crime variable in each campus in each year. All data are publicly available through the "Campus Safety and Security Data Analysis Cutting Tool" provided by the ED[113]

Crime records are available from this tool on different types of institutions. They are classified as: "Public, 4-year or above"; "Private nonprofit, 4-year or above"; "Private for-profit, 4-year or above"; "Public, 2-year"; "Private nonprofit, 2-year"; "Private for-profit, 2-year"; "Public, less-than-2-year"; "Private nonprofit, less-than-2-year"; and "Private for-profit, less-than-2-year". To control for the possibility of variations between

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[110] Diane Ward and Janice Mann, *The Handbook for Campus Safety and Security Reporting*, U.S. Department of Education, Office of Postsecondary Education, 2011, http://www2.ed.gov/admins/lead/safety/handbook.pdf.

[111] Starting 2014, the ED data set records forcible sexual assaults into the more precise categories of "rape" and "fondling". In order to make the 2014 year comparable to previous years, I re-combine these two sub-categories back into the single forcible sexual assault variable used in preceding years.

[112] The ED data set also contains information on non-negligent murder, negligent manslaughter, non-forcible sexual offenses, and arson. I exclude non-negligent murder and negligent manslaughter from the analysis on the basis that all model estimations using these dependent variables fail F-tests. I also exclude arson and non-forcible sexual offenses (which ED defines as incest and statutory rape) on the basis that I lack a coherent theory to connect the frequency of these incidents to the availability of handguns.

[113] "The Campus Safety and Security Data Analysis Cutting Tool," U.S. Department of Education, accessed October 15, 2015, http://ope.ed.gov/security/.

these institution types that may influence crime, I restrict my analysis to include only campuses that are classified as "Public, 4-year or above" and "Private nonprofit, 4-year or above."[114] The difference between these two types of higher education institutions provides an important source of exogenous variation in my empirical strategy. Specifically, private institutions are allowed to opt-out of campus carry in the affected states, while public institutions are not. Of these two institution types, I restrict campuses to those within US states in order to exclude international campuses, which are not subject to the campus carry laws under consideration. Finally, I restrict recorded crimes to those committed directly in settings listed as "on-campus property."[115]

The initial data set contains 45,702 observations. I drop 6,602 observations that I determine to be graduate, professional, or vocational schools on the basis that these institutions may be systematically different from traditional four-year undergraduate programs in ways that influence crime rates (See Technical Appendix "Note 1" for more discussion).

I make another technical adjustment to ensure each observation refers to a regional campus (in some cases aggregating localized areas into a single observation), thereby reducing the number of observations by 12,271 (see Technical Appendix "Note 2" for more detail on this procedure). Each observation therefore represents a campus of a higher education institution. For example, in each year, the Austin campus at the University of Texas is recorded separately from the Dallas campus, the Fairbanks campus at the University of Alaska is recorded separately from the Anchorage campus, and so

[114] Astute analysts may note that many of the campuses subject to concealed carry legislation are two-year community colleges. I anticipate that two-year and four-year colleges may have different relationships with crime rates at a systematic level that I may be unable to properly control for. As such, I decline to include these as observations in my analysis in order to study as uniform a sample as possible, and leave an investigation on two-year campuses for future research.

[115] The ED provides the following definition of "on-campus property":
"Under Clery [Act], the on-campus category encompasses the following: Any building or property owned or controlled by an institution within the same reasonably contiguous geographic area and used by the institution in direct support of, or in a manner related to, the institution's educational purposes, including residence halls; and, Any building or property that is within or reasonably contiguous to paragraph (1) of this definition, that is owned by the institution but controlled by another person, is frequently used by students, and supports institutional purposes (such as a food or other retail vendor)."

forth. Institutions with only a single campus are recorded as a single observation in every year.

I further restrict the sample on the basis of size in order to operationalize my theory of what a "campus" means. Specifically, at this point in the data management process, there are 3,388 observations with less than 500 students. Many of these observations represent unconventional programs, such as a laboratory centers, art programs, and small theological programs, which may not have physical areas that conform to the traditional university or college campus.[116] Moreover, these institutions often have vastly inflated crime rates due to small denominators in the rate calculations.[117] As such, although it is ultimately an arbitrary cut off point, I drop observations with fewer than 500 students in order to preserve the integrity of the "campus" definition and prevent outliers from entering the statistical models. Finally, I drop an additional 106 observations that do not include student enrollment information, resulting in a final data set with n = 23,335.

DESCRIPTIVE STATISTICS AND GENERAL DATA TRENDS

The resulting data is summarized with crime statistics in the following manner: undifferentiated crime statistics (e.g. aggregate level) in Table 2; by private schools in Table 3; by public schools in Table 4; private schools by year in Table 5; public schools by year in Table 6; campus carry states in Table 7; non-campus carry states in Table 8; campus carry states by year in Table 9; and non-campus carry states by year in 2010.

In every way the data are broken out, a high number of observations for each variable are zero. For example, the percentage of observations that are zero for robbery in

[116] For example, these small observations in the data set may not be congruent with the traditional notion of what a "campus" means. They may be a single floor level within a building, rather than a traditional college campus.

[117] Including these observations often creates enormous outliers. For example, in 2001 "The Colorado Center for Medical Laboratory Science" had a student enrollment of 18 and a total robbery count of 123, creating a robbery rate of 73,333 per 10,000 enrolled students.

Table 2: Aggregate Descriptive Statistics – Not by Any Group[118]

	Obs	Mean	St. Dev	Min	Median	Max	Percentage zero
Aggravated Assault	23,335	2.644	8.1271	0	0	350.877	62.50%
Sexual Assault	23,335	3.873	9.8822	0	0	580.183	52.50%
Robbery	23,335	1.199	7.1961	0	0	526.316	75.80%
Burglary	23,335	29.01	47.914	0	12.958	962.963	20.76%
Motor Theft	23,335	2.728	6.7699	0	0	232.198	60.78%

(Units are crimes per 10,000 students)

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[118] Note that aggravated assault does not include negligent or non-negligent murder. These two categories of crime are not included in the descriptive statistics because I do not analyze them in my statistical models.

Table 3: Aggregate Descriptive Statistics – Private Schools

Private	Obs	Mean	St. Dev	Min	Median	Max	Percentage zero
Aggravated Assault	14,183	2.996	9.293	0.000	0.000	350.877	70.92%
Sexual Assault	14,183	4.877	12.202	0.000	0.000	580.183	59.69%
Robbery	14,183	1.395	8.921	0.000	0.000	526.316	83.45%
Burglary	14,183	36.422	56.031	0.000	17.123	962.963	23.37%
Motor Theft	14,183	2.969	7.867	0.000	0.000	232.198	69.37%

(Units are crimes per 10,000 students)

Table 4: Aggregate Descriptive Statistics – Public Schools

Public	Obs	Mean	St. Dev	Min	Median	Max	Percentage zero
Aggravated Assault	9,152	2.097	5.837	0.000	0.302	122.914	49.45%
Sexual Assault	9,152	2.315	3.777	0.000	0.985	63.910	41.36%
Robbery	9,152	0.893	2.923	0.000	0.000	152.770	63.93%
Burglary	9,152	17.514	27.759	0.000	9.385	547.785	16.71%
Motor Theft	9,152	2.354	4.552	0.000	0.624	131.894	47.43%

(Units are crimes per 10,000 students)

Table 5: Descriptive Statistics by Year – Private Schools

Year	Obs	Aggravated Assault			Sexual Assault			Robbery			Burglary			Motor Theft		
		Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero
2001	994	3.973	11.498	67.40%	3.135	7.220	68.71%	1.904	15.961	83.09%	41.850	68.766	23.04%	4.437	11.367	62.97%
2002	1,000	3.428	8.020	68.60%	3.318	7.234	65.00%	1.767	8.385	81.50%	40.647	59.472	23.50%	3.495	7.619	66.30%
2003	1,002	2.850	8.023	71.96%	3.825	8.440	63.57%	1.936	10.932	83.23%	41.172	56.561	22.65%	3.893	8.626	64.27%
2004	1,013	3.552	14.531	69.69%	3.815	9.567	62.29%	2.297	19.136	81.93%	42.439	62.017	22.90%	3.934	10.530	65.65%
2005	1,001	3.092	8.155	69.03%	3.856	7.915	62.84%	1.452	8.165	82.62%	42.837	59.646	20.98%	3.872	10.027	67.13%
2006	1,015	3.470	8.580	67.78%	3.984	8.910	61.97%	1.172	4.199	82.66%	46.377	66.580	20.10%	3.148	7.557	67.48%
2007	1,009	2.888	7.572	70.37%	3.822	9.184	61.94%	1.211	5.186	84.14%	43.091	58.133	19.23%	3.309	7.828	66.01%
2008	1,014	3.006	9.355	71.70%	3.882	9.720	64.10%	1.177	4.663	81.95%	42.971	62.244	20.11%	2.484	6.687	69.82%
2009	1,019	2.607	8.099	72.52%	3.933	8.899	61.43%	1.147	6.747	85.48%	34.310	51.233	22.77%	2.299	5.952	72.33%
2010	1,021	2.734	8.610	72.28%	4.270	9.340	59.65%	1.117	6.352	84.92%	31.256	48.408	24.19%	1.917	5.180	74.92%
2011	1,032	2.303	6.751	72.67%	4.843	10.434	58.62%	1.170	5.517	85.08%	30.065	53.158	25.29%	2.207	5.922	72.58%
2012	1,026	2.687	8.439	72.61%	5.971	12.085	53.80%	1.133	4.380	83.53%	28.109	44.737	27.09%	2.255	6.629	74.65%
2013	1,023	2.710	9.042	72.04%	8.702	24.975	49.36%	1.177	5.335	82.80%	25.063	40.273	25.90%	2.255	6.732	73.22%
2014	1,014	2.701	10.656	73.77%	10.814	19.512	42.90%	0.905	3.397	85.31%	20.459	35.323	29.29%	2.197	6.205	73.37%
Total	14,183															

(Units are crimes per 10,000 students. The median for aggravated assault, robbery, and motor theft is zero throughout each year for private schools, reflecting the large number of zeros in the data set. Percentage of observations that are zero are therefore reported instead of median values.)

Table 6: Descriptive Statistics by Year – Public Schools

Year	Obs	Aggravated Assault			Sexual Assault			Robbery			Burglary			Motor Theft		
		Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero
2001	650	2.581	6.578	47.08%	1.940	3.614	48.00%	0.865	2.567	67.85%	19.39	30.692	19.23%	3.500	5.942	41.54%
2002	652	2.316	5.684	49.08%	1.826	3.169	49.23%	1.156	6.674	66.26%	20.4	28.229	17.94%	3.306	5.653	43.55%
2003	653	2.395	7.241	48.70%	2.025	3.612	45.63%	0.878	2.591	64.47%	19.23	26.578	15.93%	3.232	5.826	43.34%
2004	655	2.153	4.860	49.01%	2.153	3.649	45.34%	0.885	2.957	66.41%	19.7	28.635	16.95%	3.248	7.121	43.05%
2005	652	2.258	4.993	47.39%	2.089	3.354	44.33%	0.923	2.495	65.95%	19.96	28.103	15.18%	2.945	4.944	42.33%
2006	655	2.314	5.723	48.85%	2.002	3.462	42.29%	0.864	2.056	62.75%	20.72	26.539	14.66%	2.733	4.553	43.21%
2007	649	2.220	5.228	50.53%	1.989	3.256	42.84%	0.978	2.675	62.56%	22.27	37.469	13.09%	2.440	4.213	45.30%
2008	654	2.213	6.488	47.86%	2.006	3.220	46.02%	1.081	2.792	62.08%	20.71	28.606	15.14%	2.179	4.089	48.77%
2009	658	2.073	6.421	50.91%	1.781	3.040	43.77%	0.812	2.154	64.43%	17.14	26.941	14.43%	1.940	3.387	48.93%
2010	658	1.744	4.734	48.94%	2.204	3.455	39.67%	0.838	2.087	62.31%	15.82	26.179	17.17%	1.634	3.091	50.61%
2011	656	1.885	5.432	49.70%	2.593	4.166	36.13%	0.837	2.135	60.97%	14.21	25.815	17.38%	1.602	2.973	52.89%
2012	656	1.935	6.137	49.54%	2.615	3.793	34.60%	0.816	2.235	61.43%	13.41	24.369	19.20%	1.431	2.704	53.96%
2013	653	1.734	6.362	51.30%	2.935	3.886	33.54%	0.856	2.237	62.94%	11.04	18.838	18.84%	1.390	2.518	53.29%
2014	651	1.553	5.156	53.46%	4.261	5.678	27.65%	0.735	2.048	64.67%	11.28	24.935	18.87%	1.398	2.706	53.15%
Total	9,152															

(Units are crimes per 10,000 students. Unlike private schools, only the median for robbery is zero throughout each year in public schools. These observations are still largely comprised of zeros, so again percentage of observations that are zero are reported instead of median values.)

private schools are between eighty-three and eighty-five percent throughout the time series (Table 5). This number fluctuates from sixty-four to sixty-seven percent in public schools (Table 6). Reflecting this, median values are mostly zero throughout the descriptive statistics. Therefore, I often report the percentage of observations that are zero instead of median values. Furthermore, standard deviation is universally larger than variable mean for each type of crime in each year, suggesting a high level of variation in crimes even within the same year and the same type of school. The combination of high percentage zeros and highly dispersed data may justify a negative binomial regression as a robustness check to my main OLS approach; I turn to this check in a subsequent section.

Before beginning the regression analysis, it may be worth examining differences across the types of units observed (e.g. public vs. private, and campus carry state vs. non-campus carry state). Turning first to the distinction across school types, an interesting distinction between private and public schools emerges in the descriptive statistics. On a percentage basis, private schools report zero incidents of crime more often in the data set than public schools, on both aggregate levels and throughout the time series. Indeed, for every type of crime, a higher share of private schools report no incidents when compared to public schools. For example, using the aggregate-level statistics by school type in Table 3 and Table 4, of the 14,183 observations pertaining to private schools, 70.92% of this number reported no incidents of aggravated assault. Of the 9,152 observations pertaining to public schools, only 49.45% reported no such incidents. This suggests that, for any number of reasons, a given private school is more likely to be a crime-free zone than a given public school.

However, closer analysis shows that the mean values of crime for private schools appear to be universally higher than mean crime values for public schools, both when compared by aggregate and throughout the time series. This is likely a product of the disparity between maximum observed values across school types. Maximum values for each crime variable are considerably higher for private schools when compared to maximum values for public school, thus pulling the private school mean upward. For

example, the highest rate of sexual assault for public schools throughout the time series was sixty-three per 10,000 enrolled students, while the highest rate of this type of crime for private schools was an astonishing 580 per 10,000. This is perhaps a reflection of a number of different factors. For example, differences in maximum values across school types may be the result of stronger reporting in private schools; perhaps the incidence of sexual assault is not truly higher on these campuses, but rather reported more often. Another potential explanation may be that private schools occasionally represent concentrated bodies of students from disadvantaged backgrounds, locate in areas that represent economic disadvantage, or lack significant funding to invest in campus safety. Supporting this theory is the fact that the maximum values for aggravated assault (St. Paul's College, 2004), robbery (St. Paul's College, 2004), and burglary (Talladega College, 2001) all come from private, historically African American colleges. Public schools, on the other hand, are typically larger bodies of heterogeneous student populations that receive considerable investment from the state. Finally, it may be that transforming discrete incidents of crime to rates of crime is simply an imperfect method of standardizing variable values across school types. Indeed, it may be the case that a certain number of crimes are likely to happen on any college campus. If this is true, then public schools, which typically have large student populations (and thus large denominators in rate calculations), would see the benefit of a diluted crime rate simply by virtue of their size. In any case, there do appear to be potential differences across school types, pointing to the importance of controlling for these differences in regression analysis.

Using Table 5 and Table 6, public and private schools seem to display the same general trends across the time series, with some small exceptions.[119] The means for aggravated assault and motor theft are noticeably decreasing over the 2001 to 2014 period for both school types (with percentage of campuses reporting zero of these incidents increasing), while the mean for sexual assault is noticeably increasing (with

[119] The reader should note that I do not support these claims by conducting statistical tests (e.g. on whether there is actually a difference between mean values across 2001 to 2014), instead relying only a visual assessment of the trends in Table 4 and Table 5.

percentage of campuses reporting zero decreasing). Although the mean for robbery is down for both groups, the percentage of campuses reporting zero robberies is marginally up for private schools (83.09% to 85.31%), and marginally down for public schools (67.85% to 64.67%). This suggests that while the number of robberies may be down over both groups, the experience of robbery may be increasingly common at public schools, and less so at private schools. Again, however, these changes across the time series are marginal for both groups, and these differences may be random and not truly different from zero. Finally, the mean for burglary is also down for both groups, but the percentage of campuses reporting zero burglaries is up for private schools (23.04% to 29.29%), and almost unchanged for public schools (19.23% to 18.87%). The caveat should again be noted that standard deviation is high compared to the mean throughout the data set, and these descriptive statistics are the aggregation of considerable variation.

It may also be worthwhile to examine the differences across campus carry versus non-campus carry states. Campus carry states include those that ever passed a version of the policy in the 2001 to 2014 period (e.g. Utah, Colorado, Oregon, Wisconsin, Mississippi, Idaho, and Kansas); non-campus carry states include the remaining forty-three states that did not pass the policy during this time period (including Texas, which passed the law in 2015).[120] Unfortunately, because campus carry becomes active in those seven states at different times, there is not a point in the descriptive statistics that suggests a clear pre / post transition. The intervention in question occurs at different times within the campus carry state group. Therefore, gauging the impact of campus carry is not as simple as observing how crime rates change across campus carry states as a group compared to non-campus carry states as a group. Exploring differences across these groups may still be illuminating.

[120] Note that, as previously discussed, Kansas, Oregon, and Wisconsin do not implement campus carry in the same permissive way that Colorado, Utah, Mississippi, and Idaho do. I include all of these states within the "campus carry" group in an attempt to illustrate whether there are substantial differences between states that pass the policy and those that have not. In the statistical models ahead, however, I only assign treatment effects to states that have technically implemented campus carry in a *de facto* manner for which time series data is also available (e.g. Colorado, Utah, and Mississippi).

Table 7: Aggregate Descriptive Statistics – Campus Carry States

Campus Carry States	Obs	Mean	St. Dev	Min	Median	Max	Percentage zero
Aggravated Assault	1,856	1.627	5.325	0.000	0.000	93.070	66.33%
Sexual Assault	1,856	3.892	10.118	0.000	0.470	215.200	49.03%
Robbery	1,856	0.987	6.141	0.000	0.000	156.006	81.63%
Burglary	1,856	25.224	43.811	0.000	10.544	509.250	19.88%
Motor Theft	1,856	3.251	9.382	0.000	0.000	232.198	55.60%

(Units are crimes per 10,000 students. Observations include institutions that are located within states that were campus carry states at any time in the 2001 to 2014 period. This excludes observations from Texas, which pass SB 11 in 2015.)

Table 8. Aggregate Descriptive Statistics – Non-Campus Carry States

Non-Campus Carry States	Obs	Mean	St. Dev	Min	Median	Max	Percentage zero
Aggravated Assault	21,479	2.732	8.319	0.000	0.000	350.877	62.18%
Sexual Assault	21,479	3.870	9.861	0.000	0.000	580.182	52.81%
Robbery	21,479	1.216	7.279	0.000	0.000	526.315	75.31%
Burglary	21,479	29.330	48.237	0.000	13.115	962.963	20.85%
Motor Theft	21,479	2.682	6.493	0.000	0.000	165.165	61.22%

(Units are crimes per 10,000 students. Observations include institutions that are located within states that were campus carry states at any time from the 2001 to 2014 time period. This excludes observations from Texas as well.)

Table 9: Descriptive Statistics by Year – Campus Carry States

Year	Obs	Aggravated Assault			Sexual Assault			Robbery			Burglary			Motor Theft		
		Mean	Std. Dev	Percentage Zero	Mean	Std. Dev	Percentage Zero	Mean	Std. Dev	Percentage Zero	Mean	Std. Dev	Percentage Zero	Mean	Std. Dev	Percentage Zero
2001	125	3.667	10.522	56.00%	2.347	4.553	56.80%	0.917	3.274	82.40%	33.728	61.970	14.40%	5.627	21.955	47.20%
2002	125	2.860	7.610	60.80%	2.760	5.270	52.80%	0.610	2.093	78.40%	33.001	59.516	18.40%	3.030	5.773	55.20%
2003	127	1.527	4.598	67.71%	2.783	5.193	51.18%	1.862	14.215	80.31%	35.342	59.192	11.81%	3.923	9.851	46.45%
2004	131	2.184	7.163	64.88%	3.463	9.078	50.38%	1.954	10.213	79.38%	29.312	40.497	16.79%	4.098	7.042	48.09%
2005	130	1.825	6.348	61.53%	3.040	5.769	51.53%	0.516	2.332	83.84%	26.675	31.960	13.85%	3.758	7.482	50.76%
2006	131	1.543	3.398	63.36%	3.487	7.095	45.03%	0.764	4.506	83.21%	25.824	35.423	19.0.3%	2.682	7.259	58.01%
2007	132	1.321	3.471	67.42%	3.049	6.133	50.00%	0.648	4.390	83.33%	32.000	57.282	12.12%	4.547	12.279	52.27%
2008	135	1.032	2.942	71.64%	3.021	6.684	56.71%	0.501	1.840	82.83%	29.426	44.518	19.40%	3.323	7.912	55.22%
2009	137	0.916	2.472	70.07%	2.717	6.176	51.82%	1.237	6.637	83.21%	20.332	36.072	17.51%	2.569	5.339	52.55%
2010	139	1.284	4.630	64.74%	3.719	8.426	47.48%	1.017	4.125	78.41%	19.676	31.557	23.74%	1.749	5.431	68.34%
2011	139	1.158	4.615	71.22%	4.136	11.405	49.64%	1.763	8.848	79.13%	20.602	39.287	24.46%	2.765	6.066	58.99%
2012	136	0.952	3.078	74.26%	4.998	11.495	48.52%	0.634	3.215	84.55%	17.913	28.401	27.20%	2.290	8.814	67.64%
2013	135	1.104	3.195	70.37%	6.108	15.150	41.48%	0.642	2.691	82.96%	18.305	35.361	24.44%	2.796	7.600	57.77%
2014	134	1.716	4.367	62.40%	8.571	21.604	33.08%	0.742	2.436	80.45%	13.806	29.489	32.33%	2.733	6.453	57.14%
Total	1,856															

(Units are crimes per 10,000 students. Percentage of observations that are zero are reported instead of median values.)

Table 10: Descriptive Statistics by Year – Non-Campus Carry States

Year	Obs	Aggravated Assault			Sexual Assault			Robbery			Burglary			Motor Theft		
		Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero	Mean	Std. Dev	Percentage zero
2001	1,519	3.402	9.820	59.64%	2.681	6.193	60.82%	1.540	12.994	76.62%	32.906	57.558	22.11%	3.938	7.762	55.10%
2002	1,526	2.999	7.176	60.90%	2.725	6.071	59.26%	1.600	8.043	75.24%	32.627	49.735	21.54%	3.453	6.995	57.49%
2003	1,529	2.763	7.920	62.39%	3.148	7.131	56.96%	1.489	8.048	75.47%	32.256	47.253	20.73%	3.570	7.437	56.83%
2004	1,537	3.070	12.049	61.31%	3.135	7.725	56.11%	1.723	15.379	75.55%	33.843	53.625	20.93%	3.635	9.518	57.47%
2005	1,524	2.841	7.142	60.43%	3.167	6.629	55.90%	1.304	6.782	75.39%	34.406	52.137	19.09%	3.491	8.485	57.87%
2006	1,539	3.141	7.850	60.10%	3.182	7.362	55.03%	1.075	3.423	74.13%	37.206	57.239	17.86%	3.011	6.484	57.95%
2007	1,526	2.739	6.959	62.18%	3.109	7.609	54.84%	1.161	4.376	75.03%	35.196	51.573	17.23%	2.832	5.921	58.38%
2008	1,533	2.842	8.657	61.51%	3.159	8.012	57.01%	1.188	4.159	73.45%	34.678	53.522	18.06%	2.282	5.585	62.42%
2009	1,540	2.529	7.765	63.50%	3.122	7.359	54.74%	0.996	5.313	76.68%	28.215	44.751	19.67%	2.121	5.082	64.09%
2010	1,538	2.443	7.546	62.96%	3.439	7.596	52.17%	1.003	5.207	75.82%	25.723	42.615	21.18%	1.812	4.388	65.10%
2011	1,548	2.228	6.394	63.20%	3.953	8.341	49.90%	0.976	3.898	75.40%	24.199	45.722	22.01%	1.901	4.883	65.46%
2012	1,547	2.520	7.895	62.67%	4.632	9.713	46.11%	1.043	3.735	74.06%	22.769	39.537	23.73%	1.903	5.062	66.49%
2013	1,541	2.435	8.400	63.42%	6.481	20.217	43.38%	1.087	4.514	74.38%	19.732	34.183	23.02%	1.840	5.276	66.14%
2014	1,532	2.298	9.224	66.12%	8.224	15.377	37.27%	0.848	2.984	76.95%	17.135	32.179	24.54%	1.811	5.009	66.18%
Total	21,479															

(Units are crimes per 10,000 students. Percentage of observations that are zero are reported instead of median values.

In the aggregate statistics provided by Table 7 and Table 8, campus carry states seem to have a slightly lower rate of aggravated assault (1.627 per 10,000 enrolled students) compared to non-campus carry states (2.743 per 10,000) with a comparable difference in percentage zero (66.33% compared to 62.18%, respectively). Campus carry states seem to have lower aggregate rates of robbery (0.987 per 10,000) compared to non-campus carry states as well (1.216 per 10,000), again with similar differences across percentage zero (81.63% compared to 75.31%, respectively). Both mean and percentage zero for sexual assault are nearly the same across both groups the aggregate level. Finally, the mean for burglary is very similar across groups (25.224 per 10,000 for campus carry states, compared to 29.330 per 10,000 for non-campus carry states), with almost identical percentage zero (19.88% compared to 20.85%, respectively). Again, I do not conduct statistical tests of significance on these differences. But, importantly, any significant differences across these groups that do exist may be a difference not due to campus carry, but rather to inherent differences across these states in other factors that influence crime. I reiterate this point in discussing my empirical methodology in the next section.

Using Table 9 and Table 10, campus carry and non-campus carry states generally experience the same time trends. Aggravated assault and motor theft are down across campuses in all states in the 2001 to 2014 period (with corresponding increases in percentage zero), reflecting a nationwide decrease in these types of crime, while sexual assault is increasing across all states (with a corresponding decrease in percentage zero). The mean for burglary is down for both types of states, though campus carry states experienced a considerable increase in the number of campuses reporting zero burglaries (14.40% to 32.33%), while non-campus carry states only experienced a very marginal increase in this measure (22.11% to 24.54%). Finally, the mean for robbery is also down for both types of states, but the percentage reporting no incidents in non-campus carry states is almost unchanged (76.62% to 76.95%), while this number is slightly down in campus carry states (82.40 to 80.45%). These trends suggest that any changes in crime

due to campus carry must be parsed out of natural changes across the nation simply due to the progression of time.

NOTEWORTHY LIMITATIONS

A number of important limitations are worth noting in the ED data. Perhaps most importantly, the number of observations with treatment effects is quite small. There a total of 144 treatment observations (e.g. public campuses in campus carry states in post-implementation time periods). This number amounts to 0.617% of the total data set.

Also, in accordance with the *Clery Act*, the data collected by the ED reflect reported crime, not actual convictions for criminal offenses. Reports in the ED data may therefore not always result in a one-for-one ratio of conviction, as some offenses may ultimately be cleared in court. In such a scenario, the data set would over-report crime statistics. In perhaps a more likely alternative case, it is conceivable that students may fail to report incidents of crime, or police may fail to properly document them. This kind of under-reporting is almost certainly at play; the Bureau of Justice Statistics noted in 2014 that only twenty percent of total sexual assaults against students were reported to police from 2000 to 2013.[121] It is therefore at least somewhat uncertain whether the ED data accurately represents the reality of campus crime, whether due to over or under-reporting.

Another noteworthy issue is the fact that the data set aggregates crimes on the calendar year, but campus carry policies mostly become effective starting in August to reflect the beginning of the new school year. I attempt a minor technical adjustment in the statistical models to account for this difference across recording periods (see Technical Appendix "Note 3" for details).

Also, given the 2001 to 2014 time frame, it is impossible to estimate treatment effects for Texas, which passed SB 11 in 2015. Similarly, Idaho's implementation of SB 1254 in 2014 provides only a half year of treatment data. As such, there is not enough data in the time series to observe treatment effects in these states. Although the above

[121] Lynn Langton and Sofi Sinozich, *Rape and Sexual Assault Victimization Among College-Age Females*.

factors represent a degree of methodological weakness, I believe the extensive nature of the data source justifies proceeding with the analysis.

Chapter 5: Empirical Methodology

DEVELOPING THE ECONOMETRIC LOGIC

The empirical portion of my report is based on a quasi-experimental analysis of campus carry policies. The passage of these policies 1) in public but not private institutions, 2) in some states but not others, and 3) across a time series provides a sort of natural experiment to examine the impact of the law. Here, I develop the logic of the modeling process that incorporates these three sources of variation.

The simplest econometric approach that might be used to evaluate the impact of campus carry on crime would be a regression model incorporating a single dummy variable and a vector of other relevant control variables:

$$1) \quad Y = \alpha_0 + \delta_1 D + \Sigma\theta_k X + \varepsilon$$

In Equation 1, the dummy variable, *D*, becomes active for observations that refer to campus carry institutions, and turns off for all other observations. In this model (and in the actual estimations I perform below), the vector X includes a control for student enrollment in addition to state and time fixed effects.[122] In such a model, the conservative perspective suggests that the coefficient of interest, δ_1, should be significant and negative; that is, institutions with campus carry should see decreased crime due to deterrence of criminal activity. Progressives who believe the policy enables criminal activity suggest that this coefficient should be significant and positive.

However, this modeling approach does not account for the fact that there may be systematic differences between the institutions implementing campus carry and those that do not. In particular, this model does not account for the fact that all campus carry

[122] Ideally, other control variables that may also predict crime rates should be included in this vector, such as local economic conditions, gun ownership rates, rates of concealed carry, and factors that measure the urban-ness of the institution's surroundings, such as population density. Unfortunately, the data set I use does not have information on these potential covariates. Hence, my emphasis that the results of this report should be considered preliminary.

institutions are public schools, which may have crime rates that are affected by cultural or behavioral differences in the student population inherent to these types of schools. In such a case, δ_1 is potentially entangled with other factors that predict crime rates through a selection bias. Significance in the δ_1 coefficient could simply be the product of unaccounted differences unique to public schools. For this reason, the simple econometric model may be inappropriate for gauging the impact of campus carry.

As such, the model should factor in differences across institutions to prevent confounding. The difference in differences design becomes an appropriate econometric approach here. In this design, private institutions, which can opt out of campus carry, function as the control group and public institutions function as the treatment group. This approach allows time trends that impact crime rates across both treatment and control (e.g. fluctuations in the state economy, etc.) to be controlled for and differences across campus types (e.g. cultural differences) to be captured as well. Treatment effects can then be observed by the difference in crime rates across treatment and control institutions:

$$2) \quad Y = \alpha_0 + B_1 Type + B_2 Post + \delta_1 (Type \times Post) + \Sigma\theta_k X + \varepsilon$$

In Equation 2, the dummy variable *Type* turns on for public campuses and the dummy variable *Post* turns on for observations in the post-passage period. The single interaction variable *Type x Post* therefore turns on for public campuses in the post-passage period. Thus the coefficient of interest, δ_1, theoretically measures the impact of campus carry legislation, factoring in differences across institution types. Again, the conservative perspective theorizes that δ_1 is significant and negative.

However, Equation 2 makes an important identification assumption: that crime trends are not systematically different in states with campus carry compared to states without the policy. There are many factors that may weaken the validity of this assumption. For example, it may be that in addition to passing campus carry, Utah, Colorado, Mississippi, and the remaining campus carry states also have different economic, cultural, or demographic factors that serve as the true underlying source of

variation in campus crime rates. In such a case, the results of Equation 2 would be misleading, potentially pointing to the influence of factors unique to these observations at the state level other than the legislation itself. Therefore, in order to account for factors that may be unique to campus carry states, the model should also include observations from non-campus carry states as well. Another treatment / control dynamic is leveraged into the model by adding in difference between states with and without the policy through a *Treat* variable. Incorporating this additional dynamic results in the triple difference approach.

THE TRIPLE DIFFERENCE APPROACH

To reiterate, variability inherent to the policy creates a way to observe potential differences in crime rates 1) across public and private institutions, 2) across pre/post passage periods, and 3) across state lines where the policy is and is not present. Passage of campus carry could be considered a type of natural experiment, accounted for in the following triple difference model:

$$3)\quad Y_{ijt} = \alpha_0 + B_1 Treat_j + B_2 Post_t + B_3 Type_i + \gamma_1(Treat_j \times Post_t) +$$

$$\gamma_2(Treat_j \times Type_i) + \gamma_3(Type_i \times Post_t) + \delta_1(Treat_j \times Type_i \times Post_t) + \Sigma\theta_k X_{ijt} + \varepsilon_{ijt}$$

In Equation 3, subscript *i* refers to campus, *j* refers to state, and *t* refers to time period correlating to pre/post legislative passage. The *Type* and *Post* variables are as described above. The added dummy variable *Treat* turns on for observations within states that pass the policy at any point in the 2001 to 2014 time series (e.g. campuses that are eventually subject to the policy). The un-interacted variables in Equation 3 may be interpreted in the following manner:

- B_1 on $Treat_j$ measures systematic differences in crime rates between campus carry and non-campus carry states;[123]
- B_2 on $Post_t$ measures differences inherent to the before and after period not attributable to the policy;
- B_3 on $Type_i$ measures systematic differences in public and private schools.

The two-way interaction terms in Equation 3 are somewhat more complicated in their interpretations:

- γ_1 on $Treat_j$ x $Post_t$ parses out variation in crime unique to campus carry states in the post-passage period. This term accounts for the possibility that there may be unrelated crime shocks specific to these states after the policy is passed;
- γ_2 on $Treat_j$ x $Type_i$ absorbs variation due specifically to public institutions in campus carry states. This term accounts for the fact that, for example, public institutions in Utah and Mississippi may be systematically different compared to institutions in other states in ways the influence crime;
- γ_3 on $Type_i$ x $Post_t$ absorbs variation due specifically to public institutions in post-passage time periods. This term accounts for the possibility that there may be crime shocks specific to public institutions unrelated to campus carry after the policy is passed.

Finally, the variable of interest in Equation 3 is the three-way interaction term, which may be interpreted as follows:

- δ_1 on $Treat_j$ x $Type_i$ x $Post_t$ measures the impact on crime rates experienced by public campuses that are located within campus carry states in the post-passage period. This coefficient measures change in crime compared to the "base" case

[123] The $Treat_j$ variable is actually collinear with other fixed effects in this model. It is included as a heuristic device here, but excluded from the actual model estimations below.

(e.g. institutions that do not have the policy active, either because they are in a control state, they are a private school, or they are in the pre-implementation period).

The triple difference method is therefore more robust to potentially confounding influence of extraneous factors influencing crime rates than the simpler models discussed previously. For this reason, I believe it is a superior modeling approach. Once more, the conservative perspective suggests that the variable of interest, δ_1, is negative.

Importantly, however, the standard triple difference model above assumes a single transition from pre-passage to post-passage period. Unfortunately, this means the standard model does not lend itself to measuring the impact of campus carry without additional modification. As discussed earlier, campus carry policies were passed in a variety of different years among treatment states, meaning there is not a single pre / post transition that can be applied to the full sample of observations.[124] In light of this, I attempt to estimate a triple difference model that is generalized to allow for policy implementation at various time periods. I take the generalized version of a difference in difference model as a starting point:

$$4) \quad Y = \alpha_0 + B_1 Treatment + \Sigma B_{2\ldots15} Year + \delta_1 (Treat\ x\ Post) + \Sigma \theta_k X + \varepsilon$$

Instead of capturing the impact of crime due to a single before / after transition, the above model captures time-specific effects in every year (B_2 to B_{15}). Equation 2 and Equation 4 both accomplish the desired goal of separating the effects of time from the effect of the difference in difference estimator. The advantage of Equation 4 is that it does not require that control observations be assigned to the *Post* period in any particular year, allowing for different policy intervention times.

[124] The significance of this difficulty might be clarified further. Utah passed campus carry in 2006, while Mississippi passed the policy in 2011. The question is then: when should the observations in non-campus carry states be assigned to the post period given that there is no *uniform* implementation year?

From Equation 4, I attempt to extrapolate a generalized triple difference model with the following specification:

$$5)\quad Y_{ijt} = \alpha_0 + B_1 Treat_j + B_2 Post_t + B_3 Type_i + \gamma_1(Treat_j \times Type_i) +$$

$$\Sigma\gamma_{2..15}(Year \times Treat_j) + \Sigma\gamma_{16...29}(Year \times Type_i) + \delta_1(Treat_j \times Type_i \times Post_t) +$$

$$\Sigma\theta_k X_{ijt} + \varepsilon_{ijt}$$

In Equation 5, the single interaction terms that previously included *Post* are now replaced by year-specific interactions. The desired goal here is to separate out the effects due to the interaction between time and treatment state (γ_2 to γ_{15}) from the triple difference estimator, as well as to separate out effects due the interaction between time and campus type ($\gamma_{16\text{ to }}\gamma_{29}$). The result is that the triple difference estimator, δ_1, should measure changes in crime experienced by public schools in campus carry states without confounding influence from other interactions.[125]

Equation 5 assumes that the impact of campus carry is constant over time (e.g. δ_1 is a constant value whenever the dummy variable $Treat_j \times Type_i \times Post_t$ becomes active for an observation). As in Equation 3, the coefficient on the triple difference estimator, δ_1, measures the change in crime on public campuses in campus carry states after the policy is active. According to the deterrence theory, would-be criminals should be deterred by the uncertainty inherent to targeting potentially armed individuals on campus and therefore choose to act in these settings less frequently. As above, this theory suggests that δ_1 should be negative.

Finally, another adjustment might be made to anticipate the presence of serial autocorrelation in the data. Crime rates in one year may have considerable influence on crime rates in a subsequent year, and failing to account for such autocorrelation, in the event it is present, could result in biased coefficients. In order to test for this, I develop a

[125] This strategy is not without disadvantages. Degrees of freedom are lost by the inclusion of more variables. But, given 23,335 observations in the sample, this is ultimately a small compromise and the resulting increase in standard errors should be marginal.

final model that adds both a one year-lagged and two year-lagged dependent variable on the left-hand side of the equation:

$$6)\quad Y_{ijt} = \alpha_0 + Y_{ijt-1} + Y_{ijt-2} + B_1 Treat_j + B_2 Post_t + B_3 Type_i + \gamma_1(Treat_j \times Type_i) + \Sigma\gamma_{2..15}(Year \times Treat_j) + \Sigma\gamma_{16...29}(Year \times Type_i) + \delta_1(Treat_j \times Type_i \times Post_t) + \Sigma\theta_k X_{ijt} + \varepsilon_{ijt}$$

In Equation 6, any variation attributed to autocorrelation is parsed out from the triple difference estimator in the time lagged dependent variables, preserving the model from this potential bias.

CRITICAL ASSUMPTIONS

The lack of clarity in some state's campus carry approaches means that critical assumptions must be made in the statistical modeling process. For example, it is somewhat unclear how treatment effects should be modeled in Kansas, Oregon, and Wisconsin. For example, even as the law technically became effective for Kansas in 2014, each potentially affected campus in the state appears to have used the optional four year waiver to opt out of treatment. The same appears to be true of Wisconsin, as public colleges and universities have apparently universally used the provision that allows them to ban handguns from most areas of campus since the law's passage in 2011. Oregon seems to have followed the Wisconsin approach as well, effectively banning handguns from most campus areas.

Therefore, although there are eight *de jure* campus carry states, it appears that there are only five *de facto* campus carry states. Treatment effects cannot be observed in Texas and Idaho, however, because the data source I use does not extend past 2014. This leaves only three *de facto* campus carry states for which treatment effects can be modeled. Mississippi and Utah experience clear, all-at-once transitions from pre to post period that are captured in the data set. Colorado campuses apparently experienced

treatment effects at different times, with the CSU System allowing campus carry since 2003, the CU System since 2012, and the remaining campuses since 2010.[126] I attempt to incorporate these realities into the statistical modeling process in an appropriate manner, making my best judgments about how to assign treatment effects across these states based on the implementation approaches outlined above.

Another crucial assumption for this empirical strategy to be valid is that private schools do, in fact, universally opt out from campus carry when they are allowed to do so. After a relatively comprehensive investigation, I cannot find record of private institutions opting in to the policy.[127] For example, as of March 10, 2016, the Texas Tribune notes that twenty-six out of thirty-eight private colleges have explicitly opted out of campus carry, with the remaining universities still deliberating.[128] Commentary provided to The Texas Tribune seems to generally suggest these remaining institutions will opt out as well.

[126] These campus specific transitions for Colorado are coded appropriately into all statistical models.
[127] The website www.armedcampuses.org provides the most comprehensive listing of institutions that currently allow campus carry, none of which include private schools. In 2012, researcher John Lott compiled a list of schools allowing campus carry, none of which included private schools, available at Lott's personal blog: http://johnrlott.blogspot.com/2012/12/a-partial-list-of-206-college-campuses.html.
[128] Jimmy Ellison, "Where Texas' Private Universities Stand on Campus Carry," *The Texas Tribune*, April 1, 2016, http://apps.texastribune.org/private-university-campus-carry/.

Chapter 6: Results

PRIMARY OLS RESULTS

Given their potential deficiencies, I do not conduct regressions on Equations 1 through 4, allowing them to simply develop the econometric logic. I focus on Equation 5 (triple difference model) and Equation 6 (time-lagged triple difference model), first conducting regressions with these formulas on the full sample of observations (n = 23,335). These regressions reflect the reality of campus carry to the best of my knowledge. That is, treatment effects are only assigned to campuses in Utah, Colorado, and Mississippi. Although observations in Kansas, Oregon, and Wisconsin are technically in campus carry states, I do not assign treatment effects to these observations in order to reflect the restrictive bans placed on concealed carrying on campus in these states (See Technical Appendix Note 4 for details). To rationalize this assumption, I point to the policies in Kansas, Oregon, and Wisconsin that severely restrict or create *de facto* bans on concealed carry throughout the majority of campus, as discussed above. Assigning treatment effects to observations in these states, in my opinion, would therefore improperly represent the reality of campus carry in these states. Finally, campus carry is not active for long enough in Idaho to allow for estimation of treatment effects (See Technical Appendix Note 2).

All models feature a vector of control variables that includes state and time fixed effects, in addition to size of student enrollment.[129] Both Equation 5 and Equation 6 show no discernible change in any of the five types of crime rates. That is, models with and without time lags produce similar results suggesting no observable impact on crime rates due to campus carry. According to Table 11, a public institution in a campus carry state after the policy is active experiences a non-statistically significant decrease of 0.511 aggravated assaults per 10,000 enrolled students compared to the "base" case. However,

[129] Regressions done in Stata 14.1 IC. Data set and .do file available by request from the author.

Table 11: OLS - Modeling Campus Carry Legislation, No Time-Lag Model[130]

Equation 5: $Y_{ijt} = \ldots\delta_1 (Treat_j \times Type_i \times Post_t)$

	(1) Aggravated Assault	(2) Sexual Assault	(3) Robbery	(4) Burglary	(5) Motor theft
δ_1	-0.511	0.229	0.396	-0.214	1.272
	(0.594)	(1.478)	(0.589)	(5.685)	(0.851)
N	23335	23335	23335	23335	23335
R-sq	0.030	0.078	0.012	0.098	0.075

All units are crimes per 10,000 students enrolled at an institution. Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001. All F-tests for model significance are highly significant (Prob > F 0.0000). All estimations include state and time fixed effects, and use white's heteroskedasticity-corrected standard errors.

Table 12: OLS - Modeling Campus Carry Legislation, Time-Lag Model

Equation 6: $Y_{ijt} = Y_{ijt-1} + Y_{ijt-2}\ldots + \delta_1 (Treat_j \times Type_i \times Post_t)$

	(1) Aggravated Assault	(2) Sexual Assault	(3) Robbery	(4) Burglary	(5) Motor theft
δ_1	-0.572	0.461	0.241	-2.385	-0.441
	(0.585)	(0.924)	(0.476)	(3.941)	(0.769)
Once-Lagged Dependent Var	0.377***	0.436***	0.329***	0.518***	0.365***
	(0.0321)	(0.0594)	(0.0497)	(0.0213)	(0.0269)
Twice-Lagged Dependent Var	0.155***	0.368***	0.0107	0.203***	0.202***
	(0.0371)	(0.0414)	(0.0361)	(0.0169)	(0.0244)
N	19698	19698	19698	19698	19698
R-sq	0.237	0.393	0.168	0.535	0.321

All units are crimes per 10,000 students enrolled at an institution. Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001. All F-tests for model significance are highly significant (Prob > F 0.0000). All estimations include state and time fixed effects, and use white's heteroskedasticity-corrected standard errors.

[130] For brevity, I omit reporting results for the many other variables in these models throughout the following tables, including state and time variables, primarily because these variables are not directly related to the policy question at hand.

Table 12 shows that accounting for the presence of serial autocorrelation in the data may be necessary. Every lagged dependent variable is highly significant ($p<0.001$), with the exception of the double lag for robbery. This suggests that, in most cases, crime rates of previous years have effects that are distributed at least two years into the future. Moreover, R^2 values increase significantly when accounting for autocorrelation (in the case of aggravated assault, from 0.030 to 0.237), suggesting Equation 6 explains considerably more variation in crime rates. Importantly, the triple difference estimator, δ_1, remains non-significant for every type of crime considered. The 95% confidence interval applies to all of these interpretations.

The results should be properly qualified in the context of the large standard errors in most estimations. For example, the standard error associated with aggravated assault in Table 11 (0.594) given the point estimate (-0.511) means that I can only conclude at the 95% confidence interval that crime did not increase by more than 24% or decrease by more than 63% of the aggravated assault mean of the entire data sample (See Table 2: Mean of aggravated assault: 2.644) (See Technical Appendix Note 4 for more detail on this calculation). Thus, my analysis is incapable of concluding with a high degree of certainty that a change in crime *did not* happen within this relatively large margin of error. This is true in varying degrees for all the crime types considered (especially note the large standard errors on the triple difference coefficient for burglary).

ROBUSTNESS CHECK: THROWING OUT UNCERTAIN STATES

Although I believe the above estimations best represent the reality of campus carry through the time series, I attempt a robustness check to evaluate the sensitivity of the models to different assumptions. As discussed earlier, there is considerable uncertainty about the on-the-ground reality of campus carry in Kansas, Oregon, and Wisconsin. I risk the chance of improperly representing observations in these states by including them as non-treatment states in the models. To test whether their inclusion

Table 13: OLS Robustness Check: Modeling Campus Carry Legislation Without KS, OR, WI, No Time-Lag Model

Equation 5: $Y_{ijt} = \ldots\delta_1 (Treat_j \times Type_i \times Post_t)$

	(1) Aggravated Assault	(2) Sexual Assault	(3) Robbery	(4) Burglary	(5) Motor theft
δ_1	1.119	0.565	-0.00628	1.894	2.144
	(0.674)	(1.481)	(0.646)	(6.618)	(1.510)
N	22201	22201	22201	22201	22201
R-sq	0.029	0.079	0.011	0.099	0.073

All units are crimes per 10,000 students enrolled at an institution. Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001. All F-tests for model significance are highly significant (Prob > F 0.0000). All estimations include state and time fixed effects, and use white's heteroskedasticity-corrected standard errors.

Table 14: OLS Robustness Check: Modeling Campus Carry Legislation Without KS, OR, WI, Time-Lag Model

Equation 6: $Y_{ijt} = Y_{ijt-1} + Y_{ijt-2} \ldots + \delta_1 (Treat_j \times Type_i \times Post_t)$

	(1) Aggravated Assault	(2) Sexual Assault	(3) Robbery	(4) Burglary	(5) Motor theft
δ_1	-0.142	0.519	-0.307	-2.854	-0.906
	(0.638)	(0.986)	(0.515)	(4.790)	(0.916)
Once-Lagged Dependent Var	0.378***	0.423***	0.331***	0.523***	0.363***
	(0.0327)	(0.0588)	(0.0508)	(0.0222)	(0.0276)
Twice-Lagged Dependent Var	0.153***	0.362***	0.00721	0.204***	0.206***
	(0.0380)	(0.0416)	(0.0360)	(0.0174)	(0.0256)
N	18748	18748	18748	18748	18748
R-sq	0.235	0.382	0.171	0.540	0.320

All units are crimes per 10,000 students enrolled at an institution. Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001. All F-tests for model significance are highly significant (Prob > F 0.0000). All estimations include state and time fixed effects, and use white's heteroskedasticity-corrected standard errors.

changes results of the models, I throw out all observations in these three states from the sample and then estimate both Equation 5 and Equation 6 again.

The results of both Equation 5 and Equation 6 are generally the same when the uncertain states are thrown out from the sample. The coefficient for some coefficients switches signs between these two approaches (for example, aggravated assault switches signs to positive, between Table 11 and Table 13), suggesting at least some level of model sensitivity. Nevertheless, whether observations in the uncertain campus carry states are included or not in the regression analysis, none of the models achieve significance at the 95% confidence level. This is true even when serial autocorrelation is accounted for by the addition of time lag variables. Again, these lag variables remain highly significant ($p<0.001$), except for the second lag for robbery, which is again non-significant. It is worth noting that standard errors are once again quite high relative to point estimates, reinforcing the inability of my models to make very precise conclusions about the impact campus carry.

ROBUSTNESS CHECK: NON-OLS MODELING APPROACH

Another potential issue with my primary empirical method may be that OLS regression is simply not an appropriate approach to modeling count data. My primary approach relies on transforming the ED data from discrete counts of crime occurrences into rates of crime per 10,000 students enrolled, and then applying OLS regressions on these rate variables. Another possible way to analyze the data set is to simply keep the dependent variables in count form and undertake regression analysis using the Poisson distribution. However, this approach assumes that an analyzed variable has equal values for conditional mean and variance. Crime variables in the ED data consistently have variance greater than the mean (See Tables 2 through 10), and are therefore likely over-dispersed with respect to the Poisson distribution. As such, regression using the negative binomial distribution may be more appropriate. The negative binomial distribution adds an additional parameter compared to Poisson, allowing variance to be adjusted

Table 15. Negative Binomial Robustness Check: Modeling Campus Carry Legislation, No Time-Lag Model

Equation 5: $Y_{ijt} = \ldots\delta_1 (Treat_j \times Type_i \times Post_t)$

	(1) Aggravated Assault	(2) Sexual Assault	(3) Robbery	(4) Burglary	(5) Motor theft
δ_1	-0.443	-0.420	0.597	0.131	-0.187
	(0.435)	(0.227)	(0.409)	(0.199)	(0.316)
N	23335	23335	23335	23335	23335

All units are discrete counts of crime. Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001. All estimations return Prob > Chi^2 = 0.0000. All estimations include state and time fixed effects, and use the vce(robust) option.

Table 16. Negative Binomial Robustness Check: Modeling Campus Carry Legislation, Time-Lag Model

Equation 6: $Y_{ijt} = Y_{ijt-1} + Y_{ijt-2}\ldots + \delta_1 (Treat_j \times Type_i \times Post_t)$

	(1) Aggravated Assault	(2) Sexual Assault	(3) Robbery	(4) Burglary	(5) Motor theft
δ_1	-0.596	-0.287	-0.200	0.0226	-0.342
	(0.392)	(0.208)	(0.358)	(0.156)	(0.258)
Once-Lagged Dependent Var	0.185***	0.150***	0.208***	0.0325***	0.0845***
	(0.00820)	(0.00593)	(0.0114)	(0.000997)	(0.00540)
Twice-Lagged Dependent Var	0.0920***	0.103***	0.143***	0.0127***	0.0438***
	(0.00759)	(0.00570)	(0.0113)	(0.000834)	(0.00460)
N	19698	19698	19698	19698	19698

All units are discrete counts of crime. Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001. All estimations return Prob > Chi^2 = 0.0000. All estimations include state and time fixed effects, and use the vce(robust) option.

independently of the variable mean. As such, I believe it is arguably the best non-OLS approach to modeling the data.

Thus, I apply negative binomial regression to both Equation 5 and Equation 6. Given the results of the first robustness check above, I perform these regressions under the most realistic campus carry assumptions: allowing Kansas, Oregon, and Wisconsin to remain in the sample, but assuming they are not treatment states given their very restrictive approaches to the law.[131]

From Table 15 and Table 16, the same general pattern of significance can be observed in the negative binomial regressions. Under both non-lagged and time-lagged models, non-OLS estimations continue to suggest that there is no observable change in crime rates after campus carry implementation that can be considered significant at the 95% confidence interval. Across the negative binomial models, there is only minor inconsistency in coefficient signs; in particular, the triple difference estimator for robbery switches (to negative) for the time-lagged model, but again without obtaining significance. The triple difference coefficients for aggravated assault and sexual assault appear close to significance, but fail to achieve this threshold of certainty.

GRAPHICAL ANALYSIS OF TIME TRENDS

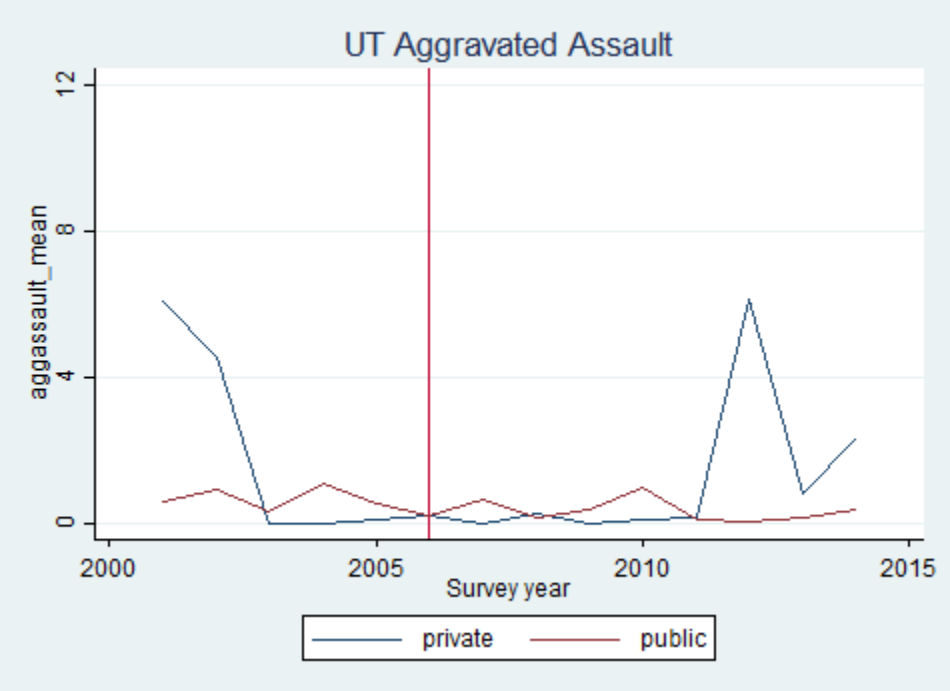
A graphical analysis may also be useful to display any potential correlation between implementation of campus carry and changes in crime rates. As such, I graph time trends for each crime variable in the two states – Utah and Mississippi – that experienced all-at-once *de facto* treatment effects. These graphs allow for a visual, within-state comparison between crime trends in private (control group) and public (treatment group) campuses before and after campus carry implementation.

Figure 1 shows the trends in aggravated assault in public (red) and private (blue) campuses within Utah, with the policy implementation date denoted by a vertical line.

[131] Though the results are unchanged again even when uncertain campus carry states are thrown out of the sample in the negative binomial approach. I do not include these results for brevity.

Points on the graph represent the average rate of a particular crime variable on public or private campuses across the state in a particular year. Immediately following implementation, public schools appear to experience a marginal increase in the average rate of aggravated assaults, while private schools experience a marginal decrease in this average rate. However, I do not use these graphs to conduct statistical analyses, and the aforementioned changes may not be statistically different from zero. Moreover, these trends gradually fluctuate over time, with subsequent increases and decreases in both types of schools. I include these illustrations to show that there are no clear before and after crime trends for schools that implement campus carry. Figures 2 through 10, available in the Appendix, provide similar results. All units for these graphs are crimes per 10,000 students enrolled.

Figure 1: Time series of average rate of aggravated assault by public / private school in Utah



(Units are aggravated assaults per 10,000 students)

Chapter 7: Discussion

Results in The Context of Competing Perspectives

The impact of concealed handgun carry policies on the safety of college and university campuses is an increasingly important topic. Between 2004 and 2015, eight states began implementing some version of the policy, though several states – including Kansas, Oregon, and Wisconsin – have restrictive and uncertain approaches to implementation of the law.

Generally, debates on campus carry may be seen as emerging from the larger context of a debate on gun rights in public spaces. Conservative advocates of the policy generally point to the possibility of a deterrence effect, which suggests that concealed handgun carriers provide a disincentive to offensive action by criminals. Progressive opponents contend that a larger determinant of crime rates is not campus carry, but rather the pre-existing stock of available firearms at large, and so the policy likely has no observable impact on crime. Other opponents of the law suggest that it may provide an enabling effect for criminals. Despite heated debate between these perspectives, the relationship between crime and concealed carry specifically within the campus environment has not been well evaluated in an empirical context before this report.

Variability inherent to campus carry policies across states, institution types, and times allows for a triple difference modeling approach – a kind of quasi-experimental analysis. This model is robust to the potential of confounding influence by controlling for the differences across public / private campus types and across campus carry / non-campus carry states. The inclusion of campuses in all fifty states over a fourteen-year time series controls for larger demographic and economic trends over time and region that may also influence crime rates, and also allows for an assessment of changes in crime after the policy is implemented (e.g. the "impact" of the policy).

My primary empirical approach uses OLS regressions on crime variables that are calculated in rate form (crimes per 10,000 students). Results suggest that the impact of

campus carry is not statistically significant at the 95% confidence level across all five of the considered crime types. These results are robust to a number of different assumptions. Specifically, the primary OLS approach returns consistent results even when states with restrictive and uncertain campus carry implementation – Kansas, Oregon, and Wisconsin -- are thrown out of the sample entirely, indicating that inclusion of these states does not drastically bias the models. I also analyze the dependent variables in their original count form, using negative binomial regressions that may be more appropriate for over-dispersed count data. This non-OLS approach does not show changes in significance across any of the considered crime variables. Moreover, all of these approaches are consistent when accounting for the possibility of serial autocorrelation in the data through the inclusion of lagged dependent variables. These time-lagged approaches generate considerably higher R^2 values, suggesting that controlling for serial autocorrelation may be an appropriate modeling approach – though not one that produces substantial differences in the variable of interest. Unfortunately, high standard errors across model estimations prevent very precise conclusions. The results nevertheless suggest that campus carry policies do not have a *dramatic* impact on crime rates, in either a positive or negative direction.

If the deterrent effect theorized by Lott, Kleck, and Students for Concealed Carry, exists in settings with campus carry, it is unobservable by my models. On the other hand, my analysis also casts doubt on the narrative that campus carry enables criminal activity, particularly sexual assault. However, my analysis is supportive of a more nuanced progressive claim that, in fact, campus carry is not the larger determinant of crime rates. This line of reasoning suggests that changes in crime rates are, in reality, determined by larger underlying trends, such as changes in the stock of available guns, demographic trends, or shocks to the economy, rather than minor changes in legal handgun carrying from concealed carry.

Important limitations inherent to my analysis mean that this project is only a starting point for future research. My analysis is limited in the sense that it attributes changes in crime rates almost explicitly to changes in policy, while excluding potentially

significant covariates in the modeling process. For example, I do not attempt to control for a number of variables that may predict crime on campus, including local population density, economic conditions, gun ownership rates, rates of concealed carry on campus, rates of incarceration, and so forth. The results of this analysis may be different when potential covariates are included in the models and, as such, these results should be considered preliminary. Future researchers may consider using my empirical framework as a starting point to undertake a more robust analysis that includes these covariates.

Also, the models I have described here may fail to capture the reality of campus carry laws in other ways. For example, the true impact of campus carry on crime may be changing over time. The models considered here apply only a constant impact, thereby failing to capture the possibility of such changes in the magnitude of treatment effect. In general, future research by other analysts might defensibly apply other assumptions than the ones I have used in the modeling process. For example, one could conceivably assign treatment effects that are allowed to differ across states, thereby better capturing the uniqueness of each state's approach to the law. Unsurprisingly, any such analyses may find different results than those found here.

Finally, the origin of the data set should be emphasized to underscore its potential weakness in accurately describing the reality of campus crime. The ED data derive from crimes reported to police by campus communities. If stigmas against reporting incidents exist on campus, the data set may under-report crime. On the other hand, the ED statistics do not represent official crime convictions, but rather *reports* of criminal activity, and therefore could conceivably be subject to over-reporting. Analysts must therefore keep the potential for reporting inaccuracies in mind when discussing the results of studies that rely on ED data.

In addition to expanding on alternative versions of the current regression models, future researchers might consider undertaking more micro-level analysis of campus crime activity. This report produces a macro-level, nationwide view of campus violence, and so it may overlook significant changes that occur within a single locality. To uncover changes at a more local level, micro-level study could be done by examining a time series

of a single campus that implements campus carry, and comparing changes on the campus against those observed in the surrounding neighborhood or city.

THE BIGGER PICTURE AND THE NEED FOR MORE RESEARCH

My analysis suggests that, when looking specifically at changes in crime rates committed on campus property, the implementation of concealed handgun carry policies does not provide measurable increases in campus safety through reduction in crime. Other, more robust statistical models produced by future research may suggest contrasting results. Even in such an event, analysts should be skeptical about the merits of campus carry. A focus on crime is but one lens through which campus carry can be evaluated, and policymakers must consider this practice within the larger context of other relevant factors that may also be affected. Although it is not the focus of this analysis to measure changes in these other factors, policymakers should be aware that even favorable impacts on campus crime due to campus carry might need to be traded off against unfavorable impacts on other events potentially related to gun ownership, such as student suicide rates, accidents, and communal feelings of safety.

There is considerable partisan debate surrounding the relationship between rates of gun ownership and rates of gun suicides within the context of campus carry.[132] Unfortunately, virtually no rigorous empirical evaluations have been conducted on the subject. This is due in large part to the fact that data pertaining to these events are not widely available at the campus level. Campus suicides, for example, are not recorded in a similarly robust fashion compared to campus crimes, making definitive evaluation on the association between campus carry and student suicide a difficult, if not impossible task at the moment.

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[132] *Common Arguments Against Campus Carry*, Students for Concealed Carry, 2011, http://concealedcampus.org/common-arguments/#2.
"More Guns - More Gun Deaths and Injuries," The Campaign to Keep Guns Off Campus, accessed March 17, 2016, http://keepgunsoffcampus.org/moreguns.html.

Nevertheless, the wider body of public health literature strongly and nearly unilaterally suggests that gun ownership at the household level is a risk factor for suicide. Specifically, the connection between firearm accessibility and suicide in adolescents and young adults has been suggested empirically as far back as the early 1990s.[133] This connection continues to emerge in more recent evaluations as well. For example, using panel data on suicides from 2001 to 2005 across all fifty states, Opoliner et al find that the prevalence of household firearm ownership is significantly and positively associated with overall state-level suicide rates, even when controlling for factors affecting mental health.[134] Another study by Briggs and Tabarrok using data on suicides from 2000 to 2009 across all fifty states showed that firearm ownership, as defined by a variety of different measures, was strongly and positively associated with rates of state-level suicide.[135] Miller et al show that, even when controlling for region, unemployment, alcohol consumption, and poverty, changes in the level of household gun ownership, as measured by survey data, significantly and positively associated with changes in overall and firearm suicide rate over the 1981 to 2002 time period.[136] Miller et al also use suicide data from 2008 to 2009 to show that household gun ownership is significantly and positively associated with both overall suicides and firearm suicides, even when controlling for state-level suicide attempt rates – in other words, that firearms are a risk factor for suicides independently of the underlying level of suicidal behavior in a state.[137] These few studies are truly only a small fraction of the total empirical literature produced

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[133] David A. Brent et al., "The Presence and Accessibility of Firearms in the Homes of Adolescent Suicides," *Journal of the American Medical Association* 266, no. 21 (December 4, 1991), doi:10.1001/jama.1991.03470210057032.

[134] April Opoliner et al., "Explaining Geographic Patterns of Suicide in the US: The Role of Firearms and Antidepressants," *Injury Epidemiology* 1, no. 6 (March 2014), doi:10.1186/2197-1714-1-6.

[135] Justin Thomas Briggs and Alexander Tabarrok, "Firearms and Suicides in US States," *International Review of Law and Economics* 47 (March 2014), doi:10.1016/j.irle.2013.10.004.

[136] Matthew Miller et al., "The Association Between Changes in Household Firearm Ownership and Rates of Suicide in the United States, 1981-2002," *Injury Prevention* 12, no. 3 (June 1, 2006), doi:10.1136/ip.2005.010850.

[137] M. Miller et al., "Firearms and Suicide in the United States: Is Risk Independent of Underlying Suicidal Behavior?," *American Journal of Epidemiology* 178, no. 6 (August 23, 2013), doi:10.1093/aje/kwt197.

that point to the relationship between firearm ownership and suicide, including for college-aged demographics.[138]

Moreover, there is some evidence to suggest that firearms regulation can lead to reductions in suicide rates in adolescent and college-aged youths. For example, Webster et al find that state-level safe storage laws, which require household firearms to be stored in safes or other devices when unused, are associated with modest reductions in suicide rates for youths aged fourteen to twenty.[139] These findings may also apply to other populations as well. For example, Hoyt and Duffy find that implementing restrictions on firearm access successfully reduces rates of suicide among United States army soldiers.[140]

Again, there is no widely available analysis specifically on the relationship between gun ownership or ease of access to firearms and suicides among college and university students. It is therefore unproven whether this relationship remains true on college and university campuses experiencing campus carry. Nevertheless, policymakers should be willing to take the possibility of such a relationship seriously until more research is done, especially in light of the evidence presented within the wider body of public health research. Analysts should therefore not rule out the possibility that increasing student access to handguns, especially by allowing them to be stored in dorm rooms or other living facilities, could impact student suicide rates.

Arguably, expanding student access to handguns could result in an increase in student suicides by expanding access to lethal means for those experiencing feelings of crisis. According to the 2014 National College Health Assessment, a survey conducted by the American College Health Association, 1.3 percent of all post-secondary students self-

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[138] I point the curious reader to the Harvard T.H. Chan School of Public Health website for a fuller review of the relationship between suicide and firearm ownership, particularly to the "Means Matter" project. "Means Matter Basics," Harvard T.H. Chan School of Public Health, September 11, 2012, accessed May 1, 2016, http://www.hsph.harvard.edu/means-matter/means-matter/.

[139] Daniel W. Webster et al., "Association Between Youth-Focused Firearm Laws and Youth Suicides," *Journal of the American Medical Association* 292, no. 5 (August 4, 2004), doi:10.1001/jama.292.5.594.

[140] Tim Hoyt and Vicki Duffy, "Implementing Firearms Restriction for Preventing U.S. Army Suicide," *Military Psychology* 27, no. 6 (November 2015), doi:10.1037/mil0000093.

reported having attempted suicide within the previous year.[141] The National Center for Education Statistics estimated that there were approximately 20.2 million total postsecondary students during this period.[142] Assuming the results of the National College Health Assessment are generalizable to a national sample, a back-of-the-envelope calculation suggests that as many as 262,000 post-secondary students attempted suicide in that survey year. Increasing student access to handgun ownership should be considered within this context, particularly given the suicide attempts by firearm are for more likely to be lethal than attempts by other methods.[143] According to a Centers for Disease Control analysis of all completed suicides and estimated total suicide attempts in the United States in 2001, the average rate of fatality across the seven leading methods of suicide was seven percent; the rate of fatality for attempted firearm suicides was eighty-five percent.[144] Shenassa et al find that this disparity cannot be explained by a higher intention to die among those who attempt suicide by firearm.[145]

Therefore, if a subsequent analysis shows that campus carry reduces crime, a cost-benefit exercise becomes crucial. How many crime reductions justify a potential increase in suicides? Policymakers should consider this potential tradeoff within the broader framework of their decision making process when weighing the merits of campus carry.

It may be worth briefly noting that increasing the prevalence of handguns on the campus environment may, by extension, also increase the number of accidental firearm discharges on campus. I opt to leave this topic mostly unexplored, though the UT-Austin Campus Carry Working Group notes that incidents of accidental handgun discharges

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[141] *Spring 2014 Reference Group Executive Summary*, American College Health Association, 2014, http://www.acha-ncha.org/docs/ACHA-NCHA-II_ReferenceGroup_ExecutiveSummary_Spring2014.pdf.
[142] "Digest of Education Statistics, 2014," National Center for Education Statistics, accessed April 30, 2016, http://nces.ed.gov/programs/digest/d14/tables/dt14_105.20.asp?current=yes.
[143] Though it should be noted that fewer than 262,000 students would actually be subject to campus carry given the public / private campus distinction.
[144] Vyrostek SB, Annest JL, Ryan GW, "Surveillance for fatal and nonfatal injuries–United States, 2001," Morbidity and Mortality Weekly Report, 2004:53(SS07);1-57, accessed May 1, 2016, http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5307a1.htm.
[145] E D Shenassa, S N Catlin, and S L Buka, "Lethality of Firearms Relative to Other Suicide Methods: A Population Based Study," *Journal of Epidemiology & Community Health* 57, no. 2 (February 1, 2003), doi:10.1136/jech.57.2.120.

have been a very rare event on campuses that allow concealed handgun carry, suggesting this tradeoff may be less dramatic.[146]

Campus carry may also impact variables that do not readily lend themselves to statistical modeling or easy cost-benefit analysis. For example, according to the UT-Austin Campus Carry Working Group, many respondents from the UT-Austin community indicated that they expected concealed carry to have a chilling effect on freedom of speech due to feelings of fear and intimidation.[147] Studies referenced in an earlier section of this report suggest that these feelings may be widely shared across different institutions.[148] The potential for communal anxiety and academic censorship following campus carry implementation must therefore also be considered.

As such, for those hoping to achieve a robust discussion on the merits of campus carry, a focus on campus crime is too narrow a framework. Other important variables such as suicides, accidents, and campus anxiety must be kept in mind for any policymaker considering implementation of the policy. In addition to refining the statistical models presented here, future research should continue to focus on the many variables that must be considered within the wider campus carry decision framework.

RECOMMENDATIONS FOR CAMPUS CARRY STATES

Given the trends in state legislatures discussed at the outset of this report, it seems likely that more states will pass campus carry measures in the future. Those states that do pass such policies should take serious care to devise approaches that address the need for safe handgun storage and carry practices. In this vein, states might consider heeding advice generated by the American Medical Association: "The 4 practices of keeping a gun locked, unloaded, storing ammunition locked, and in a separate location are each associated with a protective effect [for those living in households with firearms] and suggest a feasible strategy to reduce [suicides and unintentional] injuries in homes with

146 University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*.
147 Ibid.
148 Ryan Patten, et al, "Packing Heat."

children and teenagers where guns are stored."[149] In practice, campus carry states should implement this advice by providing biometric gun safes in locations where handguns are allowed (e.g. in dorms rooms, as the case may be) and requiring that handguns be stored, as the American Medical Association recommends, locked, unloaded, and separate from ammunition, which also be kept locked.

Furthermore, campus carry states should require that all concealed carriers on campus have their handguns placed within a restraint holster, that the restraint holster be within reach of the carrier at all times, and that handguns not be carried with a round in the chamber in order to minimize the risk of accident.

Finally, university systems implementing campus carry should begin gathering data on student suicide and accidental discharges – if they are not already. A robust data gathering process will allow campus administrators to closely monitor how the environment on campus responds to the implementation of concealed carry. By doing so, administrators can track potential crises, should they arise, and intervene appropriately.

The astute analyst will note that the above recommendations are derived directly from the UT-Austin approach to campus carry.[150] Policymakers determined to pass campus carry should reference this approach, which is embodied in the UT-Austin Campus Carry Working Group's officially adopted list of twenty-five recommendations for university-wide concealed handgun procedures. This list of recommendations clearly expresses an intent to balance concealed carry with practices that achieve relative safeguards of the public health, and might therefore be considered a starting point for future approaches to the law, where it is passed.

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[149] David C. Grossman et al., "Gun Storage Practices and Risk of Youth Suicide and Unintentional Firearm Injuries," *Journal of the American Medical Association* 293, no. 6 (February 9, 2005), doi:10.1001/jama.293.6.707.

[150] University of Texas at Austin, *Campus Carry Policy Working Group: Final Report*.

Appendix

Figure 2: Time series of average rate of forcible sexual assault by public / private school in Utah

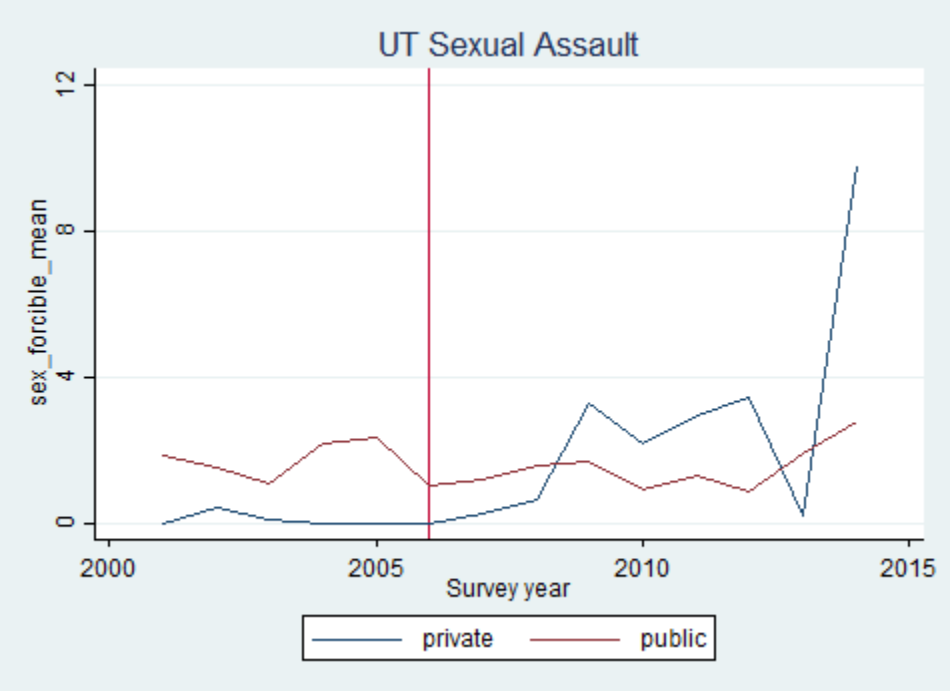

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Figure 3: Time series of average rate of robbery by public / private school in Utah

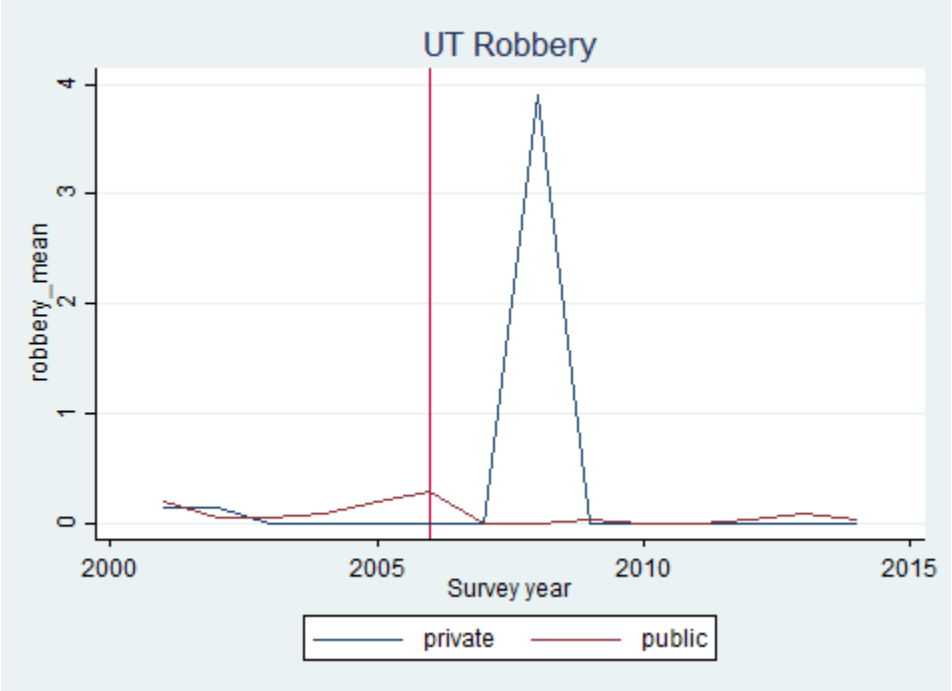

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Figure 4: Time series of average rate of burglary by public / private school in Utah

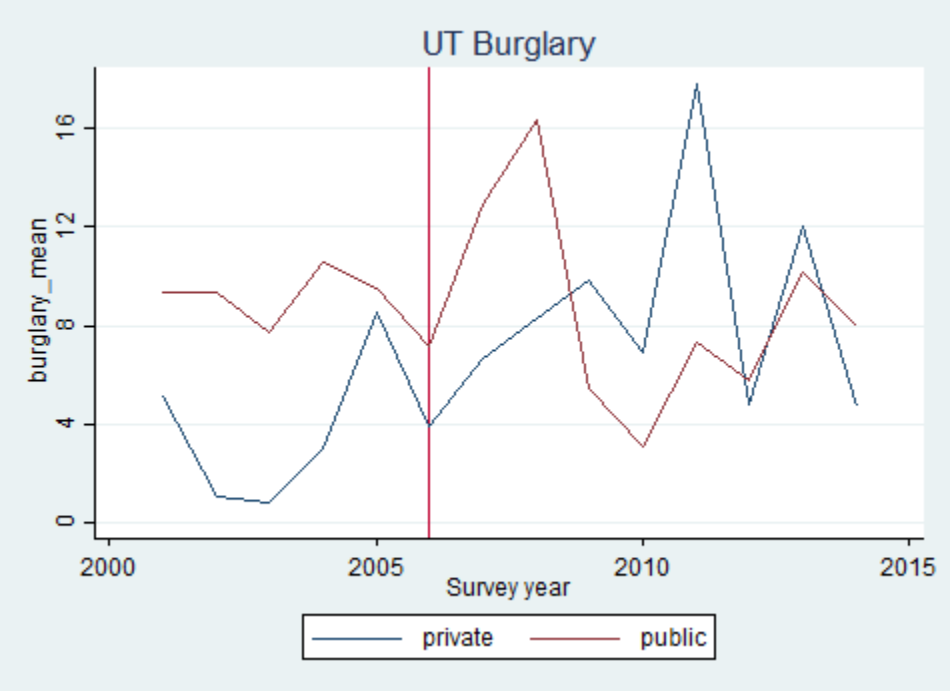

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Figure 5: Time series of average rate of motor theft by public / private school in Utah

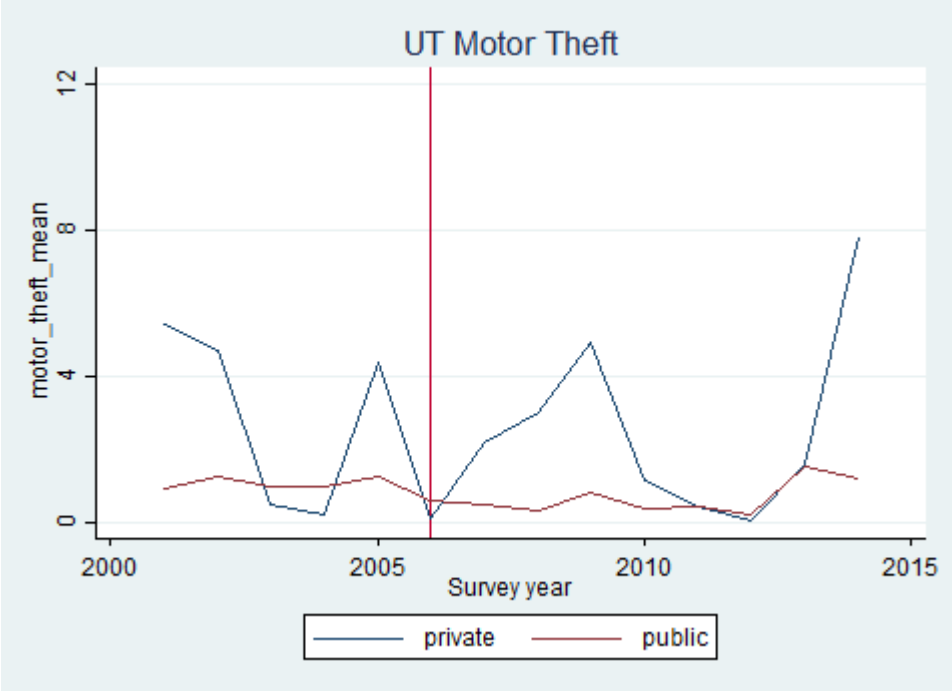

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Figure 6: Time series of average rate of aggravated assault by public / private school in Mississippi

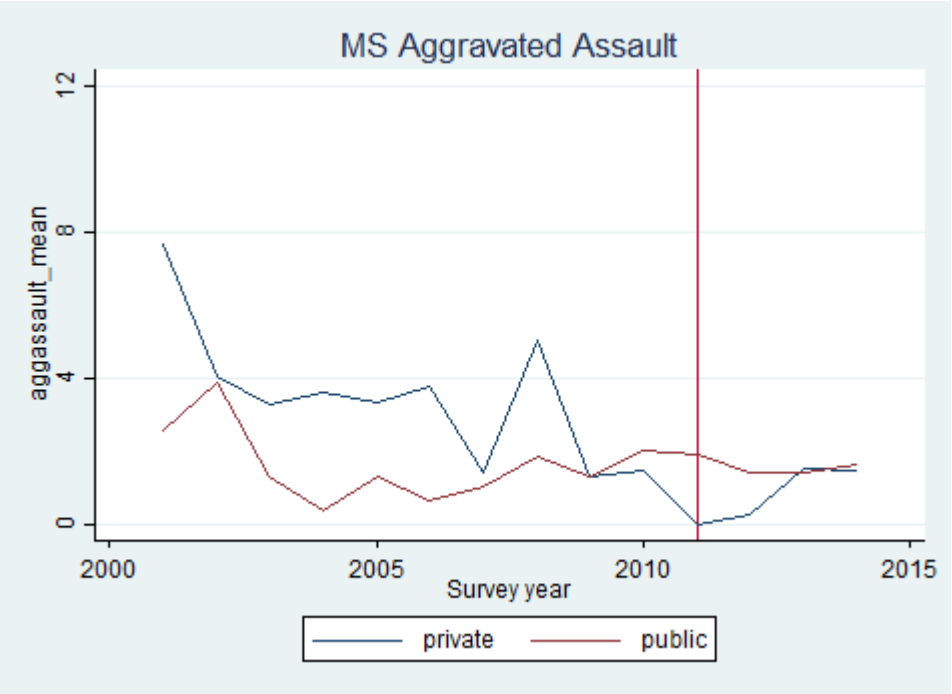

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Figure 7: Time series of average rate of sexual assault by public / private school in Mississippi

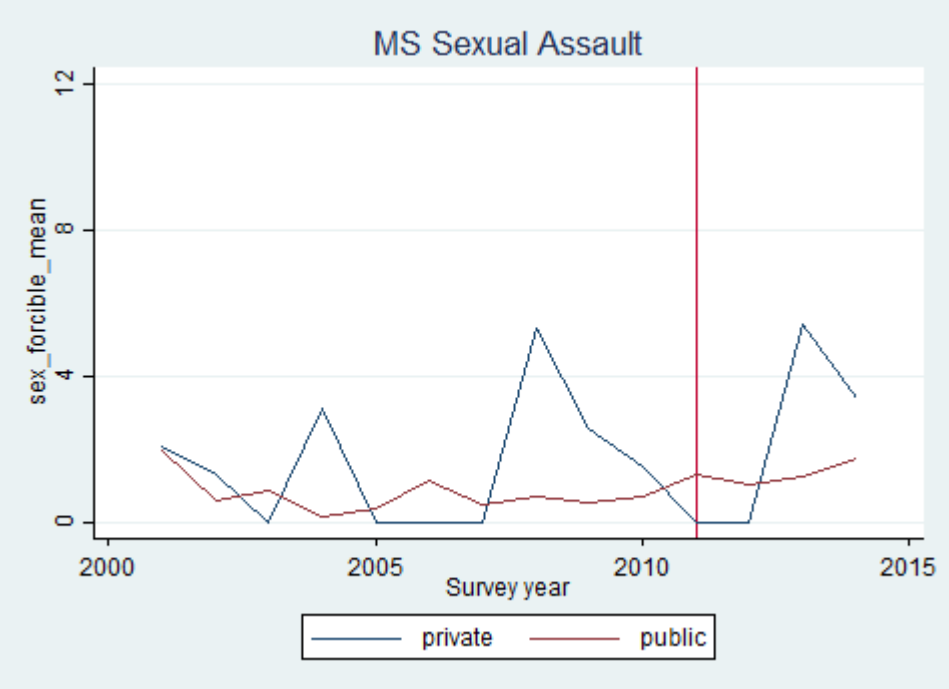

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Figure 8: Time series of average rate of robbery by public / private school in Mississippi

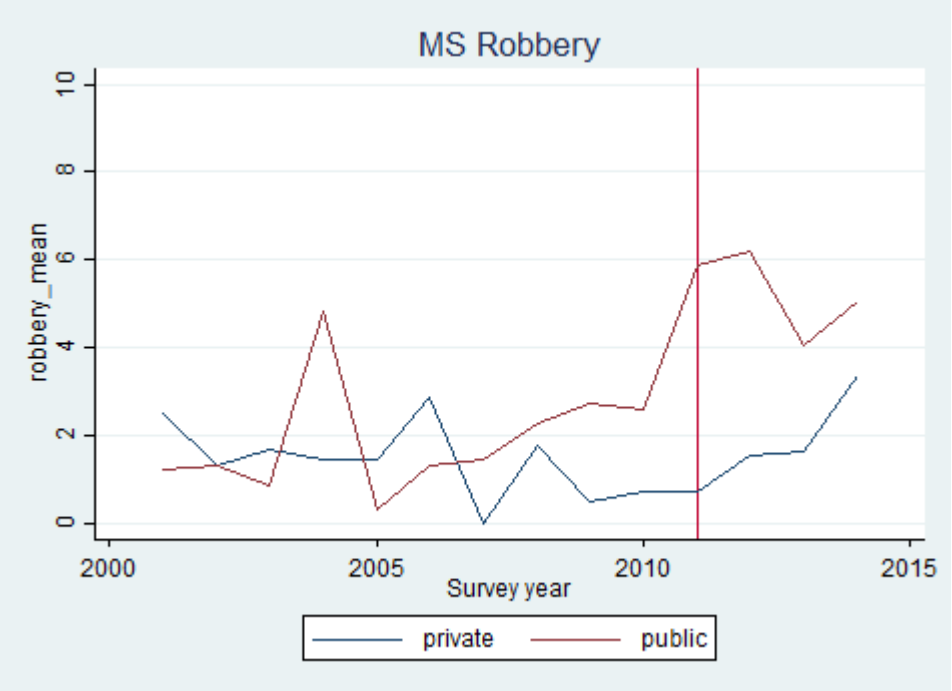

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Figure 9: Time series of average rate of burglary by public / private school in Mississippi

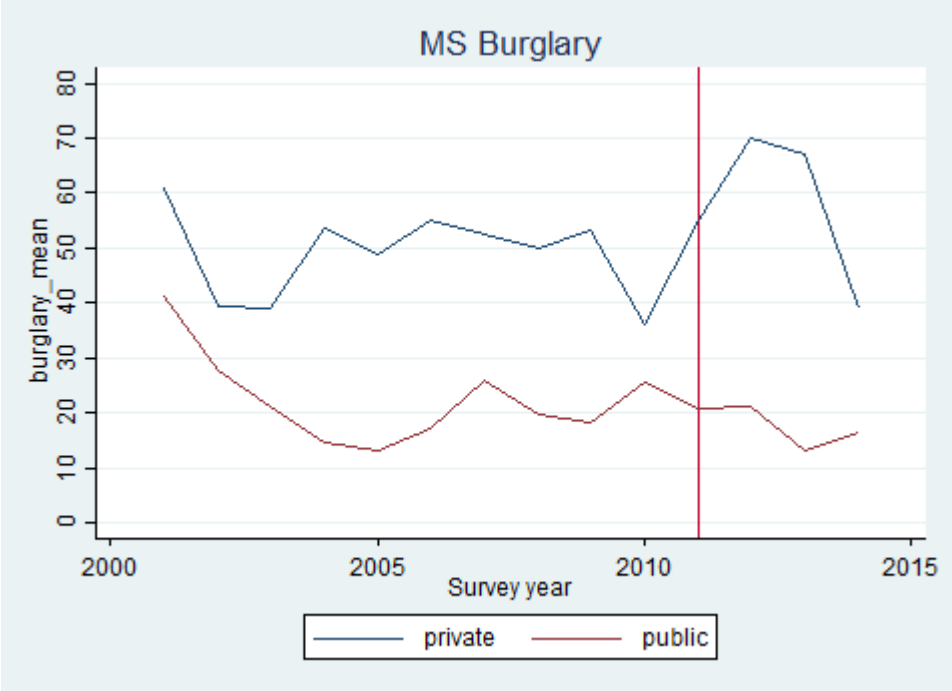

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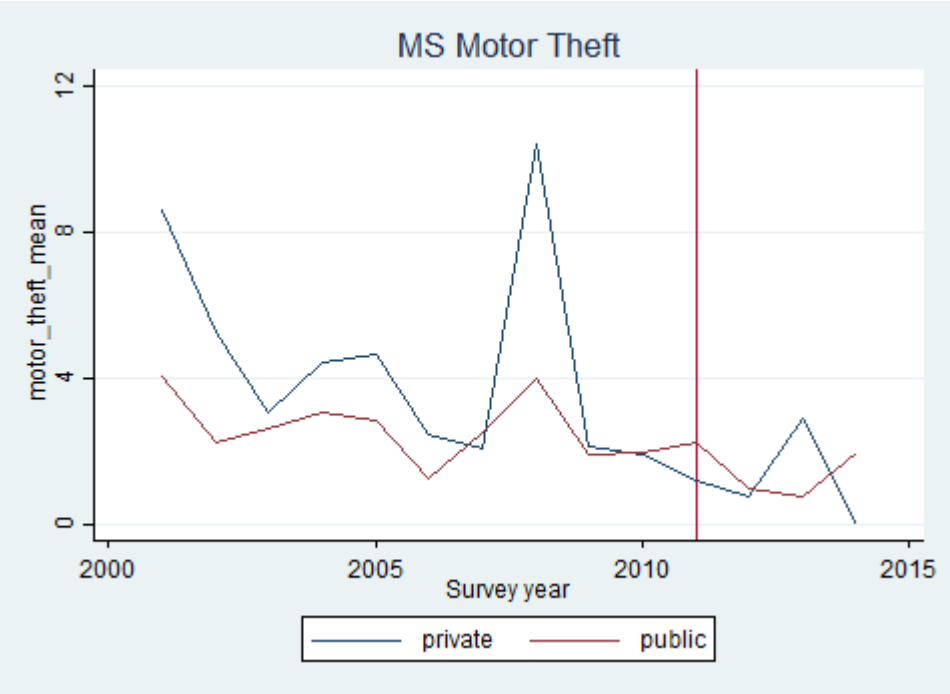
Figure 10: Time series of average rate of motor theft by public / private school in Mississippi



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Technical Appendix

Note 1

I drop graduate and non-traditional programs, such as law, medical, and seminary schools, among a number of others from the sample on the basis that these programs may have different associations with crime rates that I cannot control for in the statistical modeling process. For example, graduate programs may be commuter schools that experience higher rates of motor theft, seminary schools may have student bodies that are culturally different from other programs, and so forth. This process is meant to refine the sample so that it is as uniform as possible.

Note 2

The initial data set (n = 45,702) contains observations that are recorded at a very precise geographic level. For example, the University of Alaska - Fairbanks (UA-F) has seven observations in 2001 (e.g. “Bristol Bay Rural Campus”, “Northwest Rural Campus” and “Chukchi Rural Campus”, among others). Each of the seven UA-F campuses records its own crime statistics for that year. Unfortunately, these observations *incorrectly* list student enrollment at the UA-F level rather than at the campus level. To be specific, each of the seven UA-F 2001 observation lists a student enrolment of 7,142 - the entire UA-F enrolment for that year. Without correcting for this, rate calculations would often include campus-level crimes over university-level populations - an “apples to oranges” comparison. As such, in order to ensure proper rate calculations, I aggregate precisely recorded individual campuses such as these into a single observation to reflect the regional university they belong to. Again using the UA-F 2001 example, eight forcible sexual assaults occurred throughout all seven of the campuses for that year. I combine these occurrences to represent a single observation for UA-F 2001. I do this relying on the theoretical assumption that each of the seven UA-F campuses abide by the same overall university policies. The number of observations reduces by 14,093 when I apply this technique to the data set at large.

Note 3

With the exception of Kansas, campus carry states appear to have implemented concealed carry policies beginning in July or August to reflect the beginning of the new school year. Without accounting for this, my statistical models would incorrectly assume that a campus experienced full treatment effects throughout the entire first year of implementation. Therefore, I do not code the treatment into the affected campuses until the first full calendar year of implementation. However, when the July/August-start campuses first experience concealed carry, I do attempt to capture potential "half-year" effects by activating a separate dummy variable during these years. For example, this dummy variable is active for Mississippi public schools in 2011, for Colorado public schools in 2010, and so forth.

Note 4

In the primary OLS estimations (Table 10 and Table 11), I assign Kansas, Oregon, and Wisconsin to the treatment group (e.g. Treat = 1), but never assign them to a post-implementation period (e.g Post = 0). The triple difference estimator ($Treat_j$ x $Type_i$ x $Post_t$) is therefore never active for either public or private campuses in these states, reflecting their on-the-ground restrictive implementation or uncertainty.

Note 5

Sample mean for aggravated assault: 2.644 (See Table 3, Descriptive Statistics by Year)

Lower end of 95% confidence interval: X – 1.96(SE) = -0.511 – 1.96(0.594) = -1.675

Max possible decrease below overall mean: (-1.675 / 2.644) x 100 = % -63.360

Upper endpoint of 95% confidence interval: X + 1.96(SE) = -0.511+1.96(0.594) = 0.653

Max possible increase above overall mean: (0.653 / 2.644) x 100 = % 24.710

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