Workplace Gun Rights and Corporate Innovation

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Abstract

This paper finds that firms innovate more after the enactment of state-level Guns-at-Work (GAW) laws permitting employees to bring guns to their employer's premises. We hypothesize that this could be due to a greater sense of freedom (indirect effect), better means of self-defense (direct effect), or both. Consistent with these hypotheses, first, we find that firms experience higher inventor in-flows following the passage of GAW laws. Second, we document that the effect of GAW laws is concentrated in states with more tolerant self-defense laws. Third, we show that the effect of GAW laws is greater in states with higher assault crime rates.

Keywords: Workplace gun rights; Innovation; Patents; Citations; Self-defense

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1 Introduction

Workplace shootings have increasingly become a public concern in the US over the last few decades. According to the data from the Violence Prevention Project Research Center, mass public shootings (four or more victims killed by firearms) most frequently happen in workplaces and commerce: from August 1966 to May 2023, there were 60 mass shootings in workplaces, representing about 30.77% of the total 195 mass shootings and causing 372 deaths.[1]

To avoid gun violence and make workplaces safer, many companies implement strict weapon-free policies prohibiting employees' possession of firearms on the work premises. For example, Walgreens has a policy against guns carried by employees and customers. In 2011, Walgreens dismissed an employee who fired a gun in the store even though the employee was defending himself from a robbery.[2]

Whether these strict gun controls in workplaces help to deter firearm violence, enhance safety and improve productivity remains questionable. Rather than decreasing safety, permitting firearms at work can promote it by discouraging would-be shooters from targeting workplaces with armed workers. Moreover, armed employees can help rapidly subdue an active shooter and reduce the firearm violence before the police arrive.[3]

As the debate about workplace gun control rages on, however, there is little research on the effect of workplace gun rights on corporate and employee performance. This paper attempts to fill this research gap by investigating the relationship between workplace gun rights and corporate innovation. As innovation is considered critical for economic growth (e.g., Schumpeter, 1911; Solow, 1957; Romer, 1986) and corporate productivity (e.g., Jaffe, 1986; Cho and Pucik, 2005; Kogan et al., 2017), shedding light on whether and how firms' innovation performance interacts with employees' gun rights at work, can have broader

[1] https://www.theviolenceproject.org/mass-shooter-database/
[2] https://www.uspharmacist.com/article/selfdefense-and-employment-law
[3] https://trainingmag.com/what-businesses-must-consider-when-taking-a-stance-on-guns-at-work/

economic implications.

In theory, the effect of workplace gun rights on corporate innovation is ambiguous. On the one hand, stronger workplace gun rights by employees might spur corporate innovation performance. As discussed, some people contend that firearm possession is an effective self-defense method. This argument can find support from academic research because prior studies show that victim resistance with guns, relative to unarmed resistance or nonresistance, is associated with lower rates of both victim injury and crime completion for robberies and assaults (Kleck, 1988; Kleck and DeLone, 1993; Kleck and Gertz, 1995). Rowhani-Rahbar et al. (2022) report that approximately 70% of handgun owners who carried guns stated that their main reason for carrying guns was self-defense. It implies that people do value gun possession as an effective way of self-protection. Therefore, stronger workplace gun rights might provide employees with a higher level of perceived public safety, thus making employees more open to joining firms with more flexible gun policies. What is more, prior studies document that workplace safety is positively correlated with innovation (Tu et al., 2019; Suto and Takehara, 2022) because psychological safety could reduce job strain and enhance workers' motivation to innovate. If employees can use guns for self-defense, they might have a higher sense of workplace safety and be more willing to take long-term and risky projects, which leads to innovation.

In particular, people with high human capital, such as patent inventors, may place a premium on the right to carry a firearm for self-defense motives. Generally speaking, inventors have strong problem-solving abilities. In contrast to relying only on outside forces for security, owning a firearm can be seen as a way to take personal responsibility for one's own safety and the safety of their loved ones. Therefore, companies with more flexible gun policies might attract those inventors who value self-empowerment. This influx of human capital could nurture corporate innovation. In this sense, we hypothesize that stronger workplace gun rights lead to higher corporate innovation.

Another motivation for a positive effect of the workplace gun rights on innovation is indirect. Employees may associate improved gun rights with general freedom in the state. Prior research has documented that a greater sense of freedom is positively associated with creativity(e.g., Florida, 1995, 2006; Lehmann and Seitz, 2017), which is a key input in innovation. The direct and indirect reasons are not mutually exclusive. They could be both present and contribute to the empirical findings.

On the other hand, stronger workplace gun rights by employees might discourage corporate innovation performance. Plassmann and Tideman (2001) argue that the presence of a gun might turn nonviolent disputes into deadly games. Duggan (2001) finds a positive association between gun ownership and homicide rate. Stronger workplace gun rights might heighten employees' concern about firearms' possible hazards. As a result, workers, including innovative employees, might choose to leave firms with stronger workplace gun rights. This talent drain could weaken firms' innovation productivity. In this sense, stronger workplace gun rights might lead to lower corporate innovation.

Therefore, the ultimate effect of workplace gun rights on corporate innovation is ambiguous and needs empirical examination. To identify this effect, we rely on the staggered adoption of Guns-at-Work (GAW) laws which are state regulations that forbid property owners or employers from prohibiting individuals from keeping guns in private vehicles parked in the lot of the property owner or employer.

To prevent firearm violence at work, many employers institute strict gun-free policies that ban employees from bringing weapons to company premises. Employers usually terminate employees who violate the weapon-free policies. For example, in 2002, Weyerhaeuser (a timberland company) fired multiple employees in Oklahoma after discovering firearms in these employees' vehicles in the employee parking lot [4]. Such terminations triggered labor's concern about wrongful discharges and led to an outcry for legal protection for employees' rights to store firearms in their vehicles while at work (Duke Center for Firearms Law, 2020).[5]

[4] https://scholar.google.com/scholar_case?case=16031791622569132903&hl=en&as_sdt=6&as_vis=1&oi=scholarr

[5] https://firearmslaw.duke.edu/2020/06/parking-lot-laws-a-history/

In response to this outcry, in 2004, Oklahoma first enacted the GAW law which is a regulation that restrains employers from prohibiting employees from storing firearms in a vehicle parked in the employer's lots. Many states have joined Oklahoma to adopt the GAW law since 2004. As of June 2020, twenty-five states have the GAW law in place. All the state GAW laws have a parking lot provision that grants employees the right to keep guns in private vehicles in employers' parking lots. Essentially, GAW laws enhance employees' workplace gun rights because employees have easier access to guns at work and are free from unemployment risks resulting from carrying guns in the company's parking lots under GAW laws. The staggered adoption of state-level GAW laws provides a plausibly exogenous setting to establish the causality from workplace gun rights to corporate innovation.

Using a difference-in-differences (DiD) framework, we find that, following the enactment of GAW laws, firms headquartered in states with GAW laws exhibit an increase in the number of patent outputs and the patents' citation, compared to firms headquartered in states without GAW laws. These results suggest that stronger workplace gun rights lead to better corporate innovation.

The parallel trends assumption is a fundamental underlying assumption for the difference-in-differences strategy: without the exogenous shock, the change in innovation performance of the treated group should be the same as that of the untreated group. Consistent with the parallel trends assumption, we find that the positive effect of GAW laws on firms' patents and patent citations takes place only after the enactment of GAW laws, not before.

To shed light on the underlying mechanism, we hypothesize that stronger workplace gun rights provide innovative employees with a self-defense method and, thus, a higher level of perceived public safety. Therefore, the adoption of GAW laws makes inventors more open to joining firms in states with GAW laws and thus pushes up corporate innovation. We perform a series of empirical tests to examine this hypothesis.

First, we look into whether the enactment of GAW laws is followed by greater inventor inflows for firms headquartered in the treated states. The empirical tests reveal that firms experience an increase in the annual count of newly incoming inventors after the GAW laws take effect. This result implies that GAW laws expand the treated firms' talent influx, plausibly explaining why firms have better innovation performance after the GAW laws.

Next, we attempt to investigate whether firms' greater inventor inflows following the GAW laws are driven by inventors' self-defense incentives using guns. If inventors indeed value gun possession at work as an effective way of self-defense, the effect of GAW laws should be more pronounced in states with more lenient self-defense laws. If a state tightens people's self-defense rights, using firearms for self-defense would become futile. That is to say, stringent restrictions on individuals' self-defense rights are expected to mute the impact of GAW laws on firms' inventor inflow and innovation performance. To test this prediction, we exploit the state-level expansion to Castle Doctrine.

Regarding self-defense, the "duty to retreat" is a long-standing principle in common law, asserting that before employing lethal action to defend oneself against assault, a person must "retreat to the wall" and so have no place to retreat safely (Cheng and Hoekstra, 2013). The "Castle Doctrine" is an exemption to the "duty to retreat," stating that a person has no duty to retreat and can use deadly force in self-defense when attacked in his or her own house. The "Castle Doctrine" stems from the idea that "a man's home is his castle."(Cheng and Hoekstra, 2013; McClellan and Tekin, 2017). Since the 1970s, some states expanded the Castle Doctrine to one's workplace, allowing a person to employ reasonable force for self-defense without the need to retreat from the workplace. The expansion to the Castle Doctrine developed further in the 2000s as many states passed "Stand Your Ground" laws which assert that people have no obligation to retreat before using lethal force in self-defense if they are in an area where they have the legal right to be. We use these state-level expansions to Castle Doctrine as exogenous increases in people's self-defense.

The empirical results indicate that the favorable effect of GAW laws on firms' inventor inflows is concentrated in states with expansions to the Castle Doctrine, meaning that inventors would only value workplace gun rights when they have enforceable legal rights to self-defense. Furthermore, we find that the positive effect of GAW laws on corporate innovation only appears for firms in states with expansions to the Castle Doctrine. Taken together, these results support our contention that the effect of workplace gun rights on corporate innovation performance is driven by inventors' self-defense incentives.

Finally, we look into what inventors would use guns to protect themselves from. We conjecture that inventors prioritize gun rights as a tool to defend themselves against potential violence, such as assault or attacks. This argument predicts that firms in states with higher assault crime rates are more sensitive to the adoption of GAW laws. Consistent with this prediction, the empirical results demonstrate that the positive effect of GAW laws on corporation inventor inflows and innovation is more pronounced for firms in states with higher assault crime rates. Particularly, the results suggest that the effect of GAW laws on inventor inflows and innovation is actually negative or non-significant when the state-level assault crime rates are low. These results indicate that the effect of GAW laws on corporate innovation is conditional on assault crime rates. We interpret these results as evidence for our argument that inventors perceive gun possessions as an effective tool to protect themselves from assault attacks.

This paper contributes to at least two strands of literature. First, our study adds to the body of knowledge regarding the factors influencing corporate innovation. In particular, our paper broadens the research on the interplay between labor economics and corporate innovation. Prior research has revealed how corporate innovation relates to numerous labor economic issues such as workers' job security (Acharya et al., 2013, 2014; Francis et al., 2018), employee treatment practices (Chen et al., 2016), employee sexual orientation discrimination (Gao and Zhang, 2017), a healthy work environment (Gao et al., 2020), labor demographics (Derrien et al., 2023), and so on. However, there is no research on the impact of employees' workplace gun rights on firms' innovation performance. To our knowledge, this is the first paper that connects employees' gun rights with corporate innovation.

Second, our paper falls into the large literature on the impact of different categories of gun policies, such as concealed-carry rights (e.g., Lott and Mustard, 1997; Bartley and Cohen, 1998; Duggan, 2001), licensing and permitting requirements for gun possession (e.g., Andrés and Hempstead, 2011; Webster et al., 2020; Knopov et al., 2019), background check for gun purchases (e.g., Gius, 2015; Ludwig and Cook, 2000), and so on. The existing studies mainly focus on how crime and violence rates react to gun legislation.[6] However, there is little research focusing on the *workplace* gun rights. Moreover, there is no research on the effect of gun policies on corporate outcomes yet. This paper fills this research gap by revealing the influence of workplace gun regulations on corporate innovation.

The rest of this paper is structured as follows: Section 2 presents the hypothesis development, Section 3 provides the institutional background, Section 4 outlines the data, sample, and variables used, Section 5 explores the effect of workplace gun rights on innovation, Section 6 conducts the mechanism analysis, and finally, Section 7 presents the conclusion and key takeaways.

2 Hypothesis Development

We bring workplace gun rights and corporate innovation performance together through individuals' self-defense incentives. Among the numerous reasons people would own a gun, one highly discussed reason is defensive gun use. Protecting oneself, one's loved ones and property is contended to be the root of gun ownership tradition in the US (Thompson, 1999). That is, guns can be used to defend against criminals. For instance, the presence of a gun may scare off a criminal, lowering the possibility of property loss, harm, or death (National Research Council, 2004). The existing literature provides research results supporting that gun ownership helps individuals with self-protection. Researchers find that victim resistance with guns is related to reduced rates of both victim injury and crime completion for robberies and assaults, compared to unarmed resistance or nonresistance (Kleck, 1988; Kleck and DeLone, 1993; Kleck and Gertz, 1995). These findings suggest that ownership

[6] See Morrall (2018) for a comprehensive review of literature on the effects of gun policies in the US.

and use of firearms provide individuals with a means of self-defense and thus deter crimes. Consistent with the crime-deterring effect of gun possession, researchers find that laws allowing concealed-carry of handguns reduce violent crime rates (e.g., Lott and Mustard, 1997; Bartley and Cohen, 1998; Benson and Mast, 2001).

From the standpoint of sociology, Yamane (2017) points out that the U.S. gun culture gradually weighs more on armed self-defense relative to recreational shooting during the past half-century. Using data from the 2019 National Firearms Survey (NFS), Rowhani-Rahbar et al. (2022) find that about 70% of handgun owners who carried handguns stated that they carry guns primarily for defense against people. These studies indicate that people do value gun possession as an effective way of self-protection.

According to the US Bureau of Labor Statistics, in 2020, there were 392 homicides and 37,060 nonfatal injuries resulting from an intentional injury by another person in the workplace.[7] Employees could have incentives of self-preservation in workplace, and possession of guns could be one way for workers to defend themselves. Using an online survey presented to a sample of 54,244 individuals aged 18 or over, English (2021) finds that approximately 31.1% of gun owners have used a gun to defend themselves or their property, and about 4.8% of defensive gun uses happen at work. This implies that gun ownership functions as a way of self-preservation for individuals in the workplace. Therefore, we posit that stronger gun rights might provide employees with an extra layer of perceived public safety and thus make employees more open to moving to workplaces with strengthened gun rights.

Furthermore, if stronger workplace gun rights bring employees higher perceived safety, employees might have greater incentives to innovate. Suto and Takehara (2022) state that human resource management strategies that mitigate the physical and psychological burden of workers could incentivize employees to accept innovation challenges. That means higher perceived safety (less psychological burden for workers) could lead to better innovation performance. Regarding gun rights, people who own their weapon for protection could use their

[7] https://www.bls.gov/opub/ted/2022/workplace-violence-homicides-and-nonfatal-intentional-injuries-by-another-person-in-2020.htm

gun symbolically as an aid to manage psychological threats to their safety, control, and sense of belongingness that come from their belief that the world is a dangerous place and that society will not keep them safe (Buttrick, 2020). If workplace gun rights provide employees with self-defense means and thus better-perceived workplace safety, stronger workplace gun rights could improve innovation.

Particularly, individuals with high human capital, such as patent inventors, might value defensive gun use rights in the workplace. Business New Daily (2023) reports that workplace freedom breeds employee commitment because employees who feel free to make decisions are happier and more effective than those who feel more constrained.[8] Prior research on the relationship between personality and innovation reveals that the personality traits associated with innovation include the high desire for autonomy, social rule independence, and high self-confidence (Patterson et al., 2009), implying that innovative employees are likely to value individual freedom in the workplace. Pew Research Center (2017) states that the majority of gun owners view the right to keep and carry guns as central to their freedom, whether they use guns for hunting, sport shooting, or self-defense.[9] Therefore, inventors might consider gun rights as a layer of workplace freedom when searching for job.

Moreover, innovative people often have problem-solving skills and enjoy solving problems for their own sake (Patterson et al., 2009). As such, they might prioritize self-reliance and self-empowerment. Owning firearms could be viewed as a way to take personal responsibility for their safety and that of their loved ones rather than relying solely on external forces for protection. Therefore, if a state passes laws that strengthen employees' gun rights in the workplace, inventors might be more willing to relocate to firms in that state. This human capital inflow could spur corporate innovation within the state.

Taken together, the above discussion leads to our primary hypothesis:

Hypothesis 1: *Stronger workplace gun rights positively affect corporate innovation.*

[8] https://www.businessnewsdaily.com/609-employee-freedom-breeds-loyalty-commitment.html#ways-to-provide-employees-with-more-freedom

[9] https://www.pewresearch.org/social-trends/2017/06/22/americas-complex-relationship-with-guns/

However, it is also possible that stronger workplace gun rights lead to declined corporate innovation performance. Some studies argue that gun ownership increases firearm violence. The presence of a gun might transform a game or an otherwise nonviolent dispute into a situation with a deadly ending (Plassmann and Tideman, 2001). Duggan (2001) finds that increases in gun ownership are related to increases in the homicide rate. With strengthened workplace gun rights, employees, including patent inventors, might be concerned with firearms' potential risks and negative consequences. In this case, employees, including patent inventors, might move out of firms with more substantial workplace gun rights. As a result, corporate innovation performance might decline due to a talent drain. This leads to our alternative hypothesis:

Hypothesis 1a: *Stronger workplace gun rights negatively affect corporate innovation.*

Therefore, the ultimate effect of workplace gun rights on corporate innovation remains an open question in theory. We employ the staggered adoption of state-level Guns-at-Work (GAW) laws to provide empirical answers to this question.

3 Institutional Background

In the US, the federal Occupational Safety and Health Act (OSH Act) mandates employers to maintain employee safety at work. Employers are subject to liability for workplace injuries or fatalities caused by firearms. Additionally, companies are obligated to cover workers' compensation claims for employees hurt at work due to gun violence (Society for Human Resource Management, 2022).[10]

To minimize their legal obligations and promote workplace safety, employers often implement bans on weapons at the workplace. For instance, AOL's (a web portal and online service provider) Workplace Violence Prevention Policy stated that "[n]o weapons of any

[10] https://www.shrm.org/ResourcesAndTools/legal-and-compliance/employment-law/pages/guns-at-workplace-bruen.aspx

type are allowed in the [AOL] Call Center, or in the AOL parking lots, or while conducting AOL business..." In September 2020, three employees were dismissed by AOL for bringing guns to AOL's parking lot.[11]

What is more, Weyerhaeuser Company's ("Weyco": a timberland company) policy stated that "the possession or carrying of firearms or other weapons, explicitly or concealed, by anyone within the work environment..., including vehicles on company property, is STRICTLY PROHIBITED." In October 2002, Weyco terminated several employees found with firearms in their vehicles in the employee parking lot in Oklahoma.[12]

Such terminations in the case of Weyco triggered a call for legal protections for employees who wish to store firearms in their vehicles while at work (Duke Center for Firearms Law, 2020).[13] Therefore, in 2004, the Oklahoma legislature amended the Oklahoma Self-Defense Act, providing that "[n]o person, property owner, tenant, employer, or business entity shall be permitted to establish any policy or rule that has the effect of prohibiting any person, except a convicted felon, from transporting and storing firearms in a locked vehicle on any property set aside for any vehicle." This makes Oklahoma the first state to enact the Guns-at-Work (GAW) law which restricts employers from prohibiting employees from storing firearms in a vehicle parked in the employer's lots.

Following Oklahoma, several states adopted the GAW law to protect employers' rights to bring guns to their employers' property. As of June 2020, twenty-five states have some form of GAW laws. Table 1 presents the states with the GAW law and respective enactment year of GAW law in the state.[14]

The core idea of GAW laws is to allow employees to bear firearms (the Second Amendment rights) on their employer's premises. These laws include a parking lot provision that restricts

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[11] See the case *Hansen v. America Online, Inc.*: https://scholar.google.com/scholar_case?case=15088063698233258842&hl=en&as_sdt=6&as_vis=1&oi=scholarr#[2]

[12] See case *Bastible v. Weyerhaeuser Co.*: https://scholar.google.com/scholar_case?case=16031791622569132903&hl=en&as_sdt=6&as_vis=1&oi=scholarr

[13] https://firearmslaw.duke.edu/2020/06/parking-lot-laws-a-history/

[14] The information is from the website of Duke Center for Firearms Laws: https://firearmslaw.duke.edu/2020/06/parking-lot-laws-their-content-and-applicability/

property owners or employers from prohibiting firearms in vehicles parked in company lots. Therefore, GAW laws are also known as Parking Lot laws. This parking lot provision grants workers stronger gun rights in the workplace.

While all these parking lot provisions of GAW laws restrain property owners or employers from banning firearms in vehicles parked in company lots, the details differ from state to state. For instance, the scope of regulation varies across states. In some states (e.g., Texas, Florida, Georgia), the parking lot provision only regulates employers, while in some states (Louisiana and Arizona), the parking lot provision broadly regulates property owners, tenants, and business entities. Moreover, the coverage of protection varies across states. In eight states (e.g., Texas, Maine, Kansas), the parking lot provision protects only employees' gun rights, while in some states (e.g., Nebraska, Utah, Oklahoma), the parking lot provision protects all individuals who can legally own and carry guns. Besides, in eighteen states (e.g., Texas, Florida, Oklahoma), employers or property owners are shielded from legal responsibility for any harm brought on by the storage of a firearm in a vehicle in a parking lot.

Although the detailed provisions vary from state to state, all these GAW laws essentially enhance employees' workplace gun rights. In the first place, GAW laws grant employees the right to store firearms in their private vehicles in their employer's parking lot. That is to say, employees have easier access to firearms in workplaces. Furthermore, employers could be held liable for wrongful discharge if they terminate a current employee for storing guns in a car parked in the company lot. This reduces workers' unemployment risk associated with gun possession. In sum, the staggered adoption of state-level GAW laws offers a quasi-natural experimental setting to test the effect of stronger workplace gun rights on corporate innovation.

4 Data, Sample, and Variables

4.1 Firm Sample

We obtain our firm sample from the CRSP/Compustat Merged database. We retain firms headquartered and incorporated in the US. We remove utilities (SIC 4900-4999) and financial firms (SIC 6000-6999) because they are subject to different regulations. Our sample spans from 1999, five years before the first enactment year (2004) of Guns-at-Work laws, to 2022, the latest available year of the patent data from Kogan et al. (2017). The final sample contains 73,258 firm-year observations after excluding observations with missing variables and singleton observations. The information on the firms' historical headquarter state and incorporation state is available from the augmented 10-K/Q header dataset constructed by Bill McDonald.[15]

4.2 Measures of Innovation

We gauge corporate innovation performance by firms' patent output (e.g., Scherer, 1965; Griliches, 1981; Griliches et al., 1986; Atanassov, 2013; Kogan et al., 2017), using patent data from Kogan et al. (2017).[16]

To quantify firms' innovation output, we compute the number of patents a firm filed (and subsequently granted) in a year.[17] Given that it, on average, takes two years from the patent application to the patent grant, the simple patent count suffers from truncation bias (observations in later years of the sample have underestimated patent counts). To mitigate the truncation bias, we scale the simple firm-year patent count by the yearly mean of all firms' patent count (Hall et al., 2005; Atanassov, 2013). This adjusted patent count is labeled

[15]The augmented 10-K/Q data is from Bill McDonald's website: https://sraf.nd.edu/data/augmented-10-x-header-data/

[16]The patent and citation data is from Noah Stoffman's website: https://host.kelley.iu.edu/nstoffma/

[17]The relevant year is patents' application year which is closer to the actual innovation activities than the grant year (Griliches et al., 1986; Hall et al., 2001).

Patent Count.

To measure the scientific value of firms' innovation output, we calculate the citations received by firms' patents. Since patents can receive citations for many years after being granted, patents granted in later years in our sample have less time to accumulate citations (Hall et al., 2001). To account for this truncation bias, we scale the number of forward citations of each patent by the average citations of all patents filed in the same year (Hall et al., 2001, 2005; Gao and Zhang, 2017). Then, we construct two variables of patent citations: the first is the sum of adjusted citations received by all patents filed by a firm in a year, labeled *Citation Count*. The second is the sum of adjusted citations divided by the patent count (adjusted by the yearly mean of all firms) for each firm-year observation, labeled *Citation Per Patent*.

To mitigate the skewness of patent data, we take the natural logarithm of one plus these three measures, respectively, for each firm-year observation.[18] We set these innovation measures to zero if a firm does not have patent records in a given year.

4.3 Inventor Sample

We obtain patents' inventor data from PatentsView.[19] We rely on the patent filing years of each inventor to track inventors' firm affiliations over time. One limitation of this method is that we cannot precisely identify each inventor's employer each year during the sample period because not every inventor applies for a patent every year. For the years that an inventor does not file a patent, we have to impute the inventor's employer. First, we treat an inventor as newly joining the firm in the first year that he or she files a patent. Then we impute the inventor's affiliation over time using a similar strategy to Jin and Zhu (2021): if an inventor applies for a patent in firm A and year t and files another patent in firm B and

[18] We match the patent data to our firm sample using linking tables from Kogan et al. (2017) and Stoffman et al. (2022). Stoffman et al.'s (2022) linking table is available on Michael Woeppel's website: https://www.mikewoeppel.com/data.

[19] The inventor data can be downloaded from PatentsView's website: https://patentsview.org/download/data-download-tables.

year $t+n$ ($n>0$), we assume that the inventor had been working for firm A from year t to $t+n-1$ and moved to firm B in year $t+n$. We do not impute after the inventor's last patent application. What is more, we do not treat inventors' changes of employers reversed within less than one year as true moves (Melero et al., 2020; Jin and Zhu, 2021) because those changes probably just reflect contract R&D and collaborations (Ge et al., 2016). With this process, we obtain the imputed history of each inventor's firm affiliation from the inventor's first patent to last patent.

4.4 Control Variables

In the regression analysis, we control for a battery of firm characteristics following prior studies (e.g., Atanassov, 2013; He and Tian, 2013; Gao and Zhang, 2017), including *Log Assets* (the natural logarithm of firms' book total assets (Compustat item AT)), *Tangibility* (Compustat item PPENT / AT), *Tobin's q* (Compustat item (AT-CEQ+CSHO*PRCC_F) / AT), *Book Leverage* (Compustat item (DLC+DLTT) / AT), *Cash Holding* (Compustat item CHE / AT), *Dividend* (an indicator equal to 1 if Compustat items DVP+DVC is positive, and 0 otherwise), *Profitability* (Compustat item OIBDP / AT), and *R&D* (Compustat item XRD / AT).[20] We also include the four-digit SIC Herfindahl Index (*HI*) and squared four-digit SIC Herfindahl Index (*HI_squared*) to control for industry concentration.

4.5 Descriptive Statistics

The detailed definitions of all the variables can be found in Appendix A. We winsorize all continuous variables at the 1st and 99th percentiles by year. Table 2 presents the descriptive statistics for the variables. The average values of *Patent Count*, *Citation Count*, and *Citataion Per Count* are 0.073, 0.542, and 0.927, respectively.

[20]We set *R&D* to zero if the Compustat item XRD is missing for a firm-year observation.

5 The Effect of Workplace Gun Rights on Innovation

5.1 Baseline Model

To examine the effect of Guns-at-work (GAW) laws on corporate innovation, we employ a staggered difference-in-differences strategy:

$$Innovation_{i,t,s} = \alpha + \beta_1 * GAW_{t,s} + \beta_2 * Controls_{i,t} + Firm_{FE} + Year_{FE} + \epsilon_{i,t} \quad (1)$$

The dependent variables $Innovation_{i,t,s}$ include the three measures discussed in Section 4.2 of firm i in year t headquartered in state s. The interest explanatory variable $GAW_{t,s}$ is defined as a dummy that equals one if the GAW law has been enacted in state s in year t, and zero otherwise.[21] $Controls_{i,t}$ is a vector of control variables discussed in Section 4.4. $Firm_{FE}$ denotes firm fixed effects and $Year_{FE}$ denotes year fixed effects. Including firm and year fixed effects ensures that the coefficient of $GAW_{t,s}$ captures the difference-in-differences effects. We cluster the robust standard errors by firms' headquarter state. In the above regression, β_1 captures the before-after effect of GAW laws on the innovation performance of the treated group relative to that of the untreated group.

Table 3 presents the results of estimating regression (1). The results coefficients of *GAW* are positive and significant across all specifications, suggesting that the innovation performance of the treated group improves following the enactment of GAW laws relative to the innovation performance of the untreated group. Regarding the economic significance, column (2) shows that GAW laws lead *Patent Count* to increase by approximately 20.55% (0.015/0.073) of the sample mean; column (4) and (6) suggest that GAW laws cause *Citation Count* and *Citataion Per Count* to grow by around 16.60% (0.087/0.524) and 16.08% (0.109/0.678) of the sample mean. The results demonstrate that GAW laws significantly and positively affect corporate innovation.

[21]Virginia's GAW law regulates only "localities" (cities, counties, etc.) who act as employers. We code that Virginia's GAW law only applies to public-sector employers. Therefore, we do not consider Virginia's GAW law, given that our sample consists of publicly traded firms from Compustat.

5.2 Dynamic Analysis

The critical underlying assumption for the difference-in-differences strategy is the parallel trends assumption: the evolving trends of the treated and untreated groups' innovation performance should be the same without introducing GAW laws. To investigate the pre-treatment trends of innovations, we estimate the dynamic regression:

$$\begin{aligned} Innovation_{i,t,s} = \alpha + \beta_1 * GAW_{t,s}^{-3} + \beta_2 * GAW_{t,s}^{-2} + \beta_3 * GAW_{t,s}^{-1} + \beta_4 * GAW_{t,s}^{0} + \\ \beta_5 * GAW_{t,s}^{+1} + \beta_6 * GAW_{t,s}^{+2} + \beta_7 * GAW_{t,s}^{3+} + \\ \beta_8 * Controls_{i,t} + Firm_{FE} + Year_{FE} + \epsilon_{i,t} \end{aligned} \tag{2}$$

The variable $GAW_{t,s}^{-3}$, $GAW_{t,s}^{-2}$, $GAW_{t,s}^{-1}$, $GAW_{t,s}^{0}$, $GAW_{t,s}^{+1}$, $GAW_{t,s}^{+2}$, $GAW_{t,s}^{3+}$ are dummies that equal to one if the firm is headquartered in a state that: (1) will enact the GAW law three years later; (2) will enact the GAW law two years later; (3) will enact the GAW law one year later; (4) enacts the GAW law in the year; (5) enacted the GAW law one year ago; (6) enacted the GAW law two years ago; (7) enacted the GAW law three or more years ago. Other variables are the same with regression (1). Table 4 presents the results of estimating regression (2). The significant (above 5% significance level) effect of GAW laws occurs only after, but not before, the enactment of GAW laws, supporting the parallel trends assumption.

To visualize the parallel trends assumption, following Acharya et al. (2014) and Serfling (2016), we present a graphical analysis of the dynamic effect of the enactment of GAW laws on firms' innovation performance. We regress the innovation measures on firm and year fixed effects and dummy variables indicating the year relative to the GAW laws' enactment, for ten years before and after the law's adoption.[22] The last dummy is set to one if the GAW law was enacted ten or more years ago. Figure 1 plots the results. Panel A presents results with *Patent Count*. Panel B presents results with *Citation Count*. Panel C presents results with

[22]For this analysis, we start the sample period from 1994, ten years before the first enactment year (2004 in Minnesota and Oklahoma) of GAW laws, and end the sample period at 2022.

Citation Per Patent. The y-axis denotes the coefficient estimates on each dummy variable, while the x-axis denotes the year relative to the enactment of GAW laws. The dashed lines plot the 90% confidence intervals of the coefficient estimates. Confidence intervals are calculated from robust standard errors clustered by the headquarter state. Figure 1 shows that firms' innovation outputs are only statistically higher for treated firms after the enactment of GAW laws. Overall, the results in Table 4 and Figure 1 support the causal effect of GAW laws on corporate innovation.

5.3 Robustness

5.3.1 Excluding Industries with Geographically Dispersed Workforce

Our baseline model is essentially a quasi-natural experiment where we categorize the treated and control group according to the firms' headquarter state. One concern with this approach is that a firm's workforce might not work or live in the firm's headquarter state, especially for firms operating across multiple states.

To mitigate this concern, we follow Agrawal and Matsa (2013) and exclude industries that are likely to have a geographically dispersed workforce, namely, retail (SIC 5200-5990), whole (SIC 5000-5190), and transport (SIC 4231-4731). Table IA1 of the Internet Appendix reports the results of re-running the baseline model after dropping those industries, showing that GAW laws still significantly and positively affect firms' innovation performance.

5.3.2 Controlling for State Level Factors

Another empirical concern is that regional economic or political factors might synchronize with the staggered adoption of GAW laws, thus confounding the relationship between GAW laws and corporate innovation.

To mitigate the potential issue of regional confounding factors, we control for a battery of state-level factors in the baseline model, including the state governor's political party affiliation (a dummy equal to 1 if the state governor is a Republican and 0 otherwise), state GDP growth rate (%), the natural logarithm of state GDP per capita, the natural logarithm of the state population, unemployment rate (%), violent crime rate (the number of violent crimes divided by the population (in thousands) in a state), and police density (the number of police officers divided by the population (in thousands) in a state).[23] Table IA2 of the Internet Appendix reports the results, showing that the effect of GAW laws on firms' innovation is robust after accounting for a series of state-level factors.

5.3.3 Stacked Sample

In our baseline staggered difference-in-differences (DiD) model, early-treated firms act as effective control firms for later-treated firms. However, the advances in econometric theory (e.g., de Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021; Athey and Imbens, 2022; Baker et al., 2022) point out one concern with this kind of setting: the DiD estimates with two-way fixed effects (TWFE) could be negatively biased when dynamic treatment effects (earlier-treated firms still react to the treatment and their treatment effects evolve over time) exist.

We employ the stacked regression (Gormley and Matsa, 2011) to address this concern. The key idea is to group firms into cohorts based on the treatment year. For a year that a state enacts the GAW law, we construct a cohort of treated firms (headquartered in the state) and control firms (headquartered in a state without the GAW law in that year yet) for five years before and after the enactment of the GAW law. In each cohort, if a control firm is treated by the GAW law in a later year, we drop those post-treatment control observations. In this way, already treated firms are not used as control units, thus eliminating the problem of dynamic treatment effects. Then, we stack all the cohorts into one dataset to estimate the average treatment effect of GAW laws on corporate innovation.[24] We report the results of the stacked sample in Table IA3. The results still show a positive and significant effect of GAW

[23]The data of state-level crime rate and police density is from the website of the Federal Bureau of Investigation: https://cde.ucr.cjis.gov/LATEST/webapp/#/pages/home.

[24]Some firms appear multiple times in the stacked dataset.

laws on *Patent Count* and *Citation Count*, indicating that our results for firms' innovation output are robust after accounting for dynamic treatment effects. One caveat is that the stacked regression does not yield statistically significant results for *Citation Per Patent*, suggesting that the average quality (*Citation Per Patent*) of corporate patents may not be as responsive to GAW laws as the quantity (*Patent Count*) and overall quality (*Citation Count*) of corporate patents. The bottom line here is that GAW laws produce a robust and positive effect on firms' quantity and overall quality of innovation output.

6 Mechanism Analysis

The baseline results present that stronger workplace gun rights proxied by GAW laws lead to better corporate innovation performance. We hypothesize that stronger workplace gun rights provide employees with a means of self-defense against potential violence and thus offer higher perceived public safety for employees. If inventors value gun rights as a way to self-defense, they might be more open to flowing into firms headquartered in states with GAW laws. That is, GAW laws lift up one dimension of labor market frictions (public safety concerns) and promote firms' recruitment of innovative employees.

6.1 Inventor Inflows

First, we examine the effect of GAW laws on firms' recruitment of new inventors. Suppose stronger workplace gun rights mitigate prospective employees' concerns with public safety. In that case, firms should experience higher inventor in-flows after GAW laws take effect. To test this prediction, we construct three variables to measure firm-year inventor in-flows: (1)*Log In*: the natural logarithm of one plus the number of joining inventors for a firm in a year; (2)*Net In*: the natural logarithm of one plus the difference between the number of joining inventors and the number of leaving inventors for a firm in a year; (3)*Total Inventors*: the natural logarithm of one plus the total number of inventors for a firm in a year.[25] We re-run regression (1), replacing the dependent variable with these variables of inventor in-flows. The results are reported in Table 5: GAW laws exert a significantly positive effect on firms' net inflow of inventors and total number of inventors, implying that firms headquartered in states with GAW laws experience an increase in inventor in-flows relative to firms headquartered in states without GAW laws, after the enactment of GAW laws. We note that the results do not necessarily mean that firms in states with GAW laws, on average, have bigger absolute numbers of *Net In* and *Total Inventors*. Since we are conducting a difference-in-differences analysis, the results rather imply that the incremental change in *Net In* and *Total Inventors* are more pronounced for firms in states with GAW laws compared to firms in states without GAW laws following GAW laws. In short, Table 5 indicates that GAW laws positively affect firms' inventor recruitment.

6.2 Self-defense Rights

Next, we examine why inventors would value workplace gun rights. We hypothesize that inventors consider gun rights an effective means of self-defense. Based on this hypothesis, we expect the effect of GAW laws on inventor in-flows to be more pronounced for firms in states where people have stronger legal self-defense rights. The reasoning is that if a state has rigid restrictions on people's self-defense rights, using firearms for self-defense would be pointless, and the effect of GAW laws on inventor-inflow would evaporate. To test this conjecture, we employ the state-level expansion of the Castle Doctrine as an exogenous variation in self-defense rights.

Self-defense means that individuals can protect themselves from force or violence by using force or violence. A long-standing principle of common law, known as the "duty to retreat," states that a person has to "retreat to the wall" and thus has nowhere to retreat safely before using lethal force for defense against violence (Cheng and Hoekstra, 2013). There is

[25] We set these variables to zero if a firm-year observation does not have inventor records. The construction of our inventor sample is described in Section 4.3

an exception to the "duty to retreat," known as the "Castle Doctrine," which says that a person has no duty to retreat and can use deadly force for self-defense when facing attacks in his or her home. The "Castle Doctrine" is rooted in the notion that "a man's home is his castle" (Cheng and Hoekstra, 2013; McClellan and Tekin, 2017). Since the 1970s, some states have passed legislation expanding individuals' self-defense rights. For example, active from 1975, North Dakota expanded the "Castle Doctrine" beyond one's home, allowing a person to use reasonable force for self-defense without the need to retreat from his dwelling or place of work (S.L. 1973, Ch. 116, § 5). As time passed, the expansion to the "Castle Doctrine" evolved further. In the early 2000s, a wave of states adopted the "Stand Your Ground" laws which specify that people have no duty to retreat before using deadly force in self-defense if they are in a place where they have the legal right to be. For example, in 2005, Florida enacted the "Stand Your Ground" law (Florida Stat. Ann. § 776.013(3)) which states that "a person who is not engaged in an unlawful activity and who is attacked in any other place where he or she has a right to be has no duty to retreat and has the right to stand his or her ground and meet force with force..." (NCSL, 2023).[26] As of 2023, 28 states have adopted the "Stand Your Ground" law. For those without the "Stand Your Ground" law, six states have expanded the "Castle Doctrine" to individuals' workplaces. We classify these state-level laws as the Self-defense Laws (SDL) and use them as an exogenous increase in people's self-defense rights. Table 6 presents these Self-defense Laws (SDL) by state and effective year. [27]

Now, we examine the interactions among GAW laws, Self-defense laws, and firms' recruitment of inventors. If inventors consider workplace gun rights as an effective means of self-defense, the effect of GAW laws on firms' inventor in-flow should be more pronounced for firms in states with more tolerant legal self-defense rights. We run the following regression

[26] See "Self-Defense and Stand Your Ground," National Conference of State Legislatures (NCSL), March 2023: https://www.ncsl.org/civil-and-criminal-justice/self-defense-and-stand-your-ground#:~:text=The%20common%20law%20principle%20of,and%20expanded%20by%20state%20legislatures.

[27] The information on self-defense laws is from the RAND State Firearm Law Database: https://www.rand.org/pubs/tools/TLA243-2-v2.html.

to investigate this conjecture:

$$\begin{aligned} Inventor\ Inflow_{i,t,s} = \alpha + \beta_1 * GAW_{t,s} + \beta_2 * SDL_{t,s} + \beta_3 * GAW_{t,s} * SDL_{t,s} \\ + \beta_4 * Controls_{i,t,s} + Firm_{FE} + Year_{FE} + \epsilon_{i,t} \end{aligned} \tag{3}$$

where $SDL_{t,s}$ is defined as a dummy equal to one if the state s has adopted the stand-your-ground law or expanded the castle doctrine to the workplace, and zero otherwise in year t.[28]

Table 7 reports the results, showing that the coefficients of the interaction between *GAW* and *SDL* are significantly positive for all the measures of inventor-inflows while the main effect of *GAW* appear insignificant. The results show that the positive effect of GAW laws on firms' hires of new inventors is concentrated in states with more generous self-defense rights, implying that inventors would only find workplace gun rights value when they have binding legal rights of self-defense. These results are consistent with our hypothesis that inventors value workplace gun rights as a means of self-defense. The implementation of GAW laws adds an extra layer of perceived public safety for those inventors who own guns, thus attracting certain groups of inventors to join firms in states with GAW laws. However, due to data limitation, we cannot identify whether the increased inventor in-flows following GAW laws are attributable to inventors who indeed own guns.

Then, we examine whether self-defense rights moderate the relationship between GAW laws and corporate innovation outputs. We replace the dependent variables in equation 3 with the innovation measures and report the results in Table 8. Similar to Table 7, the interactions between *GAW* and *SDL* have significantly positive coefficients while the main effect of *GAW* is insignificant. That is, the positive effect of *GAW* only shows up for firms in states with more tolerant self-defense rights. Table 7 and 8 provide evidence for our argument that self-defense incentives are the driver for the effect of workplace gun rights on

[28] We consider the earlier year of the adoption of stand-your-ground law and expanded the castle doctrine to the workplace for a state.

corporate innovation performance.

6.3 Assault Crimes

The empirical results of Table 7 and 8 are consistent with our argument that inventors value workplace gun possession as a way for self-defense. In this section, we investigate what inventors attempt to defend themselves from using guns.

Given that self-defense rights allow people to protect themselves from force or violence by using force or violence, we hypothesize that inventors value gun rights as a way to protect themselves from potential violence, such as assault or attacks. Under this hypothesis, we expect that firms in states with higher assault crime rates should be more sensitive to the effect of GAW laws. To examine the role played by assault crimes, we calculate a state-year variable labeled *Assault Rate*, defined as the number of aggravated assault crimes divided by the population (in thousands) in a state in a year.[29]

If a state has a higher *Assault Rate*, it could cause more serious public safety concerns so that inventors could resist moving into firms within that state, even if that state has ample career opportunities for inventors. For example, during our sample period, the mean *Assault Rate* of Texas is 3.308, which is higher than the sample mean (2.829).[30] Meanwhile, according to a report by WalletHub (2023), Texas is among the top 15 most innovative states, which implies that Texas should have plenty of job opportunities for inventors.[31] However, the higher-than-average assault crime rate might deter inventors from moving to Texas for career development. Moreover, Texas is one of the states enacting the GAW law. If stronger workplace gun rights provide inventors with better self-defense, inventors might be less concerned with assault crimes and be more open to working in firms in Texas. That

[29]The data of state-level assault crimes is from the website of the Federal Bureau of Investigation: https://cde.ucr.cjis.gov/LATEST/webapp/#/pages/home.

[30]Here the mean of *Assault Rate* refers to the average value of state-year *Assault Rate* during our sample period. In Table 2, the mean of *Assault Rate* refers to the average value of firm-year *Assault Rate* during our sample period after we merge the state assault data with the firm sample based on firms' headquarter state.

[31]See "2023's Most & Least Innovative States", Adam McCann, WalletHub Financial Writer, March 2023: https://wallethub.com/edu/most-innovative-states/31890.

is to say, GAW laws may mitigate a specific labor market friction (public safety concern) and help firms recruit inventors, thus promoting corporate innovation performance.

Therefore, now we test whether firms in states with higher assault crime rates are more sensitive to the effect of GAW laws. First, we examine the moderating effect of *Assault Rate* on the relationship between GAW laws and firms' inventor in-flows:

$$\begin{aligned} Inventor\ Inflow_{i,t,s} = \alpha + \beta_1 * GAW_{t,s} + \beta_2 * Assault\ Rate_{t,s} + \\ \beta_3 * GAW_{t,s} * Assault\ Rate_{t,s} +\ \beta_4 * Controls_{i,t,s} + Firm_{FE} + Year_{FE} + \epsilon_{i,t} \end{aligned} \tag{4}$$

Table 9 reports the results: the coefficients of the interaction between *GAW* and *Assault Rate* are significantly positive for all the measures of inventor in-flows, implying that in states with higher assault crime rates, GAW laws exert a more pronounced help for firms' recruitment of inventors.

Interestingly, we find that, after interacting with *Assault Rate*, the main effect of *GAW* turns negative (Column (1),(2),(5), and (6)) or insignificant (Column (3) and (4)). These results suggest that when assault crime rates are low, the effect of GAW laws on inventor in-flows is negative. This does not necessarily contradict our previous results. One possible explanation is that when the assault crime rates are low, inventors do not feel the need to defend themselves from assault using firearms, so GAW laws lose the positive effect on firms' inventor in-flows. On the contrary, when the assault crime rates are low, inventors might be more concerned with the potential increased firearm violence that might come with stronger workplace gun rights so that inventors might leave the state after the enactment of the GAW law (a negative main effect of *GAW* in Table 9). Taking Column (1) as an example, when *Assault Rate* is below 1.796 (0.097/0.054), the net effect of *GAW* is negative. The main takeaway is that the net effect of GAW laws on firms' inventor in-flows is conditional on the assault crime rates of the firm's headquarter state.

We hasten to note that we strive to be very cautious in interpreting the results of Table 9. We do not claim that GAW laws make inventors prefer higher assault crime rates over lower assault crime rates. Rather, we interpret the results as that GAW laws cause a more pronounced *incremental* increase in firms' inventor in-flows in states with high assault crime rates compared to firms in states with low assault crime rates. Specifically, before the enactment of GAW laws, firms in states with high assault crime rates struggle to hire inventors. The adoption of GAW laws mitigates the deterring effect of assault crimes on talent recruitment for those firms. Therefore, those firms in states with high assault crime rates experience a significant increase in inventor in-flows. However, for firms in states with low assault crime rates, concerns with assault crime are not a deterring factor for firms' talent recruitment in the first place. Therefore, inventor in-flows of firms in states with low assault crime rates do not sensitively respond to the enactment of GAW laws. When the state's assault crime rate is meager, the enactment of GAW laws even negatively affects inventor in-flows. In short, our difference-in-differences analysis reveals that the *incremental* increase in inventor in-flows is larger for firms in states with high assault crime rates than those in states with low assault crime rates.

Next, we investigate whether assault crime rates moderate the relationship between GAW laws and corporate innovation outputs. We replace the dependent variables in equation 4 with the innovation measures and report the results in Table 10. We obtain similar to Table 9, the interactions between *GAW* and *Assault Rate* have significantly positive coefficients for *Citation Count* and *Citation Per Patent* while the main effect of *GAW* is insignificant or negative, implying that the *incremental* increase in corporate innovation efficiency is larger for firms in states with high assault crime rates relative to firms in states with low assault crime rates.

7 Conclusion

Exploiting the staggered adoption of state Guns-at-Work (GAW) laws (also known as Parking Lot Laws) which permit employees to bring guns to their employers' premises, we find that firms experience an increase in innovation performance following stronger workplace gun rights. The empirical analysis reveals that firms have increased inventor in-flows after the adoption of GAW laws, suggesting that talent recruitment could be the mechanism behind the effect of GAW laws on corporate innovation. Furthermore, we find that the impact of GAW laws on firms' inventor in-flows and innovation output is concentrated in states with more tolerant self-defense laws. Moreover, the effect of GAW laws on firms' inventor in-flows and innovation is positive only if the firm headquarters is in a state with a low assault crime rate. These results imply that better workplace gun rights provide inventors with a means of self-defense against potential assault threats, thus making inventors more open to moving in firms treated by GAW laws and promoting corporate innovation performance.

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Appendix A

Variable Definitions

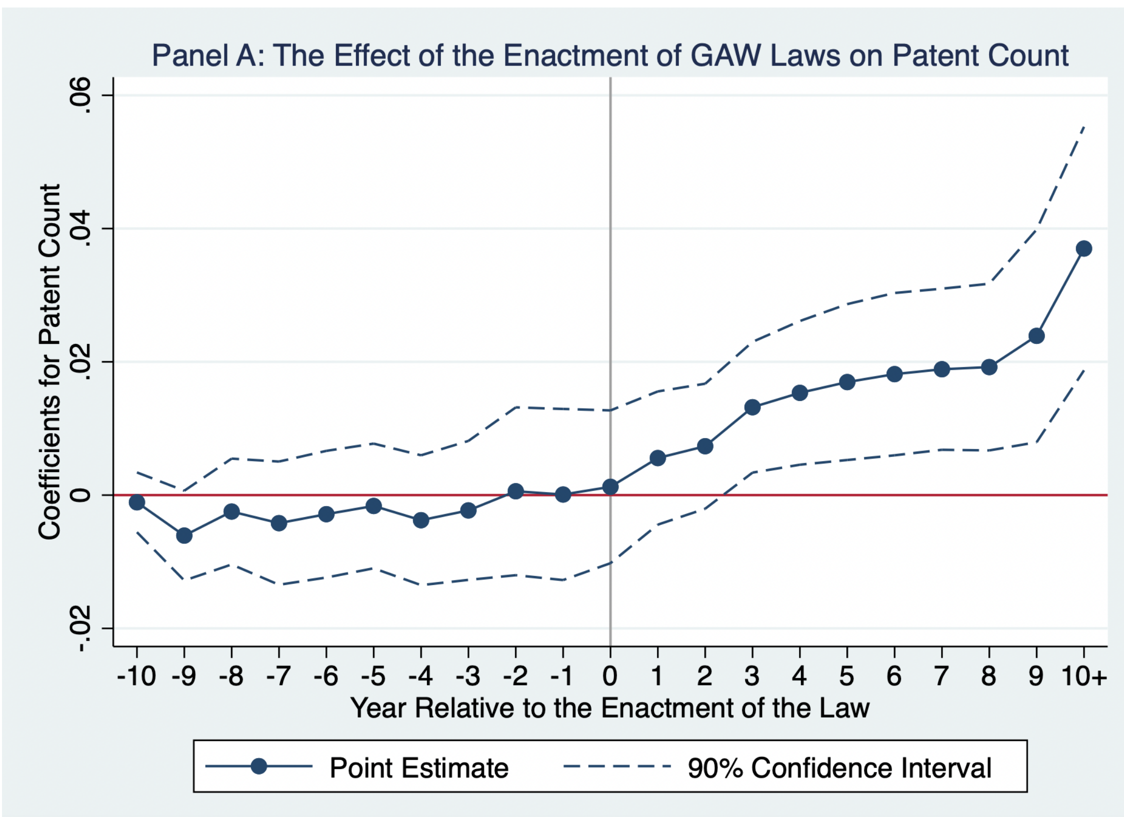
Variable	Definition (Compustat data item in parentheses when appropriate)	Data Source
GAW	A dummy that equals one if the GAW law has been enacted in the state and zero otherwise.	Duke Center for Firearms Law
Patent Count	The natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation.	Noah Stoffman's website
Citation Count	The natural logarithm of one plus the firm-year sum of citations (adjusted by the yearly mean of all patents) received by all patents.	Noah Stoffman's website
Citation Per Patent	The natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by total patent number (adjusted by yearly mean of all firms) for each firm-year observation.	Noah Stoffman's website
Log Assets	The natural logarithm of total assets (AT).	CRSP/Compustat Merged
Book Leverage	The sum of current liabilities (DLC) and long-term debt (DLTT) scaled by total assets (AT).	CRSP/Compustat Merged
Tobin's q	Market value of total assets (AT-CEQ+CSHO*PRCC_F) to book value of total assets (AT).	CRSP/Compustat Merged
Dividend	A dummy variable that equals one if dividend payment (DVP+DVC) is positive, and zero otherwise.	CRSP/Compustat Merged
Profitability	Operating income (OIBDP) scaled by total assets (AT).	CRSP/Compustat Merged
Cash Holding	Cash and short-term Investments (CHE) scaled by total assets (AT).	CRSP/Compustat Merged
Tangibility	Total property, plant, and equipment (PPENT) scaled by total assets (AT).	CRSP/Compustat Merged
R&D	R&D expense (XRD) scaled by total assets (AT).	CRSP/Compustat Merged

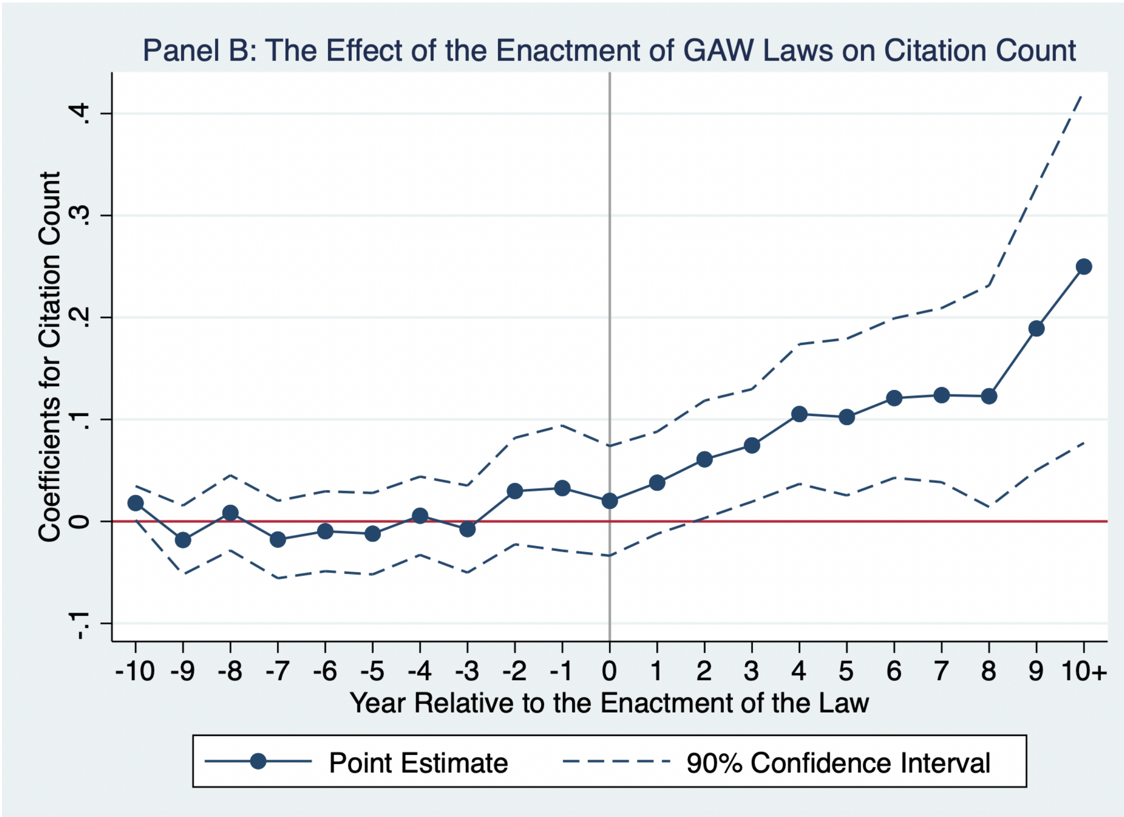
HI	Herfindahl Index: squaring the sales share of each firm competing in an industry (four-digit SIC) in a year, and then summing the resulting numbers.	CRSP/Compustat Merged
HI_squared	The square of HI.	CRSP/Compustat Merged
Log In	The natural logarithm of one plus the number of joining inventors for a firm in a year.	PatentsView
Net In	The natural logarithm of one plus the difference between the number of joining inventors and the number of leaving inventors for a firm in a year.	PatentsView
Total Inventors	The natural logarithm of one plus the total number of inventors for a firm in a year.	PatentsView
SDL	a dummy that equals one if the state has adopted the stand-your-ground law or expanded the castle doctrine to the workplace, and zero otherwise.	RAND State Firearm Law Database
Assault Rate	The number of aggravated assault crimes divided by the population (in thousands) in a state in a year.	Federal Bureau of Investigation
Governor's Party	A dummy that equals to 1 if state governor is a Republican, 0 otherwise.	National Governors Association
GDP Growth Rate	State-level real GDP growth rate.	U.S. Bureau of Economic Analysis
Log GDP Per Capita	The natural logarithm of state-level GDP per capita.	U.S. Bureau of Economic Analysis
Log Population	The natural logarithm of state population in thousands.	U.S. Census Bureau
Unemployment Rate	State-level unemployment rate.	U.S. Bureau of Labor Statistics
Violent Crime Rate	The number of violent crimes divided by the population (in thousands) in a state in a year.	Federal Bureau of Investigation

Police Density	The ratio of police officers to population (in thousands) in a state in a year.	Federal Bureau of Investigation

Figure 1: **The Dynamic Effect of the Enactment of GAW Laws on Innovation**

This graph shows the dynamic effect of the enactment of GAW laws on corporate innovation. *Patent Count* is the natural logarithm of one plus the patent count (adjusted by the yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by the total patent number (adjusted by yearly mean of all firms) for each firm-year observation. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state and zero otherwise. The y-axis denotes the coefficient estimates from regressing innovation measures on firm and year fixed effects and dummy variables indicating the year relative to the GAW law's adoption, for 10 years before and after the law's adoption. The last dummy is set to one if 10 or more years have passed since the enactment of the GAW law. The x-axis denotes the year relative to the enactment of the GAW law. The dashed lines plot the 90% confidence intervals of the coefficient estimates. Confidence intervals are calculated from robust standard errors clustered at the headquarter state. The sample period is 1994-2022.




Panel B: The Effect of the Enactment of GAW Laws on Citation Count
Coefficients for Citation Count
-.1
0
.1
.2
.3
.4
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10+
Year Relative to the Enactment of the Law
Point Estimate
90% Confidence Interval

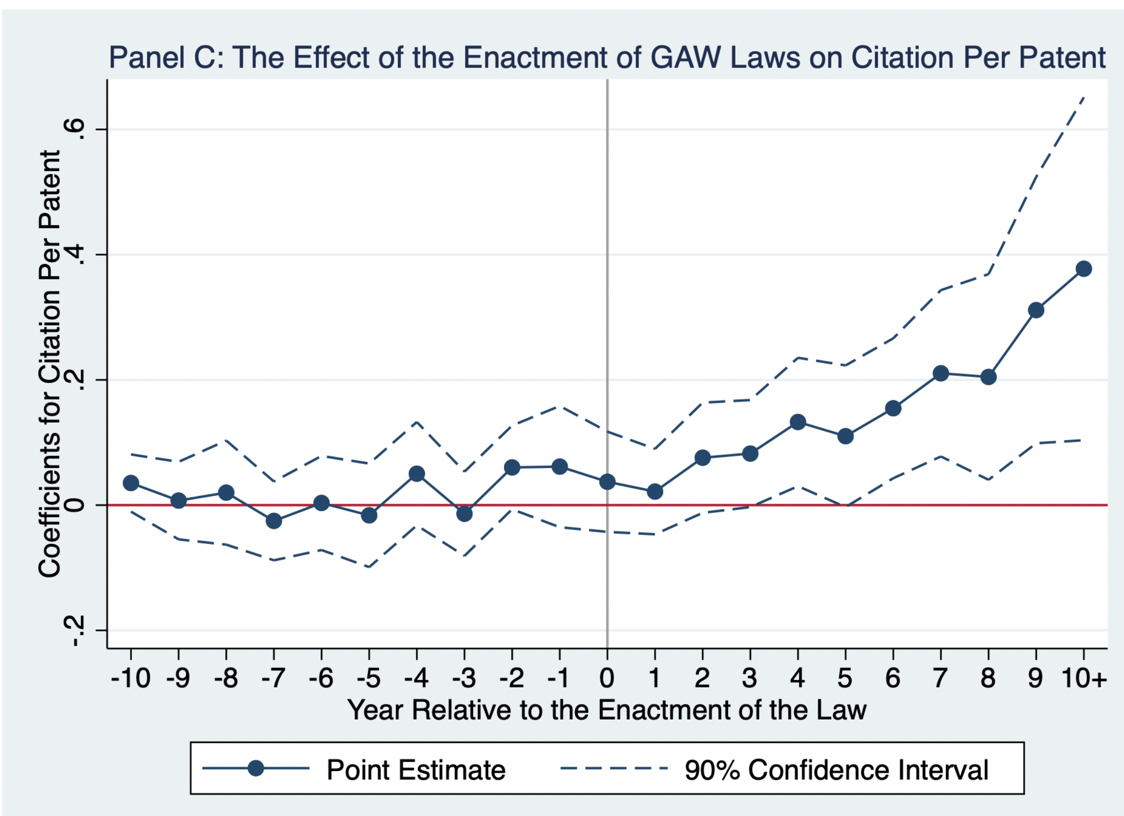

Panel C: The Effect of the Enactment of GAW Laws on Citation Per Patent
Coefficients for Citation Per Patent
-.2
0
.2
.4
.6
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10+
Year Relative to the Enactment of the Law
Point Estimate
90% Confidence Interval

Table 1: **Enactment of Guns-at-Work Laws by State and Year**

This table presents the state and the enactment year of Guns-at-Work (GAW) laws (also known as Parking Lot Laws). The information is from the website of Duke Center for Firearms Laws: https://firearmslaw.duke.edu/2020/06/parking-lot-laws-their-content-and-applicability/.

State	Year of Enactment
Minnesota	2004
Oklahoma	2004
Alaska	2005
Kentucky	2006
Mississippi	2006
Florida	2008
Louisiana	2008
Arizona	2009
Idaho	2009
Nebraska	2009
Utah	2009
Kansas	2010
Maine	2011
North Dakota	2011
Texas	2011
Indiana	2012
Virginia	2012
Alabama	2013
Illinois	2013
Tennessee	2013
Georgia	2016
Arkansas	2017
Ohio	2017
Wisconsin	2017
West Virginia	2018

Table 2: **Descriptive Statistics**

This table provides descriptive statistics of the main variables. The sample includes firms headquartered and incorporated in the US and excludes utilities (SIC 4900-4999) and financial firms (SIC 6000-6999). All the continuous variables are winsorized at the 1st and 99th percentiles by year. The detailed definitions of variables and data sources can be found in Appendix A.

	Mean	S.D.	P5	P50	P95	Count
GAW	0.150	0.357	0.000	0.000	1.000	73,258
Patent Count	0.073	0.252	0.000	0.000	0.415	73,258
Citation Count	0.524	1.196	0.000	0.000	3.443	73,258
Citation Per Patent	0.927	1.687	0.000	0.000	4.576	73,258
Log Assets	5.870	2.104	2.535	5.807	9.531	73,258
Book Leverage	0.228	0.236	0.000	0.175	0.673	73,258
Tobin's q	2.266	2.183	0.774	1.570	6.151	73,258
Dividend	0.358	0.479	0.000	0.000	1.000	73,258
Profitability	-0.005	0.318	-0.637	0.091	0.266	73,258
Cash Holding	0.243	0.264	0.005	0.134	0.847	73,258
Tangibility	0.236	0.230	0.011	0.152	0.759	73,258
R&D	0.077	0.155	0.000	0.006	0.387	73,258
HI	0.305	0.215	0.094	0.231	0.791	73,258
HI_squared	0.139	0.208	0.009	0.054	0.626	73,258
Log In	0.524	1.083	0.000	0.000	3.045	73,258
Net In	0.402	1.072	-0.693	0.000	2.833	73,258
Total Inventors	1.098	1.623	0.000	0.000	4.585	73,258
SDL	0.266	0.442	0.000	0.000	1.000	73,258
Assault Rate	2.721	0.943	1.310	2.633	4.407	67,505
Governor's Party	0.541	0.498	0.000	1.000	1.000	67,497
GDP Growth Rate	2.221	2.488	-2.400	2.300	6.800	67,497
Log GDP Per Capita	10.797	0.239	10.426	10.790	11.230	67,497
Log Population	16.266	0.862	14.891	16.273	17.460	67,497
Unemployment Rate	5.790	2.041	3.300	5.300	10.100	67,497
Violent Crime Rate	4.397	1.275	2.397	4.280	6.719	67,497
Police Density	0.877	0.203	0.531	0.875	1.281	67,497

Table 3: **Baseline Model**

This table presents the results for the baseline effect of Guns-at-Work (GAW) laws on corporate innovation. *Patent Count* is the natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by the total patent number (adjusted by yearly mean of all firms) for each firm-year observation. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Patent Count		Citation Count		Citation Per Patent	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	0.016***	0.015***	0.094**	0.087**	0.121**	0.109**
	(0.01)	(0.01)	(0.04)	(0.04)	(0.05)	(0.05)
Log Assets		0.021***		0.115***		0.151***
		(0.00)		(0.01)		(0.01)
Book Leverage		-0.013***		-0.112***		-0.210***
		(0.00)		(0.02)		(0.06)
Tobin's q		-0.001		0.006***		0.022***
		(0.00)		(0.00)		(0.00)
Dividend		0.001		0.007		0.004
		(0.00)		(0.01)		(0.02)
Profitability		-0.009**		-0.037		-0.039
		(0.00)		(0.02)		(0.05)
Cash Holding		0.014**		0.232***		0.441***
		(0.01)		(0.08)		(0.11)
Tangibility		0.052***		0.310***		0.462***
		(0.01)		(0.07)		(0.08)
R&D		0.045***		0.272***		0.333***
		(0.01)		(0.07)		(0.11)
HI		0.051**		-0.044		-0.219
		(0.03)		(0.12)		(0.21)
HI_squared		-0.009		0.252*		0.445**
		(0.03)		(0.14)		(0.19)
Constant	0.071***	-0.082***	0.510***	-0.326***	0.909***	-0.216
	(0.00)	(0.02)	(0.01)	(0.11)	(0.01)	(0.13)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	73,258	73,258	73,258	73,258	73,258	73,258
Adjusted R^2	0.83	0.83	0.75	0.75	0.59	0.60

Table 4: **Dynamic Analysis**

This table provides the results from estimating the dynamic difference-in-differences regression. *Patent Count* is the natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by the total patent number (adjusted by yearly mean of all firms) for each firm-year observation. GAW^{-3}, GAW^{-2}, GAW^{-1}, GAW^{0}, GAW^{+1}, GAW^{+2}, GAW^{3+} are dummies that equal to one if the firm is headquartered in a state that: (1) will enact the GAW law three years later; (2) will enact the GAW law two years later; (3) will enact the GAW law one year later; (4) enacts the GAW law in the year; (5) enacted the GAW law one year ago; (6) enacted the GAW law two years ago; (7) enacted the GAW law three or more years ago. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Patent Count		Citation Count		Citation Per Patent	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW^{-3}	0.001	-0.000	0.008	0.000	-0.003	-0.017
	(0.00)	(0.00)	(0.02)	(0.02)	(0.04)	(0.04)
GAW^{-2}	0.003	0.002	0.044	0.034	0.069*	0.052
	(0.00)	(0.00)	(0.03)	(0.03)	(0.04)	(0.04)
GAW^{-1}	0.004	0.002	0.052	0.041	0.074	0.055
	(0.00)	(0.00)	(0.03)	(0.03)	(0.06)	(0.05)
GAW^{0}	0.005	0.003	0.034	0.022	0.041	0.020
	(0.00)	(0.00)	(0.04)	(0.03)	(0.06)	(0.05)
GAW^{+1}	0.009**	0.008	0.054*	0.042	0.036	0.016
	(0.00)	(0.00)	(0.03)	(0.03)	(0.05)	(0.04)
GAW^{+2}	0.010**	0.009*	0.074**	0.062*	0.086*	0.068
	(0.00)	(0.00)	(0.03)	(0.03)	(0.05)	(0.05)
GAW^{3+}	0.022***	0.021***	0.139**	0.128**	0.195**	0.176**
	(0.01)	(0.01)	(0.06)	(0.05)	(0.08)	(0.07)
Controls	NO	YES	NO	YES	NO	YES
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	73,258	73,258	73,258	73,258	73,258	73,258
Adjusted R^2	0.83	0.83	0.75	0.75	0.59	0.60

Table 5: **Inventor In-flows**

This table provides the results for the effect of GAW laws on firms' inventor in-flows. *Log In* is calculated as the natural logarithm of one plus the number of joining inventors for a firm in a year. *Net In* is calculated as the natural logarithm of one plus the difference between the number of joining inventors and the number of leaving inventors for a firm in a year. *Total inventors* is calculated as the natural logarithm of one plus the total number of inventors for a firm in a year. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Log In		Net In		Total Inventors	
	(1)	(2)	(3)	(4)	(7)	(8)
GAW	0.059*	0.053*	0.092**	0.085**	0.069**	0.064**
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
Log Assets		0.121***		0.122***		0.161***
		(0.01)		(0.01)		(0.02)
Book Leverage		-0.079***		-0.132***		-0.037
		(0.02)		(0.02)		(0.03)
Tobin's q		0.002		0.008***		-0.006***
		(0.00)		(0.00)		(0.00)
Dividend		0.005		-0.010		0.015
		(0.01)		(0.02)		(0.02)
Profitability		-0.050***		-0.078***		-0.001
		(0.01)		(0.02)		(0.02)
Cash Holding		0.206***		0.229***		0.252***
		(0.05)		(0.08)		(0.05)
Tangibility		0.273***		0.292***		0.388***
		(0.06)		(0.07)		(0.07)
R&D		0.211***		0.118***		0.452***
		(0.04)		(0.04)		(0.07)
HI		-0.048		-0.112		0.243
		(0.11)		(0.12)		(0.16)
HI_squared		0.178		0.229		-0.033
		(0.14)		(0.16)		(0.18)
Constant	0.516***	-0.323***	0.388***	-0.442***	1.087***	-0.096
	(0.00)	(0.09)	(0.01)	(0.10)	(0.00)	(0.13)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	73,258	73,258	73,258	73,258	73,258	73,258
Adjusted R^2	0.73	0.74	0.56	0.56	0.87	0.87

Table 6: **Adoption of Self-defense Laws by State and Year**

This table presents the state and the effective year of self-defense laws (SDL). We include the "Stand Your Ground" laws or the expansion of the "Castle Doctrine" to individuals' workplaces. The information is from the RAND State Firearm Law Database: https://www.rand.org/pubs/tools/TLA243-2-v2.html.

State	Law Category	Effective Year
Alaska	Castle Doctrine Expanded to Workplace	2006
Alaska	Stand Your Ground	2013
Alabama	Stand Your Ground	2006
Arizona	Stand Your Ground	2006
Connecticut	Castle Doctrine Expanded to Workplace	1971
Delaware	Castle Doctrine Expanded to Workplace	1973
Florida	Stand Your Ground	2005
Georgia	Stand Your Ground	2006
Hawaii	Castle Doctrine Expanded to Workplace	1973
Iowa	Castle Doctrine Expanded to Workplace	1978
Iowa	Stand Your Ground	2017
Idaho	Castle Doctrine Expanded to Workplace	2018
Idaho	Stand Your Ground	2018
Indiana	Stand Your Ground	2006
Kansas	Stand Your Ground	2006
Kentucky	Stand Your Ground	2006
Louisiana	Castle Doctrine Expanded to Workplace	1977
Louisiana	Stand Your Ground	2006
Michigan	Stand Your Ground	2006
Missouri	Stand Your Ground	2016
Mississippi	Stand Your Ground	2006
Montana	Stand Your Ground	2009
North Carolina	Stand Your Ground	2011
North Dakota	Castle Doctrine Expanded to Workplace	1975
Nebraska	Castle Doctrine Expanded to Workplace	1972
New Hampshire	Stand Your Ground	2011
Nevada	Stand Your Ground	2011
Ohio	Stand Your Ground	2021
Oklahoma	Stand Your Ground	2006
Pennsylvania	Castle Doctrine Expanded to Workplace	1973
Pennsylvania	Stand Your Ground	2011
South Carolina	Stand Your Ground	2006
South Dakota	Stand Your Ground	2006
Tennessee	Stand Your Ground	2007
Texas	Stand Your Ground	2007
Utah	Stand Your Ground	1994
Wisconsin	Castle Doctrine Expanded to Workplace	2011
West Virginia	Stand Your Ground	2008
Wyoming	Stand Your Ground	2018

Table 7: **Self-defense Laws and Inventor In-flows**

This table reports the results for the moderating effect of self-defense laws (SDL) in the relationship between GAW laws and firms' inventor in-flows. *Log In* is calculated as the natural logarithm of one plus the number of joining inventors for a firm in a year. *Net In* is calculated as the natural logarithm of one plus the difference between the number of joining inventors and the number of leaving inventors for a firm in a year. *Total inventors* is calculated as the natural logarithm of one plus the total number of inventors for a firm in a year. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. *SDL* is defined as a dummy equal to one if the state has adopted the stand-your-ground law or expanded the castle doctrine to the workplace, and zero otherwise. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Log In		Net In		Total Inventors	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	-0.015	-0.005	0.005	0.015	-0.039	-0.026
	(0.04)	(0.04)	(0.05)	(0.05)	(0.03)	(0.04)
SDL	0.008	0.001	0.035	0.026	-0.031	-0.039**
	(0.02)	(0.02)	(0.04)	(0.04)	(0.02)	(0.02)
GAW*SDL	0.099***	0.080**	0.105***	0.086**	0.162***	0.140***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Log Assets		0.120***		0.121***		0.160***
		(0.01)		(0.01)		(0.02)
Book Leverage		-0.078***		-0.131***		-0.036
		(0.02)		(0.02)		(0.03)
Tobin's q		0.002		0.008***		-0.006***
		(0.00)		(0.00)		(0.00)
Dividend		0.004		-0.011		0.014
		(0.01)		(0.02)		(0.02)
Profitability		-0.049***		-0.076***		-0.000
		(0.01)		(0.02)		(0.02)
Cash Holding		0.204***		0.226***		0.251***
		(0.05)		(0.08)		(0.05)
Tangibility		0.269***		0.287***		0.383***
		(0.06)		(0.07)		(0.07)
R&D		0.210***		0.118***		0.450***
		(0.04)		(0.04)		(0.07)
HI		-0.035		-0.097		0.263
		(0.11)		(0.13)		(0.16)
HI_squared		0.168		0.218		-0.048
		(0.14)		(0.17)		(0.18)
Constant	0.514***	-0.321***	0.380***	-0.443***	1.094***	-0.086
	(0.01)	(0.09)	(0.01)	(0.11)	(0.01)	(0.13)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES

Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	73,258	73,258	73,258	73,258	73,258	73,258
Adjusted R^2	0.73	0.74	0.56	0.56	0.87	0.87

Table 8: **Self-defense Laws and Innovation**

This table reports the results for the moderating effect of self-defense laws (SDL) in the relationship between GAW laws and corporate innovation. *Patent Count* is the natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by the total patent number (adjusted by yearly mean of all firms) for each firm-year observation. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. *SDL* is defined as a dummy equal to one if the state has adopted the stand-your-ground law or expanded the castle doctrine to the workplace, and zero otherwise. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Patent Count		Citation Count		Citation Per Patent	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	0.007	0.009	0.022	0.030	0.008	0.021
	(0.01)	(0.01)	(0.04)	(0.04)	(0.06)	(0.06)
SDL	-0.000	-0.001	0.015	0.007	-0.010	-0.025
	(0.00)	(0.00)	(0.03)	(0.03)	(0.05)	(0.04)
GAW*SDL	0.012**	0.009**	0.093***	0.075***	0.159***	0.132***
	(0.00)	(0.00)	(0.03)	(0.03)	(0.05)	(0.04)
Log Assets		0.021***		0.114***		0.150***
		(0.00)		(0.01)		(0.01)
Book Leverage		-0.013***		-0.111***		-0.209***
		(0.00)		(0.02)		(0.06)
Tobin's q		-0.001		0.006***		0.022***
		(0.00)		(0.00)		(0.00)
Dividend		0.001		0.006		0.003
		(0.00)		(0.01)		(0.02)
Profitability		-0.009*		-0.036		-0.038
		(0.00)		(0.02)		(0.05)
Cash Holding		0.013**		0.230***		0.440***
		(0.01)		(0.08)		(0.11)
Tangibility		0.051***		0.307***		0.457***
		(0.01)		(0.07)		(0.08)
R&D		0.045***		0.272***		0.332***
		(0.01)		(0.07)		(0.11)
HI		0.052**		-0.031		-0.200
		(0.03)		(0.12)		(0.21)
HI_squared		-0.010		0.243*		0.430**
		(0.03)		(0.14)		(0.19)
Constant	0.071***	-0.082***	0.506***	-0.325***	0.911***	-0.208
	(0.00)	(0.02)	(0.01)	(0.11)	(0.02)	(0.13)

Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	73,258	73,258	73,258	73,258	73,258	73,258
Adjusted R^2	0.83	0.83	0.75	0.75	0.59	0.60

Table 9: **Assault Crimes and Inventor In-flows**

This table reports the results for the interactions among GAW laws, assault crimes, and firms' inventor in-flows. *Log In* is calculated as the natural logarithm of one plus the number of joining inventors for a firm in a year. *Net In* is calculated as the natural logarithm of one plus the difference between the number of joining inventors and the number of leaving inventors for a firm in a year. *Total inventors* is calculated as the natural logarithm of one plus the total number of inventors for a firm in a year. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. *Assault Rate* is calculated as the natural logarithm of the number of aggravated assault crimes divided by the population (in thousands) in a state in a year. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Log In		Net In		Total Inventors	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	-0.097**	-0.094**	-0.044	-0.042	-0.145**	-0.141**
	(0.04)	(0.04)	(0.06)	(0.06)	(0.06)	(0.06)
Assault Rate	0.002	0.002	0.018	0.017	-0.023*	-0.021*
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)
GAW*Assault Rate	0.054***	0.050***	0.051***	0.046***	0.071***	0.066***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Log Assets		0.133***		0.137***		0.169***
		(0.02)		(0.02)		(0.02)
Book Leverage		-0.108***		-0.161***		-0.069***
		(0.02)		(0.02)		(0.02)
Tobin's q		0.007***		0.013***		-0.001
		(0.00)		(0.00)		(0.00)
Dividend		0.007		-0.009		0.012
		(0.01)		(0.02)		(0.01)
Profitability		-0.060***		-0.089***		-0.017
		(0.01)		(0.02)		(0.02)
Cash Holding		0.122***		0.162**		0.103**
		(0.04)		(0.08)		(0.05)
Tangibility		0.152***		0.193***		0.187***
		(0.05)		(0.06)		(0.06)
R&D		0.215***		0.126***		0.394***
		(0.05)		(0.04)		(0.11)
HI		-0.039		-0.102		0.212
		(0.11)		(0.13)		(0.16)
HI_squared		0.148		0.208		-0.048
		(0.14)		(0.18)		(0.18)
Constant	0.554***	-0.302**	0.371***	-0.506***	1.239***	0.105
	(0.04)	(0.14)	(0.08)	(0.18)	(0.03)	(0.15)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES

N	67,505	67,505	67,505	67,505	67,505	67,505
Adjusted R^2	0.78	0.78	0.59	0.60	0.91	0.92

Table 10: **Assault Crimes and Innovation**

This table reports the results for the interactions among GAW laws, assault crimes, and corporate innovation. *Patent Count* is the natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by the total patent number (adjusted by yearly mean of all firms) for each firm-year observation. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. *Assault Rate* is calculated as the natural logarithm of the number of aggravated assault crimes divided by the population number in a state in a year. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Patent Count		Citation Count		Citation Per Patent	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	0.006	0.007	-0.047	-0.043	-0.158**	-0.154**
	(0.01)	(0.01)	(0.05)	(0.05)	(0.06)	(0.06)
Assault Rate	-0.004**	-0.004**	-0.002	-0.003	0.030	0.025
	(0.00)	(0.00)	(0.02)	(0.01)	(0.03)	(0.02)
GAW*Assault Rate	0.003	0.002	0.046***	0.041***	0.095***	0.088***
	(0.00)	(0.00)	(0.02)	(0.01)	(0.02)	(0.02)
Log Assets		0.022***		0.129***		0.172***
		(0.00)		(0.02)		(0.02)
Book Leverage		-0.018***		-0.136***		-0.244***
		(0.00)		(0.03)		(0.06)
Tobin's q		-0.000		0.014***		0.031***
		(0.00)		(0.00)		(0.00)
Dividend		0.001		0.004		-0.003
		(0.00)		(0.01)		(0.02)
Profitability		-0.009**		-0.046*		-0.056
		(0.00)		(0.02)		(0.05)
Cash Holding		0.002		0.141*		0.331***
		(0.01)		(0.08)		(0.11)
Tangibility		0.038***		0.207***		0.310***
		(0.01)		(0.07)		(0.09)
R&D		0.044***		0.257***		0.295**
		(0.01)		(0.09)		(0.14)
HI		0.049*		-0.055		-0.253
		(0.03)		(0.14)		(0.22)
HI_squared		-0.013		0.242*		0.452**
		(0.03)		(0.14)		(0.20)
Constant	0.088***	-0.062**	0.562***	-0.305	0.911***	-0.251
	(0.01)	(0.02)	(0.05)	(0.18)	(0.07)	(0.21)

Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	67,505	67,505	67,505	67,505	67,505	67,505
Adjusted R^2	0.86	0.87	0.79	0.80	0.62	0.62

Internet Appendix for Workplace Gun Rights and Corporate Innovation

Julian Atanassov Lin Deng Yu He

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Table IA1: **Excluding Industries with Geographically Dispersed Workforce**

This table presents the results for the baseline effect of Guns-at-Work (GAW) laws on corporate innovation, excluding industries in which the workforce is likely to be geographically dispersed, namely retail (SIC 5200-5900), wholesale (SIC 5000-5190), and transport (SIC 4231-4731). *Patent Count* is the natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by total patent number (adjusted by yearly mean of all firms) for each firm-year observation. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Patent Count		Citation Count		Citation Per Patent	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	0.017***	0.016***	0.093**	0.084**	0.118**	0.104*
	(0.01)	(0.01)	(0.04)	(0.04)	(0.06)	(0.05)
Log Assets		0.023***		0.119***		0.156***
		(0.00)		(0.01)		(0.01)
Book Leverage		-0.016***		-0.138***		-0.261***
		(0.01)		(0.03)		(0.06)
Tobin's q		-0.001		0.006**		0.022***
		(0.00)		(0.00)		(0.00)
Dividend		0.000		0.002		-0.006
		(0.00)		(0.01)		(0.02)
Profitability		-0.010**		-0.037		-0.034
		(0.00)		(0.03)		(0.05)
Cash Holding		0.011		0.220***		0.416***
		(0.01)		(0.08)		(0.10)
Tangibility		0.048***		0.281***		0.369***
		(0.01)		(0.07)		(0.08)
R&D		0.046***		0.277***		0.344***
		(0.01)		(0.07)		(0.12)
HI		0.036		-0.149		-0.410
		(0.03)		(0.15)		(0.25)
HI_squared		0.002		0.352**		0.627***
		(0.03)		(0.16)		(0.22)
Constant	0.081***	-0.072***	0.578***	-0.243**	1.021***	-0.055
	(0.00)	(0.02)	(0.01)	(0.11)	(0.01)	(0.13)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	63,774	63,774	63,774	63,774	63,774	63,774
Adjusted R^2	0.83	0.83	0.75	0.75	0.59	0.59

Table IA2: **Controlling for State Level Factors**

This table provides the results from estimating the baseline model controlling the economic and political factors at the firms' headquarter state level. *Patent Count* is the natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by total patent number (adjusted by yearly mean of all firms) for each firm-year observation. *GAW* is defined as a dummy equal to one if the GAW law has been enacted in the state, and zero otherwise. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Patent Count		Citation Count		Citation Per Patent	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	0.013***	0.011***	0.070**	0.059**	0.085**	0.072**
	(0.00)	(0.00)	(0.03)	(0.02)	(0.04)	(0.03)
Log Assets		0.022***		0.130***		0.173***
		(0.00)		(0.02)		(0.02)
Book Leverage		-0.018***		-0.137***		-0.246***
		(0.00)		(0.03)		(0.06)
Tobin's q		-0.000		0.014***		0.031***
		(0.00)		(0.00)		(0.00)
Dividend		0.001		0.005		-0.002
		(0.00)		(0.01)		(0.02)
Profitability		-0.009**		-0.046*		-0.056
		(0.00)		(0.02)		(0.05)
Cash Holding		0.002		0.141*		0.332***
		(0.01)		(0.08)		(0.11)
Tangibility		0.038***		0.208***		0.313***
		(0.01)		(0.07)		(0.09)
R&D		0.044***		0.260***		0.301**
		(0.01)		(0.09)		(0.15)
HI		0.049*		-0.061		-0.264
		(0.03)		(0.14)		(0.22)
HI_squared		-0.012		0.247*		0.463**
		(0.03)		(0.14)		(0.20)
Governor's Party		0.000		-0.021**		-0.032*
		(0.00)		(0.01)		(0.02)
GDP Growth Rate		-0.000		-0.002		0.001
		(0.00)		(0.00)		(0.00)
Log GDP Per Capita		-0.032		-0.233*		-0.293
		(0.02)		(0.13)		(0.19)
Log Population		0.003		0.009		-0.010
		(0.00)		(0.01)		(0.03)

Unemployment Rate		0.001		-0.003		-0.008
		(0.00)		(0.00)		(0.01)
Violent Crime Rate		-0.003		-0.008		0.012
		(0.00)		(0.01)		(0.01)
Police Density		0.002		0.026		0.035
		(0.00)		(0.02)		(0.03)
Constant	0.076***	0.219	0.556***	2.053	0.992***	3.073
	(0.00)	(0.19)	(0.00)	(1.24)	(0.01)	(1.95)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
N	67,497	67,497	67,497	67,497	67,497	67,497
Adjusted R^2	0.86	0.87	0.79	0.80	0.62	0.62

Table IA3: **Stacked Sample**

This table reports the stacked regression estimators (Gormley and Matsa, 2011). For each year that a state enacts the GAW law, we construct a cohort of treated firms (headquartered in the state) and control firms (headquartered in a state without the GAW law in that year yet) for five years before and after the enactment of the GAW law. In each cohort, if a control firm is treated by the GAW law in a later year, we drop those post-treatment control observations. Then we stack all the cohorts into one dataset to estimate the average treatment effect. *Patent Count* is the natural logarithm of one plus the patent count (adjusted by yearly mean of all firms) for each firm-year observation. *Citation Count* is the natural logarithm of one plus the sum of citations (adjusted by the yearly mean of all patents) received by all patents for each firm-year observation. *Citation Per Patent* is the natural logarithm of one plus total citations (adjusted by the yearly mean of all patents) divided by the total patent number (adjusted by yearly mean of all firms) for each firm-year observation. *GAW* is defined as a dummy equal to one if the GAW law has been enacted, and zero otherwise. The detailed definitions of variables can be found in Appendix A. Robust standard errors (in parentheses) are clustered at the headquarter state level. The superscripts *, **, and *** denote significance at 0.10, 0.05, and 0.01 levels, respectively.

	Patent Count		Citation Count		Citation Per Patent	
	(1)	(2)	(3)	(4)	(5)	(6)
GAW	0.014***	0.013***	0.057**	0.053**	0.048	0.042
	(0.00)	(0.00)	(0.02)	(0.02)	(0.03)	(0.03)
Log Assets		0.019***		0.114***		0.160***
		(0.00)		(0.01)		(0.02)
Book Leverage		-0.011**		-0.131***		-0.234***
		(0.00)		(0.03)		(0.05)
Tobin's q		-0.001		0.008***		0.025***
		(0.00)		(0.00)		(0.00)
Dividend		-0.000		-0.004		-0.026
		(0.00)		(0.01)		(0.02)
Profitability		-0.008**		-0.041*		-0.056
		(0.00)		(0.02)		(0.05)
Cash Holding		0.007		0.172***		0.321***
		(0.00)		(0.06)		(0.09)
Tangibility		0.030**		0.233***		0.298**
		(0.01)		(0.08)		(0.11)
R&D		0.033***		0.197**		0.208*
		(0.01)		(0.08)		(0.11)
HI		0.029		-0.046		-0.191
		(0.03)		(0.14)		(0.26)
HI_squared		-0.012		0.171		0.311
		(0.03)		(0.12)		(0.20)
Constant	0.100***	-0.031*	0.691***	-0.112	1.185***	0.075
	(0.00)	(0.02)	(0.00)	(0.12)	(0.00)	(0.16)
Firm*Cohort Fixed Effects	YES	YES	YES	YES	YES	YES

Year*Cohort Fixed Effects	YES	YES	YES	YES	YES	YES
N	249,046	249,046	249,046	249,046	249,046	249,046
Adjusted R^2	0.92	0.92	0.85	0.85	0.68	0.68