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Guns of Fortune: How Guns Move to Fulfill Demand

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Introduction

No industrial country in the world comes close to America in firearm homicides; the U.S.'s closest competitors enjoy a rate less than one-third of ours.[1] Despite this fact, gun ownership retains a unique political status in American culture. Gun manufacturers have federally granted immunity against civil lawsuits as a result of crimes committed with their products, an unusual and advantageous legal protection representing the strength of their industry in public policy. Because of the unwillingness of the American federal government to engage the topic of gun ownership, states are powerful vehicles of firearm regulation. Experimentation in gun law has allowed substantial analysis to examine the effectiveness of individual regulatory policies for firearms, and the results have been mixed.

Gun Regulation and Gun Violence

The overall prognosis for controlling gun violence has not been positive. Studies in the past have examined the overall effectiveness of regulation on gun violence and determined that the best predictors of gun violence are consistently socioeconomic indicators like alcohol consumption, unemployment and poverty, rather than local gun laws.[2]

Studies have found that stricter gun laws are not correlated with lower gun violence. One possible explanation for the inability to control gun violence is the sheer size of the American gun stock, commonly estimated to be around 350 million guns.[3] The overwhelming availability of guns in America means that no matter what laws are passed to curb ownership, it is nearly impossible to remove guns from circulation.[4]

However, firearms (both illegal and legal) are not uniformly distributed across the United States. Some work has investigated the connection between local gun markets to prevalence of

violence. For instance, the proportion of gun-related homicides has been found to be a useful indicator of gun availability across small areas such as neighborhoods. However, the proportion for other types of gun-violence like suicide and accidental discharges are less effective at indicating local gun stocks, even on the micro level.[5]

At least one study has examined gun regulations on a state by state basis and been able to provide evidence that a state's overall attitude towards gun control has a more important and measurable effect on gun violence than any individual law. This can represent the cumulative effect of multiple laws directed towards the same end, but it can also be an indicator of the level of 'seriousness' a state has towards gun regulation. Even then, socioeconomic factors continue to be the ruling predictor of violence.[6]

Decentralization Theory and Market Adaptation Theory

This study is an attempt to explore if piece-meal regulation fails because of the U.S.'s nationalized system of commerce. Decentralization theory argues that local decision making is superior to a centralized authority because local institutions hold a more specific understanding of local preferences and needs.[7] With regards to firearm regulation, local legislative bodies are more acutely aware of specific problems affecting their states and likewise are more aware of available solutions capable of solving those problems, namely how to affect the prevalence of local gun violence. Or as Howard Dean put it, *"It is unreasonable to apply laws that may be necessary in California to rural states like Montana or Vermont."*[8]

Empirical evidence testing decentralized policies has not always bore out the assertion that "local is better". In an analysis of 87 countries from the 1970s through 1980s, no relationship was easily discernable between decentralization and level of inflation, customarily a

measure of effective monetary policy.[9] However, the same analysis did note that decentralization does tend to "lock in" economic status by preventing change through the prevalence of additional veto players. For gun laws, this can explain why national gun control policies might be so slow to change. The existence of multiple levels of actors capable of stepping in to stop gun regulation on the national stage "locks in" the current status quo and creates resilience to change. It is important to note that this analysis did not discover a clear answer for whether decentralization leads to *better* policy, just that whatever policy is in place is slow to change and adapt.

Another crucial critique of decentralization is the relative stability inherent in a central authority over various regions of a territory. Regions tend to be specialized and decentralization is a barrier to regions working together to ensure overall strength rather than local prosperity. Regional disparities are unlikely to be addressed through strictly local means because severe problems are increasingly unlikely to be the result of strictly local factors.[10] For instance, invasive species of flora and fauna cannot be controlled simply through the actions of a local government, because these species are inherently nonlocal. Controlling how invasive plants and animals are transferred to places ill-suited to combat them requires cooperation between regions when the incentive to cooperate is not universally distributed.[11]

For the purposes of this analysis, gun violence can be viewed as simply a disparity between states. Because gun policy is so decentralized, states encounter a natural barrier to addressing the disparity of gun violence within their local territory. Local policy making does not naturally include concern for the effects on your geographic neighbors. There is no inherent incentive for a state to cooperate with its neighbors if its local laws have a deleterious effect on

them. A centralized authority is better equipped to realize the national consequences of a state's local laws, and pass universal policy which more evenly distributes the burden of regulation.

This study argues that overreliance on decentralization of gun control policies marginalize local decision makers, preventing local laws from producing the desired outcomes of regulation because of the policies of their neighbors. With regard to gun regulation, states with a strong desire to control gun ownership because of prevalent violence will have their efforts undercut by the policies of neighboring states.

The prevailing mantra of decentralization theorists, and indeed many politicians, is to 'let the states decide'. They argue that local governments are more capable of understanding the unique needs of their constituents, and are better equipped to address them. In some important cases, decentralized policies have been shown to have a significant impact on public health, most notably in decreasing infant mortality.[12] However, on public health campaigns reliant on public education, decentralized paths to legislation often lead to fragmented policies lacking an overall effective message necessary for impacting national public health.[13] Additionally, on issues of unique national consequence, decentralized policies have been found to undermine the ability of states to secure their own interests. Environmental protection policies require a large degree of agreement and cooperation amongst regional interests to ensure even the protection of local resources, and states have been unwilling to continue these policies when centralized authority is not present.[14]

This study puts forward the idea that the nature of markets have changed significantly enough that regional separation is no longer a sufficient barrier to market spillover. Regional markets are no longer capable of being controlled by local regulations, because they are no longer separated from each other.

Market adaptability to gun regulations relies on key assumptions about guns in the United States. Primarily, that there is a restrictive quality inherent to gun regulations that is as important to your ability to participate in the market as prices. Indeed, the main mechanism by which laws overcome individual desire for controlled products is restriction of access. Market adaptability assumes that policy makers have basic competence in crafting regulations capable of restricting access locally. If a law is passed in a state restricting access, it will be harder to obtain those products legally.

Additionally, this theory assumes that access restriction does not impact demand. Demand for a specific product, in this case firearms, is not lessened through restricted access to those products. Personal desire for a weapon is not related to the realities of whether or not it is possible to legally obtain one. The characteristics of the market, which may be socioeconomic, determine local and regional demand for firearms, regardless of access.[15] In fact, regulation only goes so far as to create an artificial *supply problem*.

Finally, the United States employs a unique interstate commerce system that is relatively free from regulation enforcement across state lines. It is remarkably easy for citizens of one state to travel across borders and participate in competing markets. This can be as simple as driving to a neighboring town to buy goods at a slightly cheaper price, or making longer treks across state lines to buy products not available locally. In cases where consumers feel the need to circumvent the supply problem, the supply problem often was an artificial creation as a result of regulations. Differences in taxation on gas between states may encourage savvy consumers to travel significant distances for better prices. Likewise, in states which outlaw firework sales, consumers are quick to look for loopholes, or to travel to neighboring states in which they are legal.[16] These are examples of consumers effectively circumventing artificial supply problems in

order to obtain desired goods. What makes this system relatively free from regulation enforcement is that states do not set up check points at the border to ensure residents can't bring back undesirable products nor do they have in place 'tariffs' for buying goods out of state which may recover lost tax revenue from circumvention.

These assumptions about economic realities for gun control serve as a capable explanation for why regulation has so far been unable to reliably and convincingly decrease violence. Areas of high demand for weapons may be a symptom of the various socioeconomic conditions that have long been associated with gun violence, but gun laws are restrictive. But while gun laws are restrictive on the local level, the market reality is that the United States no longer has what can be universally referred to as regional markets with capable barriers to participation.

Measurable Expectations

Market adaptability assumes that demand for weapons should be a constant force unaffected by restrictive access, and should therefore change very little as associated with a local legislative agenda. However, the reality of participation in a national market, as opposed to a local one, means that demand for weapons can be satiated regardless of local regulation. Access is therefore not actually restricted and instead is manifested as an artificial supply problem.

This means there should be a measurable movement of guns across state lines that are consistent with regulations. Those states with stronger gun laws should reliably import guns from states with weaker laws. This is prescient on the existence of an artificial supply problem which encourages savvy consumers to meet unaffected demand. Such a reliable correlation

would be significant evidence that local markets consistently adapt to local regulations to obtain products they have demand for.

Hypothesis

By collecting data from the Bureau of Alcohol, Tobacco, Firearms and Explosives and comparing a state by state analysis for overall regulation of firearms, market adaptability predicts that the overall traffic of guns should flow from unregulated states to strongly regulated states. The less regulated a state is with regards to firearms, the higher their ratio will be of guns exported over imported. Likewise, the more regulation a state has, the lower the same ratio will be.

Data and Methodology

In order to test the assertion that local regulations impact the amount of trafficking a state experiences, careful attention must be paid to the collection of appropriate indicators. Along with the actual amount of guns trafficked and the strength of gun laws over time, additional data was collected on a number of variables in an attempt to identify possible spurious correlations. These additional variables include the total population for each state and the percentage of urbanization, the size of each state, and the rate of violent crime.

Luckily, data on the amount of gun trafficking occurring between states is relatively easy to determine. Since 1968, the Bureau of Alcohol, Tobacco, Firearms, and Explosives agency (ATF) has been empowered to trace firearms taken from crime scenes to their point of purchase. Since 2006, the ATF has made publically available its reports on traces for each state, including the District of Columbia and Puerto Rico.[17] These reports are presented in the form of maps showing the point of purchase for weapons traced from the scene where it was collected. These

maps were then analyzed and entered into the database. From this data each state's *Export Ratio,* the ratio at which guns are exported to other states versus imported, was collected. The higher a state's export ratio, the more guns they exported; ex. An export ratio of 3.0 means the state exported 3 guns for every 1 gun it imported.

The only observations excluded from the ATF data is North Dakota in 2007 which experienced a spike in export trafficking of almost 500%, and Hawaii. Because North Dakota experiences such a small number of traces every year, the North Dakota trace from 2007 should be excluded as a small increase in firearms exports drastically changes the overall export ratio. Hawaii was excluded because it enjoys significant barriers to trafficking that no other state has, namely over 2000 miles of Pacific Ocean.

In order to define the strength of gun laws on a state-by-state basis, information was collected from the *Brady Campaign to Prevent Gun Violence*.[18] Since 2007, the Brady Campaign has collated a "scorecard" for each state based on their gun laws. This study utilizes those scores with some caveats. As the Brady Campaign has evolved their political agenda through the lifespan of their scorecard, they have changed some of the laws that they track and occasionally have reweighted the scores of individual laws based on their supposed strength in preventing gun violence.

Instead of using the raw score provided by the Brady Campaign, this study has reweighted all past years of the scorecard to its 2011 equivalent, and dropped any law from tracking which has not been tracked over the entirety of the period. As a result, while the original score was out of 100, the reweighted scores have a maximum of 84. The intended result is that a state should have the same score in 2011 as it had in 2007 if no changes in the law

occurred. This is to protect the analysis from being skewed by changes in the scoring standard over time.

The violent crime rate was taken directly from the Federal Bureau of Investigation's (FBI) website.[19] The Census Bureau was able to provide statistics related to the total population[20] estimates for each state across the 5 years examined in the study, as well as the rate of urbanization.[21] The Census also provided the official statistics related to the size, in miles, of each state.[22]

With this data, a cross sectional time series analysis was used to determine the rates of change over time as a result of each variable's impact on the export ratio. These results are standardized from 0 to 1, and represent the total measured changed as a result of each variable on the export ratio. From the analysis we can see that the strongest variables impacting the trafficking of firearms from state-to-state are the *Weighted Score* of firearm regulations, the *Size* of the state, and the export ratio lagged against itself.

The strongest association is between the export ratio and its lagged result. This is an expected occurrence, and may represent the established networks of gun trading which have long existed. Purchasers of weapons with the intent to resell them may utilize the same "routes", gun shows consistently show up to the same places every year, and gun stores are opened along the border of strongly regulated states. As a result, the previous year's rate of trafficking is very highly correlated with the next year.

Of paramount importance to this study's hypothesis, when controlling against all of the other variables present in the analysis, the weighted score of a state's gun laws have a statistically significant impact of 6%. For comparison, the only other statistically significant

relationship measured is a 4% change as a result of state size. This means that the overall rate of change for firearm trafficking is more greatly impacted by the strength of gun regulation, than by the physical reality of state size.

In this analysis, the other three tracked variables were not found to have a statistically significant relationship to gun trafficking. This shows that assumptions predicting that the ratio of urbanized population may be driving demand for weapons, and therefore the trafficking rate, do not have enough evidence to confirm. This same conclusion can be reached about both total population, and the overall rate of violent crime.

Number of Guns Sent to Other States vs. Received From Other States	
Variable	Coefficient
Number of Guns Sent – *Lagged*	.84*
Weighted Gun Law Score	-.06*
Percent of Urban Population	-.02
Total Population	.03
State Size	-.04*
Violence Rate	.02
* = Statistically Significant to .05	

Conclusions

The results of this analysis represent a strong bed of evidence to support the theory that state borders are permeable, and relying strictly on state laws to decrease the prevalence of gun violence is woefully ineffective at driving results. Additionally, the results show that overall, trafficking is remarkably resistant to changes in the geopolitical landscape, and that without generous attention to nationally proposed changes, the current sources of firearms will likely continue to help other states circumvent their artificial supply problems.

When thinking about how to generalize the results of this study, it is possible to consider any public policy that is left up to the states to individually decide. States that make it more difficult to get an abortion may see their citizens travel across borders to seek medical procedures prohibited locally, a particularly unfortunate realization because it simply ensures that poor women will unequally bear the brunt of policy. We have likewise seen similar "consumer migrations" as a result of same-sex marriage becoming legalized one state at a time. We can also hazard a guess at how the legalization of marijuana in Washington and Colorado may impact the trafficking of drugs to states which prohibit them. It is important to keep in mind how overreliance on state-by-state legislation may undermine issues of national interest.

Notes

[1] "United Nations Office on Drugs and Crime. *"Ninth United Nations Survey on Crime Trends and the Operations of Criminal Justice Systems*" Web. 12 May 2013.

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[4] Gary Kleck and E. Britt Patterson. *"The Impact of Gun Control and Gun Ownership Levels on Violence Rates"* Journal of Quantitative Criminology, Vol. 9, No. 3, 1993

[5] Edmond D Shenassa, Constantine Daskalakis, Stephen L Buka. *"Utility of indices of gun availability in the community"* Journal of Epidemiologic Community Health, 2006, pp. 60:44-49.

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[10] Rémy Prud'homme. *"The Dangers of Decentralization"* The World Bank Research Observer, Vol. 10, No. 2 (Aug., 1995), pp. 201-220

[11] More information available at http://invasivespecies.gov/

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[14] James P. Lester. *"New Federalism and Environmental Policy"* Publius, Vol. 16, No. 1, Assessing the New Federalism (Winter, 1986), pp. 149-165

[15] Charles B. Curtis. *"Curbing the Demand for Mass Destruction"* Annals of the American Academy of Political and Social Science, Vol. 607, Confronting the Specter of Nuclear Terrorism (Sep., 2006), pp. 27-32

[16] Popular Mechanics was able to spot this phenomenon when it came to fireworks: http://www.popularmechanics.com/outdoors/recreation/the-bewildering-web-of-us-fireworks-laws

[17] Data for each state is available at the ATF website, here: http://www.atf.gov/statistics/index.html

[18] Access to each year is limited to special request, but the Brady campaign current scorecard is available here: http://bradycampaign.org/?q=programs/million-mom-march/state-gun-laws

[19] Found here: http://www.fbi.gov/stats-services/crimestats

[20] Population estimates are available here: http://www.census.gov/popest/index.html

[21] The urbanization ratio was calculated by comparing the totaled population numbers from the urban clusters page at the census (http://www.census.gov/newsroom/releases/archives/2010_census/cb12-50.html) with the population listed by the census for 2010

[22] Info is available at this link: http://www.census.gov/prod/cen2000/phc3-us-pt1.pdf