Economics of Gun Violence in the U.S.

Introductory Comments

- Europeans may think Americans are crazy
- Why do we love guns so much?
  - There are about 300,000,000 guns in the U.S. – more than one for every adult
- Why is the U.S. so violent?
  - About 14,000 people are killed in homicides each year in the U.S., and slightly more than ½ of them are killed by handguns
- How can the National Rifle Association (NRA), a pro-gun lobby, have so much political power?
- I will discuss these questions, except the last one

Outline

- Economic approach to crime
  - Background information on crime
  - Is crime an economic behavior?

- 'Conceal and Carry' laws
  - History of Minnesota's C&C law
  - Evidence on effectiveness of C&C laws

- Do guns cause crime?
  - Walk through Mark Duggan's study

- Why has violent crime in the U.S. dropped?

Despite Appearances, the U.S. is Becoming Less Violent

violent crimes* per 100,000

*Murder, rape, assault, robbery
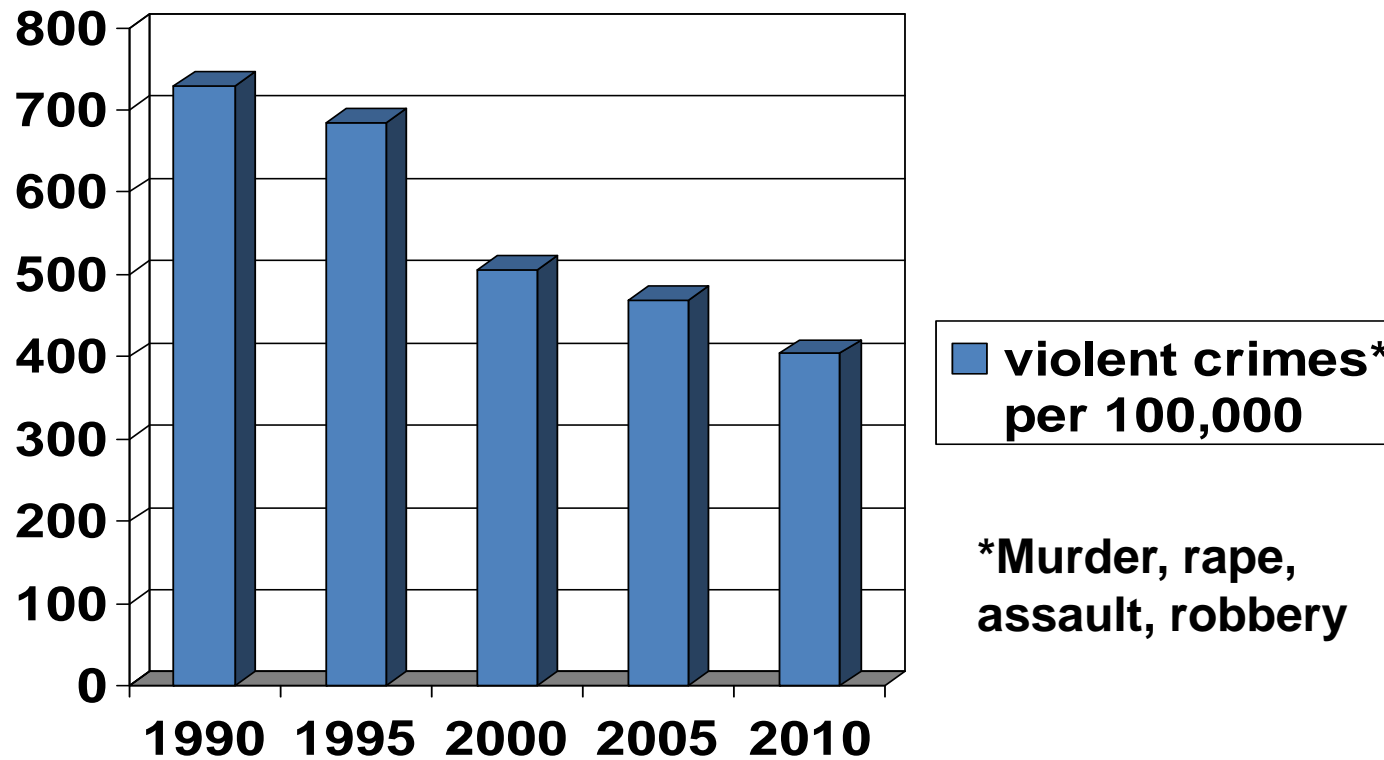
Crime in the United States, 2010

4

But Handguns Are the Still the Weapon of Choice for Homicide

Weapon or Method	1993	2003
Guns (all types)	69.6%	66.9%
Handguns	56.9	53.4
Cutting or stabbing	12.7	12.6
Blunt objects	4.4	4.5
Personal weapons	5.0	6.6
Strangulation/Asphyxiation	1.9	0.9
Fire	0.9	1.1
All others	5.5	7.4

FBI Uniform Crime Statistics

2010 Homicide Methods

Murder, Types of Weapons Used				
Percent Distribution by Region, 2010				
Region	Firearms	Knives or cutting instruments	Unknown or other dangerous weapons	Personal weapons (hands, fists, feet, etc.)
Total	67.5	13.1	13.6	5.8
Northeast	64.4	16.5	14.5	4.6
Midwest	71.9	8.7	14.1	5.3
South	68.1	12.8	13.0	6.1
West	65.0	14.9	13.6	6.6
Because of rounding, the percentages may not add to 100.0.				

FBI Uniform Crime Statistics, 2010

Few Homicides Are Justifiable

Type	Homicides	Homicides with handgun
Total homicides	14,408	7,701
Justifiable by police	370	316
Justifiable by civilian	246	163

FBI Uniform Crime Statistics

Is Crime an Economic Behavior?

- Economists argue that crime involves a rational choice based on expected benefits and costs
  - Gary Becker, "Crime and Punishment: An Economic Approach," *Journal of Political Economy*, 1968
  - Lack of legitimate economic opportunities contributes to increased crime
  - Stiffer punishment deters crime
- Crime depends on other laws and social policies
  - For example, John Donohue and Steven Levitt, "The Impact of Legalized Abortion on Crime," *Quarterly Journal of Economics*, 2001, find evidence that legalized abortion is responsible for a drop in the crime rate in the U.S.

Economic Model of Crime

- Rational choice involves maximizing the expected utility (EU) from crime:

  $$EU = P*U(Y+G–C) + (1-P)*U(Y–L–C)$$

  P = probability of successful crime

  Y = criminal's initial wealth or resources

  G = gain from successful crime

  C = cost of committing crime

  L = punishment if unsuccessful

- C&C law reduces the cost of committing crime (*facilitating effect*) but it also reduces the probability of success (*deterrent effect*)
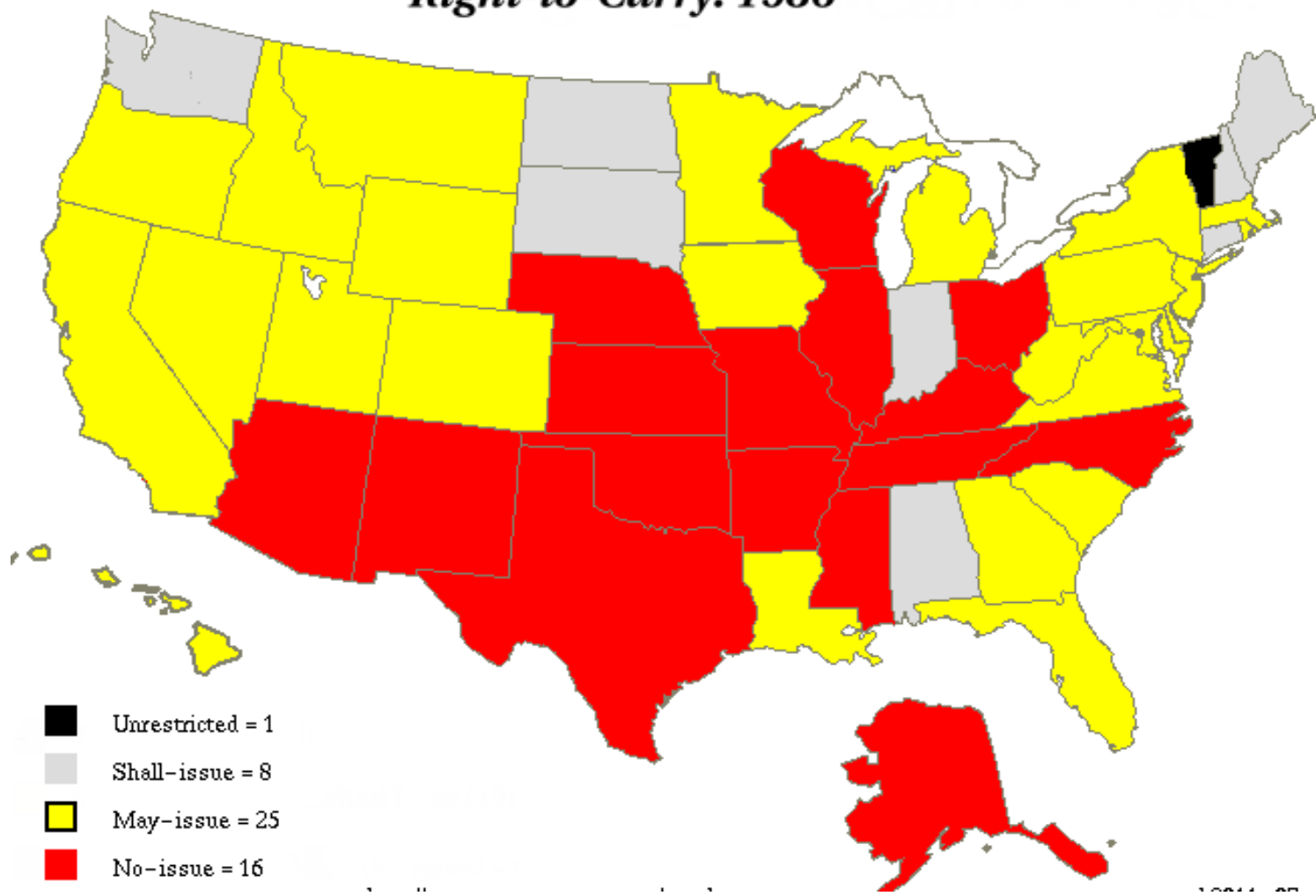- Crime could go up or down – we need to analyze data

'Conceal and Carry' Laws

- Conceal and carry (CC) laws permit civilians to carry concealed handguns

- Four types of state laws, from most restrictive to most permissive:
  - No issue: Citizens may not carry concealed handguns
  - May issue: Law enforcement officials may issue permits if carrying a concealed handgun is in the interest of public safety. In most cases the applicant must demonstrate a specific need and pass extensive security training.
  - Shall issue: Law enforcement officials have no discretion. They must issue a permit if specific conditions are met.
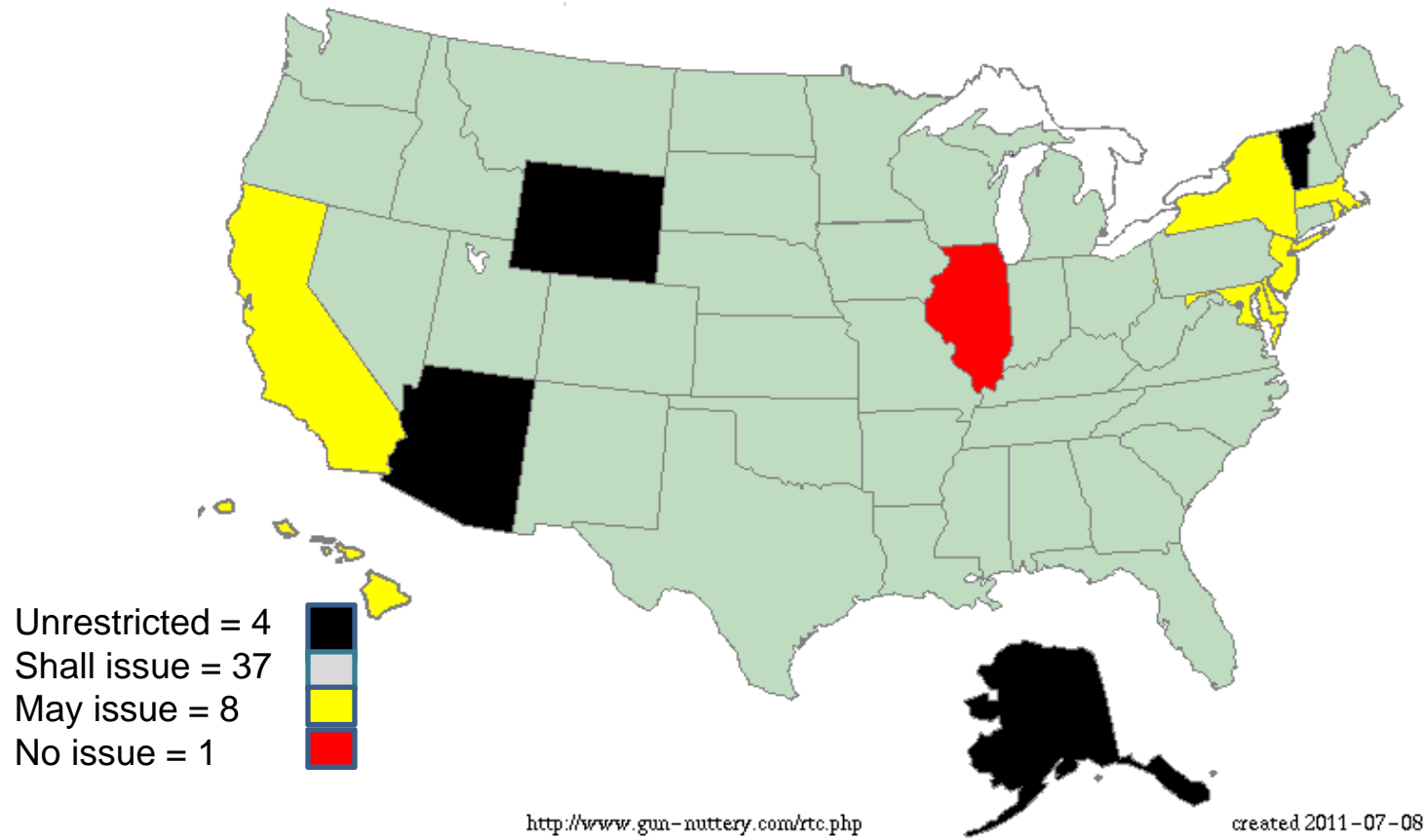 - Unrestricted: No restrictions on carrying concealed handguns

Conceal and Carry Laws: 1986

Right-to-Carry: 1986

Legend:
- Unrestricted = 1
- Shall-issue = 8
- May-issue = 25
- No-issue = 16

11

Conceal and Carry Laws: 2011

Unrestricted = 4
Shall issue = 37
May issue = 8
No issue = 1

http://www.gun-nuttery.com/rtc.php   created 2011-07-08

Conceal and Carry Arguments

- Proponents: Conceal and carry laws help ordinary citizens fight crime
  - John Birch, President of Concealed Carry Inc., Oak Brook, IL: Of the 666 murders in Chicago in 2001, his organization estimates 53 victims would have survived if armed

- Opponents: Laws are ineffective and needlessly endanger civilians
  - Illinois Council Against Handgun Violence: In 1998, 302 women were murdered for every time a woman used a handgun to kill a stranger in self-defense

  Chicago Tribune, April 11, 2002

The Strange Story of Minnesota's Conceal and Carry Law

- April 28, 2003: Minnesota Governor, Tim Pawlenty, signs 'shall issue' concealed weapons law

- July 14, 2004: Ramsey County Court declares the law unconstitutional because it embraces more than one subject (guns and regulation of ice fishing houses)

- April 12, 2005: MN Court of Appeals upholds the lower court's decision

- May 24, 2005: Governor signs retroactive enactment of the law without the unrelated provisions

Minnesota Ice Fishing House

Do C&C Laws Cause Crime to Change?

- The best strategy would be to randomly assign a law to State A and no law to State B

- We can't do this, so we analyze observational data

- Observational studies have 2 problems:
  - Association between C&C law and crime may be due to unmeasured social and economic factors that affect both C&C and crime (*omitted variables*)
  - State may pass C&C law because it has high crime rate (*reverse causation*)

- We can compare changes in crime rates in states that passed C&C laws and states that did not pass C&C laws
  - Economists refer to this method as '*difference-in-differences*'
  - Unmeasured factors that are constant over time will difference away, leaving the unbiased causal effect

Hypothetical Example

State	Murders/ 100,000 before law	Murders/ 100,000 after law	Difference
A passes law	70	50	-20
B does not pass law	50	40	-10

Difference-in-differences = -20 - (-10) = -10
Conclusion: C&C law reduced murder rate by 10

Real Example

- Lott and Mustard estimated a difference-in-differences model using multiple years of data on U.S. counties:

  $C_{it} = \alpha + \beta X_{it} + \gamma LAW_t + \delta TIME_t + \phi COUNTY_i + \varepsilon_{it}$

  C = crime rate in county i at time t

  X = economic and social factors in county i at time t

  LAW = presence of C&C law in state at time t

  $TIME$ = separate effect for each year

  $COUNTY$ = separate effect for each county

  ε = error term representing unmeasured factors

  $\alpha, \beta, \gamma, \delta, \phi$ = coefficients to be estimated

- C&C laws reduce violent and property crimes
- Their model assumes that the only effect of LAW is the γ coefficient, which is the same for all counties

John Lott and David Mustard, "Crime, Deterrence, and Right-to-Carry Concealed Handguns," Journal of Legal Studies, 1997

18

Real Example - 2

- Dezhbakhsh and Rubin argue that C&C laws may affect how crime responds to the *other* variables in the model
  - They estimated <u>separate</u> crime equations for counties in states with law and no law
  - Then they predicted the crime rate in each county, with and without a law
  - Their preferred measured of the law's effect is the <u>difference</u> between predicted crime rates for the county
- Findings:
  - Murder went down for counties in some states
  - C&C laws had no effect on rape
  - Robbery increased in many states

Hashem Dezhbakhsh and Paul Rubin, "Lives Saved or Lives Lost? The Effects of Concealed-Handgun Laws on Crime," American Economic Review, 77: 2 (1998), 468-474

Real Example - 3

- Next, they regressed Δ(Predicted Crime Rate) on social and economic factors

- C&C laws reduced crime rates in states that spent more money on police

  - More spending on police doesn't change the deterrent effect of C&C laws (civilians packing guns still should deter crime)

  - But more spending on police reduces the facilitating effect (police are present to stop criminals who carry guns)

  - Economists say that spending on police and C&C laws *complement* one another

States Haven't Gotten the Message
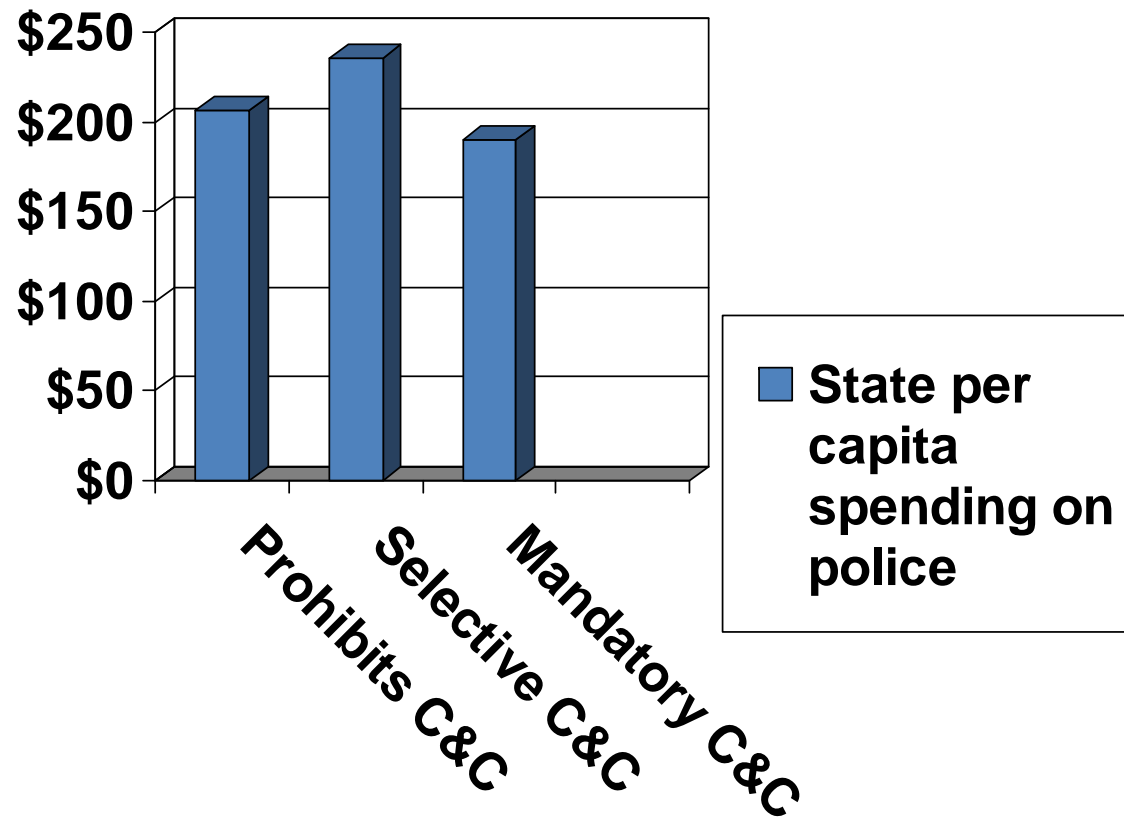
Professor's calculations from Brady Campaign and Bureau of Justice Statistics

Do Guns Cause Crime?

- Typical model posits that crime depends on guns and other variables: C = f(G, X)

- Problems:

  1. Data on gun ownership (G) are not available at the state and county levels

  2. More serious: Any association between G and C could be due to *omitted variables* that influence both crime and gun ownership or *reverse causation* (crime affects gun ownership)

Mark Duggan's Study

- Duggan proposes a new way to measure gun ownership: subscriptions to *Guns & Ammo* magazine
  - Subscription data are available by state and county over time
  - Magazine is aimed at (no pun) handgun owners

- Is this a valid measure?
  - Sales are higher in areas with demographic profiles that match those of gun owners
  - Sales are correlated with gun shows, gun accidents, gun suicides (but not non-gun suicides), and NRA membership

Mark Duggan, "More Guns, More Crime," Journal of Political Economy, 109:5 (2001), 1086-1114

23

Duggan's Model

$$\Delta \log(\text{Homicides}_{it}) = \alpha + \beta \Delta \log(G\&A \text{ Sales}_{it}) + \rho \Delta X_{it} + \lambda_t + \mu_i + \varepsilon_{it}$$

- Model includes separate effects for each state (μ) and year (λ) to control for omitted variables
- He finds $\beta \sim .2$ → a 10% increase in *Guns & Ammo* sales is associated with a 2% increase in the homicide rate
- But this result could mean that people buy guns for self-defense (reverse causation)

24

Duggan Table 5

- Do <u>past</u> changes in homicides predict <u>current</u> changes in gun ownership?
- If so, this would indicate reverse causation
- He turns the model around and uses $\Delta \log(G\&A\ Sales_{it})$ as the dependent variable
- Past increases in homicides are associated with much smaller increases in current gun ownership, as measured by *G&A* sales
- Lends credibility to argument that guns cause crime but we're still not sure

Duggan Table 6

- Individuals may purchase guns because they *anticipate* increases in the crime rate

  - Anticipation argument is more plausible if past changes in guns are associated with current increases in <u>all types </u>of homicide (gun, knife, club, etc.) because guns would protect you against all of these threats

  - Causal argument is more plausible if past changes in guns are more strongly associated with current increases in <u>gun </u>homicides

- Results support the causal argument: "…increases in gun ownership lead to substantial increases in the overall homicide rate. This is entirely driven by a relationship between firearms and homicides in which a gun is used."

Why Has Violent Crime in U.S. Decreased?

- 1975-1990: violent crime in the US rose by 80%
- 1990-2000: violent crime fell by 30%
- What explains this drop?
- Top 5 citations from articles published 1991-2001:
  - Innovative policing strategies such as New York City
  - More prisons/harsher sentences
  - Reduced use of crack cocaine
  - Fewer people in high-crime age groups
  - Tougher gun control laws

Sorting Out the Evidence

- 'Innovative policing' argument is attractive, but cities without innovative policing experienced a fall in crime similar to NYC
- More prisons and harsher sentences accounted for about 1/3 of the drop in crime
- The crash of the crack cocaine market accounted for about 15% of the reduction in crime
- Demographic change was not important
- Leaves gun control argument …
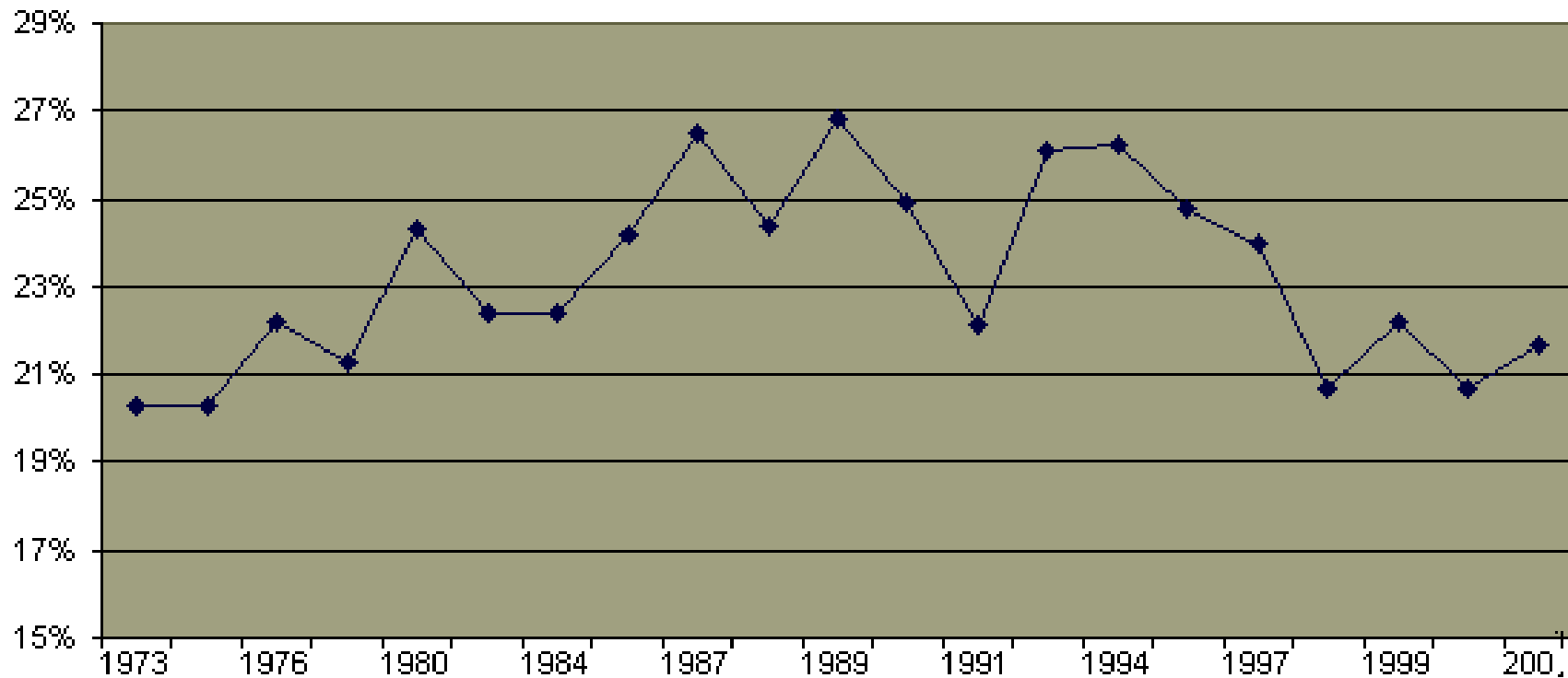
Steven Levitt and Stephen Dubner, Freakonomics, Ch. 4

Gun Ownership

Rate of U.S. Handgun Ownership 1973-2001
Source: National Gun Policy Survey
http://www.norc.uchicago.edu/online/guns01.pdf

Gun Ownership - 2

- Rate of handgun ownership rose from 1973-1989 and then fell unevenly from 27% in 1989 to 21% in 2000 (22% drop)

- Using Duggan's estimate of β = .2, this accounts for 22 x .2 = 4.4% drop in crime

- 4.4/30 = 15% of the total drop in crime from 1990 to 2000 was caused by fewer people owning handguns

- Caution: It's not clear that tougher gun control laws were responsible for the drop in handgun ownership rate

- Still leaves significant part of the drop in crime unexplained

Legalized Abortion and Crime

- In a landmark decision (*Roe v. Wade*, 1973), the U.S. Supreme Court ruled that abortion was legal on a national scale
- Crime began to drop 18 years after the *Roe v. Wade* decision
- Crime stared falling earlier in 5 states that had legalized abortion prior to *Roe v. Wade*
- Points to a causal relation between legalized abortion and drop in crime
- Confirming evidence from Australia and Canada
- These results are controversial – further analysis of the data has produced different results

John Donohue and Steven Levitt, "The Impact of Legalized Abortion on Crime," *Quarterly Journal of Economics*, 2001