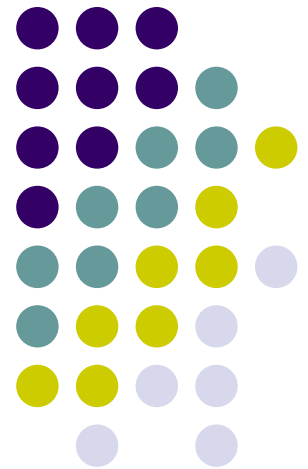
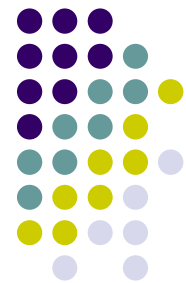


# Introduction to Economics of Development

Using Counterfactuals





## Steps toward a good research project

- Motivations: find a question in the world that interests you so much that you can't get rid of thinking about it even in the dream.
- Formulate a research question or a testable hypothesis

Your questions should be something like this:

- Was increase of police responsible for crime rate drop in 1990s?
- Has government played a positive role in China's economic growth?
- Ideally, the next step is to use data to test your hypothesis. But you may be limited by your econometrics knowledge. So you can instead rely on the methodologies that will be introduced today: using counterfactuals.
- If the empirical evidence does not match your theory (hypothesis), first check if you have handled data right. Then if the problem persists, you might want to consider changing your stories (the hypothesis). Eventually, your theory will be judged by its prediction power in the data.



## Levitt: Where have all the criminals gone?

- What is his research question?

Find out why there was a sudden drop of crime rate nationwide in the U.S. in early 1990s, and possibly establish a causal relationship.

Background check:

During 1990s, non-violent crime fell roughly 40 percent; violent crime fell 34 percent and property crime 29 percent.

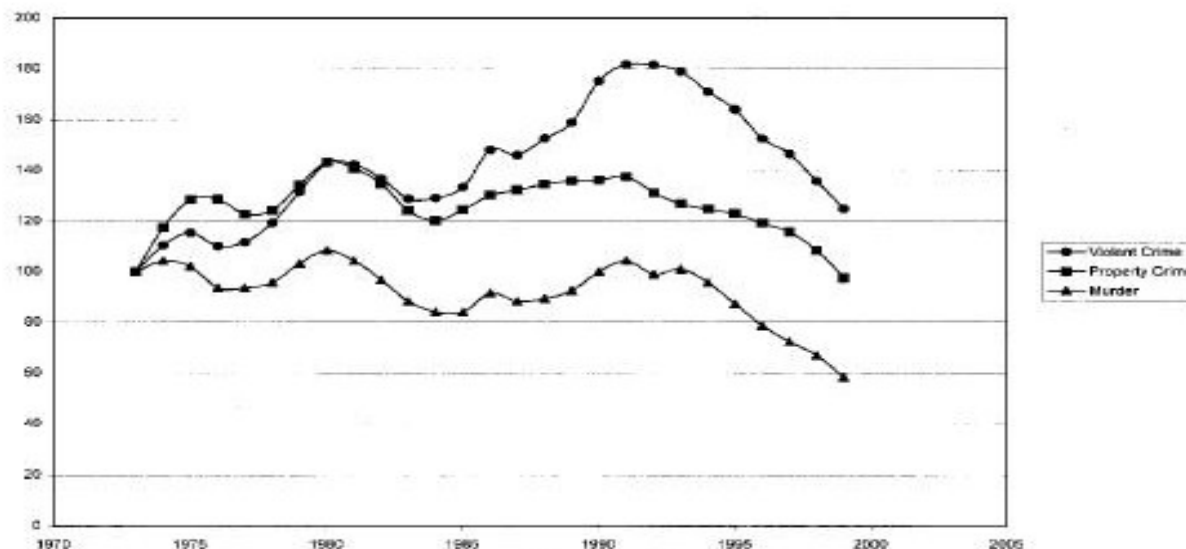


FIGURE II

Crime Rates from the Uniform Crime Reports, 1973-1999

Data are national aggregate per capita reported violent crime, property crime, and murder, indexed to equal 100 in the year 1973. All data are from the FBI's *Uniform Crime Reports*, published annually.



## Where have all the criminals gone?

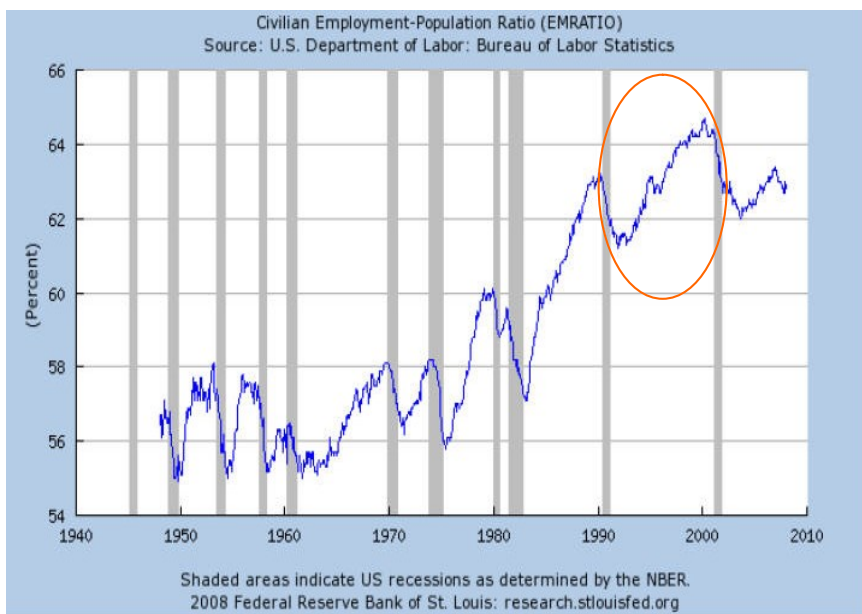
- Most popular candidate explanations
  - Innovative policing strategies
  - Increased reliance on prisons
  - Changes in crack and other drug markets
  - Aging of the population
  - Tougher gun-control laws
  - Strong economy
  - Increased number of police



# Where have all the criminals gone?

## Strong Economy

“Soaring 90s”, “New Economy”, “Information technology revolution”.



Questions:

Can “strong economy” argument explain violent crimes?

Can two percent drop in unemployment in 90s explain 40% drop in non-violent crime?

Don't we also observe similar growth pattern in 60s and 80s? Why no drop in these periods?



# Where have all the criminals gone?

## Increased reliance on prisons

Between 1980 and 2000, there was a fifteenfold increase in the number of people sent to prison on drug charges.

The timing seems to be right and the magnitude is also comparable to drop in crime.

The link between increased punishment and lower crime rates is very strong. It accounts for roughly 1/3 of the drop in crime.

## Increased use of capital punishment

Only 478 executions during 1990s for the entire US

Can capital punishment deter non-violent crimes?



# Where have all the criminals gone?

## Increased number of police

During 1990s, the number of police officers per capita rose about 14%.

Is this good enough to show the causality?

Is it possible more policemen were hired for reasons other than deterring the crime?

For example, in the months leading up to Election Day, incumbent mayors routinely hire more police to maintain law-and-order.

How did Levitt control for that?

From 1960 to 1985, the number of police officers fell more than 50 percent relative to the number of crimes. By the 1990s, the policing trend was put in reverse, with wide-scale hiring in cities across the country.

According to Levitt, the hiring of additional police accounted for roughly 10 percent of the 1990s crime drop.



# Where have all the criminals gone?

## Innovative policing strategies

Mostly in big cities, especially NYC. So this is a relatively easy to tackle?

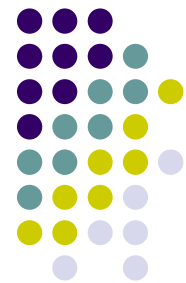
What are Levitt's strategies?

Two dimensions:

1. compare and contrast along time horizon
2. compare and contrast across geographic horizon

What are the fundamental flaws of this argument?





# Where have all the criminals gone?

## Tougher gun laws

The different views of gun opponent and gun advocate

Switzerland: *most* firearms on per capita basis in the world, yet one of the *safest* places in the world.

More fundamentally: Has gun control/regulation ever worked?

## Changes in crack and other drug markets

The nature of drug-related crimes:

bug-eyed crackhead shooting a shopkeeper over a few dollars  
more than 25% of homicides in NYC in 1988 were crack-related.

The violence associated with crack began to ebb in about 1991. From 1991 to 2001, the homicide rate among black men, who were disproportionately represented among crack dealers, fell 48%.

The crash of the crack market accounted for roughly 15% of the crime drop in 90s.



# Where have all the criminals gone?

## Abortion and Crime Drop

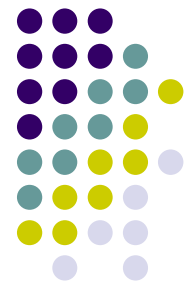
By 1970, five states had made abortion entirely legal: New York, California, Washington, Alaska, and Hawaii.

On Jan. 22, 1973, *Roe v. Wade* made abortion legal to the entire country.

In the first year after the Court's decision. Some 750, 000 women had abortions (or one abortion for every 4 live births). By 1980, the number reached 1.6 million per year (or one abortion out of 2.25 live births).

**1990-1973=17**, the first cohort of children born after *Roe v. Wade* was hitting late teen years, the years during which young men enter their criminal prime. That's around the same time crime rate starts to drop.

The much more difficult task is to prove, *abortion caused drop in crime rate.*



# Where have all the criminals gone?

## Abortion and Crime Drop

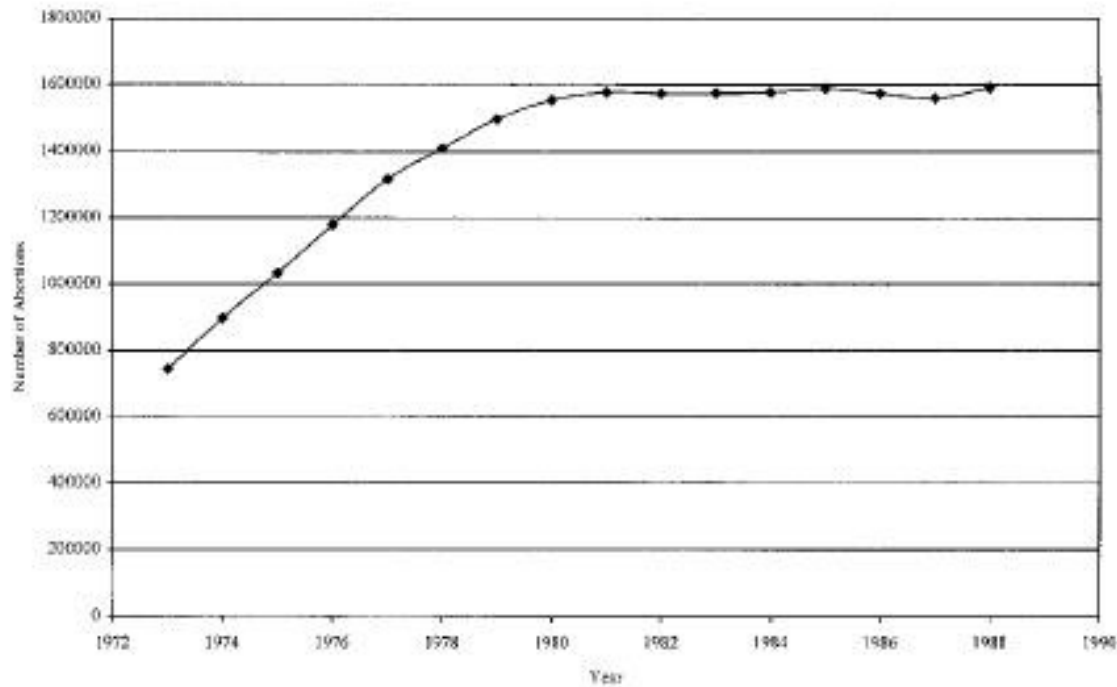


FIGURE I  
Total Abortions by Year

Source: Alan Guttmacher Institute [1992].



# Where have all the criminals gone?

## Abortion and Crime Drop: Causation vs. Correlation

Correlation is not a directional concept:

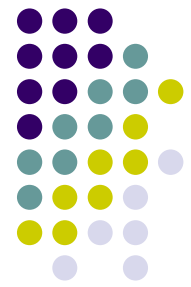
people celebrate on the street after their team wins a big game. If celebration were the cause of team's winning, then people ought to go out celebrate first. It can't be more ridiculous.

Abortion and crime rate drop may be just correlated with each other. We need to find out more.

Fortunately, in reality, we are offered with many control groups. How did Levitt use control groups to prove his case?

Again think from the two dimensions:

- 1) along time horizon
- 2) across geographical areas (this case, across different states).



# Where have all the criminals gone?

## Abortion and Crime Drop

CRIME TRENDS FOR STATES LEGALIZING ABORTION EARLY VERSUS  
THE REST OF THE UNITED STATES

Crime category	Percent change in crime rate over the period				Cumulative, 1982-1997
	1976-1982	1982-1985	1988-1994	1994-1997	
<b>Violent crime</b>					
Early legalizers	16.6	11.1	1.9	-25.8	-12.8
Rest of U. S.	20.9	13.2	15.4	-11.0	17.6
Difference	-4.3	-2.1	-13.4	-14.8	-30.4
	(5.5)	(5.4)	(4.4)	(3.3)	(8.1)
<b>Property crime</b>					
Early legalizers	1.7	-8.3	-14.3	-21.5	-44.1
Rest of U. S.	6.0	1.5	-5.9	-4.3	-8.8
Difference	-4.3	-9.8	-8.4	-17.2	-35.3
	(2.9)	(4.0)	(4.2)	(2.4)	(5.8)
<b>Murder</b>					
Early legalizers	6.3	0.5	2.7	-44.0	-40.8
Rest of U. S.	1.7	-8.8	5.2	-21.1	-24.6
Difference	4.6	9.3	-2.5	-22.9	-16.2
	(7.4)	(6.8)	(8.6)	(6.8)	(10.7)
<b>Effective abortion rate at end of period</b>					
Early legalizers	0.0	64.0	238.6	327.0	327.0
Rest of U. S.	0.0	10.4	87.7	141.0	141.0
Difference	0.0	53.6	150.9	186.0	186.0



## Application: Using Counterfactuals

- Some questions to think about:

- Government and China's economic growth

What you observe:

Governments in China play a big role, and China does not have formal property rights protection, intellectual property rights protection is also weak, but China has achieved superb economic growth.

Can you conclude the following?

- Government must be important in a country's development.
- Clearly defined property rights (the Western style) does not work in China.

- Alcohol sales and drunk driving

- Massachusetts law: alcohol drinks can only be sold in specialty stores. Regular grocery markets are prohibited from selling alcohols.
- Why is that?
- Do you think this matters? Is it effective in reducing drunk driving?



## Application: Using Counterfactuals

- Some questions to think about (cont'd):
  - Is technology the answer to the Great Divergence?  
(refresh your memory)
  - Geography and economic growth
    - If I tell you geography matters a great deal to economic development, but you are suspicious, how do you plan to tackle the question and prove you're right?
    - Again, I shall remind you to think from the two dimensions.
      - Can you find countries with unfavorable geographic but developed? Or can you find countries with favorable geography, but not developed?
      - Can you find countries that grew fast initially, but later lagged behind? Still the same country, no geography changed.