Economics of Crime

ECON 490

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Overview

Over the next few weeks, we'll cover distinct topics from recent economics research
- Tonight, we'll talk about crime
- In coming weeks, minimum wages, policing, and public assistance programs

Goals for these discussions:
- Apply concepts from metrics review
- Set you up for literature review for your capstone papers
- Let you see what modern economics looks like (not just GDP & the stock market!)

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Economics of Crime

Tonight, we'll talk about a paper that looks at the effects of DUI laws
- Topic is interesting in its own right
- Also facilitates discussion of several broader points

Topics we'll address:
1. What role does economic theory play in empirical or causal research?
2. Discussing regression discontinuity (RD) in a bit more detail

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Economic Theory and Empirical Research

Most of the group presentation papers involved very little formal theory
- This tends to be the case in lots of applied work!
- Causal inference doesn't "require" any theory (e.g., used in public health, etc.)

Regardless of field and context, ***prior information*** is important
- Recognizing potential sources of OVB requires subject matter expertise
- Economic theory is one source of relevant background knowledge

Where does theory play a larger role?
- Generally (not exclusively) in places where identification is harder (e.g., macro)

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Economic Approach to Studying Crime

Starting point – paper everyone cites is Becker (1968)

- Criminals as rational agents who weigh expected costs vs. expected benefits

$$EU = (1 - p)U(y) + pU(y - f)$$

Is this completely crazy? *(Maybe a little bit)*

- Helps clarify trade-offs
- Probability (p) and costs of being caught (f) matter
- Weighed against outside options like formal employment, etc.

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Modern Economics of Crime Research

What kind of crime-related questions do economists research nowadays?

Crime and the consequences of crime:

- What are the impacts of competing approaches to sentencing?
- How do policies like pre-trial detention or diversion programs change outcomes?
- Labor market and broader life outcomes for those leaving incarceration

Closely-related but distinct topic – economics of policing:

- How do police affect crime? What is the deterrence effect of police?
- How do training and education affect officer outcomes such as misconduct?
- How do complements to policing such as security systems, etc. impact crime?

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Studying Crime in Practice

Lots of data – this can be great… but requires care!

- Doing crime-related work requires a lot of ***institutional knowledge***
- Not enough to know about things in the abstract – you need specific details

Why do we see the data we see?

- Researchers and the police only know about ***reported*** crimes – who reports?
- There's a lot of ***path dependency*** in the criminal justice system

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Causal Effect of Criminal Punishment

What is the causal effect of punishment?

- Tricky to estimate empirically! *Corr(punishment, crime severity) > 0*

Three key channels:

1. ***Incapacitation*** – being removed from community (in jail / prison)
2. ***Rehabilitation*** – counseling, treatment, etc. offered to offenders
3. ***Deterrence*** – increasing costs of future criminal activity

For deterrence to work, offenders need to internalize costs *(bounded rationality)*

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Punishment and Deterrence: Evidence from Drunk Driving

Benjamin Hansen

Published in American Economic Review (2015)

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Introduction

Each year, roughly 10,000 people die in alcohol-related car accidents in US
- $120 billion in associated annual costs per CDC estimates

Wide range of approaches taken to reducing drunk driving
- Primary legal enforcement through driving under the influence (DUI) laws

Key question – how do offenders respond to DUI laws?

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Overview

Administrative data on 512,964 DUI stops in Washington state
- Data on punishments imposed and subsequent re-offenses
- RD around Blood-Alcohol Content (BAC) limits of 0.08 and 0.15

Study finds that DUI laws make a difference:
- BAC just above DUI threshold – re-offending reduced by 17 percent
- Results suggest that DUI laws ***deter*** offenders

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Policy Context

Blood-alcohol content (BAC) is used to determine intoxication for DUIs
- Historically, BAC limits were relatively lenient (~0.15)
- By the early 2000s, near-uniform limit of 0.08 across the US

Most states impose "tiers" of DUI offenses depending on BAC and history

Punishments in WA for your 1st DUI offense:
- **Over 0.08 BAC** - min. $865 fine + 24 hours jail time + 90-day license suspension
- **Over 0.15 BAC** - min. $1,120 fine + 48 hours jail time + 1-year suspension

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Research Design

Paper uses an RD with BAC as "running" or X variable – treatment is getting a DUI

For person i, estimate probability of future DUI offense y_i as a function of:

$$y_i = X_i'\gamma + \alpha_1 DUI_i + \alpha_2 BAC_i + \alpha_3 BAC_i \times DUI_i + u_i$$

- BAC_i: BAC when pulled over (scaled relative to DUI cutoff)
- DUI_i: indicator variable for being over BAC limit (either 0.08 or 0.15)

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Internal Validity

What do we need to believe to trust these estimates?
- In other words, did they really solve the OVB problem?

Key RD assumption – no ***selection*** around the threshold
- In this context, are folks able to estimate their BAC?
- Creates selection around the 0.08 cutoff and a bad comparisons group

In practice, BAC is hard to estimate without testing
- During the paper's timespan, private market breathalyzers weren't reliable
- Other methods of "guesstimating" BAC aren't reliable either

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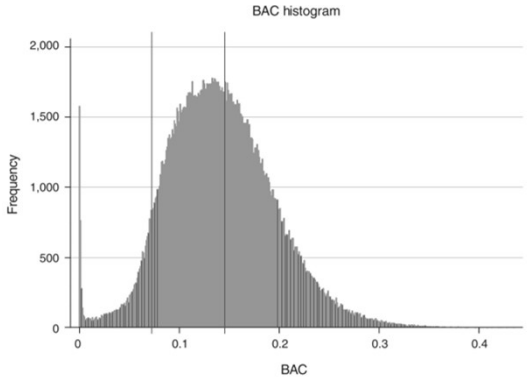
Assessing Internal Validity

Check distribution of running variable around cutoff



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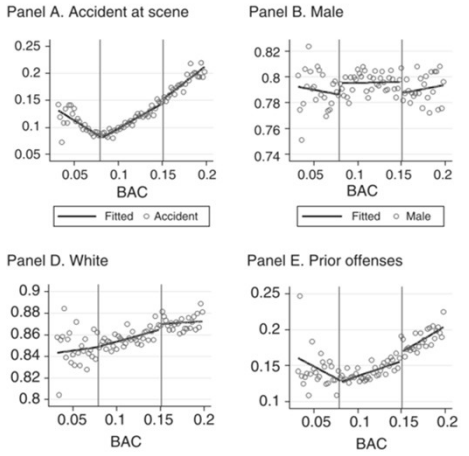
Balance Checks

Do characteristics of offenders change around cutoffs?

Age, race, and gender do not differ above / below 0.08



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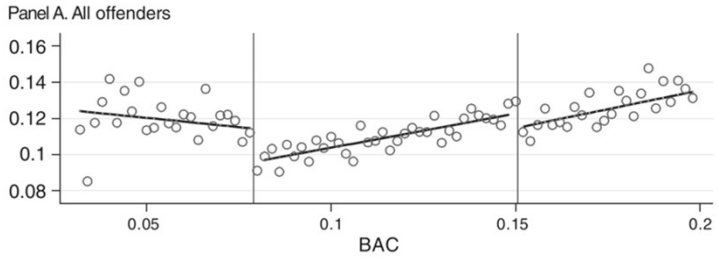
Main Results – *Reoffending Declines around BAC Cutoffs*



Outcome is probability of another DUI stop in next four years

- Decline of 2 p.p. (17 pct.) at 0.08 limit
- Decline of 1 p.p. (9 pct.) at 0.15 limit

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Exploring Channels – *Incapacitation Effects*

License suspensions (in principle) stop ability to reoffend

- Time-limited → first DUI results in 90-day suspension (1 year for agg. DUI)

Characteristics	0–90 Days (1)	90–365 Days (2)	365–730 Days (3)	730–1,460 Days (4)
Panel A. DUI threshold				
DUI	−0.003*	−0.0074**	−0.004*	−0.004**
	(0.002)	(0.003)	(0.002)	(0.002)
Mean	0.014	0.025	0.031	0.041
Controls	Yes	Yes	Yes	Yes
Observations	95,111	95,111	95,111	95,111

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Exploring Channels – *Rehabilitation Effects*

DUI punishment entails things like alcohol abuse treatment, etc.

- Do we see effects of getting a DUI on other alcohol-related crimes?

Characteristics	Assault (1)	Domestic violence (2)	Other crimes (3)	All other crimes (4)
Panel A. DUI threshold				
DUI	0.0001	0.00001	−0.0006	−0.0005
	(0.0002)	(0.00003)	(0.0004)	(0.0009)
Mean	0.0002	0.00005	0.001	0.002
Controls	Yes	Yes	Yes	Yes
Observations	95,111	95,111	95,111	95,111

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Putting Results in Context

Rational criminals?

- Getting a DUI increases *future* costs of subsequent DUIs
- But additional response to aggravated DUI penalties suggests more to story

Aggravated DUIs *aren't* treated differently in sentencing for subsequent DUIs

Specific deterrence – what matters is personal experience of costs

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Conclusion

Drunk driving imposes large costs on society

- Reducing drunk driving requires understanding offender decision making

This paper – RD design to estimate effects of DUI enforcement on offenders

Provides evidence that:

- Deterrence matters – DUIs just over 0.08 BAC less likely to reoffend
- Both foresight *and* hindsight matters in deterrence effects