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!)

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

Economic Theory and Empirical Research

Most of the papers we will talk about have 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)

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.

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?

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

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)*

Punishment and Deterrence: Evidence from Drunk Driving

Benjamin Hansen

Published in American Economic Review (2015)

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?

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

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

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)

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

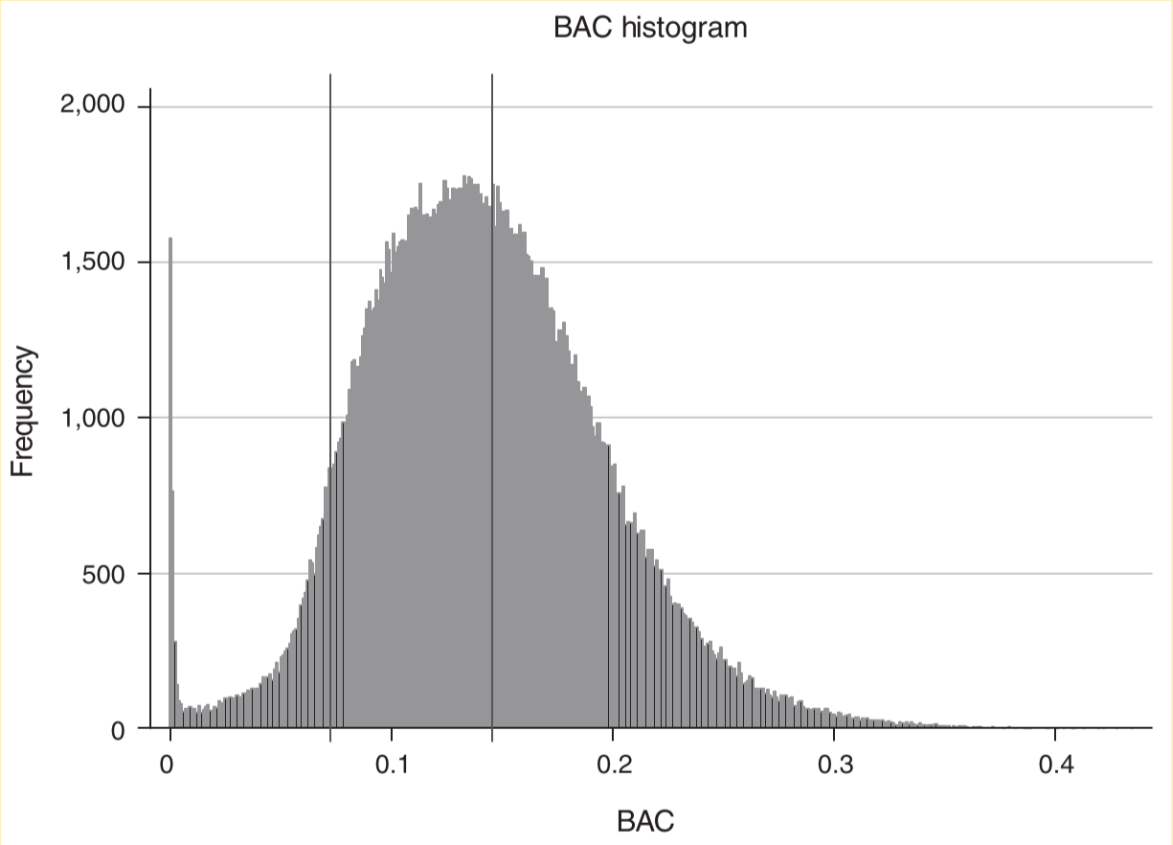
- In this context, are folks able to estimate their BAC?
- Creates selection around the 0.08 cutoff and a bad comparisons group

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

Assessing Internal Validity

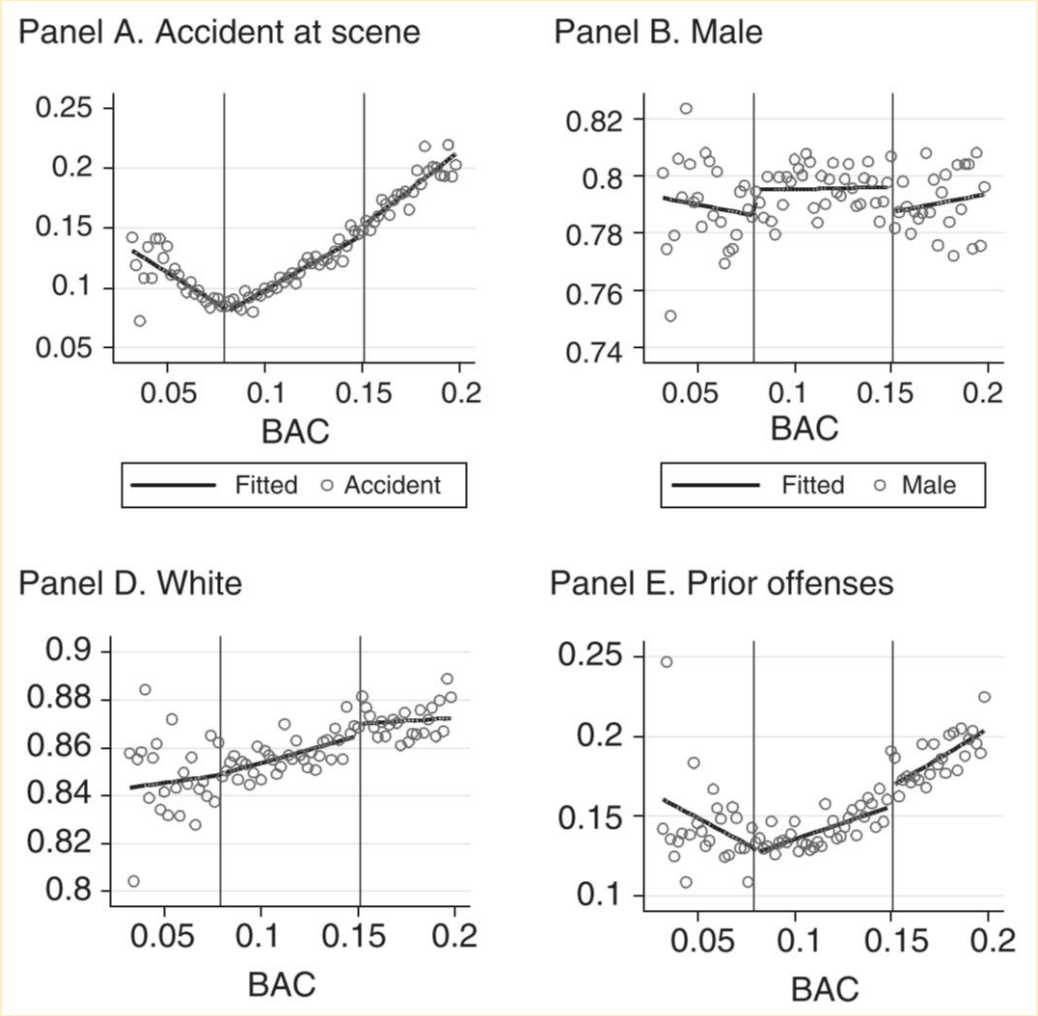
Check distribution of running variable around cutoff



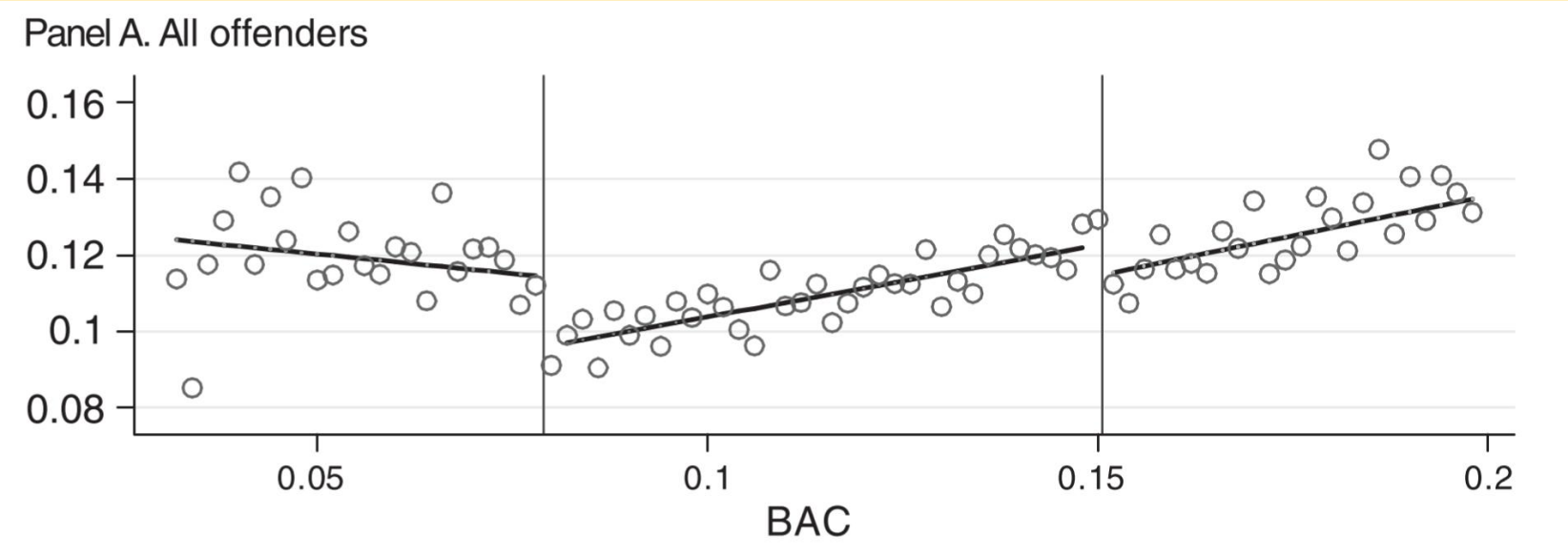
Balance Checks

Do characteristics of offenders change around cutoffs?

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



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

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

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

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

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