

# ECON4261 - Application: Incarceration, Recidivism, and Employment

Joseph Mullins

# Paper Introduction

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- **Question:** what is the effect of incarceration on recidivism and employment outcomes?
- The authors use administrative data from **Norway** and the **random assignment** of judges to estimate the effect of incarceration on future outcomes.
- They find that imprisonment reduced future criminal behavior and improved employment outcomes for those who were unemployed at the time of incarceration.

## Background

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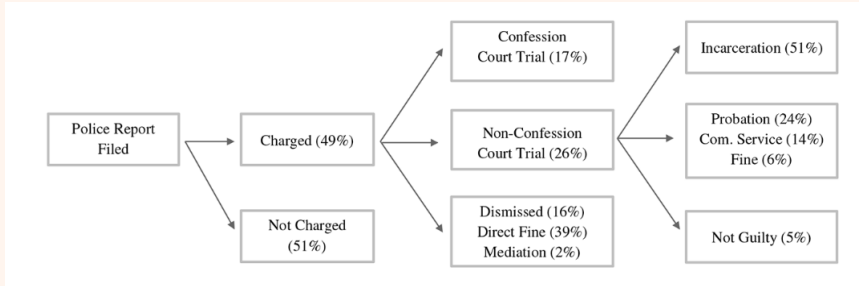


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# The Norwegian Court System

- Procedure:



- Norwegian law requires that judges be randomly assigned to cases (a few exceptions which are dropped)

## Research Design

- Model:

$$Y_{i,t} = \beta_t l_{i,0} + X_i' \theta_t + \eta_{i,t}$$

where  $l_{i,0}$  indicates incarceration of person  $i$  in period 0.

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- $X_i$  is a full set of court by year dummy variables.
- First stage:

$$l_{i,0} = \gamma Z_{j(i)} + X_i' \delta + \nu_{i,0}$$

where  $Z_{j(i)}$  is the **stringency** of judge  $j$  assigned to person  $i$ :

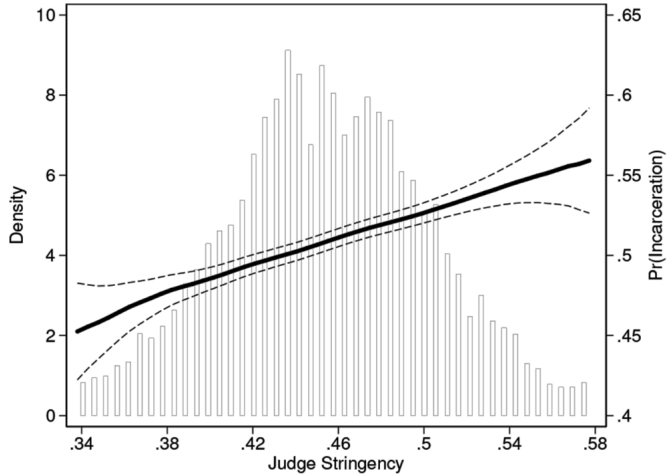
$$Z_{j(i)} = \frac{\sum_{n \neq i} l_{n,0} \mathbf{1}\{j(n) = j\}}{\sum_{n \neq i} \mathbf{1}\{j(n) = j\}}$$

# Balance Test

TABLE 1  
TESTING FOR RANDOM ASSIGNMENT OF CRIMINAL CASES TO JUDGES ( $N = 33,548$ )

	DEPENDENT VARIABLE				EXPLANATORY VARIABLE	
	Pr(Incarcerated)		Judge Stringency		Mean	Standard Deviation
	Coefficient Estimate (1)	Standard Error (2)	Coefficient Estimate (3)	Standard Error (4)		
Demographics and type of crime:						
Age	.0036***	.0004	-.0000	.0000	32.65	11.36
Female	-.0520***	.0071	-.0011	.0007	.106	.308
Foreign born	.0035	.0062	.0007	.0007	.135	.342
Married, year $t - 1$	-.0234***	.0117	-.0017	.0012	.111	.314
Number of children, year $t - 1$	-.0011	.0032	.0002	.0004	.783	1.244
High school degree, year $t - 1$	.0109	.0083	.0004	.0009	.172	.377
Some college, year $t - 1$	-.0532***	.0130	-.0013	.0015	.046	.209
Violent crime	.0843***	.0085	.0015	.0011	.256	.437
Property crime	-.0357***	.0109	.0011	.0012	.139	.346
Economic crime	-.0401***	.0116	.0018	.0015	.113	.316
Drug related	-.0484***	.0112	-.0000	.0013	.119	.324
Drunk driving	.0745***	.0128	.0002	.0014	.071	.257
Other traffic	-.0453***	.0127	.0003	.0012	.087	.281
Missing demographic information	-.2971**	.1386	-.0088	.0150	.030	.170
Past work and criminal history:						
Employed, year $t - 1$	.0284***	.0082	.0002	.0008	.352	.478
Ever employed, years $t - 2$ to $t - 5$	-.0016	.0083	.0001	.0009	.470	.499
Charged, year $t - 1$	.0498***	.0074	.0003	.0008	.459	.498
Ever charged, years $t - 2$ to $t - 5$	.0447***	.0078	-.0008	.0010	.627	.483
Incarcerated, year $t - 1$	.1423***	.0105	.0002	.0013	.139	.346
Ever incarcerated, years $t - 2$ to $t - 5$	.1690***	.0095	.0009	.0010	.279	.448
F-statistic for joint test		94.99		.593		
p-value		.000		.920		

# Instrument Strength



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TABLE 2  
FIRST-STAGE ESTIMATES OF INCARCERATION ON JUDGE STRINGENCY  
(Dependent Variable: Pr(Incarcerated))

Estimation Sample	Time of Decision (1)	Month 12 after Decision (2)	Month 24 after Decision (3)	Month 36 after Decision (4)	Month 48 after Decision (5)	Month 60 after Decision (6)
A. Court $\times$ Year of Court Case Registration Interacted Fixed Effects						
Judge stringency	.4897*** (.0665)	.4922*** (.0661)	.4887*** (.0662)	.4818*** (.0659)	.4795*** (.0661)	.4699*** (.0669)
F-statistic (instrument)	53.56	54.67	53.69	52.79	51.89	48.61
B. Add Controls for Demographics and Type of Crime						
Judge stringency	.4793*** (.0666)	.4811*** (.0662)	.4755*** (.0662)	.4694*** (.0659)	.4680*** (.0661)	.4587*** (.0670)
F-statistic (instrument)	51.11	52.07	50.82	50.09	49.41	46.20
C. Add Controls for Demographics, Type of Crime, Past Work, and Criminal History						
Judge stringency	.4705*** (.0632)	.4723*** (.0627)	.4667*** (.0624)	.4622*** (.0622)	.4606*** (.0627)	.4525*** (.0634)
F-statistic (instrument)	54.67	55.95	55.09	54.38	53.18	50.24
Dependent mean	.5083	.5077	.5066	.5055	.5047	.5045
Number of cases	33,548	33,275	32,786	32,341	31,870	31,428

NOTE.—Shown is the baseline sample of nonconfession criminal cases processed in 2005–9. Standard errors are two-way clustered at the judge and defendant level.

\*\*\*  $p < .01$ .

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- Monotonicity is only relevant if the treatment has **heterogeneous effects** (likely).
- An instrument is monotonic if different values of the instrument either uniformly increase or decrease the probability of treatment for everyone.
- Here this means that more strict judges would incarcerate all of the defendants that more lenient judges do.
- With a monotonic instrument, the TSLS estimand has a **Local Average Treatment Effect** interpretation, which you've seen before.
- You'll see more of this in recitation.

# Incarceration and Recidivism

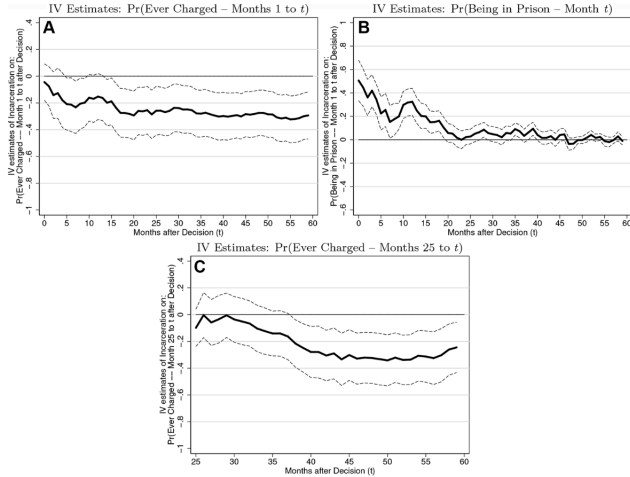


FIG. 4.—Effect of incarceration on recidivism and probability of being in prison. Shown is the baseline sample of nonconfession criminal cases processed in 2005–9 ( $N = 33,548$  at time of decision and  $N = 31,428$  in month 60 after decision). Panel *B* plots prison probabilities related to only the original sentence. Dashed lines show 90% confidence intervals.

# Incarceration and Recidivism

TABLE 4  
EFFECTS OF INCARCERATION ON RECIDIVISM ( $N = 31,428$ )

	DEPENDENT VARIABLE			
	Pr(Ever Charged)			Number of Charges
	Months 1–24 after Decision (1)	Months 25–60 after Decision (2)	Months 1–60 after Decision (3)	Months 1–60 after Decision (4)
OLS: incarcerated:				
No controls	.130*** (.007)	.115*** (.007)	.113*** (.006)	5.275*** (.321)
Demographics and type of crime	.126*** (.007)	.109*** (.007)	.105*** (.006)	5.369*** (.310)
All controls	.068*** (.006)	.050*** (.007)	.052*** (.006)	2.917*** (.278)
Complier reweighted	.057*** (.007)	.042*** (.007)	.049*** (.006)	1.595*** (.251)
RF: judge stringency:				
All controls	-.108** (.047)	-.111** (.048)	-.133*** (.045)	-5.196** (2.452)
IV: incarcerated:				
All controls	-.239** (.113)	-.245** (.113)	-.293*** (.106)	-11.482** (5.705)
Dependent mean	.57	.57	.70	10.21
Complier mean if not incarcerated	.56	.57	.73	13.62

NOTE.—Shown is the baseline sample of nonconfession criminal cases processed in 2005–9. Controls include all variables listed in table 1. In addition, RF and IV also control for court  $\times$  court entry year fixed effects. OLS standard errors are clustered at the defendant level, while RF and IV standard errors are two-way clustered at the judge and defendant level.

\*\*  $p < .05$ .

\*\*\*  $p < .01$ .

# Incarceration and Recidivism

TABLE 5  
EFFECT OF INCARCERATION ON RECIDIVISM BY PREVIOUS LABOR MARKET ATTACHMENT

	SUBSAMPLE			
	Previously Employed ( <i>N</i> = 16,547)		Previously Nonemployed ( <i>N</i> = 14,881)	
	(1)	(2)	(3)	(4)
A. Dependent Variable: Pr(Ever Charged)				
Months 1–60 after decision	Baseline	Reweightd	Baseline	Reweightd
RF: judge stringency, all controls	–.062 (.063)	–.079 (.068)	–.183*** (.060)	–.157*** (.069)
IV: incarcerated, all controls	–.117 (.119)	–.146 (.126)	–.433** (.177)	–.365* (.192)
Dependent mean	.62	.58	.79	.76
Complier mean if not incarcerated	.55	.60	.96	.86
B. Dependent Variable: Number of Charges				
Months 1–60 after decision	Baseline	Reweightd	Baseline	Reweightd
RF: judge stringency, all controls	–2.686 (3.134)	–2.304 (2.953)	–7.637** (3.167)	–8.448*** (3.046)
IV: incarcerated, all controls	–5.042 (5.983)	–4.280 (5.584)	–18.085** (8.452)	–19.688** (8.672)
Dependent mean	7.29	6.10	13.45	11.92
Complier mean if not incarcerated	3.61	5.16	24.01	21.97

NOTE.—Shown is the baseline sample of nonconfession criminal cases processed in 2005–9. Controls include all variables listed in table 1 plus controls for court  $\times$  court entry year fixed effects. Standard errors are two-way clustered at the judge and defendant level. In cols. 2 and 4, we use propensity score reweighting to adjust for differences in observable characteristics across subsamples; see discussion of the reweighting procedure in sec. VI.A.

\*  $p < .1$ .

\*\*  $p < .05$ .

\*\*\*  $p < .01$ .

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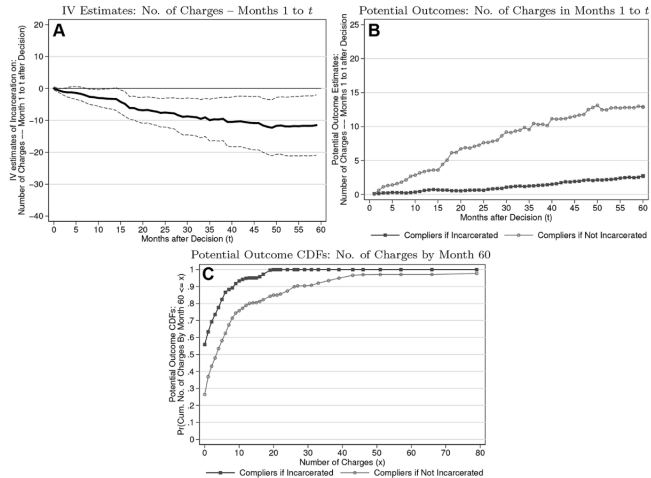
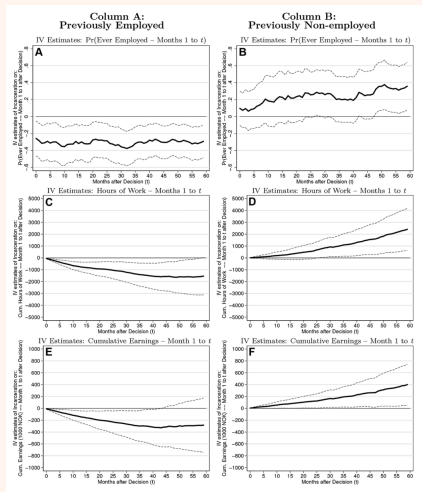


FIG. 5.—Effect of incarceration on number of charges. Shown is the baseline sample of nonconfession criminal cases processed in 2005–9 ( $N = 33,548$  at time of decision and  $N = 31,428$  in month 60 after decision). Dashed lines show 90% confidence intervals.

# Incarceration and Employment





## Other Exercises

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- Tests for violations of instrument monotonicity
- Tests for effects coming through other dimensions of judge decisions (fines, community service, etc). These would violate **instrument exclusion**.
- Conducts a cost-benefit analysis (positive)

## Conclusion

- The paper finds that incarceration reduces further criminal behavior and improves future employment outcomes.
- The effects are concentrated among those who were not working prior to incarceration.
- Some evidence that the effect comes through the provision of job training programs in prison.
- Prison in Norway is **very different** from prison in the US.