

Tyler et al.

- Impact of GED on wages
- General education development degree
- Earn a HS degree by passing an exam
- Exam pass rates vary by state
- Introduced in 1942 as a way for veterans to earn a HS degree
- Has expanded to the general public

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- In 1996, 760K dropouts attempted the exam
- Little human capital generated by studying for the exam
- Really measures stock of knowledge
- However, passing may 'signal' something about ability

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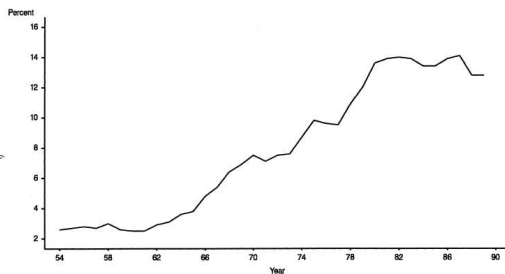


FIG. 1.—New GED recipients as a percentage of total new recipients of high school credentials (GED + high school graduates). Source: U.S. Department of Education (1989); GED Testing Service (1990); U.S. Bureau of the Census (various years).

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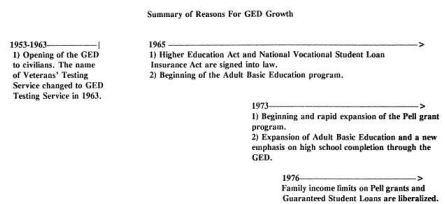
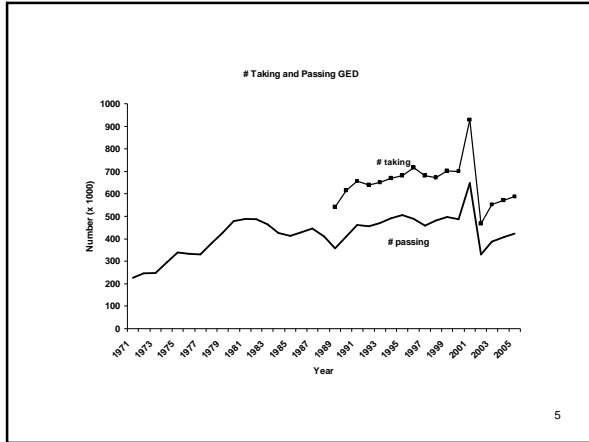


FIG. 1.—(Continued)

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Table 1
Proportion of Individuals Receiving a GED or Graduating High School

	Black	Hispanic	White
A. Age 25 males:			
GED	.11 (.01)	.11 (.01)	.07 (.01)
High school graduate	.68 (.02)	.60 (.02)	.81 (.01)
% of Current Population			
Survey measured high school equivalents who are GED certified	14	15	8
Sample size	1,088	693	1,820
B. Age 25 females:			
GED	.07 (.01)	.11 (.01)	.07 (.01)
High school graduate	.77 (.01)	.64 (.02)	.84 (.01)
% of Current Population			
Survey measured high school equivalents who are GED certified	9	13	8
Sample size	1,082	674	1,719

NOTE.—These proportions do not change much at age 28. The sample was constructed using the 1979–87 waves of the NLSY (see App. A). Individuals must have reached age 25 by 1987 to be included in the above calculations. Standard errors of the means are in parentheses.

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Table 2
Means and Deciles of Test Scores on the AFQT Exam for the Random Sample

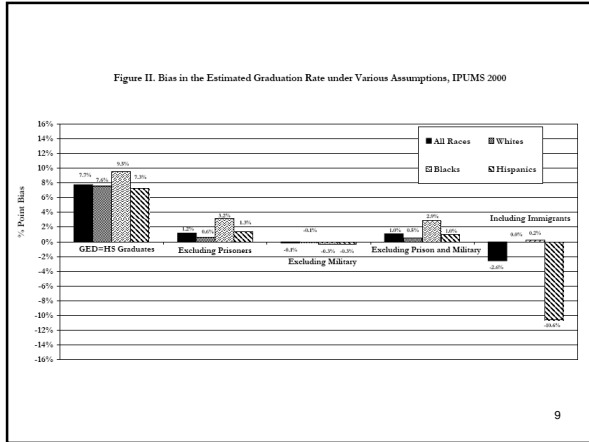
	N	Mean (SE)	Deciles (Lowest to Highest)								
			10	20	30	40	50	60	70	80	90
High school graduate	2,168	75.8 (0.40)	48	61	68	74	79	84	88	93	97
GED	209	64.7 (1.28)	38	48	54	61	66	70.5	76	82	88.5
Dropout	436	45.5 (0.79)	25	30	35	39	43	48	53	60	70
Total	2,813	70.1 (0.40)	37	49	60	68	74	80	85	90	96

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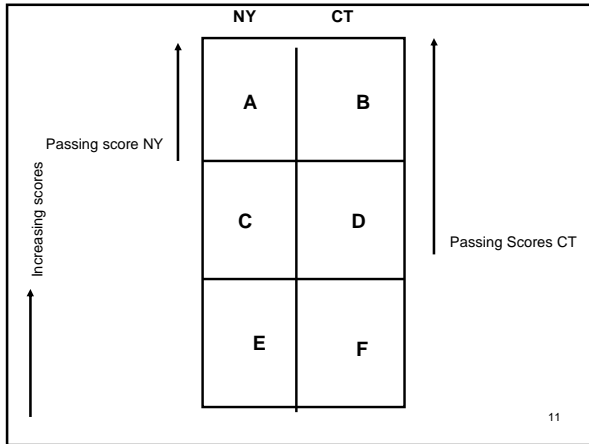
Table 5
Labor Market Outcomes at Ages 25 and 28: Sample Means

	A. At Age 25		
	High School Dropouts	GED	High School Graduates
N: working/in sample*	542/616	224/277	2,156/2,478
Hourly wage (1988 dollars)†	6.84(.17)	7.33(.23)	8.52(.09)
Salary income (1988 dollars)†	10,379.0(353.1)	11,777.2(558.7)	15,213.9(208.1)
Weeks worked last year	40.8(.6)	40.7(.9)	44.7(.3)
Hours worked last year†	1,747.1(34.8)	1,738.2(50.2)	1,905.6(15.6)
Job tenure†	96.3(3.9)	75.1(4.8)	108.5(2.0)
Total work experience‡	242.6(4.2)	210.8(6.0)	256.0(2.0)
No job last year§	.12(.01)	.19(.02)	.13(.01)

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- ### Identification strategy
- Use variation across states in pass rates to identify benefit of a GED
 - High scoring people would have passed the exam regardless of what state they lived in
 - Low scoring people are similar across states, but one is granted a GED and the other is not
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- Groups A and B pass in either state
 - Group D passes in CT but not in NY
 - Group C looks similar to D except it does not pass
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- What is impact of passing the GED
- Y_{is} = earnings of person i in state s
- L_{is} = earned a low score
- $CT_{is} = 1$ if live in a state with a generous passing score
- $Y_{is} = \beta_0 + L_{is}\beta_1 + CT\beta_2 + L_{is}CT_{is}\beta_3 + \epsilon_{is}$

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Difference in Difference

	CT	NY	Difference
Test score is low	D	C	(D-C)
Test score is high	B	A	(B-A)
Difference			(D-C) - (B-A)

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How do you get the data

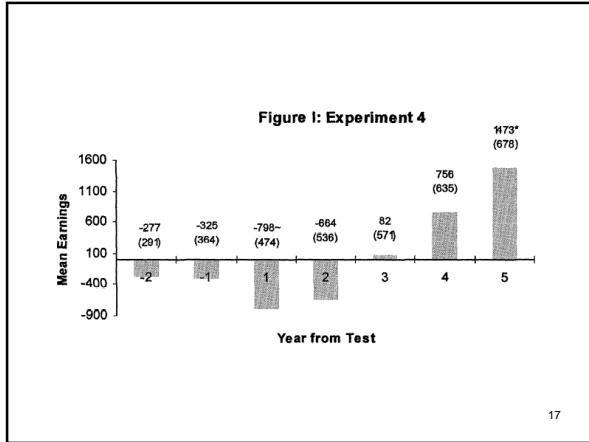
- From ETS (testing agency) get social security numbers (SSN) of test takers, some demographic data, state, and test score
- Give Social Security Admin. a list of SSNs by group (low score in CT, high score in NY)
- SSN gives you back mean, std.dev. # obs per cell

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TABLE V
DIFFERENCE-IN-DIFFERENCES ESTIMATES OF THE IMPACT OF THE GED ON 1995 EARNINGS OF DROPOUTS WHO TESTED IN 1990 (STANDARD ERRORS ARE IN PARENTHESES.)

Experiment 4			
State passing standard is		Low-High contrast	
Low	High		
Panel A: Whites			
Test score is			
Low	9628 (361)	7849 (565)	1779 (670)
High	9981 (80)	9676 (65)	305 (103)
Difference-in-differences for whites			1473* (678)

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Lojack

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Background

- Transponder installed in cars that is turned on when car is stolen
- Recover 95% of stolen cars, compared to 60% for cars without Lojack
- One-time cost at installation
- Requires working in unison with local police authorities, so market entrance is city-by-city

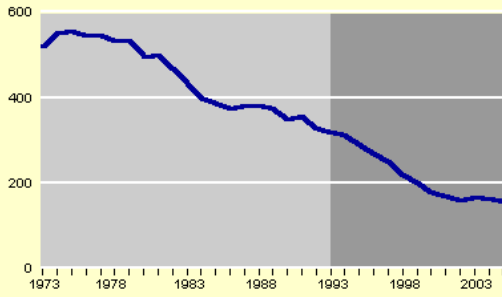
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- Starts in MA in 1986 and spreads to 12 cities by 1994
- Time period is difficult, because it is one of rapidly changing crime

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Property crime rates

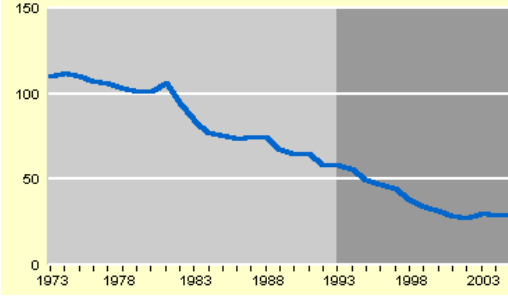
Adjusted victimization rate per 1,000 households



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Burglary rates

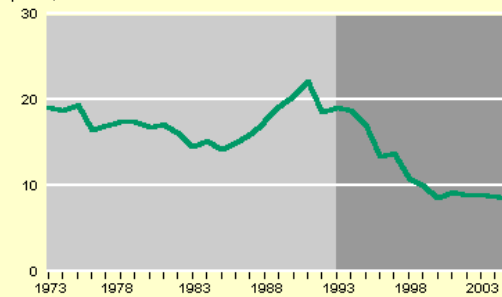
Adjusted victimization rate per 1,000 households



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Motor vehicle theft rates

Adjusted victimization rate per 1,000 households



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TABLE I
MARKETS SERVED BY LOJACK AS OF DECEMBER 1994

Market	Cities > 250,000 covered	Date of entry
Massachusetts	Boston	July 1986
South Florida	Miami	December 1988
New Jersey	Newark	March 1990
Los Angeles County	Los Angeles	July 1990
	Long Beach	
Illinois	Chicago	November 1990
Georgia	Atlanta	August 1992
Virginia	Norfolk	August 1993
	Virginia Beach	
Michigan ^a	Detroit	February 1994
New York	New York City	June 1994
Rhode Island	None	June 1994
Tampa/St. Petersburg	Tampa	July 1994
District of Columbia	Washington, DC	September 1994

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Dynamics

- Lojack installed in new cars, so market penetration is a function of
 - New car sales
 - Fraction of new cars w/ Lojack
- After 5 yrs, only 2% of all cars have Lojack once it enters an area

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Potential benefits

- Does not reduce your chance of having your car stolen, but
- Reduces your costs, given that your car is stolen
- Given previous point, will reduce your insurance costs

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- Chance any car will have Lojack is low.
- If high volume chop shop, will encounter Lojack
- 50 cars annually, 3% market penetration, 78% chance get at least one car with Lojack
- With 100 cars, this rises to 95%

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- Prob(at least one Lojack car) = $1 - \text{Prob}(\text{no Lojack cars})$
- Prob car does not have Lojack = 0.97
- All probs are independent
- Prob (non have Lojack) = $0.97^{50} = 0.22$

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Externality

- What is externality?
- How does Lojack generate externalities?
- What does this imply about whether Lojack penetration is too high or low?

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Data

- 57 cities with pop > 250,000
 - Why only larger cities?
- 1981-1994
- Collect data on local economic conditions, police, age distribution

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TABLE II
SUMMARY STATISTICS

Variable	Mean	Standard deviation	Minimum	Maximum
<u>All cities in sample:</u>				
Lojack share (% of all vehicles)	.05	.33	0	4.95
Years of Lojack	.17	.85	0	9
City population	764,268	1,045,791	250,720	7,375,097
Auto theft per capita	.012	.008	.002	.054
Robbery, burglary, larceny per capita	.078	.021	.033	.156
Assault, rape, murder per capita	.008	.004	.001	.025
SMSA unemp.	6.3	2.1	2.2	15.9
State per capita real income (\$1994)	19,911	2,821	13,720	31,228
% Black	26.0	18.7	1.2	80.7
% Aged 0-17	26.3	2.0	19.7	31.7
% Aged 18-24	11.5	1.3	8.4	15.1
% Aged 25-44	31.4	2.1	26.1	36.4
Sworn officers per capita (× 1000)	2.47	.96	1.32	7.81

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TABLE II
SUMMARY STATISTICS

Variable	Standard		Minimum	Maximum
	Mean	deviation		
Cities with Lojack coverage by 12/94				
Lojack share				
(% of all vehicles)	.21	.67	0	4.95
Years of Lojack	.83	1.71	0	9
City population	1,402,239	1,959,315	257,617	7,375,097
Auto theft per capita	.018	.011	.002	.05
Robbery, burglary, larceny per capita	.0881	.025	.044	.156
Asault, rape, murder per capita	.011	.006	.001t	
SMSA unemp.	6.5	2.1	2.7	15.9
State per capita real income (\$1994)	20,843	3,370	13,982	31,228
% Black	37.5	21.0	10.4	80.7
% Aged 0-17	24.9	2.2	19.7	31.7
% Aged 18-24	11.5	1.5	8.4	15.1
% Aged 25-44	32.0	2.3	26.1	36.4
Sworn officers per capita (x1000)	3.20	1.33	1.40	7.81

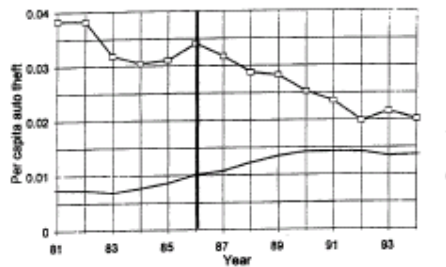
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Mean Values

	All cities	W/ Lojack
Population	764,268	1,402,239
Car theft/pop	0.012	0.018
Unemp rate	6.3	6.5
Per capita inc	\$19,911	\$20,843
% black	26.0%	37.5%
%18-24	11.5	11.5

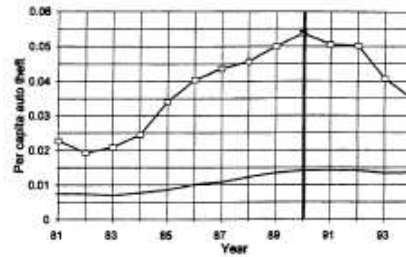
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Boston

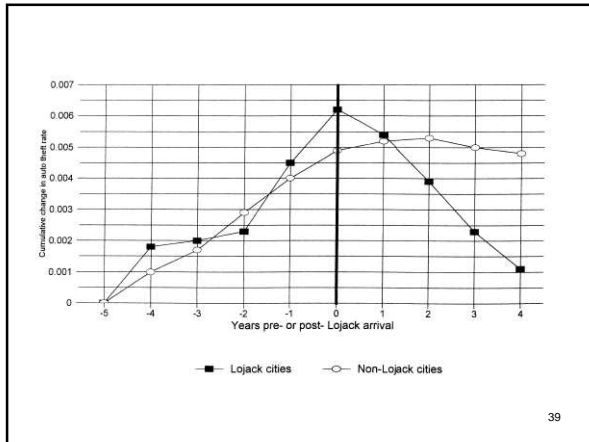
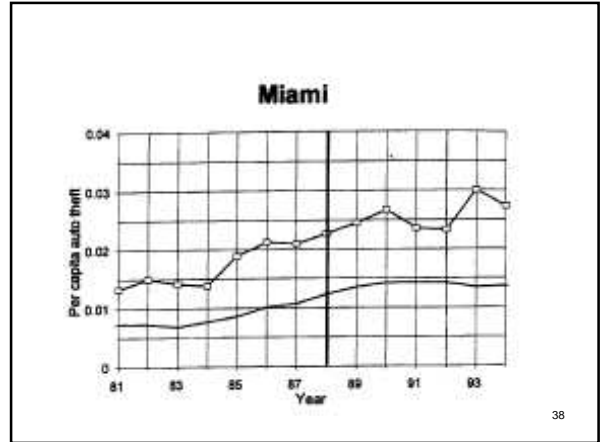
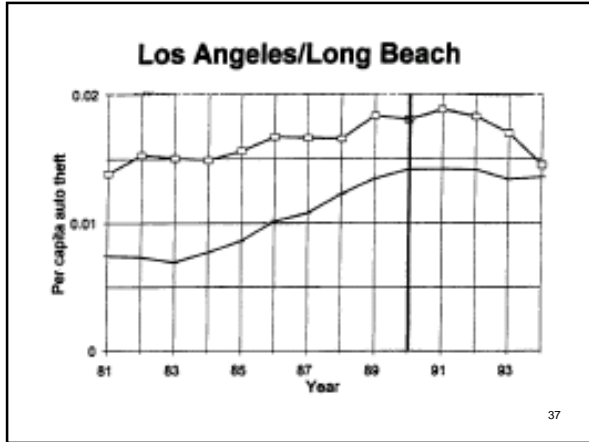


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Newark



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The form of the equations estimated in the basic specifications is as follows:

$$(1) \ln(AUTO_THEFT)_{it} = \beta LOJACK_{it} + X'_{it}\Gamma + \lambda_t + \theta_i + \epsilon_{it}$$

where i indexes cities and t corresponds to years. $AUTO_THEFT$ is the auto theft rate per capita, $LOJACK$ is one of the two Lojack proxies described earlier, and X is a vector of controls for SMSA

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TABLE III
 IMPACT OF LOJACK ON CITY AUTO THEFT RATES

Variable	(1)	(2)	(3)	(4)
Years of Lojack availability	-.109 (.013)	-.157 (.021)	-	-
Lojack share	-	-	-.242 (.031)	-.463 (.065)
Unemployment rate	.019 (.009)	.026 (.010)	.017 (.009)	.028 (.010)
State real per capita income (×1000)	.022 (.014)	.028 (.015)	.016 (.014)	.022 (.016)