

## Econ 113: April 30, 2015

- Economic Growth
- Education
  - And Incarceration
- Wrapping Up

Economic Growth    Education    Wrapping Up

## Model of Growth (and Review)

- Aggregate Production Function
- Extensive growth: Increases in inputs
- Intensive growth: Increases in productivity

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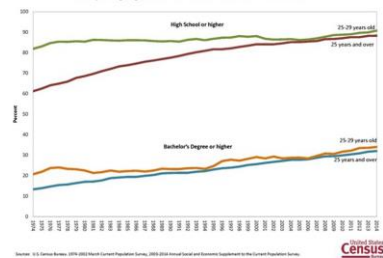
## Education matters!

- Before globalization, unskilled U.S. workers earned high wages because of high K/L ratios
- With globalization, unskilled U.S. workers compete with unskilled workers worldwide
- Education (skill) gap thus leads to now-greater income gap

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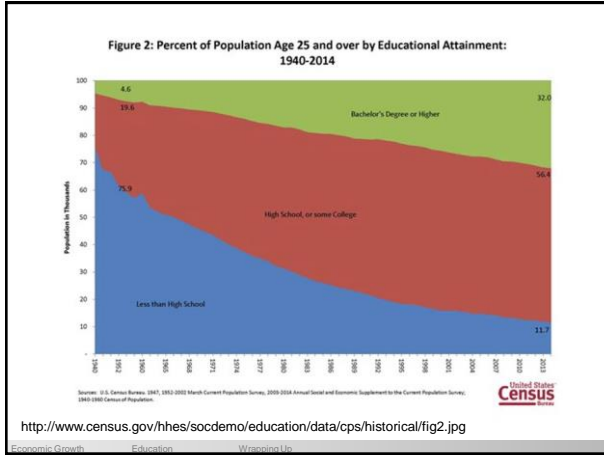
## HS & College Grad rates

Figure 4: Percent of Population 25 Years and older, and 25 to 29 Years old, completing High School or Bachelor's or more: 1974-2014



Source: <http://www.census.gov/hhes/socdemo/education/data/cps/historical/fig4.jpg>

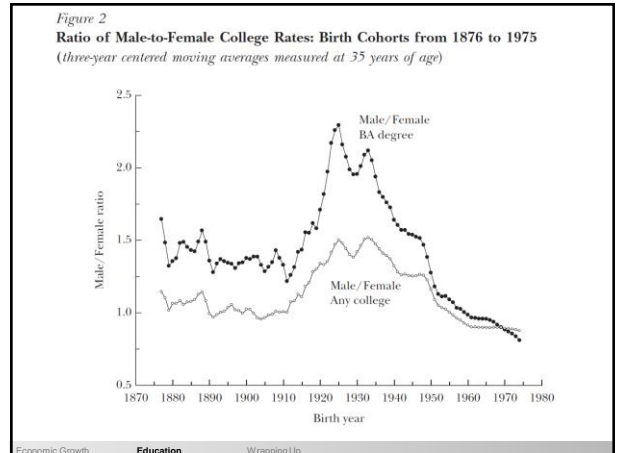
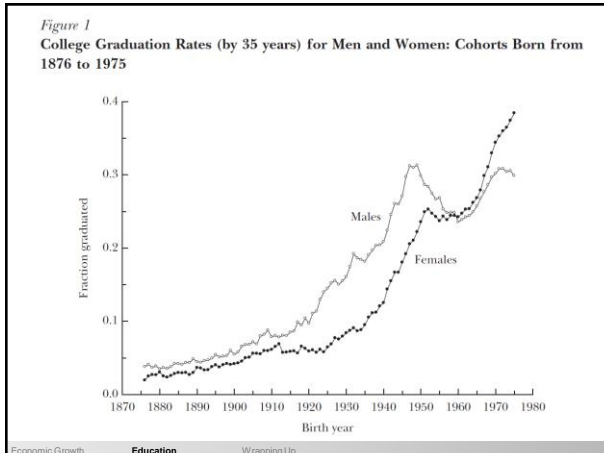
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## Where is the education gap?

- No longer between men & women

	Ages 25-29		Ages 25+	
	men	women	men	women
1950	9.6	5.9		
1960	14.8	7.6	9.7	5.8
1970	20.0	12.9	13.5	8.1
1980	24.1	20.9	20.1	12.8
1990	23.7	22.8	24.4	18.4
2000	27.9	30.1	27.8	23.6
2010*	27.4	35.1	30.3	29.6



### Why the shrinking college gender gap?

- Changing expectations
    - Of future labor force participation
    - Of gender roles
  - Rise in the age at first marriage
    - Partly endogenous; partly the Pill
  - Greater benefit for women than men
  - Higher costs of college-going & preparation for men
- Source: Goldin, Katz, & Kuziemko, "The Homecoming of American College Women: The Reversal of the College Gender Gap," *Journal of Economic Perspectives* 20 (Fall 2006): 133-156

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### Also no (or reverse) gender gap within race

Table 2. % of population ages 25 & over with 4+ years of college, 2010

	men	women
White, non-Hispanic	34.2	32.4
Black, non-Hispanic	17.9	21.6
Hispanic	13.3	14.9
Asian	54.4	49.9

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### But large gaps by race & ethnicity

Table 3. % of population, ages 25 and over, with 4+ years of college

	White	Black	Asian	Hispanic
1940	4.9	1.3	3.9	--
1980	18.4	7.9	32.9	7.6
1990	23.1	11.3	41.7	9.2
2000	28.1	16.6	44.4	10.6
2010	33.2	20.0	52.8	13.9

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### At both ends of the educational spectrum

Table 4. High School Dropouts (Percent of population age 14-24)

	Total	White	Black	Hispanic (any race)
1980	12.0	11.3	16.0	29.5
1990	10.1	10.1	10.9	26.8
2000	9.1	9.1	10.9	23.5
2010	6.4	6.3	7.2	12.8

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## Creating variance by state

**Table 6. Educational Attainment by State, 2010**  
(For graduates, expressed as percent of population, 25 years old & over)

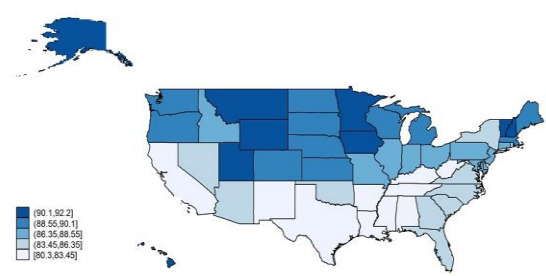
	h.s. grad	college grad
United States total	85.3	28.0
Wyoming	92.2	23.7
Montana	91.7	28.5
Alaska	91.5	27.6
Minnesota	91.4	31.8
New Hampshire	91.3	33.0
Vermont	91.1	33.7
Utah	90.5	29.1
Iowa	90.4	25.0
Hawaii	90.2	29.3
North Dakota	90.1	27.0

**Table 6. Educational Attainment by State, 2010**  
(For graduates, expressed as percent of population, 25 years old & over)

	h.s. grad	college grad
Tennessee	83.2	22.8
New Mexico	83.1	25.2
Arkansas	82.5	19.1
West Virginia	82.5	17.1
Alabama	82.0	22.0
Louisiana	81.8	21.1
Kentucky	81.7	20.5
California	80.7	30.0
Mississippi	80.7	19.8
Texas	80.3	25.8

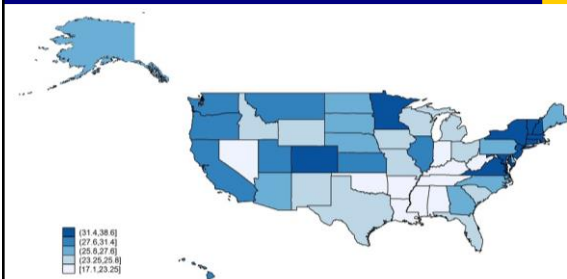
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## High School Graduates, 2010



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## College Graduates, 2010



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## Explaining 2010 H.S. Grad Rates

**Table 7. Analysis of High School Graduation Rates by State, 2010**  
(robust standard errors in parentheses)

	H.S. Grads in Population Ages 25+				H.S. Grads in Population Ages 18-24			
% Black	-0.172*** (0.04)	-0.180*** (0.03)	-0.166*** (0.03)	-0.178*** (0.02)	-0.101* (0.05)	-0.102* (0.05)	-0.122** (0.05)	-0.123** (0.05)
% Hispanic	-0.002 (0.03)	-0.003 (0.03)			-0.032 (0.04)	-0.031 (0.04)		
% Asian	-0.026 (0.07)	-0.024 (0.04)			+0.134** (0.06)	+0.134** (0.05)		
% Foreign Born			-0.132* (0.07)	-0.121* (0.07)			-0.027 (0.07)	-0.027 (0.08)
Minimum Wage * 1000 / State	-46.20** (22.5)	-39.51** (16.7)	-51.09** (25.2)	-37.10* (20.1)	-24.57 (20.9)	-23.38 (20.1)	-24.77 (22.2)	-23.87 (24.3)
Median Annual Y								
Gini Coefficient		-0.942*** (0.26)		-0.819*** (0.29)			-0.166 (0.31)	-0.053 (0.40)
Residual <sup>†</sup>								
Constant	95.51	94.49	97.27	95.27	88.65	88.47	88.90	88.78
Adjusted R2	0.41	0.58	0.49	0.59	0.18	0.16	0.14	0.12
n	50	50	50	50	50	50	50	50

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### Comparing male & female, 25-34

Table 8. Analysis of High School Graduation Rates by State by Gender, 2010  
(robust standard errors in parentheses)

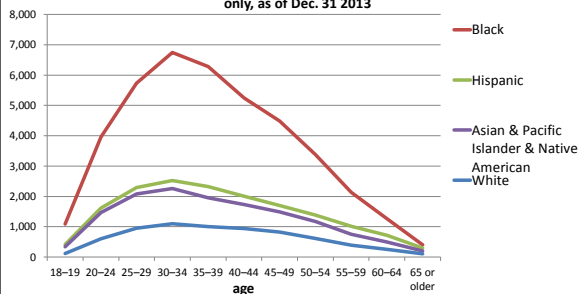
	Male H.S. Grads in Population Ages 25-34				Female H.S. Grads in Population Ages 25-34			
% Black	-0.225*** (0.05)	-0.230*** (0.04)	-0.225*** (5.14)	-0.229*** (0.04)	-0.116*** (0.04)	-0.130*** (0.03)	-0.122*** (0.03)	-0.125*** (0.03)
% Hispanic	-0.010 (0.03)	-0.006 (0.03)			-0.022 (0.03)	-0.019 (0.03)		
% Asian	+0.059 (0.09)	+0.061 (0.07)			+0.018 (0.08)	+0.020 (0.07)		
% Foreign Born			-0.160** (0.08)	-0.156* (0.08)			-0.150** (0.07)	-0.147** (0.07)
Minimum Wage * 1000 / State Median Annual Y	-27.39 (21.3)	-23.06 (17.6)	-35.42 (24.4)	-30.03 (24.4)	-23.40 (17.9)	-19.70 (15.0)	-27.11 (20.2)	-23.40 (20.9)
Gini Coefficient Residual <sup>1</sup>		-0.609* (0.31)		-0.316 (0.37)		-0.521* (0.27)		-0.217 (0.31)
Constant	93.45	92.79	96.14	95.37	95.67	95.11	97.27	96.74
Adjusted R2	0.39	0.44	0.47	0.48	0.19	0.25	0.32	0.31
n	50	50	50	50	50	50	50	50

### But denominator!

- The denominator in all Census estimates is “non-institutionalized population”
  - Excludes those in prison
- Not a problem if who is in prison is equally distributed across race and gender . . .
- But it’s not

### Imprisonment rate for men, by age

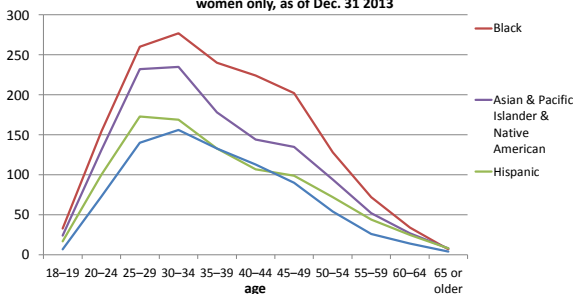
Imprisonment rate, state & federal prisoners, per 100,000 residents, men only, as of Dec. 31 2013



Source: U.S. Bureau of Justice Statistics, Prisoners in 2013, Table 8. <http://www.bjs.gov/index.cfm?ty=pbdetail&iid=5109>

### Check the scale on the vertical axis

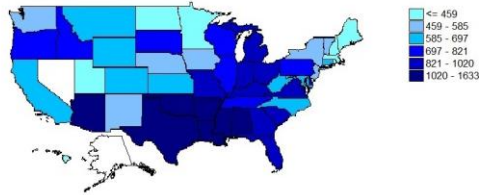
Imprisonment rate, state & federal prisoners, per 100,000 residents, women only, as of Dec. 31 2013



Source: U.S. Bureau of Justice Statistics, Prisoners in 2013, Table 8. <http://www.bjs.gov/index.cfm?ty=pbdetail&iid=5109>

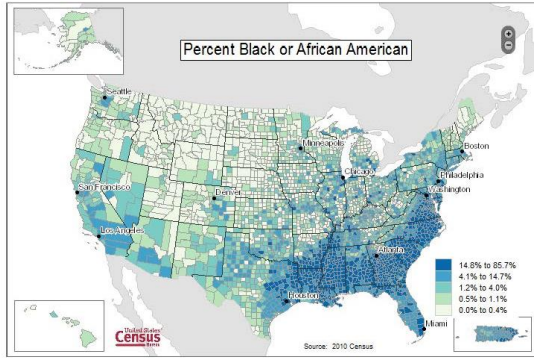
### Variation by State

#### Male Incarceration Rates 2013 Per 100,000 residents



Source: U.S. Bureau of Justice Statistics, Prisoners in 2013, Table 6. <http://www.bjs.gov/index.cfm?ty=pbdetail&iid=5109>

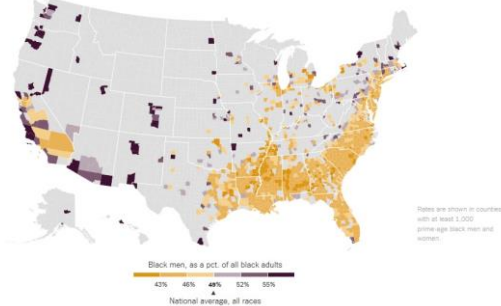
### Not strictly correlated with % black population



Source: 2010 Census

### NYTimes: 1.5 million missing black men

Where black men are missing



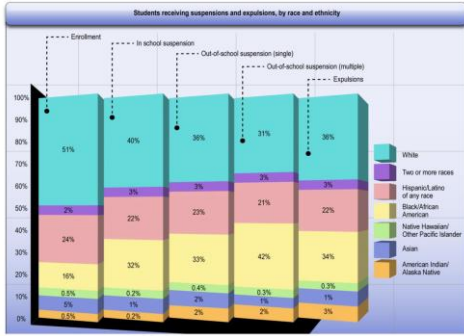
National average, all races

### Alternative measure of HS completion

Table 5. High School 4-year adjusted cohort graduation rate, 2010-11

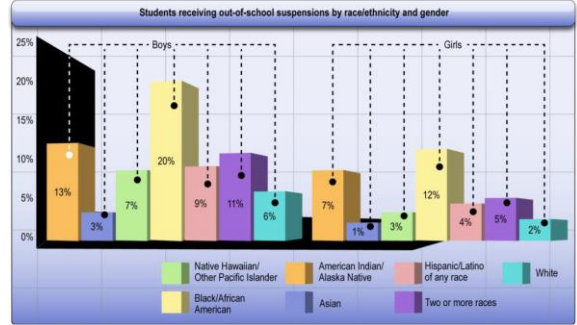
group	% of students	group	% of students
U.S.	79	Asian, PI	87
Low SES	70	White	84
Limited English	57	Hispanic	71
Students w/disabilities	59	Black	67

### Suspension rates differ by race & gender

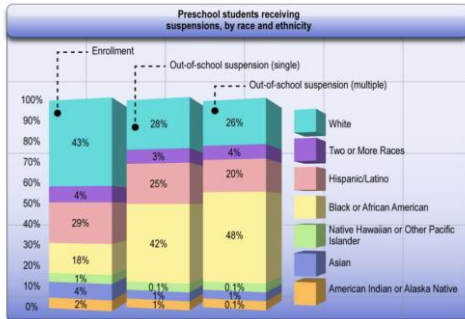


<https://www2.ed.gov/about/offices/list/ocr/docs/crdc-discipline-snapshot.pdf>

### Boys are 70% of suspended students



### Even in preschool. . .



### What do h.s. dropouts do?

Table 9. Employment Status of High School Grads & Dropouts (Percent of relevant population)

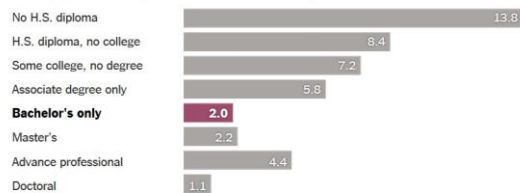
	Employed		Unemployed		Not in Labor Force	
	grad	dropout	grad	dropout	grad	dropout
1980	73.7	50.5	10.6	17.0	15.7	32.5
1990	75.0	52.4	9.9	13.5	15.1	34.1
2000	76.6	56.9	7.7	12.3	15.7	30.8
2010	65.4	51.1	8.7	10.2	25.9	38.7

H.S. grads are persons who have completed 4 years of high school but never enrolled in college. Source: 1980-2000, Statistical Abstract 2001, Table 260. 2010, computed from [http://nces.ed.gov/programs/digest/d11/tables/dt11\\_392.asp](http://nces.ed.gov/programs/digest/d11/tables/dt11_392.asp) (accessed 4/29/2013). For college grads (BA or higher), 2010 percentages were 81.8% employed, 4.3% unemployed, 13.9% out of the labor force.

## Unemployment varies by education

### The Benefits of College

Unemployment rate by education level for adults ages 25 to 34



Source: Bureau of Labor Statistics, Table 10 (not published on bureau website), March 2015

Source: <http://www.nytimes.com/2015/04/26/upshot/college-for-the-masses.html>

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## A little counterfactual exercise

- Starting from unemployment rates by education
- Combined with distribution of population across educational attainment by race (<http://www.census.gov/hhes/socdemo/education/data/cps/2014/tables.html>)
- Computed "counterfactual unemployment rates"
- Grabbed actual March 2015 unemployment rates by race from BLS report (<http://www.bls.gov/news.release/empsit.toc.htm>)
- Computed unemployment rates by race relative to white unemployment rate

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## Does education explain unemployment?

- Not entirely, no

Race	Counterfactual: $\frac{Un\ rate_{race}}{Un\ rate_{white}}$	Actual: $\frac{Un\ rate_{race}}{Un\ rate_{white}}$
White	1.0	1.0
Black	1.2	2.1
Hispanic	1.5	1.4
Asian	0.9	0.7

- Caveat: CPS data are non-institutionalized population

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## What's the return to education?

Table 10. Median Annual Earnings, Full-Time Year-Round Workers, by Highest Degree Earned, 2010

	Men	Women	White	Black	Hispanic	Asian
H.S. dropout	\$24,760	\$18,340	\$25,780	\$20,910	\$20,550	n.a.
H.S. grad	\$33,830	\$25,760	\$32,960	\$25,780	\$28,720	\$30,120
College grad	\$51,350	\$41,250	\$47,360	\$40,730	\$43,030	\$55,710
Masters or more	\$66,190	\$51,400	\$56,040	\$50,660	\$50,370	\$70,450

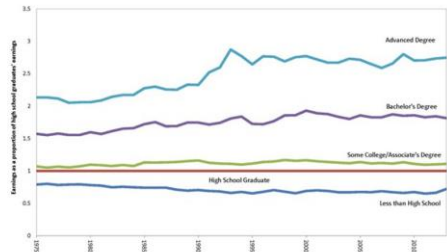
Source: In constant 2011 dollars.

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## Earnings by Education, 1975-2013

Figure 10: Average Earnings of Full-Time, Year-Round Workers as a Proportion of the Average Earnings of High School Graduates by Educational Attainment: 1975 - 2013



Source: U.S. Census Bureau, 1975-2010 March Current Population Survey, 2010-2012 Annual Social and Economic Supplement to the Current Population Survey



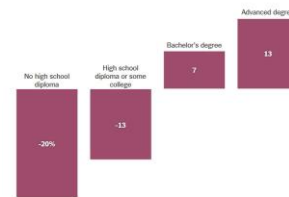
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## Earnings gap by education has worsened

### Earnings Have Fallen for Workers With Little Education

In the last generation, the earning power of less-educated American men in their prime working years has fallen.

Percent change in median real earnings of working-age men, 1990 to 2013



Men ages 30 to 45 who are employed at the time of census survey and worked 750 or more hours over the previous year

Source: Hamilton Project analysis of Census data

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## And That's the End

- What I hope you learned
- What I learned from you
- What I wish for you

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