

Educational Attainment on Wages:

A Regional Analysis of the United States of America

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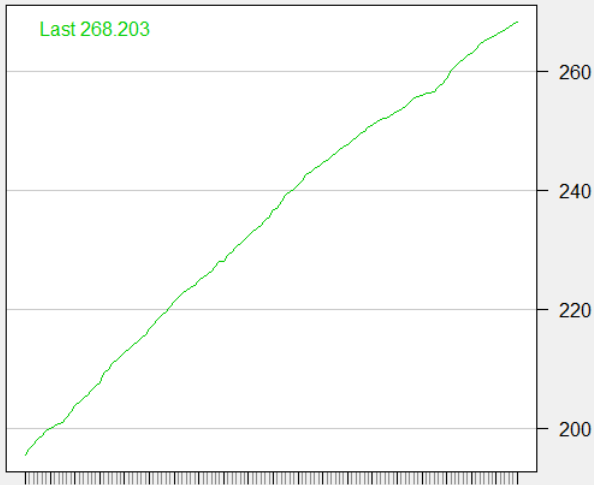
Why?

- ☐ Divisive politics over the last ten years (2010-2019).
- ☐ Rising household consumer price index (CPI) spending on education.
- ☐ With the rise in spending, is there a more advantageous region in the United States to move for greater returns on wages after increased educational attainment?

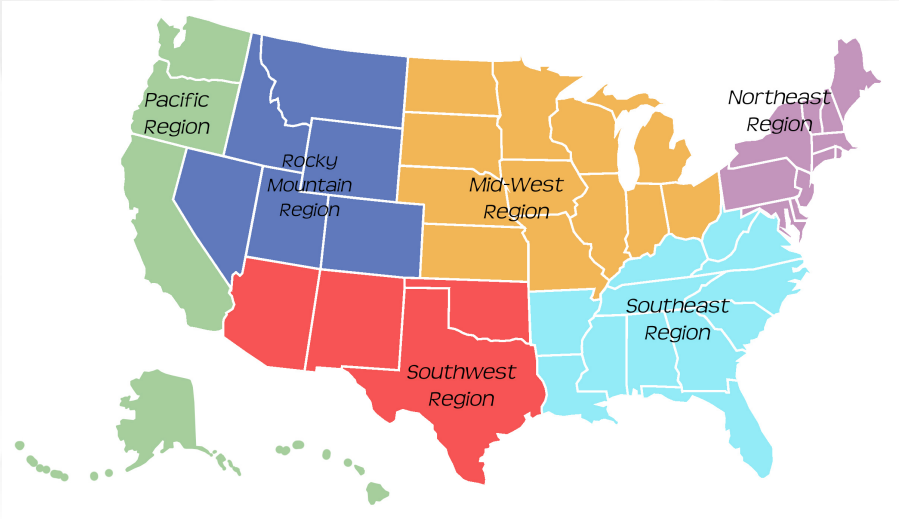


CPI US EDUCATION

[2010-01-01/2019-12-01]



Jan 2010 Jan 2012 Jan 2014 Jan 2016 Jan 2018





- ☐ Dahl, Gordon B. "Mobility and the return to education: Testing a Roy model with multiple markets." *Econometrica* 70.6 (2002): 2367-2420.
- ☐ Dickson, Matt, and Colm Harmon. "Economic returns to education: What we know, what we don't know, and where we are going—some brief pointers." *Economics of education review* 30.6 (2011): 1118-1122.
- ☐ Ransom, Tyler. "Selective migration, occupational choice, and the wage returns to college majors." (2020).



- Data retrieved IPUMS-USA using sampling from the American Community Survey (ACS).
- Entire data set has 3,956,055 observations.
- OLS logistic regressions with robust standard errors.
 - Simple Regression

$$y = \beta_0 + \beta_1 * x_1 + u \quad (1)$$

$$\log(\text{incwage}) = \beta_0 + \beta_1 * \text{EDUCYRS} + u \quad (2)$$

- Multiple Regression with Dummy Variables

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + u \quad (3)$$

$$\log(\text{incwage}) =$$

$$\begin{aligned} & \beta_0 + \beta_1 * \text{EDUCYRS} + \\ & \beta_2 * \text{AGE} + \beta_3 * \text{AGE}^2 + \\ & \beta_4 * \text{SEX} + \beta_5 * \text{RACENW} + \\ & \beta_6 * \text{MARSTD} + \beta_7 * \text{METROSTATUS} + u \end{aligned} \quad (4)$$



Side-by-Side Simple Regression Comparison of Regions

	Pacific (West)	Rocky Mountain	Southwest	Midwest	Southeast	Northeast
(Intercept)	9.389 (0.015)	9.488 (0.031)	9.724 (0.020)	9.577 (0.015)	9.587 (0.013)	9.580 (0.012)
EDUCYRS	0.098 (0.001)	0.083 (0.002)	0.073 (0.001)	0.076 (0.001)	0.077 (0.001)	0.085 (0.001)
Num.Obs.	701007	170849	424179	756201	884574	999788
R2	0.018	0.012	0.010	0.010	0.011	0.014
R2 Adj.	0.018	0.012	0.010	0.010	0.011	0.014
se_type	HC2	HC2	HC2	HC2	HC2	HC2



Side-by-Side Multiple Regression Comparison of Regions

	Pacific (West)	Rocky Mountain	Southwest	Midwest	Southeast	Northeast
(Intercept)	6.851 (0.020)	6.807 (0.039)	7.238 (0.025)	6.800 (0.019)	7.042 (0.017)	6.931 (0.016)
EDUCYRS	0.083 (0.001)	0.073 (0.002)	0.065 (0.001)	0.071 (0.001)	0.074 (0.001)	0.076 (0.001)
AGE	0.126 (0.001)	0.138 (0.001)	0.124 (0.001)	0.140 (0.001)	0.125 (0.001)	0.128 (0.001)
AGE.squared	-0.001 (0.000)	-0.002 (0.000)	-0.001 (0.000)	-0.002 (0.000)	-0.001 (0.000)	-0.001 (0.000)
SEX	-0.306 (0.002)	-0.338 (0.004)	-0.363 (0.002)	-0.328 (0.002)	-0.342 (0.002)	-0.310 (0.002)
RACENW	-0.025 (0.002)	-0.107 (0.006)	-0.096 (0.003)	-0.084 (0.003)	-0.123 (0.002)	-0.055 (0.002)
MARSTD	-0.150 (0.002)	-0.122 (0.004)	-0.148 (0.003)	-0.136 (0.002)	-0.139 (0.002)	-0.137 (0.002)
METROSTATUS	0.378 (0.006)	0.227 (0.006)	0.288 (0.005)	0.285 (0.003)	0.260 (0.003)	0.369 (0.004)
Num.Obs.	701007	170849	424179	756201	884574	999788
R2	0.160	0.178	0.171	0.198	0.171	0.170
R2 Adj.	0.160	0.178	0.171	0.198	0.171	0.170
se_type	HC2	HC2	HC2	HC2	HC2	HC2



- Areas like the Pacific (West) and Northeast demonstrated a smaller gender wage gap of 70 cents on the male dollar compared to the calculated national average of 69 cents on the male dollar earned. Whereas, the area of Southwest region gave a larger gap than the national average with 64 cents on the male dollar versus 69 cents on the male dollar.
- At only a 1 to 3 percent gap, these would be the most advantageous regions for non-white workers. The worst regions to work for non-white workers were found in the Rocky Mountain and Southeast regions. Non-white workers experienced a little over 9 percent gap in earnings compared to their white counterparts.
- The most problematic factor of the regressions are the critically low R^2 values.



- ☐ My hypothesis was rejected.
- ☐ For women and people of color there are areas that would be advantageous to move to like the Pacific West and Northeast for less wage discrimination gaps.
- ☐ This research topic could benefit from additional models like the Roy's model, Monte Carlo simulations and integration of fellow techniques from machine learning methods.
- ☐ Machine learning places a greater preference on \hat{y} versus $\hat{\beta}$ in econometric analysis which could better serve the investigation into this topic as complimentary sources from one another.



Questions, Comments, Concerns?

THANK YOU !