Educational Attainment on Wages:

A Regional Analysis of the United States of America

Abigail Hoffman

University of Oklahoma

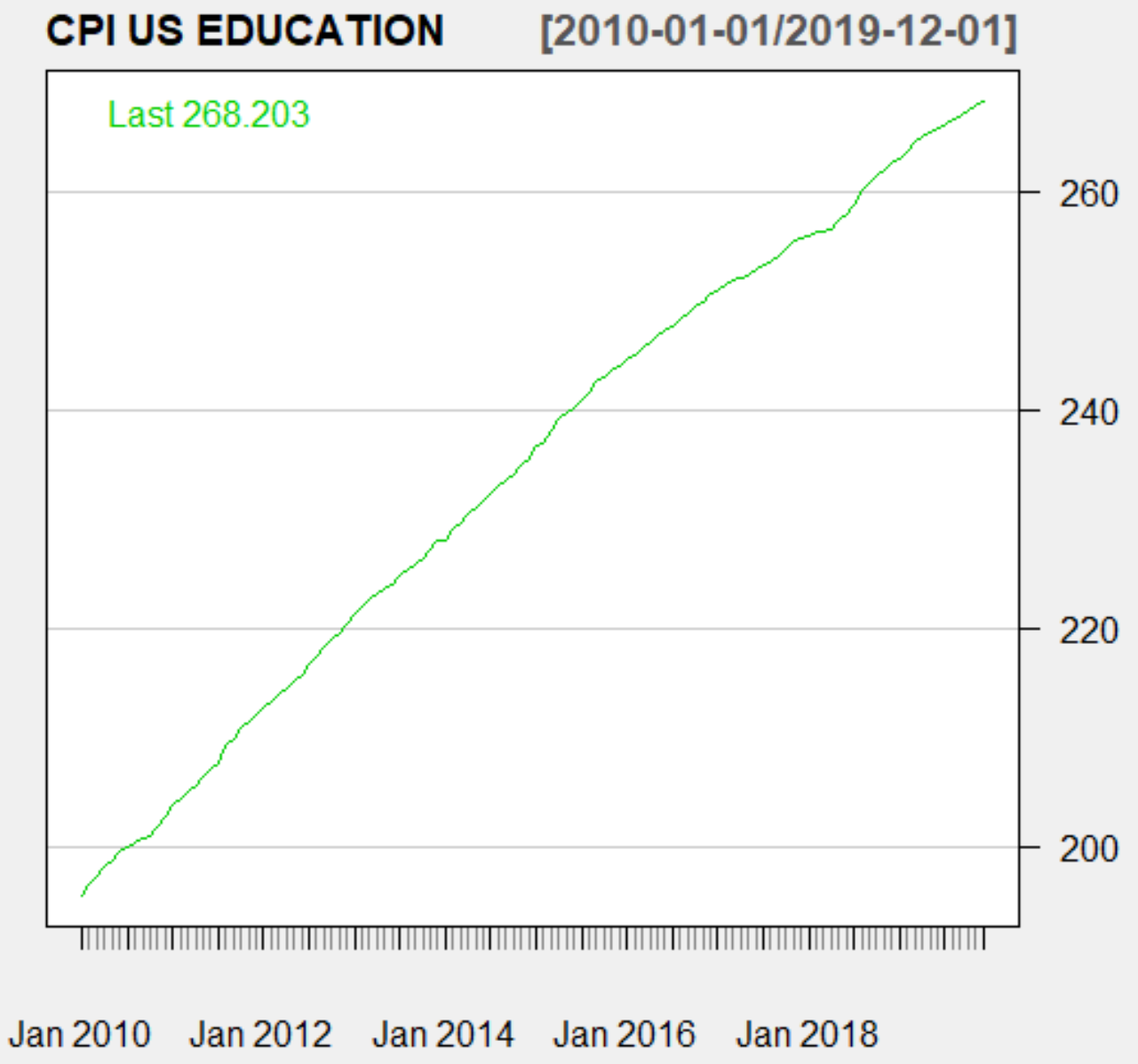
TABLE OF CONTENTS

Introduction

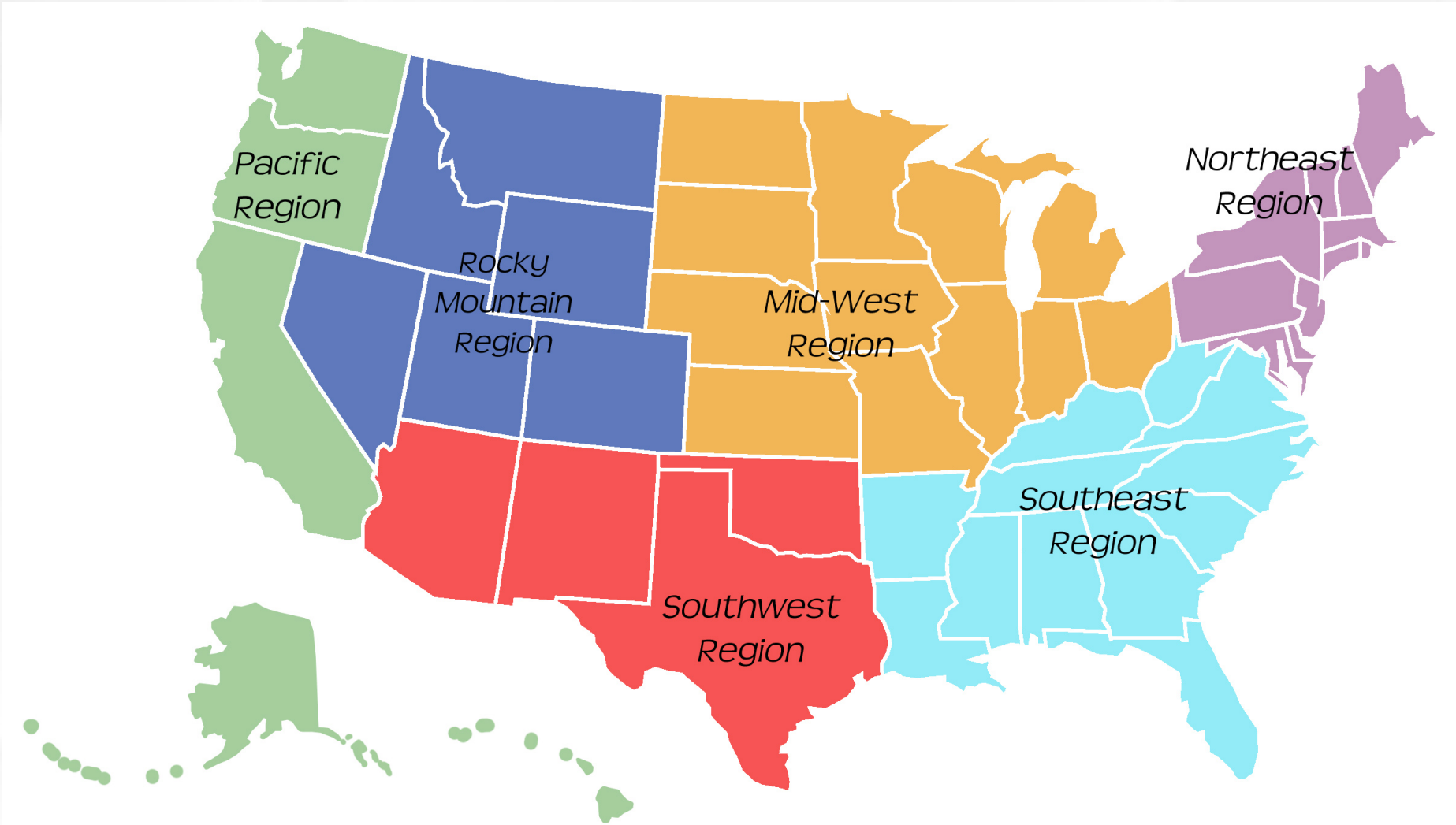
Why?

- 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



USA Regions



Literature Review

- 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 and Models

- Data retrieved IPUMS-USA using sampling from the American Community Survey (ACS).
- Entire data set has 3,816,929 observations.
- OLS logistic regressions with robust standard errors.
  - Simple Regression

$$y = \beta 0 + \beta 1 * x1 + u \tag{1}$$

$$log(incwage) = \beta 0 + \beta 1 * EDUCYRS + u \tag{2}$$

  - Multiple Regression with Dummy Variables

$$y = \beta 0 + \beta 1x1 + \beta 2x2 + \beta 3x3 + \beta 4x4 + \beta 5x5 + \beta 6x6 + \beta 7x7 + u \tag{3}$$

$$\begin{aligned} log(incwage) = & \\ & \beta 0 + \beta 1 * EDUCYRS + \\ & \beta 2 * AGE + \beta 3 * AGE^2 + \\ & \beta 4 * SEX + \beta 5 * RACENW + \\ & \beta 6 * MARSTD + \beta 7 * METROSTATUS + u \end{aligned} \tag{4}$$

Simple Regression Region Models Comparison

	Pacific (West)	Rocky Mountain	Southwest	Midwest	Southeast	Northeast
(Intercept)	9.554	9.620	9.877	9.727	9.695	9.693
	(0.014)	(0.030)	(0.019)	(0.014)	(0.013)	(0.012)
EDUCYRS	0.085	0.072	0.060	0.065	0.067	0.075
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Num.Obs.	677420	166375	409548	737003	857030	969553
R2	0.015	0.010	0.007	0.008	0.010	0.012
R2 Adj.	0.015	0.010	0.007	0.008	0.010	0.012
se_type	HC2	HC2	HC2	HC2	HC2	HC2

Findings: Multiple Regression Regional Models Comparison

	Pacific (West)	Rocky Mountain	Southwest	Midwest	Southeast	Northeast
(Intercept)	7.075	6.993	7.458	7.007	7.198	7.101
	(0.019)	(0.037)	(0.024)	(0.018)	(0.016)	(0.015)
EDUCYRS	0.073	0.065	0.056	0.062	0.067	0.069
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
AGE	0.122	0.134	0.120	0.136	0.122	0.125
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
AGE^2	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SEX	-0.252	-0.291	-0.299	-0.277	-0.284	-0.252
	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
RACENW	0.002	-0.090	-0.063	-0.061	-0.094	-0.029
	(0.002)	(0.005)	(0.003)	(0.002)	(0.002)	(0.002)
MARSTD	-0.128	-0.107	-0.122	-0.115	-0.116	-0.112
	(0.002)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)
METROSTATUS	0.339	0.208	0.248	0.257	0.228	0.333
	(0.006)	(0.006)	(0.005)	(0.002)	(0.003)	(0.004)
Num.Obs.	677420	166375	409548	737003	857030	969553
R2	0.156	0.179	0.167	0.199	0.171	0.168
R2 Adj.	0.156	0.179	0.167	0.199	0.171	0.168
se_type	HC2	HC2	HC2	HC2	HC2	HC2

Results

- Areas like the Pacific (West) and Northeast demonstrated a smaller gender wage gap of 75 cents on the male dollar compared to the calculated national average of 69 cents on the male dollar earned. Whereas, the areas of the Rocky Mountain region and Southwest region gave a more accurate depiction of the national gender wage gap at approximately 70 cents on the male dollar versus 69 cents on the male dollar.
- At only a 2 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.

Conclusion

- 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.

Closing Remarks

Questions, ***Comments***, ***Concerns***?

THANK YOU !