

Racial/Ethnic Differences in Income Inequality Across US Regions

Gary A. Hoover · Mehmet E. Yaya

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Abstract In this study we investigate the differences in income inequality among different racial/ethnic groups in the United States using both personal and household income. We find that income inequality is negatively related to the percentage of males but that the impact is muted for blacks as opposed to whites or Hispanics. In addition, we find income inequality among blacks and Hispanics is affected in vastly different ways, due to unemployment, than for whites. Finally, the impacts on inequality from the exclusion of given groups is significantly influenced by education and the percentage of males contributing to household income but not in a uniform manner for whites, blacks, and Hispanics.

Keywords Regional poverty · Racial differences · Policy analysis

Introduction

Social scientists have devoted much time and resources to understanding the causes and implications of high levels of income inequality within and between countries. Researchers have vigorously explored the impact of gender or educational differences among populations on the root causes of income inequality and on society as a whole.

Another interesting way of examining income inequality is to explore the underlying racial/ethnic group dynamics that might have significant influence on the distribution of

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G. A. Hoover (✉)
Department of Economics, Finance, and Legal Studies, University of Alabama, Alston Hall 200,
Tuscaloosa, AL 35487, USA
e-mail: ghoover@bama.ua.edu

M. E. Yaya
Department of Economics, Eastern Michigan University, 703M Pray-Harold, Ypsilanti, MI 48197, USA
e-mail: myaya@emich.edu

income. In this paper, we examine regional variations in the distribution of income by race and ethnicity. We examine the factors that might explain income inequality and whether they are the same across racial and ethnic groups. Finally, we examine the impact of within group inequality on overall inequality.

The results are two-fold. First, they suggest that income and the square of income both are significant factors influencing income inequality. **With the sign of the square of income being negative, the results are consistent with those of others supporting the Kuznets hypothesis.** Moreover, increases in unemployment were found to increase inequality, while the percentage of males leads to a decrease for all the groups, however these effects were largest for blacks. There are also regional differences in equality. Inequality is higher in the South than any other region. Second, we present the results of what the overall distribution of income and corresponding inequality measures would have been if the given racial/ethnic group were omitted. The exclusion of whites from all regions but the South increased inequality. Blacks being omitted led to an increase in inequality in the Northeast and South but the levels were virtually zero.

Over the last half-century there has been a tremendous amount of interest in the proper measure of inequality ranging from the, now-standard, Gini coefficient to the Relative Mean Deviation measure to the Theil Index. Recent work by Campano and Salvatore (2006) provides an excellent overview of the latest developments in the measurement instruments used in income distribution research. Most work in this area only uses the Gini coefficient as the measure of income inequality. **We include the Gini which allows us to incorporate the concept of movements towards or away from the average.** This work also uses two types of income: personal income and household income. Given the increasing reliance on several income earners to contribute to total family income, the results derived from household income inclusion are quite telling. This analysis is a first attempt at examining the counterfactual argument of racial/ethnic group importance to overall income inequality by omitting given groups individually and examining the resulting level of inequality.¹ In addition, this work seeks to explain what factors affect income inequality among given groups and what factors help explain the impact of our counterfactuals.

In the next section we present a review of the literature on both inequality and measurements in use along with a discussion of the findings of the impact of these measures on racial/ethnic groups. The third section discusses the data sources used and rationale for the inclusion of our explanatory variables. The fourth section has the model and results. This section also includes a discussion of the counterfactual investigation of racial/ethnic group removal. Concluding remarks are in the final section.

Literature review

The majority of previous work in this area has focused on macro scale indicators. This focus has centered on the relationship between economic output, measured mainly by GDP, and income inequality which has led to many interesting, but yet undecided findings. Is the relationship a positive one? Does growth lead to decreasing levels of

¹ Of course, this analysis is incomplete given that other groups would have certainly moved in to fill the void but it is a first attempt.

inequality? Or is the relationship much more complex, where increases and decreases occur given certain economic dynamics?

Kuznets (1955) speculated that inequality would initially be positively correlated with economic development but that the relationship between growth and inequality would become negative at higher levels of development. Later, researchers like Blinder and Esaki (1978) and Bruno et al. (1998) found results that support the Kuznets hypothesis that came from the use of cross-sectional country-specific data. For country specific investigations, there has typically been a time-series analysis of the interaction between inequality and growth. More recently, for the United States, there has been an increasing amount of interest in measuring regional and local differences in inequality and its implications on those citizens of the region. In addition, there has been a steady stream of interest in investigating the gaps between racial groups and between genders concerning wage inequality.

Most research within given countries have been of time-series investigations into the link between growth and inequality such as Bishop et al. (1994a) which is strictly a comparison of regional inequality in the United States. The premise of the Kuznets hypothesis would still be applicable even in a given country, given that certain regions or states grow at different rates over time causing inequality to vary. Recent work by Gangl (2008) investigates the link between the high level of inequality and economic mobility of individuals, over time. If given individuals like women or blacks are permanently set in the lower tail of the income distribution, then areas of the country where economic mobility is limited could experience heightened levels of entrenched inequality. Rupasingha et al. (2002) finds that a plausible explanation for persistent differences in economic growth rates is ethnic diversity, among other factors.

In addition, Nielsen and Alderson (1997) use a panel of U.S. counties and discover that the Kuznets hypothesis held for the period 1925 through 1970, where growth and income inequality had the expected inverted *U*-shape but that since 1970 there has been a “*U*-turn” in that relationship. Nielsen and Alderson (1997) partly attribute this change to racial relations. Here, the authors promote the idea that racial “dualism” may have contributed to this upswing in that whites and blacks systematically find different employment opportunities and sources of income that leads to dual economies and persistent income inequality.

Gallet and Gallet (2004) confirm the earlier findings of Nielsen and Alderson (1997) that there has been a “*U*-Turn” in the relationship between income inequality and economic growth. More interestingly for our work, the former extended their study to include racial differences of blacks and whites finding that the changes in the relationship were race specific. Namely, that the change “for Black Americans began...earlier than that for the aggregate and White Americans. Also, the income levels associated with the turning points differ...”

As mentioned previously, one of the more interesting and thorough investigations of regional income inequality analysis was done by Bishop et al. (1994b) where they found that the income distribution of people in the South was converging to the national average but, the income distributions of the other regions of the country were diverging from each other. Although not stated in the paper, the largest concentration of blacks in the United States is in the South.

McCall (2001) examines the differences in wage inequality among racial/ethnic groups and gender in metropolitan areas. The authors’ findings for wage inequality,

that the impacts of schooling on opportunities are important, follow our findings for income inequality.

Standard descriptive statistics give limited information about a distribution. Moreover, most of them fail to measure inequality sufficiently. Although, simple statistics such as range and variance have been used as an inequality metric in the literature, they have been heavily criticized for their inability to capture the pattern of distribution among the extremes (Temkin 1993). On the other hand, the Gini Coefficient and Theil Index are widely accepted in the literature as an inequality metric mostly due to their easy interpretabilities.

We formulate the Gini by calculating:

$$GINI = \frac{1}{2n^2\mu} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j| \quad (1)$$

where μ is mean income, n is the number of individuals in the group, y_i is income of the i th individual in the group, y_j is income of the j th individual in the group. The coefficient lies between zero and one, with a higher Gini coefficient corresponding to a higher level of inequality. A zero Gini coefficient means perfect equality of incomes; whereas a coefficient of one means perfect inequality of incomes.

In addition, we calculate the Theil measure using:

$$THEIL = \ln(\mu_y) - \ln(\mu_{gm}) = \ln\left(\frac{\mu_y}{\mu_{gm}}\right) \quad (2)$$

where μ_y is the arithmetic mean and μ_{gm} is the geometric mean of the distribution of income. The Theil measure has the advantage of summing income inequalities within subgroups based on statistical information theory. This measure always takes positive values but the contribution of each subgroup to total income inequality can be negative. A zero Theil measure would indicate perfect equality where the geometric mean is equal to the arithmetic mean, mode, and median. However, when the Theil measure is greater than zero, the distribution of income is skewed to the right. The higher the index, the more unequal income is distributed.

The data

This empirical study on racial/ethnic groups in the U.S. uses data from the American Community Survey (ACS) for the year 2006. The Census Bureau screens approximately three million households annually, who constitute one percent of the total population in the United States. Data is collected in all 3,141 U.S. counties. The questionnaire allows the Census Bureau to collect several important variables such as personal and household income, employment status, educational attainment, age, and gender etc. The limitation of this data set is that it has only been collected since 2001 so there is not a long enough sample to do intertemporal examinations. Year-over-year changes in income inequality generally very little. Most works use five year averages which are not possible at this time. However, the results even in this cross-section are still telling.

One of the most important variables collected was personal income, which was used to calculate the income inequality measures of the racial/ethnic groups. Personal income

is the sum of eight different sources of income in the ACS. These sources of income are wage or salary income, net self-employment income, interest, dividends, or net rental or royalty income or income from estates and trusts, social security or railroad retirement income, Supplemental Security Income (SSI), public assistance or welfare payments, retirement, survivor, or disability pensions, and all other income.

Household income is equal to the sum of all incomes of members in a household. For example, if a family of three people were surveyed: two adults and a child with one adult employed and earning \$40,000 per year, the other adult is unemployed and a child with a part time job earning \$5,000 per year, ACS reports \$45,000 in household income.² Inequality measures using household income are much closer to those reported by the Census Bureau.

Another variable collected was educational attainment. The responses of individuals approximate the actual years of schooling. A zero response corresponds to a missing variable rather than no education, while one corresponds to “no schooling completed”. The maximum level of schooling is sixteen, which corresponds to a doctorate degree. All the observations that have a missing value were excluded from the study.

In addition, we had data on the unemployment rate, age, the percent of the racial/ethnic group that is male, and the size of the group. The differences across groups were stark. While the mean unemployment rate for whites was almost 5%, which was close to the national average in 2006, the average unemployment rate for blacks was more than double at nearly 11%. These differences continued throughout most of the variables used. For instance, the average level of educational attainment achieved by blacks was 9.65; by Hispanics 9.19 but for whites was 10.35, which closely resemble the entire U.S. population. Finally average age is the highest among whites with 47.7 years while the youngest and the most dynamic racial/ethnic group is Hispanics with 39.3 years.

Tables 1 and 2 have descriptive statistics of all variables used in this analysis. We use two different measures of income inequality. These measures were the Gini coefficient and the Theil measure of inequality, which are commonly used in the literature and are presented for both personal and household income data by averages for all 50 states and the District of Columbia. In addition, these data were disaggregated for all racial/ethnic groups and for the population as a whole.

Some of the differences in measures were telling. For instance in Table 1, inequality measured by personal income yielded a Gini coefficient of 0.5150 for blacks while the same group had inequality measured at 0.4805 when using the Theil measure. Each measure has its flaws and shortcomings so using a variety of measures allows for the robustness of the analysis to be highlighted.³ Using both personal and household income is important. The corresponding average Gini coefficient for household income inequality among blacks was 0.4172, which was much smaller than the same measure using personal income. These results are true for both metrics, across all groups and support the idea that individuals’ use of household support as an important source of income pooling/smoothing.

Figures 1a–c and 2a–c show the distribution of both personal and household income for the three main racial/ethnic groups under investigation. These figures carry the fundamental characteristic of most income distributions; namely, that they were

² Children under 16 years of age are excluded from the study.

³ For brevity, we present the Gini results in the main body of the paper and have the Theil results in the “Appendix”.

Table 1 Descriptive statistics of dependent variables for the racial groups by states

Variable	USA					Whites				Blacks				Hispanics			
	Obs	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max
Personal income																	
<i>Gini</i>	51	0.5375	0.0228	0.4903	0.5794	0.5330	0.0226	0.4884	0.5743	0.5150	0.0366	0.3829	0.5996	0.5461	0.0435	0.3236	0.6256
<i>Theil</i>	51	0.5396	0.0523	0.4437	0.6560	0.5297	0.0513	0.4405	0.6514	0.4805	0.0736	0.2807	0.6950	0.5611	0.0959	0.1877	0.8551
Household income																	
<i>Gini</i>	51	0.4156	0.0249	0.3769	0.5121	0.4112	0.0215	0.3647	0.4580	0.4172	0.0387	0.3085	0.4971	0.4095	0.0402	0.3198	0.5028
<i>Theil</i>	51	0.3052	0.0411	0.2435	0.4683	0.2984	0.0345	0.2247	0.3761	0.3027	0.0518	0.1853	0.4676	0.2978	0.0658	0.1710	0.4874

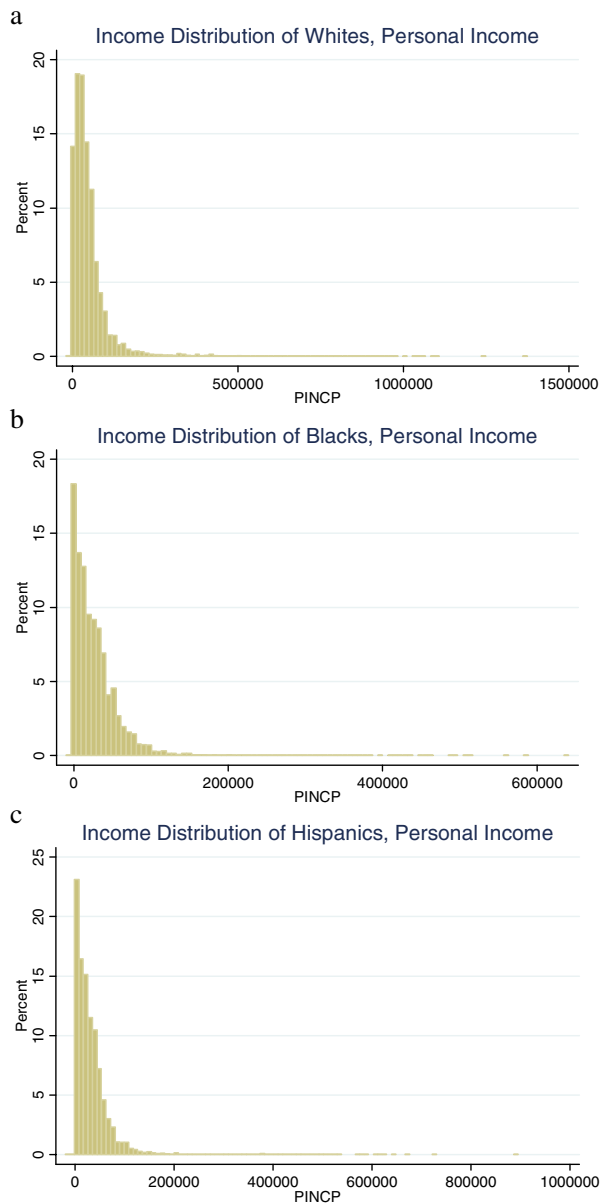
Table 2 Descriptive statistics of independent variables for the racial groups by states

Variable	USA				
	Obs	Mean	Std. dev.	Min	Max
Household income	51	72,457	13,059	51,848	104,518
Personal income	51	33,374	5,777	23,993	51,523
Unemployment	51	0.0609	0.0135	0.0330	0.0950
Age	51	47.7091	1.2123	43.4036	50.1553
Educational attainment	51	10.1696	0.3548	9.4183	11.1047
Percentage of males	51	0.4756	0.0113	0.4452	0.5044
Size	51	41,632	42,965	4,059	219,708

Variable	Whites				Blacks	
	Mean	Std. dev.	Min	Max	Mean	Std. dev.
Household income	76,248	17,198	51,991	153,209	52,497	10,698
Personal income	35,763	8,863	24,090	81,895	24,661	5,163
Unemployment	0.0500	0.0103	0.0240	0.0790	0.1058	0.0531
Age	48.4037	1.4821	42.1796	51.5727	43.2759	3.0038
Educational attainment	10.3454	0.5458	9.4088	13.1735	9.6593	0.4824
Percentage of males	0.4815	0.0096	0.4674	0.5155	0.4697	0.0696
Size	34,267	33,058	1,637	151,473	3,863	4,742

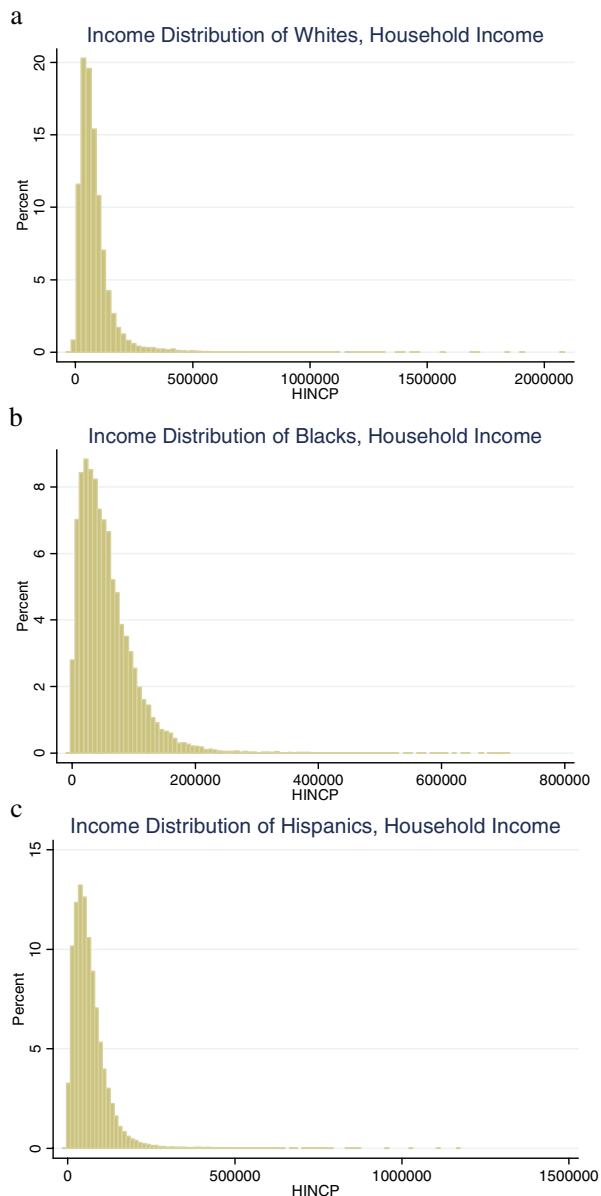
Variable	Blacks		Hispanics			
	Min	Max	Mean	Std. dev.	Min	Max
Household income	34,363	79,581	63,357	11,122	40,167	91,297
Personal income	15,688	38,662	25,394	4,955	17,081	46,936
Unemployment	0.0000	0.1950	0.0723	0.0263	0.0000	0.1170
Age	30.5833	49.0960	39.3202	2.3227	35.5674	45.0628
Educational attainment	8.6537	10.8000	9.1946	0.5364	8.3969	10.7838
Percentage of males	0.4084	0.7143	0.4766	0.0281	0.3514	0.5156
Size	12	16,419	3,114	8,009	31	45,633

Fig. 1 **a** Income distribution of Whites, personal income. **b** Income distribution of Blacks, personal income. **c** Income distribution of Hispanics, personal income



positively skewed. However the distributions for all of the ethnic/racial groups exhibited less positive skewness with household income compared to personal income. In Fig. 3a, b, we present personal and household income broken down by four regions of the country. Consistently for both household and personal income and across all regions of the country, average white income was higher than that of blacks and Hispanics and closer aligned with the national average. In addition, for all racial/ethnic groups, average income was highest for the West/Northeast region and lowest for the South/Midwest.

Fig. 2 **a** Income distribution of Whites, household income. **b** Income distribution of Blacks, household income. **c** Income distribution of Hispanics, household income



Other interesting comparisons of note were that Hispanic average household income was higher than blacks for every region but only in the Midwest and South when average personal income was used. Also of note, is that blacks in the South had the lowest average personal and household income of any racial/ethnic group in any region.

Figure 4a, b show the Gini for both personal and household income by region for each racial/ethnic group. The largest personal income inequality in a racial/ethnic group was among Hispanics in the Northeast. The smallest Gini was found among whites in the Midwest. The patterns differed dramatically for household income

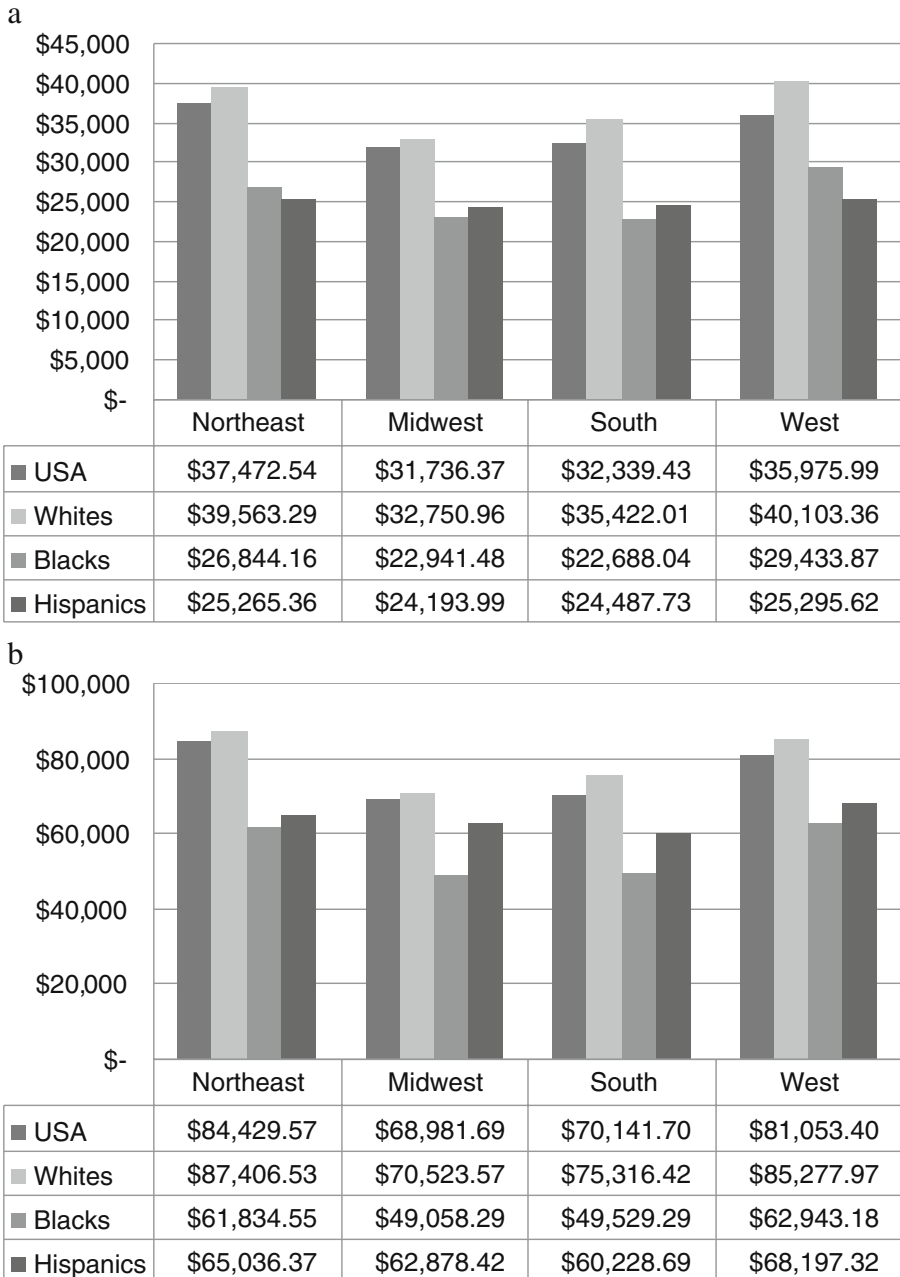


Fig. 3 **a** Average personal income of racial groups by region. **b** Average household income of racial groups by region

where Hispanics in the Northeast had the highest Gini coefficient and Hispanics in the West had the lowest. This latter result is not surprising given the concentration of Hispanics in this region.

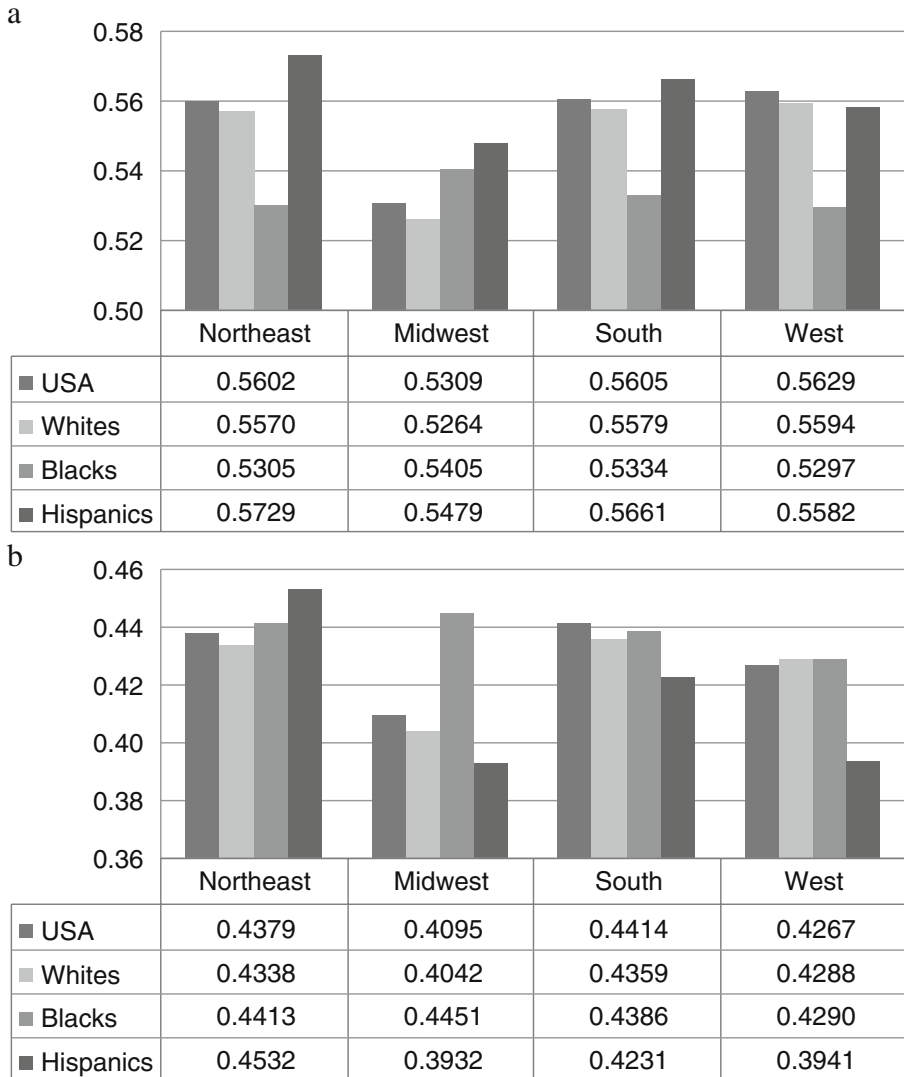


Fig. 4 **a** Personal income Gini coefficient by regions. **b** Household income Gini coefficient by regions

We use simple two-sample *t*-tests with unequal variances to examine whether the differences between income inequality among racial/ethnic groups across the 50 states and District of Columbia were significant. The results indicate that there are statistical mean inequality differences between the racial/ethnic groups.⁴ The two sample *t*-test with unequal variances shown in Tables 3, 4, and 5 suggests that there is statistical evidence that income inequality is not uniform across the regions. Compared to the Southern region, the Midwest has lower inequality for all racial/ethnic groups, while the Hispanic population exhibits lower inequalities in Northeastern and Western regions as

⁴ Test results using the personal income inequality are available from the authors upon request.

Table 3 Two-sample *t*-test with unequal variances, household income Gini coefficient

Group	Obs	Mean	Std. dev.	Min	Max
Whites	1,747,596	0.419504	0.019317	0.3647	0.4580
Blacks	197,005	0.431574	0.015923	0.3085	0.4971
Combined	1,944,601	0.420727	0.019347	0.3085	0.4971
diff = mean(Whites)–mean(Blacks)			–0.00596	<i>t</i> = –267.28	

Null Hypothesis: The difference in the mean income inequality among whites and blacks is equal to zero

Alternative Hypothesis: The difference in the mean income inequality among whites and blacks is not equal to zero

well. Moreover, the mean inequality of Hispanics is statistically larger than that of whites; hence income was more unequally distributed among Hispanics. On the other hand, income inequality for blacks was the most equally distributed among groups.

Results

Modeling

Consider the following regression model:

$$\begin{aligned}
 Inequality_i = & \alpha_0 + \alpha_1 Income_i + \alpha_2 Income_i^2 + \alpha_3 Age_i + \alpha_4 Schl + \alpha_5 Per_Male \\
 & + \alpha_6 Unemp_i + \sum_{j=1}^n \beta_j (Geographical\ Dummies) + \varepsilon_i
 \end{aligned} \quad (3)$$

where $Inequality_i$ is the Gini coefficient or Theil measure as defined in Eqs. 1 and 2, for state i . The model is used for the full sample, whites, blacks, and Hispanics. The variables included in the model are income, income squared, average age, educational attainment, percentage of males, the unemployment rate, and geographical controls. The variable definitions are given in the previous section. Based on the model, Weighted Least Squares (WLS) results are shown in Tables 6 and 7.

Table 4 Two-sample *t*-test with unequal variances, household income Gini coefficient

Group	Obs	Mean	Std. dev.	Min	Max
Whites	1,747,596	0.419504	0.019317	0.3647	0.4580
Hispanics	158,794	0.407925	0.025046	0.3198	0.5028
Combined	1,906,390	0.41854	0.020114	0.3198	0.5028
diff = mean(Whites)–mean(Hispanics)			0.01158	<i>t</i> = 222.48	

Null Hypothesis: The difference in the mean income inequality among whites and Hispanics is equal to zero

Alternative Hypothesis: The difference in the mean income inequality among whites and Hispanics is not equal to zero

Table 5 Two-sample *t*-test with unequal variances, household income Gini coefficient

Group	Obs	Mean	Std. dev.	Min	Max
Blacks	197,005	0.431574	0.015923	0.3085	0.4971
Hispanics	158,794	0.407925	0.025046	0.3198	0.5028
Combined	355,799	0.421019	0.023634	0.3085	0.5028
diff = mean(Blacks)–mean(Hispanics)			0.023649	<i>t</i> =342.03	

Null Hypothesis: The difference in the mean income inequality among blacks and Hispanics is equal to zero

Alternative Hypothesis: The difference in the mean income inequality among blacks and Hispanics is not equal to zero

The Ordinary Least Squares (OLS) method is susceptible to heteroscedasticity which leads to bias and inefficiency problems in coefficient estimation. “Weighted Least Squares” is generally used to eliminate the effect of heteroscedasticity in the data. In our estimations, we used analytic weights where the variance of an observation is inversely proportional to the size of each cohort. This method is appropriate when the observations represent the averages as in our study across the fifty states and the District of Columbia. Models estimated with WLS are more precisely estimated compared to OLS.

We also explored the issue of endogeneity as it relates to the variables in question. Earlier works on inequality assumed that income is a determining factor for inequality but not vice versa. Indeed, inequality is calculated based on income and there is a well-established unidirectional relationship between these variables. However it is possible to check the robustness of the results to the endogeneity question. For this purpose, an instrumental variable is selected from the ACS data that is uncorrelated with inequality but correlated with income. Although the ACS is limited in providing a strong instrument, *access to plumbing* seemed to work best for the purpose. Two-stage least square (2SLS) results, where income is instrumented with access to plumbing, suggest that the WLS results are sufficient to address endogeneity concerns.⁵

Impact of independent variables

We begin our analysis by simply trying to answer these questions: what impact do varying independent variables have on income inequality among racial/ethnic groups? Are these factors the same across different racial/ethnic groups? Are the factors the same across inequality metrics based on personal and household income?

Our analysis mainly centers on the results of Table 6, the middle panel, which has regional controls. Although not discussed fully here, there are results for regressions with no geographical controls and with Census divisions presented in the table. For the overall population we found that income and the square of income both have

⁵ For brevity, the 2SLS results are excluded but they are available from the authors upon request.

Table 6 Weighted least squares analysis on the determinants of income inequality across racial groups, personal income (dependent variable: Gini_P)

	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics
Personal income	0.0141 (2.11)**	0.0082 (4.23)***	0.0121 (2.16)**	0.0039 (0.79)	0.0159 (2.72)***	0.0078 (5.67)***	0.0165 (3.74)***	0.0166 (2.72)***	0.0147 (2.21)**	0.0071 (7.24)***	0.0179 (3.20)***	0.0037 (0.45)
Personal income-squared	-0.0002 (1.74)*	-0.0001 (3.28)***	-0.0003 (2.60)**	0.0000 (0.39)	-0.0002 (2.30)**	-0.0001 (3.87)***	-0.0003 (4.75)***	-0.0002 (2.22)**	-0.0002 (1.90)*	-0.0001 (4.87)***	-0.0003 (3.98)***	0.0000 (0.37)
Age	-0.0037 (1.13)	-0.0011 (0.37)	-0.0011 (0.46)	-0.0002 (0.17)	-0.0016 (0.55)	-0.0015 (0.75)	-0.0021 (0.95)	-0.0023 (2.95)***	0.0002 (0.06)	-0.0006 (0.27)	-0.0021 (1.03)	-0.0012 (1.03)
Percentage of males	-1.0209 (2.88)***	-1.3562 (3.03)***	-0.0232 (0.16)	-0.3814 (3.00)***	-0.8203 (2.35)**	-1.0529 (3.14)***	-0.1328 (0.99)	-0.5226 (2.13)**	-1.0378 (3.85)***	-1.0996 (3.76)***	-0.2687 (1.73)*	-0.4785 (1.70)*
Unemployment	0.4363 (1.87)*	0.5450 (2.38)**	0.3644 (4.55)***	0.2677 (1.26)	0.6523 (3.92)***	0.7231 (3.79)***	0.5509 (4.48)***	0.5957 (2.77)***	0.6738 (3.67)***	0.7596 (3.92)***	0.3592 (2.42)**	0.4315 (1.53)
Educational attainment	-0.0192 (1.15)	-0.0105 (0.71)	0.0091 (0.46)	-0.0149 (1.40)	-0.0275 (1.68)	-0.0116 (0.85)	0.0049 (0.25)	-0.0139 (1.62)	-0.0153 (0.72)	0.0002 (0.01)	-0.0049 (0.29)	-0.0171 (1.68)*
Regions												
Northeast					-0.0029 (0.38)	-0.0122 (1.85)*	-0.0014 (0.19)	-0.0266 (2.02)**				
Midwest					-0.0173 (2.43)**	-0.0205 (3.49)***	-0.0174 (2.18)**	-0.0262 (3.37)***				
South					(dropped)	(dropped)	(dropped)	(dropped)				
West					0.0109 (1.26)	-0.0016 (0.26)	0.0115 (1.23)	-0.0189 (4.04)***				
Divisions									(dropped)	(dropped)	(dropped)	(dropped)
New England												

Middle Atlantic	0.0079 (0.76)	0.0211 (2.14)**	0.0019 (0.11)	0.0101 (1.11)
East North Central	–0.0056 (0.51)	0.0083 (0.91)	–0.0015 (0.08)	0.0081 (0.51)
West North Central	0.0016 (0.16)	0.0131 (1.31)	–0.0142 (0.85)	–0.0033 (0.16)
South Atlantic	0.0056 (0.48)	0.0245 (3.14)***	–0.0015 (0.09)	0.0357 (1.71)*
East South Central	0.0113 (0.86)	0.0303 (3.02)***	0.0067 (0.37)	0.0589 (2.31)**
West South Central	0.0249 (2.12)**	0.0386 (4.90)***	0.0173 (1.03)	0.0154 (1.07)
Mountain	0.0241 (2.77)***	0.0262 (2.95)***	0.0263 (1.23)	0.0032 (0.16)
Pacific	0.0225 (2.36)**	0.0233 (2.71)***	0.0224 (1.25)	0.0179 (1.53)
Constant	1.0752 (4.30)***	0.3165 (1.94)*	0.7344 (4.31)***	0.8787 (4.41)***
Observations	51	51	51	51
R-squared	0.59	0.61	0.75	0.71

Dependent variable is Gini_P. Absolute value of z-statistics in parentheses.

*significant at 10% level; **significant at 5% level; ***significant at 1% level

significant estimated coefficients. With the sign of the square of income being negative, the results are consistent with those of others supporting the Kuznets hypothesis. Our a priori expectations were that income would have a positive estimated coefficient, which is also confirmed. This relationship holds for all three racial and ethnic groups.

Although, unemployment increased inequality for all racial and ethnic groups, the size of the estimated coefficient for blacks and Hispanics was smaller. This can be partly attributed to the higher unemployment rate for blacks and Hispanics. Also, in the regression for Hispanics there was a significant negative estimated coefficient for age that was unique to them. Hispanics did have the youngest average age of any group.

The percentage of males reduces income inequality for all groups but the effect is smaller for blacks and Hispanics than for whites. The regional dummy variables consistently have an estimated coefficient that is negative. Thus, inequality is higher in the South than any other region which partly confirms the findings of Bishop et al. (1994b) although no convergence testing was performed.

Table 7 had the corresponding results for household income. The results presented using household income for the entire U.S. are similar to those for personal income although schooling and average age, which were not significant for personal income, are significant for household income. An appendix table shows the pairwise correlations among the independent variables sorted by racial and ethnic group. The correlations between schooling and household incomes are not as high as those for personal income. This leads to less bias from possible multicollinearity in the household models. In this model, the estimated coefficient for schooling is negative, meaning that income inequality falls as the average educational attainment rises.

Percentage of males reduces income inequality for all the groups but the effect is smaller for Hispanics than whites, and is not significant at standard levels for blacks that have the smallest percentage of males within the cohort. This point was more pronounced with the household data.

As mentioned, average age had a consistently significant negative impact on income inequality for whites and the United States. Given that whites had the highest average level of age, the results shown, are consistent with the concept of income changing at various points on the life cycle path. This result was not found for blacks or Hispanics.

What we found is that, for the most part, factors that impact one group, impact them all (and the U.S. as a whole) but the degree to which these factors impact inequality differ by racial/ethnic group.

Counterfactual investigation

In Table 8, we present the results of what the overall distribution of income and corresponding inequality measures would have been if the given racial/ethnic group were omitted from the calculations. The results shown are the differences between inequality before the change and after. We do this analysis for both personal and household income and find that the changes to inequality are telling. See Fig. 5a, b for a graphical presentation of the before and after differences in

income inequality by racial/ethnic groups and region. In these figures, we illustrated the counterfactual effects of each racial/ethnic group on income inequality. A negative number would indicate that after-change inequality was higher. For example, in Fig. 5a the counterfactual effect of the white population in the Northeast is -0.0155 , suggesting that the whites have an equalizing effect on income inequality in the region.

Using personal income, when whites are omitted, income inequality increases in all regions but the South. Omitting Hispanics from the analysis does not result in an increase in income inequality in any region. In the West, income inequality fell when Hispanics were omitted from the analysis. Blacks being omitted leads to an increase in inequality in the Northeast and South but the amounts were virtually zero.

Since, omitting some racial/ethnic groups lead to increases or decreases in inequality, in given regions, we endeavored to explain what characteristics about that group had significant influence on those outcomes.

To that end, now consider:

$$\tilde{y}_i = y_{STATE} - y_i \quad (4)$$

where \tilde{y}_i denotes the effect of racial/ethnic group i on income inequality with y_{STATE} being the inequality measure of the entire state population in 2006 and y_i being the inequality of population in state i in the absence of the racial/ethnic group. See Table 8 for descriptive statistics of these newly created variables.

Since the Lorenz curves cross, it is impossible to say that the pre-removal Lorenz curve was Lorenz-dominated by the post; however, a negative \tilde{y}_i would indicate that the omitted groups left a Lorenz curve that was farther removed from equal distribution. The opposite effect was taking place for positive \tilde{y}_i results.

Our econometric model is then the following:

$$\begin{aligned} \tilde{y}_i = & \alpha_0 + \alpha_1 Income_i + \alpha_2 Age_i + \alpha_3 Schl + \alpha_4 Per_Male + \alpha_5 Unemp_i \\ & + \sum_{j=1}^n \beta_j (Geographical\ Dummies) + \varepsilon_i \end{aligned} \quad (5)$$

In Tables 9 and 10, we analyze, using econometric model above, how much the independent variables explain the changes in income inequality that occur when a given group is omitted. As mentioned earlier, the effects are not uniform by group or region.

The percentage of the male population had a significant negative impact on the gap that is created in income inequality when whites are omitted from the population. This effect is also negative for Hispanics but not significant at standard levels for household income. Once again, the impact for blacks runs counter to that of the other two groups.

In addition, we noted that the impact on the exclusion of blacks and Hispanics, for both household and personal income is consistently negatively influenced by schooling. This effect was not found among whites. However, as stated previously, whites had the highest correlations between schooling and income. Hence, for blacks and Hispanics, *ceteris paribus*, increases in the average level of schooling caused decreases in the gap created in income inequality caused by their exclusion.

Table 7 Weighted least squares analysis on the determinants of income inequality across racial groups, household income (dependent variable: Gini_H)

	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics
Household income	0.0058 (2.28)**	0.0026 (1.19)	0.0072 (2.86)***	0.0016 (0.85)	0.0064 (2.51)**	0.0024 (1.24)	0.007 (3.74)***	0.0073 (3.35)***	0.0074 (2.72)***	0.0022 (1.29)	0.0082 (3.83)***	0.0051 (2.03)*
Household income-squared	-3.15e-05 (2.00)**	-1.12e-05 (0.87)	-0.0001 (3.11)***	-2.4e-05 (1.63)	-3.48e-05 (2.19)**	-9.59e-06 (0.84)	-0.0001 (4.63)***	-0.0001 (3.61)***	-4.05e-05 (2.37)**	-9.64e-06 (0.89)	-0.0001 (4.57)***	-4.2e-05 (2.35)**
Age	0.0016 (0.76)	0.0043 (2.45)**	0.0024 (1.31)	-0.0007 (0.54)	0.0034 (2.41)**	0.0041 (3.48)***	0.0019 (1.01)	-0.0008 (0.57)	0.0056 (4.52)***	0.0048 (4.00)***	0.0027 (1.28)	-0.0002 (0.14)
Percentage of males	-1.5305 (5.50)***	-1.3482 (3.02)***	-0.0718 (0.60)	-1.0414 (8.01)***	-1.3696 (3.90)***	-1.0817 (3.02)***	-0.1038 (1.01)	-0.5038 (1.90)*	-1.5618 (5.83)***	-1.1286 (3.43)***	-0.2632 (2.20)**	-0.7749 (2.64)**
Unemployment	0.1478 (0.72)	0.2401 (0.90)	0.3466 (3.07)***	0.1593 (0.91)	0.3079 (1.72)*	0.4027 (1.62)	0.4425 (3.42)***	0.3804 (1.93)*	0.4871 (2.77)***	0.4473 (1.94)*	0.3086 (2.01)*	0.4819 (1.87)*
Educational attainment	-0.0179 (1.40)	-0.0018 (0.13)	-0.002 (0.17)	0.0295 (4.43)***	-0.0228 (1.72)*	-0.0041 (0.27)	0.0054 (0.45)	0.0266 (4.00)***	-0.0160 (1.05)	-0.0110 (0.62)	0.0002 (0.03)	0.0064 (0.69)
Regions												
Northeast					-0.0070 (0.79)	-0.0152 (1.69)*	0.0089 (1.44)	0.0084 (0.63)				
Midwest					-0.0128 (1.95)*	-0.0168 (2.87)***	-0.0111 (1.24)	-0.0266 (3.21)***				
South					(dropped)	(dropped)	(dropped)	(dropped)				
West					0.0052 (0.64)	-0.0050 (0.66)	0.0041 (0.58)	-0.0219 (5.46)***				
Divisions												
New England									(dropped)	(dropped)	(dropped)	(dropped)

Middle Atlantic	0.0033 (0.26)	0.0206 (1.50)	-0.0064 (0.27)	-0.0175 (1.50)
East North Central	-0.0042 (0.38)	0.0126 (1.32)	-0.0179 (0.71)	-0.0353 (2.17)**
West North Central	0.0148 (1.41)	0.0237 (1.95)*	-0.0084 (0.36)	-0.0269 (1.38)
South Atlantic	0.0064 (0.55)	0.0253 (3.04)***	-0.0167 (0.72)	-0.0015 (0.06)
East South Central	0.0161 (1.25)	0.0391 (3.63)***	-0.0044 (0.18)	0.0433 (1.74)*
West South Central	0.0231 (1.89)*	0.0410 (4.68)***	-0.0016 (0.07)	-0.0219 (1.67)*
Mountain	0.0223 (2.69)**	0.0211 (2.06)**	0.0078 (0.32)	-0.0275 (1.55)
Pacific	0.0168 (1.83)*	0.0229 (2.60)**	-0.0035 (0.15)	-0.0395 (3.11)***
Constant	0.9925 (5.18)***	0.7317 (2.83)***	0.1388 (1.18)	0.2128 (1.12)
Observations	51	51	51	51
R-squared	0.61	0.50	0.57	0.82
			0.64	0.65
			0.71	0.73
			0.73	0.79
			0.64	0.72
			0.64	0.88

Dependent variable is Gini_H. Absolute value of z-statistics in parentheses

*significant at 10% level; **significant at 5% level; ***significant at 1% level

Table 8 Descriptive statistics of the effect of the racial groups on inequality measures

Variable	Obs	Whites				Blacks				Hispanics			
		Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max
Personal income inequality measures													
<i>Gini</i>	51	-0.01328	0.030465	-0.0840	0.0271	0.001482	0.007530	-0.0067	0.0509	0.00229	0.00300	-0.0011	0.0135
<i>Theil</i>	51	-0.02223	0.067437	-0.1781	0.0642	0.003514	0.017548	-0.0129	0.1192	0.005614	0.007538	-0.0017	0.0354
Household income inequality measures													
<i>Gini</i>	51	-0.00896	0.026112	-0.0762	0.0370	0.003759	0.006878	-0.0003	0.0405	0.00030	0.001981	-0.0042	0.0059
<i>Theil</i>	51	-0.01056	0.043788	-0.1241	0.0794	0.005959	0.012512	-0.0004	0.0795	0.000573	0.002972	-0.0040	0.0093

The effect of unemployment was positive and significant for blacks and Hispanics but not significant for whites using either personal or household incomes. Once again, unemployment was almost half for whites than for blacks or Hispanics.

Finally, the South was shown to lag the other regions in the country in how the independent variables impact the changes that occur to inequality when a given racial/ethnic group is omitted.

Conclusions and policy implications

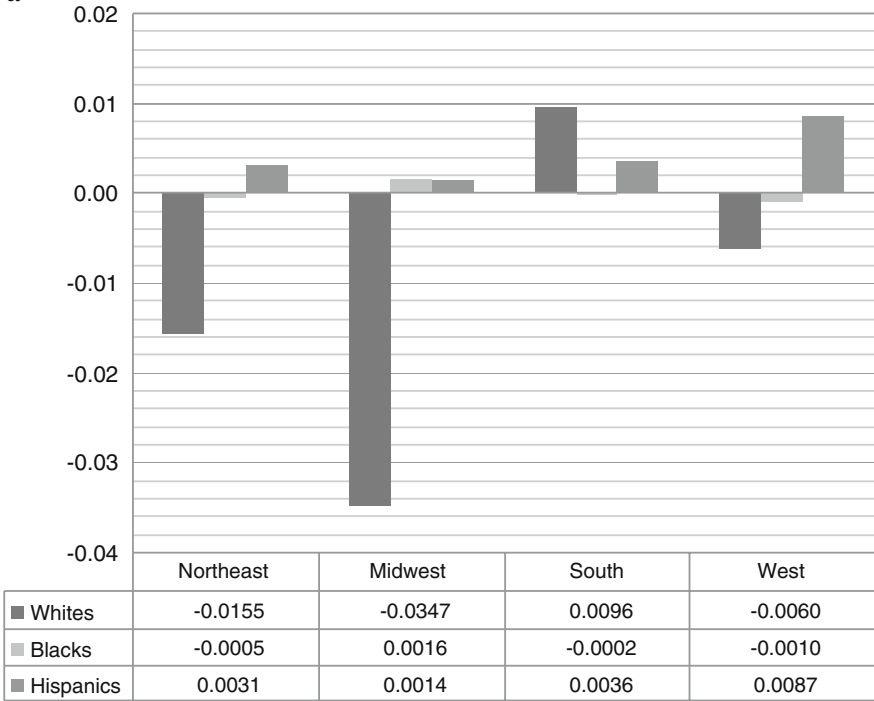
The results found in this investigation would be of importance to policy makers of different philosophical leanings. If one believed that increasing inequality was a good thing because it reflected increasing economic growth or if one was of the persuasion that increasing inequality was not necessarily good for a society because of the societal divides that were created, these results do show that not all racial/ethnic groups or regions of the country respond uniformly.

Blacks and Hispanics did show increasing inequality caused by increases in unemployment but not at the rate that whites did. This was attributable to the starting point of each group in terms of mean income and the starting level of unemployment. A policymaker that was interested in closing or expanding the amount of inequality by racial or ethnic group should be mindful that a uniform policy will not have uniform results for each group and adjustments or targeted policy prescriptions might be required.

It is clear that society is benefitted by policies that encourage stable home environments with dual earners. This work showed that another benefit of policies that encourage males to contribute to household income is that there are significant decreases in income inequality for each particular racial/ethnic group but that blacks are lagging in this regard much more than whites or Hispanics.

Fig. 5 **a** The effect of each racial group on Gini coefficient based on personal income. **b** The effect of each racial group on Gini coefficient based on household income

a



b

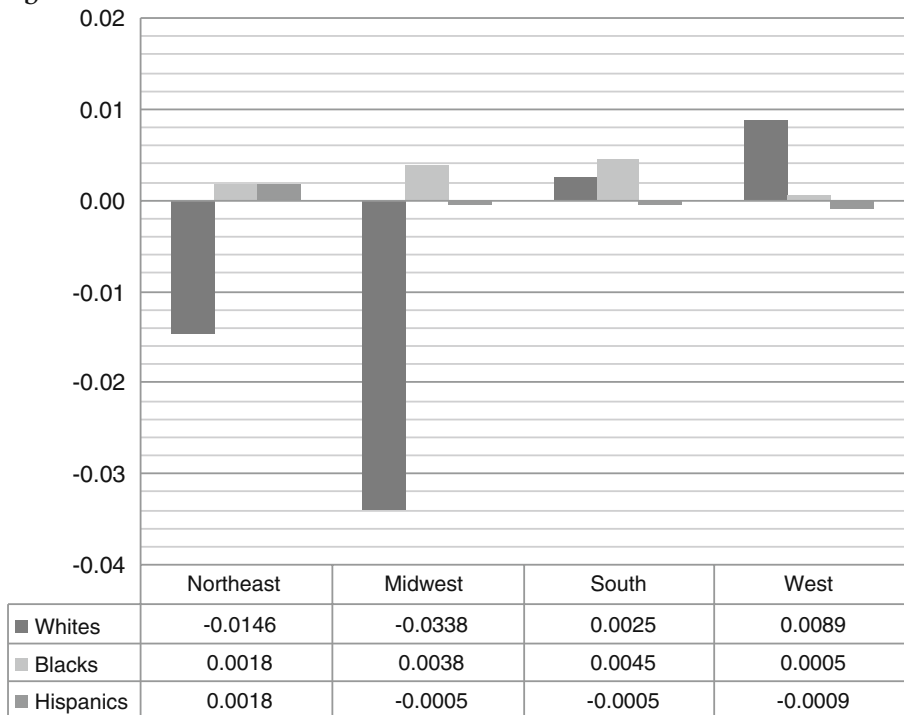


Table 9 Weighted least squares analysis on the determinants of the racial groups' effects on inequality, personal income

	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics
Personal income	0.0058 (2.37)**	0.0019 (0.57)	0.0019 (0.94)	0.0051 (2.90)***	0.0034 (0.87)	0.0027 (3.37)***	0.0056 (3.59)***	0.0034 (0.84)	0.0019 (1.57)
Personal income-squared	-3.89e-05 (1.45)	-2.03e-05 (0.39)	-1.31e-05 (0.45)	-3.28e-05 (1.66)	-4.48e-05 (0.73)	-3.01e-05 (2.33)**	-3.49e-05 (1.71)*	-4.65e-05 (0.72)	-2.03e-05 (1.11)
Age	-0.0021 (0.50)	0.0024 (1.27)	0.0006 (2.88)***	-0.0022 (1.08)	0.0022 (1.17)	0.0000 (0.13)	-0.0017 (0.80)	0.0025 (1.26)	0.0002 (1.11)
Educational attainment	-0.0227 (1.14)	-0.0174 (1.73)*	-0.0176 (4.59)***	-0.0143 (0.94)	-0.0197 (2.12)**	-0.0150 (8.60)***	-0.0118 (0.69)	-0.0179 (2.02)**	-0.0112 (4.04)***
Percentage of males	-1.7768 (2.39)**	0.1192 (1.76)*	-0.0032 (0.05)	-1.8184 (3.39)***	0.0879 (1.33)	-0.1765 (5.95)***	-1.7023 (3.21)***	0.0627 (1.12)	-0.1254 (3.69)***
Unemployment	-0.6405 (2.85)***	0.0790 (1.75)*	-0.0083 (0.14)	-0.3848 (1.58)	0.1123 (1.42)	0.0738 (1.60)	-0.0056 (0.02)	0.1538 (1.40)	0.0089 (0.21)
Regional dummies									
Northeast				-0.0401 (6.77)***	-0.0026 (0.79)	-0.0129 (6.70)***			
Midwest				-0.0284 (4.48)***	-0.0031 (0.78)	-0.0055 (5.02)***			
South				(dropped)	(dropped)	(dropped)			
West				-0.0087 (1.30)	0.0024 (0.71)	-0.0004 (0.48)			
Divisional dummies							(dropped)	(dropped)	(dropped)
New England									

Middle Atlantic	0.0148 (1.42)	–0.0064 (1.29)	–0.0015 (0.94)
East North Central	0.0213 (1.92)*	–0.0089 (1.26)	0.0039 (1.61)
West North Central	0.0293 (1.99)**	–0.0025 (0.50)	0.0038 (1.67)
South Atlantic	0.0534 (5.55)***	–0.0016 (0.45)	0.0058 (1.91)*
East South Central	0.0606 (4.50)***	–0.0029 (0.63)	0.0061 (1.94)*
West South Central	0.0487 (4.41)***	–0.0043 (1.18)	0.0101 (4.64)***
Mountain	0.0545 (4.29)***	0.0060 (1.00)	0.0067 (2.33)**
Pacific	0.0319 (3.49)***	–0.0011 (0.23)	0.0104 (4.95)***
Constant	1.0520 (2.71)***	–0.0146 (0.14)	0.1722 (8.83)***
Observations	51	51	51
R-squared	0.38	0.46	0.51

Dependent variable is the effect on Gini_P. Absolute value of z-statistics in parentheses

*significant at 10% level; **significant at 5% level; ***significant at 1% level

Table 10 Weighted least squares analysis on the determinants of the racial groups' effects on inequality, household income

	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics
Household income	0.0025 (1.24)	-0.0009 (0.72)	-0.0013 (4.51)***	0.0022 (1.41)	0.0000 (0.03)	-0.0009 (3.01)***	0.0024 (1.77)*	0.0002 (0.15)	0.0002 (0.50)
Household income-squared	-1.30e-05 (1.19)	9.01e-06 (0.91)	8.53e-06 (4.20)***	-8.93e-06 (0.99)	2.89e-06 (0.27)	5.69e-06 (2.84)***	-9.78e-06 (1.19)	1.45e-06 (0.13)	-1.32e-06 (0.52)
Age	0.0034 (1.02)	0.0014 (0.77)	0.0000 (0.06)	0.0036 (2.73)***	0.0012 (0.71)	0.0000 (0.17)	0.0057 (4.03)***	0.0013 (0.88)	-0.0002 (1.47)
Educational attainment	0.0272 (1.39)	-0.0118 (2.27)**	-0.0020 (2.19)**	0.0132 (0.92)	-0.0143 (3.31)***	-0.0020 (1.90)*	0.0228 (1.61)	-0.0126 (3.15)***	0.0002 (0.11)
Percentage of males	-0.8772 (1.08)	0.0281 (0.36)	-0.0573 (2.68)**	-0.8773 (1.57)	-0.0118 (0.15)	-0.0296 (1.13)	-0.7633 (1.34)	-0.0293 (0.48)	-0.0334 (1.19)
Unemployment	-0.2929 (0.88)	0.0462 (1.32)	0.0122 (0.54)	-0.1624 (0.75)	0.1099 (1.77)*	0.0381 (1.48)	0.0093 (0.03)	0.1864 (2.09)**	0.0677 (2.12)**
Regional dummies									
Northeast				-0.0405 (4.60)***	-0.0063 (2.19)**	-0.0001 (0.06)			
Midwest				-0.0273 (3.30)***	-0.0052 (1.36)	-0.0026 (2.96)***			
South				(dropped)	(dropped)	(dropped)			
West				-0.0012 (0.17)	0.0017 (0.43)	-0.0015 (1.45)			

In addition, this work showed that targeted policy making should not only be focused on racial/ethnic groups but also regions of the country. It has been well documented that the South lags behind other regions of the country regarding several key economic metrics. Yet another way that the South might be benefitted would be by targeted efforts to reduce income inequality.

Our work on counterfactual analysis begins a discussion on the true impact that given racial/ethnic groups have on inequality and some of the factors explaining them. We acknowledge that the work suffers from a fundamental flaw, in that; if a given group were omitted some other group would surely fill the void. While this fact is acknowledged, it does shed some new light on the impact of various racial/ethnic groups on the economy and economic inequality.

Our work showed that, counter to some popularly held beliefs, omitting blacks and Hispanics would not lead to decreases in income inequality in all instances. The impacts of excluding different racial/ethnic groups were not uniform. Our work also showed that the factors influencing the differences in inequality caused by the exclusion of a group varied. For whites and Hispanics, the percentage of males had significant effects but this effect was not found for blacks. Finally, schooling was significant for both Hispanics and blacks but not so for whites.

Appendix

Appendix Tables 11, 12, 13, and 14 shows the results of pairwise correlations among the independent variables, sorted by racial/ethnic group. Not surprisingly, very high correlations are reported between personal and household income. Also of note, but still not surprising, is the high correlation coefficient between schooling and income, especially for the full sample and whites. However, the strong relationship between schooling and income is lower for blacks compared to whites and even lower for Hispanics. The unemployment rate is negatively correlated with both `income types but the magnitudes are more than double for whites as opposed to blacks or Hispanics (Tables 15, 16, 17, and 18).

Table 11 Pairwise correlations between the independent variables for USA

	Household income	Personal income	Educational attainment	Age	Percentage of males	Unemployment	Size
Household income	1						
Personal income	0.9661	1					
Educational attainment	0.7991	0.8252	1				
Age	−0.241	−0.2261	−0.2125	1			
Percentage of males	−0.1572	−0.2184	0.0818	−0.0839	1		
Unemployment	−0.0343	0.0015	−0.2952	−0.3495	−0.4899	1	
Size	0.2491	0.2276	0.0597	−0.0914	−0.2389	0.2512	1

Table 12 Pairwise correlations between the independent variables for Whites

	Household income	Personal income	Educational attainment	Age	Percentage of males	Unemployment	Size
Household income	1						
Personal income	0.9839	1					
Educational attainment	0.8824	0.9172	1				
Age	-0.4214	-0.4496	-0.5019	1			
Percentage of males	0.1843	0.229	0.3915	-0.3405	1		
Unemployment	-0.2709	-0.3137	-0.4105	0.0635	-0.3183	1	
Size	0.1308	0.0828	-0.0522	0.0939	-0.3057	0.3534	1

Table 13 Pairwise correlations between the independent variables for Blacks

	Household income	Personal income	Educational attainment	Age	Percentage of males	Unemployment	Size
Household income	1						
Personal income	0.9401	1					
Educational attainment	0.6113	0.7155	1				
Age	-0.0428	-0.0781	-0.2412	1			
Percentage of males	0.0148	0.0811	0.491	-0.6641	1		
Unemployment	-0.1368	-0.1834	-0.356	0.5944	-0.7197	1	
Size	-0.0069	-0.1196	-0.3317	0.4027	-0.5325	0.3119	1

Table 14 Pairwise correlations between the independent variables for Hispanics

	Household income	Personal income	Educational attainment	Age	Percentage of males	Unemployment	Size
Household income	1						
Personal income	0.8641	1					
Educational attainment	0.5718	0.6332	1				
Age	0.0415	0.0925	0.0828	1			
Percentage of males	-0.083	-0.1077	-0.4266	-0.0831	1		
Unemployment	-0.0695	-0.1841	-0.2133	-0.2727	0.0125	1	
Size	0.0398	-0.0384	-0.1773	0.248	-0.0931	0.0402	1

Table 15 Weighted least squares analysis on the determinants of income inequality across racial groups, personal income (dependent variable: Theil_P)

	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics
Personal income	0.0394 (2.41)**	0.0196 (4.10)***	0.0056 (0.29)	0.01 (0.76)	0.0429 (2.67)**	0.0188 (4.82)***	-0.0143 (0.43)	0.0417 (2.16)**	0.0397 (2.31)**	0.0171 (6.81)***	0.001 (0.04)	0.013 (0.56)
Personal income-squared	-0.0004 (2.00)**	-0.0002 (3.03)***	-0.0001 (0.37)	-0.0001 (0.34)	-0.0005 (2.24)**	-0.0002 (3.28)***	0.0002 (0.29)	-0.0006 (1.68)*	-0.0005 (1.96)*	-0.0002 (4.38)***	-4.1e-05 (0.10)	-0.0002 (0.40)
Age	-0.0042 (0.54)	0.0004 (0.06)	0.023 (1.22)	-0.0003 (0.10)	-0.0004 (0.05)	-0.0004 (0.08)	0.0247 (1.29)	-0.0053 (2.64)**	0.0040 (0.49)	0.0018 (0.31)	0.0267 (1.58)	-0.0024 (0.84)
Percentage of males	-2.4439 (2.98)***	-3.0813 (3.11)***	1.2758 (1.27)	-0.8764 (2.45)**	-2.1129 (2.32)**	-2.4694 (3.10)***	1.6569 (1.33)	-1.2259 (2.01)**	-2.6602 (3.87)***	-2.6000 (3.97)***	1.127 (1.20)	-1.1596 (1.67)*
Unemployment	0.8858 (1.46)	1.0370 (1.98)*	0.9106 (2.19)**	0.4947 (1.01)	1.2656 (2.74)***	1.4177 (2.69)**	0.6831 (0.89)	1.2594 (2.76)***	1.3193 (2.74)***	1.4434 (2.84)***	-0.5656 (0.59)	1.0867 (1.46)
Educational attainment	-0.0532 (1.32)	-0.0297 (0.84)	0.0013 (0.03)	-0.031 (1.24)	-0.0706 (1.67)	-0.0245 (0.67)	0.0378 (0.43)	-0.031 (1.54)	-0.0374 (0.70)	0.0080 (0.20)	-0.0384 (0.84)	-0.0582 (2.53)**
Regions												
Northeast					-0.0034 (0.15)	-0.0229 (1.22)	0.0537 (1.18)	-0.0639 (1.92)*				
Midwest					-0.0307 (1.70)*	-0.0360 (2.47)**	0.0196 (0.32)	-0.0598 (3.01)***				
South					(dropped)	(dropped)	(dropped)	(dropped)				
West					0.0220 (0.97)	-0.0097 (0.58)	-0.0205 (0.30)	-0.0475 (3.84)***				

Table 16 Weighted least squares analysis on the determinants of income inequality across racial groups, household income (dependent variable: Theil_H)

	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics	USA	Whites	Blacks	Hispanics
Household income	0.0116 (2.53)**	0.0052 (1.40)	0.0123 (3.43)***	0.0048 (1.40)	0.0122 (2.50)**	0.0049 (1.49)	0.0118 (4.05)***	0.0147 (4.17)***	0.0135 (2.68)**	0.0045 (1.56)	0.0132 (3.71)***	0.0135 (3.46)***
Household income-squared	-0.0001 (2.24)**	-2.38e-05 (1.08)	-0.0001 (3.76)***	-0.0001 (2.10)**	-0.0001 (2.18)**	-2.16e-05 (1.09)	-0.0001 (5.02)***	-0.0001 (4.32)***	-0.0001 (2.34)**	-2.11e-05 (1.13)	-0.0001 (4.47)***	-0.0001 (3.62)***
Age	0.0049 (1.34)	0.0081 (2.68)**	0.0029 (1.01)	-0.0013 (0.56)	0.0072 (2.77)***	0.0078 (3.98)***	0.0023 (0.76)	-0.0014 (0.64)	0.0107 (4.06)***	0.0090 (3.91)***	0.0036 (1.04)	-0.0005 (0.24)
Percentage of males	-2.4613 (5.25)***	-2.0925 (3.01)***	-0.1432 (0.82)	-1.6399 (7.74)***	-2.2313 (3.44)***	-1.7188 (2.87)***	-0.1789 (1.08)	-0.7748 (1.77)*	-2.5711 (4.95)***	-1.8139 (3.28)***	-0.4242 (2.24)**	-1.1748 (2.67)**
Unemployment	0.2645 (0.76)	0.3434 (0.88)	0.5265 (3.02)***	0.1575 (0.49)	0.4739 (1.39)	0.6046 (1.34)	0.6272 (2.95)***	0.515 (1.59)	0.7432 (2.13)**	0.6162 (1.47)	0.4489 (1.73)*	0.7758 (1.98)**
Educational attainment	-0.0294 (1.38)	-0.0048 (0.21)	-0.003 (0.16)	0.0447 (3.67)***	-0.0344 (1.43)	-0.0017 (0.06)	0.0063 (0.35)	0.0375 (3.59)***	-0.0208 (0.75)	0.0243 (0.78)	0.0001 (0.00)	0.0067 (0.47)
Regions												
Northeast					-0.0104 (0.61)	-0.0217 (1.31)	0.0128 (1.45)	0.0116 (0.60)				
Midwest					-0.0166 (1.42)	-0.0212 (2.15)**	-0.0122 (0.80)	-0.0417 (2.87)***				
South					(dropped)	(dropped)	(dropped)	(dropped)				
West					0.0049 (0.33)	-0.0123 (0.95)	0.0056 (0.52)	-0.0402 (6.18)***				

Table 17 Weighted least squares analysis on the determinants of the racial groups' effects on inequality, personal income

	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics
Personal income	0.0137 (2.51)**	0.0039 (0.50)	0.0057 (1.03)	0.0121 (2.97)***	0.0076 (0.83)	0.0075 (3.69)***	0.0136 (3.64)***	0.0075 (0.79)	0.0049 (1.69)*
Household income-squared	-0.0001 (1.51)	0.0000 (0.29)	0.0000 (0.54)	-0.0001 (1.64)	-0.0001 (0.67)	-0.0001 (2.58)**	-0.0001 (1.78)*	-0.0001 (0.65)	0.0000 (1.16)
Age	-0.0043 (0.45)	0.0053 (1.18)	0.0016 (2.93)***	-0.0044 (0.92)	0.0048 (1.10)	0.0000 (0.13)	-0.0032 (0.63)	0.0054 (1.19)	0.0007 (1.27)
Educational attainment	-0.0513 (1.09)	-0.0408 (1.72)	-0.0469 (4.60)***	-0.0322 (0.88)	-0.0458 (2.10)**	-0.0396 (8.78)***	-0.0222 (0.54)	-0.0408 (1.98)**	-0.0298 (4.21)***
Percentage of males	-4.5341 (2.50)**	0.2591 (1.61)	0.0038 (0.02)	-4.8092 (3.49)***	0.1855 (1.19)	-0.4523 (6.10)***	-4.5588 (3.24)***	0.1304 (1.00)	-0.3102 (3.78)***
Unemployment	-1.4211 (2.74)***	0.1669 (1.57)	-0.0281 (0.18)	-0.9148 (1.56)	0.2533 (1.37)	0.1846 (1.65)	-0.0579 (0.07)	0.3627 (1.42)	0.0050 (0.05)
Regional dummies									
Northeast				-0.0899 (6.12)***	-0.0071 (0.92)	-0.0337 (7.33)***			
Midwest				-0.0574 (3.89)***	-0.0080 (0.86)	-0.0143 (5.06)***			
South				(dropped)	(dropped)	(dropped)			
West				-0.0184 (1.20)	0.0050 (0.61)	-0.0006 (0.30)			

Divisional dummies					(dropped)	(dropped)	(dropped)
New England					0.0318	–0.0149	–0.0037
Middle Atlantic					(1.18)	(1.30)	(0.96)
East North Central					0.0512	–0.0212	0.0100
West North Central					(1.81)*	(1.30)	(1.70)*
South Atlantic					0.0759	–0.0063	0.0098
East South Central					(2.12)**	(0.56)	(1.74)*
West South Central					0.1173	–0.0024	0.0149
Mountain					(4.75)***	(0.29)	(1.92)*
Pacific					0.1407	–0.0061	0.0157
					(4.26)***	(0.56)	(2.04)**
					0.1089	–0.0097	0.0256
					(4.04)***	(1.17)	(4.83)***
					0.1178	0.0149	0.0171
					(3.66)***	(1.07)	(2.46)**
					0.0725	–0.0029	0.0275
					(3.01)***	(0.25)	(5.32)***
Constant	2.5975	–0.0504	0.2605	2.5848	0.4445	–0.0685	0.2976
	(2.83)***	(0.28)	(2.68)**	(3.53)***	(8.92)***	(0.25)	(3.76)***
Observations	51	51	51	51	51	51	51
R-squared	0.42	0.40	0.60	0.74	0.89	0.49	0.92

Dependent variable is the effect on Theil_P. Absolute value of z-statistics in parentheses

*significant at 10% level; **significant at 5% level; ***significant at 1% level

Table 18 Weighted least squares analysis on the determinants of the racial groups' effects on inequality, household income

	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics
Household income	0.0039 (1.20)	-0.0010 (0.42)	-0.0022 (4.50)**	0.0035 (1.35)	0.0006 (0.24)	-0.0015 (3.18)**	0.0039 (1.69)*	0.0010 (0.37)	0.0004 (0.67)
Household income-squared	0.0000 (1.15)	0.0000 (0.60)	0.0000 (4.31)**	0.0000 (0.93)	0.0000 (0.02)	0.0000 (3.12)**	0.0000 (1.16)	0.0000 (0.13)	0.0000 (0.58)
Age	0.0057 (0.98)	0.0030 (0.84)	0.0001 (0.25)	0.0059 (2.52)**	0.0026 (0.82)	0.0000 (0.10)	0.0091 (3.53)**	0.0029 (0.99)	-0.0003 (1.65)
Educational attainment	0.0471 (1.42)	-0.0199 (1.99)**	-0.0054 (3.71)**	0.0283 (1.11)	-0.0230 (2.69)**	-0.0052 (3.15)**	0.0473 (1.95)*	-0.0200 (2.71)**	-0.0011 (0.44)
Percentage of males	-1.7624 (1.30)	0.0632 (0.45)	-0.0861 (2.42)**	-1.7545 (1.83)*	0.0047 (0.03)	-0.0484 (1.12)	-1.5596 (1.56)	-0.0266 (0.25)	-0.0521 (1.21)
Unemployment	-0.4300 (0.83)	0.0755 (1.19)	0.0022 (0.06)	-0.1907 (0.51)	0.1975 (1.68)*	0.0472 (1.13)	0.0403 (0.08)	0.3384 (1.98)**	0.0978 (2.10)**
Regional dummies									
Northeast				-0.0668 (4.32)**	-0.0113 (2.04)**	-0.0007 (0.22)			
Midwest				-0.0432 (3.26)**	-0.0101 (1.43)	-0.0044 (2.91)**			
South			(dropped)	(dropped)	(dropped)	(dropped)			
West				-0.0056 (0.48)	0.0011 (0.14)	-0.0023 (1.46)			

Divisional dummies					(dropped)	(dropped)	(dropped)
New England					0.0160	−0.0103	−0.0016
Middle Atlantic					(0.59)	(1.62)	(1.06)
East North Central					0.0391	−0.0150	−0.0052
					(1.35)	(1.59)	(1.78)*
West North Central					0.0514	−0.0056	−0.0031
					(1.59)	(0.96)	(1.23)
South Atlantic					0.0703	0.0066	−0.0025
					(2.73)***	(1.10)	(0.62)
East South Central					0.1076	0.0032	−0.0005
					(3.77)***	(0.34)	(0.13)
West South Central					0.0969	−0.0033	0.0069
					(3.68)***	(0.70)	(3.07)***
Mountain					0.0845	0.0202	0.0013
					(2.81)***	(1.94)*	(0.36)
Pacific					0.0603	0.0006	−0.0042
					(2.21)**	(0.08)	(1.80)*
Constant	−0.0818	0.0454	0.1649	0.1007	−0.4571	−0.0057	0.0274
	(0.12)	(0.25)	(4.63)***	(0.20)	(3.88)***	(0.03)	(0.62)
Observations	51	51	51	51	51	51	51
R-squared	0.35	0.40	0.74	0.71	0.76	0.62	0.87

Dependent variable is the effect on Theil_H. Absolute value of z-statistics in parentheses

*significant at 10% level; **significant at 5% level; ***significant at 1% level

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