

# Comparing Income Distributions Across U.S. Regions Using New Cost-of-Living Measures

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**Abstract.** U.S. Bureau of Economic Analysis recently released regional cost-of-living (COL) indices for individual U.S. states by metro/non-metro classification. We use these unique COL indices to compare income distributions across U.S. Census regions and divisions. For the U.S. as a whole, adjusting for state COL differences increases the metro poverty rate by 0.7 percentage points and reduces the non-metro poverty rate by 2.4 percentage points. For major US regions, differences in state metro and non-metro COLs significantly affect relative poverty rates, with the Midwest and South enjoying reductions in poverty rates (1.2 and 0.9 percentage points) and the Northeast and West suffering increases in poverty rates (1.7 and 1.3 percentage points). Examining the entire income distribution, we find substantial re-rankings (39 percent) in pair-wise comparisons of the 9 U.S. Census divisions. Overall, the results suggest that COL adjustments to income play a crucial role in regional distributional analysis.

Keywords: cost-of-living, regional income distribution, regional poverty

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# Comparing Income Distributions Across U.S. Regions Using New Cost-of-Living Measures

“For the first time, Americans looking to move or take a job anywhere in the country can compare inflation-adjusted incomes across the states and metropolitan areas to better understand how their personal income may be affected by a job change or move...” U.S. Secretary of Commerce Penny Pritzker (April 24, 2014 press release)

## 1. Introduction

Comparisons of incomes across households involve a series of choices that can substantially influence the results, including the choice of income concept and methods for valuing various in-kind transfers, adjustments for household size and composition, and other cost-of-living (COL) adjustments. Much has been written about income concepts and methods for valuing in-kind transfers; see Armour, *et al.* (2013, 2014) for recent research on these issues. There are also numerous ways to adjust for household size and composition by using equivalence scales or comparing similar households [see Orshansky (1963), OECD (1982), Hagenaaars et al. (1994), and OECD (2008) for examples of the more popular equivalence scales]. However, when it comes to other COL adjustments, and how these vary across locations, little can be done without detailed data on locational price variation, and such data are expensive to gather.

Fortunately for researchers, the Bureau of Economic Analysis (BEA) and the U.S. Census Bureau, in collaboration with the Bureau of Labor Statistics (BLS), recently released COL measures that calculate average price differentials among states by metropolitan classification. These measures differ from the Consumer Price Index (CPI) and have more in

common with the purchasing power parities of the Income Comparison Program (ICP) led by the United Nations and the World Bank. The CPI reflects changes in the average price level across time periods within a given country (the United States), while the ICP measures variations in average price levels across countries for a given time period, expressed in purchasing power parities. Applied to U.S. regions, the new BEA measures provide data on regional (state and metropolitan area) price parities.

Our study uses these data to compare household incomes across metropolitan and nonmetropolitan areas in the nine Census divisions. We focus initially on the bottom of the income distribution and compare headcount poverty rates by Census division. We show that COL adjustments alter poverty rates substantially, especially in non-metropolitan areas, though the impact is larger in some regions than in others. Next, we look at the full income distributions and make first-order stochastic dominance (FSD) comparisons across Census divisions. Here again we find numerous cases in which COL adjustments alter the outcomes of dominance comparisons.

Section 2 reviews the BEA procedures for generating the new COL measures and describes the regional price differences that emerge from them. It also illustrates how living costs vary across households with different characteristics. Section 3 presents our findings for the poverty and stochastic dominance comparisons by Census division. Finally, section 4 distills the main results and offers concluding comments.

## **2. Background and Data**

This paper combines newly released BEA state-level COL indices with household income data from the Current Population Survey (CPS) in order to analyze the effect of COL

adjustments on the distribution of income by U.S. Census region and division. The subsections that follow first provide an overview of the new COL indices and then summarize the COL data across U.S. regions after combining the BEA and CPS datasets.

#### *A. The New COL Measures*

An early attempt by BLS to measure regional cost of living is the *Three Budgets for an Urban Family of Four Persons*. This series estimated the cost of living for 25 metropolitan areas as well as for the four major regions' non-metro areas. Bishop, Formby, and Thistle (1992, 1994) use this series to study regional convergence in the US and provide regional cost-of-living indices for 1969 and 1979. Unfortunately, the series was discontinued in the early 1980's.

Beginning in 2003-2004, the BEA estimated U.S. regional price parities for the 38 metropolitan and urban areas that the BLS uses to generate the CPI, which contained about 87 percent of the U.S. population at that time.<sup>1</sup> The procedure was based upon price information in the CPI (covering hundreds of consumer goods and services) and used hedonic methods to adjust for differences in product characteristics (type of outlet selling a good or service, packaging, etc.) for the 75 most important item categories, representing about 85 percent of all expenditures. For the remaining categories, a method roughly equivalent to a weighted geometric mean of prices in each item category generated relative price levels. The estimation results were then checked for outliers using methods similar to those developed for comparing relative prices across countries in the ICP.

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<sup>1</sup> Aten, *et al.* (2011) and Aten and Figueroa (2014) provide a detailed overview of the BEAs newly constructed regional price parities. Except where otherwise noted, this discussion relies heavily on their documentation.

In 2005-06, the BEA extended the analysis beyond areas covered by the CPI, using housing data from the American Community Survey (ACS). Housing is the key factor in the cost of living; rents and owners' equivalent rents are the most important consumer expenditure category by far, accounting for 30 percent of the total. Once again, hedonic regression methods allow adjustments for differences in housing characteristics (the number of rooms and bedrooms; the age and type of housing unit). For all remaining goods and services, price levels for non-CPI areas are equated to the average for that region (e.g., Midwest). In April 2014, the BEA released the first official real per capita incomes for states and metropolitan statistical areas, adjusted using the new regional price parities (RPPs), i.e., percent differences in regional average prices from the national average, in April 2014 (Aten & Figueroa, 2014).

#### *B. U.S. Regional Price Level Differences*

In Table 1 we show how the U.S. Census Bureau partitions the population into four regions and nine divisions, each defined by groupings of states. The Northeast, Midwest, and West contain two divisions each, while the South contains three divisions. Divisions can have as few as three states (Middle Atlantic) or as many as nine (South Atlantic).

By construction, the national average price level is 100, and the RPPs for comparison areas are expressed as percentages of the national average. Thus, the ratio  $RPP/100$  gives the relative price level for a comparison area. In 2012, the state metro areas with the highest RPPs were Hawaii (122.7), the District of Columbia (118.7), New York (117.5), New Jersey (114.4), and California (113.6). Arkansas (89), Alabama (89), Missouri (89.5), and West Virginia (90.1) had the lowest metro RPPs among the states. The weighted-average price level in New Jersey is about 14 percent higher ( $114.4/100$ ) than the national average, and the price level in the District

of Columbia is almost 33 percent higher than in Arkansas or Alabama ( $118.7/89 = 1.334$ ). Aten, et al. (2011) note that price levels across regions vary more for services than for goods, and that the former account for two-thirds of consumer expenditures. Within the expenditure categories, housing rents vary the most, while transportation (e.g., new and used vehicle purchases) costs vary the least.

Table 2 estimates COL indices by metropolitan designation, Census region, race, and income by applying the appropriate 2012 BEA state-level metro and non-metro COL measure to each household in the 2013 Current Population Survey (CPS). As expected, the estimated COL index for the full CPS sample is 100.0. The COL is 14 percent higher in metro areas (102.6) than in non-metro areas (90.0). Comparisons by race reveal that Hispanics live in more expensive areas (103.3), while whites live in less expensive areas (99.7), implying a 3.6 percent difference. Living costs also increase with income, from 98.9 for households having comprehensive incomes below \$25,000 to 102.5 for households with incomes between \$100,000 and \$150,000, implying a 3.6 percent difference in costs of living between households in the richest and poorest income categories.

The average COL by U.S. Census region (combining metro and non-metro areas) varies from 106.8 in the Northeast to 92.6 in the Midwest, making the former 15 percent higher than the latter. Clearly, one must deal with differences of this magnitude when making income comparisons across households. Panel B of Table 2 gives more detailed COL estimates for the nine Census divisions, with metro and non-metro breakdowns. There we see that the COL is high in the metro areas of the Northeast (108.9) and West (106.2), and especially in the Middle Atlantic (112.3) and Pacific (110.4) divisions. In contrast, the COL is low in the non-metro areas of the Midwest (84.4) and South (87.6), and especially in the West North Central (84.0) division.

Among the four Census regions, COL differences between the metro and non-metro areas are largest in the South (14.4 percent) and smallest in the West (11.4 percent).

### **3. Poverty and Stochastic Dominance Comparisons**

Unless otherwise noted, all income comparisons are made using comprehensive household incomes. Comprehensive income includes Census money income [wages and salaries, self-employment income, dividends, rent, interest, cash transfers (Social Security and Unemployment Insurance), and other cash income] *plus* the market value of in-kind transfers (food stamps; housing, energy, and school lunch subsidies; the implicit return on home equity, and the earned income tax credit) *minus* taxes (federal and state income, payroll, and property). Due to significant changes in the level of cohabitation, households (instead of families) are used as the income-sharing unit. We use the Orshansky equivalence scale to adjust for differences in household size when comparing poverty rates, as is done in the official U.S. poverty statistics (Orshanski, 1963). We use the square root rule to adjust for household size when evaluating entire income distributions, as in recent publications by the Organization for Economic Cooperation and Development (OECD) [e.g., OECD (2008) and OECD (2011)].

#### *A. Headcount Poverty*

We calculate headcount poverty rates using the official U.S. poverty lines employed by the Census Bureau. There are a total of 48 possible poverty thresholds that adjust for household size and age of household members.<sup>2</sup> These thresholds are increasing in household members, but increase at a decreasing rate. Households with a head over 65 years of age have a lower

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<sup>2</sup> The official U.S. poverty thresholds are available at: <https://www.census.gov/hhes/www/poverty/about/overview/measure.html> (last accessed 1/9/2015).

threshold. For a fixed household size, changing the household composition by replacing an adult with the first child increases the poverty threshold, but thereafter, substituting other children usually reduces the poverty threshold.

Table 3 shows the impact of the new COL adjustments on headcount poverty rates for different income concepts, residential locations, and racial classifications. In the first two rows, we compare poverty rates for the entire U.S. population using cash income and comprehensive income. For both income concepts, the COL adjustment has no economically significant impact on overall U.S. poverty rates, but metro and non-metro poverty rates do change. We find a 0.7 percentage point increase in the metro poverty rate while the non-metropolitan poverty rate falls by 2.4 percentage points with COL adjustments. In all the Census regions, COL adjustments alter the estimates of poverty rates by roughly 1 percentage point or more. The poverty rate increases by 1.7 percentage points in the Northeast and by 1.3 percentage points in the West; however, it falls by 0.9 percentage points in the South and by 1.2 percentage points in the Midwest. For both whites and blacks, poverty rates are not sensitive to adjustments for living costs, but for Hispanics the poverty rate increases by roughly 1.4 percentage points. Notice in Table 3 that before the COL adjustment, the Northeast and Midwest have similar poverty rates; after the COL adjustment, however, the Midwest clearly dominates the Northeast. Similarly, the West appears to dominate the South before the COL adjustment, but the two regions have similar poverty rates after the adjustment.

These observations prompt the question, if we make pairwise comparisons of the nine Census divisions (metro and non-metro, separately), how many changes in poverty rankings will we observe? Table 4 presents poverty rates for the nine U.S. Census divisions, each divided into metropolitan and non-metropolitan areas. We focus on the changes in the 36 possible pairwise

comparisons as we adjust for COL differences. Table 5 summarizes the cases in which COL adjustments made statistically significant changes in poverty orderings at a significance level of 5% or less, with the metro changes given in Panel A and the non-metro changes given in Panel B.

Panel A of Table 5 shows that 13 of the 36 possible pairwise *metro* comparisons change as we adjust for living costs and gives the details for each of the 13 changes. For example, in the first row we compare NE to WNC without COL adjustment, and the poverty rates do not differ significantly. However, after COL adjustment the WNC poverty dominates the NE (i.e., NE has higher poverty than WNC). Of the 13 changes that we identify in Table 5, the most dramatic is the *reversal* of the MA and ESC poverty ordering when we adjust for differences in living costs.

Panel B of Table 5 presents the corresponding changes in the pairwise comparisons for the *non-metro* areas by U.S. Census division. Here 7 of the 36 possible comparisons yield changes in poverty orderings when we adjust for living costs. Similar to the metro comparisons from Panel A, the SA division moves from a position of poverty dominance to a statistically indistinguishable poverty rate in comparison to the ESC division. With the exception of the SA vs. ESC similarities, all of the other significant poverty changes in the non-metro comparisons occur for completely different division combinations than in the metro comparisons. Moreover, unlike the metro comparisons, we find no rank reversals; all the changes are between poverty equality and poverty dominance.

In sum, we find that more than one-quarter of the pairwise comparisons changed as a result of adjustments for living costs. It is apparent that adjusting for living costs will have the greatest impact in comparisons that involve the regions with the lowest living costs (non-metro ENC, WNC, ESC) and those with the highest COL (metro MA, PAC), as we reported in Panel B

of Table 2. Overall, these results cast serious doubts on the assumption that regional poverty can be accurately ordered in the absence of COL adjustments. In the subsection that follows we test for significant divisional differences in income cutoffs at every decile of the income distribution in order to obtain a fuller picture of the impact of COL adjustments on regional U.S. income.

### *B. Stochastic Dominance*

For comparisons of full income distributions, we employ the square-root rule as our equivalence scale, which has been popular for such comparisons [e.g. Ruggles (1990), Burkhauser et al. (1996), OECD (2008), and OECD (2011)]. First-order stochastic dominance (FSD) implies that one region has smaller order statistics (income cutoffs) at each decile of its income distribution in comparison to another region. Table 6 illustrates a FSD comparison of incomes by region, using Middle Atlantic (MA) and East North Central (ENC) Census divisions. When we compare unadjusted income distributions, we find one positive and significant difference (at the second decile) and negative and significant differences at all higher deciles. This result implies a significant crossing of the distributions, so they cannot be ranked by FSD. Yet when COL-adjusted income distributions are compared, all the differences are positive and significant, which means that ENC dominates MA at the first degree (i.e., the ENC distribution is Pareto-superior).

Table 7 reports all the changes in regional FSD rankings due to COL adjustments. In nine cases (25%) the adjustments transform a significant crossing into dominance, or *vice versa*. We also find five cases (14%) in which adjustments for living costs completely reverse a dominance relation between two regions. Perhaps most surprising is that the South Atlantic Census division moves from being dominated to a position of dominating both the Pacific and

Middle Atlantic Census divisions after adjusting for living costs. These findings demonstrate the importance of considering living costs when comparing income distributions across regions.

#### **4. Conclusions**

We present poverty and stochastic dominance comparisons across U.S. regions using comprehensive household incomes and new regional COL measures developed by the Bureau of Economic Analysis in the U.S. Department of Commerce. Adjusting for living costs tends to raise incomes and reduce poverty rates in nonmetropolitan areas relative to metropolitan areas. It alters more than a quarter of the pairwise poverty comparisons among nine U.S. Census divisions, separated into metro and non-metro areas. Specifically, 13 of the 36 pairwise poverty comparisons for metro areas significantly change rankings, and 7 of the 36 non-metro comparisons significantly change. It also results in significant changes in first-order stochastic dominance relations for roughly 25% of possible U.S. Census division comparisons, with significant crossings in distribution functions turning into dominance, or vice versa, and even leads to complete reversals of dominance orderings in roughly 14% of cases.

The availability of the new COL measures together with these results suggests that researchers who make income comparisons among households living in different U.S. regions should make greater use of the new measures. This point is particularly applicable to researchers who make rate-of-return calculations for human capital investments in migration. As the U.S. Secretary of Commerce, Penny Pritzker (2014), points out in the opening quote for this paper, the new COL measures are an important factor to consider in such calculations.

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**Table 1: Census Bureau Regions and Divisions**

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**Region 1 – Northeast**

Division 1 – **New England (NE)**: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

Division 2 – **Middle Atlantic (MA)**: New Jersey, New York, Pennsylvania

**Region 2 – Midwest**

Division 3 – **East North Central (ENC)**: Indiana, Illinois, Michigan, Ohio, Wisconsin

Division 4 – **West North Central (WNC)**: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota

**Region 3 – South**

Division 5 – **South Atlantic (SA)**: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia

Division 6 – **East South Central (ESC)**: Alabama, Kentucky, Mississippi, Tennessee

Division 7 – **West South Central (WSC)**: Arkansas, Louisiana, Oklahoma, Texas

**Region 4 – West**

Division 8 – **Mountain (MTN)**: Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming

Division 9 – **Pacific (PAC)**: Alaska, California, Hawaii, Oregon, Washington

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**Table 2: COL Indices by Region, Race, and Income**

<i>Panel A: Overall COL indices by region, race, and income</i>				
<b>Characteristic</b>		<b>COL Index</b>		
U.S. Average		100.0 <sup>1</sup>		
Metropolitan Areas		102.6		
Non-Metropolitan Areas		90.0		
North		106.8		
Midwest		92.6		
South		97.7		
West		104.1		
White		99.7		
Black		101.2		
Hispanic		103.3		
Less than \$25,000 <sup>2</sup>		98.9		
\$25,000 – \$50,000		99.3		
\$50,000 – \$75,000		100.9		
\$75,000 – \$100,000		101.1		
\$150,000 – \$150,000		102.5		
<i>Panel B: Detailed regional COL indices by region and metropolitan classification</i>				
<b>Region</b>	<b>Metro</b>	<b>Non-Metro</b>	<b>All</b>	
U.S.	102.6	90.0	100.0	
Northeast	97.0	108.9	106.8	
<i>NE</i>	97.9	106.3	104.3	
<i>MA</i>	112.3	94.3	109.7	
Midwest	95.9	84.4	92.6	
<i>ENC</i>	97.0	85.1	94.8	
<i>WNC</i>	94.4	84.0	90.6	
South	100.2	87.6	97.7	
<i>SA</i>	103.0	88.7	100.9	
<i>SC</i>	92.6	86.0	90.0	
<i>WSC</i>	97.2	87.5	95.4	
West	106.2	95.3	104.1	
<i>MTN</i>	98.2	93.4	96.9	
<i>PAC</i>	110.4	98.3	109.3	

1. The COL indices (including U.S. average) are estimated using CPS 2013 data and 2012 BEA state level COL indices.

2. Income is comprehensive household income, including in-kind transfers and taxes.

**Table 3: Impact of COL Adjustments on Headcount Poverty Rates**

	<b>Unadjusted (std. errors)</b>	<b>COL Adjusted (std. errors)</b>
U.S. Cash Income	0.1228 (0.0012)	0.1236 (0.0013)
U.S. Comprehensive Income <sup>1</sup>	0.1043 (0.0011)	0.1054 (0.0012)
Metropolitan Areas	0.1021 (0.0012)	0.1094 (0.0013)
Non-Metropolitan Areas	0.1131 (0.0025)	0.0892 (0.0023)
Northeast	0.0861 (.0024)	0.1032 (.0026)
Midwest	0.0891 (.0022)	0.0771 (.0021)
South	0.1262 (.0021)	0.1171 (.0021)
West	0.1035 (.0022)	0.1162 (.0023)
Whites	0.0906 (0.0011)	0.0916 (0.0011)
Blacks	0.2058 (0.0041)	0.2074 (0.0042)
Hispanics	0.1802 (0.0037)	0.1945 (0.0038)

<sup>1</sup> Comprehensive income includes in-kind transfers and taxes. Poverty rates by metropolitan designation and race are based on comprehensive income. To partially offset the effect of in-kind transfers we use 1.15 times the official poverty threshold (based on cash income) with comprehensive income.

**Table 4: Headcount Poverty Rates by Census Division**

<b>Census Division</b>	<i>Metro</i>		<i>Non-Metro</i>	
	<b>Unadjusted (Std. Error)</b>	<b>COL-Adjusted (Std. Error)</b>	<b>Unadjusted (Std. Error)</b>	<b>COL-Adjusted (Std. Error)</b>
NE	0.0716 (0.0035)	0.0842 (0.0037)	0.0689 (0.0059)	0.0640 (0.0057)
MA	0.1028 (0.0039)	0.1342 (0.0043)	0.1023 (0.0120)	0.0832 (0.0109)
ENC	0.0992 (0.0036)	0.0943 (0.0035)	0.1012 (0.0076)	0.0676 (0.0063)
WNC	0.0790 (0.0037)	0.0706 (0.0035)	0.0787 (0.0048)	0.0555 (0.0041)
SA	0.1047 (0.0028)	0.1070 (0.0028)	0.1517 (0.0080)	0.1225 (0.0072)
ESC	0.1195 (0.0069)	0.1060 (0.0066)	0.1992 (0.0106)	0.1441 (0.0094)
WSC	0.1378 (0.0045)	0.1317 (0.0045)	0.1624 (0.0105)	0.1256 (0.0095)
MTN	0.0949 (0.0040)	0.0900 (0.0038)	0.0983 (0.0062)	0.0865 (0.0059)
PAC	0.1090 (0.0031)	0.1379 (0.0034)	0.1027 (0.0092)	0.0955 (0.0089)
<b>Overall US</b>	0.1021 (0.0012)	0.1094 (0.0013)	0.1131 (0.0025)	0.0892 (0.0023)

**Table 5: Changes in Census Division Poverty Ranking due to COL Adjustments**

<b>Comparison</b>	<b>Unadjusted</b>	<b>COL Adjusted</b>
<i>Panel A: Metro Changes in Division Poverty Rankings</i>		
	<b>New England (NE)</b>	
NE vs. WNC	NE=WNC	NE < WNC
NE vs. MTN	NE > MTN	NE= MTN
	<b>Middle Atlantic (MA)</b>	
MA vs. ENC	MA=ENC	MA < ENC
MA vs. SA	MA = SA	MA< SA
MA vs. ESC	MA > ESC	MA<ESC
MA vs. WSC	MA>WSC	MA=WSC
MA vs. MTN	MA= MTN	MA <MTN
	<b>East North Central (EMC)</b>	
ENC vs. SA	ENC=SA	ENC > SA
ENC vs. ESC	ENC>ESC	ENC = PAC
	<b>South Atlantic (SA)</b>	
SA vs. ESC	SA>ESC	SA=ESC
SA vs. PAC	SA=PAC	SA>PAC
	<b>East South Central (ESC)</b>	
ESC vs. PAC	ESC = PAC	ESC>PAC
	<b>West South Central (WSC)</b>	
WSC vs. PAC	WSC < PAC	WSC = PAC

*Panel B: Non-metro Changes in Division Poverty Rankings*

	<b>New England (NE)</b>	
NE vs. MA	NE vs. MA	NE vs. MA
	<b>Middle Atlantic (MA)</b>	
MA vs. WNC	MA vs. WNC	MA vs. WNC
	<b>East North Central (ENC)</b>	
ENC vs. WNC	ENC<WNC	ENC = WNC
ENC vs. MTN	ENC=MTN	ENC > MTN
ENC vs. PAC	ENC=PAC	ENC > PAC
	<b>South Atlantic (SA)</b>	
SA vs. ESC	SA>ESC	SA = ESC
	<b>East South Central (ESC)</b>	
ESC vs. WSC	ESC vs. WSC	ESC vs. WSC

<sup>1</sup>The symbol “=” means that COL adjustments result in no significant difference in poverty rates, “>” implies region poverty dominates (i.e. x>y implies less poverty in region x in comparison to y).

**Table 6. Illustration of First-Order Dominance Tests of Incomes by Census Division (MA vs. ENC) Unadjusted vs. COL Adjusted**

Income Decile	Unadjusted			COL Adjusted		
	MA	ENC	Difference	MA	ENC	Difference
1	\$8,490	\$8,753	\$263	\$7,686	\$9,223	\$1,537*
2	\$15,538	\$15,744	\$206*	\$14,054	\$16,544	\$2,490*
3	\$20,174	\$19,940	-\$234*	\$18,396	\$21,168	\$2,772*
4	\$24,961	\$23,960	-\$1,001*	\$23,009	\$25,467	\$2,458*
5	\$30,443	\$28,520	-\$1,923*	\$27,868	\$30,168	\$2,300*
6	\$36,772	\$33,715	-\$3,057*	\$33,795	\$35,758	\$1,963*
7	\$43,826	\$39,800	-\$4,026*	\$40,572	\$42,116	\$1,544*
8	\$52,972	\$46,882	-\$6,090*	\$48,848	\$49,531	\$683*
9	\$65,443	\$57,730	-\$7,713*	\$59,912	\$61,171	\$1,259*
10	\$115,872	\$105,398	-\$10,474*	\$104,651	\$110,070	\$5,419*

Note: The incomes for each decile are order statistics. \* Denotes statistical significance at the 5% level

**Table 7. Changes in Census Division FSD Rankings due to COL Adjustments<sup>1</sup>**

Comparison	Unadjusted	COL Adjusted
	<b>New England (NE)</b>	
NE vs. WNC	NE > WNC	WNC > NE
	<b>Middle Atlantic (MA)</b>	
MA vs. ENC <sup>2</sup>	X	ENC > MA
MA vs. WNC	X	WNC > MA
MA vs. SA	MA > SA	SA > MA
MA vs. ESC	MA > ESC	X
MA vs. MTN	X	MTN > MA
	<b>East North Central (EMC)</b>	
ENC vs. MTN	MTN > ENC	ENC > MTN
ENC vs. PAC	X	ENC > PAC
	<b>West North Central (WNC)</b>	
WNC vs. SA	X	WNC > SA
WNC vs. PAC	X	WNC > PAC
	<b>South Atlantic (SA)</b>	
SA vs. PAC	PAC > SA	SA > PAC
	<b>East South Central (ESC)</b>	
ESC vs. WSC	WSC > ESC	ESC > WSC
ESC vs. PAC	PAC > ESC	X
	<b>Mountain (MTN)</b>	
MTN vs. PAC	X	MTN > PAC

<sup>1</sup> The symbol "X" means that COL adjustments results "cross" unadjusted results, ">" implies first order dominance

<sup>2</sup> For the MA and ENC Census divisions, the COL adjustment turns a significant crossing (X) into FSD of MA by ENC (ENC > MA)