

# Supplemental Poverty Measure: Alternative Geographic Adjustments

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May 28, 2020

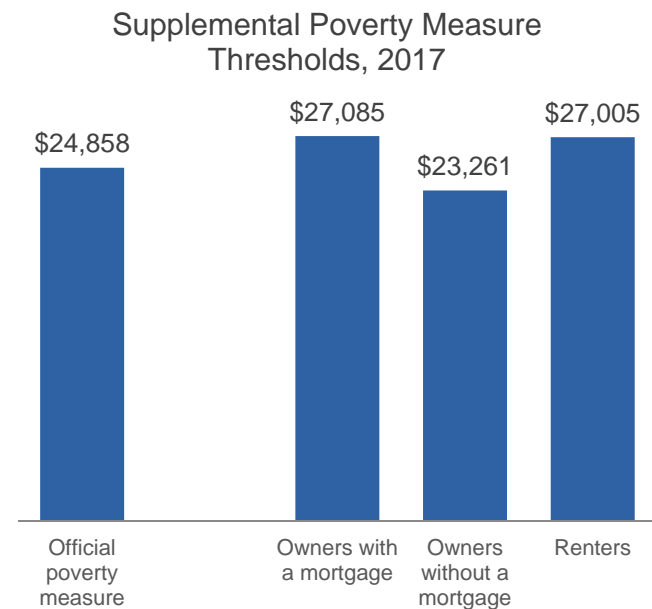
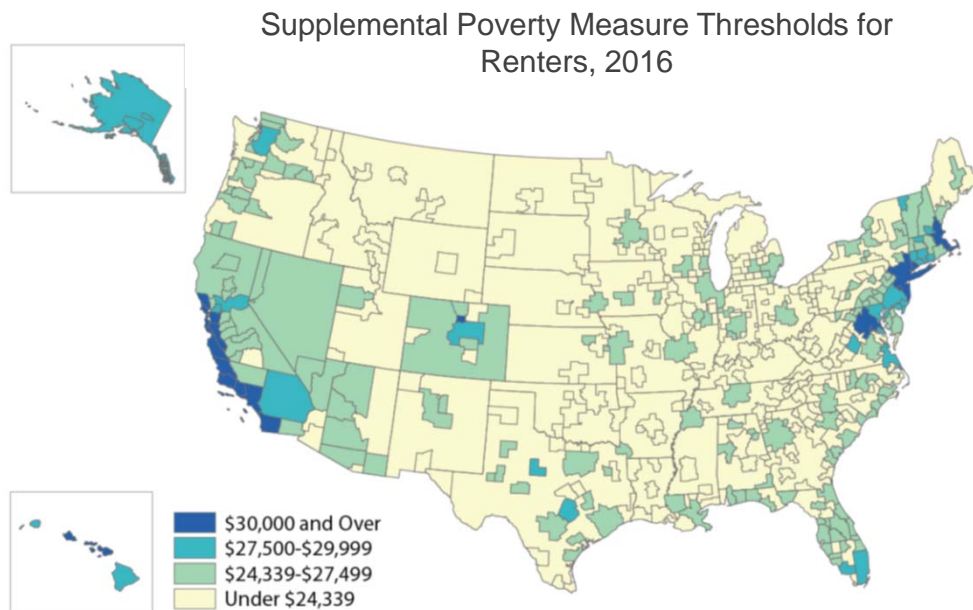
*This presentation was developed to promote research and advancements in our understanding of poverty measurement. In that spirit and to encourage discussion and thoughtful feedback at early stages of our work, this paper has undergone a more limited review than official Census Bureau reports. All views and any errors are solely those of the author and do not necessarily reflect any official position of the Bureau. All comparative statements in this presentation have undergone statistical testing, and, unless otherwise noted, all comparisons are statistically significant at the 10 percent significance level. Do not cite or distribute without author permission.*

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# Official and SPM Thresholds for Units with two Adults and Two Children



Source: Official Poverty Thresholds, <[www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html](http://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html)>, Supplemental Poverty Measure Thresholds, Bureau of Labor Statistics (BLS), <<https://stats.bls.gov/pir/spmhome.htm>>, Geographic adjustments based on housing costs from the American Community Survey 2012-2016.

# Median Rent Index

$$Threshold_{ijt} = [(HousingShare_t \times MRI_{ij}) + (1 - HousingShare_t)] \times Threshold_t$$

$i$  = state

$j$  = specific metro area, other metro or nonmetro area

$t$  = tenure: owner with mortgage, owner without a mortgage, renter

*HousingShare* = percent of threshold represented by housing and utilities (which range from 40 to 50 percent of total expenditures, depending on tenure status)

*MRI* = Median Rent Index

*Threshold* = national average dollar value for income below which  
consumer units are considered in poverty

# Washington DC vs. Nonmetro Mississippi

2017– Two Adults Two Children - Renter	Washington, D.C.	Mississippi Nonmetro Areas
Official Poverty Threshold	\$24,858	\$24,858
SPM Threshold: Renters	\$27,005	\$27,005

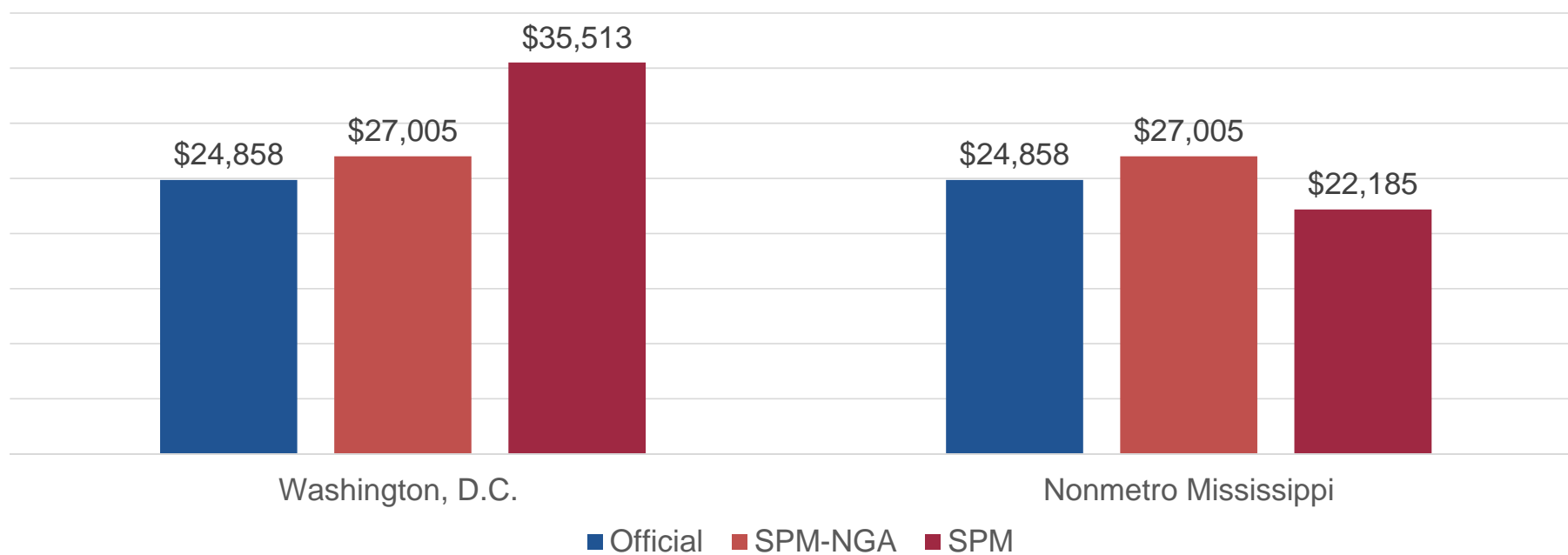
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Official Poverty Threshold	\$24,858	\$24,858
SPM Threshold: Renters	\$27,005	\$27,005
<b>Rent-based Index Using Median Rent Index (MRI)</b>	<b>\$1,517/930=1.63</b>	<b>\$598/930=0.64</b>
Apply to Only Housing Portion of Thresholds	50%*1.63+50%*1.0	50%*0.64+50%*1.0
<b>MRI Index</b>	<b>1.32</b>	<b>0.82</b>

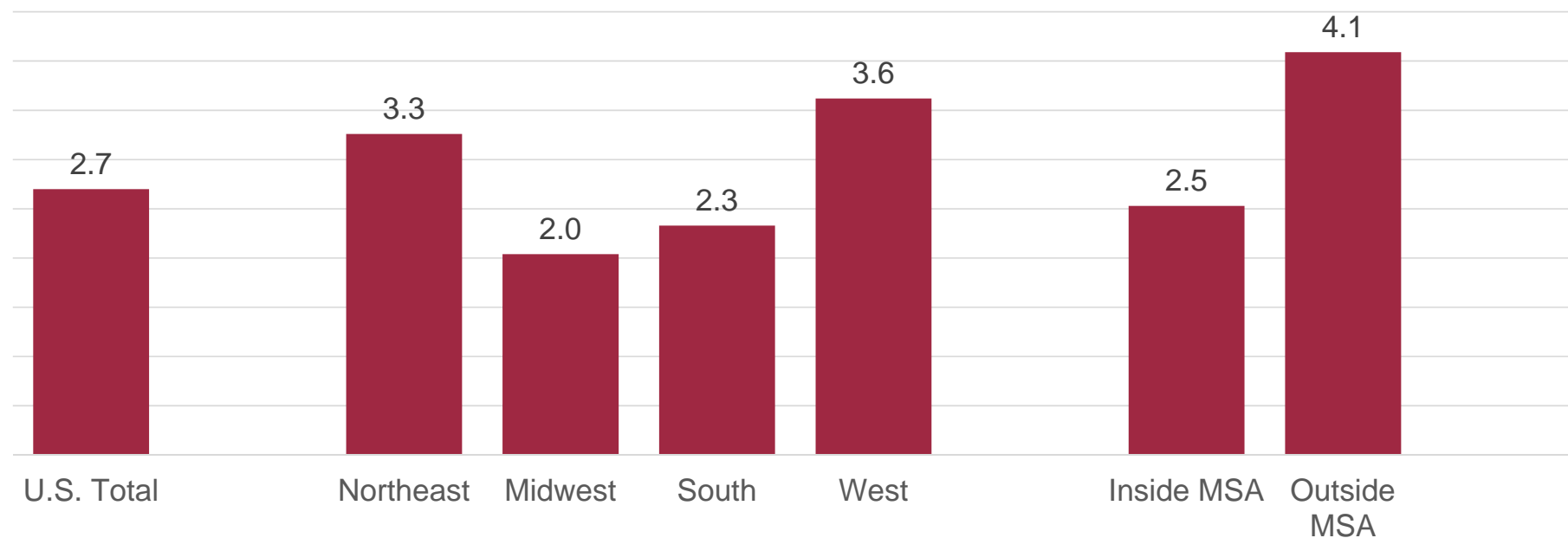
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<b>Adjusted SPM Threshold</b>	<b>\$35,513</b>	<b>\$22,185</b>

# Two Adult, Two Child Thresholds: Renters, 2017

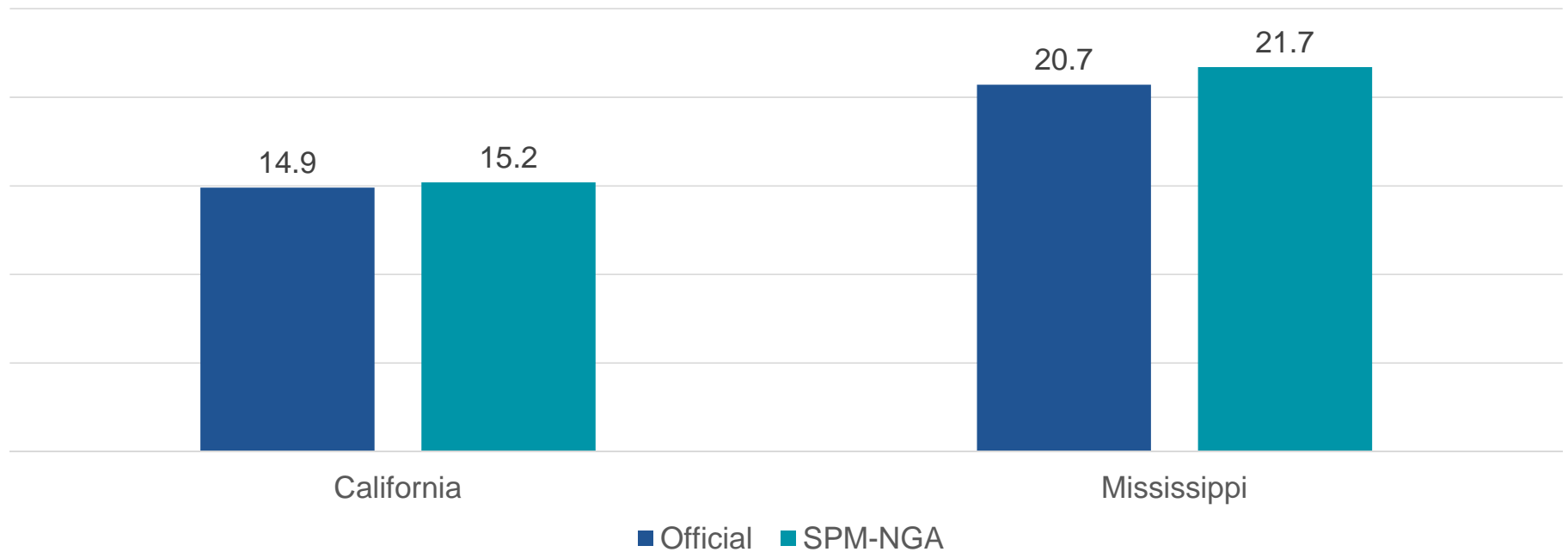


# Percent of Individuals with Change in Poverty Status Due to Geographic Adjustments

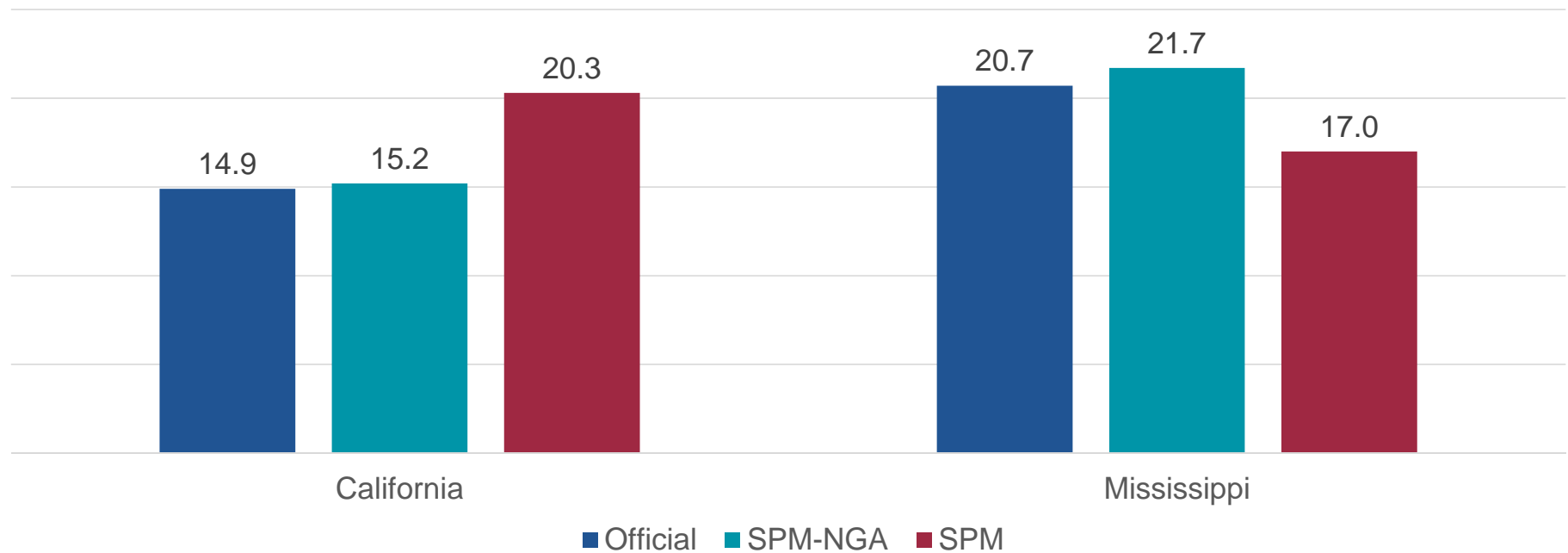




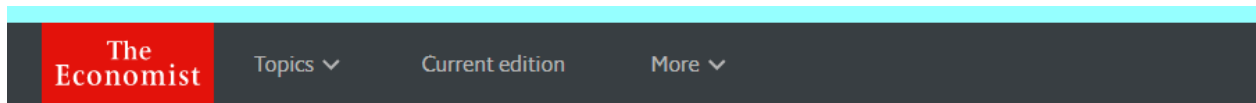
# Comparing Poverty Rates by Adjustment Mechanism



# Comparing Poverty Rates by Adjustment Mechanism



# Media likes to focus on state comparisons



Poverty in California

## Why one of America's richest states is also its poorest

OP-ED OP-ED OPINION

Los Angeles Times

## Why is liberal California the poverty capital of America?

## Accounting for housing costs, California has nation's highest poverty rate



*A new report suggests 19 percent of Californians are impoverished*

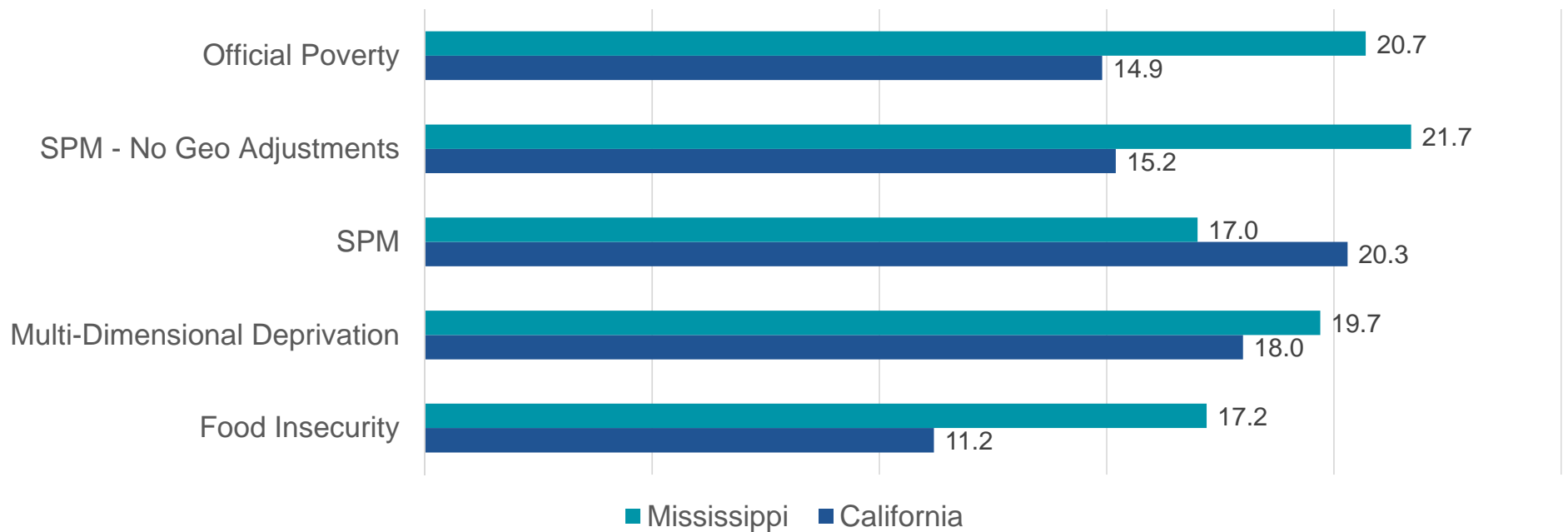
By **Elijah Chiland** | Sep 14, 2018, 8:25am PDT

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# California vs Mississippi: Poverty Rates and Material Deprivation Rates



Sources: Poverty rates – 2015-2016 CPS ASEC  
MDD – Glassman, 2019  
Food Insecurity – USDA Economic Research Service  
<https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx#map>

# Concerns with the MRI Methodology

- Adjusts only the housing portion of the thresholds
- Simple medians may not capture differences in housing quality
- Medians may not capture cost differences at the lower end of the income distribution

# Research on Alternative Geographic Adjustments

Renwick, Trudi. 2020. Using ACS Earnings Data to Adjust Supplemental Poverty Measure Thresholds. SEHSD Working Paper #2020-04. Available at <https://www.census.gov/library/working-papers/2020/demo/SEHSD-WP2020-04.html>

Renwick, Trudi. 2019. "Supplemental Poverty Measure: Alternative Geographic Adjustments. Presentation at Brookings SPM Expert Meeting. May 20.

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Renwick, Trudi, Eric Figueroa and Bettina Aten. 2017. Supplemental Poverty Measure: A Comparison of Geographic Adjustments with Regional Price Parities vs. Median Rents from the American Community Survey: An Update. SEHSD Working Paper 2017-36. Paper presented at the 2017 International Statistical Institute World Statistics Congress in Marrakech, Morocco.

Renwick, Trudi, Bettina Aten, Eric Figueroa and Troy Martin. 2014. Supplemental Poverty Measure: A Comparison of Geographic Adjustments with Regional Price Parities vs Median Rents from the American Community Survey. Paper presented at the Allied Social Sciences Association meetings, January 2014.

Renwick, Trudi. 2011. "Geographic Adjustments of Supplemental Poverty Measure Thresholds: Using the American Community Survey Five-Year Data on Housing Costs. Paper presented at the July 2011 Western Economic Association, San Diego, CA. Available from Census Bureau working papers.

# Sensitivity analysis of the “median”

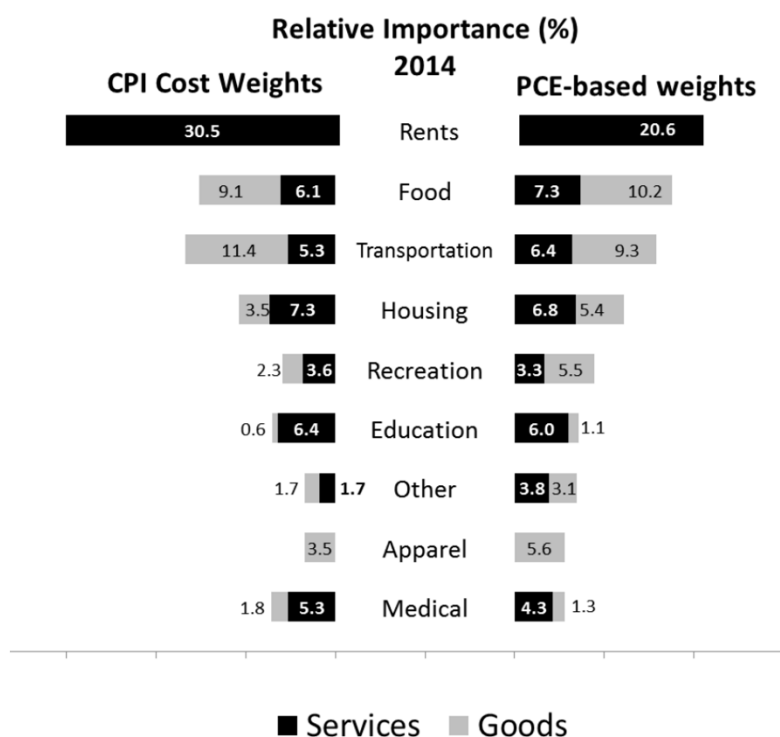
- High degree of correlations across different index methodologies – does not seem to support concerns about differences across the income distribution nor concerns about the lack of quality-adjustment
- Analysis using RPP rent-only index (which is quality adjusted using an hedonic regression) shows not much difference from the simple median – For our DC/Mississippi comparison:
  - MRI –\$35,513 vs \$22,185
  - RPP-rent only –\$36,457 vs \$20,389

Table 1: Comparing Geographic Index Values

Geography	Median	Mean	Geomean	33rd Percentile	Income below 200% poverty	Income below 150% of poverty	Income below 100% of poverty	Hedonic - BEA
Maximum	1.81	1.73	1.88	1.87	1.81	1.75	1.76	1.67
Minimum	0.58	0.55	0.57	0.60	0.59	0.59	0.59	0.55
Range	1.23	1.18	1.32	1.27	1.23	1.16	1.18	1.12
Ratio of Max to Min	3.14	3.16	3.32	3.10	3.09	2.97	3.00	3.05
CORRELATION COEFFICIENTS								
Median	0.99	0.99	0.99	1.00	1.00	1.00	0.98	
Mean		1.00	0.99	0.99	0.99	0.99	0.99	0.99
Geomean			0.99	0.99	0.99	0.99	0.99	0.99
33rd Percentile				0.99	0.99	0.99	0.99	0.98
Income below 200% poverty					1.00	1.00	0.98	
Income below 150% of poverty						1.00	0.98	
Income below 100% of poverty							0.98	

Source: American Community Survey 2005-2009. For information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, please see the “American Community Survey Multiyear Accuracy of the Data (3-year 2007-2009 and 5-year 2005-2009)” available at [http://www.census.gov/acs/www/data\\_documentation/documentation\\_main/](http://www.census.gov/acs/www/data_documentation/documentation_main/).

# BEA Regional Price Parities (RPPs)



- Spatial price indexes produced by the Bureau of Economic Analysis to measure price level differences across regions
- Stage One – price and expenditures inputs collected by the BLS CPI program and the CE – 38 urban areas (weights available for 38 urban areas plus 4 rural regions)
- Stage Two – combined with data from the ACS on housing costs to calculate index values for all metro areas
- Weights are PCE-based
- Index values applied to the entire threshold



# Regional Price Parities – Narrowly Defined (FAR)

- 2014 analysis examined differences between the MRI adjustments and the RPP adjustments.
- Concern that this index includes many goods and services not in the SPM thresholds. Differences in poverty rates driven by differences in expenditure shares.
- BEA developed a special RPP – based solely on Food, Apparel and Rent (FAR)
- One advantage of the FAR RPP is that expenditure shares vary by geography. They do not vary by tenure type.

# Regional Price Parities: Considerations

## Pros

- Developed by experts on the topic at the Bureau of Economic Analysis
- Includes quality-adjusted rent index
- Consistent with BEA adjustments to personal income
- Narrows the adjustment factors
- Adjusts the entire threshold rather than just the housing portion

## Cons

- BEA currently revising their methodology to produce RPPs
- Requires a special tabulation by BEA to get our CPS ASEC geographies
- Future plans are to produce using ACS public use data – index numbers will be available publicly at the PUMA level
- PUMAs are probably too small for geographic adjustments – would result in different thresholds for Anacostia vs. NW DC
- Could use a cross walk to match PUMAs with MSAs
- Weights are not consistent with the SPM thresholds

# Partial Adjustment of MRI Index

- Differences in prices reflect differences in the ability to purchase a given bundle of goods. This may or may not translate into equal quality of life.
- Amenities: nonmarket goods that improve the quality of life
- Considerations:
  - Assumes that amenities are not completely capitalized in rents
  - Assumes that these amenities are fungible --- can live in a smaller house because the “weather is so wonderful you can spend more time outside”. Some amenities probably not fungible – “can’t eat the scenery”. Still need enough resources to purchase basic bundle of necessities.
  - Value of amenities may vary across the income distribution
- Economists have argued that full-proportional adjustment can distort outcomes. Strong sense from the 2011 University of Kentucky Center on Poverty forum that something “less than a full adjustment” would be preferable.

# Wage-based Index

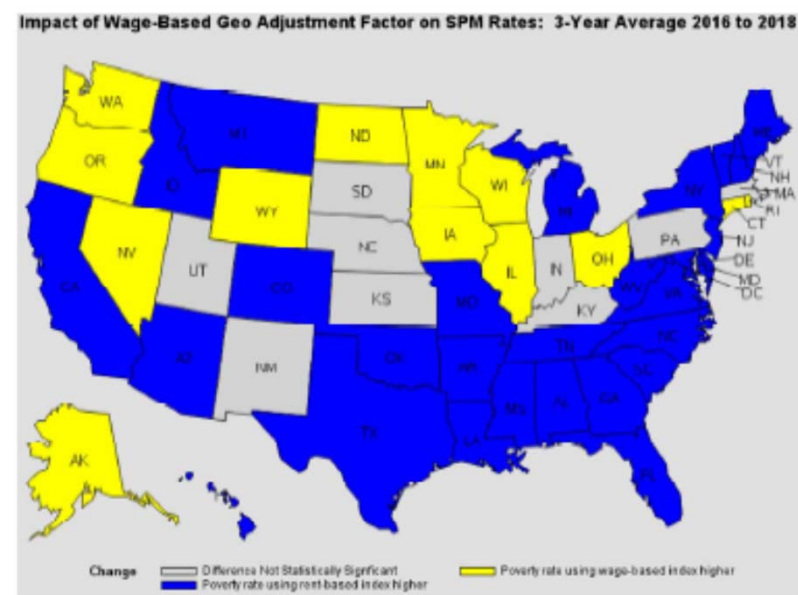
- Based on methodology developed by the National Center for Education Statistics and suggested by Baker et al. in 2013:

*Essentially, we presume that if the prevailing wage for Chicago for a worker with poverty-level characteristics is 10 percent above the national average, then the poverty income threshold in Chicago should also be 10 percent above the national average” (Baker et al., 2013, p.399).*

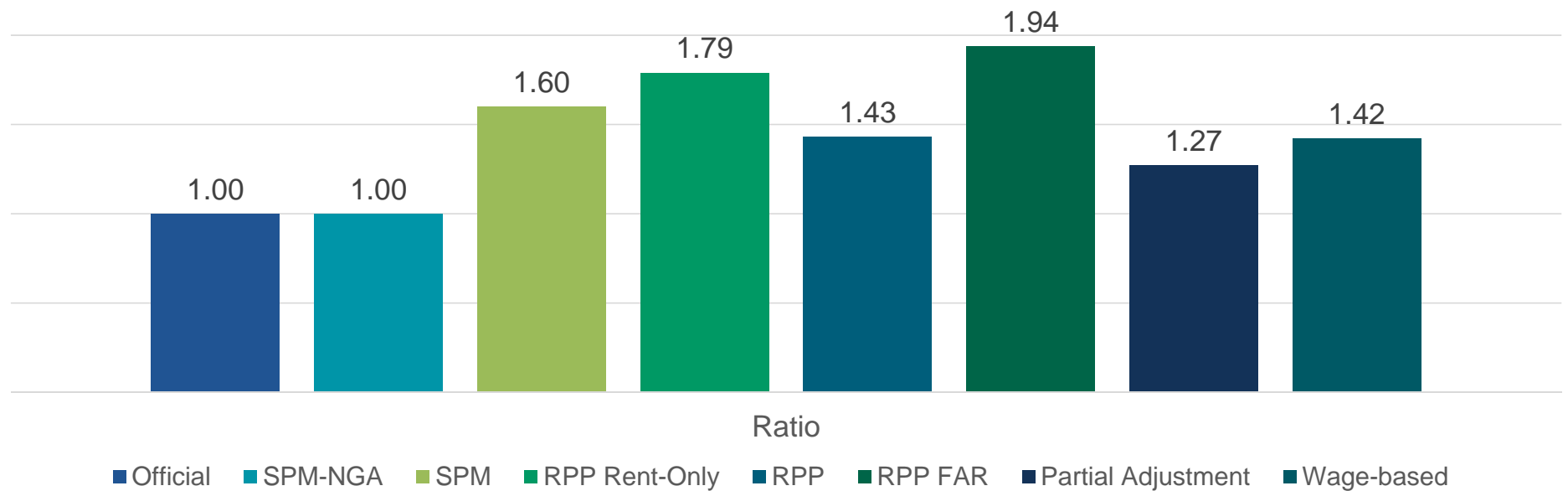
- Uses data from the 5-year ACS files limiting the analysis to working-age adults with a level of educational attainment of an associate’s degree or less with earnings greater than \$5,000 working at least 20 hours per week, 40 weeks per year.
- Controls for workers characteristics (age, gender, race, number of hours worked per week, English-speaking ability, educational attainment) and industry and occupation reported on the ACS (by year).
- Applied to the entire SPM threshold.

# Wage-based Adjustments

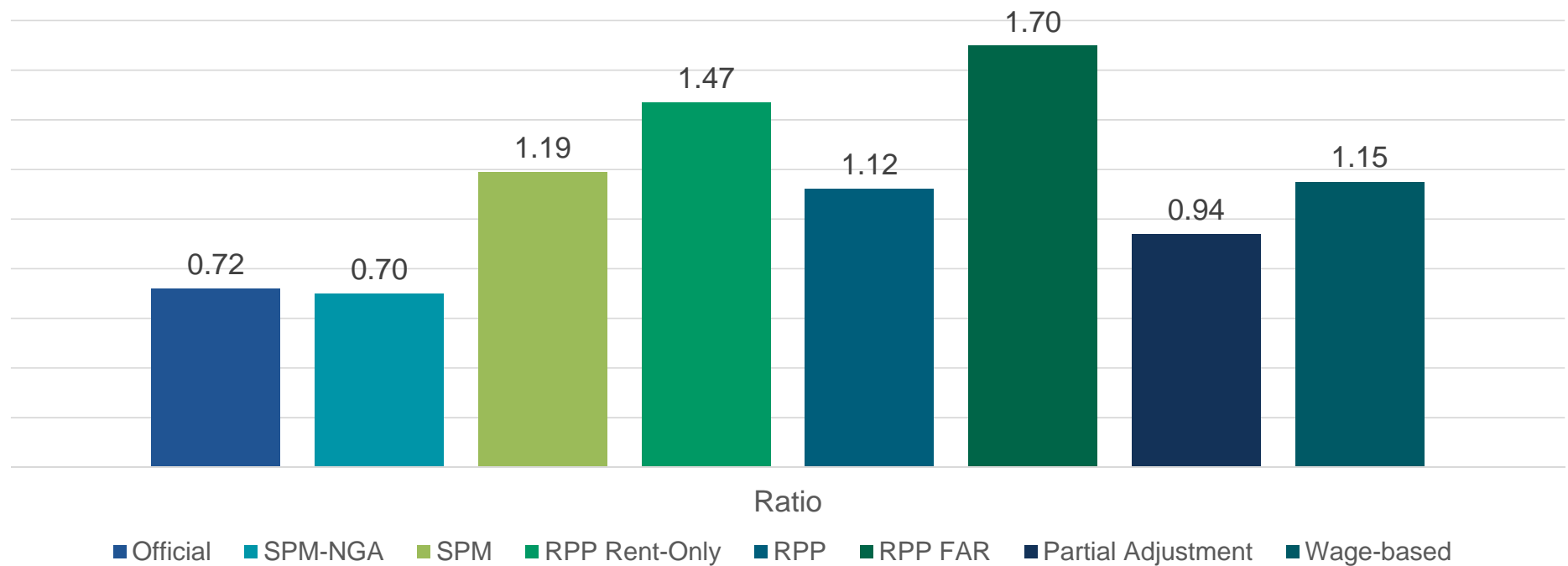
- Some of the changes were large:
  - For Hawaii the average adjustment factor fell from 1.23 using the MRI to 1.13 with the wage-based.
  - For Nevada, the average adjustment factor increased from 0.99 to 1.09
- Comparing correlations with MRI correlations – no statistical differences.
- See Renwick (2020) for complete details.



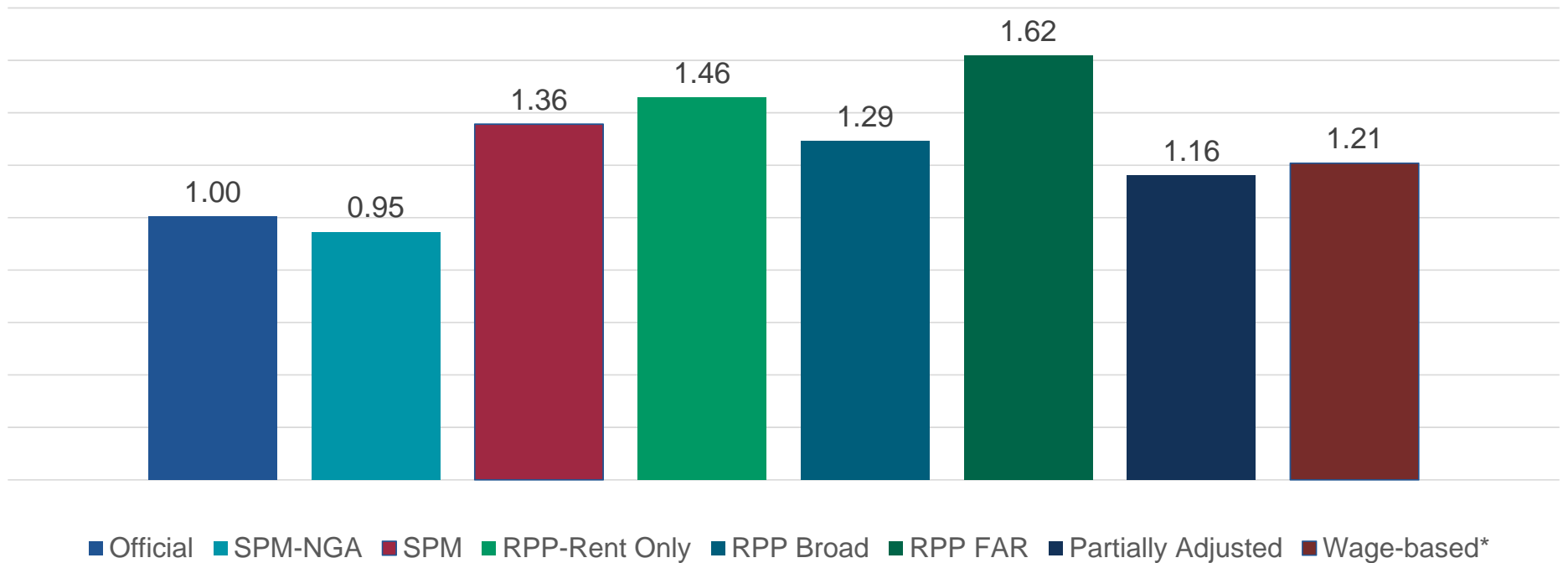
# 2017 Two Adult, Two Child Renter Thresholds: Ratio of DC Threshold to Nonmetro Mississippi



# Comparing Poverty Rates by Adjustment Mechanism: California to Mississippi



# Comparing Poverty Rates by Adjustment Mechanism: Principal City vs Outside Metro





# Discussion

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# Contact Information

## Trudi Renwick

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- 301-763-5133
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# Triple Index vs Median Rent Index

Recommendation 3: The adjustment for geographic housing price differences should be based on quality-adjusted rental costs. The current experimental approach adopted by Census for the SPM makes a distinction between renters, owners with a mortgage, and owners without a mortgage. The panel believed that only rental cost data should be used because home ownership is an asset (a stock) and the focus of the SPM is on income (a flow).

*Using owners' outlays to create a separate index for homeowners is problematic, particularly for owners with a mortgage. The outlays of homeowners with a mortgage vary with the terms of the mortgage and the length of tenure as well as the value of the home. Median costs for homeowners in an area with limited mobility may reflect relative housing prices in some previous period more than current housing market conditions. Since rental costs, even using data from the five year ACS sample, more accurately reflect current market conditions only rental outlays are used in the construction of the index.*

<https://www.census.gov/library/working-papers/2011/demo/SEHSD-WP2011-21.html>

# 2017 Two Adults, Two Child Thresholds: Renters

