BLS WORKING PAPERS

U.S. Department of Labor
U.S. Bureau of Labor Statistics
Office of Prices and Living Conditions

Note on Standard Errors and Other Relevant Statistics of Experimental Poverty Thresholds Produced at the Bureau of Labor Statistics: 2006 to 2008

Thesia I Garner, U.S. Bureau of Labor Statistics

Working Paper 436
March 2010

NOTE

STANDARD ERRORS AND OTHER RELEVANT STATISTICS OF EXPERIMENTAL POVERTY THRESHOLDS PRODUCED AT THE BUREAU OF LABOR STATISTICS: 2006 TO 2008

Thesia I. Garner
Senior Research Economist
Division of Price and Index Number Research
Bureau of Labor Statistics (BLS)
Washington, DC 20212
202 691 6576
Garner.thesia@bls.gov

March 9, 2010

In this note I provide results from ongoing research at the Bureau of Labor Statistics on experimental poverty thresholds.

The purpose of this note is to present the standard errors of National Academy of Sciences (NAS)-based thresholds based on food, clothing, shelter, and utilities (FCSU), and also those based on FCSU items plus medical care (FCSUM). For both sets of thresholds, mortgage principal payments are included in the shelter expenditures of homeowners with mortgages.

Thresholds are presented for reference families that consist of two related adults and two children. The methodology used for the 2008 thresholds was applied throughout the study. The 2008 thresholds match those on the Census Bureau website.[1] However, the estimated thresholds for 2006 and 2007 differ from those on the Census Bureau website due to changes in the methods to produce the thresholds, introduced in the fall of 2009.[2] See Garner and Short 2010) for a description of the procedures used to produce the thresholds.[3]

Standard errors are produced using the method of balanced repeated replications with 44 replicates created by the BLS Division of Consumer Expenditure Surveys. The full sample of data is used to produce the thresholds presented below, while the 44 replicates are used to produce the standard errors.

These results reveal that the standard errors of the changes in the thresholds from year to year are smaller than the standard errors of the annual thresholds. This is expected since each year's threshold is based on a rolling 12 quarters of data, and there is a considerable amount of overlap in the data used to compute the thresholds of two consecutive years.

[1] See, http://www.census.gov/hhes/www/povmeas/tables.html .
[2] Changes in the computer programs to produce the thresholds were introduced over the years as Garner and Short worked with the CE data more and more in a poverty thresholds framework. Changes in the computer code reflected refinements in the definition of expenditures.
[3] Garner, Thesia I. and Kathleen S. Short, "Identifying the Poor: Poverty Measurement for the U.S. from 1996 to 2005," *Review of Income and Wealth*, published online January 25, 2010.

The coefficient of variation (CV) is a measure of the threshold's relative precision. It is computed as the standard error divided by the threshold in percentage terms. Smaller coefficients of variation indicate more precision than larger coefficients of variation. The coefficients of variation for all of the annual thresholds are about 1%, meaning they all have a high degree of precision.

Changes in the thresholds from year to year, associated standard errors, and statistics are presented in the right most section of the table. Note, the calculated t-statistic is the inverse of the CV of the change. The t-statistics are quite large, and they all indicate that the changes in the thresholds are statistically significant at the 0.01 level; this means that the thresholds are statistically significantly different from each other from year to year over the 2006 to 2008 period.

Standard Errors of FCSU and FCSUM Thresholds (with Principal Payments) and Standard Errors of Change in Thresholds: 2006, 2007, and 2008 for Reference Families

				Change from Year to Year			
	Threshold	Standard Error	Coefficient of Variation	Change from Previous Year	Standard Error	Coefficient of Variation	t statistic of difference
FCSU							
2006	$24,069	$296	1.23%				
2007	$25,804	$276	1.07%	$1,736	$214	12.34%	8.10
2008	$27,043	$337	1.25%	$1,239	$234	18.86%	5.30
FCSUM							
2006	$25,855	$245	0.95%				
2007	$27,797	$307	1.11%	$1,942	$243	12.52%	7.99
2008	$29,654	$400	1.35%	$1,857	$277	14.94%	6.69

Source of data: Consumer Expenditure Interview Survey data.

NOTE: For each threshold year, 12 quarters of CE Interview data are used. Expenditures from each quarter of the 12 quarter series are adjusted to threshold year dollars using annual CPI with one exception. The exception is for expenditures for January through March of the year following the threshold year. These expenditures are adjusted by that quarter's CPI, which is created by averaging the monthly CPI all items indexes from January, February, and March. Thus, this quarterly CPI for 2009 is used to adjust 2009Q1 expenditure data to 2008 threshold year dollars.

The thresholds presented above are the same as those sent to Kathleen Short at the Census Bureau on October 14, 2009.

These results were produced by Thesia I. Garner, Research Economist, Division of Price and Index Number Research, Bureau of Labor Statistics for research purposes only using the Consumer Expenditures Interview Survey. Results are released to inform interested parties of ongoing research and to encourage discussion of work in progress. Decisions related to statistical, methodological, technical, and operational issues were made by the author and do not necessarily reflect official positions or policies of the U.S. Bureau of Labor Statistics.

I thank Dave Swanson, BLS Mathematical Statistician, for his assistance with the calculation of the statistical measures and for his review of this Note. I also thank staff members in the Divisions of Consumer Expenditure Surveys and Price Index Number Research for their helpful comments.