



Appendix B

Deriving a Poverty Threshold for New York City

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One of the primary goals of the NYCgov poverty measure is to establish a realistic standard of need for New York City. The NYCgov poverty threshold has developed over time to align with that of the Supplemental Poverty Measure (SPM) released by the U.S. Census Bureau since 2011.¹ However, the SPM has not been followed in all respects. This appendix briefly describes the SPM threshold and the ways in which NYC Opportunity has followed or diverged from the SPM method. It then provides the steps taken to create the New York City-specific threshold. Because year-to-year changes in the threshold are important for understanding changes in poverty rates over time, this appendix also compares growth in the City's NYCgov threshold with the U.S.-wide SPM and the U.S. official thresholds.

From NAS to SPM

The National Academy of Sciences (NAS) recommended that the first step in creating the poverty threshold was to compute a nationwide threshold based on the distribution of expenditures on food, clothing, shelter, and utilities by a reference unit composed of a two-adult, two-child family. Expenditures are measured using a three-year moving average of data available in the Bureau of Labor Statistics' Consumer Expenditure Survey (CE). An additional factor is included in the base threshold to account for miscellaneous expenses, such as non-work-related travel, household supplies, and personal care products.

The NAS did not recommend a specific poverty line; instead, it suggested that the threshold fall between the 30th and 35th percentile of the distribution of what families spend on the items in the threshold. The NAS also offered an upper and lower bound for the factor that accounts for miscellaneous necessities: a multiplier ranging from 1.15 to 1.25 times the food, clothing, shelter, and utilities expenditure estimate.²

¹ Kathleen Short. "The Research Supplemental Poverty Measure: 2010." U.S. Bureau of the Census. November 2011. Available at: <https://www.census.gov/prod/2011pubs/p60-241.pdf>. Prior to the release of this report in 2011, the NYCgov threshold followed National Academy of Sciences recommendations.

² Citro and Michael, p. 106.

The Census Bureau’s SPM threshold is also based on this CE measure of expenditures on the same group of necessities. However, the SPM included a set of recommendations from the Interagency Technical Working Group (ITWG) issued in March 2010.³ The SPM poverty threshold differs from the prior NAS method in four respects:

1. The SPM expands the reference family to include all Consumer Units in the CE with exactly two children, not just those with two adults.
2. The SPM is based on the 33rd percentile of the expenditure distribution, not a fixed percentage of the median of the distribution.
3. The SPM uses a five-year moving average of expenditure data. The NAS had proposed a three-year moving average.
4. The SPM creates separate thresholds to reflect differences in housing status for owners with a mortgage, owners free and clear of a mortgage, and renters. The NAS-based research had used a common threshold for these groups.⁴

Accounting for Housing Status

NYC Opportunity has adopted the first three of the changes listed above. However, the fourth ITWG guideline, which calls for the creation of separate thresholds by housing status, has not been followed. Instead, the NYCgov measure accounts for all differences in housing status on the income side of the poverty measure, applying a housing status adjustment to all households that reside in “non-market rate” housing. This includes homeowners without a mortgage, renters living in rent-regulated units, and renters who do not pay cash rent, along with renters participating in means-tested housing assistance programs.

The different approaches reflect the availability of data that describe the unique features of the New York City housing market. The SPM method has been created for use with the Census Bureau’s Current Population Survey (CPS). The CPS indicates whether respondents own or rent their housing. A newly added question identifies homeowners who make or do not make mortgage payments. The CPS, however, does not provide information about housing expenditures, and the survey provides little other information (such as the size or condition of the housing unit) that would make estimating these feasible. The SPM’s recourse is to create separate thresholds, by housing status, derived from the housing expenditure data available in the CE.

³ “Observations from the Interagency Technical Working Group on Developing a Supplemental Poverty Measure.” March 2010. Available at: <https://www.census.gov/library/working-papers/2010/demo/spm-working-group.html>

⁴ The NAS report was aware of the limitations of this approach and suggested that one remedy would be to develop a separate threshold for homeowners with low or no housing costs. Citro and Michael, p. 245.

NYC Opportunity, by contrast, uses the American Community Survey (ACS) as its principal data set. The ACS identifies homeowners who make mortgage payments, homeowners free and clear of a mortgage, renters who pay rent, and renters who do not pay cash for their shelter. In addition, the ACS provides data on what nearly all households pay out of pocket for their shelter and utilities.⁵ The unique-to-New York City Housing and Vacancy Survey (HVS) provides NYC Opportunity with the ability to identify households that are participating in the wide variety and far-reaching array of housing affordability programs available to renters in the city. This creates the opportunity to account for the advantages of home ownership free of a mortgage and participation in housing affordability programs on a household-by-household basis, without having to construct separate thresholds that try to capture them on average. Given the wealth of data available, NYC Opportunity concluded that it should be used to advantage. This income-side method of accounting for housing status is detailed in Appendix C.

Geographic Adjustment

The NAS argued that because living costs are not uniform across the United States the poverty thresholds should be geographically adjusted. Since research indicates that the largest source of disparity in inter-area living costs is a result of differences in housing costs, the NAS Panel recommended that only the part of the threshold that is made up of shelter and utilities expenditures should be adjusted. The NAS further suggested that the ratio of area specific to U.S.-wide Fair Market Rents (FMRs) developed by the U.S. Department of Housing and Urban Development (HUD) could be used as the adjustment factor.⁶ Following the ITWG guidelines, the SPM uses the ratio of median rents for two-bedroom units as its adjustment factor but computes these from the ACS. NYC Opportunity continues to use HUD's Fair Market Rents for two-bedroom units. The FMR ratio for New York City differs from the ACS ratio (1.544225 vs. 1.34751) in 2018 because it measures different things.⁷ FMRs are representative of recently rented units of standard quality. The rent data from the ACS covers all rental units except the small number that lack complete plumbing and kitchen facilities. Because rent regulation is so widespread in New York City, rents at the median of the ACS distribution are not an accurate reflection of the market rate rental housing market.

This creates two inconsistencies. First, the SPM method compares a New York City median rent that is influenced by housing affordability programs against a U.S.-wide median that (because of the nationally narrow scope of these programs) is not. The impact of rent regulation on the ACS-based rents for New York City creates a second inconsistency in that the NYCgov measure already accounts for the effect of housing affordability programs on the income side of the poverty measure. Therefore, the NYCgov measure continues to use FMRs to create the adjustment factor.

5 The exception is renters participating in tenant-based subsidy programs. NYC Opportunity imputes their expenditures by a statistical match with the New York City Housing and Vacancy Survey.

6 Citro and Michael, pp. 182–201. The NAS Panel regarded this approach as provisional, pending further research.

7 Both ratios are computed using a five-year moving average from their respective data sources.

Table B.1 provides the steps taken to create the NYCgov poverty threshold for 2018. The 2018 U.S.-wide SPM threshold (before the housing adjustment) is \$27,687.⁸ Housing (shelter and utilities) makes up nearly half (48.8 percent) of this threshold. The housing portion is multiplied by the ratio of U.S. to New York City Fair Market Rents (1.544225), which comes to \$20,874. This dollar amount is added together with the (unadjusted) non-housing portion of the threshold, yielding a New York City-specific threshold of \$35,044. This NYCgov threshold is 27 percent higher than the U.S.-wide SPM threshold. The geographic adjustment implies that a New York City resident needs \$1.27 to obtain a standard of living equivalent to what \$1 would obtain, on average, across the United States.

Adjustment for Poverty Unit Size

Once a threshold for the reference family has been set, thresholds need to be calculated for families (or poverty units) of other sizes and compositions, i.e., number of children and number of adults. This study uses the three-parameter scale developed by David Betson after the release of the NAS report.⁹ The scale has been used in the Census Bureau's NAS-based poverty reports and in the new SPM. It is an equivalence scale, used to compute the amounts of income needed by families of different types to be equivalently well off. The scale provides the adjustments needed to convert the threshold for the two-adult, two-child reference family to thresholds for families of other sizes. Table B.2 provides examples of family size adjustments using Betson's scale.

Table B.3 lists the resulting NYCgov poverty thresholds for a variety of families and compares them to the U.S. official thresholds for families of corresponding sizes and compositions. (A full range of NYCgov thresholds can be found in Table B.6.) The NYCgov thresholds are always higher than the official thresholds, but not by the same factor.

This reflects the differences between the Betson scale and the scale implicit in the U.S. official thresholds. An important distinction between scaling methods is that the official method creates a different, and lower, poverty threshold for individuals and some families with a householder age 65 or older. The official threshold for a single adult under 65 is \$13,064, but \$12,043 if that person is older. The NYCgov threshold makes no distinction for older adults. While the NYCgov threshold for a single, nonelderly person is 1.243 times the official threshold, it is 1.349 times the official threshold for a single, elderly person.

⁸ The Bureau of Labor Statistics does not report a pre-housing status adjustment SPM threshold. The threshold here is derived from the data provided at: <http://www.bls.gov/pir/spmhome.htm#threshold>

⁹ David Betson. "Is Everything Relative? The Role of Equivalence Scales in Poverty Measurement." University of Notre Dame. March 1996. Available at: <http://aspe.hhs.gov/poverty/papers/escale.pdf>

Changes in Poverty Thresholds Over Time

Measuring poverty is an exercise in comparing incomes to thresholds. Thus, part of understanding changes in poverty rates over time is tracking how the thresholds are changing from one year to the next. Table B.4 provides the U.S.-wide official, SPM, and NYCgov reference family thresholds for 2005 through 2018. It also reports the percentage change in the thresholds from the prior year, as well as the ratio of the SPM to U.S. official, NYCgov to U.S. official, and NYCgov to SPM thresholds. Note that the three thresholds grow at different and divergent rates over time.

The NYCgov threshold increased faster than the U.S. official threshold in both 2017 and 2018. Between 2017 and 2018, the NYCgov threshold grew by 4.4 percent compared to a 2.4 percent increase for the U.S. official threshold. While this increase in the NYCgov threshold is large, increases before the Great Recession were larger. What accounts for the differences in thresholds over time?

Year-to-year changes in the U.S. official threshold are determined by the year-to-year growth in the U.S.-wide Consumer Price Index for All Urban Consumers. Annual changes in the SPM and NYCgov thresholds, however, reflect changes in five-year moving averages in consumer expenditures. The threshold is a combination of housing and non-housing expenditures, which may not move along the same trajectory in any given year.

For 2018, the SPM and NYCgov thresholds are based on household spending during the 2014–2018 time period. Changes in the housing and non-housing portions of the SPM and NYCgov thresholds from 2014 to 2018 are shown in Table B.5. In 2018 the non-housing portion of the SPM threshold grew by \$658. This is 71 percent higher than the non-housing component of the 2016 SPM threshold, and an historically high increase. The non-housing portion of the threshold is included in the NYCgov measure and accounts for some of the increase in that threshold from 2017 to 2018.

At the same time, growth in the housing portion of the SPM threshold was compounded by growth in the non-housing component. The housing portion of the NYCgov threshold grew by \$825 in 2017. The housing portion of the threshold continues to increase at a faster rate in the NYCgov threshold than in the SPM threshold. Over time, this has consistently contributed to the NYCgov poverty threshold growing faster than both the SPM and U.S. official thresholds.

Using the NYCgov Poverty Thresholds

As explained above, poverty thresholds vary by family size and by the number of children in the family. Table B.6 provides the NYCgov poverty threshold adjusted for a range of family sizes and types.

Table B.7 presents NYCgov near poverty thresholds for the same groups. The near poverty threshold is 150 percent of the poverty threshold. It includes all people in poverty and near-poverty.

Since its first release in 2008, the NYCgov poverty measure has become a useful tool both inside and outside of New York City government. One common practice is to use the NYCgov poverty threshold as a more realistic standard of need than the U.S. official poverty threshold. NYC Opportunity cautions against such use for the following reason: The NYCgov threshold is designed to be used as a standard against the NYCgov measure of income. It is the sum of all resources in the NYC Opportunity income measure: post-tax earnings (including tax credits), public assistance, social security and disability payments, unemployment income, nutritional and housing assistance, and heating assistance. The following costs are subtracted from this summed income: work-related expenses (transportation and childcare) and out-of-pocket medical expenditures. This information should be summed for all members of an extended family living in the same domicile. The NYCgov threshold should not be compared to the U.S. official threshold's income measure of only pre-tax cash.

It is obviously difficult, if not impossible, to gather such information in many situations. If the U.S. official threshold is considered inadequate and pre-tax cash is available as income data, NYC Opportunity instead suggests a hybrid approach: expressing the NYCgov threshold as a percentage of the official measure and using pre-tax cash as a measure of income. This less-than-perfect solution may suffice for establishing a parameter of need in some cases.

Table B.8 gives both the NYCgov poverty thresholds found in Table B.6 and those thresholds expressed as a percentage of the U.S. official threshold. As an example, the NYCgov threshold for the four-person reference family containing two adults and two children is \$35,044, or 138 percent of the U.S. official threshold for that family. In this case, a person could be considered in need if the family's pre-tax cash income is less than 1.38 times the official threshold. This boundary should always be expressed in terms of the official, not the NYCgov, threshold.

Table B.1
Creation of NYCgov Threshold, 2018

U.S.-wide SPM Threshold	\$27,687
Housing Portion of Threshold	48.8%
Geographic Adjustment Factor	1.5442
Adjusted Housing Portion of Threshold	\$20,874
NYCgov Threshold	\$35,044

Sources: U.S. Bureau of Labor Statistics and U.S. Department of Housing and Urban Development.
 Note: See text for explanation of concepts.

Table B.2

Factors Used by NYC Opportunity to Adjust Reference Family Thresholds for Units of Other Sizes and Types

Number of Adults	Number of Children Under 18			
	None	One	Two	Three
One	0.463	0.699	0.830	0.953
Two	0.653	0.880	1.000	1.114
Three	1.000	1.114	1.223	1.328
Four	1.223	1.328	1.430	1.529

Source: Computed by NYC Opportunity based on David Betson's "Is Everything Relative? The Role of Equivalence Scales in Poverty Measurement." University of Notre Dame. 1996.

Table B.3

Comparison of Poverty Thresholds, 2018

Poverty Unit Composition	NYCgov	U.S. Official	Ratio NYCgov/Official
One Adult,* No Children	\$16,242	13,064	1.24
Two Adults,* No Children	\$22,901	16,815	1.36
One Adult,* One Child	\$24,509	17,308	1.42
One Adult, Two Children	\$29,096	20,231	1.44
One Adult, Three Children	\$33,392	25,554	1.31
Two Adults, One Child	\$30,845	20,212	1.53
Two Adults, Two Children	\$35,044	25,465	1.38
Two Adults, Three Children	\$39,037	29,967	1.30

*Adult is non-elderly in the official threshold.

Sources: 2018 thresholds can be found at U.S. Bureau of the Census:

<https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>

Note: NYC Opportunity calculations from Tables B.1 and B.2.

Table B.4
Poverty Thresholds, 2005–2018

Reference Family Thresholds			
Year	U.S. Official	U.S.-wide SPM	NYCgov
2005	\$19,806	\$20,492	\$24,532
2006	\$20,444	\$21,320	\$25,615
2007	\$21,027	\$22,317	\$26,979
2008	\$21,834	\$23,608	\$28,822
2009	\$21,756	\$23,854	\$29,265
2010	\$22,113	\$24,343	\$30,055
2011	\$22,811	\$24,999	\$30,945
2012	\$23,283	\$24,959	\$31,039
2013	\$23,624	\$24,931	\$31,156
2014	\$24,008	\$25,178	\$31,581
2015	\$24,036	\$25,262	\$31,756
2016	\$24,339	\$25,701	\$32,402
2017	\$24,858	\$26,612	\$33,562
2018	\$25,465	\$27,687	\$35,044
Percentage Change from Prior Year			
Year	U.S. Official	U.S.-wide SPM	NYCgov
2006	3.2%	4.0%	4.4%
2007	2.9%	4.7%	5.3%
2008	3.8%	5.8%	6.8%
2009	-0.4%	1.0%	1.5%
2010	1.6%	2.0%	2.7%
2011	3.2%	2.7%	3.0%
2012	2.1%	-0.2%	0.3%
2013	1.5%	-0.1%	0.4%
2014	1.6%	1.0%	1.4%
2015	0.1%	0.3%	0.6%
2016	1.3%	1.7%	2.0%
2017	2.1%	3.5%	3.6%
2018	2.4%	4.0%	4.4%

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Table B.4 (continued)
Poverty Thresholds, 2005–2018

Year	Ratio of Thresholds		
	U.S.-wide SPM/ U.S. Official	NYCgov/ U.S. Official	NYCgov/ U.S.-wide SPM
2005	103.5%	123.9%	119.7%
2006	104.3%	125.3%	120.1%
2007	106.1%	128.3%	120.9%
2008	108.1%	132.0%	122.1%
2009	109.6%	134.5%	122.7%
2010	110.1%	135.9%	123.5%
2011	109.6%	135.7%	123.8%
2012	107.2%	133.3%	124.4%
2013	105.5%	131.9%	125.0%
2014	104.9%	131.5%	125.4%
2015	105.1%	132.1%	125.7%
2016	105.6%	133.1%	126.1%
2017	107.1%	135.0%	126.1%
2018	108.7%	137.6%	126.6%

Sources: U.S. Bureau of Labor Statistics and the U.S. Department of Housing and Urban Development.

Table B.5
Change in SPM and NYCgov Poverty Thresholds, 2014–2018

Ratio of Thresholds			
U.S.-wide, SPM	Portion		
	Housing	Non-Housing	Total
2014	\$12,445	\$12,733	\$25,178
2015	\$12,416	\$12,846	\$25,262
2016	\$12,573	\$13,128	\$25,701
2017	\$13,100	\$13,512	\$26,612
2018	\$13,518	\$14,170	\$27,687
Change from 2014–2015	-\$29	\$113	\$84
Change from 2015–2016	\$157	\$282	\$439
Change from 2016–2017	\$527	\$384	\$911
Change from 2017–2018	\$418	\$658	\$1,075
New York City, NYCgov	Portion		
	Housing	Non-Housing	Total
2014	\$18,848	\$12,733	\$31,581
2015	\$18,910	\$12,846	\$31,756
2016	\$19,274	\$13,128	\$32,402
2017	\$20,049	\$13,512	\$33,562
2018	\$20,874	\$14,170	\$35,044
Change from 2014–2015	\$61	\$113	\$175
Change from 2015–2016	\$364	\$282	\$646
Change from 2016–2017	\$775	\$384	\$1,160
Change from 2017–2018	\$825	\$658	\$1,482

Sources: U.S. Bureau of Labor Statistics and the U.S. Department of Housing and Urban Development.
 Note: Totals are computed from unrounded numbers.

Table B.6

NYCgov Poverty Thresholds for 2018 by Size of Family and Number of Related Children Under 18 Years

Size of Family Unit	Number of Children							
	None	One	Two	Three	Four	Five	Six	Seven
One person	\$16,242							
Two people	\$22,901	\$24,509						
Three people	\$35,044	\$30,845	\$29,096					
Four people	\$42,862	\$39,037	\$35,044	\$33,392				
Five people	\$50,108	\$46,545	\$42,862	\$39,037	\$37,462			
Six people	\$56,929	\$53,565	\$50,108	\$46,545	\$42,862	\$41,350		
Seven people	\$63,416	\$60,210	\$56,929	\$53,565	\$50,108	\$46,545	\$45,088	
Eight people	\$69,629	\$66,554	\$63,416	\$60,210	\$56,929	\$53,565	\$50,108	\$48,696

Sources: U.S. Bureau of the Census and NYC Opportunity calculations from Tables B.1 and B.2.

Table B.7

NYCgov Near Poverty Thresholds, 2018

Near Poverty = 150% of NYCgov Poverty Threshold

Size of Family Unit	Number of Children							
	None	One	Two	Three	Four	Five	Six	Seven
One person	\$24,363							
Two people	\$34,352	\$36,764						
Three people	\$52,566	\$46,268	\$43,644					
Four people	\$64,293	\$58,556	\$52,566	\$50,088				
Five people	\$75,162	\$69,818	\$64,293	\$58,556	\$56,193			
Six people	\$85,394	\$80,348	\$75,162	\$69,818	\$64,293	\$62,025		
Seven people	\$95,124	\$90,315	\$85,394	\$80,348	\$75,162	\$69,818	\$67,632	
Eight people	\$104,444	\$99,831	\$95,124	\$90,315	\$85,394	\$80,348	\$75,162	\$73,044

Sources: U.S. Bureau of the Census and NYC Opportunity calculations from Tables B.1 and B.2.

Table B.8

**NYCgov Poverty Thresholds as a Percent of U.S. Official Thresholds, 2018
by Size of Family and Number of Related Children Under 18 Years**

Size of Family Unit	Number of Children							
	None	One	Two	Three	Four	Five	Six	Seven
One person as % of Official	\$16,242 1.24							
Two people as % of Official	\$22,901 1.36	\$24,509 1.42						
Three people as % of Official	\$35,044 1.78	\$30,845 1.53	\$29,096 1.44					
Four people as % of Official	\$42,862 1.65	\$39,037 1.48	\$35,044 1.38	\$33,392 1.31				
Five people as % of Official	\$50,108 1.60	\$46,545 1.47	\$42,862 1.40	\$39,037 1.30	\$37,462 1.27			
Six people as % of Official	\$56,929 1.58	\$53,565 1.49	\$50,108 1.42	\$46,545 1.34	\$42,862 1.28	\$41,350 1.26		
Seven people as % of Official	\$63,416 1.53	\$60,210 1.45	\$56,929 1.40	\$53,565 1.34	\$50,108 1.29	\$46,545 1.24	\$45,088 1.25	
Eight people as % of Official	\$69,629 1.51	\$66,554 1.43	\$63,416 1.38	\$60,210 1.34	\$56,929 1.29	\$53,565 1.25	\$50,108 1.21	\$48,696 1.19

Sources: U.S. Bureau of the Census and NYC Opportunity calculations from Tables B.1 and B.2.