The CEO Poverty Measure, 2005-2008

A Working Paper by the NYC Center for Economic Opportunity

March 2010

Center for Economic Opportunity

Michael R. Bloomberg
Mayor

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PREFACE AND ACKNOWLEDGEMENTS

The inadequacies of the official poverty measure have been known to American social scientists for decades. They became apparent to New York City policymakers in 2006. Mayor Michael R. Bloomberg had convened a Commission on Economic Opportunity and directed it to craft innovative approaches to poverty reduction in the City. The Commission Members soon learned that the current poverty measure could tell them very little about how the ideas they were considering would affect low-income New Yorkers. In addition to launching new programs, the Commission Members concluded that the City should develop a new measure of poverty. Mayor Bloomberg embraced the suggestion and poverty measurement became a project of the organization he created to implement the Commission's recommendations, the New York City Center for Economic Opportunity (CEO).

CEO issued its first working paper on poverty in New York City entitled "The CEO Poverty Measure," in August of 2008. The paper pioneered the use of the Census Bureau's American Community Survey for measuring poverty using the methodology proposed by the National Academy of Sciences. It also marked the first time that any municipal government had sponsored research that adopted the Academy's method to local conditions.

This working paper extends our efforts. It measures changes in New York City poverty rates from 2005 to 2008, the years for which American Community Survey data are now available, and incorporates improvements in our methodology. It was authored by CEO's poverty research staff, which includes myself along with Christine D'Onofrio, John Krampner, Daniel Scheer, and Todd Seidel.

We have not been alone in this work. Vicky Virgin, Demographic Analyst at the Population Division of New York City Department of City Planning, has made important contributions throughout the project. She deserves special thanks, as does Dr. Joseph Salvo, the Population Division's Director. Gayatri Koolwal, formerly of CEO, but now at the World Bank, has continued to assist our efforts.

We are indebted to many colleagues in City government who have shared their expertise. These include: Caitlyn Brazill, Deputy Director for Research and Policy,

Department of Consumer Affairs' Office of Financial Empowerment; John Grathwol and Deborah Brosen, at the Office of Management and Budget; Anneil Basnandan, Roy Holder, Juliah Lindsey, Iris Reyes, Angela Sheehan, Harold Wenglinsky, and Rebecca Widom of the Human Resources Administration; Laurie Kilpatrick, Department of Finance; Roeland Kim, Department of Housing Preservation and Development; Anne Marie Flatley and Celeste Glenn, New York City Housing Authority.

Staff at other government agencies that also assisted us included: Tanette Nguyen-McCarty, Office of Tax Policy Analysis, New York State Department of Taxation and Finance; Jane Berrie, New York State Division of Housing and Community Renewal; Dave Dlugolecki, New York State Office of Temporary and Disability Assistance; Dean Plueger, U.S. Internal Revenue Service; Edward Welniak and Jessica Semega, U.S. Bureau of the Census; and Jessica Banthin and Didem Bernard, U.S. Department of Health and Human Services' Agency for Healthcare Research and Quality.

As our work progressed, similar projects have been underway for the State of New York and the City (and metro area) of Philadelphia. We have greatly benefited from the partnership of George Falco, Director, Planning and Policy Research and Ji hyun Shin, Research Scientist at the New York State Office of Temporary and Disability Assistance as well as Mark Stern, Professor of Social Welfare and History and Co-Director, Urban Studies program, University of Pennsylvania.

CEO's poverty measurement research has also taken place in the context of national-level research and discussion about implementing the National Academy of Sciences' approach to poverty measurement. The Brookings Institution Center on Children and Families has hosted a number of meetings, some at CEO's request, where many of the nation's leading poverty experts presented work and offered us their reactions to our first report along with advice for building on the effort. We should acknowledge the generosity of Ron Haskins, the Center's Co-Director as well as the wisdom of those who have attended these events, including Jessica Banthin, Richard Bavier, David Betson, Rebecca Blank, Gary Burtless, Constance Citro, Sharon O'Donnell, Irv Garfinkel, Thesia Garner, Mark Greenberg, Amy O'Hara, John Iceland, Julia Isaacs, David Johnson, Trudi Renwick, Isabelle Sawhill, Karl Scholz, Arloc Sherman, Kathleen Short, Timothy Smeeding, Sharon Stern, Jane Waldfogel, Laura Wheaton, Sheila Zedlewski, and James Ziliak.

We benefited from the production and editorial assistance provided by our colleagues at CEO namely: Allegra Blackburn-Dwyer, Carson Hicks, Moses Magali, and Stacey Warady Gillett.

None of this work would have been possible without the leadership of Veronica White, CEO's Executive Director and Linda Gibbs, New York City Deputy Mayor for Health and Human Services. They have provided the exceptional guidance and support we have needed to do our work.

Mark Levitan, Ph.D.
Director of Poverty Research
On behalf of the New York City Center for Economic Opportunity

EXECUTIVE SUMMARY

Measuring poverty requires two fundamental judgments. The first is where to draw the line between the poor and the rest of society, to decide, "how much income is just enough"? The second judgment is to decide, "just enough of what"? What resources should be counted as income to determine whether a family has attained the standard of living represented by the poverty line?

New York City Mayor Michael R. Bloomberg directed the Center for Economic Opportunity (CEO) to develop an alternative poverty measure because the current, official measure's answers to these questions are sorely out of date. The official poverty line was developed in the mid-1960s and rested on the belief that families typically spend one-third of their income on food. The cost of a minimally adequate diet was simply multiplied by three to establish the initial level of the threshold. Since that time, the base year poverty line has been adjusted annually by the growth in the Consumer Price Index. Over four decades later, this threshold no longer represents contemporary spending patterns or takes account of advances in the nation's standard of living. It also ignores differences in the cost of living across the country, an issue of obvious relevance to measuring poverty in New York City.

The official measure's answer to "enough of what?" is also dated. The only family resource it counts is pre-tax cash. That includes wages, salaries, and some of what government does to help needy Americans, *if* it takes the form of cash assistance. Given the policies in place and data available, this was not an unreasonable choice in the mid-1960s. But today, much of what the government provides to low-income families takes the form of tax credits (such as the Earned Income Credit) and in-kind benefits (such as Food Stamps). If policymakers or the public want to know how these programs affect poverty, the official measure cannot provide an answer.

Recommendations from the National Academy of Sciences

The poverty measure adopted by CEO is based on more realistic answers to the two fundamental questions of poverty measurement. It follows a set of recommendations that, at the request of Congress, were developed by the National Academy of Sciences' (NAS)

Panel on Poverty and Family Assistance. The NAS-proposed method provides a more comprehensive definition of family resources, one that more fully captures what public policies do to support low-income families. It judges the adequacy of anti-poverty policies by comparing resources against poverty thresholds that are more appropriate to the living standards that prevail in early twenty-first century America.

The NAS Panel recommended that the poverty thresholds should reflect the amount a family needs not only for food, but for clothing, shelter, and utilities as well. Specifically, the threshold is set to equal roughly 80 percent of median expenditures by two-adult, two-child families on this market basket, plus "a little more" to account for other items necessary for personal care, household upkeep, and non-work-related transportation. The Panel proposed that these thresholds be updated each year by the change in median expenditures for the items that make up the threshold. It further suggested that the thresholds be adjusted geographically to reflect differences in the cost of living across the United States.

Along with a different poverty line, the NAS Panel recommended that a much more inclusive definition of resources be used to determine whether a family can meet its basic needs. In addition to pre-tax cash, the resource measure should account for payroll taxes; the net effect of income tax liabilities and credits; and the cash-equivalent value of in-kind benefits for food and housing. The Panel also suggested that resources be adjusted to reflect non-discretionary work-related expenses such as commuting costs and child care. Because money spent by a family to maintain its health is unavailable for purchasing the necessities represented in the threshold, the Panel also proposed that medical out-of-pocket expenses should be subtracted from income.

The CEO Poverty Measure

The NAS provided a conceptual framework for an improved poverty measure. CEO's task has been to construct the data needed to implement it in New York City. For the poverty line, we rely on the U.S.-wide thresholds that have been calculated from the Bureau of Labor Statistics' Consumer Expenditure Survey and have been used by the Census Bureau for its research on NAS-style poverty measures. In 2008, the NAS threshold for a two-adult, two-child family equaled $24,755. We then adjust the threshold to account for the relatively high cost of living in New York City using the ratio of the New York City to

U.S.-wide Fair Market Rent for a two-bedroom apartment. In 2008, the CEO threshold for this family comes to $30,419.[1]

To measure the resources available to a family to meet the needs represented by the threshold, our poverty measure employs the Public Use Micro Sample from the Census Bureau's American Community Survey (ACS) as its principal data set. The ACS, however, provides only some of the information needed to estimate all the resources required by the NAS measure. CEO has developed a variety of methodologies that model the effect of taxation, nutritional and housing assistance, work-related expenses, and medical out-of-pocket expenditures on total family resources and poverty status. We reference the resulting data set as "the American Community Survey Public Use Micro Sample as augmented by CEO" and we refer to our estimate of family resources as "CEO income."

This Working Paper

CEO's first working paper on poverty in New York City, issued in August of 2008, contrasted poverty rates for 2006 derived from our application of the NAS methodology against those based on the official method.[2] This report focuses on how and why poverty rates using our methodology have changed over time, using the one-year ACS samples for 2005 to 2008 (the years for which data are currently available).

Key Findings

- The CEO poverty rate for New York City rose from 20.6 percent in 2005 to 22.0 percent in 2008. The 1.4 percentage point increase occurred because the growth in CEO income did not keep pace with the rise in the CEO poverty threshold. Reflecting the sharp run-up in housing expenditures in this period, the CEO threshold climbed by 24.9 percent. But, as Table One indicates, CEO income grew by 21.1 percent at the 20th percentile and 19.5 percent at the 30th percentile (the part of the distribution that is most likely to influence the poverty rate).
- The official poverty rate, by contrast, declined by 1.5 percentage points from 19.1 percent in 2005 to 17.6 percent in 2008. The growth of pre-tax cash income (of 17.0

[1] The official threshold for a two-adult, two-child family in 2008 was $21,834.
[2] The report is available at: http://www.nyc.gov/html/ceo/downloads/pdf/final_poverty_report.pdf.

percent and 16.7 percent at the 20th and 30th percentiles, respectively) exceeded the 10.2 percent rise in the official poverty threshold.

Table One

Thresholds, Income, and Poverty Rates for NYC

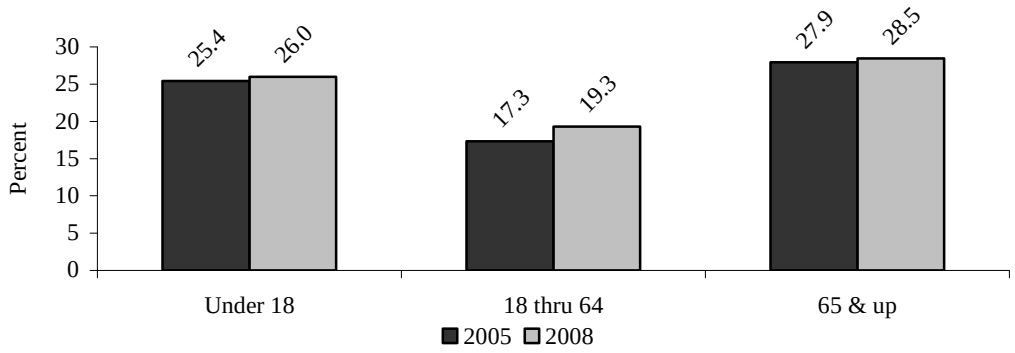
	2005	2008	Change*
CEO Threshold	$24,353	$30,419	24.9%
CEO Income:			
20th percentile	$24,054	$29,138	21.1%
30th percentile	$29,771	$35,571	19.5%
CEO Poverty Rate	20.6%	22.0%	1.4
Official Threshold	$19,806	$21,834	10.2%
Pre-tax Cash Income:			
20th percentile	$21,499	$25,149	17.0%
30th percentile	$31,193	$36,404	16.7%
Official Poverty Rate	19.1%	17.6%	-1.5

* Change in dollar figures is percentage change. Change in the poverty rate is the percentage point change.
Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

- Poverty Rates in Demographic Detail:
  - By age group: Working age adults (New Yorkers from 18 through 64 years of age) are significantly less poor than are children under 18 or the elderly (persons 65 and older). From 2005 to 2008, the poverty rate for working age adults rose by 2.0 percentage points. During this period the poverty rates for children and the elderly were unchanged.[3]

[3] The Executive Summary only notes those differences or changes in poverty rates that are statistically significant.

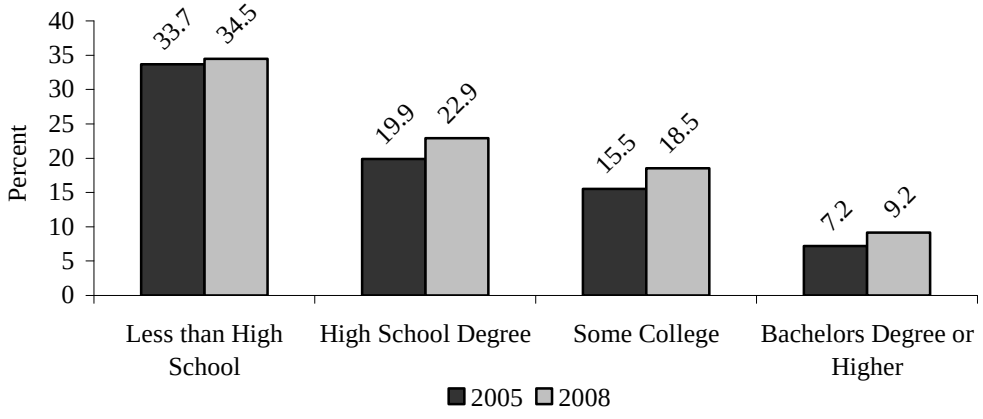
CEO Poverty Rates by Age



Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

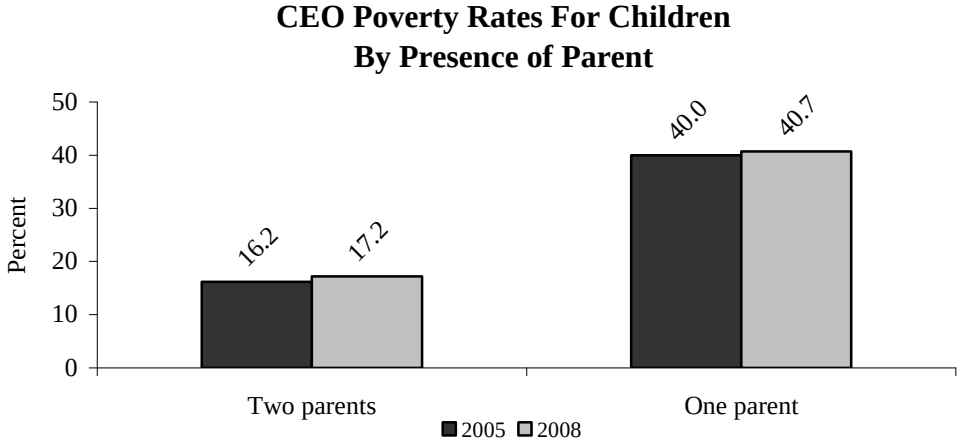
- Among working age adults by educational attainment: Levels of poverty decline dramatically as educational attainment rises. In 2008, over a third of working age adults who lack a high school degree were poor compared to less than one in ten 18 through 64 year olds who had attained a Bachelors degree or higher level of education. Changes in poverty rates, from 2005 to 2008, did not follow this pattern. The poverty rate rose by 3.0 percentage points, 3.1 percentage points, and 2.0 percentage points for working age adults with a high school degree, some college, or a Bachelors degree or higher level of educational attainment, respectively. Over the same time, the poverty rate for working age adults who have not attained a high school degree was unchanged.

CEO Poverty Rates For Working Age Adults By Educational Attainment



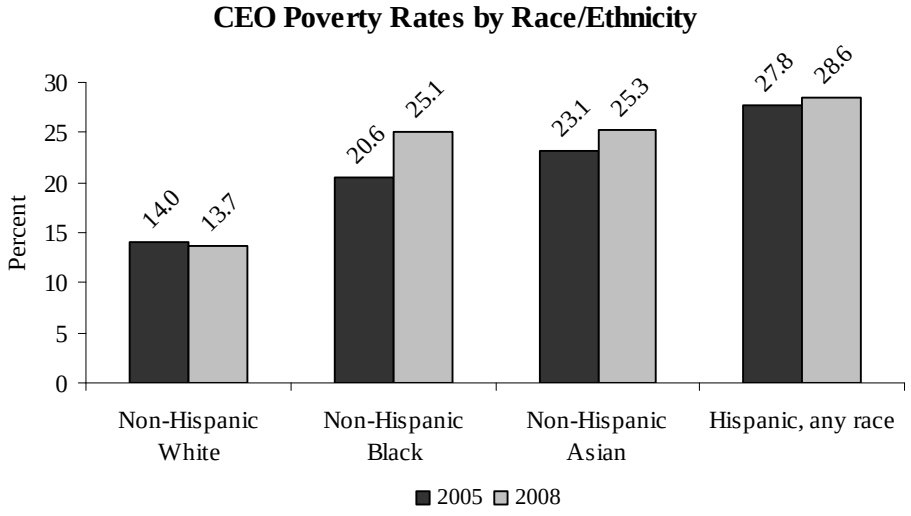
Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

- Among children by presence of parents: Children living with only one parent are over twice as likely to be poor as children living with two parents. From 2005 to 2008, neither group of children experienced a statistically meaningful change in their poverty rates.



Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

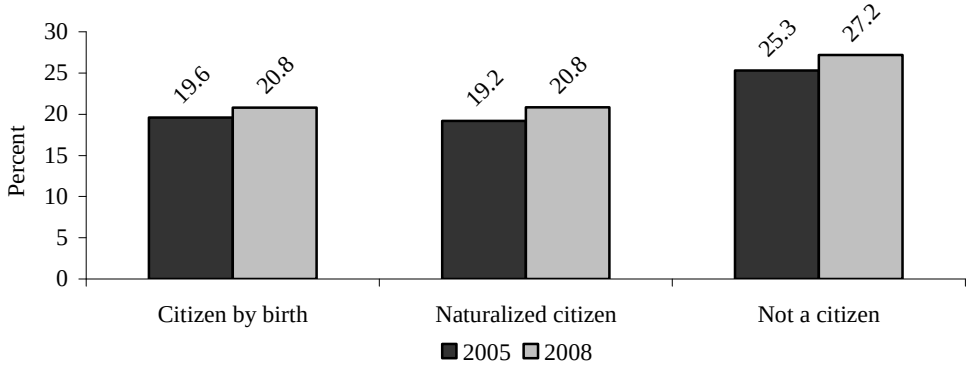
- By race/ethnicity: Non-Hispanic Whites have significantly lower rates of poverty than members of the other major race/ethnic groups in New York City. The poverty rate for Hispanics, the City's poorest race/ethnic group, is twice that of Non-Hispanic Whites. The one group that experienced a rise in their poverty rate from 2005 to 2008, of 4.5 percentage points, was Non-Hispanic Blacks.



Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

- By nativity/citizenship: Citizens by birth and by naturalization have similar poverty rates and their levels of poverty are significantly lower than those for non-citizens. The poverty rate for both groups of citizens edged upward from 2005 to 2008, by 1.2 percentage points and 1.6 percentage points, respectively. The poverty rate for non-citizens was statistically unchanged.

CEO Poverty Rates by Nativity/Citizenship

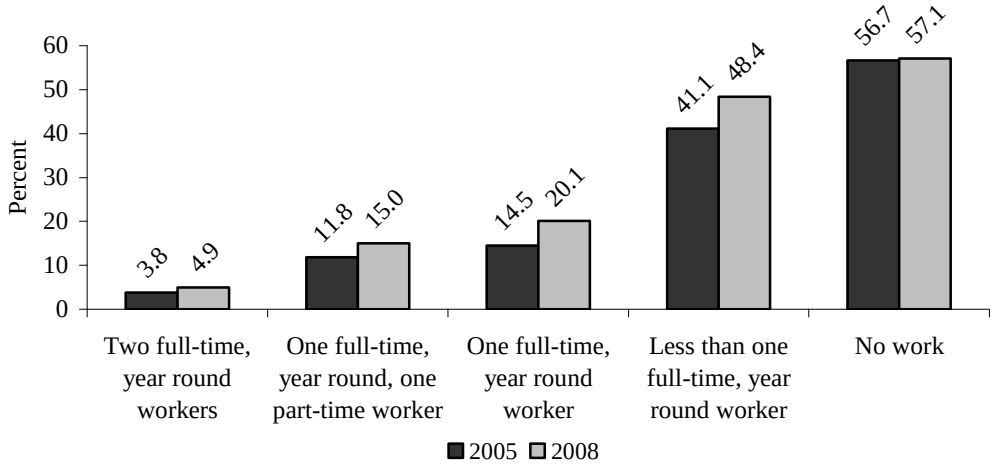


Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

- By family work experience: Someone living in a family without work is over 10 times as likely to be poor as someone living in a family with the equivalent of two full-time workers with year-round employment. But, from 2005 to 2008, poverty rate increases were experienced by: people living in a family with the equivalent of two full-time, year-round workers (of 1.1 percentage points), individuals in families with the equivalent of one full-time, year-round worker and one part-time worker (of 3.2 percentage points), persons in families with the equivalent of just one full-time, year-round worker (of 5.6 percentage points) and those New Yorkers who were living in a family with less than a full-time, year-round worker, but some work (of 7.3 percentage points). Members of families without any work in the prior 12 months did not experience an increase in poverty from 2005 to 2008.[4]

[4] See Section III for an explanation of how these work experience categories are defined.

CEO Poverty Rates by Family Work Experience



Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

Explanations and Implications

We see two patterns in the poverty rates by demographic detail. Between-group differences in the *level* of poverty largely reflect differences in the ability of groups to succeed in the labor market. Thus the likelihood that someone is poor falls dramatically with their level of education or the level of work activity in their family. However, the *increases* in poverty rates from 2005 to 2008 tended to occur for groups that rely on earned income. By contrast, poverty rates were more stable in this period for groups that have low levels of labor market participation. For example, the poverty rate for people in working families rose in this period, while the poverty rate for those living in families without work was statistically unchanged from 2005 to 2008.

Differences in housing status figure prominently in the explanation for this pattern. Three out of four low-income non-working families (74.6 percent) compared to less than half of low-income working families (46.2 percent) are residents of public housing, participate in a rental subsidy program, live in a rent stabilized or controlled apartment or own their home free and clear of a mortgage. New Yorkers in these types of "non-market rate" housing were largely shielded from the rapid rise in the CEO threshold during the period of our analysis. Although their level of poverty may be high, it did not increase. By contrast, the earnings of working families, who are more likely to live in market-rate housing, did not keep pace with the growth in the CEO threshold.

The advantages of participation in means-tested housing programs or residence in rent stabilized or controlled apartments are not restricted to families without work. Access to non-market rate housing also increases the likelihood that working families with children can escape poverty. Over one-in-five (21.2 percent) working families with children were "earnings poor" in 2008, meaning that the family's total wages or self-employment income is not sufficient to lift them out of poverty. We find that work-related tax programs, such as the Federal, State, and New York City Earned Income Credits and Child Care Credits make an important contribution to these families' incomes. But these additions are largely offset by work-related costs, such as payroll taxes, child care expenses, and the cost of commuting to and from work. A key factor that distinguishes families whose total resources lift them over the poverty line from those that remain in poverty is that a much larger proportion of the former group (over 80 percent) than the latter group (less than half) are living in non-market rate housing.

The measures of poverty in this report lend support to the belief that the poverty rate would fall with higher levels of educational attainment, increased work force participation, and more children growing up in two-parent families. In this respect, the CEO measure largely confirms widely accepted wisdom about the long-term determinants of poverty reduction. The additional insight this report offers is the need to add affordable housing to this list.

I. INTRODUCTION

Measuring poverty requires two fundamental judgments. The first is where to draw the line between the poor and the rest of society; to decide, "how much income is just enough"? The second judgment is to decide, "just enough of what"? What resources should be counted as income to determine whether a family has attained the standard of living represented by the poverty line?

Mayor Michael R. Bloomberg directed the New York City Center for Economic Opportunity (CEO) to develop an alternative poverty measure because the current measure's answers to these questions are sorely out of date. The official poverty threshold – the line between the poor and the non-poor – was developed in the mid-1960s. It rested on the belief that families typically spend one-third of their income on food. The cost of a minimally adequate diet was simply multiplied by three to establish the initial level of the threshold. Since that time, the base year poverty line has been adjusted annually by the growth in the Consumer Price Index.

Over four decades later, the official poverty threshold has little justification. The threshold no longer represents contemporary spending patterns; food now accounts for less than one-seventh of family expenditures, while housing is the largest item in the typical family's budget. The poverty line also ignores differences in the cost of living across the country, an issue of obvious relevance to measuring poverty in New York City. A final shortcoming of the threshold is that it is frozen in time. It only rises with the cost of living and thereby assumes that a standard of living that defined poverty in the mid-1960s remains appropriate despite advances in the nation's standard of living since that time.

The official measure's answer to "enough of what?" is also dated. The only family resource used to determine whether a family is poor is pre-tax cash. That includes wages, salaries, and some of what government does to help needy Americans, *if* it takes the form of cash assistance. Given the policies in place and data available in the mid-1960s, this was not an unreasonable choice. But, today much of what the government provides to low-income families takes the form of tax credits (such as the Earned Income Credit) and in-kind

benefits (such as Food Stamps). If policymakers or the public want to know how these programs affect poverty, the official measure cannot provide an answer.

1.1 The National Academy of Sciences' Poverty Measure

The poverty measure adopted by CEO is based on more current and realistic answers to the two fundamental questions of poverty measurement. It follows a set of recommendations that, at the request of Congress, were developed by the National Academy of Sciences' (NAS) Panel on Poverty and Family Assistance.[5] The NAS-proposed method addresses the key weaknesses in the official methodology. It provides a more comprehensive definition of family resources, one that more fully captures what public policies do to support low-income families. It judges the adequacy of anti-poverty policies by comparing resources against poverty thresholds that are more appropriate to the living standards that prevail in early twenty-first century America.

The NAS Panel recommended that the poverty thresholds reflect the amount a family needs not only for food, but for clothing, shelter, and utilities as well. Specifically, the threshold is set to equal roughly 80 percent of median expenditures by two-adult, two-child families on this market basket of goods, plus "a little more" to account for other items necessary for personal care (such as soap), household upkeep (such as cleaning supplies), and non-work transportation. The NAS also suggested that the thresholds be adjusted geographically to reflect differences in the cost of living across the U.S. The Panel proposed that these thresholds be updated each year by the change in median expenditures for the items that make up the threshold.

Along with a different poverty line, the NAS Panel recommended that a much more inclusive definition of resources be used to determine whether a family can meet its basic needs. In addition to pre-tax cash, the resource measure should account for payroll taxes and the net effect of income tax liabilities and credits, along with the cash-equivalent value of "near-cash" benefits for food and housing. The Panel further suggested that resources be adjusted to reflect non-discretionary work-related expenses such as commuting costs and child care. Because what a family must spend to maintain its health is unavailable for

[5] Citro, Constance F. and Robert T. Michael (eds.), *Measuring Poverty: A New Approach*, Washington, DC: National Academy Press, 1995.

purchasing other necessities, the Panel also proposed that medical out-of-pocket expenses be subtracted from income.

Taken as a whole, the NAS recommendations represent a thorough modernization of the nation's poverty measure. But the NAS approach is not simply a technical improvement, reflecting the increased availability of data that can create a more sophisticated tally of necessities and the resources at hand to satisfy them. It also represents a different way of thinking about how poverty should be defined. The official measure, we have noted, was based on what experts believed to be a minimally adequate diet. The cost of this diet could be readily determined (again by experts) and that dollar figure became the core of the base year poverty line. The NAS Panel's approach establishes a standard of family needs based on actual consumer expenditure data. What and how much Americans buy determines the poverty threshold. The role of the experts is to choose which among the items that families purchase are necessities. Then a point in the expenditure distribution is selected to draw the poverty line.[6] Subsequent changes in the threshold are then driven by changes in society. The growth in income and wealth, changes in prices, shifts in family structure, and innovations in public policy all shape the level and composition of consumer expenditures over time. In this way the Panel's approach is uniquely designed to capture how economic and social changes affect our sense of: "how much is enough"?

1.2 CEO's Adoption of the NAS Method

The NAS provided a conceptual framework. CEO's task has been to construct the data needed to implement it. For the poverty line, we rely on the U.S.-wide thresholds that have been calculated from the Bureau of Labor Statistics' Consumer Expenditure Survey and have been used by the Census Bureau for its research on NAS-style poverty measures.[7] In 2008, the NAS threshold for a two-adult, two-child family equaled $24,755.[8] We then adjust the threshold to account for the relatively high cost of living in New York City using the ratio of the New York City to U.S.-wide Fair Market Rent for a two-bedroom

[6] As noted below, the NAS Panel did not go so far as to specify a specific point in the expenditure distribution to set the poverty line. Instead it proposed a range of values. 1995. "National Research Council, Panel on Poverty and Family Assistance." Citro and Michael, p. 106.

[7] The Census Bureau's work is available at: http://www.census.gov/hhes/www/povmeas/nas.html.

[8] Several versions of the NAS threshold are available at: http:// www.census.gov/ hhes/ www/ povmeas / web_tab5_povertythres2008.xls. We use the Consumer Expenditure Survey-updated threshold that excludes medical care and mortgage principal payments.

apartment.[9] In 2008, our poverty line for this family comes to $30,419.[10] We refer to this New York City-specific threshold as the CEO poverty threshold.

To measure the resources available to a family to meet the needs represented by the threshold, our poverty measure employs the Public Use Micro Sample from the Census Bureau's American Community Survey (ACS) as its principal data set. The decision to rely on the ACS has been the project's central challenge. The advantages of this survey for local poverty measurement are obvious. The ACS is designed to provide measures of socio-economic conditions on an annual basis in states and larger localities. It offers a robust sample for New York City (roughly 25,000 households) and contains essential information about household composition, family relationships, and cash income from a variety of sources. But, as noted earlier, the NAS-recommended poverty measure greatly expands the scope of resources that must be measured in order to determine whether a family is poor.

Unfortunately, the ACS provides only some of the information needed to estimate the additional resources required by the NAS measure. CEO has developed a variety of methodologies that model the effect of taxation, nutritional and housing assistance, work-related expenses and medical out-of-pocket expenditures on total family resources and poverty status. We reference the resulting data set as "the American Community Survey Public Use Micro Sample as augmented by CEO" and we refer to our estimate of family resources as "CEO income."

1.3 Estimating CEO Income

Our income measure begins with pre-tax cash, and then accounts for the effect of taxation, the cash-equivalent value of nutritional subsidies (Food Stamps and the School Lunch Program), makes an adjustment for housing status, deducts work-related expenses (commuting and child care), and finally, reduces income by what families are spending out-of-pocket for their medical care. We offer a brief description below of how these non-pre-tax cash income items are estimated. More details can be found in this report's appendices and in CEO's initial study of poverty using the NAS methodology.[11]

[9] Details of the calculation are provided in the appendix.
[10] The official threshold for the corresponding two-adult, two-child family in 2008 was $21,834.
[11] *The CEO Poverty Measure: A Working Paper by the New York City Center for Economic Opportunity*. August 2008. Available at: http://www.nyc.gov/html/ceo/downloads/pdf/final_poverty_report.pdf.

Taxation: All but the poorest of families have a level of income that obligates them to file an income tax return. It is often in their interest to do so because the tax system includes refundable tax credits. CEO has developed a tax model that creates tax filing units within the ACS households, computes their adjusted gross income, taxable income, tax liability, and net income taxes after non-refundable and refundable credits are applied. The model takes account of Federal, State, and City income tax programs including all the credits that are designed to aid low-income filers. The model also includes the effect of the Federal payroll tax for Social Security and Medicare (FICA). We estimate that in 2008, the tax system lifted 1.4 percent of the City's population out of poverty.

Nutritional Assistance: We estimate the effect of the two largest means-tested nutritional assistance programs, Food Stamps and the Free and Reduced Price School Lunch program.[12] We count a dollar of Food Stamp benefit as a dollar added to family income. We follow the Census Bureau's method in valuing the addition to family income from the School Lunch program by using an estimate of what the family would have spent without the subsidy. Together, the Food Stamp and School Lunch programs reduced poverty by 2.2 percentage points in 2008.

Housing Adjustment: The high cost of housing makes New York City an expensive place to live. The CEO poverty threshold, we noted above, is adjusted to reflect that reality. But some New Yorkers do not need to spend as much to secure adequate housing as the threshold implies. Many of the City's low-income families live in public housing or receive a housing subsidy, such as a Section 8 housing voucher. A large proportion of New York's renters live in rent stabilized or controlled apartments. Some homeowners have paid off their mortgages and own their homes free and clear.

Rather than estimating a different poverty threshold for families in each of these different circumstances, it is simpler to adjust their incomes to reflect this advantage. CEO calculates the difference between the shelter and utilities portion of a family's poverty threshold and what the family actually spends on these items. Then we add the difference to the family's income. In 2008 this adjustment reduced the poverty rate by 5.7 percentage points.

[12] The Food Stamp program was recently renamed the Supplemental Nutritional Assistance Program (SNAP). Since the program is more widely recognized by its former name, we continue to use it.

Work-Related Expenses: Workers must travel to and from their jobs and we treat the cost of that travel as a non-discretionary expense. We estimate the number of trips a worker will make per week based on their usual weekly hours. We then calculate the cost per trip using information in the ACS about their mode of transportation and administrative data (such as subway fares). Annual commuting costs are computed by multiplying the weekly cost by the number of weeks worked over the past 12 months.

Families in which the parents are working must often pay for the care of their young children. Like the cost of commuting, the CEO poverty measure treats child care expenses as a non-discretionary reduction in income. Because the American Community Survey provides no information on child care spending, we have created a model that estimates which families would pay for child care and, for those who pay, what their annual expenses would be. Child care costs are only counted if they are incurred in a week in which the parents (or parent) are at work and are capped by the earned income of the lowest earning parent. We find that in 2008 these work-related expenses increased the poverty rate by 2.4 percentage points.

Medical Out-of-Pocket Expenditures (MOOP): The cost of medical care is also treated as a non-discretionary expense that limits the ability of families to attain the standard of living represented by the poverty threshold. MOOP includes health insurance premiums, co-pays and deductibles as well as the cost of medical services that are not covered by insurance. MOOP expenditures vary widely across the population, depending on health, income, health insurance coverage, and age. MOOP spending increases the poverty rate by 3.4 percentage points in 2008.

1.4 What is New in This Working Paper

CEO's first working paper on poverty in New York City explained the shortcomings of the official poverty measure and discussed our rationale for adopting the NAS alternative. It provided a detailed description of the methods we used to measure family resources and compared poverty rates for 2006 derived from our application of the NAS-recommended methodology against rates using the nation's official methodology. This report focuses on how and why poverty rates based on CEO's adaptation of the NAS methodology have changed over time, using the annual ACS sample for 2005 to 2008 (the years for which data are currently available).

The scope of this study is not the only way it differs from our first paper. CEO has worked to improve its resource estimates. These changes affect our poverty rate estimates, including the 2006 poverty rates that were reported in our original working paper. The City-wide poverty rate in our earlier work, for example, was estimated to be 23.0 percent; our new estimate for that year is 21.2 percent.

Detailed descriptions of the revised methods are provided in the appendix to this report, but they can be summarized as follows:

1. We have expanded our definition of a "family." The CEO measure continues to treat unmarried partners as if they were spouses of the family head. Children of the partner also become part of the head's family. An additional step has been taken to create consistency between those people who are grouped together for tax filing purposes ("tax filing units") and those people who are grouped together for determining poverty status ("poverty units"). Specifically, all the persons who are claimed as tax dependents are now included in the poverty unit of the person who claims them. This brings a number of individuals – formerly classified as "unrelated," and thus in a poverty unit made up of one person – into multiple person poverty units.[13]
2. We have revamped our creation of tax filing units in an effort to more closely match the patterns we see in Internal Revenue Service and New York State Department of Taxation and Finance data. In addition, we have updated the tax program to include the new City Child Care Tax Credit (inaugurated in 2007), as well as the Federal Recovery Rebate Credit and the Additional Standard Deduction for Real Estate Taxes that became effective in 2008.
3. We have improved our method for estimating medical out-of-pocket expenditures so that they more accurately reflect the distribution of these expenditures in the source of these data, the Medical Expenditure Panel Survey (MEPS). We have also updated our estimates for 2006 through 2008 by employing the 2006 MEPS, the most recent data available at the time of writing.[14]

[13] To avoid cumbersome terminology we refer to poverty units as families, which is the unit of analysis used in the official poverty measure.
[14] Our estimates for 2005 are based on the 2005 MEPS.

4. We have created estimates for the value of Food Stamps received that are based on New York City administrative data. Beginning in 2008 the ACS no longer provides data on the annual value of the Food Stamp benefit. We have employed a data set created from administrative records in order to estimate this income item. To make these estimates consistent with prior years' data, we applied the estimation technique to the 2005 through 2007 ACS. Our modeling resulted in estimates of the number of Food Stamp cases and benefit values that came much closer to the administrative records than the self-reported data in the ACS.
5. We have revised our method of adjusting family incomes for housing status. As noted above, families residing in public housing, benefiting from a housing subsidy, living in a rent stabilized or controlled unit, or who own their homes free and clear of a mortgage, do not require the same income that other families do to meet their housing needs. To capture the difference we adjust their incomes. In the prior report we allowed for the possibility of negative adjustments. In this report the adjustment can only be positive or zero. This prevents families from being counted as poor solely because they are voluntarily spending "too much" on their housing.[15]

The remainder of this working paper explores changes in the New York City poverty rate from 2005 through 2008. The next section focuses on the City-wide poverty rate and the reasons why the proportion of the City's population living in poverty rose from 2005 to 2007 and then leveled off. We then examine poverty rates across the City by demographic characteristic, work experience, family and living arrangements, and borough. The report's fourth section offers some observations about the patterns we see in the data. A set of appendices provide more details about how our poverty estimates were created.

The report, though number-heavy, is easy to navigate. Its tables are organized so that those who are looking for something specific, such as the CEO poverty rate for Hispanic New Yorkers in 2008, can find this with ease. The text that accompanies the tables identifies which differences or changes in the poverty rates are statistically meaningful.

Readers wishing to discern a pattern of change in the many poverty rates we provide need only to keep track of three main characters in our story: 1) the sharp rise in the CEO

[15] The reasoning behind this change can be found in Appendix D of the report.

poverty threshold; 2) the inability of low-income families that rely on earned income to keep up with the threshold's rate of growth; and 3) the programs that help protect a considerable portion of New York's low-income population from the high cost of market rate housing.

II. POVERTY IN NEW YORK CITY, 2005-2008

The CEO and official poverty rates for New York City moved in opposite directions from 2005 to 2007. While the share of the City's population living below the official poverty line declined from 19.1 percent to 17.7 percent during this period, the CEO poverty rate rose from 20.6 percent in 2005 to 22.2 percent in 2007.[16] In 2008 the official poverty rate was 17.6 percent, while the CEO poverty rate stood at 22.0 percent. Both rates were statistically unchanged from the prior year's estimate.[17]

Table One

Comparison of City-Wide Poverty Rates

	Year				Percentage Point Differences		
	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008
Official[1]	19.1	18.9	17.7	17.6	**-1.4**	-0.1	**-1.5**
CEO	20.6	21.2	22.2	22.0	**1.7**	-0.3	**1.4**

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: Differences are taken from unrounded numbers. Differences in bold are statistically significant.
[1] Household Population.

2.1 Two Measures, Two Stories

Year-to-year changes in poverty rates often follow the business cycle. The poverty rate falls during periods of economic growth and climbs when the economy contracts. Over the four years covered in this report, the official measure largely kept to this well-worn path. By contrast the CEO poverty rate rose during a period when the City economy was expanding (2005 to 2007), but did not rise from 2007 to 2008, a period when the national economy was entering a deep recession. What accounts for the unusual movement of the CEO poverty rate?

[16] As noted in Table One, the official poverty rate is restricted to persons living in private households. This is done to provide a consistent measure across the years in the table. The 2005 American Community Survey did not include group quarters residents. The CEO measure also excludes group quarters residents. See the appendix for a complete description of the CEO poverty universe.
[17] All changes and differences in poverty rates noted in this section have been evaluated for their statistical significance.

Changes in the poverty rate are governed by the interplay between the growth in family resources and the movement of the poverty threshold. Poverty rates rise when resources fail to keep up with the growth of the poverty threshold. And poverty rates fall when the growth in resources exceeds the rise in the threshold. The official poverty measure restricts its resource measure to pre-tax cash. The CEO measure of resources (which we refer to as CEO income) is far more inclusive, accounting for the effect of taxation, in-kind assistance for food and housing, work-related expenses, and medical out-of-pocket expenditures. Despite the different definitions, both resource measures grew at roughly the same rate from 2005 to 2008. Table Two reports the levels for both resource concepts at the twentieth and thirtieth percentiles of their respective distributions.[18] We choose these points in the distribution because they narrowly straddle the CEO poverty threshold. Changes in poverty rates will be most sensitive to changes in incomes for those families that are just above or just below the poverty threshold. Over the four-year period, pre-tax income grew by 17.0 percent, and 16.7 percent, respectively, at the 20th and 30th percentiles. The corresponding changes for CEO income were 21.1 percent and 19.5 percent, respectively.

Table Two

Pre-tax and CEO Income 20th and 30th Percentiles

Pre-Tax Income

	Year				Percentage Change:		
Percentile	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008
20th	$21,499	$22,654	$24,348	$25,149	13.3%	3.3%	17.0%
30th	$31,193	$32,587	$34,571	$36,404	10.8%	5.3%	16.7%

CEO Income

	Year				Percentage Change:		
Percentile	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008
20th	$24,054	$25,412	$26,787	$29,138	11.4%	8.8%	21.1%
30th	$29,771	$30,810	$32,714	$35,571	9.9%	8.7%	19.5%

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: Income is measured in current dollars.

[18] The distribution was calculated by stating each individual's family income in family size and composition-adjusted dollars. This makes the figures directly comparable to the reference (two-adult, two-child) family's poverty threshold.

The reason behind the starkly divergent trends in the two poverty rates lies, therefore, in the difference between the rates of growth in their respective poverty thresholds. The official threshold is adjusted each year by the change in the Consumer Price Index for All Urban Consumers (CPI-U). The CEO threshold, in contrast, is adjusted to reflect the growth in median expenditures for food, clothing, shelter, and utilities. In recent years, the growth of expenditures for the items in the CEO threshold has dramatically outpaced the rate of inflation and, therefore, the increase in the official poverty threshold.[19] As Table Three indicates, the official threshold rose by 10.2 percent from 2005 to 2008. Over the same period, the CEO threshold increased by 24.9 percent. Simply put, the CEO poverty rate increased in the four-year period because the rise in CEO income could not keep pace with the spike in the CEO poverty threshold.

Table Three

Poverty Thresholds, Two-Adult, Two-Child Family

	Year				Percentage Change:		
Threshold	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008
Official	$19,806	$20,444	$21,027	$21,834	6.2%	3.8%	10.2%
CEO	$24,353	$26,138	$28,214	$30,419	15.9%	7.8%	24.9%

Source: U.S. Bureau of the Census & U.S. Department of Housing and Urban Development.

A more detailed comparison between the rate of growth in CEO income and the rate of growth in the CEO threshold demonstrates the close correspondence between the relative rates of change in resources and thresholds and the resultant movement in the poverty rate during the four-year period. From 2005 to 2007, the growth in the threshold (by 15.9 percent) outstripped the growth in CEO income at the 20th and 30th percentiles of the distribution, and thus the poverty rate rose by 1.7 percentage points. From 2007 to 2008, the threshold rose by 7.8 percent, but this was matched by the increases in income (of nearly 9 percent at the 20th and 30th percentiles), which left the poverty rate unchanged.

At the end of 2007, the U.S. economy entered a deep recession. At the national level both the official and NAS-based poverty rates rose sharply. From 2007 to 2008, the official

[19] We discuss the factors behind the rapid growth in the CEO threshold below.

measure climbed from 12.5 percent to 13.2 percent and the NAS-based measure increased from 15.3 percent to 15.8 percent.[20]

Yet, as noted above, the CEO poverty rate did not rise. The continued growth in income (at a pace that matched the rapid rise in the CEO threshold) appears to be due to three factors. The first is a difference in the timing of the onset of the national and local economic downturns. Although the U.S. recession began in December of 2007, the contraction in employment, which has been so sharp and painful across the nation, did not begin in New York City until the summer of 2008.

A second factor, which is also related to timing, is the manner in which the ACS sample is collected. During each survey year, the Census collects one-twelfth of each year's ACS sample in each month. When they are surveyed, respondents provide information about their income in the prior 12 months. Thus the first twelfth of the respondents in the 2008 survey are filling out their questionnaires in January but are reporting their income over the 12 months of 2007; the second twelfth of respondents are reporting income from February 2007 through January 2008, and so on. This means that the 2008 ACS is as representative of income trends in 2007 as it is for those in 2008.[21] To a large degree, therefore, the effect of the recession on income and poverty in New York City is yet to be reflected in the ACS.

The third factor in the rise in CEO incomes from 2007 to 2008, new tax programs, emerges when we examine the effect of specific forms of income on the poverty rate. Table Four identifies the effect of individual components of CEO income on poverty. Its first row reports the poverty rate using the CEO income measure. Subsequent rows report the poverty rate using the CEO income measure while removing one of the additional resources that is added to (or subtracted from) pre-tax cash by the NAS methodology. For example, the second row in the table illustrates what the poverty rate would have been if the effect of taxation had not been included in CEO income. The third row of the table estimates what the poverty rate would have been if CEO income did not include nutritional assistance. The

[20] U.S. Bureau of the Census, Current Population Survey. The official and NAS poverty rates are available at: http://www.census.gov/hhes/www/poverty/histpov/hstpov2.xls and http://www.census.gov/hhes/www/povmeas/web_tab4_nas_measures_historical.xls.

[21] Unlike the ACS, the Current Population Survey, which is the source of annual poverty rate data for the U.S., provides calendar year estimates of income and poverty. The U.S.-wide poverty rates reported above are based solely on data for 2008.

rows under the heading, "Effect of Change in Income Concept" show the difference between each one of the poverty rates using one of the alternative income measures and the poverty rate using all of the elements of CEO income. These rows measure, therefore, the percent of the population that is moved in or out of poverty by the different additions and subtractions to family resources. For example, a poverty rate that did not include the effect of taxation would have been higher than the CEO poverty rate in each year in the table. The row labeled, "Taxation" indicates that, in 2008, an additional 1.4 percent of the population would have been poor without the resources tax credits bring to low-income families.

The individual items that add resources to families (taxation, nutritional assistance, the housing adjustment) all reduce poverty, but not equally; the housing adjustment has the largest poverty reducing effect. Work-related expenses and medical out-of-pocket expenditures (labeled "MOOP" in the table) increase the share of the population that is poor. In general, the effect of each of the additions and subtractions is stable over time. The trends in the various poverty rates in the table that omit one of the income items, therefore, parallel the trend in the poverty rate using the full CEO income measure.

There is one notable exception to this pattern: the poverty rate that omits the effect of taxation. While the CEO poverty rate is statistically unchanged from 2007 to 2008, the poverty rate that does not include taxation increases from 22.4 percent to 23.4 percent between 2007 and 2008. The row that provides the net taxation effect indicates that taxation had an unusually large downward effect on poverty in 2008, offsetting what would otherwise have been an increase in the poverty rate.

There were two important changes to Federal taxes that became effective in 2008 and appear to be responsible for this – the Recovery Rebate Credit that provided up to $1,200 for married couples and up to $600 for single filers, and the Additional Standard Deduction for Real Estate Taxes, which allows taxpayers to increase their standard deduction by the amount they pay in state and local property taxes up to $1,000 for married couples and $500 for singles. We estimate that without these two credits the poverty rate based on all the elements of CEO income for 2008 would have been 23.7 percent instead of the 22.0 percent reported in the table.

Table Four

Effect of Additional Resources on the NYC Poverty Rate, 2005-2008

	2005	2006	2007	2008
Poverty Rate by Income Concept				
Total CEO Income	20.6	21.2	22.2	22.0
CEO Income without taxes	21.3	21.9	22.4	23.4
CEO Income without nutritional assistance	22.8	23.7	24.3	24.2
CEO Income without housing adjustment	25.5	26.9	27.9	27.7
CEO Income without work-related expenses	18.5	18.6	19.7	19.5
CEO Income without MOOP	17.6	17.9	18.7	18.5
Effect of Change in Income Concept				
Taxation	-0.8	-0.7	-0.2	-1.4
Nutritional Assistance	-2.2	-2.5	-2.1	-2.2
Housing Status Adjustment	-5.0	-5.7	-5.7	-5.7
Work-related Expenses	2.1	2.6	2.5	2.4
MOOP	3.0	3.3	3.5	3.4

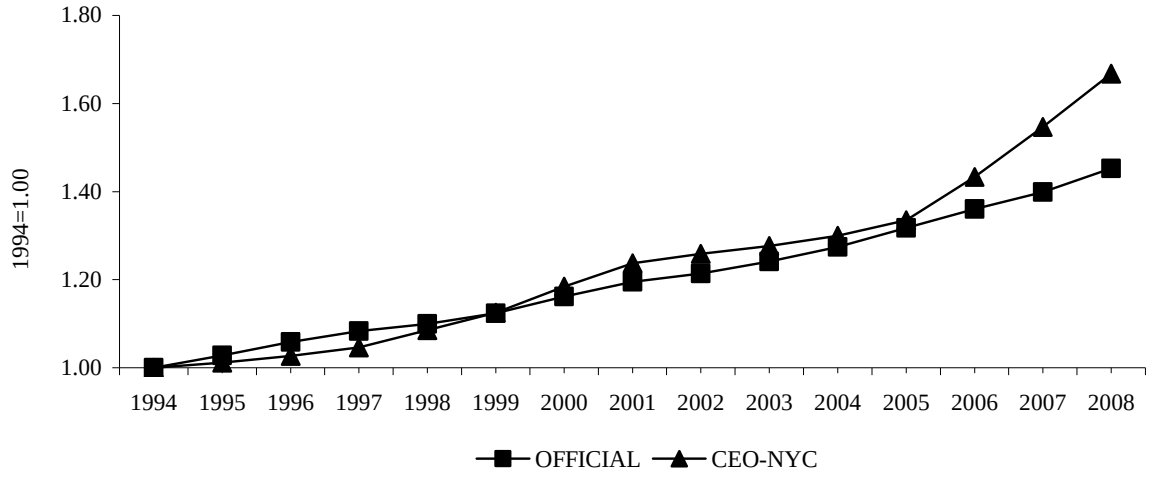
Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

2.2 The Rise in the CEO Threshold

The very rapid climb in the CEO threshold, from 2005 to 2008, appears to be an unusual one. In the past, the CEO and official thresholds had risen at a similar pace. From 1994 to 2005 the CEO poverty threshold rose by 33.5 percent while the official threshold saw a 31.8 percent increase.[22] Figure One illustrates the timing of the recent divergence in the growth rates of the two thresholds by plotting each threshold's value from 1994 to 2008 relative to their values in 1994. The similarity of the rates' growth in the two thresholds from 1994 to 2005 is readily apparent, as is the unusual acceleration in the growth of the CEO threshold from 2005 to 2008.

[22] CEO calculation from data provided by the Census Bureau and U.S. Department of Housing and Urban Development.

Figure One: Growth in Poverty Thresholds, 1994-2008



Source: Tabulated from data provided by U.S. Bureau of the Census and U.S. Department of Housing and Urban Development.

The 24.9 percent jump in the CEO threshold from 2005 to 2008 is mostly a result of the rise in the U.S.-wide NAS threshold, which grew by 19.5 percent over the four-year period. (The more rapid increase in the CEO threshold is due to the rise in the ratio of the U.S. to New York City Fair Market Rents, from 1.40 in 2005 to 1.52 in 2008). Two factors contributed to the spike in the national-level threshold. One is a run up in spending for shelter associated with the recent housing boom along with a rapid rise in energy prices that affected expenditures for utilities (such as home heating oil, electricity, and natural gas). The mean expenditures for shelter among four-person families in the Consumer Expenditure Survey rose by 19.2 percent from a three-year average ending in 2005 to the three-year average ending in 2008, and expenditures for "utilities, fuels, and public services" increased by 18.3 percent.[23] (The "fuels and utilities" item within the Consumer Price Index rose by 22.9 percent from 2005 to 2008.)[24] Across the U.S., the rise in housing-related expenditures was largely driven by home buyers. Although New York is a city of renters, local shelter expenditures exhibited a similar increase. The New York City Housing and Vacancy Survey indicates that median gross rents (rent plus utilities) for market rate apartments rose by 20.4 percent from 2005 to 2008.[25]

[23] CEO calculation from Consumer Expenditure Survey data available at: www.bls.gov/cex/#data.
[24] CEO calculation from Consumer Price Index data available at: www.bls.gov/cpi/home.htm.
[25] CEO tabulation from the 2005 and 2008 New York City Housing and Vacancy Survey.

The second factor that contributed to the rise in the NAS threshold was a change in the Consumer Expenditure Survey questionnaire and data processing methods. Beginning with the second quarter of 2007, a question about "food away from home" was reworded. It no longer asks about usual *monthly* spending. Instead, it asks about usual *weekly* spending. In addition, the survey processing methodology was adjusted to allow for interest-only mortgages. Both these changes would be expected to yield higher estimates of expenditures for the shelter and food components of the threshold. It is impossible, however, to distinguish between increases due to these changes and the growth of measured expenditures that would have occurred without the changes.

III. POVERTY RATES IN DEMOGRAPHIC DETAIL

Tables Five and Six detail levels and changes in the poverty rate for specific groups of New Yorkers using the CEO measure. We organize the data by demographic dimension (such as age) and report the poverty rate for each group for 2005 through 2008. To help readers compare subgroups to the population as a whole, the first row in Table Five provides the City-wide data. The final column in both tables gives the sub-group's share of the relevant population.

The City-wide CEO poverty rate rose from 2005 to 2007, with no statistically meaningful change from 2007 to 2008. The poverty rates for subgroups within the population generally follow the same pattern. We therefore provide the percentage point change in the poverty rate from 2005 to 2007, 2007 to 2008, and – to summarize – 2005 to 2008. The changes that are statistically significant are highlighted in bold. Differences in poverty rates between groups – such as those between children and people 18 through 64 years of age – that are noted in this section have also been evaluated for their statistical significance. Table Five classifies persons by their individual characteristics. Table Six groups individuals by the characteristics of their families and living arrangements.

3.1 Poverty Rates by Individual Characteristics

Poverty Rates by Gender: Females are more likely to be in poverty than males. The disparity averages to roughly 3 percentage points over the four years. The changes in the poverty rates for both genders are similar and track the City-wide pattern. From 2005 to 2008, the male and female poverty rates rose by 1.6 percentage points and 1.2 percentage points, respectively.

Poverty Rates by Age: New Yorkers 65 and older have the highest poverty rate among the age groups, followed closely by children.[26] Persons age 18 through 64 are the least likely to be poor. Throughout the period covered by the table, the poverty rate for the elderly was statistically unchanged. The poverty rate for working age adults, by contrast, climbed by 2.0 percentage points from 2005 to 2008. The child poverty rate rose by 2.3

[26] The difference between the elderly and children is statistically significant in 2005 and 2008.

percentage points from 2005 to 2007, but fell by 1.8 percentage points from 2007 to 2008, leaving the 2008 poverty rate for the youngest New Yorkers statistically unchanged from 2005.

Poverty Rates for Children by Presence of Parents: Children in one-parent families are more than twice as likely to be in poverty as children in two-parent families. The poverty rate for children living with two parents increased by 2.7 percentage points from 2005 to 2007, but was essentially unchanged from 2005 to 2008.

Poverty Rates by Race/Ethnicity: There is a striking disparity between the poverty rates for Non-Hispanic Whites and the other major race/ethnic groups in New York City. In 2008, for example, the poverty rates for Non-Hispanic Blacks and Asians were 1.8 times higher than the Non-Hispanic White poverty rate, and the Hispanic poverty rate was nearly twice the rate for Non-Hispanic Whites. Although the Asian poverty rate was higher than the Black poverty rate from 2005 through 2007, by 2008 the level of poverty for the two groups was essentially the same. The poverty rate for Hispanics is significantly higher than that of each of the other race/ethnic groups throughout the period.[27]

From 2005 to 2007, the poverty rate rose for Non-Hispanic Blacks (by 2.3 percentage points) and Asians (by 3.4 percentage points). But the only statistically significant change over the 2005 to 2008 period was among Non-Hispanic Blacks, a jump of 4.5 percentage points. The unique pattern of change for Non-Hispanic Blacks is due to the 2.2 percentage point rise in their poverty rate from 2007 to 2008. (We offer some thoughts about why this occurred in the paper's Discussion and Conclusions section.)

Poverty Rates by Nativity/Citizenship: The poverty rates for citizens, whether they are native-born or naturalized, are virtually identical and they exhibit similar trends over time. The poverty rate for citizens by birth rose by 1.2 percentage points and the poverty rate for naturalized citizens increased by 1.6 percentage points from 2005 to 2008. The non-citizen poverty rate, which is considerably higher (roughly 6 percentage points) than the rate for citizens, was stable over this period**.**

[27] Race/Ethnic groups are constructed as follows. First individuals are categorized by Hispanic ethnicity into Non-Hispanic and Hispanic ethnic groups. Non-Hispanic individuals are then categorized by race. We use three racial categories; White, Black, and Asian. Each only includes persons who identify themselves as members of one race group. This sorting of the population excludes roughly 2 percent of the City population that is Non-Hispanic and multi-racial or Non-Hispanic and a member of some other race, such as Native Americans.

Poverty Rates for Persons 18 through 64 by Educational Attainment: The likelihood that someone will be poor falls dramatically as his or her level of education rises. Roughly one-third of New Yorkers who lack a high school degree are poor, while less than one-in-ten City residents who have a Bachelors degree or higher live in poverty. From 2005 to 2008, however, it was the better educated groups that suffered an increase in poverty. The poverty rate for those with a high school degree (but no more), some college, or at least a Bachelors degree rose by 3.0 percentage points, 3.1 percentage points, and 2.0 percentage points respectively. By contrast the poverty rate for persons without a high school degree was statistically unchanged. (Some thoughts as to why are provided in the Discussion and Conclusions section.)

Poverty Rates for Persons 18 through 64 by Work Experience: To measure poverty by work experience over the past 12 months, we create three categories of working age adults: 1) "Full-Time, Year-round," which includes those who reported their usual weekly hours as 35 or more and who worked at least 50 weeks in the last year; 2) "Some work," which includes those who worked part-time and/or part-year; and 3) "No work," composed of individuals who did not work at all over this period.

The disparities in poverty rates across these categories are dramatic; persons in the "No work" group are at least five times as likely to be poor as are those who have had steady work. Nonetheless, each work experience category exhibited similar increases in poverty from 2005 to 2007, ranging from 1.8 percentage points to 2.4 percentage points. Only the "Some work" group suffered a further rise in poverty from 2007 to 2008, by 2.4 percentage points. (This estimate should be treated with caution, however; a change in the wording and format of the 2008 ACS questionnaire affects the comparability of that year's data with prior years.)

Table Five

Poverty Rates for Persons, By Demographic Characteristic

	Year				Percentage Point Differences			Group Share Of 2008 Pop.
	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008	
Total New York City	20.6	21.2	22.2	22.0	**1.7**	-0.3	**1.4**	100.0
Gender								
Males	19.1	19.2	20.4	20.7	**1.3**	0.3	**1.6**	47.6
Females	21.9	23.0	23.9	23.1	**2.0**	-0.8	**1.2**	52.4
Age Group								
Under 18	25.4	26.5	27.7	26.0	**2.3**	**-1.8**	0.6	23.1
18 thru 64	17.3	18.0	19.1	19.3	**1.7**	0.2	**2.0**	64.8
65 & up	27.9	27.6	28.5	28.5	0.6	-0.1	0.5	12.1
Children (under 18), by Presence of Parent								
Two parents	16.2	16.8	18.9	17.2	**2.7**	-1.7	1.0	62.6
One parent	40.0	42.1	42.7	40.7	2.7	-2.0	0.7	37.4
Race/Ethnicity								
Non-Hispanic White	14.0	14.0	15.1	13.7	1.1	**-1.4**	-0.3	35.1
Non-Hispanic Black	20.6	22.6	22.9	25.1	**2.3**	**2.2**	**4.5**	23.1
Non-Hispanic Asian	23.1	25.3	26.5	25.3	**3.4**	-1.2	2.2	11.8
Hispanic, any race	27.8	27.4	29.4	28.6	1.6	-0.8	0.8	27.7
Nativity/Citizenship								
Citizen by birth	19.6	20.0	21.4	20.8	**1.7**	-0.5	**1.2**	63.1
Naturalized citizen	19.2	19.9	21.3	20.8	**2.1**	-0.5	**1.6**	19.0
Not a citizen	25.3	26.8	26.2	27.2	0.9	1.0	1.9	17.9
Working Age Adults (18 thru 64), by Educational Attainment								
Less than High School	33.7	33.3	34.8	34.5	1.2	-0.3	0.8	18.4
High School Degree	19.9	22.2	22.9	22.9	**3.0**	0.0	**3.0**	24.0
Some College	15.5	15.6	18.4	18.5	**2.9**	0.1	**3.1**	24.6
Bachelors Degree or Higher	7.2	7.5	8.0	9.2	**0.9**	**1.1**	**2.0**	33.0
Working Age Adults (18 thru 64), by Work Experience in past 12 months[1]								
Full-Time, Year Round	5.9	7.3	7.7	8.0	**1.8**	0.3	**2.1**	53.6
Some work	19.9	20.6	22.4	24.8	**2.4**	**2.4**	**4.8**	23.0
No work	37.0	36.9	39.2	39.7	**2.2**	0.5	**2.7**	23.5

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Notes: Differences are taken from unrounded numbers. Differences in bold are statistically significant.
A change in the 2008 ACS questionnaire regarding work experience affects the comparability of 2008 estimates with those for prior years.
[1] See text for definition of work experience categories.

3.2 Poverty Rates by Family Characteristics

Table Six provides poverty rates for persons based on the characteristics of the family in which they live. As noted in the Introduction, "family," from the perspective of the CEO poverty measure, is a broader concept than that used by the Census Bureau (persons who live together and are related by blood, marriage, or adoption). The CEO "family" definition is the "poverty unit," persons who live together and are sharing resources and living costs. This includes all related persons, but also extends to unmarried partners, their children, and other persons who we believe to be economically dependent on other members of the household even if they are not kin. (See the appendix for more details.)

Panel A in Table Six categorizes people as living in families headed by a husband-wife/unmarried partner or in a single head family. A third category is unrelated individuals. Each family type category includes everyone that is a member of the family. If a husband and wife have two children and two in-laws living with them, for example, then all six family members would be characterized as living in a husband-wife/unmarried partner family. Single heads are "householders" that do not have a spouse or unmarried partner, but are living in families, for instance a single mother with her children.[28] Within each of these family types we distinguish between those that do or do not include children under 18. Because they have been a particular focus of public policy, we provide the poverty rates for members of single mother families separately.[29]

Not everyone is in a family. Unrelated individuals are people that do not have family members in their household. This would include persons that live alone (the typical case) and some persons living with others, such as roommates or boarders, who we treat as economically independent from the people they live with. Unrelated individuals are one-person poverty units.

Table Six is organized in a similar fashion to Table Five, reporting poverty rates, the change in the poverty rate, and the group share of the population. The population shares of the five main categories in each of the table's panels sum to 100 percent.

[28] The householder is typically the person in whose name the dwelling is owned or rented.
[29] Single mother families account for 90 percent of families with children under 18 that are headed by a single adult.

Husband-Wife/Unmarried Partner: Among persons living in husband-wife/unmarried partner families, those living with children have higher poverty rates than those living without children. Members of the former group experienced a 2.4 percentage point increase in their poverty rate, from 15.1 percent in 2005 to 16.2 percent in 2007. The poverty rate for persons in the latter group rose from 11.8 percent in 2005 to 13.7 percent in 2007, a 1.6 percentage point climb.

Single Head: Members of families with a single head have higher poverty rates than people in husband-wife/unmarried partner families. In 2008, for example, the poverty rate for persons living in a single head family with children was more than twice as high as the poverty rate for persons living in a husband-wife/unmarried partner family with children (35.9 percent versus 16.2 percent). Within this single head group, there is a large disparity in poverty rates between members of single head families without children and those that do include children (23.7 percent compared to 35.9 percent in 2008). This is particularly true for persons living in families headed by single mothers. The poverty rate for members of families headed by single mothers was near 40 percent from 2005 through 2008. While their poverty rates are high compared to other groups, none of the categories of persons living in single head families saw a significant change in their poverty rates over the period.

Unrelated Individuals: A little over one-in-four of the City's unrelated individuals were poor from 2005 through 2008. This group's poverty rate rose by 1.4 percentage points over the period.

Work Experience of Family: Panel B in Table Six groups individuals by the work experience of the families in which they reside. The categories were created by summing the number of hours worked by persons 18 and older for each family in the prior 12 months. Families with over 3,500 hours of work are labeled as having the equivalent of "two full time, year-round workers." Families with 2,341 through 3,499 hours are labeled "one full time and one part-time worker." Families with at least 1,750 through 2,340 hours are identified as "one full-time, year-round worker." Families with at least one hour of work, but less than 1,750 hours are called "less than one full-time, year-round worker." And finally, there are families that have "no work."

Poverty rates are steeply graduated by levels of work activity, ranging from 4.9 percent for persons in families with the equivalent of two full-time, year-round workers to 57.1 percent for members of families with no work in 2008. But even a considerable level

of work does not always spare people from poverty. Consider the one-fourth of the City's population that lives in a family with the equivalent of one full-time, year-round worker; in 2008 one-fifth of persons in this category were living in poverty.

Poverty rates rose from 2005 to 2007 for persons in all the work experience categories except those with no work. From 2007 to 2008, the poverty rate for persons in families that include two full-time, year-round workers, edged downward by 0.9 percentage points. By contrast, the poverty rate increased for persons in the one full-time, year-round and less than one full-time, year-round worker categories from 2007 to 2008. (Here we reiterate our warning that a change in the 2008 ACS questionnaire affects the comparability of data for that year with estimates for prior years.) We explore the issue of working poverty in the report's Discussion and Conclusions section.

Table Six

Poverty Rates for Persons Living in Various Family Types

	Year				Percentage Point Differences			Group Share Of 2008 Pop
	2005	2006	2007	2008	2005 - 2007	2007 - 2008	2005 - 2008	
Panel A. Family Composition								
Husband Wife/ Unmarried Partner[1]								
No children under 18	11.8	12.6	13.4	13.7	**1.6**	0.3	**1.9**	21.0
With children under 18	15.1	15.5	17.5	16.2	**2.4**	-1.3	1.1	32.9
Single Head of Household								
No children under 18	20.0	20.4	20.3	23.7	0.2	3.4	3.6	11.5
With children under 18	36.0	36.4	38.1	35.9	2.1	-2.2	-0.1	17.8
Single Mother Family	38.8	39.1	40.7	38.4	1.9	-2.3	-0.4	15.4
Unrelated Individuals	26.2	26.9	26.6	27.6	0.4	1.0	**1.4**	16.9
Panel B. Work Experience of the Family[2]								
Two Full-Time, Year Round workers	3.8	4.6	5.8	4.9	**2.0**	**-0.9**	**1.1**	34.8
One Full-Time, Year Round, one Part-Time worker	11.8	14.0	15.3	15.0	**3.4**	-0.2	**3.2**	16.1
One Full-Time, Year Round worker	14.5	16.7	18.2	20.1	**3.7**	**1.9**	**5.6**	25.1
Less than one Full-Time, Year Round worker	41.1	43.2	44.6	48.4	**3.5**	**3.9**	**7.3**	10.3
No work	56.7	57.3	57.5	57.1	0.8	-0.4	0.5	13.6

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Notes: Differences are taken from unrounded numbers. Differences in bold are statistically significant.
A change in the 2008 ACS questionnaire regarding work experience affects the comparability of 2008 estimates with those for prior years.
[1] In the CEO measure unmarried partners are treated as spouses. See text for explanation.
[2] See text for explanation of work experience categories.

3.3 Poverty Rates by Borough

In 2005, the City's boroughs could be placed into three distinct categories: a top tier, with the highest poverty rates, was composed of the Bronx (25.7 percent) and Brooklyn (24.5 percent); Manhattan (17.3 percent) and Queens (17.2 percent) constituted a middle tier; and Staten Island (11.9 percent) had the lowest poverty rate among the boroughs. (See Table Seven.) From 2005 to 2008 the borough-level poverty rates became more differentiated. The poverty rate in the Bronx rose by 3.4 percentage points to 29.1 percent, while the rate in Brooklyn was statistically unchanged, at 25.9 percent in 2008. The Bronx, as a result, emerged as the poorest borough. Over the same period the poverty rate in Queens rose by 2.0 percentage points, to 19.3 percent, while Manhattan's poverty rate was stable (standing at 16.6 percent in 2008). Thus, Queens became the third poorest borough. The poverty rate in Staten Island exhibited no statistically significant change, coming to 11.8 percent in 2008. (We discuss the pattern of change in poverty rates by borough in the Discussion and Conclusions section.)

Table Seven

Poverty Rates by Borough

	Year				Percentage Point Differences		
	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008
Bronx	25.7	26.4	26.6	29.1	0.9	**2.4**	**3.4**
Brooklyn	24.5	25.9	27.0	25.9	**2.5**	-1.1	1.4
Manhattan	17.3	16.0	17.2	16.6	-0.1	-0.6	-0.7
Queens	17.2	18.1	19.5	19.3	**2.3**	-0.3	**2.0**
Staten Island	11.9	13.6	14.1	11.8	2.2	-2.3	-0.1

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: Differences are taken from unrounded numbers. Differences in bold are statistically significant.

IV. DISCUSSION AND CONCLUSIONS

The levels and changes in poverty rates in Tables Five, Six, and Seven raise many questions. In this section we address several of them. First, we note the overlap between the pattern of change in poverty by borough and the pattern of change in poverty rates by race/ethnicity. Next we explore the unique rise in poverty among the City's Non-Hispanic Black population.

Most of the section is devoted to the issue of working poverty. We noted above that poverty rates rose for people living in families with the equivalent of at least one full-time, year-round worker, but did not for families that do not rely on work. We offer some ideas as to why. We then turn our attention to the *level* of poverty among working families with children and ask why so many families are poor despite a considerable commitment to work and a high level of participation in tax programs that supplement earned income. Two key findings emerge. One is that the rise in earned income from 2005 to 2008 could not match the rise in the CEO threshold. The other is the central importance of affordable housing for families that are vulnerable to poverty.

4.1 Poverty Rates among the Boroughs

There is considerable overlap between the pattern of change in poverty rates by borough (in Table Seven) and the City-wide pattern of change in poverty rates by race/ethnicity (in Table Five). The growth in the poverty rate from 2005 to 2007 in Brooklyn and Queens appears to be related to the demographic composition of each borough. It overlaps with the rise in the poverty rate for Non-Hispanic Blacks and Asians (reported in Table Five) in the same time period. Non-Hispanic Blacks make up a third of Brooklyn's population, a higher proportion than any other borough. The pattern for Queens and Asians is similar; one quarter of the borough's population is Asian, a greater share than any other borough.

The Bronx is the only borough that had a statistically significant increase (of 2.4 percentage points) in its poverty rate from 2007 to 2008. Just over half of that borough's population is Hispanic, but, as Table Five reports, Hispanic poverty did not rise from 2007

to 2008. However, three-in-ten Bronx residents are Non-Hispanic Black, a group that experienced a City-wide 2.2 percentage point climb in poverty City-wide. But Non-Hispanic Blacks living in the Bronx suffered a 3.7 percentage point increase in their poverty rate from 2007 to 2008.[30]

4.2 Rising Poverty among Non-Hispanic Blacks

A notable finding in Table Five is the growth in poverty among African-Americans, by 4.5 percentage points, from 2005 to 2008. Nearly half of this increase is the result of a 2.2 percentage point uptick between 2007 and 2008, a time in which the City-wide poverty rate was unchanged and the poverty rates for the other race/ethnic groups were either in decline (for Non-Hispanic Whites) or stable.

Weaker earnings (income from wages, salaries, and self-employment) growth appears to be the reason behind the unique 2007 to 2008 rise in the Non-Hispanic Black poverty rate. Table Eight reports poverty rates for Non-Hispanic Blacks compared to the rest of the City's population. The rates are based on two different income concepts; the CEO income measure is reported in the first row, while the second row reports poverty rates based solely on "earnings income," that is, the share of the population that would be poor if earned income was their only resource. Poverty rates based on earnings alone are, unsurprisingly, higher than those based on CEO income, but what is salient in this context is the differing pattern of change between the two years for Non-Hispanic Blacks and the rest of the City. For Blacks, the earnings income poverty rate rose by 2.0 percentage points, while there was no growth in earnings income poverty for other New Yorkers. The close correspondence between the rise of the earnings poverty rate and the CEO income poverty rate is no mystery. Even in the bottom third of the CEO income distribution, earned income represents nearly three-quarters of CEO income for Black New Yorkers.[31]

[30] Tabulation from the ACS as augmented by CEO. Readers should bear in mind that "overlap" between residence and race does not imply any direction in causality.
[31] Tabulation from the 2008 ACS as augmented by CEO.

Table Eight

Poverty Rates for Non-Hispanic Blacks and All Others, 2007-2008

	Non-Hispanic Blacks			All Others		
	2007	2008	Prcnt. Point Difference	2007	2008	Prcnt. Point Difference
Total CEO Income	22.9	25.1	**2.2**	22.0	21.0	**-1.0**
Earnings Income	32.9	34.9	2.0	33.0	33.0	0.0

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: Differences are taken from unrounded numbers. Differences in bold are statistically significant.

The relatively weak growth in Non-Hispanic Black earnings from 2007 to 2008 may be an early indicator of the recession's impact on the New York City labor market. But we do not find that levels of work activity as measured by hours worked in the past 12 months declined among Black families. From 2007 to 2008, mean annual hours per family for Non-Hispanic Blacks grew by 114 and median hours were up by 205. The corresponding figures for the City as a whole were 117 and 212, respectively.[32] An alternative explanation might be that the onset of the recession was changing the *composition* of Black employment in ways that would have affected earnings, but not hours. This might occur if, for example, a weakening economy was bumping Black workers down into lower wage jobs. The research needed to explore this possibility is beyond the scope of this paper, however.

4.3 The Rise in Working Poverty

Among the many numbers displayed in Tables Five and Six lies a fairly consistent pattern. People in demographic categories that rely on earned income have lower poverty rates than people in groups that are not earnings-reliant. For example, among the age groups in Table Five, working age adults have the lowest poverty rates (19.3 percent in 2008) and the elderly have the highest (28.5 percent in that year). Among working age adults, those with the lowest levels of education have the lowest levels of employment and the highest

[32] Tabulation from the 2008 ACS as augmented by CEO.

poverty rates (34.5 percent for those who lack a high school degree in 2008 compared to 9.2 percent for people with a Bachelors degree or more in that year).[33]

However, when we consider *changes* in the poverty rate from 2005 to 2008, it is the earnings-reliant groups that have experienced the increases in poverty, while the others have generally seen no change during the period. Thus, the poverty rate for working age adults rose by 2.0 percentages points, but the poverty rate for the elderly held steady. The poverty rate for those working age adults with less than a high school degree was flat from 2005 to 2008, but those with higher levels of education saw a rise in their poverty rates. When we categorize people by the work experience of their families, we find that it is only those living in families with no work activity at all that escape the period without a statistically significant increase in their poverty rate.

The pattern implies that while income for the earnings-reliant lagged the increase in the threshold, resources for the non-working group were growing at roughly the same rate as the CEO poverty threshold. This is evident in Table Nine, which provides the level and percentage change in CEO income at the lower (10^{th} and 20^{th} percentile) rungs of the distribution for persons living in families with the equivalent of at least one full-time, year-round worker. They are referred to in Table Nine as working families. (This group corresponds to the first three rows of Table Six, Panel B and comprises roughly three-fourths of the City's population.) We report CEO income at the deciles whose values span the CEO poverty threshold because this is the area of the income distribution where changes in income would be likely to translate into changes in the poverty rate. At the 10^{th} and 20^{th} percentiles, incomes grew, from 2005 to 2008, by 16.2 percent and 15.3 percent, respectively; but this growth was slower than the change in the CEO threshold (24.9 percent).[34] (During this period mean family earnings – income from employment – for people within the 10^{th} to 20^{th} percentile of CEO income increased by only 7.5 percent.)[35]

[33] CEO tabulations from the 2008 ACS find that 55 percent of working age adults without a high school degree were employed, while 84 percent of those with a Bachelors degree or higher were holding a job.
[34] The rate of growth in CEO income for persons in this group also lagged the percentage change in CEO income for the equivalent income range in the City-wide population (See Table Two).
[35] Tabulation from the ACS as augmented by CEO.

Table Nine

CEO Income by Work Experience

Panel A: CEO Income for Persons in Working Families

					Percentage Change		
	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008
10th Percentile	$24,893	$25,662	$26,753	$28,921	7.5%	8.1%	16.2%
20th Percentile	$31,137	$31,466	$33,282	$35,888	6.9%	7.8%	15.3%

Panel B: CEO Income for Persons in Families With No Work

					Percentage Change		
	2005	2006	2007	2008	2005-2007	2007-2008	2005-2008
50th Percentile	$21,966	$23,469	$25,180	$26,901	14.6%	6.8%	22.5%
60th Percentile	$25,939	$27,365	$29,418	$32,106	13.4%	9.1%	23.8%

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

Panel B in Table Nine reports CEO income at the 50th and 60th percentiles for people living in families without any work over the past 12 months. (This group corresponds to the fifth row of Table Six, Panel B. As in Panel A, these percentiles are chosen because they span the CEO threshold.) From 2005 to 2008, CEO income rose by 22.5 percent and 23.8 percent, respectively, at these deciles, nearly the same pace as the CEO poverty threshold.

What allowed incomes among the non-earners to match the rapidly rising threshold? Much of the answer appears to be housing status. Table Ten compares the housing status of people living in low-income full-time, year-round working families to low-income families with no work in 2008.[36] It reports that 53.8 percent of persons in working families were living in market rate housing, while only 25.4 percent of individuals living in families with no work were in market rate housing.

[36] Low-income is defined as below the 20th percentile cut off for people in working families and below the 60th percentile cut off for people in families with no work.

Table Ten

Distribution of Persons in Low-Income Working and Non-Working Families By Housing Status, 2008

	Working	No Work	Prcnt. Point Difference
Means-tested Housing Program	13.3	29.6	-16.3
Rent Stabilized/Controlled	29.6	37.1	-7.6
Owns Free and Clear	2.1	7.4	-5.3
Market Rate	53.8	25.4	28.4
Other	1.2	0.4	0.8
Total	100.0	100.0	N.A.

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

As explained in the Introduction, an adjustment to income is made for families that reside in non-market rate housing. This adjustment equals the difference between the housing and utilities portion of the family's poverty threshold and what the family spends out-of-pocket for these items. Because it is included in the calculation, the rise in the threshold is fully accounted for by the housing status adjustment.

If out-of-pocket spending for shelter and utilities grows more rapidly than the CEO threshold, the adjustment's value will decline and increase the chance of a family being in poverty. But the probability of large increases in out-of-pocket housing costs are a function of a family's housing status. Families participating in means-tested housing assistance programs are not likely to see percentage increases in their rents that exceed the percentage change in their incomes. Families in rent controlled or stabilized apartments are also protected from large year-to-year rent hikes.

The rise of the threshold component of the housing adjustment and the more limited growth of out-of-pocket housing-related expenditures increased the value of the housing adjustment. For people in non-working families that were residing in non-market housing, the mean increase in their housing status adjustment from 2005 to 2008 was 27.2 percent.[37] Thus, non-working families were shielded from the effect of the rise in the CEO poverty threshold to a far greater extent than families that rely on work. This difference helped to maintain incomes for people living in non-working families.

[37] Tabulation from the 2008 ACS as augmented by CEO.

4.4 Poverty Among Working Families with Children

Poverty rates, we have seen, rose for persons living in working families because the increase in earned income could not match the rapid rise in the CEO threshold. This section concerns itself not with the rise, but with the surprisingly high *level* of poverty among working families in 2008. We limit our attention to families with children that contain the equivalent of at least one full-time, year-round worker, a family with the annual hourly equivalent of 50 weeks of full-time (at least 35 hours) work. We focus on families with children because they have been a priority for recent anti-poverty policy. Given their high level of work activity and the generosity of tax credits that "support work," why are 14.6 percent of these families still poor? We consider this issue from two perspectives: First, how are poor working families different from working families that are not poor? Second, among working families that are vulnerable to poverty, why are some lifted above the poverty line by anti-poverty programs, while others are not?

4.4a Poor and Non-Poor Working Families with Children

Table Eleven contrasts some of the characteristics of poor and non-poor working families with children. Poor and non-poor families have the same average size (3.8 members), but poor families are somewhat more likely to be either smaller (9.9 percent compared to 7.7 percent having only two members) or larger (32.1 percent as opposed to 29.8 percent with five or more family members) than non-poor families. On average, poor and non-poor families also contain a similar number of working age adults, but a greater share of poor families have only one working age adult in them (23.3 percent versus 15.3 percent), and a lesser share of poor families have two working age adults (52.8 percent compared to 60.4 percent). The difference reflects the greater likelihood that poor families will be headed by a single parent (41.4 percent versus 29.7 percent) than non-poor families. In addition, a larger share of poor families has three or more children than do the non-poor families (22.4 percent versus 17.3 percent). The percentage of poor families that include a child less than five years of age also exceeds that for non-poor families (46.3 percent against 38.0 percent). In sum, poor and non-poor families are similar in size, but vary to a greater extent in their composition; poor families have fewer working age adults and more, and younger, children.

The differences that dwarf those of family size and composition begin with the number of workers in the family. Roughly two-thirds of poor families had only one person

who worked at all during the prior 12 months, while only 36.0 percent of non-poor families relied on the earnings of only one worker, a difference of 31.8 percentage points. This difference is reflected in the mean number of annual hours worked within the family (2,600 for poor families compared to 3,544 for non-poor families). But the level of work activity is not the only thing that separates the poor from the non-poor. Poor families earned an average of only $8.75 per hour of work, $20.39 per hour less than non-poor families.[38]

Table Eleven

Poor and Non-Poor Working Families with Children, 2008

	Poor	Not Poor
Number of people		
Share with:		
Two	9.9%	7.7%
Three	28.5%	29.9%
Four	29.5%	32.6%
Five or More	32.1%	29.8%
Mean	3.8	3.8
Number of Working Age Adults		
Share with:		
One	23.3%	15.3%
Two	52.8%	60.4%
Three or More	23.9%	24.2%
Mean	2.1	2.2
Share Headed by a Single Parent	41.4%	29.7%
Number of Children		
Share with:		
One	46.0%	48.6%
Two	31.6%	34.1%
Three or More	22.4%	17.3%
Mean	1.8	1.7
Share with Child Under Five	46.3%	38.0%
Work Activity		
Share with only One Worker	67.8%	36.0%
Mean Number of Workers	1.4	1.8
Mean Annual Hours Worked	2,600	3,544
Mean Family Hourly Wage	$8.75	$29.13

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: Share may not sum to 100 percent due to rounding error.

[38] Family Hourly Wage is calculated by dividing a family's annual earnings by its annual hours worked.

4.4b Low-Wage Families and Poverty

Clearly, families with children that rely on one worker with a low-wage job are in danger of living in poverty. But earned income is not the only resource available to these families. The Federal, State, and City governments all provide "work supports," programs that are designed to increase the value of work. The programs with the greatest reach are the Earned Income and Child Care Tax Credits. How effective are these, and other programs, at lifting low-income families out of poverty?

Table Twelve draws attention to "earnings poor" families. These are families with at least one full-time, year-round worker that would be living under the CEO poverty threshold if wages, salaries or income from self-employment were their only resource. In 2008, 21.2 percent of working families with children in New York City would have been poor by this measure. The table divides this population into two groups. The first are families that are lifted out of poverty by other forms of income. They comprise 31.3 percent of earnings poor families and are labeled "Lifted Out of Poverty." The second group is made up of families that remain in poverty despite the inclusion of other forms of income. They make up 68.7 percent of the earnings poor families and are identified in the table as "Remained in Poverty." The figures in the table's columns are mean values for earnings and other forms of income.

As the first row in the table indicates, those who eventually rise out of poverty start off with roughly $4,000 more in earnings than those who remain poor. The Earned Income and Child Care Tax Credits raise after-tax income for both groups of families considerably, from $23,359 to $28,034 for families who are lifted out of poverty and from $19,374 to $23,934 for families that remained in poverty. But this does not close the gap between the two groups; the difference in "Earned Income + Work Support Tax Credits" between the two groups remains close to $4,000.

An accounting of the value of work must also consider payroll taxes and work-related expenses. After including work-related costs in the ledger, Net Work-Related Income comes to $24,441 for the group that is lifted out of poverty and $20,406 for the group that remained in poverty. Where does this leave these groups relative to the poverty threshold? Both groups remain far from the poverty line. The mean poverty gap, the distance between Net Work-Related Income and the poverty threshold, is $8,521 for the families that are lifted out of poverty and $11,254 for those who remained in poverty.

The reason why some of these families move out of poverty becomes apparent when we consider "Other Income Support." The cash-equivalent value of nutritional assistance covers only $2,916 of the distance. But the housing adjustment adds the equivalent of an additional $8,516 in income to the resources of the families that are lifted out of poverty. Families that remain poor have a housing adjustment that only adds $1,978 to their mean income.[39] The source of this disparity is simply that 56.3 percent of those families who remained in poverty live in market-rate housing, while only 17.3 percent of those lifted out of poverty do so.

Net Total Income (Net Work-Related Income plus Other Income Support) rises to $35,873 for the families that rise out of poverty, but leaves the families remaining in poverty with a mean Net Total Income of $24,056. The gap between Net Total Income and the poverty threshold is eliminated for those lifted out of poverty. On average, these families end up $2,911 *above* the poverty line. The families whose incomes remain below the poverty line have a mean poverty gap of $7,604.[40]

[39] Means are calculated for all families regardless of their housing status. Families living in market rate housing have a housing adjustment of zero.

[40] Readers should note that Net Total Income does not correspond to CEO Income because it does not include medical out-of-pocket expenditures.

Table Twelve

Earnings Poor Families with Children, 2008[1]

	Lifted Out of Poverty	Remained in Poverty	Difference
Earned Income	$23,359	$19,374	$3,986
Work Support Tax Credits			
Earned Income Credits	$4,153	$4,084	$69
Child Care Credits	$522	$476	$45
Earned Income + Work Support Tax Credits	$28,034	$23,934	$4,099
Work Related Costs			
Payroll Taxes	$1,640	$1,315	$325
Child Care Expenses	$749	$768	-$19
Commuting Costs	$1,204	$1,445	-$241
Net Work-Related Income (Earnings + Tax Credits - Costs)	$24,441	$20,406	$4,035
Poverty Gap (CEO Threshold - Net Work-Related Income)	$8,521	$11,254	-$2,732
Other Income Support			
Nutritional Assistance	$2,916	$1,672	$1,244
Housing	$8,516	$1,978	$6,539
Net Total Income (Net Work-Related Income + Other Income Support)	$35,873	$24,056	$11,818
Poverty Gap (CEO Threshold - Net Total Income)	-$2,911	$7,604	$10,515

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: [1] All figures in table are mean dollar values.

4.5 Conclusion

The measures of poverty in this report lend support to the belief that the poverty rate would fall with higher levels of educational attainment, increased work force participation, and more children growing up in two-parent families. With the notable exception of the elderly, between-group differences in poverty rates using a NAS-based methodology are not strikingly different from those based on the official poverty measure.[41] In this respect, the CEO measure largely confirms widely accepted wisdom about the long-term determinants of poverty reduction.

Our alternative methodology, with its more inclusive resource measure and its more realistic poverty line, however, provides additional insights. This is clearest when it comes to the relationship between work, earned income, and poverty. Many families in New York

[41] CEO's first report on poverty in New York City found that the poverty rate for the elderly was 32.0 percent in 2006 compared to 18.1 percent under the official measure.

City devote a considerable number of hours to paid employment, but remain poor. In the four-year period covered in this report, moreover, working poverty grew as the earnings of ever fewer families were able to keep pace with the housing-led rise in the CEO threshold.

Public policy recognizes that not all families can earn their way out of poverty and that they require additional income support. The Federal, State and City Earned Income Tax Credits are the most notable case in point. But the contribution of this support must be considered in the light of the expenses – child care and transportation – that come with employment. The adequacy of "work plus supports" must also be judged in the context of the cost of market-rate housing in New York City. Notwithstanding the contribution that work supports make to family income, access to the affordable housing provided by public programs appears to be a more important determinant of whether working families with low earnings can make it over the poverty line.

APPENDIX A:
THE POVERTY UNIVERSE AND UNIT OF ANALYSIS

The Introduction to this paper noted that a measure of poverty must establish a poverty threshold, a line that demarcates the poor from the rest of society. It must also define what resources a family can draw on to meet its needs. Once these are in place, a method for measuring poverty needs to assess what groups in the population it can be meaningfully applied to. The "poverty universe" is the population whose poverty status can be determined.

Another important task is to create a "poverty unit of analysis." People live together for a variety of reasons. The ones that are relevant to poverty measurement are that they share economic resources and, typically, seek to satisfy their material needs as a unit. Families have traditionally served as the poverty unit but, for reasons outlined below, CEO believes that the traditional definition of family has become too narrow a concept.

Who is Counted in Measuring Poverty?

Not everyone can be counted in measuring poverty. For example, the poverty "universe" used by the Census Bureau in its official poverty measure excludes most people living in group quarters such as college dormitories, nursing homes, military bases, and prisons.[42] Unrelated persons living in households who are under 15 years of age are also uncounted. The main reason for excluding these individuals is the difficulty in measuring their income (which, for reasons often unrelated to poverty, can be minimal). As Table A One illustrates, the universe for this study includes almost 8.2 million out of the nearly 8.4 million New York City residents. The 191,000 people not in the poverty universe are members of groups whose resources are difficult to measure.

The excluded fall into two categories:

1. **People living in group quarters**. As mentioned above, group quarters are institutions that provide housing and (often) other services to their residents. Much of the group quarters population is in no position to earn income and many of their basic needs are being met by the institutions they reside in. The Census Bureau's poverty reports exclude most of the group quarters population from the poverty

[42] See http://www.census.gov/acs/www/Downloads/2006_ACS_GQ_Definitions.pdf for a complete definition of group quarters.

universe for this reason. We have excluded the entire population in group quarters, first, because it is conceptually more consistent and second, because the lack of data in the ACS about this part of the population makes it impossible to calculate their CEO income.

2. **Foster children living in households**. These are people who are under the age of 18 and have been placed by New York City's Administration for Children's Services in a household to receive parental care. There were 6,686 such children in 2008. By and large these young people have no, or only minimal, income. (If they are under 15, the ACS does not collect or report any income data at all.) However, public programs are contributing to their support. For example, all foster children are enrolled in Medicaid. In addition, the families that take in foster children are compensated for the expenses they incur in caring for them. The value of this support is not readily identified as a form of income either for the foster child or for the family in which the foster child resides. Under these circumstances, measuring the unmet economic needs of foster children is difficult.

Table A One

Population Included in the CEO Poverty Universe, 2008

	Number of Persons	Share of Population Universe
Total Population	8,364,302	N.A.
Group Quarters	184,312	2.2%
Foster Children	6,686	0.1%
Sum of Excluded Persons	190,998	2.3%
Total Poverty Universe	8,173,304	97.7%

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: See text for explanation of concepts.

The Poverty Unit of Analysis: Who is Sharing Income and Expenses?

From the perspective of the current Census Bureau methodology, individuals are considered poor if the total income of the family they live in fails to reach the poverty threshold for their family size and type. The rationale for this is straightforward; family members who reside in the same household share resources and living expenses. Spouses typically pool their income and make joint decisions about major expenditures. Parents

provide financial support to their children. Treating family members as lone individuals whose poverty status is determined by their own income would place nearly every non-working spouse and child in poverty.

Families in the Census Bureau's poverty measure are composed of people who are related to the household head by blood, marriage, or adoption. As indicated in Table A Two, just over eight-in-ten of those included in the New York City poverty universe live in families defined in this way.[43]

This study modifies the Census Bureau's family unit in three ways:

1. People who are unmarried partners of the household head are considered part of that head's family rather than separate unrelated individuals.[44] Following the recommendation of the NAS, such people are treated as the reference person's spouse.[45] If the household also includes children of the partner who have not already been identified as children of the reference person, they are included as children in the reference person's family.
2. This study creates additional family units labeled "People in unrelated subfamilies" within households where there is evidence that two or more persons who are not related to the householder are related to each other. An example of such a unit would be two persons who are married to each other and are boarders in someone else's home. Because of data limitations, unrelated subfamilies can only be observed when they are composed of married couple families, with or without their own children, or single persons with children. Members of unrelated subfamilies make up less than one percent of the New York City poverty universe.
3. This study (unlike our first report) places unrelated individuals who are claimed as dependents for tax filing purposes into the poverty unit of those claiming them. Individuals claimed as dependents are being supported by others in the household. Given that relationship, we judged that they should be members of the poverty unit of the person(s) who they are dependent upon.

[43] Note that Census family does not mean nuclear family. Any relative of the household head, such as a sibling, grandchild, in-law, aunt, uncle, or cousin is considered a family member in the Census (and CEO) poverty measure.
[44] The ACS Subject Definition manual defines an unmarried partner as, "a person age 15 years and over, who is not related to the householder, who shares living quarters, and who has a close personal relationship with the householder". The gender of the partners is irrelevant to this designation.
[45] Citro and Michael, p. 306.

Together, these three modifications bring 154,065 individuals who would have been treated as single-person poverty units or excluded from the poverty universe into multi-person poverty units. The latter group includes all the children (except foster children) who are excluded from the poverty universe because they are unrelated to the householder and less than 15 years of age.

The remainder of the poverty universe is composed of "unrelated individuals." These are people who are either living alone (1,023,000) or are living in a household with others, but with whom they have no familial relationship (360,000). Both groups of unrelated individuals are treated as "single-person families" and their poverty status is derived using their individual CEO incomes.[46]

Thus, the poverty unit of analysis for this study is composed of:

1. Expanded families: all persons residing in the same household who are related to the reference person by blood, marriage, adoption or as unmarried partners (and any children of those partners not already identified as related to the reference person).
2. Unrelated subfamilies.
3. Unrelated individuals.

A poverty threshold is assigned to each unit based on its size and composition. (See below.) The sum of the resources of all the people in the unit is computed and compared to the thresholds to determine whether the members of the unit are poor.

[46] One exception to this is when we have prorated the housing adjustment across several poverty units within households.

Table A Two

The Unit of Analysis for Poverty Measurement, 2008

	Number of Persons	Share of Poverty Universe
People in families: Census definition	6,635,508	81.2%
People in families: CEO definition	6,789,573	83.1%
Unrelated Individuals Living with Others	360,252	4.4%
Unrelated Individuals Living Alone	1,023,479	12.5%
Total	8,173,304	100.0%

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: See text for explanation of concepts.

APPENDIX B:
DERIVING A POVERTY THRESHOLD FOR NEW YORK CITY

One of the primary goals of the CEO poverty measure is to establish a realistic standard of need for New York City. The National Academy of Sciences recommended that the first step in creating the poverty threshold was to compute a nationwide threshold based on the distribution of "reference family" expenditures on food, clothing, shelter, and utilities, plus "a little more" for miscellaneous expenses, such as household supplies and personal care products.[47] 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 the amounts that families spend on the items in the threshold. (These percentiles were equivalent to 78 percent and 83 percent of the median level of spending on these goods at the time of the report.)[48] The NAS also offered an upper and lower bound for the "little bit more" that it recommended be included in the threshold, a multiplier ranging from 1.15 to 1.25 times the food, clothing, shelter and utilities expenditure estimate.[49] In its NAS-related alternative poverty measures research, the Census Bureau has used the mid-point of the percentage of the median (80.5 percent) and multiplier (1.2) for miscellaneous expenses.[50] This study continues that practice. As Table B One indicates, this yields a threshold of $24,755.[51]

The Academy argued that because living costs were not uniform across the United States, the poverty thresholds should be geographically adjusted. Since research indicates that the largest source of the disparity in inter-area living costs is a result of differences in housing and utilities costs, the panel recommended that only the part of the threshold that is

[47] The reference family is composed of two adults and two children. It is referred to as the reference family because, as we discuss below, the thresholds for other families are calculated in reference to families of this type. This family was chosen by the NAS because it is the most common structure among families that include children less than 18 years of age.

[48] The relationship between the percentiles of the distribution and the percentages of the median may have changed since the NAS Panel report.

[49] Citro and Michael, p. 106. Miscellaneous necessities cover items such as some non-work related travel (e.g. for shopping), household supplies (e.g. detergent) and personal care products (e.g. soap).

[50] For example see Short, Kathleen, et al. 1999. U.S. Bureau of the Census: Experimental Poverty Measures, 1990 to 1997. Washington, D.C.: U.S. Department of Commerce, Economics and Statistics Administration. and Short, Kathleen. 2001. U.S. Bureau of the Census: Experimental Poverty Measures: 1999. Washington, D.C.: U.S. Department of Commerce, Economics and Statistics Administration.

[51] The NAS thresholds are calculated from the Bureau of Labor Statistics' Consumer Expenditure Survey. A description of this survey is available at http://www.bls.gov/cex/home.htm. The U.S.-wide threshold (labeled FCSU-CE) is posted at http://www.census.gov/hhes/ www/povmeas/ web_tab5_ povertythres 2008.xls. Note that this threshold does not include principal payments by homeowners in expenditures.

made up of shelter and utilities expenditures should be adjusted. It further suggested that the U.S. Department of Housing and Urban Development's Fair Market Rents could be used as the adjustment factor.[52]

In its NAS-related research reports, the Census Bureau has used 44 percent as the share of the total threshold that represents shelter and utilities expenditures.[53] For 2008, this share equaled $10,892. This study adjusted this amount to take account of the high cost of housing in New York City. This was done by comparing the New York City metropolitan area Fair Market Rent (FMR) for a two-bedroom apartment to the national average (weighted by population) for a similar apartment. The New York City FMR in 2008 was $1,318 versus a national average of $867; this implies that New York City rents for such apartments were 1.52 times the national average.[54]

Adjusting the shelter and utilities component of the threshold by multiplying it by 1.52 to allow for New York's higher housing costs creates a new shelter and utilities portion of the reference-family threshold equal to $16,556. When this is added to the non-shelter and utilities portion of the threshold (which remains unchanged from the NAS national measure) the total threshold for the reference family of two adults and two children becomes $30,419 (see Table B1). This threshold is about 23 percent higher than the U.S.-wide NAS threshold and about 39 percent higher than the official Census Bureau poverty line.[55]

[52] Citro and Michael, pp. 182-201.
[53] This proportion has not been recalculated or updated since the early 1990s. Given the run up in housing prices and expenditures since that time, this proportion may well have risen.
[54] The Fair Market Rents are available at www.huduser.org. This approach is a deviation from that taken in the Census Bureau's experimental poverty measures reports. In that research the regional adjustments are carried out by grouping all households within each state into one metropolitan and one non-metropolitan area. This method would have put New York City in the same housing market as far lower housing cost areas such as Albany, Buffalo, and Syracuse. Our approach provides a more New York City-specific measure.
[55] Interestingly the difference between the U.S. and New York City NAS-based thresholds is close to a 2003 estimate, of 22 percent, for cost of living differences in a much more inclusive market basket of goods. See Bettina H Aten. "Report on Interarea Price Levels WP2005-11." (Washington, D.C.: U.S. Department of Commerce, Bureau of Economic Analysis, November 2005).

Table B One

CEO Poverty Threshold for Reference Family (Two Adults and Two Children), 2008

NAS threshold at national level	$24,755
Shelter & utilities share of national NAS threshold (44%)	$10,892
NAS Shelter & utilities share times FMR index for NYC (1.52)	$16,556
Non-shelter share of threshold (56%)	$13,863
Sum of adjusted shelter and non-shelter thresholds	$30,419

Source: CEO Calculation from data provided by U.S. Bureau of the Census and U.S. Department of Housing and Urban Development.
Note: See text for explanation of concepts.

Once a threshold for the reference family has been set, thresholds need to be calculated for families (or poverty units) of various 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. The scale is used in the Census Bureau's experimental poverty measure reports and has gained wide acceptance among poverty researchers.[56]

Table B Two provides a selection of family size adjustments using Betson's scale. These are known as equivalence scales, because they are used to compute the amounts of income needed by families of different types to be equivalently well-off. The scales give the adjustments that are needed to convert the threshold for the reference family of two adults and two children to thresholds for other family sizes. For example, to calculate the threshold for a family of two adults and one child, the table indicates that the reference family threshold of $30,419 would have to be multiplied by 0.88, and would yield a threshold of $26,769.

[56] Betson, David. March 1996. "Is Everything Relative? The Role of Equivalence Scales in Poverty Measurement." University of Notre Dame. http://aspe.os.dhhs.gov/poverty/papers/escale.pdf. See Appendix A for more details on how this scale compares with the scale implicit in the official Census poverty measure.

Table B Two

Factors Used by CEO to Adjust Reference Family Thresholds For Units of Other Sizes and Types

Number of Adults	Number of Children under 18				
	None	One	Two	Three	Four
One	0.463	0.699	0.830	0.953	1.069
Two	0.653	0.880	1.000	1.114	1.223
Three	1.000	1.114	1.223	1.328	1.430
Four	1.223	1.328	1.430	1.529	1.625

Source: Computed by CEO based on Betson, David. 1996. *Is Everything Relative? The Role of Equivalence Scales in Poverty Measurement.* University of Notre Dame. March. Available at: http://aspe.os.dhhs.gov/poverty/papers/escale.pdf.

Table B Three gives the resulting CEO poverty thresholds for a variety of families and compares them to the official thresholds for families of corresponding sizes and compositions. The CEO thresholds are always higher, but not by the same factor. This reflects the differences between the Betson scale and the scale implicit in the food-based official thresholds. Another important difference between the scaling methods that should be noted is that the official method creates a different, and lower, poverty threshold for individuals and families with a householder who is age 65 or older. The official threshold for a single adult is $11,201 if he or she is under 65, but $10,326 if that person is older. The CEO threshold makes no distinction by age. While the CEO threshold for a single, non-elderly person is 1.259 times the official threshold, it is 1.365 times the official threshold for a single, elderly person.

Table B Three

Comparison of Poverty Thresholds, 2008

Family Type	CEO	Official	CEO/Official
One adult[1], no child	$14,098	$11,201	1.259
Two adults[1], no child	$19,878	$14,417	1.379
One adult[1], one child	$21,274	$14,840	1.434
One adult, two children	$25,256	$17,346	1.456
One adult, three children	$28,985	$21,910	1.323
Two adults, one child	$26,774	$17,330	1.545
Two adults, two children	$30,419	$21,834	1.393
Two adults, three children	$33,885	$25,694	1.319

Source: U.S. Bureau of the Census http://www.census.gov/hhes/www/poverty/threshld/thresh08.html. And CEO calculations from Tables B One and B Two.
Note: [1] Adult is non-elderly in official threshold.

How should the poverty thresholds be updated over time?

As noted in the report's Introduction, the official poverty threshold is adjusted each year to reflect the annual change in the Consumer Price Index for All Urban Consumers (CPI-U). This method is intended to maintain the poverty threshold's value relative to the *cost* of living, but it takes no account of changes in the *standard* of living over time.[57] The NAS Panel criticized the official poverty measure for its updating methods, pointing out that over time they lead to poverty standards that have little relevance for today's needs. CEO agrees with the Panel's judgment that access to a fixed standard of living is too narrow a basis for an economically advanced, democratic society to judge who is poor. Over time, as family incomes rise, the goods and services that were once viewed as luxuries become, first, common comforts, and later, necessities of a normal life. Thus the level of consumption requisite for adequate functioning as parents, workers, or citizens, is shaped by increases in standards of living for the population as a whole. A poverty threshold that does not reflect this reality represents a standard of adequacy that is blind to social change.

The growing distance between the standard of living represented by the official poverty threshold and the standard of living enjoyed by most of the rest of society has led some researchers to suggest that the poverty line should simply be set at a fixed percentage

[57] Because it represents an unchanging standard, approaches such as these are referred to as "absolute" poverty measures.

of median family income so that a rising standard of living would be automatically translated into a higher poverty threshold.[58] The NAS Panel took a less relative approach, recommending that the poverty line be adjusted to reflect the rise in the level of expenditures for the necessities represented in its threshold. This approach would capture some of the growth in the standard of living over time, but only that part that was reflected in spending on necessities, creating a threshold that gradually rises in inflation-adjusted value, but at a rate that is slower than the growth of median family income.[59] To provide an adequate sample and guard against unusual fluctuations in the year-to-year changes in the threshold the NAS recommended, and the Census Bureau has published thresholds that are based on a three-year moving average using data from 12 quarterly interviews conducted for the Bureau of Labor Statistics' Consumer Expenditure Survey. The threshold for 2008, for example, represents data for 2006, 2007, and 2008.

[58] This is the approach taken by the Organization of Economic Cooperation and Development. For example see: June 2001. Organization for Economic Cooperation and Development. OECD Employment Outlook. Paris, France.
[59] Citro and Michael, pp. 154-157.

APPENDIX C:
THE CEO TAX MODEL

Tax payments are inevitable for wage earners. FICA (payroll) taxes and income taxes at the Federal, State, and City level are significant non-discretionary expenditures; they reduce a family's income. However, for many low-income tax filers, tax liabilities are more than offset by tax credits, especially refundable credits, and the tax system actually increases a family's ability to meet its needs.

The goal of CEO's tax model is to simulate a set of tax returns for New York City taxpayers that approximate actual Federal, State and City tax filings. This allows us to measure the net impact of taxes and tax credits on family resources.[60] The analysis can also estimate the effectiveness of individual tax programs.

We have introduced revisions to the tax model for this report. They center on decisions about how household members are likely to group themselves into tax filing units. This included new judgments on how dependents are allocated within the American Community Survey (ACS) household.

Background

The CEO tax model takes the ACS as its starting point. Census households are defined as all persons co-residing in a housing unit. The challenge is to identify how many tax returns are filed from each household, along with who is a filer and who is a dependent. Within the household, each member is identified only through their relationship to the person answering the ACS questionnaire. This person, the respondent, is usually, but not always, the primary homeowner or renter.

Household structures are often complex. Occupants may include a family embodying several generations; multiple related families; families unrelated to the respondent; and one or more unrelated individuals, including roomers and boarders. Identifying these relationships is problematic. Since each individual is only identified relative to the reference person, it is often difficult to identify their relationship to each other.

[60] Tax refunds are treated as income received in the current tax year.

CEO addresses this problem by first dividing ACS households into Minimal Household Units (MHUs) that create a richer set of information about how persons in the household are related to each other. For example, two married boarders with a child will be identified as such using age and other demographic characteristics. The children of unmarried partners (coded as "other nonrelatives" of the respondent) are identified in a similar manner and are then coded as the child of a specific parent.[61]

Tax Filing Units

Tax units are created by superimposing a set of tax returns onto each household. The tax model identifies who in each MHU is a filer, and who in the household might be their spouse or dependent. As household members are sorted into tax units, each is coded for filing status. Filing status possibilities are married joint, married separate, head of household and single filers.[62]

Tax Unit Revisions

Aligning filers with dependents is the key challenge in creating the tax units and an accurate tax estimate. The MHU and tax unit models used for our last report underestimated head of household filers, an important category for poverty analysis because such a large share of the City's low-income population is composed of persons living in single-parent families. Creation of accurate tax units with a better distribution of filer status required further assumptions about taxpayer behavior in order to approximate real decisions made by taxpayers. In this report, CEO has introduced assumptions based on administrative data and anecdotal evidence about taxpayer behavior. The most influential of these assumptions are:

1. Multiple heads of household. We allow several heads of household in the same residence. Taxpayers seem to define their householder status based on who is supported by their income. For example, two sisters living together, each with a child and sharing rent, utilities and other costs, may both file as heads of household. We assume each will view her income as covering expenses for her "household" which includes herself and her child; and the cost of her household is a share of the

[61] The MHU methodology is derived from Jeffrey Passel, "Editing Family Data in Census 2000 Public-Use Microdata Samples: Creating Minimal Household Units (MHU's)." (August 23, 2002).

[62] The ACS does not provide information to identify qualifying widows for 2005-2007. For consistency they were not included in our 2008 analysis. Widows are coded as either single filers or heads of household in the CEO estimate.

costs of the dwelling unit. Moreover, if there were a third adult in the household, that person would also take on a share of household costs and file as a single adult with no dependents.

This concept of multiple households within a single dwelling appears apt in light of the shared housing common in many areas of New York City. A dwelling unit may be composed of a leaseholder sharing the space with some combination of family, roommates and/or boarders, some of whom may form family units of their own. Each adult is paying some part of the housing costs based on his or her usage, but is also responsible for supporting, and sharing resources with his or her own family unit. The MHU analysis clarifies these relationships. The tax unit program then puts each financially independent individual or subfamily into a separate tax return. If any of the filers have children but no spouse, they are made head of household filers.

2. Dependent children are sometimes treated as a "shared" resource within the household. Since the Earned Income Tax Credit (EITC) rules from 2005-2008 limit the number of children that can be claimed to two, there are often "leftover" children in the household. We believe these children are often "shared" among relatives for tax purposes. In particular, grandparents and unmarried partners who are living in the household may be assigned these children in the CEO model. Unmarried partners are given special attention in this situation. We assume they do not file a joint return, and that each files individually. Each partner will claim at least one of his or her own children, but we have tried to give each income eligible unmarried partner an EITC dependent where possible, even if that dependent is a biological child of his or her partner.

   Given the complexities of the EITC phase-out, we have not matched who gets the greater tax benefit with who claims the child. It is our belief that taxpayers have a general knowledge of the benefits of the EITC, and will try to maximize the number of claimers in the household, but most will not resort to the tax table in an attempt to maximize the credit for each household member. Instead, our emphasis in assigning children for EITC claims is on the closeness of the claimer's relationship to the child and/or the child's parent.

3. Qualifying Relatives. Low-income households have many indigent residents, both related and unrelated to tax filers in the home. The model tries to identify who among them may be eligible to be claimed as a qualifying relative dependent, and who in the household would have the resources to support them and thus claim them as a tax exemption.[63] The tests are stringent and based on household cost. For this purpose, we estimate household cost to be 150 percent of annual rent or ownership cost. This cost is divided among adults in the household to find household cost per person. To become a qualifying relative, a person must have income below the filing threshold *and* have resources (including public assistance) of less than the household costs per person**.** To claim a qualifying relative, a filer must have resources greater than 50 percent of total household costs.
4. Definition of Filing Types: "File type" defines who must file based on their income. Each filing status (married filing joint, single, etc.) has an income threshold above which they must file a return. Most filers (over 80 percent) are "normal" 1040 filers, with income above the filing threshold. [64] In this report, CEO has added two additional categories: dependent filers (dependents with income high enough that they must file a separate return); and filers with income so low that they are not required to file taxes, also known as "below the threshold filers."[65] Filers whose ACS income data sums up to a negative income are currently eliminated from CEO analysis and treated as non-filers.
5. Which potential tax filing units actually submit a return? We assume that all filers with income above the filing threshold file a return. In addition, any filers with earnings so low they are not required to file a tax return, but who have dependent children, are also assumed to submit a return since they receive sizeable benefits from the EITC and other refundable credits. Single filers who are below the filing threshold do not submit a return.

Table C One summarizes our progress in improving the distribution of filers. It compares results from our first report, our new estimates, and (as a reality check) filing status data from the IRS. The table shows that the new model has improved the filing status

[63] IRS rules allow non-relatives to qualify as a dependent in some instances.
[64] For simplicity, all filers are assumed to fill out Federal Form 1040 and NYS IT-201.
[65] Below threshold filers in the CEO model have payroll taxes and filed for the Recovery Rebate Credit in 2008. The Recovery Rebate credit is part of the Economic Stimulus Act of 2008.

distribution, particularly head of household filers, but adds more taxpayers. The new estimates include dependent filers and below threshold families who file for the EITC, two groups who were excluded from our previous estimate. One reason for the greater number of tax returns in the CEO estimates is the inclusion of all potential tax filers in the ACS, compared to administrative data that reports only actual filers.

Table C One:

Comparison of Distribution of Tax Filers, by Type, 2006

	Administrative		CEO New		CEO Prior	
	Number	Percent	Number	Percent	Number	Percent
Married, joint	843,666	23.8%	1,180,695	26.3%	1,138,720	28.0%
Head of Household	835,412	23.6%	795,075	17.7%	608,357	15.0%
Married, separate	62,809	1.8%	75,542	1.7%	52,266	1.3%
Single	1,799,072	50.8%	2,431,718	54.2%	2,268,544	55.8%
Total	3,540,959	100.0%	4,483,030	100.0%	4,067,887	100.0%

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO. Administrative Data: IRS Wage & Investment: Planning, Research and Analysis. Individual Return Transaction File, Compliance Data Warehouse.

Table C Two shows the most recent distribution of tax filers by filing status for 2008. The number and distribution of filers remains stable over time. The distribution of filer status in 2008 resembles the "CEO New" estimate for 2006.

Table C Two:

Distribution of Tax Filers, By Type, 2008

	Number	Percent
Married, joint	1,198,056	26.0%
Head of Household	802,947	17.4%
Married, separate	78,260	1.7%
Single	2,524,320	54.8%
Total	4,603,583	100.0%

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: See text for explanation of concepts.

The Tax Calculator

Once the tax units are defined, a tax calculator model essentially generates a Federal, New York State and New York City tax return for each filing unit. The tax unit's Adjusted Gross Income (AGI) is calculated from the following types of income that are reported in the ACS: Wages, Self Employment, Retirement/Pension, Social Security, Interest, and Other

Income. They are summed and adjusted for includable Social Security and self employment taxes. The ACS provides no data that could be used for other adjustments. New York State AGI is adjusted from Federal AGI to account for taxable Social Security income. No other data is available for State adjustments to Federal AGI.

Taxable income is calculated as: AGI net of the standard deduction and personal exemptions. Dependent exemptions are based on dependent relationships, age, and disability status. A standard deduction is assumed for all tax units. (New York State taxable income uses State standard deduction and exemption rules.)

There is not enough information in the ACS to easily estimate most Schedule A deductions, including the home mortgage deduction. Since renting is the predominant form of housing in New York City, this is less of a concern than it would be for other localities. Moreover, the focus of our analysis is tax filers with adjusted gross income of $50,000 or less. In this income range, homeowners may not claim a home mortgage deduction at the Federal or State level. Only 13.5 percent of low-income filers itemize on a Schedule A, the rest claim standard deductions.[66]

Tax Estimates

Once Taxable Income is computed, tax rates are applied and total liabilities are estimated. Then credits are estimated and applied. The tax credits calculated are:[67]

Federal	New York State	New York City
Child & Dependent Care	Household Credit	Household Credit
Elderly & Disabled	Child Tax	STAR
Child Tax	Child & Dependent Care	EITC
EITC	EITC	Dependent Care
Additional Child Tax	Real Property Tax	
Recovery Rebate Credit	College Tuition	
Real Estate Standard Deduction		

After taxes are estimated, the net tax impact (Taxes Owed minus Tax Credits plus FICA) is computed and incorporated into the poverty units' resource measure.[68]

Revised Tax Estimates

[66] IRS Master File extract, Tax Year 2006. "low-income" includes returns with Federal AGI up to $40,000.
[67] Some credits may not apply in every year.
[68] Non-refundable taxes are estimated up to the value of filer's tax liability.

Implementing the above assumptions has brought us closer to our goal: An improved set of tax filing units within ACS households so that the distribution of filers by filing status more closely resembles the distribution of filers found in IRS tax data. We have also made a limited number of small-scale improvements in how we "walked the tax units through the tax form," but these technical nips and tucks have little effect on the aggregate estimates of income after taxes.

Changes in Tax Law

Comparing tax liability and credits from year to year requires several caveats. Total tax liabilities and credits reflect underlying changes in the ACS sample, and are sensitive to changes in age and income distributions in the City population. Tax rules also change. Most tax rates or brackets and many tax credit rules, including income eligibility, change annually. No tax credits were phased out during the time period involved, but several new credits were added. In 2007, New York City added a Dependent Child Care Credit. A bigger impact occurred the following year when two new, temporary Federal credits were added as part of the Economic Stimulus Act of 2008. The Recovery Rebate added an average of $800 more in tax credits to most of the low-income households in our tax model. The Federal Additional Standard Deduction for Real Estate Taxes made a difference for those taxpayers who own their homes.

Table C Three shows that along with the distribution of filers, our estimate of total net Federal, State and City income taxes has become more accurate. But the table also shows that while our estimates are improving, they are far from exact. There is an overestimate of Federal tax credits and an underestimate of State tax credits for the lowest income taxpayers (Federal AGI up to $20,000). The two balance out when we total Federal, State, and City taxes. Our original tax model overestimated the summed, total tax benefits to this group by 57 percent. The revised model differs by only 10 percent. For filers with AGI over $20,000 and under $40,000, the CEO estimate has not improved significantly and continues to overestimate the amount of taxes paid by these filers.

Table C Three:

Comparison of Federal, State, and City Net Income Taxes, 2006

	Adjusted Gross Income Between[1]					
	$1-20,000			$20,001-40,000		
	Admin.	CEO New	CEO Prior	Admin.	CEO New	CEO Prior
Federal	-$208,008,670	-$493,768,908	-$588,894,000	$1,133,464,560	$1,333,011,337	$1,415,469,000
State	-$431,304,649	-$261,699,147	-$428,282,000	$338,327,384	$550,198,513	$574,630,000
City	-$156,909,956	-$115,276,491	-$235,736,000	$320,133,379	$385,850,980	$375,108,000
Total	-$796,223,275	-$870,744,546	-$1,252,912,000	$1,791,925,323	$2,269,060,830	$2,365,207,000

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO. Administrative Data: IRS op. cit; NYS Dept. of Taxation and Finance
Note: [1] AGI computed as per Federal or New York State Rules as appropriate.

However, estimates of taxes and credits for filers around the CEO poverty line are much more accurate than estimates for the larger population. As an example, Table C Four shows the accuracy of the CEO's estimated Earned Income Tax Credit (EITC) for households in the $15,000 – $35,000 income range. The credit is the single most important tax credit for the working poor, and an important factor in measuring the effect of taxes on poverty. For households in this income range, the EITC has the potential to move families out of poverty. The dollar amount of CEO's EITC estimates in this group range from 90 percent to 113 percent of administrative totals. The estimates of how many tax filers receive the credit range from 85 percent to nearly 100 percent in their accuracy.

Table C Four:

Comparison of Selected Federal, State, and City Earned Income Tax Credits, 2006

	Adjusted Gross Income Between[1]					
	$15,000-25,000			$25,001-35,000		
	Admin.	CEO	CEO/Admin.	Admin.	CEO	CEO/Admin.
Federal:						
EITC Value	$537,763,366	$484,599,615	0.901	$138,916,936	$153,348,814	1.104
EITC Claims	197,166	167,696	0.851	127,771	124,348	0.973
State:						
EITC Value	$146,469,909	$133,982,904	0.915	$37,220,698	$41,946,659	1.127
EITC Claims	195,679	167,696	0.857	122,396	121,899	0.996
City:						
EITC Value	$26,646,436	$24,229,981	0.909	$6,878,346	$7,659,871	1.114
EITC Claims	196,313	167,696	0.854	125,679	121,899	0.970

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO. Administrative Data: IRS op. cit; NYS Dept. of Taxation and Finance
Note: [1] AGI computed as per Federal or New York State Rules as appropriate.

Tables C Three and C Four lead to the conclusion that CEO estimates are less accurate for tax filers at the extreme low end of the income range, and for incomes over $40,000. At the low end, we assume errors are due to weakness of data for low-income families in the ACS and that IRS data reflects a lower level of taxpayer compliance and accuracy in that group. Where filer incomes are above $40,000 we believe that the lack of data to estimate itemized deductions affects our estimate.

The Impact of Net Taxes on Income and Poverty

Net taxes have a considerable impact on families near the poverty line. Adding additional resources via tax credits can lift a family out of poverty. But if a family does not qualify for sizable credits (because it does not include minor children) payroll taxes can pull them under the poverty line.

Table C Five shows the mean and median components of net income tax liability in lower income tax filing units for 2008. For tax filers with income up to $20,000 it is important to note that net income tax is negative, meaning that tax refunds exceed taxes paid, and that on average tax refunds are over 300 percent greater than tax liability. The median tax filer in this group has no taxable income after deductions and exemptions, and receives over $700 in refunds.

Tax filers in the next income grouping, $20,000 – $40,000, have a positive tax balance – they owe more taxes than they have tax credits – but on average, a taxpayer in this group, after credits, pays only 41 percent of their total tax liability, or $1,482 on $3,590 in taxes owed.

Table C Five:

Components of Net Income Tax Liability, 2008

	Adjusted Gross Income Between			
	$1-20,000		$20,001-40,000	
	Mean	Median	Mean	Median
Adjusted Gross Income	$11,534	$12,221	$29,236	$29,533
Taxable Income	$2,191	$0	$15,644	$15,680
Pre-Credit Liability	$572	$192	$3,590	$3,363
Federal Credits	$1,835	$651	$1,653	$600
State Credits	$458	$217	$1,076	$1,034
City Credits	$315	$290	$762	$756
Net Income Tax	-$1,847	-$745	$1,482	$2,130

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Notes: Adjusted Gross Income, Taxable Income are based on Federal Tax Code. New York State and City tax code for these items differs slightly. Liability minus Credits does not equal net tax. Credits include non-refundable credits that are limited by taxes owed.

A second component of taxes is the FICA payroll tax for Social Security and Medicaid. All work-related income under $102,000 was subject to the flat FICA rate of .0765 in 2008. The impact of FICA taxes is reported in Table C Six**.**

Table C Six:

FICA (Payroll Taxes)

Adjusted Gross Income Between	Mean	Median
$1-20,000	$598	$639
$20,001-40,000	$1,896	$2,026

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

For tax filers earning $20,000 and under, mean FICA payment is $598. Their taxes, even after FICA, still represent a net resource gain. Filers earning over $20,000 and up to $40,000 have a mean and median FICA payment close to $2,000. The impact of FICA on

these filers is notable. It is roughly as much as their mean and median net income tax liability. For wage earners in this group, FICA roughly doubles their tax burden.

Table C Seven shows the sum of selected Federal, State and Local tax credits for 2008 for tax filers earning under $40,000. CEO's tax model estimates $3.4 billion in tax relief for this group. The Federal Earned Income Credit is a significant factor, providing over 36 percent of tax relief. The combined Federal, New York State and New York City Earned Income Credits account for nearly half of all tax relief. Taxpayers in New York City pay Federal, local and State taxes, but they also receive credits from all three entities. State and City credits combined account for nearly a quarter of tax relief, or $826 million in tax credits. It needs to be noted that not all tax relief takes the form of cash refunds to filers. Instead, some tax credits (non-refundables) are applied only to taxes owed, while others (refundables) provide refunds if the credit exceeds taxes owed. Tax relief is a combination of tax offsets and refundable credits.

Table C Seven:

Selected Tax Credits, 2008
Tax Filers with Adjusted Gross Income up to $40,000

	Mean[2]	Median[2]	Total
Federal			
Child & Dependent Care	$998	$930	$113,117,695
Child Tax[1]	$1,266	$1,000	$173,084,283
Elderly and Disabled	$125	$131	$915,134
Tuition	$742	$616	$25,226,910
Earned Income Tax Credit	$2,085	$2,134	$1,236,843,999
Real Estate Standard Deduction	$689	$500	$157,744,119
Recovery Rebate	$881	$600	$882,873,900
New York State			
Household Credit	$47	$45	$42,166,787
Child & Dependent Care	$1,158	$1,056	$80,729,693
Child Tax	$193	$100	$37,286,710
Tuition	$313	$200	$29,863,096
Real Property Tax	$72	$49	$1,565,630
Earned Income Tax Credit	$630	$629	$351,987,425
New York City			
Household Credit	$31	$20	$10,199,614
School Tax Relief (STAR)	$172	$145	$175,733,330
Child & Dependent Care	$700	$666	$34,340,107
Earned Income Tax Credit	$104	$107	$61,842,200
TOTAL TAX RELIEF			$3,415,520,631

Notes: [1] Includes refundable additional child tax credit.
[2] Means and medians for credit recipients only.

Taxes and Poverty

Table C Eight illustrates the effect of taxes and tax credits on the poverty rate for the City as a whole, and then for working families with children. The poverty rate would be higher in the absence of net taxes. For low-income New Yorkers, payroll and income tax liabilities are offset by tax credits, producing modest declines in the poverty rate.

The net tax benefit to working families with children is even larger than for the population as a whole. Tax credits such as the Earned Income Tax Credit are targeted to, and are far more generous for, working families with children. In 2008, for example, the impact of all tax programs on the total City population was a reduction of 1.4 percentage

points. In the same year, tax programs reduce the poverty rate for persons living in working families with children by 3.4 percentage points.

Table C Eight:

Impact of Net Taxes on Poverty Rates, 2005 - 2008

	2005	2006	2007	2008 [1]
All Persons:				
Poverty Rate Based On:				
Total CEO Income	20.6	21.2	22.2	22.0
CEO Income without taxes	21.3	21.9	22.4	23.4
Impact of taxes on Poverty Rate	-0.8	-0.7	-0.2	-1.4
Persons living in working families with children:				
Poverty Rate Based On:				
Total CEO Income	11.8	13.2	14.8	14.6
CEO Income without all taxes	14.2	15.9	16.5	18.0
Impact of all taxes on Poverty Rate	-2.4	-2.7	-1.7	-3.4

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: [1] Includes Recovery Rebate Credit.

Conclusion

While our estimate of the relation between taxes and poverty has improved, it continues to fall short of what we see in the IRS data. We believe that there are several reasons why it may be difficult to improve much further on this. First, filers can claim head of household status if they are contributing to the support of a dependent child that is not currently living in their household. There is no way to establish relationships across households within the ACS. A second reason is that members of some couples who are unmarried and are filing as heads of household may be reporting that they are married in the ACS, or vice versa. There is no way to detect who in the ACS is misreporting their marital status on a tax return.

A third problem stems from the nature of the ACS methodology. It is a 12 month rolling sample, where respondents are interviewed at various times during the year and report the income earned by the household in the past 12 months, a time frame that does not correspond to the calendar year. Tax return data, on the other hand, is based on income earned during the calendar year. Because of this, CEO estimates are based on a slightly different time frame than a tax year and there is no way to measure the difference due to timing.

Finally, we do not impute a probability of whether or not someone is filing a tax return, or whether that tax return is accurate. Our 100 percent filing rate obviously overestimates actual taxpayer participation. The model also assumes that tax filers file their returns correctly, that they take advantage of every tax credit available to them, and they report income to the Census Bureau commensurate with income as reported to the IRS.

APPENDIX D:
NUTRITIONAL ASSISTANCE

The cash-equivalent value of nutritional assistance, including Food Stamps and the National School Lunch Food Program, is an important component of income in the CEO poverty measure. Unfortunately our main data set, the American Community Survey (ACS), contains no information on school lunches. Furthermore, the data it reports on the Food Stamp program suffers from high degrees of underreporting in both the number of recipients and the value of the benefit over the course of the year.[69] In this report we continue to estimate school program participation as we did in our prior report. (Readers who wish to understand the details of that approach should consult our first working paper.) In light of the problem of underreporting and changes in the ACS questionnaire, we have developed a new method for estimating the value of Food Stamp receipt.

Food Stamps

The problem of underreporting of various forms of public assistance is common in survey research and the Census Bureau has taken steps to address it in the ACS. The Census Bureau's testing of the ACS question about participation in the Food Stamp program revealed that respondents were more likely to indicate receipt of the benefit if the follow-up question about the value of the benefit did not appear in the survey instrument.[70] Therefore, beginning with the 2008 survey, the ACS only inquires whether some member of the household received Food Stamps, not into the value of the benefit.

An additional problem affecting the accuracy of Food Stamp reporting in the ACS is that Food Stamp participation and value are reported at the household level. The ACS household differs from a typical Food Stamp case. In the ACS, a "household" is comprised of all persons living within a shared housing unit, including the householder, occupants related to the householder, and lodgers, roomers, boarders and so forth. In contrast, Food Stamp cases are comprised of co-resident individuals who purchase and prepare food together. The distinction shows up clearly in the data. While the average New York City Food Stamp case has 1.85 members, the average ACS household reporting Food Stamp

[69] The Food Stamp program was renamed as the Supplemental Nutritional Assistance Program in the 2008 Farm Bill. We will refer to SNAP benefits colloquially as "Food Stamps," as most people still use the term.
[70] http://www.census.gov/acs/www/AdvMeth/content_test/H6_Food_Stamps.pdf.

receipt has 2.81 members. This leads to a potential undercounting of Food Stamp cases, as some households may have more than one case.

As a result of these data limitations, CEO needed to develop a method for imputing the yearly value of Food Stamps into the ACS. This process involves three steps: 1) creating Food Stamp units; 2) estimating the value of yearly Food Stamp receipt; and 3) adjusting the number of cases in the ACS data.

To address the unit of analysis problem, we developed a program to divide ACS households into the maximum number of "Food Stamp units" that the program rules would allow. The Supplemental Nutrition Assistance Program (SNAP) uses the following rules to determine who in a household must be in the same Food Stamp case:

1. Spouses.
2. Parents and children under 22, including spouses of these children and grandchildren.
3. A child under 18 living with, and under the parental control of, an adult who provides 50.0 percent or more of that child's support.
4. Anyone else in the household that purchases and prepares food together.

The first three of these rules are based on relationships within the household. Some of these are readily described by variables in the ACS. Others are not and must be constructed. To construct these relationships, we use the minimal household unit (MHU) program, which was originally written by Jeff Passel, Senior Demographer at the Pew Hispanic Center. The MHU program is designed to parse an ACS household into its smallest family units. (We made no determination on who purchases and prepares food together.) This program loops through the data, linking individuals within the ACS household by kinship and marriage. Because we do not attempt to infer who in the household is purchasing and preparing food together, the program creates the maximum number of possible Food Stamp Units within each household. Given the very high proportion of Food Stamp cases in New York City that are single member cases (57.6 percent), we believe that this may actually reflect how the SNAP program is administered in the City.

The size and composition of the Food Stamp cases produced with this method more accurately reflect that of the cases in the administrative data. Using the Food Stamp unit rather than the ACS household increases the estimated number of Food Stamp cases in the

2007 ACS from 423,601 (55.1 percent of the administrative number) to 584,913 (76.0 percent of the administrative number), and more accurately reproduces the distribution of cases by size.

Table D One

Distribution of Food Stamp Cases by Size, 2007

	CEO unadjusted		CEO adjusted		Administrative	
Size	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	141,758	33.5	321,915	55.0	443,378	57.6
2	92,042	21.7	114,297	19.5	149,863	19.5
3	67,252	15.9	62,050	10.6	89,344	11.6
4	54,085	12.8	44,853	7.7	49,685	6.5
5	30,977	7.3	21,507	3.7	21,282	2.8
6	18,712	4.4	10,825	1.9	8,439	1.1
7	8,260	1.9	4,539	0.8	3,685	0.5
8	4,857	1.1	1,889	0.3	1,735	0.2
9	3,699	0.9	2,528	0.4	895	0.1
10+	1,959	0.5	510	0.1	997	0.1

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

We began the Food Stamp value estimation process by compiling administrative data on Food Stamp cases in New York City from the Human Resources Administration's internal database. The data included all cases in New York City that were active for any period between July 2006 and June 2007, a total of 769,303 cases.[71] June was chosen since it represents the mid-point in the ACS rolling sample, helping to ensure the administrative data was comparable to the ACS data. Consistent with the standard methodology used by CEO in our poverty measure, individuals in group quarters were removed from both the administrative data and the ACS sample.

The administrative data set contained demographic information about the Food Stamp case-heads and families, as well as relevant budget information such as household income. For each case, we summed the total of Food Stamp payments over the previous year. Using this data, we developed a regression model using the demographic characteristics present in both the administrative and ACS data sets in order to predict the yearly value of Food Stamp payments of families in New York City. This model was

[71] 2007 was used to test and calibrate the Food Stamp adjustment, as it was the last year for which self-reported Food Stamp values were present in the ACS. Further references to the development of this procedure were initially tested on the 2007 data before being implemented on the other years.

developed after testing numerous specifications. The final model we arrived at displays consistency over the years 2005-2008.

Table D Two

Regression Modeling of Yearly Food Stamp Value 2005-2008

	2005	2006	2007	2008
Intercept	246.37	275.18	238.40	202.90
	[3.05]	[3.06]	[2.98]	[3.50]
Income*	-53.63	-54.95	-54.21	-52.18
	[0.35]	[0.34]	[0.33]	[0.34]
Household Size	849.74	878.74	849.70	912.05
	[1.78]	[1.73]	[1.72]	[3.07]
Children	103.48	102.29	139.67	88.70
	[1.55]	[1.51]	[1.52]	[2.44]
Elderly/Disabled in household	181.70	216.18	315.29	337.91
	[3.28]	[3.25]	[3.16]	[3.28]
Elderly/Disabled household head	223.80	228.29	237.39	220.82
	[3.64]	[3.59]	[3.45]	[3.63]
R^2	0.570	0.567	0.544	0.537
N	607,045	669,016	723,255	781,353

Notes: See text for source of data. Standard errors in brackets. All coefficients significant at the $p < 0.001$ level.
* Income is measured as the log of total income within the Food Stamp unit

The ACS contains data on whether a household received Food Stamps for some period over the previous year, but does not contain data on how many months the household participated in the program. This is potentially a source of unexplained variation, as households receiving Food Stamps for six months will have a lower yearly value than a household receiving for the full year, holding other factors constant. However, using a model that excludes the months of receipt variable is justified for two reasons. First, the variables included in regression correlate with the months of receipt variable. Lower income households, for example, are more likely to receive Food Stamps for a whole year. As a result, a good deal of the variation from the months of receipt variable is captured by the coefficients in the included variables. Second, since this model is used for prediction rather than inference we are less concerned with potential bias in the individual coefficients.

The regression model described above was then used to impute Food Stamp values through a predictive mean match (PMM).[72] First, we used the regression coefficients to estimate Food Stamp values for observations in the ACS and in the administrative data. These ACS and administrative values were then matched using a nearest neighbor algorithm, whereby an ACS case would be matched with the administrative case with the closest estimated value. The ACS case was then given the actual Food Stamp value from the administrative case. Once an administrative case donated its value to an ACS case, it was removed from the donor pool.

The advantage of using PMM rather than simply using the estimated values is that PMM does a better job at preserving the actual distribution of Food Stamp values, as can be seen in Table D Three. Regression estimates accurately capture the mean and aggregate values of the distribution, but yield considerably less variation than seen in the actual data. This is unsurprising, given the fact that regressions are designed to model means, rather than full distributions.

Table D Three

Comparison of Estimated and PMM
Food Stamp Value Distributions in the 2007 ACS

	Estimated	PMM	Administrative
FS Units	651,597	651,597	769,303
Mean	$1,840.78	$1,845.98	$1,809.28
Median	$1,293.73	$1,632.00	$1,646.00
Std. Deviation	$1,306.90	$1,553.25	$1,496.44
Sum	$1,199,445,699	$1,202,833,446	$1,391,874,686

Note: See text for source of data.

Given the gap between the number of Food Stamp cases in the administrative data and the number of reported cases in the ACS, we can conclude that a number of ACS households that do receive Food Stamps are not reporting this receipt. There are several possible reasons for not reporting receipt, including: social stigma; inattentiveness while filling out the survey; and cases that were not active at the time of sampling but became active later in the year. Unfortunately, none of these factors are directly observable, which limits our ability to model underreporting of participation.

[72] O'Donnell, Sharon and Rodney Beard "Imputing medical out of pocket (MOOP) expenditures using SIPP and MEPS."

What is known is that Food Stamp participation is highly correlated with participation in other income support programs, such as Public Assistance (PA) and Supplemental Security Income (SSI). Analysis of administrative data shows that roughly 80 percent of people on PA and SSI participate in the Food Stamp program. Given this high degree of participation, we assigned Food Stamp values to individuals who were eligible for Food Stamps and reported PA or SSI receipt, but did not report Food Stamp receipt.[73] Adding these cases increased the number of Food Stamp units from 584,913 to 651,597.

Table D Four

Comparison of Self-Reported and Estimated Food Stamp Values in the 2007 ACS

	Cases		Individuals		Total Value	
	Number	Ratio	Number	Ratio	Number	Ratio
ACS	423,601	0.55	1,162,242	0.81	$854,492,600	0.61
CEO value adjusted	584,913	0.76	1,162,242	0.81	$1,098,214,715	0.79
CEO value and case adjusted	651,597	0.85	1,263,576	0.89	$1,202,833,446	0.86
Administrative	769,303	NA	1,425,442	NA	$1,391,874,686	NA

Note: See text for source of data.

The CEO Food Stamp estimates of the trends in Food Stamps receipt and value from 2005 to 2008 are reported in Table D Six. They come close to replicating the observed trends in the administrative data, but do not do so exactly. Specifically, while the administrative data shows a consistent upward trend over the four years, the CEO estimates show a decrease in cases and aggregate value from 2006 to 2007, which interrupts the overall trend of increases. This is likely the result of sampling variability in the ACS. Additionally, the CEO estimates show a larger spike in the number of cases between 2007 and 2008 than seen in the administrative data. This may be a result of the change in the question regarding Food Stamps in the 2008 ACS survey, described above.

[73] "Eligible" is defined using the SNAP program rules such as citizen or legal resident for five years or more with a gross income less than or equal to 130 percent of the official poverty line.

Table D Five

Comparison of CEO Estimates to Administrative Food Stamp Data

	Recipients		Aggregate Value		CEO/Admin.	
	CEO	Admin.	CEO	Admin.	Recipients	Value
2005	1,232,477	1,330,485	$1,119,330,576	$1,256,974,264	0.926	0.890
2006	1,283,999	1,353,842	$1,211,516,687	$1,267,019,323	0.948	0.956
2007	1,263,576	1,425,442	$1,202,833,446	$1,391,874,686	0.886	0.864
2008	1,382,896	1,450,703	$1,303,327,727	$1,431,316,157	0.953	0.911
Percentage change, 2005-2008:						
	12.2%	9.0%	16.4%	13.9%		

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO. New York City Human Resources Administration, EDW.

Our new methods have a modest effect on the overall poverty rate. Moving from the reported values to the PMM values decreases the overall poverty rate for 2007 by 0.4 percentage points, from 22.7 percent to 22.3 percent. Adding the additional cases results in a further 0.1 percentage point decrease to 22.2 percent.

School Lunches

The National School Lunch Program (NSLP) offers free lunches to all school children whose family income is below 130 percent of Federal poverty guidelines and reduced-price lunches to school children whose family income is between 130 percent and 185 percent of Federal poverty guidelines. Like Food Stamps, receipt of free or reduced-price school lunches can free resources for other uses that would otherwise be spent on food.

The American Community Survey does not record whether children in households receive free or reduced-price lunch, making it necessary for the study to estimate how much families might benefit from the program. To develop this estimate we first used ACS schooling and income variables to establish eligibility. Only children from kindergarten through high school were assumed to be eligible for lunch subsidies. The total number of free and reduced-price lunch recipients found in the ACS was comparable to the numbers shown in City administrative data.[74]

[74] We compared the ACS data with New York City Department of Education data from October 31, 2005 indicating that 599,896 public school students were eligible for either free or reduced-price lunch. One possible explanation for the discrepancy in data is that the ACS analysis calculates eligibility for all students, while the DOE data is only for public school students.

Next, the benefit value per lunch was applied, and multiplied by the number of school days. To calculate an annual school lunch value, the study followed the United States Census Bureau methodology and used the Census Bureau's dollar value for free and reduced-price school lunch – $2.726 per day for free lunches, and $2.326 for reduced-price in 2008.[75] The school lunch value was then multiplied by 175 school days, assuming 180 days in the school year and allowing five days for absences.[76] This established an annual value of $477 for those children who received free lunches and $407 for those who received reduced-price lunches.

The value of the lunch subsidy was then assigned to each family based on number of eligible children. Table D Six provides the mean, median, and aggregate values for family units with children receiving free or reduced-price lunches. The estimates of free and reduced price school lunches are quite consistent over the four year period. The differences in the population eligible for the program are small enough that they could simply be the result of sampling variability.

Table D Six

Students Eligible for Free or Reduced Price School Lunch

	2005	2006	2007	2008
Free	438,604	456,729	420,360	418,038
Reduced Price	169,470	163,606	168,492	159,780
Total	608,074	620,335	588,852	577,818
Aggregate Value (in thousands)	$249,577	$252,045	$255,634	$255,178
Mean per Recipient Family (Poverty Unit)	$740.84	$765.50	$804.30	$812.72
Median per Recipient Family (Poverty Unit)	$719.25	$738.15	$780.50	$814.10

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

Impact of Nutritional Assistance on CEO Poverty Rate

Adding the value of nutritional assistance to family resources has a noticeable impact on the poverty rate. As Table D Seven shows, nutritional assistance decreased the City-wide poverty rate by over 2 percentage points in each year. This effect is somewhat higher for families with children, lowering the poverty rate for this group by over 3 percentage points;

[75] Jessica Semega, personal correspondence to the authors. Ms. Semega is a Statistician with the U.S. Census Bureau Income Surveys Branch, Housing and Household Economic Statistics Division.
[76] School Year Calendar for 2005-2006 and 2006-2007, The New York City Department of Education.

this difference is driven by the fact that families with children can take advantage of both Food Stamps and the School Lunch program.

Table D Seven

Impact of Nutritional Assistance on Poverty Rates, 2005 - 2008

All Persons:	2005	2006	2007	2008
Total CEO Income	20.6	21.2	22.2	22.0
CEO Income without Nutritional Assistance	22.8	23.7	24.3	24.2
Impact of Nutritional Assistance on Poverty Rate	-2.2	-2.5	-2.1	-2.2
Persons Living in Families with Children:				
Total CEO Income	22.3	22.9	24.7	23.1
CEO Income without Nutritional Assistance	25.5	26.7	27.9	26.5
Impact of Nutritional Assistance on Poverty Rate	-3.2	-3.7	-3.2	-3.4

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

APPENDIX E:
ADJUSTMENT FOR HOUSING STATUS

Any credible method for measuring poverty in New York must account for the high cost of housing in the City. Appendix B, which details how the CEO poverty threshold is constructed, describes how we create a more realistic poverty line for New York City by adjusting the U.S.-wide NAS threshold for the difference between housing costs in the City and the nation. But measuring poverty in New York must also recognize that what families need to pay for shelter of adequate quality varies widely. As Table E One indicates, homeowners who have paid off their mortgages spend less on shelter than do those who are still making mortgage payments. Renters living in public housing or who are receiving a Section 8 or similar housing subsidy have dramatically lower shelter costs than families who pay market rate rents. Tenants in rent-stabilized or controlled apartments also receive some protection from the high cost of housing.

Table E One

Distribution of NYC Households by Housing Status, 2008

	Renters				Owners	
	Public Housing	Rent Assistance	Controlled / Stabilized	Market Rate	With Mortgage	Free and Clear
Number of households	165,399	186,582	997,676	802,692	770,540	312,616
Percent of households in NYC	5.1	5.7	30.7	24.7	23.7	9.6
Median Out-of-Pocket Expenditures for Shelter & Utilities	$6,336	$4,836	$12,000	$18,000	$24,120	$8,800
Median Value of Housing Status Adjustment	$4,517	$6,779	$0 [1]	N.A.	N.A.	$1,869

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.
Note: [1] 43.9% of Controlled/Stabilized Renter Households have some Housing Adjustment.

If families in different housing circumstances do not require the same income to meet their housing needs, an additional adjustment is needed to capture the effect of these different circumstances. In principle, CEO could have developed different poverty thresholds for families with different housing statuses to account for this variation. But it is far simpler to make an adjustment to family resources. Households living in "non-market rate" housing units (participants in means-tested housing assistance programs, tenants in

rent-stabilized or controlled apartments, and home owners free and clear of a mortgage) all receive the difference between the shelter and utilities share of their poverty threshold and what they pay out-of-pocket for these items.[77]

Housing Status Adjustment =
Housing and Utilities Portion of CEO Poverty Threshold –
Out-of-Pocket Housing and Utilities Expenditures

This approach places a dollar value on the benefits of residence in non-market rate housing. If housing-related expenditures are less than the housing and utilities portion of the threshold, the difference represents funds that are available to the family to meet their non-housing needs.

Revision of Approach to the Housing Adjustment

Many families in New York City spend more on shelter than the shelter and utilities portion of their threshold. A majority of them are living in market-rate housing, but some tenants in rent-stabilized or controlled apartments or owners who have paid off their mortgages also spend more on housing than what the shelter and utilities portion of their threshold implies they need to pay to meet their housing needs. Most of this latter group is made up of families whose incomes are high enough to insure that their excess spending does not jeopardize their ability to meet their other basic needs. The reduction in their CEO income that would come from a negative housing status adjustment would not change their poverty status.

But there is a small group of families and individuals for whom this is not the case. In our first working paper we allowed for negative housing adjustments which pulled some families, whose out-of-pocket spending for housing-related needs exceeded the shelter and utilities share of their threshold, below the poverty line. If we had continued that practice, the 2008 CEO poverty rate would have been 23.1 percent rather than 22.0 percent.

[77] For renters, out-of-pocket expenditures are their gross rent, which includes utility payments. Homeowners' expenditures include utilities, property taxes, homeowners insurance, and real estate taxes. If there is more than one poverty unit within the household, the adjustment is prorated across the units by their share of the number of members of the household.

In this report the housing adjustment is either positive or zero; we do not allow families' out-of-pocket housing expenditures to place them in poverty. The rationale for this lies in the meaning of discretionary and non-discretionary spending in the context of the NAS method for measuring poverty. Under the NAS methodology, consumer expenditures for necessities are used to establish the poverty threshold. Where it is difficult to create an appropriate standard of need based on the distribution of expenditures by the NAS reference families, (e.g. for medical needs that must be met by out-of-pocket spending), the NAS method subtracts this spending from income. What a particular family is actually spending for medical care is treated as a non-discretionary expense.

Other forms of actual spending by families on necessities influence the poverty threshold, but do not figure into the determination of the individual family's poverty status. What families spend on food or clothing is a case in point. Since these needs are represented in the threshold, the relevant question to ask in order to determine the family's poverty status is whether the family has the capacity, given its resources, to obtain adequate food and clothing. Their actual spending on these necessities is considered to be discretionary and plays no role in whether they are poor.

When it comes to housing in New York City, the judgment CEO is now making is that our adjustment of the U.S.-wide poverty threshold is sufficient; families can obtain housing that is adequate *for the purposes of poverty measurement*, at the cost represented by the adjusted shelter and utilities threshold (equal to $16,556 for a two-adult, two-child family in 2008). If families are spending more, we consider this to be discretionary and not a reason to classify them as poor.

We find support for this judgment in local housing expenditure data. We use the Census Bureau's 2008 New York City Housing and Vacancy Survey to compute gross rents paid by households composed of two adults and two children. The shelter and utilities share of the CEO threshold is meant to represent a need that is met at market rates. It should also correspond to a notion of adequate quality. In order to capture market rate costs we restrict our estimate to households living in market rate apartments that they have moved into since 2000. We address the issue of quality by limiting our estimate to two and three bedroom apartments. (This number of bedrooms corresponds to the regulations in HUD's Section 8

voucher program.) For these households median annual gross rents came to $16,320.[78] The close correspondence between this figure and the shelter and utilities share of the threshold is a strong argument that families can find appropriate housing in the City at the cost represented by the shelter and utilities portion of the CEO threshold and that expenditure above this level should be treated as discretionary.

Use of the New York City Housing and Vacancy Survey for Housing Data

The American Community Survey (ACS) does not contain the data needed for the CEO housing adjustment. To remedy this, data from the New York City Housing and Vacancy Survey (HVS) were merged with the ACS sample data for New York City. The HVS is a survey of local housing costs and conditions that is conducted every three years by the U.S. Census Bureau. It includes a sample of more than 15,000 households from all five boroughs and collects detailed information on rents paid, subsidies received, the presence or absence of rent controls or stabilization, and a host of other housing-related information.[79]

The years included in this report, 2005 through 2008, are covered by two editions of the HVS, 2005 and 2008. To use them in this study, therefore, it was necessary to update the 2005 data for 2006 and 2007 to reflect changes in housing costs since 2005. (The 2008 data was covered by the corresponding year of the HVS and required no update.) Separate adjustments were made for different housing statuses. Out-of-pocket rents for Public Housing increased by 5.9 percent for 2006 and by 12.6 percent for 2007, based on information from the New York City Housing Authority (NYCHA). The adjustment for stabilized and controlled units was 4.0 percent for 2006 and 7.1 percent for 2007, based on New York City Rent Guidelines. The adjustment for market rate rental units was 6.8 percent for 2006 and 11.6 percent for 2007, derived from the U.S. Bureau of Labor Statistics' Consumer Price Index for "rent of primary residents" for the New York-New Jersey region. The analog of rental costs for home owners is the sum of the values of mortgage or condo fees, insurance, real estate taxes and water/sewer charges. These were adjusted up by 6.0 percent for 2006 and 9.8 percent for 2007, based on the regional Consumer Price Index for "owners' equivalent rent of primary residence."

[78] CEO tabulation from the 2008 New York City Housing and Vacancy Survey.
[79] More information is available at: www.census.gov/hhes/www/housing/nychvs/2005/overview.html.

To assign the HVS housing data to ACS households, we matched individual HVS households to ACS households on several characteristics: 1) the Public Use Microdata Area (PUMA) or Community District where the household resides;[80] 2) whether the housing was owned or rented; 3) the number of people in the household; 4) household income; 5) ethnicity of the household head; and 6) whether or not the household head was 65 years of age and above. Matching was conducted by first randomizing the order of the households in each file. Then, taking the first HVS record, we scanned through the ACS list to find the first ACS household that matched it on all of the characteristics mentioned. About 64 percent of households were matched on all characteristics, and 92 percent were matched on income, family size, renter/owner status, and PUMA. (More details on the HVS and the matching procedure can be found in Appendix C of our first working paper.)

Impact of Housing Adjustment on Poverty Rates

As shown by Table E Two, adjusting income to reflect housing costs has a considerable impact on poverty in 2008. Across the entire population the housing adjustment lowers the poverty rate by 5.7 percentage points. The effect of the adjustment is especially dramatic for families in means-tested housing programs. The poverty rate for residents of public housing, for example, would be almost 17 percentage points higher if housing was not taken into account when calculating their CEO income. The reason for this large difference is seen in Table E One; the median amount of the housing adjustment for people in public housing is $4,517.

Table E Two

Effect of Housing Adjustment on Poverty Rate, 2008

	Poverty Rate based on Total CEO Income	Poverty Rate without Housing Adjustment	Difference
Total New York City	22.0	27.7	-5.7
Public Housing	42.5	59.2	-16.7
Rent Assistance	41.9	68.4	-26.5
Controlled/Stabilized	29.8	34.6	-4.9
Free and Clear	15.2	19.6	-4.4

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

[80] The PUMAs created by the Census Bureau are designed to approximate New York City's Community Districts.

APPENDIX F:
WORK-RELATED EXPENSES

The National Academy of Sciences Panel recommended that work-related expenses be treated as a non-discretionary expense that should be deducted from family resources. As in our first report we account for child care expenses and commuting costs in our measure. Unfortunately, the American Community Survey does not include all of the data needed to calculate these items. What follows is a brief description of our method for estimating these costs. (A more detailed explanation is available in Appendix D of our initial report.)

Child Care Expenses

Our estimates are based on child care expenditures by urban families in the 2001 and 2004 child care modules of the Survey of Income and Program Participation (SIPP). Families in different circumstances have differing child care needs and expenditures are likely to vary significantly. To ensure that these were accurately measured, we separated our sample into married and single-headed family groups. Next, we employed a two-step process to determine, first, the probability that a family paid for child care and, second, to estimate the child care expenses. To determine which families paid for child care, we used a logit regression based on socioeconomic characteristics such as: the ages and number of child and adult family members; education and employment levels of adults in the family; the proportion of adult female earnings in the family; and participation in programs such as TANF or Food Stamps. Once we determined that a family would be paying for child care, we used an OLS regression based on similar socioeconomic characteristics to estimate the weekly amount paid for child care.

The one methodological change we made from our first report was to include unmarried partners into calculations for whether or not child care expenditures were discretionary. This change limited the amount of child care expenses by the earnings of the lowest earning spouse or *unmarried partner*. We made this change to be conceptually consistent with our poverty unit of analysis – unmarried partners are assumed to behave just as a married couple when making child care decisions.

Table F One presents the distribution of child care expenditures for working families, with at least one child under 12, in the CEO augmented ACS for 2008. As expected, both the share of families paying for child care and their expenditures rise as income rises. For

example, only slightly more than 7 percent of the families below the 10th percentile of the income distribution pay for child care, with a median cost of $63 per week, while over 70.2 percent of those above the 90th percentile of income are paying with the highest median weekly cost of $258 per week. This leads to a disproportionate share of families paying for child care from the higher income brackets; over 19 percent of the paying families coming from the top decile and only 1.4 percent coming from the lowest decile.

Table F One

Estimated Child Care Expenditures by Income Level, 2008

Percentile of pre-tax income	Share of income decile paying for child care	Share of all paying for child care	If paying: Weekly child care exp.		Annual child care exp.	
			Mean	Median	Mean	Median
0-10	7.1%	1.4%	$69	$63	$2,209	$2,035
10-20	23.0%	4.6%	$79	$72	$3,300	$3,229
20-30	29.4%	7.0%	$92	$82	$3,838	$3,847
30-40	31.6%	8.0%	$97	$94	$4,392	$4,361
40-50	40.8%	8.2%	$109	$103	$4,654	$4,707
50-60	42.1%	10.9%	$124	$118	$5,346	$5,268
60-70	49.4%	10.6%	$141	$128	$6,065	$5,956
70-80	54.1%	13.8%	$161	$148	$7,147	$6,958
80-90	62.4%	16.4%	$192	$180	$8,589	$8,147
90-99	70.2%	19.1%	$287	$258	$12,176	$11,319
All	42.6%	100%	$165	$137	$7,130	$6,104

Source: Tabulated from New York City Sample of 2006 American Community Survey augmented with data from the 2001 and 2004 SIPP.
Notes: Poverty units with at least one parent working and at least one child under 12. Household weights were used to construct the estimates.

Commuting Costs

As in the first working paper, transportation to work costs were estimated using information from the ACS and various outside sources. There were a number of changes for the 2008 estimates; the largest is a result of a change in the ACS variable "WKW- weeks worked in the last 12 months." Prior to 2008, WKW reported the number of weeks worked; this was changed into a range of weeks. WKW now has six values representing different ranges of weeks worked such as "14 to 26 weeks" or "50 to 52 weeks," as opposed to the specific number of weeks. When using WKW to calculate the annual commuting costs (weekly commuting cost multiplied by the number of weeks worked) we used the mid-point of each category range to represent the number of weeks worked. The other change for 2008 was that the cost of many modes of transport increased in March of 2008. This

includes the cost of a Metrocard, travel via railroad, and tolls on both Port Authority and Metropolitan Transportation Authority bridges and tunnels.

Table F Two shows commuting modes with weekly and annual costs for 2008 and reflects both these changes. The highest commuting costs were incurred by those that commuted by taxi, railroad or driving alone. Close to half (47.6 percent) of all commuters used either the subway or bus for their commute. At a cost per trip of $1.93, this resulted in a weekly median commuting cost of $19. The annual median for commuting costs was $965.

Table F Two

Transportation Mode and Costs, 2008

Mode of Transport	Number of Commuters	Percent	Weekly Cost		Annual Cost	
			Median	Mean	Median	Mean
Drove Alone	894,133	21.0%	$41.41	$48.47	$1,932	$2,345
Drove with Others	207,030	4.9%	$17.25	$22.10	$828	$1,049
Bus	470,591	11.1%	$19.30	$18.39	$965	$863
Subway	1,549,843	36.5%	$19.30	$19.35	$965	$917
Railroad	66,637	1.6%	$43.25	$50.64	$2,163	$2,398
Ferry	8,852	0.2%	$0.00	$0.00	$0	$0
Taxi	39,744	0.9%	$96.00	$88.55	$4,704	$4,234
Motorcycle	1,809	0.04%	$28.99	$32.19	$1,449	$1,567
Bike	24,029	0.6%	$0.00	$0.00	$0	$0
Walked	389,949	9.2%	$0.00	$0.00	$0	$0
Worked at Home	138,971	3.3%	$0.00	$0.00	$0	$0
Other Method	19,112	0.4%	$19.30	$19.00	$965	$902
No Mode	439,672	10.3%	$19.30	$15.87	$386	$461
All Modes	4,250,372	100.0%	$19.30	$23.70	$965	$1,104

Source: Tabulated from New York City Sample of 2006 American Community Survey augmented with data from the following sources, "Regional Travel-Household Interview Survey," February 2000, New York Metropolitan Transportation Council- New Jersey Transportation Planning Authority; IRS Revenue Procedure 2008-72 established the standard mileage rates for deductible costs of operating an automobile for business purposes; The New York City Taxicab Fact Book, March 2006, Schaller Consulting.
Note: Those that commuted via "Other Method" or had no mode but did have work within the last 12 months were assigned the average cost of a subway or bus trip.

Effect of Work-Related Expenses on Poverty Rates

Panel A of Table F Three illustrates the impact of work-related expenses on poverty rates for the years 2005-2008. The first line of this table shows the poverty rate using all the elements of CEO income. The second line provides the poverty rate using CEO income without work-related expenses. As expected, poverty rates without work-related expenses are lower (with decreases ranging from 2.1 percentage points to 2.6 percentage points)

because families would now have more income available to purchase the necessities in the threshold. When looking at the poverty rate estimated after each specific work-related expense (reported on the fourth and sixth lines of the table) we see that the largest impact is from commuting costs.

Table F Three

Impact of Work-Related Expenses on Poverty Rates, 2005 - 2008

	2005	2006	2007	2008
Panel A.				
All Persons:				
Total CEO Income	20.6	21.2	22.2	22.0
CEO Income without Work-Related Expenses	18.5	18.6	19.7	19.5
Impact of Work-Related Expenses on Poverty Rate	2.1	2.6	2.5	2.4
CEO Income without Commuting Costs	19.2	19.4	20.3	20.3
Impact of Commuting Costs on Poverty Rate	1.4	1.8	1.9	1.7
CEO Income without Child Care Expenditures	19.8	20.2	21.5	21.1
Impact of Child Care Expenditures on Poverty Rate	0.7	1.0	0.7	0.9
Panel B.				
Persons Living in Working Families with Children:				
Total CEO Income	11.8	13.2	14.8	14.6
CEO Income without Work-Related Expenses	8.3	9.0	10.9	10.6
Impact of Work-Related Expenses on Poverty Rate	3.5	4.2	3.9	4.0
CEO Income without Commuting Costs	9.7	10.6	12.1	12.2
Impact of Commuting Costs on Poverty Rate	2.1	2.6	2.6	2.4
CEO Income without Child Care Expenditures	10.4	11.2	13.3	12.8
Impact of Child Care Expenditures on Poverty Rate	1.4	2.1	1.5	1.8

Source: Tabulated from American Community Survey Public Use Micro Sample as augmented by CEO.

Panel B of Table F Three shows the impact of work-related expenses on persons living in working families with children.[81] Work-related expenses have a larger impact on poverty rates for this specific population than they do for the City as a whole. The difference between the poverty rates calculated with and without the deduction for work-related expenses ranges from 3.5 percentage points to 4.2 percentage points. Unsurprisingly, given the definition of the group in Panel B, the difference in the effect of work-related expenses on poverty rates comes from both child care and commuting costs.

[81] A working family is defined as a family that has collectively in the past 12 months worked the equivalent of at least one full time, year-round worker (at least 1,750 hours).

APPENDIX G:
MEDICAL OUT-OF-POCKET EXPENDITURES

In our first working paper CEO developed estimates of medical out-of-pocket (MOOP) expenditures that relied on data from the Medical Expenditure Panel Survey (MEPS) for 2005 that were provided by Jessica Banthin, Director of Research at the U.S. Department of Health and Human Services' Agency for Healthcare Research and Quality. The data divided families in the MEPS sample into 79 cells defined by their demographic and economic characteristics. For each cell, estimates were made of MOOP expenditures for the 25th, 50th, and 75th percentiles of the spending distribution. Using these expenditure values, we employed a "hot-deck" imputation method to assign MOOP expenditures to families in ACS cells that were constructed with the identical demographic and economic characteristics. (Details of this procedure can be found in Appendix E of the report.)

We received suggestions that by allowing more variation in the estimation of expenditures, our technique would more accurately capture the pattern of MOOP expenditures evident in the MEPS. Specifically, rather than relying on three possible values for each demographic group, we should estimate nine decile values of MOOP expenditures for each group. The result of this new approach is illustrated in Table G One. The column labeled "MEPS-US" reports estimates from the U.S.-wide MEPS donor file. The column labeled "CEO-NEW" reports estimates using the nine-value methodology. The column labeled "CEO-OLD" reports estimates using the old, three-value methodology. The wider range of values per cell creates a set of estimates for MOOP expenditures in the ACS that more closely resembles the distribution of expenditures in the MEPS. The most salient comparisons between the three columns are the ratios listed at the bottom of the table. They measure the inequality in spending between different points in the distribution. The new method comes dramatically closer to reproducing the pattern of expenditure inequality found in the MEPS than the old method.

Table G One

Comparison of Medical Expenditures for Families, by Decile, 2006
Distribution of MOOP Expenditures

Percentile	MEPS-US	CEO-NEW	CEO-OLD
10	$80	$96	$207
20	$412	$398	$480
30	$868	$808	$953
40	$1,394	$1,239	$1,283
50	$2,040	$1,792	$1,846
60	$2,720	$2,314	$2,301
70	$3,648	$3,038	$2,724
80	$4,864	$4,036	$3,733
90	$7,115	$5,720	$4,862
Ratios			
90/10	88.9	59.6	23.5
90/50	3.5	3.2	2.6
50/10	25.5	18.7	8.9
Means	$3,088	$2,401	$2,182

Source: Tabulated from New York City Sample of the American Community Survey augmented with data from the 2006 Medical Expenditure Panel Survey.
Note: Household weights were used to construct the estimates. In the MEPS, families are CPS Families. In the ACS, families are poverty units.

Another notable feature of the new method is that, in the 2006 estimates, with the exception of the 10th decile, MOOP spending across the distribution is lower in our new model than in the donor MEPS data set. The reason for this is that our model uses demographic attributes, such as race and ethnicity, along with income to predict MOOP expenditures.[82] Independent of income, Blacks and Hispanics have lower MOOP spending than do Non-Hispanic Whites. Because New York City has a much lower proportion of Whites in its population than does the nation as a whole, the estimates for spending will be lower.

Another change in our imputation strategy is due to the addition of health insurance coverage questions to the ACS in 2008. Respondents were asked whether they had any of

[82] Because of the addition of health insurance coverage in the 2008 ACS, we altered the imputation slightly which results in race/ethnicity not being used to divide the population into demographic cells.

eight types of health insurance including: coverage by a current or former employer or union, coverage purchased directly from an insurance company, Medicare, Medicaid or other government-assistance plans (including SCHIP or individual state health plans), Tricare or other military health care, Veterans Administration (VA), Indian Health Service, or any other type of coverage.

The ACS Public Use Micro Sample includes respondent's specific coverage and also provides three insurance coverage summary variables. A respondent was coded as having private health insurance if they answered that they had coverage provided by an employer or union, coverage purchased directly from an insurance company, or Tricare (military) coverage. If a respondent answered that they had Medicare, Medicaid (or other public plan), or VA coverage, they were coded as having public health insurance. If a respondent didn't indicate any coverage or their only coverage was Indian Health Service, then they were coded as uninsured.[83]

A third change from the approach we took in our first report is that we make use of the 2006 MEPS in addition to the survey for 2005. We employ the 2005 MEPS for our MOOP estimates for 2005 and use the 2006 MEPS for later years. The MOOP estimates for 2007 and 2008 were inflation adjusted by the CPI-U U.S. All-City Average for Medical Care.

Estimates

Table G Two provides the distribution of MOOP expenditures in the 2008 ACS for poverty units with elderly and non-elderly heads by their health insurance status. As a comparison, it also provides data from the 2006 MEPS[84] by families. The table suggests a wide variation in MOOP expenditures based on the family head's health insurance coverage. We see much higher MOOP expenditures for families with elderly and non-elderly heads with private insurance and much lower expenditures for those uninsured or with public coverage.

[83] American Community Survey, 2008 Subject Definitions, page 49.
[84] The 2006 MEPS data has been inflation adjusted to 2008 dollars.

Table G Two

Distribution of Medical Expenditures, By Family, 2008

NYC, ACS 2008

	Non-Elderly Head			Elderly Head	
	Private	Public	Uninsured	Private	Public and Uninsured
Weighted Sample	1,764,345	394,623	451,975	330,582	305,029
Mean	$3,356	$802	$984	$4,162	$2,601
Percentile					
10	$603	$4	$0	$1,488	$289
20	$1,012	$35	$0	$1,781	$866
30	$1,508	$99	$88	$2,430	$1,174
40	$2,100	$162	$227	$3,076	$1,638
50	$2,568	$295	$341	$3,349	$2,169
60	$3,309	$463	$707	$4,093	$2,468
70	$4,188	$746	$1,020	$4,720	$3,105
80	$5,340	$1,299	$1,910	$6,020	$4,142
90	$7,425	$2,396	$2,435	$8,184	$5,725

US, MEPS 2006, CPI - ADJUSTED TO 2008 DOLLARS

	Non-Elderly Head			Elderly Head	
	Private	Public	Uninsured	Private	Public and Uninsured
Weighted Sample	76,401,534	10,752,457	17,560,689	14,042,099	10,123,741
Mean	$3,953	$1,025	$1,258	$4,676	$2,974
Percentile					
10	$478	$0	$0	$1,064	$198
20	$953	$16	$0	$1,804	$745
30	$1,450	$62	$35	$2,430	$1,301
40	$2,068	$127	$146	$3,013	$1,835
50	$2,729	$226	$302	$3,694	$2,291
60	$3,506	$394	$561	$4,407	$2,848
70	$4,437	$722	$998	$5,346	$3,650
80	$6,039	$1,377	$1,961	$6,663	$4,783
90	$8,662	$2,780	$3,602	$9,177	$6,627

Source: Tabulated from New York City Sample of the American Community Survey augmented with data from the 2006 Medical Expenditure Panel Survey and 2006 Medical Expenditure Panel Survey.
Note: Household weights were used to construct the ACS based estimates.

Table G Three indicates that MOOP expenditures also vary widely with income. It reports estimated MOOP expenditures by pre-tax income deciles for the 2008 ACS. Poverty units with elderly heads have significantly higher mean and median expenditures, especially in the lower income deciles, than those headed by the non-elderly.

Table G Three

**Estimated Medical Expenditures,
By Poverty Unit Income Level, 2008**

Percentile of pre-tax income	Non-Elderly Head		Elderly Head	
	Mean	Median	Mean	Median
0-10	$1,007	$463	$1,850	$1,526
10-20	$1,081	$463	$2,307	$2,042
20-30	$1,587	$962	$3,434	$2,996
30-40	$2,017	$1,299	$3,731	$3,227
40-50	$2,410	$1,689	$4,258	$3,898
50-60	$2,827	$2,102	$4,170	$3,594
60-70	$3,258	$2,568	$4,413	$4,093
70-80	$3,463	$2,945	$4,454	$3,898
80-90	$3,812	$3,073	$4,526	$4,093
90-99	$4,048	$3,309	$4,613	$4,093
All	$2,699	$2,049	$3,413	$2,979

Source: Tabulated from New York City Sample of 2008 American Community Survey augmented with data from the 2006 CPI-adjusted Medical Expenditure Panel Survey.
Note: Household weights were used to construct the estimates.

The Effect of MOOP Expenditures on Poverty Rates

Table G Four illustrates the effect of MOOP expenditures on poverty rates for 2005 through 2008. For the City as a whole, MOOP expenditures brought an additional 3.0 percent to 3.5 percent of the population into poverty. The elderly are particularly vulnerable to impoverishment due to out-of-pocket medical expenditures. Poverty rates for persons living in families headed by an elderly person are 6.7 percentage points (in 2008) to 7.9 percentage points (in 2005) higher because of MOOP expenditures. An explanation for the apparent decline in the effect of MOOP on the poverty rate for elderly-headed families is the enactment of the Medicare Part D prescription drug coverage that went into effect on January 1, 2006. The estimates for 2008 are also influenced by the addition of health insurance coverage status to our imputation methodology.

Table G Four

Impact of Medical Expenditures on Poverty Rates, 2005 - 2008

	2005	2006	2007	2008
All Persons:				
Total CEO Income	20.6	21.2	22.2	22.0
CEO Income without MOOP	17.6	17.9	18.7	18.5
Impact of MOOP on Poverty Rate	3.0	3.3	3.5	3.4
Persons Living in Families with Elderly Head:				
Total CEO Income	27.5	27.1	27.6	28.3
CEO Income without MOOP	19.6	19.9	20.4	21.6
Impact of MOOP on Poverty Rate	7.9	7.2	7.2	6.7

Source: Tabulated from New York City Sample of the American Community Survey augmented with data from the 2005 & 2006 Medical Expenditure Panel Survey.

Estimating MOOP Expenditures from the Medical Expenditure Panel Survey

This section provides a detailed description of our new method for imputing MOOP expenditures.

The MEPS is a panel design survey with five rounds of interviews over a two-year time period. A specific calendar year (we'll use 2006 throughout the rest of this section as our example) will have information from two different panels of the survey. Therefore, 2006 is represented by Rounds three, four and five of Panel nine, initiated in 2005 and Rounds one, two and three of Panel ten, initiated in 2006.[85] The portions of the MEPS that we used to calculate MOOP are the Full Year Consolidated Data (Full Year) File and the Person Round Plan Public Use (PRPL) File.

The Full Year file is a hierarchical file with a unique identifier, DUPERSID, for each member of a respondent's household. DUID identifies a dwelling unit and a person number, PID, identifies each person within the dwelling unit. DUPERSID is the combination of the DUID and PID. The TOTSLF variable records out-of-pocket expenditures for medical services paid by the patient or patient's family over the course of the calendar year. TOTSLF does not include health insurance premiums. The INSCOV06 variable records what type of insurance (private, public or uninsured) a person has but not the cost of the premium. Private health insurance premiums are recorded in the PRPL File (The PRPL File contains only insurance premiums for private policies and does not contain any information on Medicare Part B premiums, which we discuss below).

[85] Round three of a panel is the only round that crosses calendar years and therefore provides data for both years.

The PRPL file contains information collected through a respondent's medical insurance provider and includes information such as health insurance premiums, diagnosis, procedural codes, dates of visits, charges, and payments. The PRPL File contains a unique record for each Round of a Panel and therefore may contain multiple records for each DUPERSID.

Within the PRPL File, a flag of 1 for variables OOPELIG and PHOLDER indicates that a person is a policy holder and therefore should have a health insurance premium value. The monthly out-of-pocket premium (OOPPREM) is collected at the beginning of the year in Round one or Round three (depending on the Panel). Because the monthly out-of-pocket premium is only collected at the beginning of a round, persons receiving insurance in the middle of the year will not have a recorded premium value and therefore will have to have a premium assigned. The process we use to accomplish this is discussed below.

For those with a recorded OOPPREM value, the annual premium value provided in the PRPL File, OOPX12X, is the monthly premium multiplied by 12. This is done to provide researchers with an annualized cost but does not consider actual coverage in the calculations. Therefore it does not accurately record the actual premium expenditures and some manipulation is required to create the actual out-of-pocket health insurance premium expenditures.

A respondent's insurance coverage is recorded with the STATUS variables. There are 24 STATUS variables, each representing a month of coverage in the year 2006 (STATUS 1 – 12 for respondents in Panel 10 and STATUS 13 – 24 for respondents in Panel 9). The corresponding STATUS variable will have a 1 to indicate coverage, a 2 to indicate lack of coverage or a -1 if that STATUS variable doesn't correspond to the current panel and round of the survey. Using the STATUS variables, we calculated the number of months that a respondent had health insurance coverage for the year. Once the number of covered months was calculated, we used that value coupled with the yearly premium to calculate the out-of-pocket premium expenditure (the formula we used was (months covered/12) × OOPX12X).

It is important to note that a person can have more than one plan premium, as they can be covered by multiple insurance policies. Once all the plan premiums were calculated, if a person was covered by more than one plan, we aggregated these plans to get that person's total health insurance premium expenditures. This total person premium was then

merged into the Full Year File and aggregated so that we generate one value for each family's premium.

After appending the person-level premium value to the individuals in the Full Year File, we still have those people, mentioned above, who are privately insured but do not have premium values because of when they started to receive insurance. To assign premiums to these persons we used a hot-deck imputation, a method which assigns data to missing values using recorded values from other complete data in that sample. For our purposes, this will assign health insurance premium values for those persons that are coded, through the INCOV06 variable in the Full Year File, as having private insurance but do not have premiums.[86]

To insure that we imputed premiums from data respondents with similar characteristics, we assigned individuals with private health insurance into a number of different demographic subgroups. First, we separated them into those residing in elderly family and non-elderly family groups based on the age of the family head. Within each of these age groups, we grouped the sample based on family size – either one person or two or more persons. This resulted in four sample groups, each of which is then sorted in the order of the characteristics listed in Table G Five.

[86] In this work we follow a procedure described in Altmayer, Lawrence. Hot-Deck Imputation: A Simple DATA Step Approach. U.S. Bureau of the Census.

Table G Five

Order of Sorting Within Groups
For Premium Imputation

	Elderly /Non-Elderly	
	Single Person	Multi-person
Poverty Status Group	1	1
Marriage Status		2
Education Status	2	3
Race/Ethnicity	3	4
Absolute Poverty Status	4	5

Notes: Poverty Status Groups: 'Less than 100%', '100 - 199%', '200 - 299%', '300 - 399%', '400% or More'
Race/Ethnicity Groups: 'Black and Hispanic', 'White and Other'
Education Status Groups: 'Some college and Below', 'Bachelors or Higher'
Marriage Status Groups: 'Currently married', 'Not Currently Married'
Absolute Poverty Status: Income/Threshold

Once the groups were sorted on the above characteristics, the imputation program assigned recorded premiums to those family heads without premium values. Table G Six is an example of how the program works. The program steps through the database and finds records without premium values. Once it has located a missing record, it finds the closest neighbor with a populated premium value and assigns that value to the missing record. The program is designed to find the closest populated premium value, which could be above or below the missing field. In this case, the program begins and finds that record 1 is missing a premium value. It steps down to find the next populated premium value, record 2 in this example, which is then assigned to record 1. Record 4 is also missing and the program assigns it the value from record 3 because it is the closest non-missing premium.

Table G Six

Illustration of Imputation Method

Record	Premium	Imputed	Imputed Premium
1	-	X	1200
2	1200		
3	3276		
4	-	X	3276
5	-	X	0
6	0		
7	1400		
8	0		
9	900		
10	0		

After assigning these imputed private insurance premiums to the individuals in the Full Year File, we moved onto assigning premium costs for Medicare Part B recipients. We assumed that everyone that indicated Medicare coverage, through the MCARE06X variable, was also covered by Medicare Part B and paid the appropriate premium ($938.40/year for 2005, $1,062/year for 2006). We did not assign a premium value to those that had income below 135 percent of the Federal poverty guidelines because of public programs that subsidize the premiums of low-income Medicare participants.

Once all the medical insurance premiums were assigned to the individuals in the Full Year File, we aggregated all of the individual's premiums to arrive at a total family premium. We also aggregated the TOTSLF variable for the entire family to arrive at the family's total expenditures on medical services. Total family premium and total out-of-pocket medical expenditures were summed to arrive at a total MOOP expenditure value for the family in the Full Year File.

We can then impute the MOOP values from the MEPS onto the ACS sample. For this, we followed the recommended variant of the method used in our working paper, computing decile values of MOOP expenditures within demographic cells constructed within the MEPS. Each of the cells was based on specific socioeconomic characteristics that were highly correlated with family medical expenditures and could be replicated in the ACS.

For the 2005 to 2007 imputations, we created two subgroups consisting of elderly and non-elderly family heads in both data sets. Each subgroup was then divided into family groups. Within these subgroups, the characteristics included 1) family size, measured in 1-

person increments from 1 to 5 and over; 2) income status, measured as a percentage of the Federal poverty line (taking the values: less than 100 percent, 100 percent –199 percent, 200 percent – 299 percent, 300 percent – 399 percent and 400 percent or more); 3) (not used in elderly sample) whether or not the family head worked full-time (35 hours or more); 4) race/ethnicity of the family head (White, Black, Hispanic, and other); 5) whether or not the family head had graduated from college; and 6) whether or not the family received Food Stamps. Within each of the cells in the MEPS, we estimated decile values of MOOP expenditures. We then created a program to break the corresponding socioeconomic cells in the ACS into nine segments and randomly and equally distribute each of the decile values to the families within them.

For the 2008 imputation, we altered the creation of our cells slightly because of the presence of information on health insurance status in the ACS. Again, we created two subgroups consisting of elderly and non-elderly family heads in both data sets. Each subgroup was then divided into smaller cells. For the elderly, we grouped the small number of uninsured with those covered by public insurance.[87] We then segmented for those above and below 150 percent of the Federal poverty line and broke up families by whether they were single-person units or consisted of two or more persons.

For the non-elderly, we segmented by health insurance status–either covered by public insurance, private insurance, or uninsured. Within each of these groups we divided families by percentages of the Federal poverty line (these were different based on insurance coverage status) and composition of the family (single adult, single adult with children, two or more adults, and two or more adults with children).

[87] The uninsured, like low-income persons with public health insurance, have relatively low MOOP expenditures.

APPENDIX H:
ACCURACY OF THE DATA

The principal data set for CEO's poverty estimates is the American Community Survey (ACS) Public Use Micro Sample (PUMS). The ACS is designed to sample one percent of the households in the U.S. each year. The PUMS is a subset of the full ACS sample. It provides information collected from roughly 25,000 households in New York City annually.

Because the ACS is a survey, it is subject to two types of error: non-sampling error and sampling error.

Non-sampling Error: Nonsampling error is the error within survey data that is not specifically associated with the statistical sampling procedures of the sample data. Non-sampling error can occur because of erroneous responses by survey respondents, for example. Another source of non-sampling error can come from mistakes in the processing of the data by the Census Bureau, such as when data are edited or recoded.

Non-sampling errors can affect the data in two ways; either randomly, which increases the variability of the data, or systematically, which introduces bias into the results. To minimize bias in the survey, the Census Bureau conducts extensive research of sampling techniques, questionnaire design, and data collection and processing procedures. For instance, after identifying a systematic underreporting of Food Stamp receipt and benefit dollar values in the ACS, the Census Bureau researched methods to increase the reported participation rate. The Census Bureau concluded, through this research, that changing the wording of the Food Stamp question to include "Food Stamp benefit card," as well as not asking about the Food Stamp benefit value, would significantly increase the number of households responding that they received Food Stamps.[88]

Sampling Error: Sampling error occurs in the ACS, as in other sample survey data, because inferences about the full population (such as the poverty rate for New York City) are derived from a subset of it (the poverty rate for the ACS sample). Another sample, drawn from the same population would provide a different estimate of the poverty rate. The sampling error is estimated by the standard error, which can be thought of as a measure of

[88] Hisnanick, John, T. Loveless, and J. Chesnut. January 3, 2007. U.S. Bureau of the Census: *2006 American Community Survey Content Test Report H.6 - Evaluation Report Covering Receipt of Food Stamps.* http://www.census.gov/acs/www/AdvMeth/content_test/H6_Food_Stamps.pdf.

the deviation of an estimate drawn from one sample from the average estimate of all possible samples.

For this report, CEO employed the replicate weight method recommended by the Census Bureau to compute direct standard errors for our estimated poverty rates. The standard errors provide a measure of sampling error and some types of non-sampling error.[89] Using the standard errors we tested the statistical significance of differences and changes in the report's poverty rates at the 10 percent level of significance. In the report's tables, we highlight, in bold, statistically significant differences between poverty rates.

An additional source of error in the data results from CEO's need to impute information on items such as the value of Food Stamp benefits, housing status, child care expenditures, and medical out-of-pocket expenditures from other survey data into the ACS sample. We do not, however, account for the imputation error in this report. We are currently working with Mathematica Policy Research, Inc. to assist us in creating a methodology to account for imputation error. The results of this project will be incorporated into future work.

[89] U.S. Bureau of the Census. 2009. PUMS Accuracy of the Data (2008). Available at http://www.census.gov/acs/www/Downloads/2008/AccuracyPUMS.pdf.

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