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Combining Surveys for Poverty Measurement

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Chair: Philippe Van Kerm (CEPS/INSTEAD and University of Essex, UK)
Discussant: Richard Burkhauser (Cornell University, USA)

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by

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Combining Surveys for Poverty Measurement

I. Introduction

Over the past several years, proposals have been introduced to construct an alternative poverty measure for the U.S. These proposals are based on the linkage of sample records from several surveys as well as federal program benefit data. These data combinations provide substantial opportunities for improved measurement and reductions in survey respondent burden. However, challenges have arisen regarding modeling using additional information and making inferences from the use of combined data sources.

The new proposals are grounded in recommendations of the U.S. National Academy of Sciences (NAS) released in 1995 to improve the official measure of poverty (see Citro and Michael 1995). More recent changes are reflected in a bill introduced in the U.S. Congress (MAP Act, H.R. 2909 with a companion Senate bill, S. 1625, 2009) and guidelines by the Interagency Technical Working Group on Developing a Supplemental Poverty Measure (2010).[1]

Among the NAS data recommendations were that Consumer Expenditure Survey (CE) be used to produce the thresholds and that the Survey of Income and Participation (SIPP) be used for the resources. However, subsequent deliberations abandoned the use of SIPP in favor of a supplementary questionnaire to a labor force survey, the Annual Social and Economic Supplement to the Current Population Survey (CPS).

The use of a combination of surveys to produce the NAS measure has several challenges. One of the most important challenges has been to ensure consistency in the construction of estimates across the two sides of the poverty measure; thresholds and resources. Some of these consistency challenges include unit of analysis definitions and controlling for receipt of in-kind benefits.

Within the production of the thresholds there are also data challenges. For example, all data thus far are from the CE Interview. This is a challenge when using the CE Interview in which food expenditures are asked about using global question. The U.S. Bureau of Labor Statistics considers a more reliable source of food expenditure data to be the CE Diary, with detailed expenditures collected. In most of the research on NAS-based poverty thresholds, expenditures that are net of housing subsidies have been used. However, if one wants to account for the value of in-kind benefits in resources, these need to be accounted for in the thresholds as well. The same is true of subsidies for food, and utilities.

To determine poverty status following NAS recommendations, income is reduced by necessary expenditures. These subtractions include taxes, work-related expenses, and health care expenditures. Noncash benefits are valued and included in income to obtain resources that are compared to the thresholds. The CPS collects information on cash income receipt, but does not have information on most of the other elements of the proposed measure. The U.S. Census

[1] See Gabe (2010), of the U.S. Congressional Research Service, for an outstanding report on the history of poverty measurement in the U.S. that includes a comparative review of the current official poverty measure and the proposed changes outlined in the MAP Ace and Interagency Working Group observations document.

Bureau has explored a variety of ways to develop linkages from other surveys to expand the estimates of resources for the NAS poverty measure. Federal income taxes are estimated using a tax calculator and tax codes. Work-related and health care expenditures are modeled or statistically matched to the CPS survey data. Data from the CE, Medical Expenditure Panel Survey (MEPS), and SIPP have been used in part or together to model medical out-of-pocket expenses and work-related expenses including childcare. Administrative and program data have been used to value housing subsidies.

A variety of methods, such as modeling and statistical matching, have been employed to bring in elements listed above that are not available on the CE and CPS. In the meanwhile, new questions are being developed for the CPS and CE to address shortcomings in the current surveys. When the questions are available we can assess the quality of those data and the success of our linkage methods by comparing the two, one against the other. This paper describes these methods and explores the problems with and the challenges of this data combination process.

A major contribution of this study is to produce, for the first time, poverty thresholds and consistently defined resources that account for federal government in-kind benefit subsidies and to account for the differing spending needs of owners with mortgages, owners without mortgages and renters. Poverty rates for the U.S. and for select groups of people are also presented.

II. Background

The official U.S. poverty measure follows the logic of comparing economic resources to a threshold representing needs and is based on subjective judgment. The current poverty measure's concept of needs (expressed in the poverty threshold) reflects the cost of a nutritionally adequate basket of food commodities multiplied by three. These thresholds reflect the empirical observation that in the 1960's the average family, with children, spent roughly one-third of their budget on food. Once these thresholds were set, they have been annually updated to maintain their real purchasing power by inflating their nominal value by the CPI-U. The current poverty measure utilizes a concept of available resources that reflects the before tax post transfer income of a family received in the form of cash.

Since the release of NAS report, many of the NAS Panel's recommendations have been questioned and tested. Attention has been placed on the child care (see Short 2009, 2010); medical care (Banthin et al. 2001; Bavier 2001; Short and Garner 2002), geographic adjustment (Renwick 2009; Ziliak 2010) and shelter. Work on shelter began in earnest shortly after the Panel's report was published. The consumption value of owner occupied housing was included in alternative poverty measures first by Johnson, Shipp, and Garner (1997), followed by Garner et al (1998), and the first Census Bureau report released on an alternative poverty measure in 1999 (Short et al. 1999). The consumption value of owner-occupied housing has also been addressed in Garner and Short (2001, 2008).[2] Also in the 1999 Census report, outlays or out-of-pocket (OOP) spending based thresholds were produced. Garner and Rozaklis (1999, 2001) and Rozaklis and Garner (1999) presented poverty thresholds that accounted for the rental equivalence value of owner occupied housing and market value of subsidized rental housing. In

[2] See Garner and Verbrugge (2009a, 2009b) for studies of the relationship between reported rental equivalence in the Consumer Expenditure Survey and user costs.

the mid-2000's, Garner computed and compared thresholds based on three different definitions of shelter: CE-defined expenditures, OOP spending, and OOP spending for food, clothing, utilities, rents and maintenance and repairs for renters, and the rental equivalence value of owner occupied housing (replacing owners' shelter expenditures) for homeowners (Garner 2005). Short (2005) used these OOP and shelter consumption based thresholds and created consistently defined resources measures; using this measure she produced poverty rates (see Garner and Short 2010 for an update of this earlier research). Renwick (2009, 2010) focused on resources and how to account for subsidizes for rental units in resources. In more recent work, Betson (2009) presented alternative ways to account for the consumption needs of owners without mortgages and renters living in subsidized housing using regression methods.

Beginning in 2008, conversations and meetings with Congressional staff from the Joint Economic Committee, staff within the BLS and Census Bureau and outside experts were held to learn more about the research that had been conducted on the NAS-based poverty measure. On June 17, 2009, the "Measuring American Poverty Act of 2009" was signed and introduced to the House of Representatives. From henceforth, we refer to the Act as MAP. The Act was introduced to amend title XI of the Social Security Act. According to the proposed legislation,

> ….this Act is to provide for an improved and updated method for measuring the extent to which families and individuals in the Unites states have sufficient income to allow a minimal level of consumption spending that meets their basic physical needs, including food, shelter (including utilities) clothing, and other necessary items, in order to better assess the effects of certain policies and programs in reducing the prevalence and depth of poverty, to accurately gauge the level of economic deprivation, and to improve understanding of targeting of public resources, without directly affecting the distribution of, or eligibility for, any Federal benefits or assistance. (page 3, lines 21 through page 4, lines 1-8).

The MAP specified that modern poverty thresholds are to be based on a distribution of consumption expenditures that includes food, clothing, shelter and utilities. The threshold is to be produced for a reference family with the threshold equal to 120 percent of the 33rd percentile of the distribution of FCSU consumption expenditures, or a limited band converging on this percentile. Four or more of the most recent years of CE data, or a combination with other data, are to be used to produce the thresholds. The thresholds are to be updated no less often than annually using this method (page 6, lines 5-20).

Due to differences in the out-of-pocket expenditures of owners with and without mortgages the MAP further specifies that the calculation of the threshold "shall be made separately" for (1) families who own their primary residence and do not have a mortgage secured by the residence, and (2) all other families such that they can "purchase similar quality shelter" (page 8, lines 1-17).

Studies in which the 33rd percentile was used for NAS type thresholds have been conducted by Garner (2009a, b) and Garner and Betson (2010). This work also focused on ways to account for the differences in the spending needs of owners with mortgages, owners without mortgages, and

renters. Poverty rates have not been produced using this percentile until the study as reported in this paper.

III. The Supplemental Poverty Measure

In January and February of this year, 2010, an Interagency Technical Working Group met to discuss and provide guidance on developing a Supplemental Poverty Measure (SPM) for the U.S. (*Observations from the Interagency* 2010). The Working Group was formed by the Office of Management and Budget's Chief Statistician and included representatives from Bureau of Labor Statistics (BLS), the Census Bureau, the Council of Economic Advisers, the Department of Commerce, the Department of Health and Human Services, and OMB. The Working Group was charged with developing a set of initial starting points to permit the U.S. Census Bureau, in cooperation with the Bureau of Labor Statistics (BLS), to produce a Supplemental Poverty Measure (SPM). A document was prepared that reflect discussions made by the Working Group to the Chief Statistician in the U.S. Office of Management and Budget and the Under Secretary for Economic Affairs in the U.S. Department of Commerce (see OMB-Commerce, 2010). When there was no consensus within the Working Group, these two individuals made choices that are reflected in the specific recommendations provided. The NAS recommendations served as the starting point regarding the how to define thresholds and resources in order to produce SPM statistics. Recent research and the needs of users were also considered.

In the SPM measure document, a stated goal is that a measure be developed that can used to assess the impact of poverty programs, for example, in-kind benefits that families. The assumption is that families are better off when they receive these benefits, holding other income constant, than families who do not receive the benefits. For consistency in measurement, the thresholds too are to include the value of these benefits. The Census Bureau has a long history and experience in collecting and imputing in-kind benefits to add to income (U.S. Bureau of the Census, 1982). However, this is not the case for the BLS and the Consumer Expenditure Survey. Thus, for all but food stamps for which data are collected, imputations for the value of in-kind benefits need to be developed. These imputations and supplemental data sources are the primary focus of this paper.

Another goal of the SPM is to capture the notion that homeowners without mortgages are better off than homeowners with mortgages, and that receiving housing subsidies are better off than those who do not, given the same levels of income or resources. Since the NAS report was released in 1995, the SPM measure document notes that there are a significant number of low-income households who own their homes without mortgages and therefore have low shelter expenses. With a spending-based measure, not taking into account differences in spending needs due to home ownership status can overstate poverty rates for this group under the original NAS measure (see Betson 1995 and Garner and Betson 2010 for early estimates of the impact on poverty thresholds). The Interagency Technical Working Group suggested one way to account for the needs of owners with and without mortgages was to have separate thresholds for them. This approach was suggested as an alternative in the NAS Report (Citro and Michael, 1995, p. 71). Details of the approach are presented in the Methods section.

The current official U.S. definition of poverty finds a family to be poor if total family pre-tax money income is below that family's poverty threshold, defined to be a particular dollar amount depending upon the family size and composition. The alternative concept of family income that is to be used in the SPM is "discretionary income" – income that can be used to meet a family's basic needs after subtracting necessary expenses such as taxes, and work-related and medical expenses. Thus, family income is the sum of money income from all sources plus the value of near-money benefits less expenses that cannot be used to buy the threshold bundle of goods and services.

The calculation of resources for alternative poverty measures starts with current money income as defined and measured in the CPS and used to calculate official poverty statistics. This is cash income received on a regular basis and includes income from earnings, any cash transfers, and property income. This is money income received in the previous calendar year of the family residing together as of February/March/April of the current year. It is before-tax income that was regularly received, and thus does not include net capital gains, gifts, lump sum inheritances, or insurance payments.

IV. Methods

In this section the methods and data to produce the thresholds and resources are presented. Included is a brief outline of the calculation of the thresholds, followed by resources. The next section includes as description of the primary and then secondary data. In-kind benefit means and aggregates are presented for CE and CPS populations. For simplicity, whenever we use the term "consumer unit" we are referring to the Consumer Expenditure Interview sampling unit or to the threshold estimation sample unit. Whenever we refer to a household, we are referring to the sampling unit used for the Current Population Survey. When we use the word "families" with reference to the SPM, we are using the unit as defined in the *Interagency Technical Working Group* document. The SPM family differs from a Census family in that unrelated children and unmarried partners are included in the unit.

A. Thresholds

The SPM threshold produced in this study is based on out-of-pocket spending on food, clothing, shelter, and utilities (FCSU) and a multiplier of 1.2 to account for additional basic needs. See equation (1):

$$SPM\ \ Threshold = 1.20 * 33rd\ \ percentile\ .$$

Five years of CE data are used to produce thresholds for 2008. The estimation sample to determine the 33rd percentile of FCSU expenditures is composed of all consumer units that include exactly two children, related to the family or not. Unrelated partners are also included. FCSU expenditures are converted to adult equivalent values before the 33rd percentile, based on the average of expenditures in the 30th to the 36th percentile range, is estimated. A three-parameter equivalence scale (See: Betson 1996, Johnson et al. 1995, Short et al., 1999, Short 2001) is applied to the 33rd percentile value, times 1.2, to produce an overall FCSU threshold for units composed of two adults and two children.

The Interagency Technical Working Group members were concerned that a single threshold for all reference families (produced in earlier studies following NAS guidelines) does not adequately account for the different spending needs of owners with and without mortgages and renters. There are a number of ways to address the concern; however, the approach we chose for this study is to produce a base threshold for all consumer units with two children, and then to replace the overall shelter and utilities portion by what consumer units with different housing statuses spend on shelter and utilities, holding other expenditures constant. Three housing status groups were determined and their expenditures on shelter and utilities produced within the 30-36th percentiles of FCSU expenditures. The three groups are: owners with mortgages, owners without mortgages, and renters. Below is the threshold calculation that is used when consumer units' expenditures are equivalized. The equivalence scale for 2 adult+2 child consumer units is $3^{0.7}$.

$$Threshold_i(2) = Threshold(1) - ((3^{0.7} * shelter\ \&\ utilities(all)) + (3^{0.7} * shelter\ \&\ utilties(group_i))) * 1.2$$

for each *i* housing tenure group. FCSU threshold (2) is the 2 adult+2 child threshold adjusted for shelter and utilities spending for the *i* different housing groups. Threshold (1) is the *2adult+2child threshold* for all consumer units in the estimation sample with no distinction by housing tenure.

Previous NAS-based thresholds only included the value of food stamps as they are implicitly collected in food expenditures as noted earlier. However, the value of other in-kind programs of interest to the Interagency Technical Working Group, like school, lunch, WIC, rent subsidies, and energy assistance are not available in the CE. Values for all but energy assistance are included in the thresholds produced in this study. Whether a consumer unit lives in subsidized housing or participates in another government program that results in reduced rent is collected in the CE.

B. Resources

The CPS, for our purposes, is treated as a cross-sectional survey that measures income on an annual basis. Respondents report income received in the previous calendar year and their families' participation in most government programs. The appendix table shows all income sources collected in the CPS. For each of these income types annual amounts are reported as received in the previous calendar year. These data are collected in February/March/April of each year, near the date when income taxes are due, under the assumption that annual income amounts are available to individual respondents at that time. This official income measure is defined, according to an Office of Management and Budget (OMB) directive[3], as income received on a 'regular' basis. Non-means-tested cash transfers such as Social Security benefits and means-tested cash transfers such as Temporary Assistance to Needy Families (TANF) benefits are included in this definition.

Constructing alternative measures of poverty starts with gross cash money income, calculated in the CPS and to this we add various in-kind transfer payments. Following the recommendations

[3] Office of Management and Budget Statistical Policy Directive No. 14, DEFINITION OF POVERTY FOR STATISTICAL PURPOSES, May 1978.

of the NAS panel, these will only be non-medical in-kind transfers, so that we are not including the value of medical benefits such as Medicare and Medicaid. As will be seen, we will take care of health care needs as a 'necessary expense'. The noncash benefits considered are primarily from the large federal programs that are means-tested and aimed at helping poor families meet their needs. These include the SNAP (Food Stamps) program, the school lunch and breakfast programs, Supplementary Nutrition Program for Women, Infants, and Children (WIC), housing subsidy programs, and the energy assistance program (LIHEAP). In this section of the paper, each program is considered in terms of data collection and imputation methods and resulting benefit estimates.

C. Primary Data

This paper uses several surveys and data sources to construct a Supplemental Poverty Measure for the year 2008. First, the Consumer Expenditure Survey (CE) quarterly Interview data, collected from 2004 Quarter 2 through 2009 Quarter 1 (20 consecutive quarters), are used as the basis of the thresholds. Consumer units are included in the CE sample for up to 5 quarters, with data used for the study from the last 4 interviews only. CE data collected in an interview refer to expenditures made during the three months prior to the interview month. It is assumed that data from each reference quarter are independent of the data from other quarters; this same assumption is made for official publications of CE data, and was also made by the Panel in their report. Data from earlier years and the first quarter of the next year in the five-year cycle are adjusted to the threshold year using the annual All Items Consumer Price Index, U.S. City Average (CPI-U). In contrast to the SPM, NAS-based thresholds previously produced were based on three years of quarterly data.

Unlike earlier thresholds the values of in-kind benefits, with one exception, were not counted in the estimation of the thresholds. The value of food stamps is implicitly being counted as part of food expenditures as these expenditures are collected in total, not according to source of payment. Whether a consumer unit lives in subsidized housing is also collected in the CE, however, but the value of the subsidy is not available in the CE data file. School lunch and Women, Infant, and Children Program (WIC) receipt and subsidy values are not available in the CE.

To measure family income or, as more broadly defined, family resources, the analysis uses the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) for 2008 with data collected in February/March/April of 2009. Information from the Survey of Income and Program Participation (SIPP) 2004 Panel is used to value work-related expenses, child care expenses and medical out of pocket expenses (MOOP). The calculation of resources for the SPM starts with current money income as defined and measured in the CPS ASEC and used to calculate official poverty statistics. This includes cash income received on a regular basis, such as income from earnings, any cash transfers, and property income. It includes money income received in the previous calendar year by the family residing together as of February, March, or April of the interview year. Before-tax income, regularly received, does not include net realized capital gains, gifts, lump sum inheritances, or insurance payments. The CPS collects no information on taxes paid, so a tax calculator is employed. As part of the tax calculator, net realized capital gains are simulated and added to income in the computation of adjusted gross income (AGI).

D. Secondary Data: Additions to Thresholds and Resources

1. Food stamps /Supplemental Nutritional Assistance Program (SNAP)

Food stamps are designed to allow eligible low-income households to afford a nutritionally adequate diet. Households who participate in the SNAP program are assumed to devote 30 percent of their countable monthly cash income to the purchase of food, and food stamps make up remaining cost of an adequate low-cost diet. This amount is set at the level of the U.S. Department of Agriculture's Thrifty Food Plan.

The SNAP program has financial, employment, and 'categorical' tests for eligibility. To establish financial eligibility, countable monthly income is the primary determinant. This includes all household cash income (excluding certain 'disregards' such as irregularly received income, income earned by school children, etc.) net of deductions such as work expenses, child support payments, dependent care expenses, and shelter expenses. For elderly or disabled members, out-of-pocket medical expenses in excess of a certain amount are also deducted from 'countable' income. 'Countable' income must not exceed the Federal poverty guidelines (based on the official poverty thresholds). There are also liquid asset tests that apply to such assets as cash on hand, bank accounts, as well as a portion of the value of vehicles owned.

SNAP benefits are a function of household size, income, and maximum levels (which may vary by geographic location). Benefits are calculated by subtracting 30 percent of countable income from a maximum allotment. The maximum is tied to the Agriculture Department's Thrifty Food Plan for a four-person family, adjusted to other family sizes via an equivalence scale. These are adjusted annually for food price inflation.

In the CE, SNAP participation and the value of SNAP benefits are collected. In the second and firth interview of the CE, respondents report if they ever received food stamps in the previous 12 months and if so how much. These reports are carried over to the third and fourth interview. Since these data are collected in the CE and are implicitly in total food expenditures, it is not necessary to add SNAP benefits to FCSU. However, it has been suggested that SNAP participation and benefits are underestimated in the CE. Thus, using consumer unit characteristics data, we estimate SNAP eligibility and benefits to compare to the reported values.

For the CPS, SNAP benefits are by far the easiest non-cash program to value. Similar to the CE, in the CPS respondents report if they ever received food stamps in the previous calendar year and if so how much. The calculation of SNAP benefits is straightforward, using the reported face value amounts that are added directly to income. In the CPS calculation, the method adds an annual figure to family income, prorated from a reported household amount..

2. School Meals Programs

These programs offer children free meals if family income is below 130 percent of Federal poverty guidelines, reduced-price meals if family income is between 130 and 185 percent of the federal poverty guidelines, and a subsidized meal for all other children. In the 2008 school year per-lunch subsidies ranged from $2.73 and $2.33 for free and reduced-price lunches, respectively. Subsidies for breakfasts were slightly less per meal. Total federal costs for these

programs for 2007 were $8.7 billion for lunches (including regular price lunch subsidies) and $2.2 billion for breakfasts.[4]

The CE collects no information on the receipt or benefits of school meals. U.S. Department of Agriculture (USDA) Nutrition Program eligibility guidelines were used to estimate the receipt of school lunches and WIC benefits. To estimate subsidy amounts, school lunch eligibility was imputed using data for the number of children in the household who are school age (ages 4 to 18). Students are automatically eligible to receive free meals if their family receives welfare or food stamps. For other students, their net family income must be below the poverty line for that family. Gross income is net of the value of food stamps, pension income and other retirement income, supplementary income (SSI), income from farm and non-farm rents, interest received, and other select incomes. We assume that the children received the lunches every day during the last school year. Then we multiply the number of children by a dollar amount per lunch. That figure is then multiplied by the number of days in the typical school year.

In the CPS the reference person is asked how many children 'usually' ate a complete lunch, and if it was a free or reduced priced school lunch. Since we have no further information, The value of school meals is based on the assumption that the children received the lunches every day during the last school year. As for the CE, we multiply the number of children by a dollar amount per lunch. That figure is then multiplied by the number of days in the typical school year.

To value benefits we obtain amounts on the cost per lunch from the Department of Agriculture Food and Nutrition Service that administers the school lunch program.

Nothing is collected in the CE or CPS for school breakfasts so no expenditures or income are assigned. In the SIPP respondents report the number of breakfasts eaten by the children per week, similar to the report of school lunches. Calculating a value for this subsidy in the same way as was done for the school lunch program adds approximately $2.8 billion to income of families in the SIPP for the year 2004.

3. Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

This program is designed to provide food assistance and nutritional screening to low-income pregnant and postpartum women and their infants, and to low-income children up to age 5. Incomes must be at or below 185 percent of the poverty guidelines and must be nutritionally at-risk (having abnormal nutritional conditions, nutrition-related medical conditions, or dietary deficiencies). Benefits include supplemental foods in the form of food items or vouchers for purchases of specific food items. In fiscal year 2007, the national average Federal cost of a WIC food package was $39 per month, the program served approximately 8.3 million women and children. Total federal cost of the program was $3.9 billion.[5]

As with SNAP, the CE does not collect information on WIC. Again, consumer unit characteristics are used to impute eligibility and benefits. Consumer units with children who are up to 5 years of age and mothers as noted above are automatically eligible if they receive welfare

[4] Greenbook - Chapter 15 http://waysandmeans.house.gov/media/pdf/110/15school.pdf.
[5] WIC Annual Summary, http://www.fns.usda.gov/pd/wisummary.htm.

or participate in Medicaid. If income, net of the value of food stamp, is less than the poverty guideline then members of the family are also eligible.

There are questions on current receipt of WIC in the CPS.

Lacking additional information, for the CE and CPS, we assume 12 months of participation and value the benefit using program information obtained from the Department of Agriculture.

4. Housing Subsidies

Federal housing assistance consists of a number of programs administered primarily by the Department of Housing and Urban Development (HUD). These traditionally take the form of rental subsidies and mortgage-interest subsidies, targeted to very-low-income renters and are either project-based (public housing) or household-based subsidies. The programs generally reduce tenants' rent payments to a fixed percentage of their income after certain deductions, currently 30 percent. In 2007, about 4.7 million households received such assistance and total program outlays were about $33 billion.[6]

In the CE, respondents are asked whether they live in public housing or have received government assistance to help with shelter expenses. To determine the value of the rent subsidy, Fair Market Rents (FMRs) from the U.S. Department of Housing and Urban Development for 2004-2009 for cities and counties were compared to the rent paid by consumer units living in subsidized housing. This value was added to the FCSU expenditures for subsidized renters.

Including the value of housing subsidies in cash income is a complex task. In the CPS, respondents are asked only to report their current status as of the interview date concerning whether or not they live in public housing or receive help from the government with rent. There is no further information collected that helps to determine a dollar amount to add to family income. Furthermore, since we know only current status we must make assumptions about the duration of receipt of subsidies. In this case we assume the subsidy was received for all 12 months in the previous calendar year. The amounts used in this calculation are based on average 2008 FMRs for states by metropolitan area or nonmetropolitan status. The subsidy amount is calculated by subtracting 30 percent of 'qualified' family income from the appropriate FMR. The appropriate FMR is chosen depending upon the composition of the family and the size of the unit they are, therefore, eligible to rent and the county in which they reside. Because housing subsidies are not fungible, the amount of the subsidy is capped at the portion of the renter threshold that is spent on shelter and utilities, excluding the contribution of the renter.

E. Additional Secondary Data for Resources

1. Low-Income Home Energy Assistance Program (LIHEAP)

This program provides three types of energy assistance. Under this program, states may help pay heating or cooling bills, provide allotments for low-cost weatherization, or provide assistance during energy-related emergencies. States determine eligibility and can provide assistance in various ways, including cash payment, vendor payment, two-party checks, vouchers/coupons,

[6] Greenbook - Chapter 15 http://waysandmeans.house.gov/media/pdf/110/hap.pdf

and payments directly to landlords. In 2006, total heating assistance was $2.3 billion, assisting approximately 5.0 million households.[7]

No energy assistance information is collected in the CE and we did not impute a value for respondents in the CE sample.

The CPS asks if, since October 1 of the previous year, the reference person received help with heating costs and, if yes, the amount received. Many households receive both a "regular" benefit and one or more crisis or emergency benefits. Additionally, since LIHEAP payments are often made directly to a utility company or fuel oil vendor, many households may have difficulty reporting the precise amount of the LIHEAP payment made on their behalf. Also, no assistance for cooling in the summer months is captured in the CPS or any emergency benefits that can be paid when disconnection notices are received. Addressing these problems would require a valuation procedure for energy assistance in an alternative poverty measure.

2. Income Taxes

The panel recommended that the calculation of family resources for poverty measurement should subtract federal, state, and local income taxes, and Social Security payroll taxes (FICA) before assessing the ability of a family to obtain basic necessities such as food, clothing, and shelter. Taking account of tax liability also allows us to account for receipt of an earned income credit (EITC). The EITC is available to low-income working taxpayers.

The CPS does not collect information on taxes paid but relies on a tax model to simulate taxes paid. These simulations include federal and state income taxes, and social security taxes. These simulations are based on a tax calculator and statistical matches to the American Housing Survey (AHS) and Statistics of Income (SOI) microdata file of tax returns.

The tax model initially creates both a person and household level file. The data that are extracted focus mainly on income and family and household structure. The first step in the process of calculating taxes is to complete a statistical match with the AHS. The statistical match allows a variable flagging the presence of a mortgage to be added to the file. The additional variables will allow the deductions for mortgage interest to be imputed later in the process. The statistical match uses age of householder, household income, and household size as the main matching criteria for determining the presence of a mortgage.

3. Work Expenses and Child Care

a. Expenses Related to Work

Typically, in order for a family to purchase a basic set of needed goods, some members of the family must work. Earning a wage may entail incurring expenses, such as travel to work and purchase of uniforms or tools. For work-related expenses (other than child care) the NAS panel recommended subtracting a fixed amount, $750 for 52-week work-year per earner 18 years of age or older (or about $14.42 per week worked) in 1992. Their calculation was based on 1987 SIPP data that collected information on work expenses in a set of supplementary questions. Then they calculated 85% of median weekly expenses -- $14.42 per week worked for anyone over 18 in the family in 1992. Total expenses were obtained by multiplying this fixed amount by the

[7] LIHEAP Report to Congress FY2006. Note LIHEAP estimates are for FFY2006.

number of weeks respondents reported working in the year. The panel argued that, since many families make other sacrifices, move near work, work opposing shifts, to minimize work expenses, reported expenses wouldn't reflect these costs and thus it would be better to use a fixed dollar amount.

In the 1996 panel of SIPP, a new topical module, similar to the one last administered in 1987, was included to collect work-related expenses. This module has been repeated every year since that time. Each person in the SIPP reports their own expenditures on work-related items in a given week. For each person we then sum the number of hours reported worked by the number of weeks worked in each month. The number of weeks worked is multiplied by the weekly work-related expenses, and these are summed over the calendar year for each person. These amounts are then summed across family members as of December of a given year.

b. Child Care Expenses

Another important part of work-related expenses is paying someone to care for children while parents work. These expenses have become important for families in which both parents work and for single-parents who work. To account for child care expenses while parents worked in the CPS, we subtracted an amount modeled using data from the SIPP 2004 panel topical module on child care expenses.[8] The 2004 panel of SIPP included a separate module of questions about child care in wave 4 of the panel.[9] The amount paid for any type of child care, while parents are at work or attending school, are summed over all children. Weekly reported costs are then multiplied by the number of weeks worked by the parent or guardian. In addition to modeling childcare amounts, the NAS report recommended capping the amount subtracted from income, when combined with other work related expenses, so that these do not exceed reported earnings of the lowest earner in the family. This capping procedure is not considered explicitly here but is applied before determining poverty status.[10]

The 2010 CPS ASEC asked about amounts paid for childcare along with the questions about whether or not parents paid for care. If these data are of sufficient quality then these direct responses will be used to calculate childcare expenses paid. The method employed here shows what we might expect from the new CPS questions by replicating, as closely as possible, the reported distribution of childcare expenses from the SIPP. We are currently evaluating the quality of these data.

This paper uses SIPP data for 2005, the most recent data available. These data were collected in wave 4 of the 2004 panel, administered between February 2005 and May 2005. The SIPP asks about childcare arrangements and expenses for children in a household where the designated parent or guardian is working, owns a business, or is going to school, or a combination of all three. We use these data, based at the level of reporting parents, to estimate a model of weekly childcare expenses. Then we use the predicted values in both the SIPP and the ASEC to perform a statistical match, assigning the actual reported expenses once the match is made. This process

[8] The child care model has been updated for alternative measures for 1999 and later years that take advantage of a question that was added to the CPS about paying for child care.

[9] See, Smith, Kristen, 'Who's Minding the Kids; Child Care Arrangements Spring 1997', p70-86, July 2002.

[10] Some analysts have suggested that this cap may be inappropriate in certain cases, such as if the parent is in school, looking for work, or receiving types of compensation other than earnings.

more closely replicates the distribution of childcare expenses reported in the SIPP than earlier methods.

4. Medical Out-of-Pocket Expenditures (MOOP)

Other necessary expenses that we will account for in this poverty measure are those required to maintain the health of family members. While many individuals and families have health insurance that covers most of the very large expenses, there are the costs of health insurance premiums and other small fees that the typical family pays out of pocket. Further, there are some who are not covered by medical insurance. Expenditures on health care have increased and become a more significant portion of a family's budgets and spending for health care should be accounted for as an important expense. Questions ascertaining medical out of pocket expenditures have also been included in the 2010 CPS ASEC

A similar exercise for medical expenses as that described above for child care expenses shows what we might expect from new CPS questions by statistical match to the SIPP that replicates the reported distribution. Following O'Donnell and Beard (2009) we model medical out of pocket expenses using the SIPP 2004 panel data on utilization of health care, again performing a predicted mean match to assign medical expenses to the ASEC. Tables 3 and 4 show descriptive statistics and the estimated model used in the match. In these calculations it is assumed that the responses to questions in the SIPP about expenditures on health insurance premiums do not include reporting of Medicare Part B premiums. Given this assumption, we add the standard premium amounts, $96.40 per month in 2008 to the MOOP of elderly individuals who are not covered by Medicaid.

5. Child Support Paid

In the 1996 panel of the SIPP, respondents reported this information in supplementary questions in a topical module on child support that is very comprehensive but not asked every year. There are also very brief summary questions included once every calendar year. These questions attempt only to ascertain the amounts paid. Some comparisons have been made of the short set of questions in the SIPP to the complete battery of questions from the topical module on support of non-household members.[11] There are some discrepancies in the reporting of child support paid. Regardless of differences in the structure of the questions that are posed, however, the aggregate amounts are similar. Across those responding to the short questions a total of $18.5 million is reported, from the complete child support topical module a total of $17.9 million is reported paid as child support. These amounts are substantial if subtracted from income. New questions ascertaining amounts paid in child support have been included in the 2010 CPS ASEC, though no attempt has been made to include a value for this item in the estimates presented here.

6. Housing for Homeowners for Resources

The CPS collects information on whether the housing unit is owned or rented, but does not collect information on home equity. Imputation of presence of mortgage is implemented by

[11] There are slightly fewer respondents who report paying child support with the short set of questions, 1,214, compared with 1,341 who reported amounts in the complete topical module. A total of 738 (61 %) of those reporting paying child support in wave 3 also reported amounts in wave 5. Of those who responded to the short questions, on average they reported $4,738 per year (with a median amount $3,600). Responding to the broader set of questions in the topical module, an average amount of $4,084 and a median of $3,000 were reported.

conducting a statistical match to the American Housing Survey (AHS) based on characteristics such as age of householder, state, Metropolitan Statistical Area (MSA), and central city status of the household, household income, household size, number of living quarters in the building, and the race, sex, and educational attainment of the householder. The variables obtained from this statistical match are market value of owned residence and land, and the amount of the balance remaining on any mortgage. These data are required in order to match the appropriate threshold to households in the CPS ASEC. In the 2010 CPS ASEC, questions have been added to ascertain the presence of a mortgage for any homeowner.

V. The Impact of Secondary Data on Thresholds and Resources

A. Additions for All Sampling Units in the CE and CPS

Table 1 includes CE and CPS population summary statistics for in-kind benefits. For the CE all estimates are based on 2004 quarter one through 2009 quarter 1 data with benefit values reported in 2008 dollars; participation or eligibility rates also reflect the situation over this 5 year period. For the CPS, values are for 2008 alone. A comparison of participation rates, mean amounts for those participating, and aggregates are presented for food stamps or SNAP, school lunches, WIC, and housing subsidies.

Total SNAP expenditures, as reported by the (USDA were $34.6 billion for 2008. The 2008 participation rate was 11.6 percent for all households with an average household benefit of $2,724.[12] The rates of participation and aggregates were low for the CE and CPS, but noticeably low for the CE. Based on CE reported data, only 6.1 percent of consumer units participated in the food stamp program with an average benefit is almost $800 less than that reported for the CPS. If the high average benefit noted by the USDA were used for the CE and CPS sampling units, the impact on poverty would be significantly high.

In 2008, approximately 10.2 percent of all people in the U.S. received school meals with an estimated aggregate benefit of $7.23 billion.[13] Of all benefit programs under consideration in this study, school meals are the most often received. It is estimated that about 10.4 percent of all CE consumer units had children who qualified for school lunch meals. This is in contrast to 18.4 percent of reporting units in the CPS reporting participation in the school meal program. School lunch aggregate benefits for the CE are estimated to be $13.2, almost double the national estimated aggregate, while the CPS aggregate is $8.4 billion. The average school lunch is valued to be about $368 per sampling unit in the CPS but more than twice that amount for CE consumer units. With the average school lunch value per child per day to be about $2.33 and the average number of children in households with food stamps in the U.S to be about 2.17 (from the CE), the expected average household school lunch benefits is $847, assuming a school year of 167 days. In general, since we assume full year participation in the school lunch program for eligible consumer units for each quarter independently, it would seem that the valuation procedure in the CE is probably assigning about the right value to subsidy sampling units.

[12] http://www.fns.usda.gov/ora/MENU/Published/snap/FILES/Participation/Trends2001-2008.pdf

[13] http://www.fns.usda.gov/pd/slsummar.htm for school lunch data and http://factfinder.census.gov/servlet/DTTable?_bm=y&-geo_id=01000US&-ds_name=PEP_2009_EST&-mt_name=PEP_2009_EST_G2009_T001 for population and authors' own calculations.

For 2008, the national aggregate for WIC benefits was $6.2 billion with an average person-benefit of $712; 2.9 percent of all people in the U.S. participated in the program.[14] The CE average consumer unit benefit is close to this national person level average as determined using USDA data. Aggregate WIC benefits are about the same as for the CE consumer units but underestimated in the CPS by about $4.4 billion dollars. It is surprising that the CE benefits are so close since the CE estimates are based on limited program eligibility factors; the CE does not collect information on the nutritional health of mothers and children. This impact of WIC benefits on poverty measurement is expected to be small as a relatively low percentage of families participate in the WIC program.

Using 2008 household population statistics and data from the U.S. Department of Housing and Urban Development (HUD), slightly less than 4.0 percent of all households received rental subsidies. The average benefit for those participating in the program was $7,068, and the aggregate was $31.4 billion. About 4.0 percentage of CE consumer units reported participating in this subsidy program with the average subsidy value lower at $6536 but a higher aggregate value than the HUD reports. The average subsidy amount for the CPS is essentially the same as that based on administrative data; yet, the CPS aggregate is slightly greater. It is surprising that the CE data are not more in-line with the HUD and CPS data since data about subsidized renters, participation in the program and the out-of-pocket rent paid, are collected in the CE. One possible explanation is that the rents being reported by subsidized renters are under-reported. Although small percentages of consumer units and households report participating in rental subsidy programs, the impact of the benefits can be quite large due to the high average benefits per reporting unit.

In summary, as with most of the information on income, both cash and non-cash, there is generally evidence of significant underreporting of transfer receipts in survey data when compared with administrative data.

B. Additions and Subtractions to/from Resources for All and the Poor

In Table 2 the percent of all sampling units, those who are poor, and those who are near poor are presented for each addition and subtraction from CPS income. The "percent poor" refers to units classified as poor using the current official poverty thresholds and compared to pretax money income in each survey. Also included are the mean and aggregate amounts from the CPS.

Additional benefits added to resources but not to thresholds include energy assistance and earned income tax credits (EITC); these are presented in Table 2. The energy assistance estimates are the reported amounts and, thus, on average are lower than expected. The aggregate amount reported in the CPS for 2008 is $1.4 billion. The estimates show percentage of families with federal income tax liabilities, with the mean values. The EITC and Social Security payroll (FICA) taxes are also shown. Housing subsidy values differ here from Table 1, because the actual value added to income is capped by the proportion of the threshold that represents housing needs.

[14] http://www.fns.usda.gov/pd/wisummary.htm for WIC and http://factfinder.census.gov/servlet/DTTable?_bm=y&-geo_id=01000US&-ds_name=PEP_2009_EST&-mt_name=PEP_2009_EST_G2009_T001 for population and authors' own calculations.

Poor sampling units, compared to all sampling units, on average are more likely to participate or receive benefits from SNAP or food stamps, school lunch, WIC, energy assistance, rental housing subsidies, and earned income tax credits (EITC). Of the poor, 32 percent participated in SNAP, 25 percent in school lunches, 10 percent in WIC, 11 percent had energy assistance, and 16 percent has housing subsidies.

Subtractions from resources include work-related, including child care, and medical expenditures. Work expenses are valued following the NAS methods described above, taxes, child care expense, MOOP are model-based. The model estimates for all units and those who are poor are in the table. Table 3 shows descriptive statistics of the variables used in the child care expenditure model, Table 4 includes the model estimates. Tables 5 and 6 present similar estimates for the MOOP model.

It is clear that we will be subtracting more than we will be adding to family income when moving from an official measure of poverty to the SPM. This is particularly true for taxes. Medical out-of-pocket expenses also are quite large regardless of the method applied. In-kind transfers, on the other hand, are very small when viewed across all families.

More interesting is to examine what happens to the incomes or resources of those people who are classified as poor. The additions and subtractions for those who are classified as poor using the official measure show a more balanced picture, with additions exceeding subtractions. The major subtraction for the poor is for MOOP.

Finally, a closer look at the "near poor", who are most likely to become poor by the changes to income calculations, is provided in the last column of the table. These calculations are for people with household income just above the official poverty line; household income is between 100 and 125 percent of the poverty line. The table shows more subtractions than additions and therefore suggests that more "near-poor" people will be classified as poor under this new measure, and it will often be caused by the deduction of medical out of pocket expenses from income.

C. Additions to FCSU Expenditures for the Threshold Estimation Sample

In order to produce the FCSU threshold following the SPM guidelines, subsidies need to be added to expenditures for food, clothing, shelter, and utilities. Specifically, subsidies for SNAP benefits (food stamps), school lunches, and WIC benefits are added to food and housing rental subsidies are added to shelter. The averages of expenditures within the range of 30^{th} to the 36^{th} percentiles of the FCSU spending include subsidies. The ranking of expenditures is for the estimation sample of consumer units with 2 children using the 3-parameter equivalence scale adjustment. Adult equivalence values are converted to produce statistics for consumer units composed of 2 adults and 2 children, referred to by the NAS Panel as the reference family.

For comparison, Table 7 includes mean expenditures for food, clothing, shelter, and utilities with and without subsidies. Mean FCSU expenditures and subsidy values are based on a ranking of FCSU expenditures that include subsidies; these results are shown in the top portion of the table. Mean FCSU expenditure that do not include subsidies are ranked for the no benefits added results show in the lower part of the table.

Higher percentages of consumer units with 2 children in the 30-36th percentile range participate in subsidy programs than in the CU population as a whole. However, compared to the CPS-defined poor participating in these same programs, CE participation rates for the range estimation sample are lower for food stamps and housing subsidies. Greater participation rates among the estimation sample result for school lunch and WIC benefits with 41 percent of families with 2 children in this range estimated to be school lunch eligible and 22 percent to be WIC eligible.

Mean benefit levels for 2 adult-2 child consumer units, converted from adult equivalent values for the estimation sample, are also presented in the table. These means are more similar to means for the officially poor using the CPS based sample and presented in Table 2. For those reporting having received food stamps in the past 12 months, the CE SNAP average benefit for 2008 is $2,034 while the benefit for the official poor is $2,838. If the CE reported receipt of food stamps is used, but rather than using the reported food stamps value, we assigned food stamp recipient consumer units with SNAP benefits from USDA program data, the average benefit for CE consumer units is $3108. Closer to that reported for the officially poor using CPS data.

Average school lunch benefits for the estimation CE sample and the CPS officially poor is nearly the same at $757 and $760 annually. This is reassuring as the same benefit levels were used to compute the values although eligibility had to be imputed for the CE.

WIC benefits for the estimation sample are higher on average for the CE estimation sample compared to the CPS poor. This is expected due to the lack of data in the CE on the mother's nutritional health, data that is needed to determine WIC eligibility.

Housing subsidies for the CE estimation sample appear to be well estimated at $6,805 compared to the CPS poor mean. AS noted earlier, CE data included data on both participation in subsidy programs and actual rents paid. HUD Fair Market Rents at the county level are compared to actual rents paid.

D. FCSU Thresholds with and Without Subsidies

FCSU thresholds for consumer units composed of 2 adults and 2 children are presented in Table 8. The first column of values includes the adult equivalent means of the range of expenditures in the 30-36th percentile from 3 different FCSU distributions. The first section of the table includes the FCSU with subsidy values. It is this set of thresholds, after geographic price adjustments, that are compared to CPS based resources to determine SPM poverty status. The second FCSU distribution does not include subsidies for food or shelter. The last set of results in the table are for FCSU that include food stamps only; this distribution is presented for comparison as the earlier NAS-based thresholds all included food stamps in food expenditures implicitly.

Not surprisingly the FCSU-based thresholds with subsidies are higher than the other two sets of thresholds. The 2 adult-2 child threshold is $24,531 with housing status is not accounted for. The SPM guidelines call for adjustments to the base threshold, referred to as Threshold 1 in Table 8, to take account of the fact that owners with and without mortgages and renters have different spending needs. With the housing status adjustment, thresholds for owners with

mortgages are highest at $25,197, followed by those for renters at $24,547. The lowest thresholds are for owners without mortgages; this was expected since lower resources are needed when once does not have a mortgage and not paying rent.

E. Threshold Adjustments for Geographic Price Differences

The American Community Survey (ACS) is used to adjust the FCSU thresholds for differences in prices across geographic areas. ACS data has been used to create a simple geographic cost of living index based on 2007 gross rental costs (Bishaw, 2009). In this work, Bishaw assigns each household one of 99 locations based on the state and whether or not the household is in a metropolitan area. (The District of Columbia, New Jersey and Rhode Island have all their population in metropolitan areas.) The geographic cost index for each location is the median gross rent for that location divided by the national median gross rent. This index is then normalized to set the national average at 1.00 and applied to the 59.4 percent of the threshold assumed to represent shelter and utility costs.

Renwick (2009) notes several concerns with the ACS-based index. First, the median gross rent represents the midpoint of the rental distribution regardless of the size of the unit. The median rent in one geographic location might represent the rent for a studio or one bedroom apartment while the median rent in another geographic location may represent the rent for a two or three bedroom unit. Second, the ACS index does not control for differences in housing quality. While the FMR index limits data to rental units that meet minimum HUD standards for participation in the Section 8 program, the ACS indexes developed by Bishaw include all rental units, regardless of quality. Since housing quality varies by geographic area, for geographic areas with a higher incidence of substandard rental units, the ACS methodology may underestimate the cost of decent housing. If substandard units were excluded from the distribution, the median rent would be higher. Third, the ACS-based index represents only differences in housing costs for renters and does not reflect differences in housing costs for homeowners.

In this paper, the geographic adjustments to the thresholds are based on three-year ACS estimates of median gross rents for two-bedroom apartments with complete kitchen and plumbing facilities. Separate medians were estimated for each of the 309 metropolitan statistical areas (MSAs) large enough to be identified on the public use version of the CPS ASEC file. This increases the number of adjustment factors from the 99 used by Bishaw to 401. For each state, a median is estimated for all non-metro areas (48), for each MSA with a population above the CPS ASEC limit (309), and for a combination of all other metro areas within a state (44). The plan is to use five years of ACS data for indexes when that becomes available.

VI. Poverty Estimates 2008

This paper described in some detail all of the calculations performed in two surveys to arrive at a measure of family resources similar to that recommended by the NAS panel to calculate an improved measure of poverty.

The final table, Table 9, shows poverty rates for two different measures and for select groups. The measures are the official poverty measure and one new measure, the SPM. The new measure

incorporates new thresholds, new unit of analysis, and uses three thresholds based on housing status as described above. In this measure, subsidized renters are assigned the same threshold as renters and the subsidy that helps them meet that rent is added to income, but capped at the housing expense in the threshold.

In general, poverty rates are higher with the new method that uses CE-based thresholds, subtracts amounts from income for MOOP and for work expenses that include childcare and add in noncash benefits. Differences for subgroups include lower poverty rates for children, individuals included in new family units, those reporting living rent free or living in non metropolitan areas, and those living in the Midwest. Most other groups have higher poverty rates using the new measure, particularly the elderly, Hispanics, and those living in central cities and the Northeast and West regions.

VII. Discussion Issues

This paper has described a proposal to develop a supplemental poverty measure for the U.S. These proposals require the linkage of sample records from several surveys as well as federal program benefit data. These data combinations provide substantial opportunities for improved measurement and reductions in survey respondent burden. However, challenges have arisen regarding modeling using additional information and making inferences from the use of combined data sources.

The use of a combination of surveys to produce the NAS measure has several challenges. One of the most important challenges has been to ensure consistency in the construction of estimates across the two sides of the poverty measure; thresholds and resources. Some of these consistency challenges include unit of analysis definitions and controlling for receipt of in-kind benefits.

Challenges previously tackled include the Census Bureau's work to develop linkages from other surveys to expand the estimates of resources for the NAS poverty measure. Federal income taxes are estimated using a tax calculator and tax codes. Work-related and health care expenditures are modeled or statistically matched to the CPS survey data. Data from the CE, Medical Expenditure Panel Survey (MEPS), and SIPP have been used in part or together to model medical out-of-pocket expenses and work-related expenses including childcare. Administrative and program data have been used to value housing subsidies and net rental income. A variety of methods, such as modeling and statistical matching, have been employed to bring in elements listed above that are not available on the CE and CPS.

Newly tackled in this study, is the use of federal program eligibility guidelines and administrative data for the estimation of rent subsidies, and school lunch and WIC benefits. The findings in this study suggest that overall participation and average benefits for consumer units in the CE Interview population sample are likely underreported. However, for the estimation sample composed of units with two children, our findings suggest that this might not be a problem for SPM threshold measure. However, more research is needed on this topic. The reporting of rental housing assistance participation appears to be fairly good in the CE based on the comparison with HUD data; however, average rents subsidies might be low. The biggest challenge for the CE with regard to accounting for school lunch and WIC benefits is that the CE

does not collect data on these programs. More research is needed to estimate participation and benefit levels.

To produce one measure of the SPM, a variety of methods has been used to impute estimates for the additions to thresholds and to the additions to and subtractions from income to produce resources. Each estimate contributes additional variation to the measure of poverty. An important question that arises has to do with measuring the variation introduced into the measure by the various imputations and adjustments that are an important part of the measure. One important example is that the thresholds, estimated from CE survey data, are themselves subject to sampling error and bring with them their own standard errors (see Garner 2010). How imputations affect the overall variances for this new poverty measure is uncertain. Other papers have addressed this issue, particularly having to do with estimating variances in the context of micro-simulation models: Pudney and Sutherland, 1994 and National Research Council, 1991.

Besides, individual variation brought into the measure by each additional imputation, one needs to consider the co-variation between the imputed estimates. Independently imputing receipt of benefits without regard to participation in other programs, similarly imputed, is problematic. A further complication is the probable correlations among expenditures accounted for in the FCSU thresholds, and those imputed on the resource side such as taxes paid, MOOP, work expenses, child care expenses.

In part, some of these complicating issues will be resolved by including new questions in our surveys, so that fewer imputations are required to produce a new poverty measure using the CPS ASEC with CE based thresholds. However, similar estimates using other survey data, such as the ACS, will face these important issues.

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Table 1. Reported and Estimated Noncash Benefits of All Survey Sample Units (Population Weighted) in the CE and CPS in 2008 Year Dollars

	Consumer Expenditure Interview (based data collected in 2004Q2-2009Q1)			Current Population Survey (based on data collected in March 2009)			
	aggregate (Bil$)	% of CUs Paid/Received	Mean Amount of Paid/Received	aggregate (Bil$)	% of SPM Families Paid/Received	Mean Amount of Paid/Received	aggregate (Bil$)
Supplemental Nutrition Assistance Program (Food Stamps)	$33.10	6.1%	$1,644	$14.7	7.4%	$2,465	$22.7
School Lunches	$5.20	10.4%	$847	$13.0	18.4%	$368	$8.4
Women, Infants, and Children Nutriction Progam (WIC)	$4.5	5.5%	$769	$6.3	2.8%	$528	$1.8
Housing Subsidies	$31.4	4.0%	$6,581	$39.2	3.8%	$7,069	$33.2

Table 2. Noncash Benefits and Necessary Expenses of Weighted Sampling Units in the CPS: 2008

	% Paid/Received				Mean Amount ($)				Aggregate Amount (bil$)					
	All	Standard Error	Poor	Standard Error	All	Standard Error	Poor	Standard Error	All	Standard Error	Poor	Standard Error	Near Poor	Standard Error
MOOP	81.1	0.2	62.2	0.5	3,607	56.0	1,944	86.4	377.4	5.96	21.6	0.97	10.8	0.58
Food Stamps	7.4	0.1	32.3	0.5	2,465	35.6	2,838	46.5	22.7	0.50	15.7	0.41	2.4	0.13
School lunch	18.4	0.2	25.1	0.4	368	3.6	760	10.2	8.4	0.10	3.2	0.07	0.9	0.04
WIC	2.8	0.1	9.9	0.4	528	1.4	528	2.3	1.8	0.05	0.9	0.03	0.2	0.02
Energy Asst.	2.9	0.1	10.7	0.4	399	8.4	391	10.6	1.4	0.05	0.7	0.03	0.2	0.01
Housing subsidy/cap	3.7	0.1	15.7	0.5	5,016	78.8	6,140	103.3	22.7	0.84	16.6	0.70	3.1	0.21
Work expenses NAS	78.1	0.2	48.8	0.5	2,041	4.8	1,242	11.2	197.0	0.56	10.1	0.16	5.3	0.13
Childcare model	6.0	0.1	3.4	0.2	6,418	99.8	4,089	240.3	47.4	1.00	2.3	0.17	1.5	0.18
Taxes before credits	71.7	0.2	12.5	0.3	10,854	123.6	2,386	313.2	961.9	11.72	4.6	0.62	1.4	0.13
EITC	13.9	0.1	36.1	0.5	1,837	17.1	2,104	34.0	31.5	0.40	12.7	0.27	5.6	0.19
FICA	78.0	0.2	48.6	0.5	4,973	20.3	1,032	17.8	480.0	2.12	8.3	0.17	5.3	0.14

Table 3: Descriptive Statistics for Parents with Children Who Paid for Child Care by Survey

	SIPP 2005		ASEC 2008	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Children 0-2	0.385	0.726	0.410	0.746
Children 3-5	0.416	0.742	0.474	0.780
Children 6-11	0.679	0.966	0.698	1.001
Children 12-15	0.221	0.616	0.212	0.646
ln family income	8.437	1.320	9.750	1.092
Mother's earnings share	0.572	0.415	0.539	0.395
Age	34.953	10.250	36.360	11.184
Age2 (/100)	12.813	7.558	14.126	9.012
Married	0.674	0.622	0.672	0.616
Avg. hours	35.124	17.093	38.250	12.636
Avg. hours2 (/100)	13.996	9.582	15.568	9.792
Urban residence	0.855	0.468	0.862	0.451
Suburb	0.576	0.656	0.533	0.654
Some college	0.398	0.650	0.315	0.608
College	0.236	0.564	0.249	0.566
Advanced degree	0.116	0.426	0.044	0.269
Subsidy	0.054	0.299	0.045	0.272
Extra adult	0.158	0.484	0.123	0.431
Midwest	0.229	0.557	0.249	0.566
South	0.349	0.633	0.350	0.625
West	0.244	0.570	0.222	0.545
Ln child care expenses	4.143	1.494	4.273	0.742

The unit of anaylsis in the SIPP is designated parent. The unit used for the ASCE is poverty group unit. There may be more than one designated parent in a primary family or poverty group unit in ASEC. Standard deviations incorporate a sample design effect of 2.3 for the SIPP and 1.2 for the ASEC.

Table 4. Estimated Coefficients of Model of Family Expenditures on Childcare for 2005			
	All Parents		
	Coefficient		Standard Error
Intercept	1.67	***	0.602
Children 0-2	0.75	***	0.044
Children 3-5	0.58	***	0.044
Children 6-11	0.23	***	0.035
Children 12-15	-0.02		0.055
Midwest	-0.15	***	0.070
South	-0.16	***	0.740
West	-0.05		0.076
ln family income	0.20	***	0.035
Average hours	-0.02		0.007
Average hours squared (/100)	0.04	***	0.011
Some college	0.05		0.052
College	0.20	***	0.064
Urban residence	0.32	***	0.066
Suburb	0.05		0.043
Age	0.01		0.031
Age Squared (/100)	-0.02		0.042
Advanced degree	0.32	***	0.073
Mother's earnings share			
all income	-0.19		0.188
Extra adult	-0.21	***	0.084
Subsidy	-0.83	***	0.153
Interaction w/ married			
Average hours	0.02	**	0.009
Average hours2 (/100)	-0.03	*	0.017
Mother's earnings share of all income	0.50	**	0.220
Subsidy	0.47	*	0.309
Root MSE	0.97		
R^2	0.26		
Number of observations	2810		
Note: Estimates based on observations 4th wave of 2004 panel of the SIPP			
Natural logarithms specification of dependent variable., estimated with Proc Surveyreg.			
* Significant at .10 level.** Significant at .05 level. ***Significant at .01 level.			

Table 5. Descriptive Statistics for Families Medical Out-of-Pocket Spending				
	SIPP 2005		ASEC 2008	
	Mean	Standard Deviation	Mean	Standard Deviation
Private insurance	0.775	0.718	0.707	0.671
Public insurance	0.128	0.574	0.176	0.561
Elderly	0.216	0.707	0.221	0.612
Excellent health	0.218	0.710	0.211	0.601
Income < 1.5 official poverty threshold	0.244	0.738	0.245	0.634
Single person	0.384	0.836	0.394	0.721
More than 3 in family	0.214	0.705	0.197	0.586
Midwest	0.225	0.717	0.222	0.613
South	0.290	0.780	0.367	0.710
West	0.210	0.700	0.230	0.620
Urban residence	0.827	0.651	0.839	0.542
ln family income	9.472	3.620	9.590	2.733
Own home	0.654	0.818	0.644	0.705
College	0.171	0.647	0.188	0.577
Advanced degree	0.092	0.497	0.028	0.244
Ln MOOP	5.809	5.369	5.592	2.483
The unit of anaylsis in the SIPP is census family. The unit used for the CPS ASEC is poverty group unit that includes cohabitors and unrelated individuals under age 15. Totals for the unit are the sum across combined families and UIs. Standard deviations incorporate a sample design effect of 2.3 for the SIPP and 1.4 for the ASEC.				

Table 6. Estimated Coefficients of Model of Family Expenditures on MOOP			
	Coefficient		**Standard Error**
Intercept	5.84	***	0.094
Private insurance	0.81	***	0.049
Public insurance	-0.42	***	0.058
Elderly	0.38	***	0.021
Excellent health	0.33	***	0.024
Income lt 1.5 poverty	-0.24	***	0.027
Single person	-0.55	***	0.020
More than 3 in family	0.20	***	0.022
Midwest	0.09	**	0.028
South	0.14	***	0.026
West	-0.07	**	0.024
Urban residence	0.01		0.030
ln family income	0.04	***	0.008
Own home	0.35	***	0.020
College	0.18	***	0.021
Advanced degree	0.19	***	0.028
Root MSE	1.3287		
R^2	0.2127		
Number of observations	32877		
Note: Estimates based on observations 4th wave of 2004 panel of the SIPP			
Natural logarithms specification of dependent variable., estimated with Proc Surveyreg in SAS.			
* Significant at .10 level.** Significant at .05 level. ***Significant at .01 level.			

Table 7. Reported and Estimated Noncash Benefits in the 30-36th Percentile Range of FCSU with Subsidies and without Subsidies for CUs with 2 Chidlren in 2008 Dollars, No Housing Adjustment, Equivalence Scale Adjusted to Reflect Values for Two Adults with Two Children Consumer Units

Ranking by FCSU				Means within 30-36th Percentile of FCSU Adult Equivalent Values Converted to Consumer Units with 2 Adults and 2 Children				U.S. All Consumer Units	
				Without Subsidies	With Subsidies				
						% of CUs Participating	Mean Amount of Those Participating	% of Cus participating	Mean Amount of Those Participating
unweighted number of observations				1097	1090				
Benefits Added									
	Sum of FCSU				$20,442				
		Food			$7,190				
			Supplemental Nutrition Assistance Program (Food Stamps)		$245	13.3%	$2,034	6.1%	$1,662
			School Lunches		$303	41.4%	$757	10.4%	$857
			Women, Infants, and Children Nutriction Progam (WIC)		$161	21.6%	$755	5.5%	$777
		Shelter			$8,542				
			Housing Subsidies		$431	7.4%	$6,805	4.0%	$6,536
		Clothing			$1,119				
		Utilities			$3,591				
No Benefits Added									
	Sum of FCSU			$19,362					
		Food		$6,685					
		Shelter		$7,891					
		Clothing		$1,152					
		Utilities		$3,633					

Weighted data from the CE Interview Survey: 2004Q2-2009Q1 dollars values converted to 2008 dollars using the All Items CPI-U.

Table 8. FCSU Thresholds With and Without Government Subsidies: 2008

Sample	FCSU based on 30-36th Percentile Range						
		Threshold 1	For All CUs with 2 Chidlren				Threshold 2
	30-36th percentile range for All CUs with 2 Children	2 Adults with 2 Children Threshold	Shelter within FCSU 30-36 range	Shelter + Utilities within FCSU 30-36 range	Shelter exp as % of FCSU 33rd perc.	Shelter + Utilities as % of FCSU 33rd perc.	2 Adults with 2 Children Threshold with shelter+utilities replaced*
With Subsidies (adding values for Food Stamps, WIC, School Lunches, Rental Subsidies)							
CUs with 2 children							
all	$9,474	$24,531	$3,959	$5,623	41.8%	59.4%	$24,531
owners with mortgages			$4,083	$5,880	43.1%	62.1%	$25,197
owners without mortgages			$1,786	$3,940	18.9%	41.6%	$20,171
renters			$4,225	$5,630	44.6%	59.4%	$24,547
WITHOUT Subsidies (no Food Stamps, WIC, School Lunches, Rental Subsidies)							
CUs with 2 children							
all	$8,973	$23,234	$3,657	$5,341	40.8%	59.5%	$23,234
owners with mortgages			$3,832	$5,605	42.7%	62.5%	$23,918
owners without mortgages			$1,836	$3,815	20.5%	42.5%	$19,283
renters			$3,851	$5,362	42.9%	59.7%	$23,288
WITH only Food Stamps as subsidy as in earlier NAS-type Thresholds							
CUs with 2 children							
all	$9,041	$23,409	$3,700	$5,370	40.9%	59.4%	$23,409
owners with mortgages			$3,859	$5,644	42.7%	62.4%	$24,119
owners without mortgages			$1,872	$3,871	20.7%	42.8%	$19,529
renters			$3,863	$5,331	42.7%	59.0%	$23,310

CE sample restricted to owners and renters who had shelter expenses for their primary residences and renters living in government subsidized housing. Annual CPI-U All Items used to adjust quarterly expenditures to 2008 year dollars. Five years of CE Interview data used, assuming quarterly reports are independent.

*Threshold2=Threshold1-((3^.7*shelter+utilties share for all) + (3^.7*shelter+utilties for subgroup))*1.2

Table 9. Percent of People in Poverty by Different Poverty Measures: 2008					
	Number*	Official	Standard Error	Experimental	Standard Error
People	301,483	13.4	0.2	15.9	0.2
Children	74,510	19.5	0.3	19.3	0.3
Nonelderly Adults	189,185	11.7	0.1	14.5	0.2
Elderly	37,788	9.7	0.3	16.4	0.3
In married couple family	188,489	6.7	0.1	10.3	0.2
In female householder family	60,809	26.7	0.4	29.4	0.4
In cohabiting family groups	20,821	30.0	0.7	18.8	0.8
White, not Hispanic	197,159	8.8	0.2	10.4	0.2
Black	38,076	24.9	0.6	25.6	0.6
Other	22,555	15.5	0.6	19.3	0.5
Hispanic Origin	47,175	23.3	0.5	31.1	0.6
Tenure					
Owner	209,239	7.0	0.1	9.9	0.2
Renter	88,547	27.7	0.4	29.8	0.4
Rent-free	3,698	27.9	1.5	24.3	1.5
Renter/Mortgage	231,911	13.9	0.2	16.8	0.2
Owner/No mortgage/rent-free	69,572	11.6	0.3	13.1	0.3
Residence					
Central city	97,364	17.8	0.3	22.1	0.4
Suburb	156,036	10.0	0.2	13.3	0.2
Not metro	48,084	15.3	0.5	12.0	0.5
Region					
Northeast	54,191	11.7	0.3	15.1	0.4
Midwest	65,672	12.5	0.3	12.1	0.3
South	110,845	14.5	0.3	16.6	0.3
West	70,774	13.7	0.4	19.1	0.4
*Numbers in thousands; include unrelated individuals.					
For information on confidentiality, protection, sampling error, and definitions, see http://www.census.gov/hhes/www/p60_236sa.pdf					

Details of calculations presented in Table 9:
Thresholds:
--Thresholds FCSU with mortgage principal payments, 2004q2 -
[1] Threshold for all reference units within 30th to 36th percentile
[2] Separate thresholds for owners with mortgages, renters, and owners with no mortgages
--With geographic adjustments using ACS, 3-parameter
Resources:
-- Unit of analysis is family and includes cohabitors.
--Work expenses imputed from SIPP 2004 panel wave 6
-- Child care expenses modeled from 2004 SIPP wave 4
--Combined work expenses and childcare expenses capped at
--MOOP in new measures imputed from 2004 SIPP wave 6 and
--Housing subsidies = FMR - 30% qualifying income, capped at
-- Income is after-tax and includes face value of foodstamps, and
free and reduced-price school lunch, WIC, and energy assistance
-- Presence of mortgage obtained with statistical match to 2003
Source: Calculations use data from the Current Population Survey
by Kathleen Short, U.S. Census Bureau, and Thesia I. Garner, Bureau
For more details on measurement see Short, Kathleen,
Current Population Reports, Consumer Income, P60-216, U.S.

Appendix Table A

CPS Income Sources

Earnings
Unemployment compensation

Workers compensation
Social Security benefits
SSI benefits
Public Assistance, such as TANF
Veterans payments

Alimony payments received
Disability benefits
Survivor Payments
Pensions
Interest/Dividends
Rents, royalties
Educational assistance
Child support received
Regular private transfers