BLS WORKING PAPERS

**Income Imputation and the Analysis of Expenditure Data
in the Consumer Expenditure Survey**

Jonathan Fisher, U.S. Bureau of Labor Statistics

INCOME IMPUTATION AND THE ANALYSIS OF EXPENDITURE DATA IN THE CONSUMER EXPENDITURE SURVEY

Jonathan D. Fisher*
Research Economist
Bureau of Labor Statistics, Division of Price and Index Number Research
2 Massachusetts Ave., NE, Room 3105
Washington, DC 20212-3105

Fisher.Jonathan@bls.gov
T: 202-691-6596
F: 202-691-6583

Abstract

The Consumer Expenditure (CE) Survey began imputing income in its 2004 data. Imputation predicts income for households that reported receiving income but failed to report a specific value. In this study, I examine how income imputation affects analysis of the CE expenditure data. Most importantly, research that uses both income and expenditures from 2004 on will not have to restrict the sample to households that reported income. The expenditure results most sensitive to the introduction of income imputation are statistics that focus on households with low levels of expenditures.

The Bureau of Labor Statistics' (BLS) Consumer Expenditure (CE) Survey began imputing income in its 2004 data. Imputation predicts income for households that reported receiving income but failed to report a specific value. Many national household surveys such as the Current Population Survey and the Survey of Consumer Finances impute missing income values. While imputation is common practice, it remains beneficial to highlight precautions researchers should take when using imputed data.

In this study, I examine how income imputation affects analysis of the CE *expenditure* data. Most importantly, research that uses both income and expenditures from 2004 on will not have to restrict the sample to households that reported income. I present results with the sample employed before imputation was introduced and compare it to results using the sample that should be employed after imputation. I compare the distribution of expenditures and measures of well-being such as the Gini coefficient and the poverty rate in the two samples.

Researchers that want to create a time series using income and expenditures will not have imputed income data before 2004 because the BLS will not go back to impute income before 2004. Not imputing before 2004 could create a break in a time series of statistics in 2004, which this study examines. Using data from 2002-2004 allows me to show how the introduction of income imputation creates a break in the time series for some statistics such as the poverty rate. The Data section describes the relevant factors of the CE, and the imputation section provides an overview of the imputation procedure and how it interacts with expenditures. The Methodology section describes the sample, defines the measure of expenditures, and defines other key variables. Finally I compare the distributions of expenditures before and after imputation as well as look how measures of well-being are affected by the introduction of income imputation.

DATA

The CE Survey is a continuing quarterly survey of consumer units. A consumer unit consists of members of a household who are related or share at least two out of three major expenditures: housing,

food, and other living expenses. In each consumer unit, one individual is designated as the reference person, who is the person who rents or owns the residence as designated by the respondent. Data are collected from consumer units and the individuals within these consumer units five times over a 13-month period. The first interview is used for bounding purposes and is not released publicly. The remaining four quarters of data are used in this analysis. I restrict the sample to consumer units that appear in all four quarterly interviews, which allows me to create a measure of actual yearly expenditures for each consumer unit.

The CE asks eighteen income variables. Six are collected for each individual in the consumer unit including: wage and salary, self-employment (non-farm) income, farm income, Social Security benefits, Railroad retirement benefits, and, Supplement Security Income benefits. The remaining twelve variables are collected for the consumer unit and are pension income, interest income, dividend and royalty income, unemployment benefits, worker's compensation benefits, child support, alimony, income from roomers or boarders, income from other rental units, food stamp benefits, and, other income.

The Bureau of Labor Statistics (BLS) creates a complete income reporter designation to determine whether consumer units provided sufficient income data for use in official publications (Garner and Blanciforti, 1994).[1] A consumer unit is designated a complete income reporter if:

1) The reference person reports a non-zero amount for a major income source (i.e., wage and salary, self-employment, farm income, Social Security benefits, Railroad retirement benefits, or Supplemental Security Income benefits); or,

2) At least one other consumer unit member reports a non-zero amount for a major income source and reports valid zeros for all major income sources for the reference person; or,

3) The consumer unit reports a non-zero amount for at least one other income source and valid zeros for all major sources for all members.

---

[1] T. I. Garner and L. A. Blanciforti "Household Income Reporting: An Analysis of U.S. Consumer Expenditure Survey Data," *Journal of Official Statistics,* 1994, vol. 10 no. 1, pp. 69-91.

A consumer unit could be classified as a complete income reporter and still not provide a full accounting of its income. For example, the reference person could report wage and salary income but fail to report a valid amount for its alimony income, and this consumer unit would be classified as a complete income reporter under condition (1). In 2004, 13 percent of consumer units are complete income reporters and only 64 percent of complete income reporters reported valid amounts for every income source. Overall 44 percent of consumer units in 2004 reported an invalid amount for at least one of the eighteen income components.[2]

INCOME IMPUTATION IN THE CE

For the 44 percent of consumer units that reported at least one invalid income amount, the BLS imputes income using the multiple imputation technique described in Rubin (1987).[3] Multiple imputation is an iterative regression-based approach, where the data for the regression comes from the valid non-zero reporters for each income component. The dependent variable equals the income component being imputed, and each of the eighteen components is imputed in a separate regression. The independent variables include demographic characteristics of the consumer unit and a variable that equals the quarterly expenditure-outlays for the consumer unit.[4]

An initial regression is run with all of the independent variables. Any independent variable that is not statistically significant at the 15 percent level using a two-sided test is removed from the regression model. A second regression is then run with the variables that were statistically significant in the initial regression. This iterative process continues until all remaining variables are statistically significant at the 15 percent level. The coefficients from this last regression are used to predict income for invalid

---

[2] All results are population weighted. The weighting methodology is described in the data appendix.
[3] Rubin, D.B. *Multiple Imputation for Nonresponse in Surveys* (New, York, NY J. Wiley & Sons, 1987).
[4] Specifically, the quarterly expenditure-outlays variable is named *ERANKMTH*, and it equals the dollar amount of expenditure outlays made during the last three months.

reporters.[5] Through this iterative removal of independent variables, the quarterly expenditure-outlays variable may or may not be in the final regression for a given income variable. If the expenditure-outlays variable remains in the regression model, the level of quarterly expenditure-outlays affects imputed income. This creates dependence between expenditure-outlays and income that may affect conclusions about the relationship between the expenditure and income variables.

Imputed income also directly affects the BLS' official measure of expenditures. The publication category "Personal insurance and pensions" includes employee contributions to Social Security that is derived by the BLS from the wage and salary variable. In the 2004 sample used in this study, 25 percent of consumer units had wage and salary imputed. After the BLS imputes missing wage and salary for these 25 percent of individuals, the BLS then assumes that each individual paid Social Security taxes at the required 7.65 percent rate.[6] This 7.65 percent is added to the official "Personal insurance and pensions" category and in the official BLS measure of total expenditures. Because of this imputation of Social Security taxes, the BLS warns in its publications that "average annual expenditures and expenditures for personal insurance and pensions are not strictly comparable to previous [year's] data."[7]

METHODOLOGY

The expenditure variable used in this study differs from the official BLS measure of total expenditures. I exclude the "Personal insurance and pensions" category from my measure because it is more accurately classified as savings or taxes. My measure of consumption-expenditures equals the sum of outlays for housing, food, transportation, apparel, medical care, entertainment, gifts, and miscellaneous items. The data appendix provides additional details about consumption-expenditures. The definition

---

[5] Paulin, Tsai, and Grance (2005) provide a more detailed description of the BLS' imputation procedure. G. Paulin, S. Tsai, and M. Grance "Model-Based Multiple Imputation," *Proceedings of the Twenty-Ninth Annaul SAS Users Group International Paper 210-29,* 2004.
[6] Officially, 6.2 percent is paid for Old-Age Survivors and Disability Insurance (OASDI), and 1.45 percent is for Medicare deductions.
[7] U.S. Bureau of Labor Statistics, "Consumer Expenditures in 2004." Accessed at https://www.bls.gov/news.release/cean.nr0.htm, on December 5, 2005.

follows the literature that defines expenditures as outlays (Rogers and Gray, 1994; Fisher et al, 2005),[8] but there is no consensus about the proper definition of outlays or expenditures. Rogers and Gray (1994) define three measures of expenditures, and all of the studies referenced throughout this paper deviate from these three definitions. Even the definition I employ in this paper differs slightly from Rogers and Gray (1994) because they include insurance and pension contributions in their expenditure outlays measure while I exclude it.

I employ two samples of consumer units to show how income imputation affects the analysis consumption-expenditures. The first is complete income reporters, as defined above. Complete reporters is the sample often used by past research that studies income and expenditures together. Income imputation will allow researchers to utilize all consumer units, which includes complete and incomplete income reporters.[9]

One might be concerned that adding incomplete reporters may alter the sample in observable ways. Research that excludes incomplete income reporters implicitly assumes that incomplete reporters are a random sample of the population. The assumption that incomplete reporters are a random sample denotes that the inclusion of them would not affect the sample. The purpose of this study is to show whether the inclusion of incomplete reporters affects conclusions about the distribution and the analysis of consumption-expenditures after income imputation. The study also shows how a time series of economic statistics might be affected by the introduction of income imputation.

I start by comparing the distribution of consumption-expenditures for the two samples by presenting the percentiles, the Gini coefficient, and the poverty rate. For the poverty rate, I compare the level of consumption-expenditures to the official poverty thresholds. Then I use consumption-expenditures in an Engel curve regression as a further test of the sensitivity of results to the two samples.

---

[8] J. M. Rogers and M. Gray, "CE Data: Quintiles of Income versus Quintiles of Outlays," *Monthly Labor Review*, 1994, vol. 117, no. 12, pp. 32-37. J. D. Fisher, D. S. Johnson, J. Marchand, T. Smeeding, and B. B. Torrey, "The Retirement Consumption Conundrum: Evidence from a Consumption Survey," *Center for Retirement Research Working Paper 2005-14*, 2005.

[9] Researchers will still have the option to restrict the sample to complete income reporters. The variable identifying which households are complete income reporters is included in the 2004 dataset and beyond.

An Engel curve estimates how the share of food expenditures in total consumption-expenditures depends on permanent income and other factors. Engel curves have been estimated for all households (Phipps and Garner 1994), for Hispanic households (Paulin 2003), and for the poor (Attanasio, Battistin, and Leicester 2004).[10] The dependent variable equals the share of total consumption-expenditures devoted to food. The key independent variable is the log of permanent income. Most research including Paulin (2003) and Attanasio et al. (2004) use consumption-expenditures as a proxy. I follow this methodology and include the log of consumption-expenditures and its square. The regression also contains a number of control variables: the number of adults in the household, the number of children in the household, and the square for each as well as dummy variables for region, education, race, and year.

COMPARING DISTRIBUTIONS

Most analysis in this paper compares two samples, all consumer units and complete income reporters. Focusing on these two groups obscures some of the differences in the data because incomplete income reporters are a small proportion of all consumer units. Incomplete reporters are only 13.6 percent of all consumer units. In the first two tables and in the Figure 1, I include separate results for incomplete income reporters.

Table 1 compares selected demographic characteristics for complete income reporters, incomplete income reporters, and all consumer units. The mean age of the reference person for each group is almost identical at 51.5 years old. The mean masks some heterogeneity in the distribution of age, as shown by the age brackets in Table 1. Incomplete income reporters are less likely than complete reporters to be under age 35 and over age 65. Garner and Blanciforti (1994) find a similar pattern for the ages of complete and incomplete reporters. Family size is identical across samples, with each sample

---

[10] G. Paulin, "A Changing Market: Expenditures by Hispanic Consumers, Revisited," *Monthly Labor Review*, 2003, vol. 126, no. 8, pp. 12-35. S. Phipps and T. I. Garner, "Are Equivalence Scales the same for the United States and Canada?" *Review of Income and Wealth*, 1994, vol. 40, no. 1, pp. 1-17. O. Attanasio, E. Battistin, and A. Leicester, "Inequality, Poverty, and Their Evolution in the US: Consumption and Income Information in the Consumer Expenditure Survey," *Notes prepared for the National Poverty Center's ASPE-Initiated Workshop on Consumption among Low-income families*, 2004. Available at http://www.npc.umich.edu/research/npc_research/consumption.

having 1.8 adults and 0.8 children on average. There are also only small differences across samples for family type, education, region of residence, and urban status. There are noticeable differences in race, with incomplete reporters more likely to be black and less likely to be white.

Table 2 moves to the consumption-expenditures data and presents percentiles of the consumption-expenditures distribution. I present the mean and median as measures of central tendency. The mean exceeds the median by approximately $6,000 for complete and incomplete reporters, indicating that the distributions are right-skewed. Figure 1 shows the skewness in more detail by presenting the frequency distribution of consumption-expenditures for complete income reporters, all consumer units, and incomplete income reporters. All three distributions exhibit a long right-tail.

Table 2 and Figure 1 also reveal that consumption-expenditures are higher for complete reporters across all percentiles of the consumption-expenditure distribution. Incomplete reporters are more likely to be in the lower half of the consumption-expenditures distribution of complete income reporters. The comparison of interest is between complete reporters and all consumer units because these are the two samples researchers will use. And because incomplete reporters are a small fraction of the all consumer units sample, the distributions for complete reporters and all consumer units virtually overlap at consumption-expenditures greater than $23,000. The large grouping of incomplete reporters with consumption-expenditures less than $23,000 causes the distributions of complete reporters and all consumer units to visibly differ in this range.

An additional way to describe a distribution is to look at inequality, and I present the Gini coefficient in the bottom of Table 2.[11] The Gini coefficient for complete income reporters equals the Gini for all consumer units. The two Gini coefficients differ only in the third digit after the decimal place.

Another common statistic for economists to focus on is the poverty rate (e.g., Cutler and Katz 1992; Slesnick 1993; and Federman et al. 1996).[12] Table 3 presents the percent of consumer units with

---

[11] For an example of research that examines consumption inequality, see D. S. Johnson, T. M. Smeeding, and B. B. Torrey, "Economic inequality through the prisms of income and consumption," *Monthly Labor Review*, 2005, vol. 128, no. 4, pp. 11-24.

consumption-expenditures below the official U.S. Census Bureau poverty threshold. I find that 10.8 percent of complete reporters had consumption-expenditures below the poverty threshold, while 11.5 percent of all consumer units were consumption-expenditure poor. With over 102 million consumer units represented by the 2004 CE, this 0.7 percentage point difference in the poverty rate means that an additional 748,000 consumer units are considered consumption-expenditure poor in the all consumer units sample. This difference persists when I split the sample by family type and race in Table 3.

TIME SERIES ANALYSIS

Because of this difference in the poverty rate between the two samples, the introduction of income imputation could affect conclusions about the change in the poverty rate between 2003 and 2004. A researcher that recreates the time series analysis of poverty rates as in Slesnick (1993) might use complete income reporters before 2004 and use all consumer units in 2004. Table 4 shows that the poverty rate for complete reporters equals 10.6 percent in 2003 and 10.9 percent in 2004. If I instead use all consumer units in 2004 then the poverty rate equals 11.9 percent. Either the poverty rate increased 0.3 percentage points or 1.3 percentage points between 2003 and 2004, which is a large difference that cannot be ignored.

A similar issue might arise for the Gini coefficient and other statistics of interest. Using complete reporters, the results suggest that the Gini for consumption-expenditures increased by 3.8 percent between 2003 and 2004 (Table 4). If I use complete reporters in 2003 and all consumers in 2004 instead, inequality increased by 4.1 percent.

Table 4 also presents the change in consumption-expenditures between 2003 and 2004 at different points of the consumption-expenditures distribution. The growth in mean consumption-expenditures between 2003 and 2004 equals 0.6 percent when using complete income reporters in both

---

[12] D. M. Cutler and L. Katz, "Rising Inequality? Changes in the Distribution of Income and Consumption in the 1980's," *American Economic Review*, 1992, vol. 82, no. 2, pp. 546-551. D. T. Slesnick, "Gaining Ground: Poverty in the Postwar United States," *Journal of Political Economy*, 1993, vol. 101 no. 1, pp. 1-38. M. Federman, T. I.

years, while it equals –1.7 percent using complete reporters in 2003 and all consumer units in 2004. The change in expenditures is always lower when using all consumer units in 2004 than using complete income reporters in 2004. Taken as a whole, Table 4 suggests that researchers using multiple years of CE data must be aware of the fundamental change in the sample between 2003 and 2004. Statistics that focus on the bottom of the consumption-expenditures distribution, such as the poverty rate, will be most sensitive to the change in the sample. Other statistics that consider the whole distribution, like the Gini coefficient, may not be as sensitive to the change.

REGRESSION ANALYSIS

As a final test of the sensitivity of the consumption-expenditure data to the introduction of income imputation, I use the data in a regression framework. As described in the methodology section, I estimate Engel curves, which means I regress the share of food on consumption-expenditures and other control variables. Table 6 displays ordinary least squares estimates of the coefficients on consumption-expenditures and its square. The coefficients match expectations for complete income reporters and all consumer units; the linear term on consumption-expenditures is negative and statistically significant, while the quadratic term is positive, statistically significant, and small relative to the linear term. These results are very similar to the ones presented in Attanasio et al. (2004).

I next restrict the sample to those households that have consumption-expenditures below the official poverty threshold. Restricting it to low consumption-expenditure consumer units allows me to test the sensitivity of the regression results in the sub-sample most likely to be affected by income imputation. Instead of a negative coefficient on consumption-expenditures, the coefficient is positive and statistically significant, which again matches the findings in Attanasio et al. (2004). While the coefficient on consumption-expenditures is positive and significant for both complete reporters and all consumer units, the point estimate for the linear term for all consumer units is 41 percent higher. The regression

---

Garner, K. Short, W. B. Cutter IV, J. Kiely, D. Levine, D. McGough, and M. McMillen, "What does it Mean to be Poor in America?" *Monthly Labor Review*, 1996, vol. 119, no. 5, pp. 3-17.

results are sensitive to the sample chosen, especially when the sample comes from the bottom part of the consumption-expenditures distribution.

CONCLUSIONS

Income imputation has been a needed improvement for the CE Survey data, but researchers need to be aware of the consequences of income imputation. I discussed four consequences.

- A BLS created measure of expenditure-outlays is used to impute income, which means that there may be an artificial dependence between income and expenditures.

- Imputed income also directly affects the BLS' official published measure of expenditures. After imputing wage and salary income, the BLS assumes each consumer unit pays Social Security taxes from its wage or salary income. The amount of Social Security taxes is added to the official "Personal insurance and pensions" category and in the official BLS measure of total expenditures.

- From 2004 on, researchers will not have to restrict the CE sample to complete income reporters if they want to examine income and expenditures together. Because incomplete income reporters are more likely to have lower consumption-expenditures than complete income reporters, research that focuses on low consumption-expenditure households is more likely to be affected by the use of all consumer units. In this study, the results most affected by the inclusion of incomplete income reporters are the poverty rate and the Engel curve for consumption-expenditure poor households. Alternatively, the Gini coefficient and the Engel curve for all households were not affected by the inclusion of incomplete reporters.

- Finally, there may be a break in any time series of statistics that uses 2004 data with earlier data. I show that the difference in the poverty rate in 2003 and 2004 depends greatly on what sample is used in each year. The poverty rate is much higher when using all consumer units than when using complete income reporters.

Overall, there are legitimate concerns about using the consumer units with imputed income data. There may be a temptation to continue using the complete income reporter sample rather than using all consumer units. As long as researchers are aware of the potential problems, researchers should use all consumer units starting in 2004. The biggest advantage of using all consumer units is in the precision of estimates. In 2004, 13 percent of all consumer units were classified as incomplete income reporters. By having a larger sample size after imputation, the precision of analysis using the CE Survey will increase. It has taken the CE longer than other surveys to introduce income imputation, but researchers should be satisfied that a long term issue with the CE data is being addressed while also being aware what affect the solution may have on analysis of the data.

DATA APPENDIX

The consumption-expenditures measure includes the amount that the consumer unit actually spends for current consumption. This includes expenditures for food, housing, transportation, apparel, medical care, entertainment, gifts (of cash, goods and services) to organizations or persons outside the consumer unit, and miscellaneous items for the consumer unit. Excluded are expenditures for pensions and social security, savings, and life insurance.

Housing includes expenses associated with owning or renting a home or apartment, including rental payments, mortgage principal and interest, property taxes, maintenance, repairs, insurance, and utilities.

Transportation includes expenditures for the net purchase price of vehicles, finance charges, maintenance and repairs, insurance, rental, leases, licenses, gasoline and motor oil, and public transportation. Public transportation includes fares for mass transit, buses, airlines, taxis, school buses, and boats.

Medical care expenditures are for out-of-pocket expenses including payments for medical care insurance, medical services, and prescription drugs.

Entertainment expenditures are for fees and admissions, televisions, radios, sound equipment, pets, toys, playground equipment, and other entertainment supplies, equipment, and services.

Miscellaneous expenditures are for personal care services, reading, education, tobacco products and smoking supplies, alcoholic beverages, other lodging, and house furnishings and equipment.

I adjust all expenditure data using the Consumer Price Index research series (CPI-U-RS). The CE weight named *FINLWT21* is used. Because young renters are under-represented in the sample of consumer units who remain in the survey for all five interviews, I use a procedure presented in Sabelhaus (1993) to adjust the weight variable by age and housing tenure (homeowner/ renter) to obtain a better representation of the population as a whole.[13]

---

[13] J. Sabelhaus, "What is the Distributional Burden of Taxing Consumption?" *National Tax Journal*, 1993, vol. 46, no. 3, pp. 331-344.

For measures of inequality such as the Gini coefficient, it is desirable to have a comparable unit of measurement. It is difficult to compare the consumption-expenditures of a single-person consumer unit to a four-person consumer unit. I expect the four-person consumer unit to have higher consumption-expenditures everything else equal. To overcome this difficulty, I adjust the consumption-expenditures of a consumer unit by an equivalence scale, which allows me to make comparisons across consumer units of different sizes. The scale is given by the square root of the family size and indicates that the resources for a four-person consumer unit must be twice that of a single-person consumer in order for the two to have an equivalent standard of living. The equivalence scale is only used for calculation of the Gini coefficient.

TABLE 1
DEMOGRAPHIC CHARACTERISTICS BY INCOME REPORTER
STATUS (2002-2004)

	Complete income reporters	Incomplete income reporters	All consumer units
Number of observations	11,271	1,780	13,051
Age of reference person (%)			
Age 25 or less	4.1	3.5	4.0
Age 26-35	15.1	12.9	14.8
Age 36-45	21.6	23.1	21.9
Age 46-55	21.4	23.5	21.7
Age 56-65	15.3	17.3	15.5
Age 66 plus	22.5	19.7	22.1
Family size			
Adults	1.8	1.8	1.8
Children	0.8	0.8	0.8
Family type (%)			
Single -- no children	26.6	26.1	26.5
Single parent	5.5	4.6	5.4
Married -- no children	23.7	24.3	23.8
Married with children	26.9	27.0	26.9
Married -- other	4.3	4.7	4.3
Other family type	13.0	13.3	13.1
Education of reference person (%)			
High school dropout	15.6	13.8	15.4
High school graduate	27.8	29.6	28.0
Some college	28.8	30.2	29.0
College graduate	27.8	26.4	27.6
Race of reference person (%)			
White	84.5	81.0	84.0
Black	10.5	15.2	11.1
Other race	5.0	3.8	4.9
Region of residence (%)			
Northeast	19.1	20.1	19.2
West	20.9	18.9	20.6
South	36.0	34.1	35.8
Midwest	24.0	26.9	24.4
Live in urban area (%)	72.4	71.3	72.3

Source: Consumer Expenditure Survey (2002-2004). All data are population weighted.

TABLE 2
DISTRIBUTION OF CONSUMPTION-EXPENDITURES BY INCOME
REPORTER STATUS (2002-2004)

	Complete income reporters	*Incomplete income reporters*	*All consumer units*
Mean	35,441	31,099	34,845
10th percentile	11,899	9,973	11,568
25th percentile	18,870	15,614	18,386
50th percentile	29,542	25,905	28,953
75th percentile	45,060	40,093	44,436
90th percentile	64,577	58,543	63,703
Inequality measure			
Gini	0.32	0.32	0.32

Source: Consumer Expenditure Survey (2002-2004). All data are population weighted. Expenditure data is in real 2004 dollars using the CPI-U-RS.

TABLE 3
PERCENT OF CONSUMER UNITS BELOW OFFICIAL
POVERTY THRESHOLD USING
CONSUMPTION-EXPENDITURES (2002-2004)

	Complete income reporters	*All consumer units*
All	10.8	11.5
By family type		
With children in consumer unit	10.7	11.3
Elderly head of household	16.3	17.4
By race of the reference person		
White	8.9	9.4
Black	23.3	26.9
Other race	12.5	12.7

Source: Consumer Expenditure Survey (2002-2004). All data are population weighted. Expenditure data is in real 2004 dollars using the CPI-U-RS. The poverty thresholds are the official thresholds published by the U.S. Census Bureau.

TABLE 4
EXAMINING THE CHANGE IN CONSUMPTION-
EXPENDITURES BETWEEN 2003 & 2004

	Complete income reporters		All consumer units	% change	% change
	2003	2004	2004	CIR only	CIR to ACU
	(A)	(B)	(C)	[(B)-(A)] / (A)	[(C)-(A)] / (A)
Poverty rate	10.64	10.94	11.85	2.8%	11.3%
Gini	0.32	0.33	0.33	3.8%	4.1%
Mean	23,143	23,291	22,739	0.6%	-1.7%
25th percentile	13,470	13,124	12,666	-2.6%	-6.0%
50th percentile	19,899	19,534	19,022	-1.8%	-4.4%
75th percentile	28,799	28,565	28,055	-0.8%	-2.6%

Source: Consumer Expenditure Survey (2002-2004). All data are population weighted. Expenditure data is in real 2004 dollars using the CPI-U-RS. The poverty thresholds are the official thresholds published by the U.S. Census Bureau.

TABLE 5
ORDINARY LEAST SQUARES ESETIMATES OF ENGEL CURVES FOR FOOD EXPENDITURES (2002-2004)

	Complete income reporters	*All consumer units*
All		
Consumption-expenditures	-0.329	-0.340
	(0.020)	(0.020)
Consumption-expenditures squared	0.012	0.012
	(0.001)	(0.001)
Consumption-expenditure poor		
Consumption-expenditures	0.630	1.075
	(0.246)	(0.227)
Consumption-expenditures squared	-0.043	-0.067
	(0.014)	(0.013)

Source: Consumer Expenditure Survey (2002-2004). All data are population weighted. Expenditure and income data are in real 2004 dollars using the CPI-U-RS. Consumer units that have consumption-expenditures below the official Census poverty threshold are classified as consumption-expenditure poor. The poverty thresholds are the official thresholds published by the U.S. Census Bureau.

Notes: The dependent variable equals the share of food expenditure in total consumption-expenditures. The other independent variables in each regression are age, the number of adults, the number of children, and the square of each. There are also dummy variables for region, education, race, and year.

Figure 1: Frequency distribution for consumption expenditures