AN EXAMINATION OF SPENDING PATTERNS OF FAMILIES RECEIVING FORMS OF PUBLIC ASSISTANCE

William D. Passero, U. S. Department of Labor
Bureau of Labor Statistics, Bldg. PSB, Room 3985, 2 Massachusetts Ave., NE, Washington, DC 20212

Key Words: Expenditures, Welfare, Public Assistance

I. Introduction

This paper uses 1992-93 data from the Quarterly Interview Survey component of the Consumer Expenditure Survey (CE) to analyze spending patterns of families receiving forms of public assistance. Comparisons of demographic characteristics and expenditures are made between families receiving assistance and those not receiving assistance. Among families receiving assistance, those with working members are compared with those with no working members.

Weighted means and percent distributions of selected family characteristics and weighted annual means and shares of expenditures are calculated. Statistical tests demonstrate that expenditure shares for most item categories are significantly different between the compared groups. The analysis then considers factors related to transportation expenditures. A regression equation is specified and estimated by the ordinary least squares (OLS) technique. Results from the regression are examined.

II. Methodology

A. Sample

Different approaches can be used to identify "poor" families. A poor family could be identified as one in which a member participates in a government program, providing general income maintenance or specific assistance for food, housing, or medical care. Another is to compare the family's income or expenditures to some threshold, below which they would be considered poor.

The former approach is chosen for a number of reasons. The CE data base contains variables positively identifying families in many of these programs. The processing of income variables in the CE introduces limitations such that one cannot determine conclusively that a family is below or above a poverty threshold. While it is possible to create a poverty line based on expenditures which avoids this problem, neither a sample of "income-poor" nor "expenditure-poor" families would necessarily include all families receiving program assistance

The sample constructed for this study consists of 6,307 interviews from qualifying families. A family can qualify for the sample in three ways. The family can report receiving welfare or public assistance, Supplemental Security Income (SSI), or Food Stamps. It can live in public housing or receive housing subsidy payments. Finally, any member of the family can be enrolled in Medicaid. This is not an exhaustive list of assistance programs available to families, but covers those collected in the CE survey instruments.

B. Data source

The objective of the Interview survey is to obtain one year's worth of expenditures from each sample family. A questionnaire is administered by a Census Bureau interviewer. Each sample family undergoes five interviews. In the first interview, housing unit characteristics, demographic characteristics for each member, and an inventory of durables are collected. Expenditure data are collected over a one-month recall period and are used for bounding purposes only. The remaining four interviews are conducted at three-month intervals, wherein families report expenditures that have been made during that time. At the second and fifth interviews, income data are collected for the 12-month period prior to the interview. Overall, about 90 percent to 95 percent of all expenditures are covered by the Interview survey.[1]

Families are interviewed using a rotational sampling procedure. Each month new families begin the interviewing cycle, replacing old families that have completed their participation. The Interview survey is designed to replace 20 percent of the sample every three months.

C. Reference period

For this study, data from interviews completed between January 1992 and March 1994 are analyzed. These interviews provide data for 1992 and 1993, supplying a sufficient sample of qualifying families. Expenditures reported over the 1992-93 period do not manifest significant shifts in spending behavior that would render combining data from the two years suspect. While exceptions exist for some categories, overall expenditures increase less than 3 percent from 1992 to 1993.

[1]Expenditures for postage, housekeeping supplies, personal care products, and nonprescription drugs are not collected.

D. Variables

Demographic variables in the analysis include number of persons in the family, age, sex, race, and education of the reference person, housing tenure, number of children under 18, family composition, number of persons over 64, worker composition, number of earners, number of owned vehicles, and types of assistance received. These variables reflect the characteristics of the family at the time of each interview.

Expenditure variables in this analysis identify total expenditures, food, housing[2], apparel, transportation,[3] health care, entertainment, and personal insurance and pensions. Expenditures for alcoholic beverages, personal care, reading, education, tobacco, miscellaneous expenditures, and cash contributions are combined into a category of all other expenses.

Expenditure variables aggregate all purchases made during the three-month reference period of the interview. They are multiplied by four for annualization prior to computation of weighted means.

In this study, each interview is treated as an independent observation. Each family in the CE sample is assigned a population weight. This weight can change from quarter to quarter for any family, depending on the characteristics of the families interviewed during that quarter. All means and percent distributions are computed using these weights.

III. Statistical comparisons

Means are often inadequate for analysis in that large differences in expenditure levels between groups hides variations in the allocation of the expenditure dollar. Thus, mean expenditures have been converted to shares of total spending. T-statistics are calculated to determine if the shares allocated to each category are significantly different.

A. Families receiving public assistance vs. families not receiving public assistance

Tables 1 and 3 show that families receiving public assistance are different than families not receiving such assistance, both in demographic characteristics and expenditure patterns. Table 1 shows that families receiving assistance are larger and have more children than families not receiving assistance. The reference person in recipient families is only slightly younger, running counter to the perception that families receiving assistance are much younger than the population at large. Many of the families receiving assistance have working members and own a vehicle. Families not receiving assistance own twice as many vehicles and have more than one earner.

Table 1. Selected family characteristics by receipt of public assistance, 1992-1993

	Family receives assistance	Family receives no assistance
Age of reference person	46.4	47.9
Number of:		
Persons	3.0	2.4
Children under 18	1.3	0.6
Vehicles	1.0	2.1
Earners	0.9	1.4
Percent:		
Female	58.9	32.4
Black	30.1	8.4
Homeowner	29.4	67.7
Renter	67.1	30.0
Husband/wife families	32.7	56.0
Single parent, at least one child under 18	22.0	4.3
Single person	25.0	29.5
All other families	20.3	10.1

The ratio of homeowner to renter for nonrecipient families is the reverse of the ratio for recipient families. Almost 60 percent of the families obtaining assistance are female-headed while three in 10 have a black reference person. About one-third of the families not receiving assistance have a female reference person, while over 90 percent of the reference persons are white. Husband/wife families comprise just over one-third of those receiving assistance. Single person families make up 25 percent, while single-parent families account for another fifth. On the other hand, husband/wife families comprise the majority of nonrecipient families. About 3 in 10 are single person families, while just five percent are single-parent families.

Families can receive one or more forms of public assistance. Table 2 shows no one combination dominates. The most common combination is Medicaid only. Food Stamps is a common component of the next three most frequent combinations. No other combination is received by more than about 6 percent of the sample.

[2]This variable does not include the principal portion of mortgage payments, considered a loan repayment, thus a reduction of liabilities.
[3]This variable contains the net outlay of a vehicle purchase, that is, the amount paid after trade-in allowance and any cost paid by an employer.

Table 2. Percent distribution of types of assistance received, 1992-1993

Medicaid only	14.6%
Welfare, Food Stamps, and Medicaid	11.0
Food Stamps and Medicaid	9.1
Food Stamps only	9.0
SSI and Medicaid	6.1
All other combinations	41.6

Table 3 reveals that families receiving public assistance spent $15,304 on average during 1992-93, just over one half of the $29,800 average for nonrecipient families.

Table 3. Shares of average annual expenditures by receipt of public assistance, 1992-1993

	Family receives assistance	Family receives no assistance
Total expenditures	$15,304	$29,800
Food**	22.4	15.3
Housing**	37.1	31.6
Apparel	5.0	4.9
Transportation**	15.3	19.3
Health care**	4.3	5.8
Entertainment**	4.1	5.4
Personal insurance and pensions**	5.5	10.6
All other expenses**	6.4	7.2

**Share difference is significant at 99-percent level.

About three-fifths of total spending for recipient families is allocated to food and housing. Transportation takes up the next largest share at about 15 percent of total spending. The shares of total spending apportioned to entertainment, apparel, health care, and personal insurance and pensions hover between four and five percent. All other expenses combine to make up the remainder, just over 6 percent.

Housing and transportation account for over 50 percent of total spending among families not receiving assistance. Food is relegated to third place at 15 percent. Over 10 percent is directed to personal insurance and pensions. Expenditure shares for health care, entertainment, and apparel hover between five and six percent, while all other expenses account for the final seven percent.

With the exception of apparel, the share apportioned to each category by families receiving assistance is significantly different from the share apportioned by nonrecipient families.

B. Recipient families with working members vs. recipient families with no working members

In Tables 4 and 6, expenditure patterns and demographic characteristics of families in which there are no working members are compared with families with one or more working members. To be considered "working", a family member must be over 15 years of age and have been employed full-time or part-time for at least 27 weeks over the previous 12 months.

Each subgroup is limited to families with a reference person under age 65. Families headed by reference persons 65 and over are found primarily in the nonworking subgroup and unduly affect the distribution of expenditures of that subgroup, particularly for health care and housing.

Referring to Table 4, the average age of the reference person of the subgroups is almost identical. Families in the working subgroup are larger than families in the nonworking group, yet the number of children is about the same in both subgroups.

Table 4. Selected family characteristics for families with reference person under 65 receiving public assistance by presence of working members, 1992-1993

	No working members	One or more working members
Age of reference person	38.9	38.3
Number of:		
Persons	2.9	3.8
Children under 18	1.5	1.6
Vehicles	0.5	1.6
Earners	0.3	1.7
Percent:		
Female	69.0	47.2
Black	39.7	23.7
Homeowner	15.1	35.2
Renter	80.1	61.7
Husband/wife families	19.4	50.7
Single parent, at least one child under 18	41.6	15.7
Single person	24.6	7.5
All other families	14.5	26.0

By design of the subgroups, the average number of earners is different between the subgroups. It is noteworthy that so many of the families in the working subgroup have more than one earner.[4]

A female reference person is found in almost 70 percent of the families in the nonworking subgroup, compared to less than half in the working subgroup. About 2 in 5 nonworking families have a black reference person, dropping to about 1 in 4 among working families. Renters predominate among nonworking families. While renting is also the most common option among working families, over one-third are homeowners.

The prevalence of female-headed families is reflected in the distribution of family types in the nonworking subgroup. Two in five families are made up of a single parent with at least one child under 18. An additional 25 percent are single-person families. Less than 20 percent contain a husband and wife. By contrast, over one-half of the working subgroup families are husband/wife. Single parent families make up 1 in 6 families.

Table 5. Percent distribution of types of assistance received by families with reference person under 65 by presence of working members, 1992-1993

	No working members	One or more working members
Welfare, Food Stamps, & Medicaid	18.8%	9.3%
Medicaid only	4.6	21.2
Food Stamps & Medicaid	8.3	11.2
Food Stamps only	7.0	11.0
Welfare, other gov't housing support, Food Stamps, & Medicaid	7.5	2.0
SSI only	2.5	7.5
SSI, Food Stamps, & Medicaid	6.3	1.8
All other combinations	45.0	36.0

Differences also appear in Table 5 among the most frequent combinations of public assistance each subgroup collects. In the nonworking subgroup, the combination of welfare, Food Stamps, and Medicaid tops the list. That combination ranks fourth in the working subgroup. Medicaid only is received by the largest portion of the working subgroup, reported by over four times as many families as in the nonworking subgroup. Food Stamps and Medicaid and welfare, other government housing support, Food Stamps and Medicaid round out the top three among the nonworking subgroup. Food Stamps and Medicaid is also the second most frequent combination for working families, while welfare, other government housing support, Food Stamps and Medicaid is seldom reported. In this subgroup, Food Stamps only holds third place, while it ranks fourth for nonworking families.

The impact of additional earners can be seen in the disparity in total expenditures between the subgroups displayed in Table 6. Working families report total expenditures over double that of nonworking families. The allocation of the expenditure dollar varies markedly for each subgroup as illustrated by the preponderance of statistically significant share differences.

Table 6. Shares of average annual expenditures for families with reference person under 65 receiving public assistance by presence of working members, 1992-1993

	No working members	One or more working members
Total expenditures	$10,771	$21,664
Food**	28.5	19.4
Housing**	43.2	33.9
Apparel	5.6	5.1
Transportation**	9.5	19.1
Health care**	2.1	3.4
Entertainment**	3.7	4.6
Personal insurance and pensions**	1.3	7.9
All other expenses	6.1	6.5

**Share difference is significant at 99-percent level.

The nonworking subgroup apportions over 70 percent to food and housing versus 53 percent by its working counterpart. The working subgroup, on the other hand, allocates more to transportation and personal insurance and pensions. Transportation makes up twice the share of total spending of the working subgroup compared to the nonworking subgroup. Vehicle purchases drive the disparity in

[4]An earners in the CE data base is not the same as the "working" member defined here. An "earner" is over 14 years old and has worked any number of weeks, for pay, over the previous 12 months.

share between the subgroups. Personal insurance and pensions command but one percent of the expenditures of the nonworking subgroup, but rank fourth at almost eight percent for the working subgroup. The difference in share can be explained almost entirely by payroll deductions for Social Security and pension contributions - outlays contingent on being employed.

While expenditure shares for apparel, health care, entertainment, and all other expenses appear very similar, share differences for health care and entertainment prove to be statistically significant.

C. Regression analysis of transportation expenditures

Regression analysis is employed to ascertain the relationship of selected demographic variables with expenditures for transportation. OLS is the technique chosen for the regression equation. Statistical tests are run on expenditure variables for transportation and total expenditures to determine if data transformation is appropriate. Regressions results for food, housing, and apparel appear in the full paper.

1. Dependent variables

It was decided to limit regression analysis to food, housing, transportation, and apparel, as they represent a significant part of total expenditures. The dependent variables represent the log of annualized quarterly expenditures for each item category.

2. Independent variables

Most of the independent variables selected apply to all four regression equations. An income variable is a natural choice for inclusion where a consumption expenditure is the dependent variable. Income variables on the CE data base suffer shortcomings, in that no imputation is done for invalid nonresponse. A total expenditures variable can be used as a proxy for income. It is reported for all families and represents "permanent income".

Potential exists for simultaneous equations bias in this model as transportation makes up a sizable portion of total expenditures. However, this may not be a concern as OLS is being used for the regression.

Independent variables capturing demographic characteristics are developed for the regression analysis. These variables are posited as dummy variables and follow the customary structure of being coded '1' if the condition is true and '0' if it is not.

To account for the effects of marriage, a dummy variable based on family composition assigns a code of '1' to any husband-wife family. All other families are coded '0'. The number of children under 18 is likely to have an impact on expenditures and is included as a continuous, right-side variable in the equations. The number of owned vehicles certainly affects transportation expenditures and is described by a continuous variable in the regression.

Four variables assess the impact of working members. A continuous variable contains the number of earners in the family. A dummy variable denotes the presence of working members in the family. A code of '1' indicates no working members in the family. An interaction variable combining this dummy variable with the total expenditures variable carries a value of total expenditures for families with no working members and 0 for families with working members. The parameter estimates for this variable and the total expenditures variable measure differences in the marginal propensity to consume transportation of the working family and nonworking family subgroups. A dummy variable for age of reference person is added in case the effects of having nonworking members is really an age effect, in that nonworking members are often the retired elderly. A code of '1' for this variable signifies the reference person is over 64.

Six dummy variables assess the effects of each type of assistance families can obtain. What the dummy variables signify subtly differ due to the way the data is collected and stored. For welfare, Food Stamps, and SSI, a code of '1' indicates the family reported a dollar amount. For Medicaid, a code of '1' means someone in the family was enrolled in Medicaid. Residence in a structure owned by a local housing authority or other public agency satisfies the "true" condition for public housing. A code of '1' for other government housing support signifies the family does not reside in public housing, but receives a government housing subsidy.

Since education may affect expenditures, a dummy variable representing education level of the reference person is crafted. Families whose reference person is not a high school graduate are coded '1'.

3. Data transformation

Before estimating the regression, statistical testing is done to determine whether variables for transportation and total expenditures are amenable to conversion to natural log form. With this transformation, the parameters associated with the total expenditure variable and the interaction variable can be interpreted as the income elasticity of the working and nonworking subgroups for transportation.

A Box-Cox transformation of the form, $(y^{\lambda} - 1) / \lambda$, is estimated and suggested values for λ range from -0.125 to 0.1875. As these values are all very close to 0, it is deemed appropriate to transform expenditures from y to log(y) in the regression.

4. Results for the transportation regression

Total transportation proves to be income elastic for both the working and nonworking subgroups. Logged total expenditures indicates the working subgroup has an income elasticity of 1.08 for transportation, which increases to 1.27 for the nonworking subgroup.

From the parameter estimate for the working member variable, it can be inferred that families with no working members are likely to spend much less on transportation than families with working members. Families with working members would require some mode of transportation to commute to work. The negative sign and magnitude of the coefficient for the age variable bear out the expectation that the elderly spend a smaller share on transportation as they are more likely to hold on to a vehicle longer and make more infrequent purchases of a replacement vehicle. Replacement vehicles are more likely to be smaller since the average size of elderly families is smaller.

The number of vehicles is positively correlated with transportation expenditures as anticipated. Each additional vehicle would lead to an expected increase of 32 percent in transportation spending. The number of children, however, is negatively correlated with an expected decline of about 5 percent with each additional child.

Three of the six variables for public assistance yield significant results. The welfare variable behaves as anticipated, as the sign for the coefficient is negative. Families receiving welfare income are expected to spend about 14 percent less on transportation than families not receiving welfare. Food Stamps and public housing both display significant positive coefficients, from which it can be inferred that families receiving Food Stamps or residing in public housing are expected to spend about 9 percent and 12 percent more respectively on transportation than families not receiving such assistance. Families receiving welfare income tend to be poorer and allocate a relatively small share to transportation. As their incomes increase and they can afford to allocate relatively more to transportation, they also become ineligible for continued welfare assistance. Eligibility for Food Stamps and public housing may not be less affected by rising income, so families can maintain these benefits, even as their increased incomes allow them to purchase more transportation. The R^2 for this model is a very respectable .5709.

Table 7. Parameter estimates for regression on transportation expenditures for families receiving public assistance, 1992-1993

Intercept	**-3.573
Total expenditures (log)	**1.079
Total expenditures X no working members	**0.191
Family has no working members	**-2.008
Number of children under 18	**-0.048
Number of vehicles	**0.324
Reference person is over 64 years old	**-0.243
Family receives welfare	**-0.129
Family receives Food Stamps	*0.082
Family resides in public housing	*0.116

** Significant at the 99-percent level.
* Significant at the 95 percent level.

REFERENCES

Chao, Lincoln L. (1980) *Statistics for Management.* Monterey, CA: Brooks/Cole Publishing Company

Danziger, Sheldon H. and Daniel H. Weinberg, eds. (1986) *Fighting Poverty*. Cambridge, MA: Harvard University Press

Freund, Rudolf J. and Ramon C. Littell (1991) *SAS System for Regression, Second Edition*. Cary, NC: SAS Institute Inc.

Kennedy Peter (1985) *A Guide to Econometrics, Third Edition.* Cambridge, MA: The MIT Press.

Neter, John and William Wasserman (1974) *Applied Linear Statistical Models.* Homewood, IL: Richard D. Irwin, Inc.

Ruggles, Patricia (1990) *Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy*. Washington, D.C.: The Urban Institute Press.

Statistical Analysis System (SAS) Institute (1985) *SAS User's Guide: Basics, Version 5 Edition.* Cary, NC: SAS Institute Inc.

Statistical Analysis System (SAS) Institute (1985) *SAS User's Guide: Statistics, Version 5 Edition*. Cary, NC: SAS Institute Inc.

U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, 1992-94: Internal files from Quarterly Interview Survey.