# SOCIAL SECURITY PAYMENTS AND THE AGED HOUSEHOLD EXPENDITURES IN THE U.S.

Teh-wei Hu and Sharif Ghalib, The Pennsylvania State University*

## I. Introduction

During the last decade, the United States has witnessed a marked increase in the aged population (65 years old and over) from 17 million in 1960 to 20 million in 1970. The growth of the aged segment of the population has special significance for the Social Security program. Of the 21.7 million Social Security recipients in 1966, 67 percent received benefits because they or their wives were retired workers aged 65 or over. In 1970, the Social Security program transferred income to 85 percent of the households in the aged cohort.

Social Security benefits have increased substantially in recent years. Benefits of about $1,715 were paid to an average recipient in 1972 (Mullineaux, 1973, p. 3). This figure had increased by about 70 percent of the average annual payment in 1965. The most recent increase was enacted in 1972 when benefits were boosted 20 percent in order to cover the cost-ov-living change. In November, 1973, the Congress has again proposed a 6 to 7 percent increase pending the resolution of the bill.

Many empirical studies have utilized household budget data to analyze the relationship between expenditure and income as well as other socioeconomic variables for the U.S. population as a whole. However, in spite of the growing importance, in both absolute and relative terms, of older consumer units in the U.S., there is a relatively paucity of studies, particularly of the household budget type, that deal with the expenditure patterns of aged family units. Moreover, many of these studies, such as those by Fisher (1955), Brady (1955, 1956), Goldstein (1960, 1965, 1966, 1968), and Reinecke (1971), analyze 1950 or 1960 data and are largely descriptive; only Crockett (1963) and Chu (1972) make use of multiple regression techniques to control for various sociodemographic factors in aged household expenditure patterns.

There is, therefore, a need for further research and more rigorous analysis of the household expenditures of the aged by using regression techniques based on more recent data (1969 to 1970). The objective of this paper is to estimate expenditure functions of the aged population by incorporating Social Security payment information in the model so that the impact of the recent major increase in Social Security benefits on various expenditure items can be determined.

*The authors are, respectively, Professor of Economics and Part-time Instructor, The Pennsylvania State University. The authors are grateful for the financial support of the Social Security Administration. This paper is to be included as a part of the report to be submitted to the Social Security Administration, under Grant No. 56073. The opinions expressed are those of the authors and do not necessarily reflect those of the sponsoring agency.

## II. Analytical Framework and the Specification of the Model

Economic theory assumes that a household has a preference function and tries to maximize its satisfaction in choosing the optimal commodity mix, subject to the constraint of household income. In addition to the income factor, it is explicitly recognized that various sociodemographic characteristics--e.g., age, sex, and race--affect these preference orderings and thus the expenditure behavior of households. This recognition is based on both theoretical grounds and previous empirical findings. There is also an important econometric reason for taking these characteristics into account if a goal of the study is to estimate income effects (marginal propensities to expend) using regression analysis: because most sociodemographic variables are correlated with income, if the former variables are omitted from the regression equation, the estimated income coefficients will not show its net effect upon expenditures (they would partially reflect the influences of the excluded variables). Specification errors are introduced when relevant explanatory variables are omitted, resulting in biased estimates of income effects, a characteristic of earlier family budget studies. Therefore, the net influence of income, or "pure income effects" can be picked up only if one controls for relevant sociodemographic variables by explicitly introducing them as regressors in the expenditure functions, thus maintaining the ceteris paribus condition. This procedure does not only permit the estimation of pure income effects, but it also allows us to detect and measure the net influence on expenditures of any single characteristic as the remaining ones are effectively held constant.

Since this paper is also interested in examining the possible impact of Social Security payments ($Y_1$) on family expenditures, the income variable is decomposed into two parts: account is taken of Social Security payments ($Y_1$) and other income ($Y_2$). The use of several income components in the expenditures function is analogous to specifications of aggregate consumption functions in studies by Brown (1952), Klein and Goldberger (1955), and Halbrook and Stafford (1971).

The analyses by Reinecke (1971) and our separate empirical results have shown that, even among the aged households, there are differences in spending behavior between the old (65 to 74 years) and the very old (75 and above). Therefore, a dummy variable (D) is introduced to test and measure the differences in levels of expenditure categories, holding other factors constant. To test and measure possible differences in marginal propensity to expend (MPE), a product of income and dummy variable ($DY_1$) is introduced.

In addition to variables of income source and age classification, two other groups of variables will be included: (1) economic

variables, such as wealth proxies, debt status, and home ownership; and (2) sociodemographic variables such as household size and composition (classified in terms of single or husband and wife), education, sex, race, employment condition (retired or not retired), physical condition (disabled or not disabled) of the head of household, and region and degree of urbanization of the household. Since the data from two years (1969 to 1970) are pooled into one regression equation, a dummy variable for survey year is introduced to account for possible differences in price and economic conditions between years. Thus, the analytical model is specified as follows:

$$E_i = f(Y_1, Y_2, DY_1, DY_2, D, X_1, X_2, \ldots, X_n, U_i)$$

where $E_i$ represents various expenditure categories (food, alcohol, cigarettes, housing, and the sum of these four expenditures and the value of car(s) owned). Due to data limitations, total expenditures and other types of expenditures are not available. $Y_1$ denotes Social Security payments; $Y_2$ denotes other sources of income; D denotes the old age group (65-74); $X_1, X_2, \ldots, X_n$ denote other economic and sociodemographic variables; and $U_i$ is an error term.

A linear equation form is used in this study. The justification is that, for the great majority of expenditure categories, the square of Social Security benefits was not found to differ significantly from zero when the quadratic model was run. This implies that the marginal propensities to expend out of Social Security benefits are, by and large, constant (i.e., independent of the level of income) and that saturation levels are not attained; the latter is not surprising in view of the fact that such saturation levels may be reached, at least in principle, only at relatively high income levels while average annual Social Security benefits are relatively small (about $1,500 a year, or 25 percent of total income). Moreover, the correlation coefficient between Social Security benefits ($Y_1$) and its square ($Y_1^2$) was found to be exceedingly high (.96). Given the relatively small size of the Social Security subsamples, the consequence was a high degree of multicollinearity that often gave rise to large standard errors of the coefficients $Y_1$ and $Y_1^2$.

## III. Data Source and Definition of Variables

The specified models are estimated from both the 1960 to 1961 Survey of Consumer Expenditures (CES, by the U.S. Department of Agriculture and the Bureau of Labor Statistics) and the 1968 to 1971 Panel Study of Income Dynamics (Panel data by the Survey Research Center at the University of Michigan). This paper will present the results of Panel data alone. The 1968 Panel data consisted of a cross section of 4,802 families in the United States (excluding Alaska and Hawaii) who were interviewed four times. By 1971, the sample consisted of 4,840 households, about 750 of them having been newly created as adult members of original Panel units splitting off to form their own families. The Panel study generated a unique data set which provides a wealth of information on sociodemographic characteristics of households in addition to detailed income information by sources and costs of earning income. However, these data do not cover all expenditure items of a household; only the major expenditure items such as food, housing, alcohol, cigarettes, and car are included in the survey.

Since the income data referred to the year prior to the interview while the expenditure data pertained to the survey year, and since 1968 data do not separate the Social Security benefits and other income sources, the complete income and expenditure information was reduced to two years--1969 and 1970. By eliminating the nonaged sample and aged sample with no Social Security benefits, a total of 331 households is retained for the analysis, or a total of 662 households on a two-year pooled basis. The introduction of a dummy variable for survey year has accounted for the possible differences between years.

The definitions of dependent and independent variables in the study are as follows:

### Dependent Variables

Food expenditures are defined as the value of annual food consumption, which includes food purchases, values of home-produced food, free food, and one-half of restaurant expenditures (in dollars).

Alcohol and cigarette expenditures are measured on an annual basis (in dollars).

Housing expenditures are defined as the rental value of the residence and utility expenses incurred by the household. For homeowners, they are defined as property taxes, property insurance, mortgage interests, utilities, costs of repair, and the opportunity cost, equivalent to 6 percent of the net equity in the house (in dollars).

Car expenditures are defined only as the three-year average (1968 to 1970) value of cars owned by the household. The Panel data do not provide information on car repair costs and gasoline expenses (in dollars).

Partial total expenditure is the sum of the first four expenditure categories (in dollars).

### Independent Variables

Net real disposable income other than Social Security benefits is defined as annual money income minus income taxes, work expenses, and Social Security benefits, plus the value of goods and services produced by, or provided to, the family (in dollars).

Social Security benefits (in dollars).

Partial assets are defined as the sum of estimated savings and net equity in home (in dollars).

Mortgage debt is a dummy variable: 1 = has mortgage debt; 0 = otherwise.

Homeownership is a dummy variable: 1 = homeowner; 0 = otherwise.

Level of education is represented by four categories of dummy variables: (1) less than nine grades; (2) nine grades or more, but less than high school graduation; (3) high school graduate; and (4) education beyond high school. Category (4) is omitted in the regression equation.

Household size is a continuous variable (in number of persons).

Household compositions are in dummy variables: (1) single individuals; (2) husband and wife; (3) other types. Category (3) is omitted in the regression equation.

Age of the head of the household is a dummy variable: 1 = age 65 but less than 74; 0 = otherwise.

Employment status is a dummy variable: (1) = retired; 0 = otherwise.

Location of the household is characterized in two ways, by region and by degree of urbanization. Dummy variables are created for three regions: Northeast, North Central, and South. West is omitted in the regression equation. Urbanization is categorized by dummy variables on the basis of location of sampling unit: (1) population greater than 500,000 (2) population between 50,000 and 500,000 (3) between 10,000 and 50,000, and (4) less than 10,000 persons. Number (4) is omitted in the regression equation.

Sex is a dummy variable: 1 = male; 0 = female.

Race is a dummy variable: 1 = white, 0 = otherwise.

Disability is a dummy variable: 1 = a head of the household who has a physical or nervous condition which completely or severely limits one's productive activities; 0 - otherwise.

Welfare is a dummy variable: 1 = household received any in-kind and/or cash public welfare assistance; 0 = otherwise.

Year is a dummy variable for the year 1970. The dummy variable for the year 1969 is omitted in the equation.

Table 1 presents the means and standard deviations of the variables in the Social Security recipients sample. Several interesting points are revealed.

(1) The average size of household of Social Security recipients is 1.85 members. Of these households, about 38 percent have a family of a single person; 45 percent have husband and wife only.

(2) Among the Social Security recipients, 32 percent are retired, 52 percent are disabled, but only about 9 percent are on welfare.

(3) About 82 percent of Social Security recipients are homeowners, and only 12 percent have outstanding mortgages. Therefore, the net equity of their assets including cash savings is about $12,000, which is about twice their average income of $5,449.

(4) Among the Social Security recipients, 65 percent are between ages 65 and 74. The head of the household is male in about 66 percent of the sample and white in about 90 percent of the sample.

(5) Over 50 percent of the Social Security recipients in the sample have less than a ninth-grade education. About 50 percent of the sample is located in cities with less than 50,000 people. Seventy percent of the sample is from the North Central and Southern parts of the U.S.

(6) Social Security benefits accounted for about 27 percent of the total income for Social Security recipients. They spend most on household items and utilities (30 percent) and food (18 percent). The sum of their alcohol and cigarettes expenditures is only about 1 percent of their total income.

## IV. Empirical Estimation

It is well known that cross sectional data on household income and expenditures are subject to errors in measurement. As a result, estimates of MPE will be biased. As Friedman (1957), Summers (1959), and Liviatan (1961) point out, an alternative to overcome these biased estimates is to treat the income as errors in variables and to use either instrumental variables or the two-stage least squares technique to obtain consistent estimates from the model. A commonly used method is to use total expenditures as an instrumental variable for measured income. Since the Panel data do not have information on total expenditures, however, a sum of four separate expenditures (partial total expenditures) is used as an instrumental variable. The results show that regression coefficients become less significant than the classical least squares method. The coefficient of instrumental variables is also rather difficult to use for policy implications and economic interpretation. Furthermore, this study is interested in various income components in relation to expenditures, and the instrumental variable technique is not suitable for this purpose. Therefore, measured incomes are used in the analysis.

Tables of regression results are available from the authors upon request. Table 2 shows the estimated marginal propensity to expend (MPE) of the old aged group and the very old group of the Social Security recipients. Several interesting findings may be summarized with regard to Social Security benefits and income of other sources.

(1) The classification of income into two components (Social Security benefits and income from other sources) is statistically significant to explain the variation of most expenditure items except cigarettes. Apparently, cigarettes are a habit-forming consumption item that is not significantly affected by income.

(2) All MPE's are statistically significant at least at the 10 percent level, except for cigarettes, alcohol (for Social Security benefits, 65-74 age group), and car (for Social Security benefits, 75 and over age group).

(3) For alcohol, housing, and food expenditures, the MPE of Social Security benefits is higher than the MPE of income from other sources. For cigarettes, however, there is no significant difference between the MPE of Social Security benefits and the MPE of income from other sources. The MPE of other income on cars is higher than the MPE of Social Security benefits.

(4) Statistical tests show that the differences of MPE between Social Security benefits and income from other sources are statistically significant within each age group (old and very old), respectively. However, the MPE's of Social Security benefits between the two age groups and the MPE's of income from other sources between the two age groups are not statistically significant. Thus, it is concluded that the classification of age group (old and very old) is not as important as the classification of

TABLE 1

Means and Standard Deviations of Variables: Social Security Subsample Pooled; 1969-1970

| Variables | Means and Standard Deviations | Variables | Means and Standard Deviations |
|---|---|---|---|
| Soc Sec B ($Y_1$) | $1494.28 (721.35)[a] | Male | .657 (.475) |
| Husband/Wife | .452 (.-98) | Homeowner | .822 (.383 |
| Single | .375 (.484 | White | .900 (.300) |
| Retired C | .323 (.468) | City GE 500 | .174 (.379) |
| Disabled | .518 (.500) | City GE 50 | .233 (.423) |
| Mortgage Debt | .125 (.331) | City GE 10 | .307 (.461) |
| Household Size | 1.85 (1.06) | Northeast | .177 (.382) |
| Ed LE 8 | .545 (.498) | Northcentral | .326 (.469) |
| Ed Le 9-11 | .156 (.363) | South | .369 (.483) |
| Ed Le H.S. | .086 (.281) | Alcohol | $35.50 (114.64) |
| Welfare | .092 (.289) | Cigarette | $33.86 (76.15) |
| Pt Asst | $11,885.22 (11,793.85) | Hset a Util | $1,633.66 (1,111.57) |
| ODRY ($Y_2$) | $3,955.44 (4,444.34) | AFoodC | $987.88 (583.06) |
| Year = 70 | .530 (.499) | Av Car V | $537.83 (755.82) |
| Age 65 to 74 D | .650 (.477) | Pt Exp | $2,690.92 (1,431.07) |
| Sample Size | 662 | | |

[a]Standard deviations are in parentheses

Social Security benefits and income from other sources. The dummy variable for age is also not statistically significant for every expenditure category.

(5) For the very old group (75 and above), the magnitude of MPE of Social Security benefits is highest for food, followed by housing. There is no influence on cigarettes and car. The negative MPE on alcohol is not a plausible result. However, the magnitudes of MPE of income from other sources is highest for car, followed by food, alcohol, and housing.

(6) For the old age group (between 65-74), the magnitude of MPE of Social Security benefits is highest for car, followed by housing and food. There is no influence on cigarettes and alcohol. The magnitude of MPE of income from other sources is highest for car, followed by food and alcohol.

Other findings with regard to sociodemographic factors and expenditure relations are as follows:

(1) Household size has a significant positive effect on food expenditures but not on other items. On the other hand, single-person families spend much less on most items than other types of families.

(2) The head of the household who is disabled spends significantly less on food and car than other types of families.

(3) Other things being equal, welfare

TABLE 2

Marginal Propensities to Expend: Social Security Sample, 1969-1970

| MPE of Income Sources for Aged Group \ Expenditures | | Alcohol | Cigarettes | Housing and Utilities | Food | Average Car(s) Value | Partial Expenditures |
|---|---|---|---|---|---|---|---|
| Age 75+ | MPE (Social Security) | -.021** | -.012 | .076** | .128*** | -.020 | .171** |
| | MPE (Other Income) | .020** | .002 | .011* | .024*** | .061*** | .057*** |
| Age 65-74 | MPE (Social Security) | .010 | .003 | .092*** | .088*** | .114** | .193*** |
| | MPE (Other Income) | .006*** | .001 | .006 | .036*** | .087*** | .049** |

Notes: *** significant at the 1% level (two-tailed test).
** significant at the 5% level (two-tailed test).
* significant at the 10% level (two-tailed test).

families of the aged group spend more on food and cigarettes but less on housing and car than non-welfare families.

(4) For the Social Security recipient sample, there is no significant difference in expenditure patterns whether the head of the household is male or female, or whether the head is retired or otherwise. However, the head of the household who is white spends more on cigarettes, housing, and food than the heads of nonwhite households.

(5) Households that are located in large cities with population over 500,000 spend more on all expenditure categories except car (they spend less on the value of their car).

(6) Households that are located in the North Central region spend less on food and housing but more on car than households in the West. There is no significant difference among regions with respect to alcohol and cigarette expenditures.

## V. Policy Implications and Concluding Remarks

The empirical results presented in the previous section show that aged Social Security recipients have a higher marginal propensity to expend on food and housing out of Social Security benefits than the marginal propensity expended from income of other sources. This finding implies that additional increases in Social Security benefits will most likely result in an increase on food and housing rather than on other non-necessity items such as alcohol and cigarettes. Two reasons may explain the above findings: (1) Social Security benefits are considered by recipients as a constant source of income; therefore, this amount of income is allocated for the necessities; and (2) Social Security recipients, on the average, have a much lower level of income ($5,445, including the Social Security benefits) as compared to an average income of $8,300 for all households in the Panel data. In fact, the average income of the Social Security recipients is even lower than the average income of welfare families in the sample ($5,700) as shown by Hu and Knaub (1973). Furthermore, the Social Security benefits account for about 25 percent of the household's total income. The budget allowance on food and housing is about 50 percent of the income. Thus, it is most likely that the Social Security recipient will spend the payment more on food and housing than on any other items.

One of the objectives of this study is to estimate the impact of the proposed or enacted increases in incomes from Social Security benefits on expenditures of aged recipients. The increase will amount to about $200 for single persons and $400 for couples. The estimated marginal propensity to expend with respect to Social Security benefits, as shown in Table 2, suggests that there will be a significant increase in food and housing expenditures. Suppose the increase of Social Security benefits is about $200 for a typical recipient. Then the very old group (75 and above will spend an extra $26 on food and $15 on housing but no extra amount on alcohol, cigarettes, and car. On the other hand, the old age group (between 65 and 74) will spend an extra $17 on food, $18 on housing, and $23 on car. Given the 1966 information on the number of people who receive Social Security (14.5 million), the additional increase of $200 per recipient will generate at least an extra $290 million on food and $217 million on housing expenditures (assuming each recipient spends an extra $20, on the average, for food and $15 for housing). Therefore, the demand for food and housing items will increase as a result of an increase in Social Security benefits.

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