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# THE IMPACT OF DEMOGRAPHIC VARIABLES ON EXPENDITURES FOR FOOD AWAY FROM HOME

Frederick W. Derrick, Rachel Dardis and Alane Lehfeld

## ABSTRACT

Whereas considerable effort has been expended in prior research in discussing the appropriateness of alternative measures of income in expenditure studies, this paper looks in depth at the impact of incorporating a broad range of demographic variables in the expenditure analysis. Food expenditures away from home are used to analyze the additional gains in explanatory power and the impact of demographic variables on income elasticities. Considerable divergence of results is found under the alternative measures of income.

## INTRODUCTION

The demographic composition of society has changed drastically in recent years and is expected to continue to change as family sizes get smaller, the number of elderly increase and the education level of the work force increases (Lehfeld and Dardis; Manchester and King). Yet the impact of demographic variables on consumer decisions has received little attention. By using demographic variables in addition to price and income it should be possible to obtain a better understanding of expenditure behavior and thus be better able to make predictions as the underlying demographic composition changes.[1]

Furthermore, while there has been considerable discussion of the appropriate measure of income to use in expenditure studies, there has been little discussion of the impact of incorporating demographic variables under alternative definitions of income. If the omission of demographic variables results in underspecification of the expenditure equation, biased estimates of the income coefficients and the resulting income elasticities would occur.

Food expenditures away from home will be used to study the impact of including demographic variables on the estimated income coefficients and resulting elasticities under alternative income measures. From the 1972-73 Consumer Expenditure Survey, it is possible to obtain a comprehensive set of demographic variables using more refined definitions or subdivisions of the variables than have been used in other research. The further delineation of the demographic variables is expected to yield a more detailed explanation of the food expenditures away from home.

## DATA AND EMPIRICAL SPECIFICATION

The double-log form of the Engel curve for food expenditures away from home is used as a basis for estimating the impact of income on food expenditures away from home. The choice of the double-log functional form between income and expenditures is based on the success of using the double-log found in other studies of luxuries (Ferber; Prais and Houthakker). The explanatory power of the double-log form was approximately 50 percent larger than the explanatory power obtained when alternative functional forms were estimated. The alternative forms were estimated on data from the 1972 Consumer Expenditure Survey.[2] The demographic variables are added linearly to the double-log form, thus resulting in a semi-log form between the demographic variables and expenditures.

The 1972-73 Consumer Expenditure Survey is the most recent comprehensive data available on consumer expenditures and provides the necessary socioeconomic and demographic variables to control for differences across families. In the survey over 10,000 families were contacted in each year. Of these observations, 7,902 families from 1972 and 8,179 from 1973 were used in this study. The remaining family units were deleted because they gave incomplete reports of income or because they failed to report the demographic information employed in this study. For those families that reported zero expenditures on food away from home, a value of one dollar was assigned. Thus when logs were taken for the double-log specification, expenditures for food away from home would have a value of zero.[3]

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The authors are Assistant Professor and Professor, Department of Textiles and Consumer Economics, University of Maryland, and Financial Economist, National Credit Union Administration. The views expressed in this paper are those of the authors and do not necessarily reflect those of the institutions with which they are affiliated. The authors wish to thank Cleve Willis and an anonymous reviewer for their helpful suggestions.

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[1] While economists have generally skirted the issue of including demographic variables in estimations due to the difficulty of developing a theoretical justification, demographics have been widely used in business and in sociology. For example, see Wells and Gubar (1966), Stampfl (1978), or Derrick and Lehfeld (1980).

[2] Adjusted R-squares for the alternative forms considered were as follows: linear 0.23, quadratic 0.27, semi-log 0.23, and double-log 0.40. As noted by a reviewer, a more appropriate comparison would be the calculation of adjusted R-squares based on the transformed predicted values for the double-log term and actual expenditures in nonlog form (Salathe, 1979).

[3] An alternative approach to the estimation would be to use Tobit analysis because of the observations at lower limit of zero. Given the relatively few observations of zero expenditures for food-away-from-home Tobit was not used in this study.

## DEMOGRAPHIC VARIABLES

In the strictest form, an Engel curve is the relationship between expenditures and income. However, this strict form includes income without controlling for the influence of additional factors on the expenditure decision. In early attempts the solution to control for different family composition was to study Engel curves for families of only a particular characteristic (David; Phlips). However, these smaller samples resulted in smaller degrees of freedom and larger standard errors, thus causing a weakening of the power of the statistical test (Houthakker and Taylor; Johnson; Kmenta). In this paper, the demographic aspects will be controlled through the inclusion in the estimation of the individual demographic variables.

Justification for the choice of demographic variables can be made by viewing the decision facing the consumer of utility maximization between the food-at-home and food-away-from-home. The total utility derived from food is equal to the sum of utility from food at home and food away from home. Utility of food away from home ($U_a$) is a function of:

$t_a$ = time away from home,

$x_a$ = quantity of food away from home and

$E_a$ = environmental factors away from home.

In a similar fashion, utility of food at home ($U_h$) is a function of:

$t_h$ = time at home,

$x_h$ = quantity of food at home, and

$E_h$ = environmental factors at home.

The utility maximization is under the constraints of:

$$T = t_a + t_h + t_e \text{ and}$$
$$w(T - t_a - t_h) + V = px_a + px_h$$

where

$T$ = total time,

$t_e$ = time at work

$w$ = wage rate

$V$ = unearned income, and

$p$ = price.

Within the framework, the impact of changes in price or wage rate is ambiguous due to income and substitution effects on $t_a$. The income effect (changes in V) is positive on food expenditures away from home. The environmental impact of items favorable (unfavorable) to food at home is expected to exert negative (positive) influences on food-expenditures-away-from-home. For ease of discussion, the environmental and time influences are organized under the headings: family type, social class, location, and other (Table 1).

FAMILY TYPE: In the past, family composition has received the most attention in controlling for differences in expenditure patterns. There have been attempts to normalize family units through the conversion to adult-equivalent or unit-equivalent scales (Brown and Deaton; Buse and Salathe; Prais). In addition, there has been extensive effort expended in determining the influence of the stage in the life cycle as measured jointly by marital status, child rearing, and age of the head of the household on the expenditures (Ferber; Hamburg; Lansing; Lee and Phillips; Moore; Wells and Gubar).

This study does not use either of these methods due to the difficulty of ascertaining the influence of specific variables when multiple variables are aggregated into a single measure. Instead the components or individual variables that were used in developing the scales or stages in the life cycle are included separately. Marital status is classified in the data according to married and not married. The not married classification is rather diverse in that it includes widowed, divorced, separated, or never married individuals. The expectation is that single individuals will have greater expenditures on food away from home because of the entertainment characteristic of food away from home. Additionally, it could be argued that single individuals face higher relative prices in preparing food at home. Child rearing is included in the estimation by incorporating a dummy variable for families who have their youngest child less than or equal to six. Previous research has indicated that the presence of young children places additional demand on the family budget and time and will result in a difference in behavior as measured by expenditures (Lansing and Kish; Schiffman and Kanuk; Wells and Gubar). In particular, it is expected that families with young children will have reduced spending on food away from home because of the increased demands on the budget for other commodities as well as the additional difficulty of "eating out" with a youngster. The remaining measure of family type, age of the head, is subdivided into six categories (less than 25, 25-34, 35-44, 45-54, 55-64, and over 64). The major expectation for age is that the elderly, due to the difficulty and the cost of transportation, will have reduced expenditures, ceteris paribus.

Family size has been included in virtually all analysis of the demand for food and has been found to be the most influential variable next to income on nondurable expenditures including food (Crockett and Friend; Crockett). Its inclusion has been through the equivalence techniques (Buse and Salathe; Prais and Houthakker; West and Price), the number of adults (Houthakker and Taylor), and the number of persons in the household (Crockett; Houthakker and Taylor; Prochasta). Family size, as measured by the number of persons in the household, has been included in linear as well as nonlinear forms (Crockett; Houthakker and Taylor; Salathe, 1979). In this study the average number of persons living in the household during the year is used as the measure of the family size and is entered linearly. Its impact on food expenditures away from home is not predicted due to the expectation that large families eat out less frequently but in turn have larger bills than smaller families.

SOCIAL CLASS: The influence of life styles

Table 1: Mean Values and Distribution of Independent Variables[1]

| Variable | 1972 | 1973 |
|---|---|---|
| Disposable Income | $10,371.13 (7,240.75)[2] | $11,474.98 (8,094.36) |
| Current Consumption | 8,027.69 (4,847.93) | 8,746.72 (5,287.71) |
| Household Size (persons) | 2.98 (1.78) | 2.95 (1.78) |
| Age of Household Head (years) | 47.8 (16.8) | 47.1 (17.0) |
| Less than 25 | 7.1% | 7.1% |
| 25-34 | 19.7 | 21.5 |
| 35-44 | 17.8 | 17.4 |
| 45-54 | 19.9 | 19.1 |
| 55-64 | 16.8 | 16.5 |
| 65 and older* | 18.7 | 17.7 |
| Marital Status | | |
| Married | 73.7% | 71.9% |
| Not married* | 26.3 | 28.1 |
| Age of Youngest Child | | |
| Less than six | 18.9% | 18.9% |
| Otherwise* | 81.1 | 81.1 |
| Education of Household Head | | |
| Some grade school | 22.9% | 20.6% |
| Some high school | 16.8 | 15.8 |
| High school graduate* | 31.8 | 32.7 |
| Some college | 13.2 | 13.8 |
| College graduate | 15.2 | 17.1 |
| Occupation of Household Head | | |
| Self-employed | 5.6% | 4.5% |
| Salaried professionals | 12.7 | 13.2 |
| Salaried managers | 10.8 | 12.4 |
| Clerical workers | 8.0 | 8.0 |
| Sales workers | 3.5 | 4.4 |
| Craftsmen* | 15.8 | 14.2 |
| Operatives | 13.6 | 13.6 |
| Unskilled labor | 5.7 | 5.4 |
| Service workers | 8.7 | 8.7 |
| Not working | 1.0 | 1.1 |
| Retired | 15.5 | 15.5 |
| Region | | |
| Northeast | 21.9% | 21.1% |
| Northcentral | 28.1 | 28.4 |
| South | 30.1 | 30.1 |
| West* | 19.9 | 20.4 |
| Location | | |
| Rural | 16.4% | 16.7% |
| Urban* | 83.6 | 83.3 |
| Employment Status of Spouse | | |
| Working | 35.1% | 36.6% |
| Not working* | 64.9 | 63.4 |
| Race of Household Head | | |
| Non-black* | 91.7% | 90.8% |
| Black | 8.3 | 9.2 |

[1] For the categorical variables dummy variables have been used. In particular the variable will have a value of one if it has the prescribed characteristic and will be 0 otherwise. The categories denoted with asterisks are deleted in the estimation and are used as the reference group.

[2] Standard deviations appear in parentheses.

on expenditures is based on measures of occupation and education of the head of the household. Researchers have included occupation in a variety of methods: traditionally employed, self-employed, and not gainfully employed (Crockett and Friend); blue collar and white collar (Hamburg); or agricultural, industrial, and civil servants (Prais and Houthakker). The approach used in this study is to incorporate a broader range of occupations. In addition, those not working or retired are also included. Similarly education has been divided into five divisions: some grammar school, some high school, high school graduate, some college and college graduate. For both variables the necessary dummy variables have been created. The loss in degrees of freedom resulting from their creation is not significant given the sample sizes.

LOCATION: Differences in consumption expenditures have often been attributed to differences in climate or to cultural differences. Additionally, price, which is assumed constant in a cross-section study, may vary across regions due to the proximity to production (Prochaska). For a similar reason, there may be a price difference between urban and rural locations (Crockett and Friend; Houthakker and Taylor; Prais and Houthakker; Prochaska).

To identify and to control for these differences where broad geographical areas have been surveyed, locational variables have been incorporated in expenditure analysis. For example, comparisons have been made between farm and nonfarm families (Lee and Phillips) or between different city sizes (Maisal and Winnick). In a broader approach, Salathe and Buse incorporated region, urban, and farm/nonfarm variables into their investigation of food consumption patterns.

This analysis of food expenditures includes region in an attempt to pick up the expected differences due to price and/or cultural differences. The regions are relatively broad and the associated assumption of homogenity within regions may be tenuous. In an attempt to overcome part of this heterogenity, the distinction between urban and rural is made. An additional reason for the inclusion of the urban-rural variable is the expectation of lower expenditures for food away from home in the rural areas due to home grown production and to increased transportation and time costs, i.e., lower relative price of food at home in rural areas.

OTHER: In recent years, the impact on expenditures of spouses working for pay has become of interest. Significant differences were found in the case of food away from home (Prochaska). A dummy variable for spouse working outside the home is incorporated in this study. This variable, in conjunction with marital status, creates three options: not married, married and spouse not working, and married and spouse working. The expectation is that spouse working outside of the home will lead to greater expenditures for food away from home than for those households where the spouse does not work. Arguments in support of this premise could be given in terms of a shift to less time intensive goods or in terms of difference in the expenditures decision process when there are multiple wage earners. An interpretation based on additional income is inappropriate since total income has previously been incorporated.

Several studies have also been concerned with the differences in expenditures on food due to racial differences (Buse and Salathe; Crockett and Friend; Hamburg). Race has been included in this study under the premise that it will serve as a proxy for differences in taste. For example attitudes toward food-away-from-home as a form of entertainment may differ. Race is included under divisions of black and nonblack as limited by the Consumer Expenditure Survey.

In concert, the variables discussed above give a more complete demographic view of the consumer units than has previously been presented in an expenditure study, either by presenting expanded variables as in the case of occupation and education, or by combining aspects which have been presented in a disjointed fashion in the literature. This is the case of family type and working spouse where only one or the other has generally been used.

## INCOME

Research discussions on Engel curve analysis have often centered on the appropriate measure of income to be used. The arguments pivot on whether disposable income or total current consumption is a better proxy for the complete income history and the anticipated income of the family (David; Prais and Houthakker). In addition, arguments have been made for one or the other based on the relative income hypothesis (Ferber) or based on the competition between savings and consumption (David). Based on theoretical grounds, there is justification for using either income measure.

The Engel functions for food expenditures away from home in this study are estimated separately for both measures of income: total current consumption and disposable income. The use of current consumption raises a possible problem since it includes the dependent variable. This will result in inconsistent estimates (Kamenta, p. 315-18). Because of the additional variation introduced by different saving rates across families, it is expected that the disposable income measure will have smaller explanatory power than the total current consumption measure.

The results of the estimation of the strict Engel function, i.e., based solely on income without the inclusion of any demographic variables, are presented in Table 2. Income coefficients (income elasticities) are significantly greater than one. The estimated elasticities for the disposable income measure of income are smaller than for current consumption. This is expected under the premise that food expenditures away from home must compete with all other expenditures as well as savings under the disposable income measure but must compete only with all other expenditures under the current consumption measure. The adjusted R-squares are smaller when disposable income is used as the income measure.

Table 2: Strict Engel Curves Results

| | Current Consumption 1972 | Current Consumption 1973 | Disposable Income 1972 | Disposable Income 1973 |
|---|---|---|---|---|
| Income Elasticity | 2.066* | 1.961* | 1.467* | 1.322* |
| | (0.027) | (0.026) | (0.023) | (0.23) |
| Adjusted $R^2$ | .43 | .41 | .33 | .29 |

*Significant at the 0.05 level.

Standard errors in parentheses.

## RESULTS FROM THE ESTIMATION OF THE COMPLETE ENGEL CURVE

The estimated Engel relationships for food expenditures away from home are presented in Table 3 for 1972 and Table 4 for 1973. In each table the estimated coefficients are presented for the continuous variables. However, the antilogs of the coefficients of the dummy variables multiplied by 100 are provided for ease of discussion. A comparison of the transformed regression coefficients with 100, the value of the omitted category, will show the percentage differences between the various dummy variable categories.[4]

As expected, the estimations that use the current consumption measure of income explain a greater portion of the variation than those using the disposable income measure (adjusted $R^2$ = 0.49 vs 0.42 in 1972 and 0.48 vs 0.41 in 1973). This is not surprising in that disposable income has the additional source of variation contributed by savings. In all instances greater explanatory power was gained with the inclusion of the demographic variables over the strict Engel curve using just income. All joint tests for the impact of the demographic variables were also significant. These tests, reported in Table 5, were made for the family type, social class, location, and for the omission of all demographic variables. The consistent significance of these groups in conjunction with the greater explanatory power gained with their inclusion, offers justification for the inclusion of demographic variables in future consumption/expenditure studies. For ease of discussion, the data shown in Tables 3, 4, and 5 will be discussed under the following headings: economic, family type, social class, location, and other.

ECONOMIC: The income variable has the expected influence of causing expenditures to increase as income rises, as noted by the positive coefficients. The estimated coefficients of income are elasticities. Under the current consumption measures of income, the elasticity is greater than one (1.757 and 1.633) as is predicted for a luxury good. However, for the disposable income measure, the elasticity is not significantly different from one (1.034) in 1972 and is significantly less than one (0.886) in 1973. Thus the categorization of food away from home as a luxury good may be influenced by the choice of income measure.

When the coefficients of income are compared with those found in the estimation of the strict Engels curve, it is found that the incorporation of the demographics into the specification leads to a reduction of the estimated elasticities by approximately 15 percent under the current consumption definition (2.066 to 1.757; 1.961 to 1.633) and by approximately 30 percent under the disposable income definition (1.467 to 1.034; 1.322 to 0.886). Thus deleting the demographic variables leads to enlarged estimates of the income elasticity which in turn may lead to an erroneous classification of the commodity in terms of luxury or normal good.

FAMILY TYPE: The joint test of the variables incorporated here (family size, age of the head, marital status, and youngest child) shows a significant contribution to the estimation of food expenditures away from home as shown by the F-tests in Table 5. The contribution of the individual variables is particularly interesting (Tables 3 and 4). Whereas the impact of family size on food away from home expenditures was not predicted because of the reasons expressed earlier, it is surprising that under the alternative definitions of income, opposite results were found. Expenditures are positively related to family size in the case of disposable income and negatively related in the case of current consumption.

The remaining components of family type might be expected to contribute to the explanation of the difference in signs of the coefficients of family size found under the two definitions of income. However, when the untransformed coefficients are examined,[5] it is found that the

[4] The approach used in the paper is similar to the approach suggested in Halvorsen and Palmquist (1980) but differs in that Halvorsen and Palmquist report the differences from 100. A note by Kennedy (1981) suggested an improved method of estimation for the dummy variables in semilogarithmic equations.

[5] For the purpose of combining multiple variables, the antilogs multiplied by 100 reported in Tables 3 and 4 are inappropriate. The appropriate method would be to divide the values reported for the dummy variables by 100 and to take logs. This will result in the derivation of the actual coefficients which can then be combined as needed. This is the approach used

signs are consistently negative for marital status and youngest child under the alternative definitions of income. In addition the marital status coefficient is more negative under current consumption than under disposable income. The reverse occurs for youngest child less than six. The combined impact of marital status and youngest child on the expenditure decision is more negative for the current consumption measure of income. Thus, it does not offset the differences found under family size but tends further to expand the differences.

The coefficients of age are also different under the alternative definitions of income. The coefficients of age are positive in all instances. Expenditures are relatively stable across the younger age groups (less than 44) and decrease across the remaining groups down to the least expenditures for those over 65. The coefficients of age under the disposable income measure are approximately twice the size of the coefficients of age under the current consumption measure, thus tending to increase the gap in expenditures under the two income measures. Finally when the coefficient of family size is viewed in comparison with the coefficients of age, marital status, and youngest child, family size is found to have less impact on the expenditure than each of the other three variables.

The variables age, marital status, and youngest child appear to support the hypothesis that dining out or "social eating" is highly influenced by certain steps in the life cycle. This claim is justified by the following: expenditures on food away from home are the least for older heads of households where one might expect difficulties in mobility; expenditures are significantly less for those households where the couple is married and where in turn there would be less "social dating;" and expenditures for a family with a young child are less than other families under the arguments of reduced mobility and reduced "social dating." In all instances, the differences are more pronounced when disposable income is used as the income measure. The results for marital status could also reflect greater relative price effects of preparing meals by single person households.

SOCIAL CLASS: The social class variables (education and occupation) on an individual basis do not appear to have a strong and consistent impact on expenditures away from home. The exceptions are the not working group and the retired group. Both of these groups showed significantly smaller food expenditures away from home. The significance of these two groups could be taken as support for their inclusion in future studies instead of their omission as has frequently been done in the past. In view of the inconclusive results for the other measures, it is probably best to view the contribution of occupation and education jointly. The joint F test is significant in both years (Table 5). The lack of a pattern and the significant F may be an indication of multicollinearity between occupation and education. This would be a further reason for studying the joint but not the individual tests.

LOCATION: The results for the regional and urban-rural measures are consistent across the two measures of income. In both years, households in the northeast portion of the country spend significantly less (14-23 percent) on food away from home than households in the rest of the United States under similar conditions. Households in rural areas spend less on food away from home by approximately the same percentage. When viewed together, the location variables indicate that rural northeasterners spend the least on food away from home. Northeastern rural inhabitants spend approximately 20 percent less than northeastern urban dwellers and approximately 35 percent less than urban dwellers in the remaining sections of the country.

OTHER: Expenditures on food away from home are found to be approximately 25 percent greater in those houses that have a working spouse in them. If this variable is combined with the marital status variable, the three categories are: not married with a score of 100, married but spouse does not work with a score of 76, and married with spouse working with a score of 96. When viewed in this fashion, it is found that the nonmarried households and households where the spouse works, ceteris paribus, spend approximately the same amount on food away from home. Both are significantly different from married households with a nonworking spouse. This may be explained by the different value of time for persons working in the labor force and working at home. Those households headed by blacks were found to spend significantly less on food away from home than nonblacks.

## CONCLUSIONS

The impact of including demographic variables in the analysis of expenditures is presented with expenditures on food away from home as an example. The demographic variables in some instances have been included under rather tenuous justifications. However, this limited prior justification appears to be supported in two major ways by the example in this paper. First, there is a considerable improvement in the explanatory power of the expenditure equation when the demographic variables are included. Justification for their inclusion is also provided by the significant F values found in all tests of the demographic variables. Second, there is the major change in the estimated income elasticities when the demographic variables are incorporated in the analysis. Deleting the demographic variables caused the estimated income elasticities to be overstated by approximately 25 to 35 percent. The magnitude of this change leads to concern of potential misspecification where demographic variables have not been employed.

In the estimation, two alternative measures of income, total current consumption and disposable income, were found to yield significantly different estimates of the elasticities when the demographic variables were included. Total current consumption as the measure of income was

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in combining marital status and youngest child. Similarly, this approach is used elsewhere in the discussion.

Table 3: Food Away From Home Expenditures for 1972

| Variables | Current Consumption | Disposable Income |
|---|---|---|
| A. Coefficients for Continuous Variables | | |
| Income Measure | 1.757* (0.037)[a] | 1.034* (0.031) |
| Family Size | -0.026* (0.013) | 0.048* (0.014) |
| B. Percentage Expenditures by Demographic Characteristics | | |
| Age (as % of 65 and older) | | |
| less than 25 | 135* | 208* |
| 25-34 | 148* | 201* |
| 35-44 | 140* | 181* |
| 45-54 | 128* | 169* |
| 55-64 | 115* | 131* |
| Married (as % of not married) | 76* | 88* |
| Youngest child less than six (as % of other households) | 77* | 70* |
| Education (as % of high school graduate) | | |
| some grade school | 71* | 61* |
| some high school | 96 | 92 |
| some college | 108 | 114* |
| college graduate | 108 | 115* |
| Occupation (as % of craftsman) | | |
| self-employed | 101 | 121* |
| salaried professional | 96 | 97 |
| salaried manager | 108 | 120* |
| clerical workers | 101 | 97 |
| sales worker | 111 | 119 |
| operatives | 90 | 86* |
| unskilled labor | 85 | 83* |
| service worker | 96 | 99 |
| not working | 40* | 42* |
| retired | 51* | 54* |
| Region (as % west) | | |
| Northeast | 77* | 77* |
| Northcentral | 106 | 97 |
| South | 106 | 98 |
| Rural (as % urban) | 84* | 72* |
| Working wife (as % other households) | 126* | 124* |
| Nonblacks (as % blacks) | 184* | 196* |
| $R^2$ | 0.49 | 0.42 |

*Significant at the 0.05 level

[a]Standard errors in parentheses.

Table 4: Food Away From Home Expenditures for 1973

| Variables | Current Consumption | Disposable Income |
|---|---|---|
| A. Coefficients for Continuous Variables | | |
| Income Measure | 1.633* (0.035)[a] | 0.886* (0.029) |
| Family Size | -0.031* (0.013) | 0.046* (0.013) |
| B. Percentage Expenditures by Demographic Characteristics | | |
| Age (as % of 65 and older) | | |
| less than 25 | 144* | 210* |
| 25-34 | 147* | 199* |
| 35-44 | 152* | 202* |
| 45-54 | 135* | 176* |
| 55-64 | 125* | 143* |
| Married (as % of not married) | 69* | 78* |
| Youngest child less than six (as % of other households) | 83* | 76* |
| Education (as % of high school graduate) | | |
| some grade school | 63* | 53* |
| some high school | 115* | 84* |
| some college | 102 | 110 |
| college graduate | 109 | 120* |
| Occupation (as % of craftsman) | | |
| self-employed | 100 | 118 |
| salaried professional | 94 | 94 |
| salaried manager | 103 | 114 |
| clerical workers | 94 | 96 |
| sales worker | 101 | 118 |
| operatives | 92 | 92 |
| unskilled labor | 81 | 77* |
| service worker | 103 | 104 |
| not working | 38* | 39* |
| retired | 50* | 49* |
| Region (as % west) | | |
| Northeast | 81* | 86* |
| Northcentral | 104 | 98 |
| South | 106 | 101 |
| Rural (as % urban) | 86* | 78* |
| Working wife (as % other households) | 126* | 127* |
| Nonblacks (as % blacks) | 178* | 191* |
| $R^2$ | 0.48 | 0.41 |

*Significant at the 0.05 level

[a]Standard errors in parentheses.

Table 5: F-tests for Contribution of Groups of Variables

| Variable Group | Current Consumption F | Current Consumption df | Disposable Income F | Disposable Income df |
|---|---|---|---|---|
| 1972 | | | | |
| Family Type (family size, age of the head, marital status, youngest child) | 14.47* | 8 and 7,873 | 16.82* | 8 and 7,873 |
| Social Class (occupation, education) | 14.86* | 14 and 7,873 | 20.35* | 14 and 7,873 |
| Location (region, urban/rural) | 17.45* | 4 and 7,873 | 19.73* | 3 and 7,873 |
| Family Type, Social Class, Location | 34.15* | 26 and 7,373 | 50.35* | 26 and 7,872 |
| 1973 | | | | |
| Family Type (family size, age of the head, marital status, youngest child) | 19.94* | 8 and 8,150 | 19.85* | 8 and 8,150 |
| Social Class (occupation, education) | 18.85* | 14 and 8,150 | 28.82* | 14 and 8,150 |
| Location (region, urban/rural) | 12.71* | 4 and 8,150 | 10.52* | 4 and 8,150 |
| Family Type, Social Class, Location | 40.31* | 26 and 8,150 | 69.89* | 26 and 8,150 |

*Significant at the 0.05 level.

also found to explain more of the variation of the expenditures on food away from home than disposable income. However, the use of disposable income incorporates the food-away-from-home decision into the broader picture of consumption and savings with its additional variability across consuming units. Because of this broader picture and because of the inconsistent estimates when total consumption is used, disposable income appears to be the more appropriate measure. On a practical note, the choice of income measure may be limited by the data sets.

While differences were expected in the income elasticities because of the choice of income measure, the persistent differences in the magnitudes of the coefficients (and opposite influences in some cases) of the demographic variables (family type, social class, location, and other) were not expected when the different income measures were used. This is a point that has not been discussed in the literature as most of the discussion has been centered around the income elasticity and degree of explanation ($R^2$). In general, the differences that are attributed to the demographic variables are found to be greater when disposable income is used. If care is not taken to consider the broad picture of the influence of the income measure on the entire equation, faulty conclusions may be reached concerning food programs.

The demographic variables used in this study are broader and are broken down into more detail than those generally used in expenditure studies. In most instances, significant coefficients were found for the individual coefficient as well as in the joint test. In particular the components of family type: size, age, marital status, and age of the youngest child are significant. The location variables - region and urban versus rural - also carried significant information. While social class was significant using the joint test, it was not possible to determine the impact of individual categories, reflecting possible multicollinearity. Overall, the results indicate the importance of incorporating demographic variables in an analysis of expenditure patterns. In addition gains may also be made by using more refined measures of demographic variables than are currently employed in this paper. For example, working wife could be extended by distinguishing between part time and full time work.

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