Owner-Occupied Shelter in Experimental Poverty Measures

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This paper reports the results of research and analysis undertaken by BLS and Census Bureau staff. It has undergone a more limited review than official publications. This paper is released to inform interested parties of research and to encourage discussion. All views expressed in this paper are those of the authors and do not reflect the views or policies of their respective agencies or the views of other staff therein. The authors accept responsibility for all errors.

Introduction

The National Research Council Panel on Poverty and Family Assistance (Citro and Michael, 1995) recommended poverty thresholds be calculated for a reference family (two related adults with two children) by specifying " . . . a percentage of median annual expenditures for such families on the sum of three basic goods and services-food, clothing, and shelter (including utilities)-and apply a specified multiplier to the corresponding dollar level so as to add a small amount for other needs" (Citro and Michael 1995, p. 6).

Following this recommendation, the Panel's treatment of housing (as opposed to shelter that includes utilities) is the same for owners and renters. Although the Panel only used out-of-pocket expenditures to define the thresholds, they also referred to consumption and needs in their discussion of the basic needs threshold and adjustments for different family types (e.g., see Citro and Michael, 1995, p. 102) *If* the purpose of the poverty threshold is to provide a level of expenditure that represents the consumption costs for food, clothing, housing, and utilities, then we suggest that the valuation or cost of housing consumption be re-examined before a final decision is made concerning the production of the threshold.[1]

It is likely there is general agreement that expenditures for food, clothing, and utilities are good approximations of the consumption costs associated with these commodities. However the same cannot be said for the expenditure and consumption cost of housing. It is unlikely that the out-of-pocket expenditures for homeowners with low or no mortgages represent their consumption of housing. The Panel's approach treats the consumption of these owners in the same way as they treat the consumption of owners with mortgages and renters (see Citro and Michael, 1995, p. 148). While, homeowners with low or no mortgages have relatively low out-of-pocket housing expenses, their consumption costs are expected to be more like those of other homeowners and renters. For such low mortgage households, part of the costs of their housing consumption is being met through the implicit cost of the equity investment in their owned housing unit. If reference families are primarily composed of homeowners with low or no mortgages, the out-of-pocket housing expenditures used in the production of the thresholds would be relatively low compared to their expected consumption costs. Following the out-of-pocket approach would result in an underestimate

of these owners' housing consumption costs because it ignores the implicit cost of their equity ownership of the housing unit. If reference families were primarily composed of homeowners with newer mortgages, their out-of-pocket housing expenditures would be relatively high compared to the expenditures of other owners and renters. If this were the case, an overestimate of the cost of housing consumption could result. Using the out-of-pocket expenditures for owners with mortgages could also result in an overestimate of housing costs because owners with mortgages are allowed to take a tax deduction for mortgage interest paid, thus reducing their "true" costs for housing. Using out-of-pocket housing expenditures also ignores the implicit benefit of house price appreciation, which is one of the primary advantages of homeownership. Furthermore, thresholds based on owner out-of-pocket expenditures are likely to be more sensitive to fluctuations in interest rates and decisions to refinance.

With regard to poverty thresholds, basing owner housing costs on the actual outlays when the estimated housing costs are lower could mean, theoretically, that some owners could quite easily be considered poorer than renters only because these families own their homes and their out-of-pocket housing expenditures are higher. Such could be the case if different thresholds were produced for owners with higher mortgages, for owners with low or no housing costs, and for renters. Producing thresholds by housing status (e.g., own with mortgage, own without mortgage, renter) was an alternative mentioned by the Panel (Citro and Michael 1995, p. 245). We think it is counterintuitive that owners would be more likely to be poor than would renters, given the same amount of housing and other expenses. When out-of-pocket expenditures are higher for owners than for renters living in similar types of dwellings and in the same areas, and only one threshold is produced (using all reference families' expenditures as is recommended by the Panel) rather than different ones based on housing status, renters would implicitly be "allocated" the higher expenditure amount for their housing consumption. This means that conceivably renters could spend more on other goods and services represented by the threshold.

The Panel acknowledged some of the problems associated with using actual out-of-pocket housing expenditures as reported in the U.S. Consumer Expenditure Interview Survey (CE), however they used these expenditures for processing convenience. They stated that "a preferable definition would include

[1] Here we distinguish between cost and expenditure. Cost is used here to represent the value of goods, actual services, and service flows from owner occupied housing. Expenditure represents the amount "paid" (or, for some items, the amount obligated to be paid if a type of credit is used for the purchase) for goods and services.

actual outlays for mortgage payments, taxes, insurance, and maintenance and repairs, together with an imputed amount for the estimated rental value of the home net of such outlays. Such a definition would treat homeowners with low or no mortgage payments in a comparable manner with other homeowners and renters" (Citro and Michael 1995, p. 148). The Panel noted that such an approach would account for the implicit costs of housing consumption of owners with low or no mortgages more appropriately. We contend that a better approach than this would be to estimate the housing consumption costs for owners regardless of their out-of-pocket expenditures for mortgage payments, taxes, insurance, and maintenance and repairs. The mortgage principal payment and part of the expenditures for the other items would implicitly be included in an owner's reported rental equivalence. The part of taxes, insurance, and maintenance and repairs associated with being a property owner would not be included. Only those associated with being a renter of their owned home. By following this approach, the housing costs of all owners and renters living in similar housing and the same areas would be treated conceptually the same.

We propose that a consumption approach for owner occupied housing be applied in the production of any new poverty threshold. Such an approach would be based on the costs of the consumption flow of housing services, rather than on out-of-pocket expenditures, for owner occupants. This approach is consistent with other major federal statistical programs including the U.S. Consumer Price Index and Personal Consumption Expenditures of the National Accounts.

In this paper we describe and present four approaches to include the "cost" of shelter in a poverty measure through the thresholds. These include two approaches based on shelter expenditures and two approaches that include the costs of consumption flows of shelter services which account for the occupancy of owner occupied housing. The first two approaches do not account for homeownership but use out-of-pocket shelter costs as the NAS Panel did and then expand on that measure. The first of these two approaches we refer to as the Consumer Expenditure (CE) publication definition or the NAS measure. The second we refer to as the CE outlays measure. The third is based on rental equivalence values reported by consumer units participating in the CE Interview. For the fourth, we estimate a value for the flow of services using a combination of reported rental equivalence and market value of owned home. This last measure is based on the approach employed by the Bureau of Economic Analysis (BEA) for the PCE.

Accounting for the flow of services from owner-occupied housing would affect not only the thresholds, but also the resources which are compared to the thresholds to determine if someone is poor using the NAS general approach. As noted by the panel, economists have long argued that the economic resources for owners and renters should be treated comparably because the resources available are related to a household's expenses. For example, if the household owns its home without a mortgage, then more money is available to purchase other needed goods and services, although the household's consumption need for housing may not differ from that of owners with a mortgage or from that of renters.

In the last two measures presented here, we take account of the value of owner-occupied housing in resources in order to maintain a consistent estimate of poverty. Homeowners with a positive amount of home equity receive a benefit in the form of housing service that is not generally counted as income. In this paper we apply a rate of return to the estimated amount of home equity, that is, we treat equity in the owner occupied home as an asset from which the owner receives interest income.

The Census Bureau publishes annually an income measure that includes a value related to the imputed rent from owner-occupied housing. This value is based on the hypothetical income that a household would receive if it chose to shift the amount held as home equity into an interest bearing account. Given the tremendous fall in mortgage interest rates over the year, such a situation seems quite plausible. Although this measure provides a basis for illustrating the potential importance of developing and implementing a well-founded measure of imputed rent, it is not complete. It is not consistent with a threshold measure that only counts out-of-pocket expenses as reported in the CE, but that does not include a measure of imputed rental value in the calculation of basic needs. Coupling this measure with the thresholds that account for homeownership is a complete and consistent method.

In addition to accounting for imputed rental value for homeowners, this method would also allow us to value the total cost of subsidized housing in our threshold, rather than the out-of-pocket costs that would be counted without this imputation. This method of constructing the thresholds would also be consistent with the addition of housing subsidies received as income on the resource side, because it would then reflect the total cost of housing that subsidized renters face. Without this imputation on the threshold

side, it is inconsistent to add the value of housing subsidies to income.[2] The issue of housing subsidies is not addressed in this paper however, but has been addressed in an earlier one by Garner and Rozaklis (2001).

In this paper we examine each of the shelter costs based measures, both in terms of their basic statistics, distributional properties, and impact on poverty rates. To begin, we first examine the characteristics of the overall sample. With regard to particular analyses, we focus specifically on the reference family (families of two adults and two children). Again the four measures that we consider are: 1) CE publication definition of shelter, 2) CE outlays definition of shelter, 3) reported rental equivalence, and 4) BEA based approach. The first approach was used by the Panel while the second has been promoted by some as an alternative which is more accounting based. The latter two approaches are briefly reviewed and supported in total or in part in the Panel's report in their discussion of rental equivalence. Participants at the 1998 Brookings workshop on Housing and Geographic Issues in the Measurement of Poverty support our exploration of these approaches for poverty measurement. In addition, Conveners of the Working Group on Revising the Poverty Measure sent an open letter on revising the office measure of poverty (August 2, 2000) that supports additional research on poverty measurement. Signers of the letter include individuals from the 1998 Brookings meeting, a University of Wisconsin conference held in the spring of 1999, and other interested parties. In the letter "Determining how best to treat the flow of services form owner-occupied housing in measuring poverty" is identified as a priority area for additional research (Conveners, 2000, p. 4).

Background on Thresholds and Plans for this Study

In order to orient the current research within the NAS proposed poverty measurement literature, we provide a basic description of the threshold measure since the threshold would be most affected by any change in how shelter costs are defined. First a threshold is produce for a reference family. This then is used in combination with equivalence scales to produce thresholds for all other families (including singles) in the population. The equivalence scale was designed to account for both the differences in needs between adults and children and economies of scale in consumption.

[2] Preliminary estimates, however, suggest that this calculation only adds approximately $15.00 to the thresholds for the

Equation (1) is used to derive the basic bundle (FCSU[3]) poverty threshold for the reference family.

$$T_{FCSU} = \frac{(M_1 * P_1 * E_m) + (M_2 * P_2 * E_m)}{2} \qquad (1)$$

where T_{FCSU} = threshold based on food, clothing, shelter, and utility expenditures
M_1 = multiplier for smaller additional amount
M_2 = multiplier for larger additional amount
P_1 = lower percentage of median expenditures for basic bundle
P_2 = higher percentage of median expenditures for basic bundle
E_m = median expenditures for food, clothing, housing, and utilities (FCHU).

To produce the FCHU threshold, the panel recommended that the percentage of median expenditures lie between 78 percent and 83 percent. These percentages correspond to the 30th and 35th percentiles of the distribution of total FCHU expenditures for a family of two adults and two children when the Consumer Expenditure publication definition of shelter expenditures are used. The Panel recommended a lower and upper value for the multiplier of 1.15 and 1.25. These multipliers and multipliers were based on the out-of-pocket expenditure approach to define expenditures for FCSU using quarterly data collected in 1989 through 1991. In this paper we use the originally calculated percentages to calculate our thresholds.

A two-parameter equivalence scale was used by the panel to produce the additional family thresholds. However, we recommend the use of a three-parameter scale which is more generous for single parents. Such as scale allows for the fact that the costs of an additional person in the family is likely to be greater when there is an additional person relative, regardless if the additional person is an adult or a child. For the thresholds presented in this paper (and in our more recent work), we use the three-parameter scale. The two-parameter scale is presented in Equation (2).

$$\text{Equivalence scale} = (adults + p * children)^{f} \qquad (2)$$

where p is 0.7 and f ranges between0.65 and 0.75. The panel chose the two-parameter scale in an attempt to be consistent with the cost-of-raising a child literature and to smooth out the increases in the scale for larger family sizes. The three-parameter scale is presented in Equation (3a) for single parents and in (3b) for all other families.

$$\text{Equivalence scale for single parents} = (adults + 0.8 + 0.5 * (children - 1))^{0.7} \qquad (3a)$$

reference family of two adults and two children. Thus, the effect on poverty estimates would be minimal.

$$\text{Equivalence scale for all other families} = (\boldsymbol{adults} + 0.5 * \boldsymbol{children})^{0.7} \quad (3b)$$

For this study, we also use the three-parameter scale to produce our basic thresholds. Poverty rates are produced using our estimated thresholds and are then compared to those resulting from the official measure of poverty. In order to examine how generous these scales are as family size increases, we also examine the implicit equivalence scales that would result if thresholds were produced for each family in the Consumer Expenditure Survey sample. This allows use to examine particularly the economies of scale implicit in the scales.

Description of Data and Basic Organization of Data for Study

Data from the U.S. Consumer Expenditure Interview Survey (CE) are used to value the costs of shelter in the production of the experimental poverty thresholds. In this section, we first describe the data. The Consumer Expenditure Survey (CE) is designed to collect data related to family expenditures for goods and services and to provide the market basket for the Consumer Price Index. Data from the quarterly Interview Survey are used for this study. [4] For the Interview, each consumer unit is to be interviewed once per quarter for five consecutive quarters. The first interview is used to collect demographic characteristics, as well as an inventory of major durable goods. Data from this first interview are collected for bounding purposes and are not used for expenditure estimates. After the fifth interview, the sample unit is dropped and replaced by a new consumer unit. Data collected in each quarter are considered to be independent by the BLS. We follow the same assumption in the study as did the panel in their work. For this study, internal BLS CE data are used. However, the data are available to the public on CE-ROM. Tabulations of the data are also available for selected socio-demographic groups in BLS publications.

Following the panel's approach, we use three years of data to produce each yearly threshold. Data from quarter two 1998 through quarter one 2001 are used to produce the 2000 experimental poverty thresholds. Approximately 5,000 consumer units were interviewed in each quarter of 1998 and 7,500 in the

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[3] FSHU is being used here rather than FCSU to distinguish housing from shelter. The Panel used the word "shelter" to include both housing and utilities. In previous studies conducted by the BLS/Census team, we have used shelter to be the same as housing in this study.

[4] A separate Diary, with its own sample, is also used to collect CE data; these data are not used for the current study. For more information about the Consumer Expenditure Survey, consult BLS Handbook of Methods (Bulletin 2490, Bureau of Labor Statistics, U.S. Department of Labor, April 1997) or refer to the website: http://stats.bls.gov/csxhome.htm.

each of the following quarters. We begin with calendar quarter two data for each threshold since some of these data refer to expenditures incurred as early as January. Data collected in April, the first month of the second collection quarter, refer to expenditures incurred in January, February, and March. But data collected in May would refer to expenditures incurred in February, March, and April. Quarter one data refer to expenditures made as early as the last quarter of a calendar year, for example, beginning with October. Thus due to the rotating panel design of the survey, expenditures will not entirely refer to a calendar year. As noted previously, for the thresholds, quarterly data are assumed to be independent and are multiplied by four to produce annual values. All quarterly expenditures are converted to threshold year dollars using the U.S. Consumer Price Index for All Urban Consumers (CPI-U) U.S. City Average, All Items. This same approach was followed by the Panel and has been followed by the BLS/Census team in earlier work.

To calculate family income or resources we use the 2001 March Supplement to the Current Population Survey (CPS). The Current Population Survey (CPS) is a monthly survey of about 50,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics. The survey has been conducted for more than 50 years. The CPS is the primary source of information on the labor force characteristics of the U.S. population. The sample is scientifically selected to represent the civilian non-institutional population. Respondents are interviewed to obtain information about the employment status of each member of the household 15 years of age and older. The sample provides estimates for the nation as a whole and serves as part of model-based estimates for individual states and other geographic areas. Estimates obtained from the CPS include employment, unemployment, earnings, hours of work, and other indicators. They are available by a variety of demographic characteristics including age, sex, race, marital status, and educational attainment. They are also available by occupation, industry, and class of worker. Supplemental questions to produce estimates on a variety of topics including school enrollment, income, previous work experience, health, employee benefits, and work schedules are also often added to the regular CPS questionnaire.

The March Supplement, or the Annual Demographic Survey or March CPS supplement, is the primary source of detailed information on income and work experience in the United States. Numerous publications based on this survey are issued each year by the Bureaus of Labor Statistics and Census. A

public-use micro-data file is available for private researchers, who also produce many academic and policy-related documents based on these data. The Annual Demographic Survey is used to generate the annual Population Profile of the United States, reports on geographical mobility and educational attainment, and detailed analysis of money income and poverty status. The labor force and work experience data from this survey are used to profile the U.S. labor market and to make employment projections. To allow for the same type of in-depth analysis of Hispanics, additional Hispanic sample units are added to the basic CPS sample in March each year. Additional weighting is also performed so that estimates can be made for households and families, in addition to persons.

Valuation Approaches

In this section the three methods are described that we use to determine the value of shelter for all consumer units participating in the CE survey: out-of-pocket expenditures, reported owner rental equivalence, and the BEA based approach. The first method was used by the Panel and has been used by the Bureau of Labor Statistics (BLS) and Census team in producing thresholds for earlier studies (e.g., Short et al. 1999). Two consumption costs approaches have been previously used by a BLS/Census research team (Garner and Rozaklis 1999; Johnson, Shipp, and Garner 1997; Short et al. 1998), one the reported rental equivalence approach and another based on a hedonic regression model of rents and housing characteristics. The hedonic approach is not presented in this paper but two approaches using reported rental equivalence are used. In an earlier paper (Garner and Rozaklis 2001), hedonic regressions were used to impute owner's implicit rent. Results from the hedonic approach were compared to the NAS measure and the outlays and reported rental equivalence measures. For each, the researchers estimated the percentages of the medians and multipliers that were used to calculate the thresholds rather than apply the ones used by the Panel. In this paper we only use those percentages and multipliers used by the Panel that were based on 1989-91 out-of-pocket expenditure data, but note, for future work, that these too will be recalculated.

1. Out-of-Pocket Expenditures

For homeowners, housing expenditures include those for mortgage interest, property taxes, maintenance, repairs, and homeowner's insurance. Mortgage principal payments are not included since

these are considered an investment. In contrast, renters' housing expenditures include those for rent paid, repairs and maintenance, and tenants insurance.

2. Out-of Pocket Expenditures – complete outlays

This is calculated in the same manner as (1) but includes mortgage principal payments as part of the cost of shelter for owner occupants.

3. Reported Rental Equivalence

The reported rental equivalence of owner occupied housing is based on the response of each owner to a specific question asked in the CE Interview: "If someone were to rent your home today, how much do you think it would rent for monthly, unfurnished and without utilities?" These monthly values are converted to quarterly values for homeowners and then replace their reported quarterly housing out-of-pocket expenditures for the production of the thresholds. Of the 85,341 consumer unit interviews, 55,563 represented owners. Of these 55,255 provided a positive value for reported rental equivalence. This is about 0.5 percent of all owners. However, for these imputed rents are assigned based on building type (e.g., single family detached, row or townhouse, end row or end townhouse, duplex, high-rise, mobile home) and primary sampling using (the finished geographic dis-aggregation available in the CE data base). In order to have owners' housing costs reflect those of renters, a multiplier is applied to the reported rental equivalence to present the property taxes, insurance, maintenance and repairs of renters. Using data from the Garner and Rozaklis (2001) study, multipliers are produced for nine family types that reflect varying numbers of adults and children (these groups are listed in the Appendix under All Consumers). On average the multiplier is 1.02.

In an earlier study (Johnson, Shipp, and Garner 1997), rental equivalence values reported in the 1995 CE and the 1995 Consumer Price Index Housing Survey were compared and were found to result in very similar responses on average. Whether owner occupants are accurate evaluators of the rental values of their housing units has not been examined based on our search of the literature.[5] We are unaware of other federally sponsored surveys in which the rental equivalence question has been asked.

[5] On a related topic, Follain and Malpezzi (1981) examined the accuracy of owner occupants concerning the market value of their homes using hedonic methods and the Annual Housing Survey. They found that the average over-occupant downwardly biases its estimate of the market value by about 2 percent.

4. BEA

To estimate imputed rents for owner occupants in the Personal Consumption Expenditures (PCE) of the National Accounts, the BEA uses data from the 1990 Census of Housing Residential Finance Survey and data from the 1990 American Housing Survey. Actual space rents paid for owned property are used to create ratios for rent to reported market values. Data from one-unit properties only are used to produce these ratios. Then these are applied to the distribution of all owned housing by market value as reported in the American Housing Survey. The most recent ratios are for 1990. The 1990 PCE estimates have been updated each year uing the Consumer Price Index for owners' equivalent rent. For the period 1995 and earlier, the BEA incorporated BLS improvements to the CPI for owners' equivalent rent that are included in the BLS series for 1995 forward (Smith 2001).

In the CE, market values of rented properties are not collected in the CE. Therefore, we use reported rental equivalence and market value of each primary residence. Following the BEA approach, market values are grouped into 11 property value classes ranging from $1 to $20,000 up to greater than or equal to $300,000. Ratios of the reported rental equivalence to market value are grouped into eight groups. The lowest ratio group is less than 5 percent but greater than 0, and the highest is greater than or equal to 40 percent. Implicit returns from possible renting to investing in owned property are estimated. These are then applied to the midpoints of the property value classes for weighted consumer units in each group to produce an estimated rent for homeowners. This calculation is done for each owner occupant consumer unit in the CE data file. Of all owners, most provided (55,309 of 55,563) reported positive values for both rental equivalence and market value. Only 0.6 did not have values for both. The reported rental equivalence, actual or imputed as described above, are used in the creation of the ratios. Market values are imputed for cases with missing values for owner occupied housing. This is the first time that the BEA based approach has been applied using the CE data.

Imputed rents based on the BEA approach and reported rental equivalence is presented by owned property reported market value in Table 1. For owned housing valued at less than $40,000, the average annual rent is higher based on CE rental equivalence alone as compared to the BEA approach which is based both on reported rental equivalence and market value. Properties in the lowest property class ($1 to less than $20,000) are almost as high as those for properties in the $60,000 to less than $80,000 range. For

properties in all but two of the remaining value classes, the BEA measure produces slightly higher rents. CE reported rental equivalence is higher for market value properties in the $100,000 to less than $120,000 and greater than or equal to 300,000 ranges than those based on the BEA approach. Average imputed rents are quite close. These estimates represent space rent only.

(Table 1 about here)

Defining housing costs for owner occupants in the last two ways contrasts with what the Panel described as a "preferable definition." As noted in the Introduction, the Panel's preferable definition of housing costs would include actual outlays for mortgage payments, taxes, insurance, and maintenance and repairs, plus an imputed amount for the estimated rental value of the home net of such outlays. The Panel states that such an approach would treat homeowners and renters comparably. For homeowners with low or no mortgage payments such an approach would result in housing costs which are more comparable in size with the out-of-pocket expenditures of homeowners with mortgages. And yes, some imputed estimated rental value of the owned home would be included so that implicit housing services would be valued. However, given differences in the economy and mortgage markets, it is conceivable that homeowners with mortgages could have out-of-pocket expenditures that are higher than their imputed shelter costs. When this is the case, an inconsistency in concept across homeowners would exist. The housing costs of homeowners with low or no mortgages would be based primarily on imputed shelter costs while those of homeowners with high mortgage payments and associated costs would be based on out-of-pocket expenditures. Following the Panel's definition, owners with high mortgage payments and other large expenditures would be treated differently than other homeowners and renters living in similar types of dwellings and in the same areas.

Descriptive Statistics

Since the experimental poverty thresholds are based on the experience of reference families (families composed of two adults and two children) only, the results in Tables 2 and 3 compare the all consumer units with the reference family. Presented in Table 2 are the percentage distributions of population weighted families (including single persons) and persons by housing status. As noted earlier, for owners, whether the reference family has a mortgage or not greatly affects out-of-pocket shelter

expenditures as well as the other measures of shelter costs, as does the mix of homeowners and renters among the reference families. We find that approximately 79 percent of the reference families live in owner occupied housing. This is in contrast to the full weighted sample in which approximately 65 percent of all consumer units live in owner occupied housing. About 68 percent of the reference families live in owner occupied housing and have a mortgage. In contrast only 39 percent of the consumer unit population lives in owned housing that is mortgaged. Earlier work (Garner and Rozaklis 2001) has shown that mortgage interest payments account for about 69 percent of the owners-with-mortgages' out-of-pocket housing expenditures. Other expenditures include those for property taxes (20 percent), maintenance, repairs, and related goods and services such as homeowners' insurance (11 percent). Since mortgage interest is a substantial portion of the out-of-pocket expenditures paid by many owners, thresholds will tend to rise and fall with the movement of mortgage interest rates. In addition, larger mortgage interest payments are associated with families living in newer, larger housing units located in high amenity neighborhoods. This means that thresholds will tend to be relatively high when reference families have higher interest payments and live in such neighborhoods.

(Table 2 about here)

Presented in Table 3 are the means of annual housing (includes shelter plus expenses for property taxes, insurance, maintenance and repairs) costs for all consumer units and reference families. These are further distinguished by housing tenure: owners with mortgages, owners without mortgages, and renters. The mean imputed housing costs for all renters is approximately $5,700 compared to $6,700 for reference family renters. The highest housing costs are for owners. For all consumer units the costs range from approximately $9,600 based on the CE publication definition to $12,800 based on reported rental equivalence. Reference families with mortgages have housing costs that range from about $700 to $1,600 higher than the population at large (including reference families). Housing costs represent approximately 43 percent of CE publication and outlays food, clothing, shelter, and utilities (FCSU) expenditures. The share increases to 51 percent once imputed rents are assigned to owner occupants. The ratios are somewhat closer for the reference family. The share based on the CE definition of housing is 43 percent while that based on reported rental equivalence is highest at 49 percent, only slight higher than those based on the two

other remaining measures. The implication is that different multipliers and percentages of the median should be used when the definition of shelter differs from the one used by the Panel.

Among housing status groups, owners with mortgages have the highest out-of-pocket housing expenditures, as well as the highest costs using outlays, reported rental equivalence, and BEA imputed rents. For all consumer units, housing costs based in some part on rental equivalence are higher for owners with mortgages than for other groups. However, for the reference sample, the highest housing costs are those based on outlays. This is likely since this group is likely to have newer mortgages with higher costs and may live in higher cost areas. Not surprisingly, owners without mortgages gain the most from using the rental equivalence based approaches.

Garner and Rozaklis (2001) found housing costs that included reported rental equivalence resulted in higher estimates than those based on the hedonic model. This would not be surprising if the respondents answer the rental equivalence question with respect to their neighborhoods, and current housing expenditures. Houses with higher mortgages are likely to be in neighborhoods with more amenities. Or it could just be that respondents think that their homes are worth more on the rental market than they actually are. On the other hand, the reported rental equivalence values are likely to be capturing variations in housing and neighborhood quality that hedonic approaches do not.

(Table 3 about here)

Inequality Analysis and Equivalence Scales

Food, clothing, shelter, and utilities were selected by the panel to representative some set of commodities that everyone would be expected to need. Given this, one might expect the costs of these to be fairly equally distributed. To examine this issue, we use three generalized entropy measures and the Gini coefficient to examine the distributions of FCSU expenditures for all consumer units and for a smaller sample. Results are presented for persons in the population. In order to present person based inequality results, we applied and tested different equivalence scales. First the three parameter scale and then those implicit in thresholds that are produced for groups of consumer units rather than using the one applied to the reference family only. **.** (Thresholds are not presented but are available upon request from the authors.) Poverty thresholds were produced for all consumer units as defined by the nine family types presented

below. For some of these family types, the same equivalence scale is applied when a family included a varying number of adults and or children.

All Consumer Units	
	one adult, no children
	two adults, no children
	3 or more adults, 0 child
	1 adult, one child
	1 adult, 2 or more children
	2 adults, 1 child
	2 adults, 2 children
	2 adults, 3 or more children
	3 or more adults, some children

In order to produce an equivalence scale that is based on an exact number of adults and children, we created an additional grouping. For this grouping we account for differences in shelter costs that could result for younger versus older consumer units. This distinction is made only for singles and couples however. This distinction is made we expect older consumer units to be more likely to be owners without mortgages rather than with mortgages. Thus their implicit rents due to greater home ownership would increase their shelter costs and would make more even the distribution of FCSU expenditures. There is no distinction by age in the panel's two-parameter scale or in the three-parameter scale but there is in the official poverty measure. The second grouping represents about 89 percent of all consumers units during the time of our study and 78 percent of all persons. (see Appendix table)

Selected Consumer Units	
	one adult, no children, head <65
	one adult, no child, head>=65
	two adults, no children head<65
	two adults, no children, head>=65
	three adults, no children
	two adults, one child
	two adults, two children
	two adults, three children
	one adult, one child
	one adult, two children

The three-parameter scale is compared to the implicit scale of the official poverty thresholds, and those implicit in the thresholds defined using each of the FCSU measures and for the second group of consumer units. These scales are presented in Table 4. As can be clearly seen, the three-parameter scale

allows more for each additional person in multi-person families. The official scale is rather generous for larger families as well. Greater economies of scale are reflected by the equivalence scales implicit in the thresholds for the selected groups. The distinction by age reveals that couples headed by an older person have greater needs when the rental equivalence based measures are used to define shelter costs in FCSU.

(Table 4 about here)

The inequality results are presented in Table 5. In the first panel, results are presented based on applying the three-parameter scales but are applied to each family type noted above. The second panel includes results that are based on the implicit scales in the estimated thresholds for each family. The top half of the table is based on all consumer units while the lower is for the select sample only. Distributions are person weighted. It appears that expenditure outlays for shelter introduce a great deal of variability in FCSU costs. The inequality index values are all higher when this measure is employed. The large size of the general entropy measure, half the coefficient of variation squared index, suggests that there might be a higher concentration of such expenditures at the upper end of the FCSU distribution. When reported rental equivalence is used, the distributions are more equal. They are most equal when the BEA approach is used. This is not surprising given that there is less variation in the imputed rents applied. In other words, each owner occupant consumer unit will receive only one of 11 values of imputed rents since only 11 property value classes are used. Due to the relatively large inequality in FCSU thresholds based on shelter outlays, this measure seems to be an unlikely choice for a FCSU threshold is one believes and desires a relatively equal distribution of FCSU expenditures.

(Table 5 about here)

Accounting for homeownership on the resource side of the poverty equation

The March supplement to the CPS collects information on whether the housing unit is owned or rented, but does not collect information on home equity. The rate of return approach is implemented by preparing a statistical match to the AHS based on household characteristics. The variables used to match the two files were age of householder, state, MSA, and central city status of the household, household income, household size, number of living quarters and the race sex and education attainment of the householder.

In the March 2001 CPS, housing finance characteristics are available from the 1995 AHS. The variables that we pick up from this statistical match are monthly mortgage amount, annual property taxes in current dollars, market value of residence/land, market value of land if mobile home and own land, balance remaining on mortgage, part of a condominium or cooperative. Values are updated to 2000 values using the percent change in total home equity from the Federal Reserve flow of funds data.

Values for these variables are attached to each household in the CPS, when characteristics match with similar households in the AHS. If we look at the values of the variables for family heads who live in owned homes in the CPS we find that, on average, family heads pay $431 per month for their mortgage cost, they have an average of $37,648 balance on their mortgage. Mean value of home is $115,895. Using these values the Census Bureau calculates that the average home equity of families, computed as value of home minus balance on mortgage, is $78,544.

The estimate of the amount of income derived from home equity is dependent on the rate of return that is chosen. The rate chosen for the calculation in the CPS is the average rate of return on high-grade municipal bonds from the Standard and Poors series. For March 2001 the high grade municipal bond yield was 5.77 for 2000. Using this rate of return for all homeowners, the average net return to home equity that would be added to income for 2000 is $5,046 for the year.

There are, however, some small problems with this calculation. The first is that the values collected on the AHS for current market value and mortgage balance sometimes yield negative amounts for home equity. Clearly this can happen, for example, if a home loses value after the homeowner purchases it. That value can fall below the amount of the mortgage obtained. If this is the case, however, it should not be included in the calculation of net return to home equity. The calculation is designed to account for the flow of services from owned home, and not intended to account for the liabilities of the homeowner. How the homeowner chooses to hold debt, either in the form of a mortgage, or home equity loan, rather than as charges to a credit card or a personal loan from the bank, is not relevant to this measure. Ideally, net return to owned home is only calculated for those homeowners whose equity is positive. Thus, if we restrict the calculation only to this group, then the mean amount of home equity is increased slightly to $79,016. Using the same interest rate as before, this computation yields average net return to home equity of $5,076.

Clearly, this is not a large difference, however, housing markets change from year to year. In a time of rising home prices, one would expect to find that the addition of net return to home equity would affect poverty measures, insofar as home owners are made better off by this increase. And vice versa for falling home prices. For example, it may be that housing values in 1995 are not reflective of the increase in housing values experienced by homeowners in 2000. Since this measure should reflect current housing market conditions as closely as possible, it would more useful to update the match as often as possible.

There is another difficulty with the calculation as done in the CPS process. While the home equity values are matched to households in the CPS, the calculation then assigns these household characteristics to all people in the CPS files. So that each person is assigned the home equity of the household for which they live. This is in turn added to their family income to calculate income before determining poverty status.

The result is that, if more than one family resides in a household, or if there are unrelated individuals residing together, each of those families or individuals is assigned the full value of home equity. This method essentially counts this value as many times as there are families, as though each family or individual owned their own separate home.

This value can be recalculated in such a way that the home equity is assigned only to the primary family, or it could be prorated to the families or unrelated individuals sharing the home. This first method is applied here. The two difficulties we have found with the net return calculations have opposing effects on the subsequent values that are added to income. The net result of correcting these two problems is a mean home equity amount of $74,928 and annual net return to home equity amount of $4,814.

Because homeowners pay property taxes, the final estimate of the amount of income derived from home equity is made equal to the imputed return less the amount of property taxes paid. As in the above calculation, the amount of property taxes paid is assigned to all people residing in the household, so that for households with more than one family the property tax is paid in full by each family or unrelated individual. Assigning these values for primary families only changes the average value of property tax paid by families from $1,608 per year to $1,500 per year. In the calculations that follow we will delete all negative home equity values and assign home equity returns to primary families of multifamily households.

Effect of Accounting for Homeownership on Poverty Estimates

We can assess the importance of accounting for owner-occupied housing in a poverty measure by looking at the way it changes measured poverty rates. In the year 2000, the official measure of poverty, which does not take account of owner-occupied housing, showed that 11.3 percent of all persons were in a family with income below the official poverty threshold. In this section, we calculate poverty rates for various population subgroups to assess the effect of our various measures on our perception of who is poor.

First, we want to examine the effect of using experimental thresholds. We begin with the FCSU thresholds that the Panel used, which include out-of-pocket shelter costs. Since this method takes no account of homeownership in the threshold, we compare family income as used in the official poverty measure, without adding net return to home equity. Poverty rates for different subgroups are shown in Table 6. Changing from the official thresholds to an experimental threshold increases the overall poverty rate slightly to 11.7 percent and also increases poverty rates for nearly every subgroup of the population shown.

(Table 6 about here)

Next, we use an experimental poverty threshold that accounts for shelter costs in a more comprehensive way. In this case, we use the method that accounts for homeowners payments on mortgage principal. Adding these outlays to out-of-pocket shelter costs results in a threshold that is higher than the basic bundle FCSU threshold; $19,053 compared with $17,884 for 2000. The net effect on poverty rates is to raise poverty rates by over a percentage point to 12.9 percent for 2000.

Next, to understand the importance on the resource side of a poverty measure, we add the value of net return to home equity and subtract property taxes paid from family income, comparing to the official poverty thresholds. Note that we only use official thresholds in these calculations to assess the effect of adding net return to home equity to income. When we change the income measure in this way, we calculate that 10.2 percent of the population is poor. So that including net return to home equity and subtracting property taxes reduces the national poverty rate by almost a full percentage point. We also see that the effect is much greater for groups that tend to have more home equity. One important group is the elderly. When their incomes include net return to home equity, the subsequent fall in poverty rates is quite large, from 10.2 percent poor under the official measure to 6.7 percent with net return to home equity. Other

groups with large declines are families with no workers and female householder families, both groups that tend to include a large percentage of elderly.

The last two columns represent poverty measures that account fully for owner-occupied housing. We have seen earlier that using a rental equivalence rather than an out-of-pocket measure in the thresholds results in higher thresholds. Poverty rates for all people using these measures are 13.1 and 13.6 percent. So that only groups with large counterbalancing returns to home equity do not reveal increased poverty rates. For example, 11.6 percent of the elderly are classified as poor using an out-of-pocket measure, 13.2 percent when that included payments to mortgage principal. Whereas, only 10.8 percent of elderly are poor when we add net return to home equity to income and use rental equivalence to value shelter cost in the threshold.

Conclusions

The housing costs of owners and resulting thresholds are evaluated in this research using three different approaches: out-of-pocket housing expenditures, reported rental equivalence, and imputed costs based on a hedonic regression model. Thresholds tend to be the lowest when based on out-of-pocket approach, followed by those based on imputed housing costs. The highest thresholds are based on the reported rental equivalence of owners.

In developing this research, several questions arose and remain with us. For example, should the focus of the poverty measure be based on the expenses that people face and the income that they have to meet those expenses? Or should the measure be based on the costs of consumption or some basic needs and the resources available to provide for that consumption or to meet those needs? Are the out-of-pocket expenditures that the Panel used too high due to the fact that there is no accounting for the deduction of mortgage interest when one estimates their income taxes.

If a consumption approach for the thresholds is assumed, a consistent measure of resources would be needed. In the Panel's estimate for resources, there is no accounting for the value of the flow of services that owners obtain from their homes. Thus, owners with low or no mortgages have more of their incomes available for the consumption of items not covered by the basic bundle when the threshold is defined in terms of out-of-pocket expenditures of reference families. Reference families tend to have relatively high out-of-pocket expenditures since they tend to be homeowners with mortgages. The Panel noted that by

excluding values for this implicit income is to underestimate homeowners' resources relative to their poverty thresholds (Citro and Michael 1995, p.245). Valuing the implicit income from owner occupied housing has interesting implications especially for elderly households who own their homes and do not have mortgages or have very low mortgage interest payments. Ignoring this implicit income for the elderly means that households living in large value houses with substantial wealth and hence implicit income in the form of owner's equity are just as likely to be classified as poor as those in small inexpensive units. If we assume that elderly households can transform their home equity into a flow of guaranteed income using a reverse annuity mortgage, this equity could be used to increase their resources. Following this approach for resources, one could assume that this implicit income could be used to meet their basic consumption. As noted by the Panel (Citro and Michael, 1995, p.246), some analysts (e.g., Ruggles, 1990) think that it may not be appropriate to add the full net imputed rent to resources especially for the elderly. The Panel stated that a downward adjustment to the value for a larger-than-needed home would be appropriate, but there appears to be no agreement concerning what the adjustment would be. One approach suggested is to cap the amount of imputed rent at the level of the housing component in the poverty thresholds (Citro and Michael, 1995, p. 246).

If the implicit cost of the flow of services from owner occupied housing is included in the thresholds, what is the best approach to account for the flow of income on the resource side? This and our earlier questions asked will be addressed in future research.

Basic Conclusions

- Housing in poverty measures
- NAS proposed bundle for thresholds intended to represent group of goods relatively inelastic with respect to income, necessities. Not true for housing. Plus problem of owner/ renter.
- Different way of valuing shelter cost
- CE publication method –
  - Lowest $ amount
  - Implicit equivalence scales suggest greater economies of scale than officila or 3 parameter
  - More unequal distribution than the rental measures
- Outlays method
  - Lower $ amount
  - Implicit scales suggest greater economies of scale the official or 3 parameter
  - Most unequal – very high upper tail
- Rental equivalence

Highest $ amount

Implicit scales suggest fewer economies of scale than official for adults with no kids, but with kids, more than official

More equal distribution than the outlays measures

- BEA based method

  Higher $ amount

  Implicit scales like rental equivalence

  Most equal distribution – less variation imposed by method used…

These findings suggest that quite possibly the NAS threshold we are currently using is

Too low – underestimate cost of shelter 'need'

Assumes too few economies of scale – especially for families with kids

Measures shelter expenses in a way that is relatively uniformly distributed – possible removes some of the discretionary income elastic portion of shelter cost by not including mortgage principle payments.

That being said – look at the effect on poverty rates when incorporated in a poverty measure – first need to adjust income for rental mesures. Also remember using only official and 3 parameter scale to apply thresholds. Poverty outcomes would be different if we used implicit equivalence scales. But essentially we are just sliding the threshold up and using the same equivalence scale no matter what.

Get higher poverty rates no matter what

Adjusting income for owners, lowers poverty especially for groups who own their own home without debt, elderly mostly. Lowers very little for kids, families with workers, married couples.

FCSU-CE definition based- compared with official – higher except for kids, male hosueholders, people in West

Outlays – higher especially for elderly, black, Hispanic, groups just above the poverty line ???

Rental equiv with income adjustments – higher for kids, blacks, Hispanics, female householders

BEA method with income adjustments – higher for kids, black, Hispanic, female housedholder .

This last is mostly due to the addition of very low home equity returns for kids at least.

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Table 1. Average Annual Imputed Rents by Market Value Class					
for Owner Occupied Housing Using					
CE Quarterly Interview Data: 2001 Quarter One					
Market Value		**BEA Based**		**CE Reported**	
		Imputed Rent		**Rental Equivalence**	
$1<$20,000		$3,975		$7,632	
$20,000<$40,000		$6,504		$6,737	
$40,000<$60,000		$6,697		$6,579	
$60,000<$80,000		$7,865		$7,852	
$80,000<$100,000		$9,351		$9,285	
$100,000<$120,000		$10,082		$10,092	
$120,000<$150,000		$11,845		$11,839	
$150,000<$200,000		$14,130		$13,858	
$200,000<$250,000		$16,608		$15,669	
$250,000<$300,000		$19,010		$18,503	
>=$300,000		$21,428		$24,548	
average imputed rent		$11,543		$11,853	

Table 2: Percentage Distribution of Consumer Units by Housing Tenure over CE Interview Quarters 1998Q2-2001Q1											
	Full Sample					**Two Adults with Two Children Families**					
			Consumer Units		**Persons**			**Consumer Units**		**Persons**	
			n=85341		n=210,541			n=7668		n=30,672	
Housing Status			N=1.301E9		N=3.1595E9			N=1.1576E8		N=4.63E+08	
All Owners		0.65		0.70			0.79		0.79		
Owners with Mortgages			0.39		0.47			0.68		0.68	
Owners without Mortgages			0.27		0.23			0.11		0.11	
Renters		0.35		0.30			0.21		0.21		

Table 3: Mean Annual Shelter Costs by Housing Status in 2000 U.S. Dollars (1998Q2-2001Q1)					
Housing Status		**CE Publication**	**Outlays**	**Rent+Rental Equivalence**	**Rent+BEA Based Imputed Rent**
All Consumer Units		$6,383	$7,321	$9,522	$9,393
	Owners with Mortgages	$9,553	$11,985	$12,751	$12,047
	Owners without Mortgages	$2,689	$2,695	$9,877	$10,416
	Renters	$5,693	$5,693	$5,693	$5,693
Shelter Share as % of Bundle for					
All Consumer Units		0.42	0.45	0.51	0.51
	Owners with Mortgages	0.46	0.51	0.53	0.51
	Owners without Mortgages	0.24	0.24	0.54	0.55
	Renters	0.46	0.46	0.46	0.46
Two Adults with Two Children Families		$9,306	$10,923	$11,868	$11,220
	Owners with Mortgages	$11,167	$13,534	$13,776	$12,711
	Owners without Mortgages	$2,677	$2,695	$9,691	$10,400
	Renters	$6,736	$6,736	$6,736	$6,736
Shelter Share as % of Bundle					
Two Adults with Two Children Families		0.43	0.47	0.49	0.48
	Owners with Mortgages	0.46	0.51	0.51	0.49
	Owners without Mortgages	0.18	0.18	0.45	0.47
	Renters	0.42	0.42	0.42	0.42

Table 4. Equivalence Scales Based on FCSU Thresholds using Alternative Shelter Definitions						
	3-parameter	**Official**	**CE Publication**	**CE Outlays**	**BEA Based**	**Rent Equivalence**
one adult, no children, head <65	1.00	1.00	1.00	1.00	1.00	1.00
one adult, no child, head>=65	1.00	0.92	0.70	0.69	0.98	1.03
two adults, no children head<65	1.62	1.29	1.40	1.44	1.54	1.56
two adults, no children, head>=65	1.62	1.16	1.02	1.02	1.40	1.44
three adults, no children	2.16	1.50	1.53	1.59	1.71	1.74
one adult, one child	1.51	1.32	1.16	1.16	1.12	1.10
one adult, two children	1.79	1.55	1.25	1.25	1.17	1.17
two adults, one child	1.90	1.55	1.62	1.66	1.61	1.60
two adults, two children	2.16	1.95	1.82	1.89	1.82	1.80
two adults, three children	2.40	2.29	1.82	1.89	1.78	1.76

Table 5. "Food, Clothing, Shelter, and Utilities" Expenditure Inequality in 2000[1]										
			Food, Clothing, Utilities plus				*Food, Clothing, Utilities plus*			
					Rents +	**Rents +**			**Rents+**	**Rents+**
			CE Pub.	**Shelter**	**Reported**	**BEA Based**	**CE Pub.**	**Shelter**	**Reported**	**BEA Based**
			Shelter	**Outlays**	**Rental**	**Imputed**	**Shelter**	**Outlays**	**Rental**	**Imputed**
					Equivalence	**Rents**			**Equivalence**	**Rents**
			3-parameter equivalence scale				*Implicit equivalence scale*			
All Consumer units[2]										
	observations	85,038								
	population	3,152,835,039								
Gini			0.307	0.319	0.289	0.260	0.297	0.310	0.274	0.241
Mean Log Deviation			0.158	0.172	0.143	0.117	0.149	0.163	0.130	0.102
Theil			0.166	0.191	0.153	0.114	0.155	0.180	0.137	0.098
(CV^2)/2			0.240	0.617	0.269	0.142	0.217	0.596	0.228	0.117
mean annual expenditures										
	per person		$9,130	$9,702	$10,865	$10,761	$10,580	$11,011	$13,204	$13,258
Selected Consumer Units										
	observations	75,556								
	population	2,457,975,603								
Gini			0.307	0.320	0.285	0.254	0.299	0.311	0.277	0.244
Theil			0.167	0.194	0.150	0.109	0.159	0.184	0.142	0.101
Mean Log Deviation			0.159	0.174	0.140	0.113	0.152	0.166	0.134	0.106
(CV^2)/2			0.244	0.678	0.276	0.138	0.240	0.620	0.249	0.122
mean annual expenditures										
	per person		$9,613	$10,222	$11,512	$11,413	$11,819	$12,292	$13,284	$13,100

Table 6. Experimental Poverty Rates: 2000

	Cash Income			Cash Income + Net Return to Home Equity		
					Rent+	Rent+BEA
		CE	CE		Rental	Based
	Official	definition	outlays	Official	Equivalence	Imputed Rent
All persons	11.3	11.7	12.9	10.3	13.1	13.6
Children	16.2	16.2	17.9	15.4	18.8	19.6
Nonelderly adults	9.4	9.8	10.7	8.8	11.1	11.5
Elderly	10.2	11.6	13.2	6.7	10.9	11.8
Race						
White	9.4	9.7	10.8	8.5	11	11.5
Black	22.1	23	24.8	20.6	24.9	25.8
Other	13.7	14.1	15.5	12.5	15.6	16.5
Hispanic origin	21.2	21.7	24.2	20	25.7	26.7
Family workers						
No workers	33.2	34.5	36.6	28.6	34.1	35.2
One or more workers	8	8.2	9.3	7.6	9.9	10.3
Persons in family of type:						
Married couple	5.7	6	6.9	5	7.1	7.5
Male householder	14.9	14.9	16	14	16.5	16.9
Female householder	25.7	26.4	28.6	23.5	28.6	29.6
Geographic regions:						
Northeast	10.3	10.7	11.7	9.6	12.1	12.7
Midwest	9.5	9.7	10.4	8.8	10.8	11.1
South	12.6	13.3	14.7	11.2	14.5	15.1
West	11.9	11.9	13.5	11	14	14.6
Metropolitan area:						
Central city	16.2	16.4	17.8	15.4	18.7	19.4
Not central city	7.8	8.2	9.2	6.9	9.2	9.6
Nonmetropolitan area	13.4	14.1	15.7	11.7	15.3	15.8
Source: March 2001 CPS						
Appendix Table 1. Distribution of Consumer Units and Persons by Family Type						
CE Interview Data 1998Q2-2001Q1						

Appendix Table 1. Distribution of Consumer Units and Persons by Family Type			
CE Interview Data 1998Q2-2001Q1			
All Consumer Units		**Consumer Units**	**Persons**
	one adult, no children	32.98	13.58
	two adults, no children	25.43	20.94
	3 or more adults, 0 child	6.58	8.99
	1 adult, one child	3.48	2.87
	1 adult, 2 or more children	3.66	5.33
	2 adults, 1 child	7.94	9.8
	2 adults, 2 children	8.9	14.66
	2 adults, 3 or more children	4.92	10.89
	3 or more adults, some children	6.12	12.95
Selected Consumer Units		**Consumer Units**	**Persons**
	one adult, no children, head <65	23.32	9.6
	one adult, no child, head>=65	9.66	3.98
	two adults, no children head<65	16.8	13.83
	two adults, no children, head>=65	8.63	7.1
	three adults, no children	4.83	5.96
	two adults, one child	7.94	9.8
	two adults, two children	8.9	14.66
	two adults, three children	3.56	7.33
	one adult, one child	3.48	2.87
	one adult, two children	2.31	2.85
	Others	10.58	22.02