

2008

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Recommended Citation

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Colby

***Demographic Differences in Household
Expenditure for Low Income Families:
Evidence from the United States***

**Joerose Tharakan has completed the requirements for
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May 2008**

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Demographic Differences in Household Expenditure for Low-Income Families: Evidence from the United States

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Abstract

Despite being one of the world's most prosperous countries, the United States of America was home to roughly 7.7 million households living in poverty in 2006. Of this figure, 53% percent of households were headed by a single mother. What is more disturbing is that a significant majority of these households were those of full time workers, unable to meet the basic needs of their families at federally mandated minimum wage rates. Researchers and activists from a multitude of disciplines have repeatedly called for an overhaul of the current method of estimating poverty in the United States, and further proposed a variety of tools for its reevaluation. This paper makes use of some of those tools to motivate an analysis of demographic differences in household expenditure on basic necessities as a way of bringing the plight of these families into the spotlight being cast on issues of poverty. Using recently released data from the Panel Study of Income Dynamics, this paper looks at the how certain demographic characteristics affect household expenditure and which categories of expenditure put a family at risk of falling (albeit unnoticed) below a more realistic measure of poverty than the one currently in use.

Acknowledgements

I owe my deepest gratitude to Professors Michael Donihue and Philip Brown for their careful comments and leading questions. I have also benefited from conversations with Professors Debra Barbezat and Jason Long, and thank the Economics Department at Colby College for supporting my endeavors. Working on this project has been immensely satisfying for me, and it would not have been possible without the encouragement and support of those around me. In this regard I have to thank my friends and family - most notably my parents, Suzanne Thivierge, Hank Brunell, Nahita Nishmin, Leonardo Costa, Andrei Roman, Ishan Singh, Kostadina Nacheva and Karan Singh.

Introduction

In 1938 the United States of America passed a landmark piece of legislation by way of the Fair Labor Standards Act (FLSA). This enactment initiated a national minimum wage, mandated the payment of overtime wages and made illegal the recruitment of minors into the workforce. The Declaration of Policy that accompanied this Act states that the minimum wage should allow for “maintenance of the minimum standard of living necessary for the health, efficiency, and general well-being of workers.”¹ The establishment of such a wage floor was expected to boost consumption and thereby the average standard of living, particularly for low-income groups of the population. The minimum wage came with the added benefit of being relatively easy to enforce, without straining state resources and taxpayer dollars. Indeed, arguments in favor of this motion were plentiful. Seven decades later, it is important to ask if the current minimum wage is meeting its stated objectives. Nowadays the statutory minimum is more commonly thought of as the lowest hourly wage that any employer may legally pay his workers. While the concept of a ‘minimum’ wage was initially articulated as a matter of social justice, it was soon discovered that federal standards were not living up to this function. The minimum wage was largely found to define levels of mere subsistence for workers and their families, and nothing more.

Why it is that minimum wage legislation has failed to keep up with the everyday cost of living? The simple answer to this question is that the minimum wage has not kept up with the cost of inflation. Moreover, when Molly Orshansky of the Social Security Administration first calculated poverty thresholds in the 1960’s (which would later be used

¹ U.S Code Collection; Title 29 – Labor, Chapter 8 – Fair Labor Standards, Section 202 (a) – Congressional finding and declaration of policy; http://www.law.cornell.edu/uscode/html/uscode29/usc_sec_29_00000202----000-.html

to determine such wage levels), she did so based on a single piece of basic household expenditure – food (Willis 2000). By determining that the average four member family spends about one-third of their household income on food expenses, Orshansky was able to recommend hourly earnings that could adequately pay for an economical food plan set out by the U.S Department of Agriculture – but nothing else. That method is in use even to this day. Once a year, the Census Bureau defines the number of people considered to live in poverty as those families whose incomes fall below this poverty threshold for their family type (based on household size and number of children) and it is this measure that is so widely cited towards affecting policy decisions concerning poverty and welfare (Sullivan and Meyer 2006).

Let us look at some of the figures generated by 2006 federal poverty measures and reported by the U.S Census Bureau². In 2006, the weighted average poverty threshold for a family of four stood at \$20,614; \$16,079 for a family of three; \$13,167 for a family of two; and \$10,294 for individuals. Using these baselines, 9.8% of the country's families lived in poverty in 2006. In real terms, this represents 7.7 million households unable to meet even the most basic of necessities. Of this number, 4.1 million (53.25%) households were headed by a woman, with no husband present, as against the 671,000 (8.71%) households with a male head and no wife present. It was also determined that 28.3% of all female headed families were poor while only 13.2% of all male headed families suffered the same fate. In a similar vein, 20.6% of Hispanics were found to fall below the poverty threshold while only 8.2% of non-Hispanic whites were classified to be poor. The corresponding rates are 24.3% of blacks and 10.3% of Asians in 2006. 9.4% of senior citizens, 17.4% of

² U.S Census Bureau News – Press Release; August 28th 2007 - 'Household Income Rises, Poverty Rate Declines, Number of Uninsured Up.'; http://www.census.gov/Press-Release/www/releases/archives/income_wealth/010583.html

minors (children under 18) and 10.8% of the population aged between 18 and 64 were deemed to be living in poverty. The figure above for the population of minors represents approximately 12.8 million poor families with children under the age of 18. Geographically, southern states had the highest poverty rate at 13.8% followed by 11.6% in the West, 11.5% in the Northeast and 11.2% in the Midwest. This federal profile of poverty in the United States appears to delineate some groups as being more susceptible to poverty than others. Yet, these figures do not take into account the statutory misgivings that accompany the calculation of poverty thresholds; they only highlight a broader issue at hand.

There seems to be consensus, both in public opinion and academic literature, that it is desirable to move towards a system where an individual with full participation in the workforce should be able to lead a life unscathed by poverty. Whether that may be achieved within the labor market framework or assisted by welfare reform, this goal begins with re-assessing what it costs (realistically) to live in today's world. Furthermore, in evaluating consumption and expenditure of those in the lowest quartile of income, it is pertinent to account for various choices and needs, as dictated by household demographics. A central focus in this aspect is to examine demographic and characteristic influences on household expenditure, and the impact of any such effects on households that lie at risk of falling below a realistic measure of poverty. Of particular interest in this regard has been the question of gender-based differences to household expenditure as a means of addressing the growing pay-gap between the sexes in today's workforce. As part of a larger effort towards understanding household consumption of basic necessities, this project looks at the calculation of basic needs budgets and proposes equivalent wages required to meet those needs for various types of low-income households in the United States.

This paper is organized into two parts, subdivided into sections. Part I is primarily intended to motivate this study while Part II analyses demographic influences on household expenditure using a model-based approach. Part I is arranged into eight sections. Sections 1 and 2 set the context for this study - with a discussion of the living wage movement in the United States and some background information on the concept of basic needs budgets. Section 3 motivates the focus on gender differences in expenditure in light of previous academic literature and feminist perspectives on poverty. Section 4 details the different types of data used and its limitations, and further explains methods of calculation used in this paper. Section 5 presents the findings of this part of the study and indicates overarching demographic trends in various items of household expenditure on basic goods. Section 6 details the pitfalls encountered while using Census expenditure data and makes a case for continued analysis using empirical modeling. Part II of this paper begins by briefly recapitulating the work done in Part I - putting forward a concrete thesis statement and two different hypotheses for the econometric analysis that follows. Section 2 lays out the analytical framework for modeling the population of interest. Sections 3 and 4 introduce a new source of data and describe that data in considerable detail. Section 5 develops empirical models to conduct an analysis of demographic influences on household expenditure, as well as to study that part of the population which is at risk of being unable to meet basic necessities. Section 6 discusses the results and implications of this study. A conclusion follows to summarize the work done in this project.

PART I

1. History and Review of FLSA and subsequent living wage ordinances

July 24th 2007 marked an important day in the life of the FLSA. With the passing of the Fair Minimum Wage Act of 2007, the federal minimum wage rose from \$5.15 per hour – a level at which it had stagnated for almost a decade - to \$5.85 per hour. This move is to be followed by a series of steps over the next two years, designed to bring the rate to \$7.25 per hour, in an attempt to better reflect the cost of living faced by workers everywhere in the nation. But during those intervening years, state governments and local labor unions had already taken matters into their own hands and ratified statewide minimum wage levels, adjusting the statutory level to reflect inflation seen in local market prices for food and basic amenities.

Since the federal poverty level was introduced in 1959, the annual earnings expected from full-time minimum wage employment have varied from 90% of the poverty line in 1968 to hover between 53 and 62% since 1985 (Smith 1989). Social inequality was still rampant, with millions of men and women working full-time yet unable to earn enough to climb out of the poverty bracket. This realization then led to the origination of what were coined as 'living wages'. This new standard was construed as a measure of economic justice in terms of how workers lived rather than as fair wages paid for labor received - sensitive to geographic area living conditions and adjusted to support workers' familial dependents. In his book *'A Living Wage'* (1997), Lawrence Glickman reports that this ideology was crucial to the U.S labor movement that followed the Civil War, spurring the working-class of the nineteenth century to demand a higher standard of living as afforded to them by their participation in the workforce. Despite going contrary to economic faith in

efficient labor markets, the concept thrived and the first living wage ordinance was passed in Baltimore in 1994, mandating that private contractors who enter into service for the state pay their employees a living wage of \$8.20 per hour. Today, nearly 80 cities or counties in the U.S have passed such ordinances and an equal number await approval on the books as many noteworthy grassroots organizations (such as ACORN³ and the Center for Policy Alternatives) have forged formidable coalitions to provide community groups with the resources needed to start up living wage campaigns, both locally and at the state level. These movements have resulted in the establishment and revaluation of state minimum wages. For example, Washington State currently has the highest minimum wage rate at \$7.93 per hour. Even so, there is much left to be done. Georgia, Kansas, New Mexico and Wyoming have set their minimum rates below the federal level. Some of the southern states (e.g. Alabama, Mississippi) have not implemented any minimum wage laws to date; thus, workers in these areas are subject to grave social injustice in spite of their participation in the country's labor force.

There are many motivations for studying living wages. Besides posing as guidelines in setting or revaluing national and statutory minimum wages, they can also be used to advise on labor market policies directed at those at or below the federal poverty line. It is the best measure of the number and type of workers subsisting at an unacceptable rate of remuneration for participation in the labor force. A central objective of this paper is to study living wages as a means of gaining a better understanding of poverty in the United States. In order to do so, it is first indispensable to understand the underlying relationship between receiving a low wage rate and living in a poor household. Plowman, et. al (1996) pointed to the 'reasonable needs' definition embedded in the concept of minimum wages to

³ ACORN - Association of Community Organizations for Reform Now.

indicate the manner in which they should be defined. They suggested the application of some needs-based analysis of 'reasonable living' for laborers employed by the Australian community. In the same vein, the initial parts of this paper seek to develop the concept of a basic needs budget so as to recognize the extent to which poverty is caused by unacceptable wage rates, as opposed to household demographics and labor market inefficiencies.

Despite the normative nature of living wages, this concept faces many challenges. Critics attack the living wage campaign on grounds that it is far too politically charged and difficult to implement. Having been construed as an arm of the social justice movement, living wage ordinances are subject to the existing political environment. Undoubtedly, the success of any given campaign will depend on the level of organization and relative bargaining power held by labor union workers. Even in counties where living wage ordinances have passed into law, big businesses with considerable bargaining clout have been made exempt from mandated levels. Consequently, the limited coverage of employees afforded by living wage ordinances cause many to question their effectiveness in raising the standard of living of low-income groups of the population. Furthermore, by mandating public service contractors to pay their workers a higher wage, state governments and municipalities fear that contracts will be harder to come by and that reduced competition in this market will drive up budget costs. As wages reflect the price of labor, an increase in price is expected to lower the demand for labor. Accordingly, opponents also voice concern that implementing higher wage floors will create higher costs and greater unemployment. In addition to the above, methods of calculation of living wages vary widely. They are calculated based on a budget of basic household necessities, which are then adjusted for varying demographics such as geographic area, size of the family unit and number of

dependents. Without any nationally accepted guidelines to go by, the suggested living wage ranges from a few dollars over the minimum wage rate to twice that amount as methods vary even among organizations operating within the same county or state.

Some of these concerns can be addressed by turning to empirical evidence from research conducted by the Economic Policy Institute:

1. On the issue of implementation, supporters of the ideology argue that living wage calculations have been used as a baseline in motivating incremental increases on the federal wage rate, implemented as minimum wages at the state level. Furthermore, research done in Boston and Los Angeles has demonstrated that most living wage workers were living in households struggling to afford a basic needs budget (Brenner and Luce 2005, Fairris 2005), thereby providing conclusive evidence that the effects of living wage implementation are, in fact, accruing to the targeted population.
2. Empirical research by Thompson and Chapman (2006) has shown that living wage laws have had small or moderate effects on the fiscal budgets of cities and counties that have put higher rates into practice. A survey of 20 cities found that actual budgetary costs represented less than 0.1% of the total budget (Elmore 2003). Two separate studies conducted in Baltimore each found that the increase in the cost of city contracts after passing the living wage ordinance was less than the rate of inflation for the same period (Niedt, et al. 1999). In addition, Sander and Lokey (1998) have shown that competitive bidding for contracts with the state have continued at levels comparable to those prior to implementing living wage laws.

The same Los Angeles survey mentioned above also found that job losses affected only 1% of those whose wages were lifted by the adoption of living wages. Similar trends

were found in San Francisco (Reich, et al. 2005), where employment increased for airport and health care workers who had directly benefited from a new living wage law in the area. The Neidt and Brenner studies found similar results in other areas, but a notable exception comes from Adams and Neumark (2003, 2005) who argue that the inclusion of living wage clauses has increased wage levels only with a corresponding and significant decrease to employment. Thompson and Chapman attack these results on the argument that the Current Population Survey data used by Adams and Neumark does not adequately represent the proportion of workers affected by living wage ordinances in various counties, but this remains an ongoing debate in the living wage literature.

The issue of variability is one that hinders many otherwise successful campaigns and requires careful consideration. To fully understand the methodology behind living wages, an exploration of the concept of basic needs budgets is in order.

2. Basic Needs Budgets and Cost of Living

The single strongest criticism of the federal measure of poverty is that the budget for food as a basic necessity has changed over time and is now facing stiff competition from other, unavoidable expenses which are not included in Orshansky's estimate. It has been found that families now spend less than one-fifth of their income on food⁴. Merely multiplying the threshold by a factor of five (in keeping with the Orshansky method) would change poverty thresholds dramatically. Further, by basing poverty thresholds on a single item of household expenditure we ignore a variety of cost of living differences among geographic areas. A 1995 survey by Citro and Michael showed that American people believed that they needed 1.4 times the poverty measure for that year to meet their

⁴ Economic Policy Institute – Poverty and Family Budgets Issue Guide FAQ, August 2001.
http://www.epinet.org/content.cfm/issueguides_poverty_povertyfaq

household needs, and thus the discrepancy has been exacerbated because official poverty measures have failed to keep up with public opinion on what families need to get by on. Arguably, the inclusion of other necessary items in this computation creates issues of variability similar to those encountered in living wage computations, but failure to do so is costly in that it greatly distorts the picture of poverty existing in the United States.

Basic needs budgets were developed as an alternative approach around this problem. Bergmann and Renwick (1993) were among the first to recalculate poverty rates for single-parent families using basic needs budgets. These budgets demonstrate costs faced by low-income households striving to achieve a frugal yet acceptable standard of living. Many organizations (particularly those promoting living wage ordinances, e.g. ACORN) have risen to the task of computing the cost of basic needs at a local level, and the impact of such endeavors has been crucial in influencing a variety of public policy decisions. To my knowledge, there has been no comprehensive calculation of family budgets, and thereby living wages, across different household demographic categories for the United States as a whole. Thus, the contribution of this paper stretches over a number of different spheres – in determining the need for welfare reform as evaluated against a realistic poverty line, pushing for appropriate increments to state minimum wages, and facilitating the adoption of living wage-floors – in addition to the empirical analysis of household expenditure on basic necessities that follows in Part II of this paper.

To judge the effects of using an alternative measure of poverty much work has also been done pitting these budgets against official price indices. Researchers have found that the cost of goods included in a basic needs budget has grown much faster than the increase in CPI against which official poverty measures are adjusted each year (Renwick 1998).

Thus, the majority of low income families who are grazing the federal poverty line are those households which rely on minimum wages brought in by one or two principal earners and cannot afford even basic standards of living at that income. Yet by our flawed federal measures of poverty, these people are not considered to constitute the “poor” of society. The combined incongruity of these two statutory measures further backs the origination of living wages, which are calculated for specific geographic areas and are oftentimes varied for household demographics (e.g. different family sizes and compositions).

One point to note alongside this discussion is that despite multiple motivations to use basic needs budgets to set an alternative measure of poverty, the adoption of a new baseline is unlikely for the time being. Computation and consensus on any new measure is likely to be a long and complicated process and would have to gain political consent before it can be enforced. The Census Bureau does not hold free reign in this matter and is subject to approval from the Office of Management and Budget. In all possibility, presidential administrations will be reluctant to change the manner in which poverty is measured since the revision will most certainly change the number of people considered to be poor in this country.

3. Feminist perspectives/gender effects on components of household expenditure

In the United States, poverty can be construed as a feminist issue. Over the course of the 1945 hearings of the Women’s Bureau (under the Equal Pay Act), Senator Morse noted that employers were keen to adopt the “equal pay for equal work” slogan during the war, when labor was scarce and women were encouraged to enter the labor market to overcome the shortage of workers in the labor force⁵. When labor markets cleared after

⁵ as noted by Figart, et al. (2001).

World War II, this was no longer the case and discriminatory practices re-emerged. The argument against equal wages was based on alleged disparity in productivity among the genders, rather than any concrete differences in needs and standards of living. Therefore in looking at poverty from a wage angle, we find significant amount of evidence in academic literature that demonstrates the existence of a growing pay-gap between the genders, despite continued programs designed to promote equal-employment opportunities in the market (Kahn and Blau 2000, Dey and Hill 2007). Recall the statistical profile of poverty in the United States in 2006 that was presented in the introductory paragraph of this paper. There were 4.1 million female headed households with no husband present living in poverty during that time.⁶ Given the already dismal methods used to approximate poverty thresholds, this number is likely to be much higher when comparing household income to the cost of basic needs. Consequently, it is a matter of great interest to explore gender disparity in expenditure on basic needs and to further examine how these differences may have implications for those families who are “at-risk” of falling below the poverty line when it is defined in an alternative, more realistic manner.

There are ample reasons to expect gender differences in household expenditure. Hoddinott and Haddad (1995) found that the percentage of household income contributed by a female member of families in Cote d’Ivoire significantly affects budget share for a number of goods in the household basket. In Sri Lanka, an increase in women’s earnings resulted in higher expenditure on certain types of foodstuff (Senaur, et al. 1986). An experiment conducted in the United Kingdom has demonstrated that expenditure on various goods differs according to whether child care payments were made to a male or female head of the household (Lundberg, et al. 1997). Developing on Bergmann and Renwick’s

⁶ U.S Census Bureau News – Press Release from August 28th 2007. See pg. 2, footnote 2.

idea of using basic necessities to determine living wages, this paper seeks to explore gender differences in expenditure on items included in the basic needs budget. It is hypothesized that variations in expenditure will demonstrate gender-specific preferences on basic necessities, which then suggests that the notion of a “fair” wage has different outcomes by gender.

Economic literature proposes few tools aimed at lifting working women out of a vicious cycle of low wages and unrecognized poverty. McKay (2001) argues that by including a gender component into aspects of welfare we create the potential for gender neutral citizenship rights – a first step at attacking the aforementioned pay gap. One of her suggestions include using measures such as implementing a citizen’s basic income (CBI) which would provide regular and equal income, but is not tied to the “patriarchal” outcomes of labor market participation. Orazem and Mattila (1990) and Hartmann and Aaronson (1994) have found reforms based on the theory of comparable worth to have had significant success at reducing the gender-gap with respect to remuneration for labor. Bergmann and Renwick (1993) demonstrate that official poverty measures are ill-suited to dealing with poor families with only one parent present, stressing that these measures under-represent single mothers who should be eligible for welfare considerations. Seguino (2002) responds by suggesting that living wages calculated on the basis of alternate measures of poverty have the potential to reduce gender inequality via their effect on gender wage differentials. The scope of this paper (and further work that needs to be done) lies in filling this gap between theory and implementation.

4. Data and Methods of Calculation

Data needed for this study is two-fold. On one hand, we require estimates of household expenditure on basic necessities so as to be able to examine any possible gender effects on the consumption of such goods. In addition to exploring such effects, this data can be used to demonstrate variations in cost of living based on a variety of demographic factors. This is done by computing expenditures for the very basic of necessities for various family sizes, types, locations and by gender (for revealed preferences), based on available data. The second part of this project aims at calculating basic needs budgets by state, following on the method developed by Bergmann and Renwick (1993) and that which is currently in use by a host of local organizations as part of their efforts towards the living wage campaign in the United States. Care is taken to include all necessities while keeping costs to a minimum so as to be prudent in terms of their implications for policy and reform.

Expenditure Data -

The data for the first part of this study comes from the Consumer Expenditure Survey (CES) 2006, conducted by the U.S Census Bureau and published by the U.S Bureau of Labor Statistics. This program, which was started in 1980 and operates on an ongoing basis in 105 areas of the United States, is aimed at collecting detailed information on the expenses faced by American households, thereby lending insight into the spending habits of American consumers. It is stated that the data available accounts for between 80 to 95 percent of total expenditures.⁷ The 2006 CES yields 7,500 observations of the total non-institutionalized population, with significant information on income and demographic characteristics of the sampled consumer units, in addition to household expenditure on an

⁷ CES 2006 notes - Appendix A: Description of the Consumer Expenditure Survey
<http://www.bls.gov/cex/anthology05/csxappendix.pdf>

exhaustive group of goods and services. This data is indeed far-reaching in the scope it lends to economic analysis of household budgets and is most popularly used in updating the U.S Consumer Price Index (CPI) inflation estimates on a standard basket of goods.

In the CES, a consumer unit is defined as those members of a household who are related by some legal arrangement, financially independent single persons living alone or sharing a household with others, or two or more persons cohabiting such that they share responsibility for at least two-thirds of all major household expenditures. Consumer units are sampled so as to be representative of the general composition of the U.S population. Once the total number of households to be surveyed is set in accordance with budget constraints, the program allocates sample households to specific geographic areas in proportion to their share of the U.S population. Data is compiled from two separate survey components: an Interview Survey, designed to record relatively larger expenditures as well as those expenses that occur on a regular basis; and a Diary Survey, fashioned so as to capture smaller, more frequent expenses incurred by the consumer unit. The Interview survey is conducted every three months with sampled consumer units being interviewed for five consecutive quarters with reference to the calendar year. This component asks for dollar amounts for all goods and services purchased during the reporting period, irrespective of whether payment has been made towards those expenses or not. The amounts reported include all sales and excise taxes but suppresses any expenditure for which persons have been reimbursed. The Diary Survey is administered to the same 7,500 households for two consecutive one-week periods so as to obtain a record of all actual expenditures made by the household in a given week. Any expenses incurred away from home overnight or longer are excluded.

All expenditure data from the CES used in this study are categorical averages, and this must be accounted for in interpreting data on household expenditures. For items in the basket which are purchased less frequently, the reported average may be lesser than the average for all those consumer units that purchased the item. Furthermore, as with any data collected using sample surveys, users need to be wary of two types of errors. Since the observations come from a representative sample rather than the entire population, we can expect systematic sampling errors to arise. Nevertheless, the program's method of allocation by population share allows us to make conclusions that accurately reflect the entire population. Further, discrepancies in reported data arising either from non-response (for any number of reasons), measurement error in faulty recording, or human processing, will all result in non-sampling errors.

A major limitation of the CES data for the purposes of this project has been the unavailability of microdata at the individual level for survey respondents. Aggregate data available on the BLS website can only be generated according to certain set parameters. This hinders our ability to carry out any empirical evaluation of gender differences as per the stated objective. Ideally, the data could be cross-tabulated so as to obtain expenditures on household items by gender of the household head (or reference person for the household) for different regions and family types. Thus, the remainder of this paper which utilizes aggregate CES data is used to present evidence of varying expenditures by gender, region, family composition and household size, separately.

Data used in calculating region specific basic needs budgets -

The basket of necessities used in the calculation of a basic needs budget often varies according to the organization which sets out to calculate it. Since this paper strives to

calculate wages and thresholds that are driven by needs rather than follow any political agenda, data for this endeavor is collected from a variety of different sources⁸. Family budgets typically include costs for items that form a major part of household expenditures. In computing basic needs, special care is taken to include necessities (e.g. food, rent, etc.) and exclude unnecessary spending (e.g. consumption of cigarettes, alcohol, etc.). Wherever local figures are available, costs are included specific to the area of interest. This budget portrays a more representative reflection of income constraints when compared to that which is used to determine poverty thresholds because it includes essential items of household spending such as child care and transportation, in addition to commonly touted basic necessities. There has been some debate on whether the cost of education for family members should be included in the budget, but most labor reform and welfare organizations have chosen to exclude tuitions, study materials, etc. on the basis that education is an investment rather than a necessary cost. Thus, it is not included in the calculations used in this study.

Basic needs budgets are typically calculated for the median family type (two parents and two children) and then adjusted for other family types. Since small differences in this adjustment can lead to significantly different thresholds, family budgets are usually computed separately for a few different types of family composition. With the data available at present, it is beyond the scope of this paper to adjust for every conceivable configuration of family size and type, and calculations carried out for this study are based on costs incurred for a four member family as described above.

The data sources and methodology used for individual components of the basic needs budget are as follows:

⁸ See also list of data sources under Appendix of Data.

1. *Food*: There is hardly any data available on the cost of using local sources. However, this portion of the budget varies very little by state/city and can be computed on a national scale. The U.S Department of Agriculture puts the cost of a thrifty, yet well-balanced, food plan at \$518.10 per month (at 2006 price levels) for a family of four consisting of an adult couple, each between 20-50 years of age, and two children. It is further assumed that one child is between the ages of 6-8 and the other is between 9-11 years of age. This figure is pre-adjusted according to the Consumer Price Index for prices of food items included in the food plan.
2. *Housing*: Rent paid for housing a family of four varies widely depending on the area in which the family is placed. It is reasonable to expect that low income families living in Boston, Massachusetts will allocate a larger part of their meager household income to housing costs than families situated in Montpelier, Vermont, for instance. The Department of Housing and Urban Development administers a Fair Market Rent Survey which results in a comprehensive spreadsheet of average rents by state, sub-classified according to county and/or metropolitan statistical area. It is assumed that a family of four requires a two-bedroom unit, at the very least.
3. *Child Care*: This is an important variable to be included as the cost of raising children has been exacerbated by the income gap between the minimum wage and one that allows parents to provide for the welfare of their children. Statewide averages for child care costs are published by the Children's Defense Fund. The reported figure is measured to be the average annual cost of placing a four-year old in a child care center, as calculated for May 2006. While it is likely that the cost of child care varies to some degree between rural and urban areas within each state, data is only available at the aggregate state level. Some

evidence for this difference can be seen from the results – the cost of child care in urban areas is almost always higher than for rural ones.

4. *Health Care:* The cost of health care in the United States is among the highest in the world and growing at a rapid pace. To exclude this item from the budget would preclude something that is both necessary and forms a major proportion of household spending. A point to note with regard to this item of household expenditure is that many low-income families are eligible for Medicaid assistance with health care costs. Nevertheless, out-of-pocket expenses for individuals and families tend to be fairly significant – up to 2.4% of poor households' income in 2002 - appearing in the form of co-payments, deductibles, coinsurance and medical services that are not covered by Medicaid (Ku and Broaddus 2005). The U.S Department of Health and Human Services provides the mean medical out-of-pocket expense per person for 29 of the 50 states as part of the results obtained from the Medical Expenditure Panel Survey 2004. This data is then adjusted using the CPI to reflect 2006 prices. Where data was not available for any given state, the national average expenditure on medical needs was used in computation.
5. *Transportation:* This is a critical component of the basic needs budget as the majority of miles driven in the United States tend to be to and from the workplace. Census data results from the National Household Travel Survey (2001, conducted every five years) gives us some indication of the average number of miles driven according to population size. EPI analysis of national surveys has published figures showing that approximately 31% of all miles driven are for social purposes, which much be excluded from our calculations. To obtain the cost of transportation, IRS published cost-per-mile is used. For 2006, the

standard mileage rate for a household vehicle was \$0.445 per mile for business miles driven.⁹

6. *Miscellaneous Necessities*: Data from the Consumer Expenditure Survey 2006 is used for this component. Looking at expenditures, it was determined that four member households set aside approximately 12.8% of the amount spent on food and housing combined to spend on personal goods and services and other miscellaneous products. This proportion was computed after excluding any spending on entertainment, leisure and other such costs, and represents a frugal basket of basic necessities, including apparel, personal care products and household cleaning supplies.

All of the above data is obtained in annual figures. It is assumed that costs are distributed equally across the calendar year, and monthly figures (annual costs ÷ 12) are used in all calculations of basic needs budgets that follow. The methodology used in calculating basic-needs budgets for each state is relatively straightforward. Data from all of the above sources is classified by state capital and aggregated to obtain the monthly cost of living expenses on basic necessities for each state. This figure is then divided by the total number of hours worked over the same time frame – here, taken to be 176 hours, assuming 40 hours of paid work per week – and that produces the requisite living wage per hour.

5. Results

Table 1.A shows that on average, single female consumer units spend 3.65% less on basic necessities per month than households consisting of a single male. When looking at the population with total incomes between \$10,000 and \$15,000, single female households incur 1.68% more in expenditures on basic necessities than single male households (Table

⁹ IRS Press Release, November 2005.

1.B). Looking at the budget created for all single males versus that of all single females, it appears that females tend to spend more on housing, clothing and apparel, personal care products and health care where men spend more on food and transportation. These trends are as can be expected. Men are thought to be biologically in need of more food and nutrients for survival and satisfaction than what is needed by women. However, this result runs somewhat contradictory to the results of Doss (2003) who found that when women contribute a greater share of household income (here 100%), a greater proportion of income is devoted to food expenditures. This study also found that expenditures on clothing and medical care remained unaffected by women's relative contribution to household income, although it appears here that women demonstrate some preference for these goods when compared to their male counterparts.

The federal poverty threshold for a single person family in 2006 stood at \$10,294. In order to focus on the population that is at or near federal poverty levels, basic needs budgets are created for singles with income before tax ranging from \$10,000 to \$15,000. It is found that the above-mentioned trends in expenditure follow through even when restricting the sample to only those singles with incomes skimming the federal poverty line for 2006 (Table 1.B). For example, single males, with incomes at or near federal poverty levels, incur 24.7% higher expenditure on food, while single females in the same category incur 4.99% higher expenses on housing and 80% higher expenses on health care, relative to the opposite sex.

The gender disparity in expenditure on health care described above is particularly interesting to the larger picture of poverty as it is measured for the purposes of this paper. In examining gender effects on family budgets for basic necessities as a tool to improving

gender inequality for those at-risk of falling below the poverty line, there arises a strong critique against using expenditure in this manner. Economists will argue (as economists do) that the budgets computed in Tables 1.A and 1.B (and subsequently Tables 2.A – 3.B) reflect differentials in gender *choices* as opposed to in gender-dictated *needs*, and this is certainly a possibility when using survey data such as that of the CES. The trend seen here on health care expenditure poses some counter-argument to this claim. It is reasonable to suppose that in a country like the United States, where any publicly available medical resources and health care is well-regulated and of a decent standard in quality, low-income households are only spending what they absolutely need on health care. There is then, perhaps, the gist of an argument supporting gender variations in basic needs.

Tables 2.A and 2.B demonstrate how expenditures for components of the basic needs bundle varies by size of consumer unit. As can be expected, larger households incur greater expenses on food, housing, and other basic necessities. Expenditure on each item shows evidence of diminishing marginal costs per additional member of the household. For example, there is a 90.64% increase in expenditure on food moving from single person households to two member households, and an 18.52% increase moving from two to three people households. Similar trends are seen for expenditure on other categories and are consistent for both populations of interest. Table 3.A provides evidence of regional variations in expenditure on basic necessities. There is a 36.77% difference in average expenditure on housing between households in the West and households in the South. Expenditures on clothing, personal care and health care do not appear to vary significantly by region of residence, but households in the West appear to spend disproportionately more on transportation than any of the other regions. These trends are not strong when looking at

the low-income population group (Table 3.B) but such households in the West tend to incur greater expenses than the other three regions, mandating a wage (based on expenditure) of \$8.80 per hour¹⁰ – 13.99% higher than that required in the South.

Table 4 presents a comprehensive list of living wages for each state, allowing costs from the state capital to proxy for the entire state. As detailed in Section 5, costs for items in the basket are from 2006. Thus, in 2006, Massachusetts was found to be the most expensive state for basic necessities, with disproportionately high housing and health care costs. Accordingly, a worker would need to be paid \$18.69 per hour to single-handedly support a family of four from falling below a decent standard of living in Boston, Massachusetts. At the other end of the spectrum, the state of Missouri had relatively low housing costs and therefore, a worker would only need to be paid \$10.90 per hour to meet an acceptable standard of living in Jefferson City, Missouri. As can be expected, all living wage levels calculated here exceed corresponding state minimum wage rates in existence, or being proposed for the coming years.

6. Data Limitations and A Case for Further Empirical Analysis

The results presented above allow us to compare trends in household spending between men and women, different family sizes and between those who live in the different regions of the United States. However, they do not reveal if such influences are significant in their effects on various components of expenditure. Furthermore, nothing can be said about the relative magnitude of any one demographic characteristic on any item in the basket of basic necessities. Lastly, in order to fully understand the factors that place one group of people more “at-risk” of falling into poverty over another, it is pertinent to model

¹⁰ Note: all living wages calculated in Tables 1-3 are based on what it costs for a single earner to support a family.

household expenditures against the demographic profile of each family unit for which data is collected. Thus, there is a clear need for further empirical analysis to understand how the influence of demographic factors places a family at risk of falling below cost-of-living based poverty standards.

The CES data set poses many hindrances in this regard. As can be seen from Tables 1-3, results can only be tabulated according to set parameters, and cross-tabulation with respect to two or more variables of interest is not possible with the format of data currently available from the Bureau of Labor Standards. In order to model at-risk families, we must have access to microdata. The Inter-University Consortium for Political and Social Research (ICPSR) operated by the University of Michigan, Ann Arbor, provides access to some variables compiled out of the CES 2003¹¹ microdata. Similarly, the National Bureau of Economic Research provides a compilation of family-level extracts from the CES 2003. These sources provide greater flexibility with CES data but they are not without limitations. The CES does not collect information on child care expenditures and there are few proxies for child care among other items of household expenditure. Furthermore, the quality of such CES microdata is not optimal for our purposes. The ICPSR collection is limited to few expenditure variables and needs to be aggregated in order to obtain total expenditure on any of the items in our basic needs bundle. In some cases expenditure on the same good(s) has been collected from the Interview Survey as well as from the Diary Survey leading to overestimated aggregate expenditures.

Part II of this project rests on analytical foundations developed here in Part I. Using the results and trends presented in Tables 1-4 (and as described in Section 5 above), we proceed with an alternate data source and develop model specifications to examine

¹¹ Latest available compiled results are for the year 2003.

demographic influences on low-income families in greater detail. Section 2 below provides the framework for models developed later in the paper and Section 3 introduces the PSID data set which enables such analysis. The work done with CES data has been crucial to formulating the necessary model specifications and it is hoped that the results stemming from such an analysis of “at-risk” families will be of contributory interest vis-à-vis the economic literature presented earlier in this paper.

PART II

1. Research Questions

The first part of this project examined the need for an overhaul of the current method of estimating poverty in the United States by utilizing the following tools – living wages, basic needs budgets and household cost of livelihood. Using CES household data that was evaluated against current measures of poverty, a profile of the poor living in the United States in 2006 was generated. The results presented in Section 5 of Part I compare household spending across different demographic criteria and certain trends were noted. Furthermore, it was found that a significant majority of households living below the federal poverty line were those in which one or more family members were employed full time at the minimum wage level. To demonstrate this phenomenon, basic needs budgets were created based on 2006-prices for each state and correspondingly, the requisite living wage was also computed. Perhaps unsurprisingly, the living wage per hour needed to meet merely the basic necessities - food, clothing, shelter, transportation, child care and health care – was significantly above the state minimum wage in each case. The basic-needs budget method is then used to define a new measure of poverty, varied by state as was calculated in Table 4. To this end, a consumer unit was defined to be “at-risk” if the family’s total income is less than the cost of this computed bundle of goods in their respective region of residence.

The continuation of this project hinges on this revaluated measure of poverty and a thorough understanding of the factors that influence different categories of household spending. Do demographic factors play a part in whether a family falls below the poverty line? It was found that 53% of households that fell below the poverty line in 2006 were

headed by a single mother¹². It is then plausible to ask - are there any gender differences in household spending that make female-headed families more likely to spend more on one of the basic necessities over another? Moreover, do other factors besides the gender of the household head - such as size of the family unit, age and ethnicity of the household head and region of residence – affect the choices made with regard to basic needs expenditure among low-income families in the United States?

In keeping with the methodology of Plowman, et al. (1996) this study has thus far proposed ‘reasonable living’ goods criteria for living wage determination and used household expenditure survey information to suggest amounts that provide for a decent standard of living for employed persons and their families in the United States. Consequently, the section of the population on which this study focuses are those families which do not fall under the federally defined poverty line, but are struggling to make ends meet – a facet which should be captured by the expenditure-based statewide poverty measures calculated in Table 4. Now, does expenditure on any one commodity in the bundle pose a higher threat at putting a family at risk, when compared to others? In other words, do rising costs or emergency expenses incurred on any one category of basic necessities increase the probability of a family falling below this new poverty line? These questions are especially pertinent during this time when minimum wage legislation is under review and has caught the attention of policy-makers in the United States. If we are able to illuminate those ‘reasonable need’ categories of expenditure which put families at increased risk, it can act as a stepping stone for re-estimating the Orshansky criteria.

¹² U.S Census Bureau News – Press Release from August 28th 2007. See pg. 2, footnote 2.

2. Analytical Framework

Empirical analysis needed to examine demographic differences in expenditure is relatively straightforward. Tabulated calculations such as those contained in Tables 1-3 reveal demographic differences in household expenditure, and the significance of explained effects of gender, ethnicity, geographic region and household size can be tested using an ordinary least squares model. Expenditure for any of the basic components of household expenditure can be obtained from survey results, and this should then form the dependent variable in our model. If the main explanatory variable of interest is gender, then the effect of gender on household expenditure is best reflected by looking at the sex of the household head. The CES survey is completed by a 'reference person' relative to whom the household is defined. This person is likely to be the household head and most influential to expenditure decisions made by the household. Thus, we define a gender dummy which is set to be 0 if the household head is female and coded as 1 if the head is male. This can then be regressed on a complete set of demographic controls. This model is run separately for each item of expenditure included in the calculation of basic needs budgets – namely, expenditure on food, housing, child care, health care, transportation and miscellaneous necessities.

Since there appears to be significant variation in household expenditure by region (Tables 3.A and 3.B) we must include categorical dummy variables to capture regional effects on household expenditure. Four regions are defined as per Census classifications – Midwest, Northeast, South and West. Any of these may be used as the reference category, and the coefficients of other region variables will be interpreted relative to this reference category. Tables 2.A and 2.B demonstrate that household expenditure on necessities also

varies by size of the consumer unit, and thus we must account for the effect of these factors on household expenditure so as to control for any omitted variable bias in the model. Typically, the calculation of basic needs budgets is adjusted according to both household size and composition variables, after having been calculated for a mean family size of four, consisting of two parents and two children¹³. It is not possible to control for family size by including variables for both factors as this would result in multicollinearity - family composition is highly correlated with the number of members in the consumer unit. If both variables were to be included¹⁴, the model estimated by OLS would produce high and erratic point estimates for the coefficients of the correlated variables, large standard errors and unsatisfactorily low t-statistics. Note that the other coefficients would remain largely unaffected (unbiased) and standard errors would remain valid.

The next stage of analysis seeks to assess the impact of the findings contained above on that segment of the population which is considered to be “at-risk” of falling below the poverty line as it is defined using a basic needs model. The calculations presented in Table 4 reflect the cost of a bundle of basic necessities in different state capitals. This data is used as a new measure of poverty - defined so as to ensure a basic standard of living - varied by state. A consumer unit is considered to be “at-risk” if the unit’s total household income after taxes is less than the cost of this bundle in the respective state of residence. Thus, we can create a variable that is coded as 1 if the unit of observation is “at-risk” and 0 otherwise, to be used as the dependent variable of interest.

The use of a binary variable implies the use of a linear probability model (e.g. logit or

¹³ Methodology used in the calculation of basic needs budgets by many organizations (MECEP, EPI, etc.)

¹⁴ Note: In the models that follow, it was decided to control for family size rather than number of children. After experimenting with both variables in separate regressions, family size was found to be the better predictor of household expenditure.

probit). The objective here is to model a specification which, if interpreted correctly, will identify how increases in expenditure on any of the items included in the basic needs budget affects the probability of falling below the poverty line – i.e. as dependent variable values change from 0 to 1. In addition, this specification can be used to assess if there is a particular “type” of family, as profiled by the household head, which is more susceptible to poverty with rising expenditures in any of the above categories. This analysis can be carried out in two ways – either by interacting variables of expenditure with characteristic variables or by fitting the model separately for different categories of households in the sample, and together these models will serve to elaborate upon the results obtained in Part I of this study.

3. The PSID Data

Following on the heels of Sullivan and Meyer (2006), who argue that consumption data is preferred for measuring changes in the situation of those families living at or near poverty levels, we seek microdata on household expenditures and characteristics, similar to that collected by the CES, so as to be able to build on the framework described in the previous section. Owing to the limitations discussed in Section 6 of Part I, and so as to be able to undertake a more thorough evaluation of the various influences on household expenditure, it was decided to turn away from the Consumer Expenditure Survey and use data from the Panel Study of Income Dynamics (PSID). The PSID is conducted at the Institute for Social Research at the University of Michigan and is primarily funded by the National Science Foundation, alongside other U.S research agencies. It is a longitudinal survey which was first conducted in 1968 and is now repeated biennially. It is usually administered between the months of March and November. Over time, from the period of

its origination, the PSID has collected information on over 65,000 individuals and their families and therefore provides a representative sample of American households. Of particular interest are variables that collect expenditure and income data similar to that found in the CES, and this data is available for a sizeable number of observations/respondents. The latest wave for which PSID data is published is for the year 2005. The survey is conducted over the telephone, with computer-assisted interviewing techniques. Information is collected on a broad spectrum of topics, with a particular focus on dynamic aspects of economic and demographic behavior. The PSID has had great success in following young adults and maintaining contact with the same families over time (96%-98%), thus procuring a sample size of 8002 observations in 2005. These two features make the PSID the data set of choice in examining demographic effects on family expenditures.

PSID data consists of three independent national samples – a cross sectional sample drawn by the Survey Research Center (SRC) at the University of Michigan, a sample of low-income families compiled from the Survey of Economic Opportunity (SEO) conducted by the Census Bureau and a refresher sample of post-1968 immigrant families and their adult families. The SRC sample is an equal probability sample of households from the 48 contiguous states. The SEO sample was selected from low-income families with heads under the age of sixty, confined to metropolitan areas in the northern region of the country and non-metropolitan areas in the south. This sample is particularly relevant to the study being conducted here. The third part of the sample, consisting of immigrant families, was introduced in 1997 so as to make the data more representative of the overall population of the United States. One aspect of using survey data is the variation in data that arises out of

such sampling. If the survey was administered to different households, the variation of the data about the mean would differ and this represents the diversity of households present in the United States at the time. The inclusion of descriptive variables – like household size – in the models that follow allow us to capture this diversity. Some variation also arises from the timing of the survey as the data might have been accordingly different. However, most survey questions regarding expenditures ask for a weekly or monthly estimate, rather than expenses incurred over any specific week. Less variation of this type could only have been achieved with constant diary-type data collection occurring throughout the year of interest, and such data is, of course, unavailable.

This paper is primarily concerned with the household head's demographic characteristics, acting a proxy for the family as a whole. This is because the household head is assumed to be responsible for all major spending and expenditure decisions undertaken by the household. PSID data defines a family unit as a group of people living together as a family. These persons are generally related by blood, marriage or adoption, although unrelated persons are included in the family if they are found to be living together permanently and share both income and expenses with the family unit. Within this definition, the survey collects the most detailed demographic information regarding the head of the household, substantial amount of detail on the "wife" or partner of the household head and some level of detail for other family members. Each family unit has only one current household head and was originally defined to be the husband in a husband-wife pair (in accordance with Census Bureau definitions). Between the different waves of the PSID, the person designated as head can have changed depending on changes to family structure. When choosing a new household head, the person has to be at least 16

years of age and must be financially responsible for the family unit as a whole. All questions collecting information regarding household expenditures used in this study were directed to the household head defined in such a manner.

The survey collects extensive data on household expenditure in various categories which makes it excellent for the purposes of this study. The categories of interest include food, housing or rent, child care, health care, transportation and other miscellaneous necessities like clothing and utilities. These were chosen based on the results and trends found in Part I. Data for the first four goods is straightforward as the PSID asks specific questions regarding the cost of food, rent, etc. In most cases (food, rent, transportation and utilities) the household head reported either weekly or monthly spending amounts and this data was standardized into annual amounts assuming equal consumption over the period of a year. Data for child care, health care and clothing was collected as annual estimates of what was spent on each for the preceding year. The variable used to capture transportation expenditures was composed out of five separate data questions asking about monthly expenses on each of the following: car repair, gasoline, parking, bus/train fares, cab fares and other transportation costs. Expenditure on miscellaneous necessities was defined as the total spent on clothing and utilities combined. All data was cleaned to account for missing values and unreported, unknown, or miscoded quantities for any of the categories in use.

4. Profile of Households – Data Description

The set of demographic characteristics used in this study include gender, age and ethnicity of the household head, number of members in the family unit (family size), region of residence and total household income. Table 5 details summary statistics for all variables taken from the 2005 wave of the PSID dataset and used in the models that follow. 69.9% of

households (5,591 observations) sampled were headed by a male, while the remaining 30.1% were female-headed households (2,408 observations). The mean age of the head of the family falls at approximately 45 years of age, with the oldest head of household at 99 years and the youngest a mere 16 years of age. Partners of the household head were typically younger – with a mean age of approximately 43 years. Ethnically, 61.48% of the sampled population considers themselves “white” (4,882 observations) while 33.60% classified themselves as ethnically “black” (2,668 observations). Small proportions of the sample also aligned themselves with other ethnicities – Native American or Alaskan, Pacific Islander or Hawaiian, Asian, Hispanic and other. These were together classified as “other” to preserve adequate sample proportion. 4.92% of the population falls under this category as it is so defined (391 observations). Family size ranges from one person households to 13 member families, with the mean at approximately 3 persons per household. This sample includes 1,831 single-person households (22.89%) and 2,410 two-person families (30.13%). These households had anywhere between none and 8 children present, with the mean number of children at approximately one child per family. Geographically, the sample is representative of all states but the data collected with regard to state of residence is recoded here into region categories – Northeast, Midwest, South and West – as defined by the Census Bureau¹⁵. The southern states are best represented in this sample with 43.03%, followed by 24.97% from the Midwest. 13.71% of households reside in the Northeast and 18.29% in the western states. The PSID survey also collects information on household income. This variable is the sum of information collected from seven different survey questions which ask about all sources of transfer, social security and taxable income available to both the head of the household and his/her cohabiting partner.

¹⁵ See Appendix for classification of states into their respective regions.

The sample is restricted between households with no income flows whatsoever to households with income up to \$5,500,000¹⁶. In total, this yields 7999 observations for analysis. Mean household income stood at \$62,204.73. In 2004, the federal poverty threshold for a family of three was \$15,063¹⁷ and 16.21% of sampled households fell below this poverty line. Mean household income for families living below the federal poverty line was \$9,150.80. These figures lend a preliminary glimpse into what can be expected when looking at households which fall at risk of not being able to meet their daily costs of living on basic necessities.

Moving to survey questions concerned with household spending, the mean reported cost of food at home per week was \$93.51 and the mean rent per month for families in the PSID sample was \$188.65. It was found that 59.78% of the sample owned their own home while 34.99% rented their living space. Of this population, 11.89% found their homes already furnished and 31.52% found that their rent includes the cost of heating the house. Mean annual child care expenses for 2003 stood at \$412.10 and on average, households spent \$12,265.83 on medical care over the previous two years. One family even paid up to \$1,000,000 for medical care over two years. On average, families spent \$296.20 per month on various transportation costs and about \$1401.92 on clothing over the course of the previous year. Summary statistics of annualized expenditures for all these goods are also provided in Table 5. Table 6 provides the same statistics, restricted to those households deemed to be living below the 2004 federal poverty line.

Since this study is also concerned with re-defining poverty levels as computed in Part I of this paper, total household income was pitted against the corresponding annual

¹⁶ Note: This range was obtained after trimming abnormally high outliers which were thought to be coding errors, but maintained at an upper bound of \$5.5million so as to be representative of a wide range of household income.

¹⁷ Source: U.S Census Bureau Poverty Thresholds 2004

basic needs budget calculated for the state in which the household resides. The values in Table 4 were deflated using the CPI-U to reflect the cost of goods in 2004 as the income data available from the PSID is for that year. Using this measure, we are able to see how many households were “at-risk” of being unable to meet the basic necessities needed by the family. Adjusted state poverty levels (as derived from basic needs budgets) ranged from \$21,564.96 in Missouri to \$36,983.92 in Massachusetts, with the mean value at \$26,561.61. It was found that 29.33% of sampled households (2324 observations) were at risk of falling below the poverty measure calculated for their state of residence. Recall that the federal poverty threshold for 2004 stood at \$15,067 for a family of three and \$19,307 for a family of four¹⁸. This evidences that federal poverty measures understate the number of households who are struggling to make ends meet (even in expenses towards the most basic of necessities) and puts forward a strong case for reevaluating the current method of determining poverty thresholds.

5. Model Specification

Armed with the above data and variables, it is now possible to proceed with the empirical analysis discussed in Section 2. To examine the influence of demographic characteristics on each category of household expenditure on basic goods, a simple model is estimated – where expenditure on each item is regressed on total household income and a full set of demographic control variables as detailed below. Care is taken to include all demographic characteristics that arise from our previously discussed poverty profile in the United States, so as to control for any omitted variable bias when estimating the model. Note that the poverty profile for the United States in 2005 follows the same trends as those

¹⁸ See Footnote 17.

discussed for 2006 and hence, the same demographic characteristics remain our variables of interest.

The influence of gender on basic necessities is captured by a dummy variable indicating if the household head is male or female. Based on the literature discussed in Section 2 of Part I, we expect the coefficient of this variable to be negative for food and miscellaneous necessities and positive for housing, child care and transportation. As discussed earlier, there is some debate regarding the influence of gender on health care expenses. The variable 'Age' refers to the age of the household head and it is expected that expenditure on each category, except for health care, decreases with age. A set of region controls are included as categorical variables referring to the family's region of residence. These are classified as Northeast, Midwest, South and West. In this analysis (and all that follow), the reference category is set as those families residing in the Northeast (Region1) and is therefore omitted from the model. It is commonly thought that the northeastern and western parts of the country face similar prices and expenditure patterns and goods are typically more expensive in these regions compared to in the Midwest (see Table 3.B). Similarly included is a set of categorical dummies controlling for ethnicity of the household head. These are classified as "white", "black" or "other", and "white" (Ethnicity1) is the omitted reference category in this case. There is no clear trend (or suggestive literature) regarding the influence of ethnicity on various categories of expenditure. One might expect non-white ethnicities to face lower expenditures on food, housing and health care because on average, such families appear to earn lower household incomes and may thereby have greater numbers eligible for participation in various welfare programs. However, no such trends have been documented. A variable for family size is included so as to capture the

number of members partaking of total expenditures of the family unit and we expect the coefficient on this variable to be positive. Finally, total household income is expected to be an important determinant of household expenditure and appears in model as a regressor. Undoubtedly, an increase in household income leads to increased expenditures in all categories. All these variables are defined as detailed in the previous section. Thus, we have the following model as a system of six equations:

$$\begin{aligned} \text{Expenditure on item } x_i = & \beta_1 + \beta_2 * \text{Gender}_i + \beta_3 * \text{Age}_i + \beta_4 * \text{Region2}_i + \beta_5 * \text{Region3}_i + \\ & \beta_6 * \text{Region4}_i + \beta_7 * \text{Ethnicity2}_i + \beta_8 * \text{Ethnicity3}_i + \\ & \beta_9 * \text{FamilySize}_i + \beta_{10} * \text{Income}_i + \epsilon_{x_i} \end{aligned}$$

Each category of household expenditure on basic necessities is regressed on the same set of variables as described above. One point to note here is that these expenditures occur simultaneously since each good is essential to maintaining livelihood. Household expenditure decisions are linked because the family (or deciding person in the family) must choose at least enough of each good needed for survival and all these expenses are collectively constrained by the total income available to the household. Thus, the family's expenditure on food depends on exactly the same factors as its expenditure on rent or other necessities. Considering the system of equations as whole, it is expected that each error term (ϵ_{x_i}) is related to each of the other error terms in every equation. These terms will be positively or negatively correlated depending on the correlation between the specific goods considered in this study – whether they complement or supplement each other, given limited resources. This correlation between error terms in simultaneous equations may give rise to some simultaneous equation bias, and so to circumvent this issue the system is

estimated using the ‘Seemingly Unrelated Regressions’ (SUR)¹⁹ model technique. Since there may not be any apparent link between the six equations being estimated simultaneously, the SUR model produces estimates that are consistent and efficient in each case. Additionally, the use of SUR allows for analysis of that proportion of the sample for which observations²⁰ are available for every variable contained in the model. Summary statistics for the sample used in this regression are provided in Table 5.B.

The second stage of empirical analysis is concerned with that part of the population considered to be “at-risk” as defined earlier in this paper. Since the dependent variable takes only binary values by way of its definition, it is inadvisable to use the OLS method as we encounter fitted probabilities greater than 1 and less than 0. If fitted using OLS, we find that the partial effects of some variables remain constant and this hinders our goal of evaluating the probability effect of a change in expenditure on any one category of basic necessities. Furthermore, in such a model the disturbance terms are subject to the same variance and it is necessary to use a linear probability model to correct for such heteroscedasticity. Thus, we specify the following model, to be fitted using the logistic function:

$$\text{Whether at-risk}_i = \beta_1 + \beta_2 * \text{Gender}_i + \beta_3 * \text{Age}_i + \beta_4 * \text{Region2}_i + \beta_5 * \text{Region3}_i + \beta_6 * \text{Region4}_i + \beta_7 * \text{Ethnicity2}_i + \beta_8 * \text{Ethnicity3}_i + \beta_9 * \text{FamilySize}_i + \beta_{10} * \text{Income}_i + \beta_{11} * \text{Food}_i + \beta_{12} * \text{Housing}_i + \beta_{13} * \text{Child Care}_i + \beta_{14} * \text{Health Care}_i + \beta_{15} * \text{Transportation}_i + \beta_{16} * \text{Misc. Necessities}_i + \epsilon_i$$

¹⁹ Also known as ‘Multivariate Least Squares’ (Schmidt 2005)

²⁰ In this case, complete data was available for 4030 observations.

The demographic characteristic variables appearing on the right-hand side of the model are as defined in the previous model presented in this section. The expenditure variables represent annual expenditure in each category, as collected by the PSID. Summary statistics for each variable included in this model, restricted to the logit sample, are provided in Table 5.C.

Some issues of concern prevail in these models. Since the variables of interest have to do with household income and expenditures, the problem of under or over-reporting must be taken into account. Care has been taken to choose variables generated by precisely worded survey questions. Where a question does not cover all aspects of expenditure on a particular category, different variables have been aggregated together to form the dependent variable in use. In addition, all expenditure units have been converted into annual amounts, to fall in line with household income. There is significantly less possibility of measurement error with regard to demographic characteristic variables as respondents have little or no incentive to misreport and such information can be easily verified by the interviewer. Nevertheless, issues surrounding measurement error must be kept in mind when interpreting the results yielded by this model estimation. Where respondents have over-reported expenses, we expect an upward bias and vice-versa where total household income may have been under-reported. There may also exist an approximate relationship between the different categories of household expenditure, hence leading to multicollinearity in the model. Nevertheless, this is not an issue of concern as coefficients remain unbiased and standard errors remain valid; one must, however, note that the problem of multicollinearity leads to erratic point estimates of the coefficients and unsatisfactorily low t-statistics. To investigate this further, pair-wise correlations were

computed among all categories but all relationships were found to be only moderately correlated, except for that between expenditure on food and health care, which only showed a weak correlation.

Fitting these models with the appropriate estimation techniques should lend to the results laid out in Part I using tabulated data. Where it was deemed to be illustrative, these models have been fitted separately for different subgroups of the population – male and female headed households, households with income below 2004 federal poverty thresholds, etc. – and these results are presented and discussed in the next section.

6. Results and Implications

Tables 7-9 present results of models estimated using the SUR technique. It was found that the gender of the household head was significant to some categories of expenditure and not others (Table 7). For example, it was found that male-headed households spend \$920.30 more on food and \$732.60 on transportation costs annually than their female-headed counterparts (significant at the 1% level). These results are in accord with trends presented in Section 5 of Part 1, and once again, the result pertaining to food expenditure runs contrary to the findings of Doss (2003). Table 7 also shows that male-headed households spent \$728.60 less on annual housing expenditure (also significant at the 1% level); further reinforcing results tabulated using CES data. It appears that expenditures on child care, health care and miscellaneous necessities are not significantly influenced by the gender of the household head. The Doss (2003) study made note of the fact that expenditures on clothing and health care remained unaffected by women's relative contribution to household income, and taking these two results in tandem, it appears that there is, in fact, no gender based preference for these goods as is commonly believed. It is,

however, interesting to note that child care expenses are not significantly influenced by the gender of the household head, implying that both male and female-headed households (which include single parents) face similar costs to child care. Tables 8.A and 8.B estimate the same models for male and female-headed households separately. We see similar results as interpreted by the gender coefficient in Table 7. The discussion that follows here with regard to other demographic factors which influence household expenditures takes into account the results of Tables 8.A and 8.B and distinguishes between male and female-headed households wherever possible.

SUR results in Table 7 also show that the age of the household head and family size are significant influences on each category of expenditure on basic necessities. Each additional year of age causes an \$18.36 increase in expenditure on food and a \$111.30 increase in annual expenditure on health care, keeping all other factors constant, demonstrating the relative magnitude of costs incurred by older sections of the population who may require extensive medical care. An additional year also leads to a \$56.74 decrease in annual expenditure on rent, showing a negative age preference for more comfortable areas of accommodation. Similar trends follow for expenditures on child care, transportation and other necessities in accord with life-cycle preferences for these goods. Note that these results are all significant at the 1% level. The presence of an additional member of the family generates a \$789.60 cost towards food expenses per year, *ceteris paribus*, which seems overestimated when compared to the cost of a basic bundle of food as calculated in Part 1 of this study. Similar trends are seen for all other categories, with the exception of expenditure on housing, which falls by \$232.40 per year for each additional member. This reflects diminishing costs of sharing accommodation with each additional

member, though this might also imply diminishing marginal utility with respect to the amount of space available for each family member. The relative influence of age and family size on various categories of expenditure on basic necessities is seen by the confidence levels at which the respective coefficients are statistically significant.

The omitted reference category in Tables 7-9 represents, separately, white households, female-headed households, and households residing in the northeastern part of the United States. It was found that black households spent significantly less on food and health care expenses and significantly more on transportation and housing costs when compared to white households. There was no statistically significant difference between white and black populations in terms of expenditures towards child care and miscellaneous necessities. Similarly, households where the head classified him/herself as neither “white” nor “black”²¹ saw significantly higher expenditures towards rent and transportation, but lower expenses towards health care. Thus, it appears that non-white households have access to cheaper or subsidized forms of medical care, or are choosing to allocate a lesser proportion of total household income towards health care and insurance expenses. This result is further affirmed by the results contained in Tables 8.A and 8.B. The negative coefficient on both ethnicity variables with respect to expenditure on health care demonstrates the comparative effect of non-white ethnicities on this category of spending, and the same trend holds for both male and female-headed households. It must be noted, however, that the difference in effect on healthcare between “white” and “other” households is significant only at the 5% level for male-headed households (Table 8.A) and only at the 10% level for female-headed households (Table 8.B), suggesting a welfare gap between the sexes. If this is so, and families are disadvantaged by their ethnicity and/or the

²¹ Hence falling into the ‘Ethnicity – Other’ category.

gender of the household head, then it is an issue of immense policy importance in the field of health care. Table 7 also shows that when holding all other factors at the mean, expenditures on food, rent and other necessities are lower for families living in the Midwest and South compared to those residing in the Northeast. There does not appear to be any statistical difference for most expenditure categories between households residing in the West compared to those in the Northeast. The exception here is for rent – families in the West spend, on average, \$311.60 less on housing than families in the reference category, when keeping all other factors constant. Note that this result is significant only at the 10% level. There are two interesting results with regard to geographic influences on household expenditure. The basic-needs-budget analysis conducted in Part 1 of this study showed no variation in the cost of food across the United States, yet families in different regions report statistically varying expenditure on foodstuff. On the other hand, the cost of child care was found to differ greatly depending on the state of residence, yet families of the same type do not report statistically different expenditures on this good.

The other factor which is able to explain much of the differences in household expenditure is that of total income available to each household in our sample. As can be expected, total household income is a highly statistically significant (1% level) influence to each category of expenditure on basic necessities (Table 7). In almost each category of expenditure, an additional dollar of total income was found to have a small positive effect on expenditure on that particular good. The exception here is expenditure on housing - where an additional \$10,000 of total household income was found to decrease spending on rent by \$27. Housing is most certainly a normal good and a possible explanation for this result is that nearly 60% of the sampled population owns their home and hence do not face

renting costs. The small relative magnitude of income coefficients suggests that income does not have a directly linear relationship with these categories of household expenditure, but fitting log and semi-log models did not particularly improve the fit and the model was estimated linearly for simplicity. Table 9 presents SUR model results for the same categories of household expenditures, restricted to the sampled population falling below the 2004 federal poverty line. For this group the effect of total income is statistically significant only to expenditures on rent and transportation – the two goods for which a family is hard-pressed to find subsidies or protective government programs that cover such necessities.

Turning now to the results of our analysis of households deemed to be at-risk of falling below state poverty levels, it was found that region of residence, family size and total income were the three significant demographic influences that place a family at-risk of being unable to meet expenditure on their basic necessities (Table 10). Families residing in the Midwest and South have a lesser probability of falling at-risk while households situated in the West are at a greater risk, compared to those in the Northeast (significant at the 5% level). Calculated odds-ratios show that the odds of falling “at-risk” are 5.02 times higher for families in the west than for those in the Northeast. However, households in the Midwest and South face odds 0.105 times and 0.125 times that of those in the Northeast. The presence of an additional member in the family puts a household at greater risk with the odds increasing by 26.27%, while an additional dollar to total income causes the odds of falling at risk to lower by 8.34%. These results are as expected. The most insightful part of this analysis tells us which categories of expenditure place a household significantly at-risk of being unable to meet its basic necessities. From Table 10, it appears that expenditure on housing and transportation are the two major categories which place families at such

risk. An extra \$100 incurred in yearly transportation costs increases the odds of falling at risk by 1.85% and an additional \$100 in housing expenses annually increases the odds by 1.68% (significant at the 10% and 1% level respectively). This result is not unexpected because the period for which this analysis is conducted is one in which house prices were steadily rising and rents moved alongside. Furthermore, as previously explained, rent and transportation costs are the two categories of spending for which the poor have minimal access to subsidies or government assistance in the United States, unlike with publicly funded health insurance or food stamp programs that help with the cost of food. In any policy consideration aimed at alleviating poverty and lack of basic necessities, particular focus must be placed on these two categories as expenses towards one or both are likely to place a family well below the means necessary to achieve a decent standard of living.

Conclusion

Over the years, the ideology behind minimum wages has degraded into a poorly-defined concept that lacks a clear methodology. We need a minimum wage formula that is economically feasible and legislatively acceptable. Determining an appropriate living wage for any subset of the population (or the population as a whole) must take into account the variability of needs of those to who the benefits of this wage floor are meant to accrue. There is an immediate need to bridging the gap between theory and implementation – a goal that is much sought after by feminists, activists and policy makers alike.

To that end, this project examined the need for an overhaul of the current method of estimating poverty in the United States by utilizing the following tools – living wages, basic needs budgets and household cost of livelihood. Furthermore, by combining these different academic theories, we were able to formulate a clearly defined method of calculation. In the first part of this study, CES data was used to generate a profile of the poor living in the United States and also compare household spending across demographic criteria. Trends were noted which suggested that certain demographic factors came into play in determining the “type” of family which stood at risk of being unable to meet their basic necessities, and hence fall to poverty levels. It was found that single males and females incur different expenditure on food, with higher deviations between those families with incomes below federal poverty levels, suggesting clear gender differences to basic necessities. Significant regional variation in expenditure on various categories of basic necessities makes a case for computing different needs-based poverty levels classified by state or geographic region. In addition to the above findings, living wages were determined as per the ‘reasonable needs’ criteria of Plowman et al. (1996) using the concept of ‘basic-

needs budgets' developed by Bergmann and Renwick (1993). Using these measures, we were able to present a strong case for reevaluating current federal measures of poverty as they fail to adequately capture what it costs to even obtain the basic minimum in household necessities.

The second part of this study took the calculations and trends found in Part I and conducted an in-depth analysis of demographic differences in household spending, with a particular focus on certain groups of the sample population, so as to capture some of the variation in needs as described above. The population was modeled so as to statistically predict if changes in expenditure on any one category of household expenditure would place families more at risk of falling below these newly defined measures of poverty in the United States. Contrary to expectations, it was found that gender differences in spending were not significant for a number of categories of basic expenditure – a finding which suggests that poverty levels need not be varied according to the whether the family is headed by a man or a woman. Even at this juncture, there is an interesting question to be asked regarding differences in spending for single-parent families, varied by the gender of the household head. Unfortunately, this analysis was not possible with the chosen dataset. All the same, it must be remembered that there are major implementation issues surrounding the possibility of varying poverty levels by gender. This study also found that family size and total household income were the strongest predictors of expenditure on any of the basic goods considered. When looking at that section of the population whose total household income fell at or below calculated state poverty levels, it was found that expenditure on rent and transportation were the two categories which significantly affected

the odds of a household falling into poverty – the two categories for which families do not have access to organized social welfare.

Thus, the results of this study should not be underestimated. The lack of gender differences in certain categories of expenditure reveals that policy directives implemented in the spheres of child care and health care are unlikely to contribute towards narrowing the gender-gap in poverty profiles. On the other hand, age of the household head and family size should be key factors of consideration for social welfare programs directed at alleviating poverty. The variability of expenditure towards rent and transportation costs across states and family configurations should also lend some insight into areas of focus for public assistance programs. Above all, the findings of this study should provide significant motivation for abandoning the Orshansky method in favor of basic-needs measurement of poverty levels in the United States. While the issues surrounding wage floors are still at hand, and millions of working families continue to be unable to meet their basic necessities, much work remains to be done in this field.

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Appendix of Data:

Gender – Gender of Household Head (Male or Female)

Age – Age of Household Head

Region - Region of Residence

Northeastern states – Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Pennsylvania.

Midwestern states – Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio, Nebraska, North Dakota, South Dakota and Wisconsin.

Southern states – Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia, Maryland, Delaware, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma and Texas.

Western States – Alaska, California, Hawaii, Oregon, Washington, Arizona, Colorado, Idaho, Montana, Nevada, Utah, New Mexico and Wyoming.

Ethnicity – Ethnicity of Household Head (White, Black or Other)

Family Size – Number of Members in the Family

Income – Total Annual (Disposable) Household Income

Food – Annual Expenditure on Food

Housing – Annual Expenditure on Rent

Child Care – Annual Expenditure on Child Care

Health Care – Annual Expenditure on Medical Care + Insurance

Transportation – Annual Expenditure on Transportation (various)

Misc. Necessities – Annual Expenditure on Clothing + Utilities

Table 1.A - All single member households
Classification: Gender

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	2,881.00	240.08
Housing+Utilities	10,497.00	874.75
Clothing and Apparel	1,054.00	87.83
Personal Care	471.00	39.25
Health Care	2,114.00	176.17
Transportation	3,587.00	298.92
Total	\$20,604.00	\$1,717.00
Living Wage	\$9.87	\$9.76
Avg. income a/ tax	\$25,729.00	\$12.18
Avg. tot. reported expenditure	\$26,382.00	\$12.49

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	3,502.00	291.83
Housing+Utilities	10,422.00	868.50
Clothing and Apparel	858.00	71.50
Personal Care	193.00	16.08
Health Care	1,399.00	116.58
Transportation	5,011.00	417.58
Total	\$21,385.00	\$1,782.08
Living Wage	\$10.24	\$10.13
Avg. income a/ tax	\$33,840.00	\$16.02
Avg. tot. reported expenditure	\$30,149.00	\$14.28

Table 1.B - All single member households with income \$10,000-\$14,999
Classification: Gender

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	2,046.00	170.50
Housing+Utilities	7,320.00	610.00
Clothing and Apparel	477.00	39.75
Personal Care	299.00	24.92
Health Care	2,161.00	180.08
Transportation	2,155.00	179.58
Total	\$1,204.83	\$6.85
Living Wage	\$12,355.00	\$5.85
Avg. income a/ tax	\$17,356.00	\$8.22
Avg. tot. reported expenditure	\$17,356.00	\$8.22

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	2,721.00	226.75
Housing+Utilities	6,972.00	581.00
Clothing and Apparel	499.00	41.58
Personal Care	136.00	11.33
Health Care	1,207.00	100.58
Transportation	2,684.00	223.67
Total	\$1,184.92	\$6.73
Living Wage	\$12,488.00	\$5.91
Avg. income a/ tax	\$17,766.00	\$8.41
Avg. tot. reported expenditure	\$17,766.00	\$8.41

Table 2.A - All households
Classification: Size of consumer unit

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	3,162.00	263.50
Housing+Utilities	10,463.00	871.92
Clothing and Apparel	965.00	80.42
Personal Care	345.00	28.75
Health Care	1,789.00	149.08
Transportation	4,234.00	352.83
Total	\$1,746.50	\$9.92
Living Wage		
Avg. Income a/ tax	\$29,416.00	\$13.93
Avg. tot. reported expenditure	\$28,094.00	\$13.30

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	7,140.00	595.00
Housing+Utilities	18,119.00	1,509.92
Clothing and Apparel	2,380.00	198.33
Personal Care	664.00	55.33
Health Care	2,841.00	236.75
Transportation	10,455.00	871.25
Total	\$3,466.58	\$19.70
Living Wage		
Avg. Income a/ tax	\$70,467.00	\$33.37
Avg. tot. reported expenditure	\$55,748.00	\$26.40

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	9,213.00	767.75
Housing+Utilities	20,867.00	1,738.92
Clothing and Apparel	2,955.00	246.25
Personal Care	685.00	57.08
Health Care	2,617.00	218.08
Transportation	11,595.00	966.25
Total	\$3,994.33	\$22.70
Living Wage		
Avg. Income a/ tax	\$79,486.00	\$37.64
Avg. tot. reported expenditure	\$63,645.00	\$30.13

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	6,028.00	502.33
Housing+Utilities	15,905.00	1,325.42
Clothing and Apparel	1,768.00	147.33
Personal Care	601.00	50.08
Health Care	3,500.00	291.67
Transportation	8,965.00	747.08
Total	\$3,063.92	\$17.41
Living Wage		
Avg. Income a/ tax	\$60,909.00	\$28.84
Avg. tot. reported expenditure	\$49,592.00	\$23.48

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	8,583.00	715.25
Housing+Utilities	20,729.00	1,727.42
Clothing and Apparel	2,781.00	231.75
Personal Care	741.00	61.75
Health Care	2,806.00	233.83
Transportation	11,698.00	974.83
Total	\$3,944.83	\$22.41
Living Wage		
Avg. Income a/ tax	\$77,922.00	\$36.89
Avg. tot. reported expenditure	\$63,101.00	\$29.88

Table 2.B - All households with income \$10,000-\$14,999
 Classification: Size of consumer unit

One person, \$10,000-14,999		Two persons, \$10,000-14,999	
ITEMS	EXPENDITURE Annual Monthly	ITEMS	EXPENDITURE Annual Monthly
Food	2,275.00 189.58	Food	3,812.00 317.67
Housing+Utilities	7,199.00 599.92	Housing+Utilities	8,371.00 697.58
Clothing and Apparel	485.00 40.42	Clothing and Apparel	994.00 82.83
Personal Care	242.00 20.17	Personal Care	262.00 21.83
Health Care	1,826.00 152.17	Health Care	2,121.00 176.75
Transportation	2,341.00 195.08	Transportation	3,400.00 283.33
Total	\$1,197.33	Total	\$1,580.00
Living Wage	\$6.80	Living Wage	\$8.98
Avg. income a/ tax	\$12,402.00	Avg. income a/ tax	\$12,702.00
Avg. tot. reported expenditure	\$17,492.00	Avg. tot. reported expenditure	\$22,769.00
Avg. income a/ tax	\$5.87	Avg. income a/ tax	\$6.01
Avg. tot. reported expenditure	\$8.28	Avg. tot. reported expenditure	\$10.78

Three persons, \$10,000-14,999		Four persons, \$10,000-14,999	
ITEMS	EXPENDITURE Annual Monthly	ITEMS	EXPENDITURE Annual Monthly
Food	4,370.00 364.17	Food	5,305.00 442.08
Housing+Utilities	8,999.00 749.92	Housing+Utilities	9,532.00 794.33
Clothing and Apparel	1,337.00 111.42	Clothing and Apparel	1,477.00 123.08
Personal Care	312.00 26.00	Personal Care	282.00 23.50
Health Care	912.00 76.00	Health Care	812.00 67.67
Transportation	2,990.00 249.17	Transportation	4,619.00 384.92
Total	\$1,576.67	Total	\$1,835.58
Living Wage	\$8.96	Living Wage	\$10.43
Avg. income a/ tax	\$13,308.00	Avg. income a/ tax	\$12,856.00
Avg. tot. reported expenditure	\$21,889.00	Avg. tot. reported expenditure	\$25,663.00
Avg. income a/ tax	\$6.30	Avg. income a/ tax	\$6.09
Avg. tot. reported expenditure	\$10.36	Avg. tot. reported expenditure	\$12.15

Five or more persons, \$10,000-14,999	
ITEMS	EXPENDITURE Annual Monthly
Food	6,586.00 548.83
Housing+Utilities	10,138.00 844.83
Clothing and Apparel	1,944.00 162.00
Personal Care	412.00 34.33
Health Care	759.00 63.25
Transportation	5,620.00 468.33
Total	\$2,121.58
Living Wage	\$12.05
Avg. income a/ tax	\$13,434.00
Avg. tot. reported expenditure	\$28,986.00
Avg. income a/ tax	\$6.36
Avg. tot. reported expenditure	\$13.72

Table 3.A - All households
 Classification: Region of residence

Midwest	ITEMS	EXPENDITURE	
		Annual	Monthly
	Food	5,759.00	479.92
	Housing+Utilities	14,419.00	1,201.58
	Clothing and Apparel	1,725.00	143.75
	Personal Care	526.00	43.83
	Health Care	2,828.00	235.67
	Transportation	7,626.00	635.50
	Total		\$2,740.25
	Living Wage		\$15.57
	Avg. income a/ tax	\$55,094.00	\$26.09
	Avg. tot. reported expenditure	\$45,068.00	\$21.34

Northeast	ITEMS	EXPENDITURE	
		Annual	Monthly
	Food	6,357.00	529.75
	Housing+Utilities	17,072.00	1,422.67
	Clothing and Apparel	2,046.00	170.50
	Personal Care	549.00	45.75
	Health Care	2,586.00	215.50
	Transportation	7,776.00	648.00
	Total		\$3,032.17
	Living Wage		\$17.23
	Avg. income a/ tax	\$61,341.00	\$29.04
	Avg. tot. reported expenditure	\$48,564.00	\$22.99

South	ITEMS	EXPENDITURE	
		Annual	Monthly
	Food	5,570.00	464.17
	Housing+Utilities	13,938.00	1,161.50
	Clothing and Apparel	1,786.00	148.83
	Personal Care	540.00	45.00
	Health Care	2,691.00	224.25
	Transportation	8,244.00	687.00
	Total		\$2,730.75
	Living Wage		\$15.52
	Avg. income a/ tax	\$52,599.00	\$24.90
	Avg. tot. reported expenditure	\$43,513.00	\$20.60

West	ITEMS	EXPENDITURE	
		Annual	Monthly
	Food	6,745.00	562.08
	Housing+Utilities	19,064.00	1,588.67
	Clothing and Apparel	2,050.00	170.83
	Personal Care	652.00	54.33
	Health Care	2,751.00	229.25
	Transportation	10,112.00	842.67
	Total		\$3,447.83
	Living Wage		\$19.59
	Avg. income a/ tax	\$63,290.00	\$29.97
	Avg. tot. reported expenditure	\$55,214.00	\$26.14

Table 3.B - All households with income \$10,000-\$14,999
 Classification: Region of residence

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	2,713.00	226.08
Housing+Utilities	7,213.00	601.08
Clothing and Apparel	697.00	58.08
Personal Care	261.00	21.75
Health Care	1,914.00	159.50
Transportation	2,868.00	239.00
Total		\$1,305.50
Living Wage		\$7.42
Avg. income a/ tax	\$12,550.00	\$5.94
Avg. tot. reported expenditure	\$18,883.00	\$8.94

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	3,312.00	276.00
Housing+Utilities	8,408.00	700.67
Clothing and Apparel	886.00	73.83
Personal Care	236.00	19.67
Health Care	795.00	66.25
Transportation	1,850.00	154.17
Total		\$1,290.58
Living Wage		\$7.33
Avg. income a/ tax	\$12,504.00	\$5.92
Avg. tot. reported expenditure	\$19,161.00	\$9.07

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	3,071.00	255.92
Housing+Utilities	7,475.00	622.92
Clothing and Apparel	770.00	64.17
Personal Care	264.00	22.00
Health Care	1,642.00	136.83
Transportation	3,083.00	256.92
Total		\$1,358.75
Living Wage		\$7.72
Avg. income a/ tax	\$12,730.00	\$6.03
Avg. tot. reported expenditure	\$19,297.00	\$9.14

ITEMS	EXPENDITURE	
	Annual	Monthly
Food	3,604.00	300.33
Housing+Utilities	8,931.00	744.25
Clothing and Apparel	845.00	70.42
Personal Care	285.00	23.75
Health Care	1,550.00	129.17
Transportation	3,373.00	281.08
Total		\$1,549.00
Living Wage		\$8.80
Avg. income a/ tax	\$12,527.00	\$5.93
Avg. tot. reported expenditure	\$23,088.00	\$10.93

Table 4: Cost of Basic Necessities by State (Capitals)

State	Capital	Food	Housing	Child Care	Health Care	Transportation	Misc. Necessities	Total	Living Wage
Alabama	Montgomery	518.10	599.00	251.33	135.79	314.21	142.99	1961.42	11.14
Alaska	Juneau	518.10	1059.00	557.00	131.43	390.90	201.87	2858.29	16.24
Arizona	Phoenix	518.10	770.00	489.67	135.12	338.24	164.88	2416.00	13.73
Arkansas	Little Rock	518.10	590.00	282.00	131.43	312.87	141.84	1976.24	11.23
California	Sacramento	518.10	1008.00	635.17	123.86	293.96	195.34	2774.43	15.76
Colorado	Denver	518.10	889.00	585.00	154.30	319.36	180.11	2645.88	15.03
Connecticut	Hartford	518.10	922.00	704.92	190.20	312.87	184.33	2832.43	16.08
Delaware	Dover	518.10	682.00	459.58	131.43	312.87	153.61	2257.59	12.83
Florida	Tallahassee	518.10	687.00	412.33	160.01	312.87	154.25	2244.56	12.75
Georgia	Atlanta	518.10	818.00	335.42	139.46	293.96	171.02	2275.96	12.93
Hawaii	Honolulu	518.10	1126.00	468.33	131.43	293.96	210.44	2748.26	15.62
Idaho	Boise	518.10	672.00	367.50	131.43	312.87	152.33	2154.23	12.24
Illinois	Springfield	518.10	579.00	567.17	132.10	312.87	140.43	2249.67	12.78
Indiana	Indianapolis	518.10	673.00	450.67	117.05	319.36	152.46	2230.64	12.67
Iowa	Des Moines	518.10	669.00	447.92	131.43	312.87	151.95	2039.92	11.59
Kansas	Topeka	518.10	568.00	370.50	131.43	312.87	139.02	2208.09	12.55
Kentucky	Frankfort	518.10	593.00	392.50	171.37	390.90	142.22	2208.09	12.55
Louisiana	Baton Rouge	518.10	619.00	396.67	143.24	312.87	145.55	2135.43	12.13
Maine	Augusta	518.10	560.00	528.67	131.43	390.90	138.00	2267.09	12.88
Maryland	Annapolis	518.10	878.00	542.92	159.01	312.87	178.70	2589.61	14.71
Massachusetts	Boston	518.10	1324.00	802.33	89.62	319.36	235.79	3289.20	18.69
Michigan	Lansing	518.10	659.00	518.00	119.93	312.87	150.67	2278.57	12.95
Minnesota	Saint Paul	518.10	882.00	736.00	92.22	293.96	179.21	2701.50	15.35
Mississippi	Jackson	518.10	613.00	325.33	131.43	312.87	144.78	2045.51	11.62
Missouri	Jefferson City	518.10	504.00	330.58	121.52	312.87	130.83	1917.90	10.90
Montana	Helena	518.10	571.00	373.83	131.43	390.90	139.40	2124.66	12.07
Nebraska	Lincoln	518.10	596.00	425.00	131.43	312.87	142.60	2126.00	12.08
Nevada	Carson City	518.10	767.00	266.67	131.43	312.87	164.49	2160.56	12.28
New Hampshire	Concord	518.10	815.00	584.50	131.43	390.90	170.64	2610.56	14.83
New Jersey	Trenton	518.10	1022.00	748.75	116.96	312.87	197.13	2915.82	16.57
New Mexico	Santa Fe	518.10	843.00	421.17	131.43	312.87	174.22	2400.79	13.64
New York	Albany	518.10	715.00	710.83	120.19	312.87	157.84	2534.83	14.40
North Carolina	Raleigh	518.10	817.00	489.67	132.47	293.96	170.89	2422.09	13.76
North Dakota	Bismarck	518.10	520.00	398.67	131.43	312.87	132.88	2013.95	11.44
Ohio	Columbus	518.10	655.00	481.42	134.63	319.36	150.16	2258.67	12.83
Oklahoma	Oklahoma City	518.10	571.00	328.33	153.21	319.36	139.40	2029.41	11.53
Oregon	Salem	518.10	622.00	430.00	128.88	312.87	145.93	2157.79	12.26
Pennsylvania	Harrisburg	518.10	693.00	566.67	120.94	312.87	155.02	2366.60	13.45
Rhode Island	Providence	518.10	891.00	650.00	131.43	312.87	180.36	2883.76	15.25
South Carolina	Columbia	518.10	632.00	348.33	123.95	312.87	147.21	2082.46	11.83
South Dakota	Pierre	518.10	500.00	400.33	131.43	390.90	130.32	2071.07	11.77
Tennessee	Nashville	518.10	666.00	349.00	123.96	319.36	151.56	2127.99	12.09
Texas	Austin	518.10	804.00	368.92	123.52	319.36	169.23	2303.13	13.09
Utah	Salt Lake City	518.10	721.00	397.00	131.43	312.87	158.60	2239.00	12.72
Vermont	Montpelier	518.10	684.00	544.75	131.43	390.90	153.87	2423.04	13.77
Virginia	Richmond	518.10	757.00	654.33	119.84	312.87	163.21	2525.35	14.35
Washington	Olympia	518.10	749.00	574.25	123.42	312.87	162.19	2439.84	13.86
West Virginia	Charleston	518.10	540.00	323.83	131.43	312.87	135.44	1961.67	11.15
Wisconsin	Madison	518.10	752.00	580.67	112.82	312.87	162.57	2439.04	13.86
Wyoming	Cheyenne	518.10	612.00	453.17	131.43	312.87	144.65	2172.22	12.34

Table 5.A: Profile of Data

Variable	Min	Mean	Max
Gender of Household Head	0	.699 (.4587)	1
Age of Household Head	16	45.0774 (16.2647)	99
Ethnicity of Household Head - Black	0	.3335 (.4715)	1
Ethnicity of Household Head - Other	0	.0561 (.2302)	1
Region of Residence - Midwest	0	.2487 (.4323)	1
Region of Residence - South	0	.4284 (.4949)	1
Region of Residence - West	0	.1821 (.386)	1
Family Size	1	2.696 (1.4649)	13
Total Household Income - 2004	0	62,204.73 (103449.3)	5,500,000
Expenditure on Food	0	4,862.686 (7125.253)	225,316
Expenditure on Rent	0	2,263.798 (4133.166)	49,800
Expenditure on Child Care	0	412.098 (1660.488)	32,000
Expenditure on Health Care	0	6,132.913 (19285.58)	500,000
Expenditure on Transportation	0	2,166.02 (2494.635)	74,400
Expenditure on Misc. Necessities	0	1,444.312 (4372.191)	319,200

Observations = 7999

Standard deviations in parentheses

Table 5.B: Summary Statistics for SUR Regression

Variable	Min	Mean	Max
Gender of Household Head	0	.737 (.4405)	1
Age of Household Head	17	42.8638 (14.7204)	98
Ethnicity of Household Head - Black	0	.3131 (.4638)	1
Ethnicity of Household Head - Other	0	.0464 (.2104)	1
Region of Residence - Midwest	0	.2531 (.4348)	1
Region of Residence - South	0	.4260 (.4946)	1
Region of Residence - West	0	.1983 (.399)	1
Family Size	1	2.661 (1.4639)	13
Total Household Income - 2004	0	65,662.77 (84783.74)	2,883,100
Expenditure on Food	0	4,702.669 (4066.337)	52,000
Expenditure on Rent	0	2,272.496 (4048.347)	49,800
Expenditure on Child Care	0	466.179 (1855.27)	32,000
Expenditure on Health Care	0	6,271.964 (19755.03)	500,000
Expenditure on Transportation	0	2,266.44 (2662.842)	74,400
Expenditure on Misc. Necessities	0	1,471.821 (2223.844)	40,000

Observations = 4030

Standard deviations in parentheses

Table 5.C: Summary Statistics for Logit Regression

Variable	Min	Mean	Max
Gender of Household Head	0	.737 (.4409)	1
Age of Household Head	17	42.8588 (14.719)	98
Ethnicity of Household Head - Black	0	.3121 (.4634)	1
Ethnicity of Household Head - Other	0	.0458 (.2091)	1
Region of Residence - Midwest	0	.2553 (.4361)	1
Region of Residence - South	0	.4258 (.4945)	1
Region of Residence - West	0	.2 (.400)	1
Family Size	1	2.662 (1.4660)	13
Total Household Income - 2004	0	65,708.9 (84985.54)	2,883,100
Whether At Risk	0	.2641 (.4409)	1
Expenditure on Food	0	4,696.099 (4057.345)	52,000
Expenditure on Rent	0	2,250.503 (4026.57)	49,800
Expenditure on Child Care	0	465.032 (1854.833)	32,000
Expenditure on Health Care	0	6,302.142 (19830.19)	500,000
Expenditure on Transportation	0	2,271.07 (2662.785)	74,400
Expenditure on Misc. Necessities	0	1,474.436 (2230.157)	40,000

Observations = 3995

Standard deviations in parentheses

Table 6: Expenditure Statistics for Population with Income below 2004 Federal Poverty Threshold

Variable	Obs	Min	Mean	Max
Expenditure on Food	1251	0	2,347.039 (6517.676)	204,256
Expenditure on Rent	1240	0	2,610.736 (3232.156)	36,000
Expenditure on Child Care	1284	0	94.6994 (684.7129)	19,000
Expenditure on Health Care	600	0	3,134.418 (10078.7)	125,000
Expenditure on Transportation	1228	0	919.5244 (1128.005)	8,400
Expenditure on Misc. Necessities	1218	0	557.3317 (1011.571)	20,000

Standard deviations in parentheses

Note:

Threshold used is a weighted average of values for the 48 contiguous states, Alaska and Hawaii for a family of 3; 2004 Federal Poverty Threshold = \$15,067

Table 7: Seemingly Unrelated Regression Results

COEFFICIENT	Expenditure on Basic Necessities					
	(i = 1)	(i = 2)	(i = 3)	(i = 4)	(i = 5)	(i = 6)
	Food	Rent	Child Care	Health Care	Transportation	Miscellaneous
Gender - Male	920.3*** (141)	-728.6*** (148)	-51.39 (68.3)	582.9 (753)	732.6*** (98.8)	-128.8 (79.8)
Age	18.36*** (3.99)	-56.74*** (4.20)	-15.98*** (1.93)	111.3*** (21.3)	-9.232*** (2.79)	-8.858*** (2.25)
Ethnicity - Black	-953.1*** (142)	971.1*** (149)	17.31 (68.7)	-3613*** (757)	-176.2* (99.4)	-9.670 (80.2)
Ethnicity - Other	315.3 (282)	1259*** (296)	-27.34 (136)	-4053*** (1500)	542.0*** (197)	91.06 (159)
Region - Midwest	-890.3*** (202)	-1164*** (213)	112.8 (97.9)	1216 (1079)	-50.54 (142)	-281.1** (114)
Region - South	-473.7** (193)	-1294*** (203)	-69.26 (93.3)	838.4 (1028)	-45.15 (135)	-328.8*** (109)
Region - West	-311.6 (212)	-386.6* (222)	-101.1 (102)	1571 (1128)	-35.75 (148)	-115.4 (120)
Family Size	789.6*** (41.1)	-232.4*** (43.1)	219.9*** (19.9)	559.3** (219)	187.0*** (28.7)	120.8*** (23.2)
Total Income	0.00779*** (0.00072)	-0.00273*** (0.00076)	0.00369*** (0.00035)	0.00284 (0.0038)	0.00430*** (0.00050)	0.00883*** (0.00041)
Constant	1397*** (290)	6599*** (305)	378.8*** (140)	-259.0 (1546)	1412*** (203)	1278*** (164)
Observations	4030	4030	4030	4030	4030	4030
R-squared	0.18	0.09	0.08	0.02	0.07	0.13

Standard errors in parentheses

*** p<0.01 ** p<0.05 * p<0.1

Table 8.A: Seemingly Unrelated Regression Results for Male-headed Households

COEFFICIENT	(i = 1)	(i = 2)	(i = 3)	(i = 4)	(i = 5)	(i = 6)
	Food	Rent	Child Care	Health Care	Transportation	Miscellaneous
Age	17.92*** (5.06)	-60.74*** (5.01)	-19.35*** (2.55)	118.9*** (28.0)	-9.225** (3.72)	-7.387*** (2.71)
Ethnicity - Black	-1013*** (180)	1061*** (178)	69.09 (90.6)	-3872*** (995)	-180.3 (132)	-29.99 (96.1)
Ethnicity - Other	530.5 (330)	1257*** (327)	-50.51 (167)	-4050** (1832)	672.9*** (243)	235.4 (177)
Region - Midwest	-913.1*** (242)	-1172*** (239)	125.7 (122)	1772 (1340)	-118.1 (178)	-294.2** (129)
Region - South	-340.7 (232)	-1108*** (229)	-107.6 (117)	1444 (1285)	-74.69 (170)	-316.2** (124)
Region - West	-389.4 (250)	-402.3 (247)	-203.9 (126)	1880 (1384)	-137.1 (184)	-248.4* (134)
Family Size	874.1*** (49.5)	-260.7*** (49.0)	256.7*** (25.0)	624.7** (275)	175.1*** (36.4)	132.7*** (26.5)
Total Income	0.00684*** (0.00077)	-0.00252*** (0.00077)	0.00376*** (0.00039)	0.00144 (0.0043)	0.00397*** (0.00057)	0.00804*** (0.00041)
Constant	2143*** (342)	6017*** (339)	385.6** (173)	-471.0 (1897)	2248*** (251)	1137*** (183)
Observations	2969	2969	2969	2969	2969	2969
R-squared	0.15	0.08	0.09	0.02	0.03	0.14

Standard errors in parentheses

*** p<0.01 ** p<0.05 * p<0.1

Table 8.B: Seemingly Unrelated Regression Results for Female-headed Households

COEFFICIENT	Expenditure on Basic Necessities					
	(i = 1) Food	(i = 2) Rent	(i = 3) Child Care	(i = 4) Health Care	(i = 5) Transportation	(i = 6) Miscellaneous
Age	17.90*** (5.94)	-48.15*** (7.72)	9.131*** (2.30)	95.32*** (26.3)	-9.201*** (3.19)	-11.91*** (3.97)
Ethnicity - Black	-469.4** (219)	771.6*** (285)	-5.801 (84.9)	-2622*** (972)	-119.0 (118)	229.7 (146)
Ethnicity - Other	-475.2 (520)	1310* (675)	38.66 (201)	-3966* (2305)	91.36 (279)	-391.2 (347)
Region - Midwest	-652.4* (352)	-1211*** (457)	64.77 (136)	-340.4 (1562)	241.0 (189)	-69.19 (235)
Region - South	-695.2** (330)	-1827*** (428)	29.31 (128)	-872.7 (1462)	127.4 (177)	-224.8 (220)
Region - West	10.32 (384)	-274.7 (499)	286.9* (149)	598.4 (1703)	344.9* (206)	405.2 (256)
Family Size	505.1*** (70.1)	-115.6 (91.1)	122.1*** (27.2)	305.0 (311)	214.3*** (37.7)	65.59 (46.8)
Total Income	0.0232*** (0.0026)	-0.00402 (0.0034)	0.00242** (0.0010)	0.0251** (0.012)	0.0103*** (0.0014)	0.0222*** (0.0017)
Constant	1295*** (454)	6388*** (590)	260.7 (176)	1072 (2015)	918.8*** (244)	783.3*** (303)
Observations	1061	1061	1061	1061	1061	1061
R-squared	0.15	0.07	0.05	0.04	0.10	0.16

Standard errors in parentheses

*** p<0.01 ** p<0.05

* p<0.1

Table 9: Seemingly Unrelated Regression Results for Households below 2004 Federal Poverty Threshold

COEFFICIENT	Expenditure on Basic Necessities					
	(i = 1) Food	(i = 2) Rent	(i = 3) Child Care	(i = 4) Health Care	(i = 5) Transportation	(i = 6) Miscellaneous
Gender - Male	890.3*** (272)	-798.7*** (276)	-84.78 (80.6)	-510.4 (908)	26.57 (98.5)	-142.0 (103)
Age	6.255 (7.42)	-33.13*** (7.53)	-3.306 (2.20)	55.54** (24.8)	-12.07*** (2.69)	-8.718*** (2.82)
Ethnicity - Black	48.94 (302)	305.2 (306)	87.05 (89.4)	-781.1 (1007)	-327.2*** (109)	206.4* (115)
Ethnicity - Other	-441.9 (735)	-798.5 (747)	-172.9 (218)	-5108** (2454)	13.74 (266)	125.5 (279)
Region - Midwest	77.20 (529)	3.794 (537)	-10.84 (157)	166.7 (1766)	342.0* (192)	53.13 (201)
Region - South	218.1 (496)	-1009** (503)	-10.79 (147)	-1314 (1654)	236.3 (180)	-55.95 (188)
Region - West	503.9 (575)	396.2 (584)	319.7* (170)	3542* (1918)	439.7** (208)	482.0** (218)
Family Size	260.7*** (89.8)	-74.83 (91.2)	81.71*** (26.6)	824.7*** (300)	53.03 (32.5)	124.5*** (34.1)
Total Income	0.0362 (0.029)	0.123*** (0.029)	-0.00288 (0.0086)	0.0528 (0.097)	0.0233** (0.010)	0.00716 (0.011)
Constant	544.0 (697)	3805*** (708)	75.32 (207)	-281.8 (2327)	1075*** (253)	532.5** (265)
Observations	542	542	542	542	542	542
R-squared	0.04	0.09	0.04	0.05	0.09	0.08

Standard errors in parentheses

*** p<0.01

** p<0.05

* p<0.1

Table 10: Logit Model Results

COEFFICIENT	Whether at-risk	Odds Ratio
Gender - Male	0.344 (0.30)	-
Age	0.01026 (0.0091)	-
Ethnicity - Black	0.257 (0.33)	-
Ethnicity - Other	0.984 (0.78)	-
Region - Midwest	-2.254*** (0.54)	0.105
Region - South	-2.076*** (0.52)	0.125
Region - West	1.614** (0.58)	5.023
Family Size	0.233** (0.102)	26.27% ($\Delta = 1$)
Total Income	-0.0008712*** (0.000064)	-8.34% ($\Delta = 100$)
Food	-0.0000365 (0.0000485)	-
Rent	0.00001665*** (0.0000435)	1.68% ($\Delta = 100$)
Child Care	-0.00000781 (0.000021)	-
Health Care	-0.00000386 (0.000011)	-
Transportation	0.000183* (0.000096)	1.85% ($\Delta = 100$)
Misc. Necessities	-0.000138 (0.000129)	-
Constant	22.32*** (1.78)	-
Observations	3995	
Pseudo R-squared	0.9231	

Standard errors in parentheses

*** p<0.01 ** p<0.05 * p<0.1

Odds Ratios only displayed for statistically significant coefficients