AN EVALUATION OF THE RELATIONSHIP BETWEEN INCOME AND HEALTH

A QUANTITATIVE EVALUATION OF THE RELATIONSHIP BETWEEN INCOME AND SELF-REPORTED HEALTH IN CANADA, 1996-1999

By

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Abstract

The focus of the research is on the quantitative characterization of a potential relationship between income and health. The study is conducted in both levels and increments contexts. As a background, the research relies on Grossman's standard economic model of health as well as on previous empirical investigations. The source of the data is the Survey of Income and Labour Dynamics, administered by Statistics Canada. The set of instruments implemented includes ordered probit and ordered logit models, gamma GLM models, the OLS method and bootstrapping techniques in linear models. The results of the study suggest that there exists a strong association between the levels of health and income, whereas no evidence of significant association between their increments is present.

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1 Introduction

1.1 Problem Foundations

The two-way relationship between income and health has been a main focus of research attention for the last half century. Although researchers from different fields have provided evidence of the existence of the association, a complete economic theoretical model consistent with the relationship was not available until 1972 when Michael Grossman created the standard economic model of health (Grossman, 1972).

The model includes a health production function in which the health at any given time is a result of factors, including health in previous time period, medical care received, adoption of healthy personal behaviors, etc. (Smith, 1999).

The economic reasoning behind his approach is that health is a stock. The current inputs and chosen behaviors are treated like investments producing increments to that stock. The increments themselves are affected by the current personal choices and thus today's health stock is a function of the entire history of all current and past prices, income, health behaviors and personal health endowment (Smith, 1999). However, health can also affect available economic resources. Thus health enters the model in two ways producing a two-way association (Smith, 1999).

1.2 Objectives

The objective of the research is to characterize the relationship between income and health, conditioned on income and health from previous periods, for Canada in the

following aspects (McLeod and Veall, 2002)

- Levels analysis: The relationship between current health, lagged health and lagged income as well as its direction,
- Increments analysis: The relationship between change in health, change in income, lagged change in health and lagged change in income as well as its direction,
- Discovering supplemental predictors and investigating channels that influence the relationships.

The analysis is based on the longitudinal section of the Survey of Labour and Income Dynamics (SLID) administered by Statistics Canada.

The overall temporal framework of the data spans from 1996 to 1999 by years. In particular, for the levels models, the years from 1996 to 1999 were used, unless otherwise indicated. The increments analysis, on the other hand, was performed for the changes between 1996 to 1998.

The number of respondents for the years 1996 to 1998 is 67364 and for the years 1996 to 1999 it is 71278.

The analysis does not take into account the SLID sampling weights. In addition, there is no adjustment for the clustering in the sample.

2 Data Description

2.1 SLID Overview

The Survey of Labour and Income Dynamics was initiated in 1993 with the purpose of understanding the economic well-being of Canadians by collecting data on labor market activity, income and related socio-economic and demographic characteristics. The survey consists of a cross-sectional block and a longitudinal block.

As in all recurring surveys, in the cross-sectional SLID survey a new sample of people is being interviewed each time, thus making the data collected more representative of the population and revealing the levels and trends of income or labor for the whole population or sub-groups.

SLID's longitudinal aspect, on the other hand, provides information on the changes experienced by same individuals through time, in that way creating a powerful background for studying transitions, durations, and repeat occurrences in individual financial and work situations.

To keep the longitudinal sample representative, the respondents in each panel stay in the survey for 6 years. A new panel of longitudinal respondents is selected every three years, so there is always an overlap between two panels of respondents. Each panel includes about 15,000 households, including about 30,000 adults.

The SLID is administered by Statistics Canada and the data are collected by computer-assisted telephone interviews. A preliminary interview takes place at the beginning of each panel to collect background information. Each of the six years

has a split-interview format, with labor topics covered in January and income topics in May. In both cases, questions refer to the previous calendar year. The income interview occurs in May to take advantage of income tax time when respondents are more familiar with their records.

2.2 Variables Under Consideration

The two basic raw variables under consideration in the analysis are the current state of health variable and the economic family after-tax-income variable.

The health variable (*crhlt26*) represents a response to the question *"Compared to other people his/her age, how would you describe [respondent]'s state of health? Would you say it is... "* with possible answers *"...excellent?"*, *"...very good?"*, *"...good?"*, *"...fair?"*, *"...poor?"*, coded as one to five respectively. The health variable is observed for persons aged 16 or older.

The income variable (*atinc27*) represents the economic family after-tax income for a specific year. The respondents have the option of answering the questions on income in an interview, or giving permission to Statistics Canada to allow SLID to use the information from their income tax return. Over 80% of the respondents give their consent for accessing their administrative records. The income variable is continuous, in the range $-9999999 : 99999995$, it is measured in dollars (CDN) and is recorded for all persons.

Additional variables considered in the analysis are

- Highest level of education (*hlev2g18*) recorded for persons aged 15 or older, having four categories corresponding to *less than high school education* (LHS), *graduated high school* (GHS), *non-university postsecondary certificate* (NUPC)

and *university degree* (UD), coded as one to four respectively,

- Annual labor force status (*alfst28*) observed for persons aged 16-69, having seven categories: *Employed all year*; *Unemployed all year*; *Not in the labor force all year* (NLF); *Employed part-year, unemployed part-year* (EPY-UPY); *Employed part-year, not in labor force part-year* (EPY-NLFPY); *Unemployed part-year, not in labor force part-year* (UPY-NLFPY); *Employed, unemployed and not in labor force during year* (AOA), coded as one to seven respectively,

- Person's age as of December 31 of the reference year (*age26*) is observed for all persons, it is continuous and within the range 0:150,

- Sex (*sex21*) variable is recorded for all person and has two categories: *Male*; *Female*, coded as one and two respectively,

- Current stress level in persons life (*crstr26*) refers to persons aged 16 or older, having four categories: *Very stressful*; *Somewhat stressful*; *Not very stressful*; *Not at all stressful*, coded as one to four respectively.

In the modelling part, good health, LHS, employed all year, male, very stressful are most frequently used as reference categories.

2.3 Data Cleaning and Manipulation

Data management procedures were implemented in the following order:

1. Based on the variables characterizing the respondent status in the SLID, investigation of possible dropouts due to various reasons was implemented. Due to a partial substitution of subject in the panel, which took place in 1999, there

were 32430 dropouts for that year. The resulting useful portion of the data for the period 1996 to 1999 decreased from 67364 to 34934 individuals.

2. The review of the raw variables used in the analysis showed that all of them contained the additional categories

   ◇ Not in Sample, ◇ Refusal,
   ◇ Don't Know, ◇ Not Applicable,

   and the variable Current stress level also having

   ◇ No Opinion.

   As these categories could be treated as uninformative, the subjects that had corresponding records were removed. The removal however, was implemented selectively, depending on the model considered and the factors included in it, thus ensuring that no useful data have been lost.

3. The income variables in the SLID are nominal income, but real income is the one of interest. To overcome that problem, a deflation procedure was employed.

4. Differenced health, differenced stress and differenced income variables were created

   - As the variable Current state of health (*crhlt26*) is categorical, the differenced health variables were constructed on the basis of code subtraction. As a result, nine categories where obtained, which were aggregated into five by the rule

$$\Delta h_{i,t} = \begin{cases} 1, & \text{if } h_{i,t} - h_{i,t-1} \in \{4, 3\}; \\ 2, & \text{if } h_{i,t} - h_{i,t-1} \in \{1, 2\}; \\ 3, & \text{if } h_{i,t} - h_{i,t-1} \in \{0\}; \\ 4, & \text{if } h_{i,t} - h_{i,t-1} \in \{-1, -2\}; \\ 5, & \text{if } h_{i,t} - h_{i,t-1} \in \{-3, -4\}; \end{cases}$$

where $i = 1, ..., n, \quad t = 1997,\ 1998.$

Thus, according to the new coding the categories defined for the change in health variable (*health*) are: *Improved substantially* (1); *Improved a bit* (2); *Unchanged* (3); *Worsened* (4); *Worsened badly* (5). Unchanged is used as a reference category in the modelling part.

- The differenced stress variable (*stress*) was defined by grouping the differences from the category codes of *crstr26* in the following way

$$\Delta s_{i,t} = \begin{cases} 1, & \text{if } s_{i,t} - s_{i,t-1} \in \{-3\}; \\ 2, & \text{if } s_{i,t} - s_{i,t-1} \in \{-1, -2\}; \\ 3, & \text{if } s_{i,t} - s_{i,t-1} \in \{0\}; \\ 4, & \text{if } s_{i,t} - s_{i,t-1} \in \{1, 2\}; \\ 5, & \text{if } s_{i,t} - s_{i,t-1} \in \{3\}; \end{cases}$$

where $i = 1, ..., n, \quad t = 1997,\ 1998.$

The newly formed categories of change in stress level were defined as: *Substantially reduced stress* (1), *Reduced stress* (2), *Unchanged* (3), *Increased stress* (4), *Substantially increased* (5). Substantially reduced stress and, less frequently, unchanged stress are used as a reference categories in the modelling part.

- The differenced income variables (*Datinc27*) were obtained by straightforward subtraction by the rule:

$$\Delta I_{i,t} = I_{i,t} - I_{i,t-1}, \quad i = 1, ..., n, \quad t = 1997,\ 1998.$$

5. As some extremely small and extremely large observations of income were present in the data, the raw income for the two years of interest and the differenced income were trimmed by removing all cases having records less than the first or greater than the last percentile (2% trimming was performed).

6. For the purposes of the analysis of the income health relationships by age groups, the respondents have been divided into four groups as follows:

   - Under 20 years,
   - From 20 to 49,
   - From 50 to 59,
   - 60 and over.

   The individuals have been allocated to the different groups based on their age within a three year period. People who in most of the years were within one age group were regarded as members of that group. The border cases were treated as members of the lower age group.

3 The Approach

Research on the two-way relationship between health and income has a long history but many questions concerning the degree of direct and indirect causality, incremental contributions and relationships still remain. The present research tries to provide an answer to some of these issues.

In that context, the approach involves a preliminary investigation of the relationships in the data by means of conventional descriptive tools and, at a second step, a study of the causality, directly or indirectly influenced by other predictors, in the levels models and the increments models by regression techniques application.

4 Methodology

4.1 Economic Methodology

4.1.1 Levels Analysis

Health models

The levels models used in the analysis are characterized by the use of current health status as a response variable and a number of explanatory variables, including income and lagged health, as predictors.

The first model under consideration is a levels model that investigates the relationship between current health, lagged health and lagged income defined as follows

$$h_{i,t} = \beta_{i,0} + \beta_{i,1} h_{i,t-2} + \beta_{i,2} I_{i,t-2} + \mathbf{p}\prime_{i,t-2}\mathbf{z}_i + \varepsilon_{i,t}, \qquad t = 1998, \quad i = 1, ..., n_1 \quad (1)$$

where:

- $h_{i,t}$ is current health status,
- $h_{i,t-2}$ is lagged health status,
- $I_{i,t-2}$ is lagged income,
- $\mathbf{p}_{i,t-2}$ is a vector of other lagged predictors like level of education, labor force status, age,
- $\mathbf{z}_i$ is the vector of regression parameters corresponding to the elements of $\mathbf{p}_{i,t-2}$,
- $\varepsilon_{i,t}$ are the random errors,

- $i = 1, ..., n_1$ where n_1 is the number of individuals in the period 1996-1998.

The other model considered is the one investigating the relationship between current health on the left-hand side and health in 1996 and income in 1996 complemented by additional variables on the right-hand side. It is represented by

$$h_{i,t} = \beta_{i,0} + \beta_{i,1} h_{i,t-3} + \beta_{i,2} I_{i,t-3} + \mathbf{p}\prime_{i,t-3}\mathbf{z}_i + \varepsilon_{i,t}, \qquad t = 1999, \quad i = 1, ..., n_2 \quad (2)$$

where $i = 1, ..., n_2$, n_2 being the number of individuals in the period 1996-1999.

Income models

The income levels models in the analysis are used for predicting current income conditioned on health, income and other covariates from previous periods. The two specific forms of investigation are

$$I_{i,t} = \beta_{i,0} + \beta_{i,1} h_{i,t-2} + \beta_{i,2} I_{i,t-2} + \mathbf{p}\prime_{i,t-2}\mathbf{z}_i + \varepsilon_{i,t}, \qquad t = 1998, \quad i = 1, ..., n_1 \quad (3)$$

where current income $I_{i,t}$ is predicted by the two-year lagged health $h_{i,t-2}$, the two-year lagged income $I_{i,t-2}$ and other two-year lagged covariates in the vector $\mathbf{p}_{i,t-2}$, and

$$I_{i,t} = \beta_{i,0} + \beta_{i,1} h_{i,t-3} + \beta_{i,2} I_{i,t-3} + \mathbf{p}\prime_{i,t-3}\mathbf{z}_i + \varepsilon_{i,t}, \qquad t = 1999, \quad i = 1, ..., n_2 \quad (4)$$

where the time span is increased by one year.

4.1.2 Increments Analysis

In the increments analysis two basic models, the health model and the income model, are considered. The first relates change in health as a response to lagged change in

health and lagged change in income along with other predictors (Veall, 2002)

Health model

$$\Delta h_{i,t} = \beta_{i,1}\Delta h_{i,t-1} + \beta_{i,2}\Delta I_{i,t-1} + \mathbf{p}\prime_i\mathbf{z}_i + \varepsilon_{i,t}, \qquad t = 1998, \quad i = 1, ..., n \qquad (5)$$

where:

- $\Delta h_{i,t} = h_{i,t} - h_{i,t-1}$ is change in health status,
- $\Delta h_{i,t-1} = h_{i,t-1} - h_{i,t-2}$ is lagged change in health status,
- $\Delta I_{i,t-1} = I_{i,t-1} - I_{i,t-2}$ is lagged change in income,
- $\mathbf{p}_i$ is a vector of other predictors like level of education, labor force status, age,
- $\mathbf{z}_i$ is the vector of regression parameters corresponding to the elements of $\mathbf{p}_i$,
- $\varepsilon_{i,t}$ are the random errors.
- $i = 1, ..., n$ where n is the number of individuals in the period 1996-1998.

The second model investigates the relationship between change in income as a response and the lagged change in income, the lagged change in health predictors complemented by additional explanatory variables (Veall, 2002)

Income model

$$\Delta I_{i,t} = \beta_{i,1}\Delta I_{i,t-1} + \beta_{i,2}\Delta h_{i,t-1} + \mathbf{p}\prime_i\mathbf{z}_i + \varepsilon_{i,t}, \qquad t = 1998, \quad i = 1, ..., n \qquad (6)$$

where $\Delta I_{i,t} = I_{i,t} - I_{i,t-1}$ is change in income.

4.1.3 Auxiliary Models

In the analysis, some auxiliary models have been used for preliminary assessment of the relationships between health and income and vise versa existing in the data.

The models

$$h_{i,t} = \beta_{i,0} + \beta_{i,1} I_{i,t} + \varepsilon_{i,t},$$

$$I_{i,t} = \beta_{i,0} + \beta_{i,1} h_{i,t} + \varepsilon_{i,t},$$

where $t = 1996, ..., 1999$ and

$$h_{i,t} = \beta_{i,0} + \beta_{i,1} I_{i,t-j} + \varepsilon_{i,t},$$

$$I_{i,t} = \beta_{i,0} + \beta_{i,1} h_{i,t-j} + \varepsilon_{i,t},$$

where $t = 1997, ..., 1999, \quad j = 1, ..., 3, \quad 1996 \leq t - j \leq 1999,$
have been estimated separately for each t.

4.1.4 Income Deflation Procedure

For obtaining the real (deflated) income the following formula has been used

$$DI_t = (\frac{I_t}{CPI_t}) \times 100$$

where:

- DI_t is the real (deflated) income in the period t,
- I_t is the nominal income in the period t,
- CPI_t is the consumer price index in t calculated with reference to a predefined base.

The base change of the chain CPI's has been done in the following way

$$CPI_{t_N} = 100 + \left(\frac{CPI_t - CPI_{NB}}{CPI_{NB}} \right) \times 100$$

where:

- CPI_{t_N} is the CPI in the period t having a base CPI_{NB},
- CPI_{NB} is the new base of the chain indices.

As a base of the CPI's in the analysis the CPI_{1996} has been used.

4.2 Statistical Methodology

4.2.1 Ordinary Least Squares

The Ordinary Least Squares procedure is based on the minimization of the sum (Draper and Smith, 1998)

$$\boldsymbol{\varepsilon}'\boldsymbol{\varepsilon} = (\mathbf{Y} - \mathbf{X}\boldsymbol{\beta})'(\mathbf{Y} - \mathbf{X}\boldsymbol{\beta}) \tag{7}$$

where

- $\mathbf{Y}$ is a $(n \times 1)$ vector of observations,
- $\mathbf{X}$ is a $(n \times p)$ known matrix,
- $\boldsymbol{\beta}$ is a $(p \times 1)$ vector of parameters,
- $\boldsymbol{\varepsilon}$ is a $(n \times 1)$ vector of errors, and $E(\boldsymbol{\varepsilon}) = \mathbf{0}$, $V(\boldsymbol{\varepsilon}) = \mathbf{I}\sigma^2$

By taking the partial derivatives of the above equation with respect to the elements of $\boldsymbol{\beta}$, the normal equations

$$(\mathbf{X}'\mathbf{X})\mathbf{b} = \mathbf{X}'\mathbf{Y}$$

are obtained. The least squares estimates of $\boldsymbol{\beta}$ is $\mathbf{b}$, which in case that there are p independent equations in the normal equations system, are determined by

$$\mathbf{b} = (\mathbf{X}'\mathbf{X})^{-1}\mathbf{X}'\mathbf{Y} \tag{8}$$

The properties of the solution $\mathbf{b}$, irrespective of the distribution of the errors are:

- $\mathbf{b}$ minimizes the error sum of squares $\boldsymbol{\varepsilon}'\boldsymbol{\varepsilon}$,
- $\mathbf{b}$ is an unbiased estimate of $\boldsymbol{\beta}$ and has minimum variance in the class of linear unbiased estimators $\mathbf{W}'\mathbf{Y}$, where $\mathbf{W}$ is not a function of $\mathbf{Y}$.

4.2.2 Latent Variable Approach in Categorical Data Analysis

Let the model of interest be (Greene, 1990)

$$\mathbf{Y}^* = \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\varepsilon}$$

where

- $\mathbf{Y}^*$ is the vector of observations of the variable Y^*, having a continuous distribution and
- $E(\mathbf{Y}^*) = \mathbf{X}\boldsymbol{\beta}$.

However, Y^* is unobserved and there are no values recorded. Instead, there is a variable Y which is discrete and ordered. The relationship between the latent variable Y^* and the realized discrete and ordered outcome is

$$y_i = j \quad \text{if} \quad \delta_{j-1} < y_i^* \leq \delta_j$$

where δ_j is a threshold value such that

$$\delta_0 < \delta_1 < ... < \delta_{J-1} < \delta_J, \qquad \delta_0 = -\infty, \delta_J = \infty$$

and J is the number of categories of the discrete and ordered outcome.

The model for Y^* could be expressed as a cumulative probability model (Powers and Xie, 2000)

$$P(y_i \leq j|\mathbf{x}_i) = P(y^* \leq \delta_j|\mathbf{x}_i) = P(\mathbf{x}_i'\boldsymbol{\beta} + \varepsilon_i \leq \delta_j) = P(\varepsilon_i \leq \delta_j - \mathbf{x}_i'\boldsymbol{\beta}) = F(\delta_j - \mathbf{x}_i'\boldsymbol{\beta})$$

where $F(\cdot)$ is the distribution function of ε and $\mathbf{x}_i$ is the vector of predictors corresponding to y_i.

Then the cumulative probabilities under the latent variable model (without an intercept) have the form (Powers and Xie, 2000)

$$P(y_i = j|\mathbf{x}_i) = \begin{cases} F(\delta_1 - \mathbf{x}_i'\boldsymbol{\beta}), & j = 1; \\ F(\delta_j - \mathbf{x}_i'\boldsymbol{\beta}) - F(\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}), & 1 < j \leq J-1; \\ 1 - F(\delta_{J-1} - \mathbf{x}_i'\boldsymbol{\beta}), & j = J. \end{cases} \tag{9}$$

The estimation of the parameters δ_j and $\boldsymbol{\beta}$ of the ordered probability model is usually done by the Newton-Raphson method. A set of ordinal variables (Maddala, 1985)

$$Z_{ij} = \begin{cases} 1, & \text{if } Y_i \text{ falls in the } j\text{th category;} \\ 0, & \text{otherwise.} \end{cases} \qquad (i = 1, ..., n, j = 1, ..., J)$$

is defined such that

$$P(Z_{ij} = 1) = F(\delta_j - \mathbf{x}_i'\boldsymbol{\beta}) - F(\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}).$$

The likelihood function for the model is then

$$L = \prod_{i=1}^{n}\prod_{j=1}^{J}\{F(\delta_j - \mathbf{x}_i'\boldsymbol{\beta}) - F(\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta})\}^{Z_{ij}}$$

and the log-likelihood function is

$$l = \sum_{i=1}^{n}\sum_{j=1}^{J} Z_{ij}\log\{F(\delta_j - \mathbf{x}_i'\boldsymbol{\beta}) - F(\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta})\}.$$

The maximum likelihood estimates of the parameters are the solutions to

$$\left.\frac{\partial l}{\partial \boldsymbol{\beta}}\right|_{\boldsymbol{\beta}=\widehat{\boldsymbol{\beta}}} = 0, \qquad \left.\frac{\partial l}{\partial \boldsymbol{\delta}}\right|_{\boldsymbol{\delta}=\widehat{\boldsymbol{\delta}}} = 0$$

where no constraints are posed, the second partial derivatives are less than 0 and the second partial cross derivatives are equal to 0, where these are defined as:

$$\frac{\partial^2 l}{\partial \boldsymbol{\beta}^2}, \quad \frac{\partial^2 l}{\partial \boldsymbol{\beta}\partial \boldsymbol{\beta}'}, \quad \frac{\partial^2 l}{\partial \boldsymbol{\delta}^2}, \quad \frac{\partial^2 l}{\partial \boldsymbol{\delta}\partial \boldsymbol{\delta}'}, \quad \frac{\partial^2 l}{\partial \boldsymbol{\beta}\partial \boldsymbol{\delta}}.$$

The Newton-Raphson procedure is

$$\widehat{\boldsymbol{\theta}} \approx \boldsymbol{\theta}^* + J^{-1}(\boldsymbol{\theta}^*)U(\boldsymbol{\theta}^*)$$

where

- $\widehat{\boldsymbol{\theta}}$ is the vector of Newton-Raphson MLE's,
- $\boldsymbol{\theta}^*$ is the vector with initial values,
- $J(\cdot)$ is the observed information matrix based on the second derivatives,
- $U(\cdot)$ is the vector of first derivatives,

and is implemented by

1. Choosing a sensible starting value $\boldsymbol{\theta}^{(0)}$,
2. Updating the estimate

$$\widehat{\boldsymbol{\theta}}^{(k+1)} = \boldsymbol{\theta}^{(k)} + J^{-1}(\boldsymbol{\theta}^{(k)})U(\boldsymbol{\theta}^{(k)})$$

until

$$\| \widehat{\boldsymbol{\theta}}^{(k+1)} - \widehat{\boldsymbol{\theta}}^{(k)} \| < \varepsilon,$$

for obtaining the MLE's of the parameters. The variances and covariances of the estimates are obtained by

$$V(\widehat{\boldsymbol{\theta}}) = \left(J|_{\boldsymbol{\theta}=\widehat{\boldsymbol{\theta}}}\right)^{-1}.$$

4.2.3 Ordered Probit/Logit Models

The distribution of the error term $F(\cdot)$, or the distribution of the latent variable Y^*, could be any of the wide variety of continuous distributions. However, a frequent choice of distribution is either the standard normal, $N(0,1)$ or the logistic $logistic(0, \frac{\pi^2}{3})$, mainly due to the fact that they both have a mean of 0 and are symmetric.

In the case the latent variable has a standard normal distribution, the cumulative probabilities are given by (Powers and Xie, 2000)

$$P(y_i = j|\mathbf{x}_i) = \begin{cases} \Phi(\delta_1 - \mathbf{x}_i'\boldsymbol{\beta}), & j = 1; \\ \Phi(\delta_j - \mathbf{x}_i'\boldsymbol{\beta}) - \Phi(\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}), & 1 < j \leq J-1; \\ 1 - \Phi(\delta_{J-1} - \mathbf{x}_i'\boldsymbol{\beta}), & j = J. \end{cases} \tag{10}$$

where $\Phi(\cdot)$ is the cumulative standard normal distribution function.

In the case the distribution of the latent variable is logistic, the cumulative probabilities are

$$P(y_i = j|\mathbf{x}_i) = \begin{cases} \frac{\exp\{\delta_1 - \mathbf{x}_i'\boldsymbol{\beta}\}}{1+\exp\{\delta_1 - \mathbf{x}_i'\boldsymbol{\beta}\}}, & j = 1; \\ \frac{\exp\{\delta_j - \mathbf{x}_i'\boldsymbol{\beta}\}}{1+\exp\{\delta_j - \mathbf{x}_i'\boldsymbol{\beta}\}} - \frac{\exp\{\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}\}}{1+\exp\{\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}\}}, & 1 < j \leq J-1; \\ 1 - \frac{\exp\{\delta_{J-1} - \mathbf{x}_i'\boldsymbol{\beta}\}}{1+\exp\{\delta_{J-1} - \mathbf{x}_i'\boldsymbol{\beta}\}}, & j = J. \end{cases} \tag{11}$$

Unlike the ordinal probit model, the ordered logit model is linear in the logistic scale. This means that (Powers and Xie, 2000)

$$\log\left(\frac{P(y_i \leq j|\mathbf{x}_i)}{1 - P(y_i \leq j|\mathbf{x}_i)}\right) = \log\left(\frac{P(y_i \leq j|\mathbf{x}_i)}{P(y_i > j|\mathbf{x}_i)}\right) = \delta_j - \mathbf{x}_i'\boldsymbol{\beta}.$$

In addition, it is also often called proportional odds model, since given two covariate vectors $\mathbf{x}_{i1}$ and $\mathbf{x}_{i2}$, the odds of a response $y_i \leq j$ versus $y_i > j$ are proportionally

higher or lower in the situations $\mathbf{x}_i = \mathbf{x}_1$ and $\mathbf{x}_i = \mathbf{x}_2$. This could be seen if the cumulative odds ratio (COR) is defined

$$\frac{\omega(\mathbf{x}_1)}{\omega(\mathbf{x}_2)} = \frac{P(y \leq j|\mathbf{x}_1)/P(y > j|\mathbf{x}_1)}{P(y \leq j|\mathbf{x}_2)/P(y > j|\mathbf{x}_2)} = \frac{\exp(\delta_j - \mathbf{x}_1'\boldsymbol{\beta})}{\exp(\delta_j - \mathbf{x}_2'\boldsymbol{\beta})} = \exp(\mathbf{x}_1 - \mathbf{x}_2)'\boldsymbol{\beta}$$

where $\omega(\cdot)$ denotes the cumulative odds associated with either $\mathbf{x}_1$ or $\mathbf{x}_2$. The COR is proportional to the distances between the values of the explanatory variables. It is important also to notice that the effects of $\mathbf{x}$ are invariant with respect to the outcome categories, namely $\boldsymbol{\beta}$ is not indexed by j. The cumulative log-odds ratio is also invariant with respect to j

$$\frac{\omega(\mathbf{x}_1)}{\omega(\mathbf{x}_2)} = (\mathbf{x}_1 - \mathbf{x}_2)'\boldsymbol{\beta}.$$

The proportional log-odds model defines that the odds of being in each category j or higher compared to all previous categories is constant. Also, the estimated coefficients $\widehat{\boldsymbol{\beta}}$ represent log-odds ratios.

4.2.4 Regression with Gamma Distribution in the Generalized Linear Models Case

The gamma distribution in the GLM modelling is employed whenever the errors of a regression model follow a gamma distribution. Thus, $Y \sim Gamma(\mu, \nu)$ and according to the parametrization of the gamma distribution used in the GLM estimation (McCullagh and Nelder, 1989)

$$f(y; \nu, \mu) = \frac{(\frac{\nu y}{\mu})^{\nu} \exp\{-\frac{\nu y}{\mu}\}}{\Gamma(\nu) y}, \qquad y > 0,\ \nu > 0$$

where ν is the shape parameter, the log likelihood for each Y_i has the form

$$l_i(\theta_i; y_i) = \nu(-\frac{y_i}{\mu_i} - \log \mu_i) + (\nu - 1)\log y_i + \nu \log \nu - \log \Gamma(\nu).$$

Using the general form of the log-likelihood for the exponential family (McCullagh and Nelder, 1989)

$$l(\theta, \varphi; y) = \frac{(y\theta - \gamma(\theta))}{\varphi(\theta)} + \tau\left(y, \varphi(\theta)\right)$$

where θ is a natural parameter, φ is the dispersion or scale parameter, it is possible to see that for the gamma distribution $\theta_i = -\frac{1}{\mu_i}$, $\gamma(\theta) = -\log(-\theta_i)$, $\varphi(\theta_i) = \frac{1}{\nu}$ and the $E(Y_i) = \gamma'(\theta_i) = \mu_i$ and $Var(Y_i) = \gamma''(\theta_i) = \mu_i^2$.

Commonly used links for the gamma distribution are

$$\eta(\mu_i) = \mu_i^{-1},$$

$$\eta(\mu_i) = \log \mu_i,$$

$$\eta(\mu_i) = \mu_i,$$

which are called inverse, log and identity links respectively.

The deviance, which is proportional to twice the difference between the log likelihood achieved under the model and the maximum attainable value is (McCullagh and Nelder, 1989)

$$D(\mathbf{y}; \widehat{\mu}) = -2 \sum_{i=1}^{n} \left\{ \log\left(\frac{y_i}{\widehat{\mu}_i}\right) - \frac{y_i - \widehat{\mu}_i}{\widehat{\mu}_i} \right\}$$

where y_i are the observed response values and $\widehat{\mu}_i$ are the fitted mean values.

The estimation of the model based on the gamma distribution is realized by applying the Newton-Raphson procedure.

4.2.5 Marginal Effects in Ordered Probit/Logit Models

Marginal effects account for the change in the dependent variable for a unit change in the independent variable in the simple linear regression model. In the multiple regression setting, the marginal effects account for the change in the dependent variable

for a unit change in a specific independent variables, where all other predictors are held constant. In the OLS regression models where no transformation has been made on any of the predictors or the response, the marginal effects are the estimates of the regression parameters. However, in the case of the ordered probit/logit models, the situation is slightly different.

For the ordered probit model the marginal effects of x_k are given by (Powers and Xie, 2000)

$$\frac{\partial P(y_i = j|\mathbf{x}_i)}{\partial x_{ik}} = \begin{cases} -\phi(\delta_1 - \mathbf{x}_i'\boldsymbol{\beta})\beta_k, & j = 1; \\ \{\phi(\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}) - \phi(\delta_j - \mathbf{x}_i'\boldsymbol{\beta})\}\,\beta_k, & 1 < j \leq J-1; \\ \phi(\delta_{J-1} - \mathbf{x}_i'\boldsymbol{\beta})\beta_k, & j = J. \end{cases} \tag{12}$$

where $\phi(\cdot)$ is the probability density function of the standard normal distribution.

In the ordered logit situation the marginal effects of x_k are given by

$$\frac{\partial P(y_i = j|\mathbf{x}_i)}{\partial x_{ik}} = \begin{cases} -\left\{\frac{\exp\{\delta_1 - \mathbf{x}_i'\boldsymbol{\beta}\}}{\left[1+\exp\{\delta_1 - \mathbf{x}_i'\boldsymbol{\beta}\}\right]^2}\right\}\beta_k, & j = 1; \\ \left\{\frac{\exp\{\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}\}}{\left[1+\exp\{\delta_{j-1} - \mathbf{x}_i'\boldsymbol{\beta}\}\right]^2} - \frac{\exp\{\delta_j - \mathbf{x}_i'\boldsymbol{\beta}\}}{\left[1+\exp\{\delta_j - \mathbf{x}_i'\boldsymbol{\beta}\}\right]^2}\right\}\beta_k, & 1 < j \leq J-1; \\ \left\{\frac{\exp\{\delta_{J-1} - \mathbf{x}_i'\boldsymbol{\beta}\}}{\left[1+\exp\{\delta_{J-1} - \mathbf{x}_i'\boldsymbol{\beta}\}\right]^2}\right\}\beta_k, & j = J. \end{cases} \tag{13}$$

4.2.6 Marginal Effects in the Gamma distribution GLM

The way the marginal effects for the fitted gamma GLM are estimated depends on the link function used. Considering the links already presented, the marginal effects could be presented as follows:

- Link $\eta(\mu) = \mu^{-1}$

$$\frac{\partial \mu}{\partial X_j} = -(\mathbf{X}\boldsymbol{\beta})^{-2}\beta_j$$

since the model under consideration has the form $\mu_i = (\mathbf{X}\boldsymbol{\beta})^{-1}$,

- Link $\eta(\mu) = \log \mu$

$$\frac{\partial \mu}{\partial X_j} = \beta_j \exp\{\mathbf{X}\boldsymbol{\beta}\}$$

since the model under consideration has the form $\mu_i = \exp\{\mathbf{X}\boldsymbol{\beta}\}$,

- Link $\eta(\mu) = \mu$

$$\frac{\partial \mu}{\partial X_j} = \beta_j$$

since the model under consideration has the form $\mu_i = \mathbf{X}\boldsymbol{\beta}$.

4.2.7 Likelihood Ratio Test

Let us suppose that there are two models considered, ω_1 and ω_2, such that $\omega_1 \subset \omega_2$. The main idea is to compare the maximized likelihoods of the two models in order to determine whether ω_1 is an acceptable model compared to ω_2 for the data available.

The maximized likelihood under the model ω_1 is

$$\max_{\theta \in \omega_1} L(\theta; y) = L(\widehat{\theta}_{\omega_1}; y)$$

where $\widehat{\theta}_{\omega_1}$ denotes the maximum likelihood estimate of θ under the model ω_1.

The maximized likelihood under the model ω_2 is

$$\max_{\theta \in \omega_2} L(\theta; y) = L(\widehat{\theta}_{\omega_2}; y)$$

where $\widehat{\theta}_{\omega_2}$ denotes the maximum likelihood estimate of θ under the model ω_2.

The likelihood ratio

$$\lambda = \frac{L(\widehat{\theta}_{\omega_1}; y)}{L(\widehat{\theta}_{\omega_2}; y)}$$

is defined and, under suitable regularity conditions, minus twice the log of the likelihood ratio has asymptotically a chi-square distribution with degrees of freedom equal to the difference in the number of parameters between the two models. Thus,

$$-2\log\lambda = 2l(\widehat{\theta}_{\omega_2}; y) - 2l(\widehat{\theta}_{\omega_1}; y) \sim \chi^2_\nu,$$

where the degrees of freedom ν are

$$\nu = \dim(\omega_2) - \dim(\omega_1).$$

4.2.8 Wald Test

Under certain regularity conditions, the maximum likelihood estimator $\widehat{\theta}$ has approximately in large samples a (multivariate) normal distribution with mean equal to the true parameter value and variance-covariance matrix given by the inverse of the information matrix, so that

$$\widehat{\theta} \sim AN_p(\theta, I^{-1}(\theta))$$

The regularity conditions include the following:

- The true parameter value θ must be interior to the parameter space,
- The log-likelihood function must be thrice differentiable,
- The third derivatives must be bounded.

This result provides a basis for constructing tests of hypotheses and confidence regions. For example under the hypothesis

$$H_0 : \theta = \theta_0$$

for a fixed value θ_0, the quadratic form

$$W = (\widehat{\theta} - \theta_0)' Var^{-1}(\widehat{\theta})(\widehat{\theta} - \theta_0)$$

has approximately in large samples a chi-squared distribution with p degrees of freedom. These results are extendable to arbitrary linear combinations of θ, including sets of elements of θ.

When the subset has only one element the square root of the Wald statistic is taken and the ratio

$$z = \frac{\widehat{\theta} - \theta_0}{\sqrt{Var(\widehat{\theta})}}$$

is treated as a z-statistic.

Frequently, for estimating the variances the observed information matrix is used.

4.2.9 Bootstrap Confidence Intervals of Parameters Estimates in Linear Regression

Standard parametric confidence intervals (SPCI's) provide a measure of significance for the estimates of the regression parameters. However, a requirement for the construction of the SPCI's is the acceptance of Gaussian assumptions regarding the estimates. In cases when such an assumption is inappropriate, an alternative to the SPCI's could be CI's built on the basis of nonparametric methods using bootstrap estimates of the variability of the estimated coefficients.

For the purpose of the analysis the nonparametric bootstrap normal, percentile and bias-corrected (BC) confidence intervals have been considered.

The $100(1 - 2\alpha)\%$ bootstrap normal confidence interval is defined as

$$\left[\widehat{\theta} - t_{1-\alpha,R-1}\sqrt{\widehat{v}_B},\ \ \widehat{\theta} - t_{\alpha,R-1}\sqrt{\widehat{v}_B}\right]$$

where α is the significance level, $t_{(\cdot),R-1}$ is the $(\cdot)$ quantile of the Student's t distribution with $R-1$ degrees of freedom and

- R is the number of replications,
- $\widehat{\theta}$ is the parameter estimate,
- $\widehat{v}_B$ is the bootstrap estimate of the variance of $\widehat{\theta}$, defined as $Var(\widehat{\theta}) \approx Var(\widehat{\theta}^* - \widehat{\theta}|X^*)$.

A crucial requirement for the usage of the bootstrap normal interval is that, in the worst case, the distribution of $\widehat{\theta}$ has to be symmetric. If this is not the case, the inference based on that CI could be misleading.

The two sided $(1-2\alpha)$ bootstrap percentile interval is defined to be (Efron and Tibshirani, 1993)

$$\left[\widehat{\theta}^*_{(\alpha)},\ \ \widehat{\theta}^*_{(1-\alpha)}\right]$$

where $\widehat{\theta}^*_{(\cdot)}$ is the $(\cdot)$ percentile of the $\widehat{\theta}^*$ distribution.

Now, let

$$z_0 = \Phi^{-1}\left\{\frac{\#(\widehat{\theta}^*_i \leq \widehat{\theta})}{R}\right\}$$

where $\#(\widehat{\theta}^*_i \leq \widehat{\theta})$ is the number of elements of the bootstrap distribution that are less than or equal to the estimated statistic and Φ is the standard cumulative normal. Let

$$p_1 = \Phi(2z_0 - z_{1-\alpha})$$

$$p_2 = \Phi(2z_0 + z_{1-\alpha})$$

where $z_{1-\alpha}$ is the $(1-\alpha)$th quantile of the standard normal distribution. Then the BC interval is defined as (Efron and Tibshirani, 1993)

$$\left[\widehat{\theta}^*_{p_1},\ \ \widehat{\theta}^*_{p_2}\right]$$

where $\widehat{\theta}_p^*$ is the pth quantile of the bootstrap distribution.

The multiple linear regression was performed with 1000 bootstrap replications, by fixing the design matrix and resampling from $(y_i, \mathbf{x}_i)$, the possible responses conditional on the vector of predictors that referred to them. If the confidence interval for a parameter estimate failed to include 0, then the p-value was deemed to be less than or equal to $\alpha = 0.05$, and the coefficient was regarded as significant.

The sampling weights were not taken into account in the bootstrapping. In addition, no clustering adjustment was performed.

4.3 Assumptions in the Analysis

The assumptions on the basis of which the analysis has been conducted could be summarized as follows

- The observations on the different subjects are independent within one time period and between periods,
- Under the ordered probit model, the latent variable $\mathbf{Y}^* \sim N(\mathbf{X}\boldsymbol{\beta}, \mathbf{I})$ whereas under the ordered logit $\mathbf{Y}^* \sim \mathit{logistic}(\mathbf{X}\boldsymbol{\beta}, \frac{\pi^2}{3}\mathbf{I})$, where $\mathbf{I}$ is the identity matrix,
- The coefficients in the ordered probit model are the same for all groups of the response,
- For the ordinal logit model, the odds across response categories are proportional,
- In the GLM situation the errors are assumed to have gamma distribution. The canonical link is taken to be log.

4.4 Research Hypotheses

The economic theory, the numerous relative research results from previous studies and the objective reasoning suggest the following research hypotheses:

1. Health and income are positively related which implies that when income increases health improves, as well as when health improves income increases,

2. Change in health and change in income are positively related in a way that a positive increment in income produces a positive increment in health as well as vise versa,

3. There are additional predictors like level of education, age, labor force status, stress, sex that contribute to the explanation of the health-income relationships so that

   (a) A higher educational level produces a higher income as well as better health,

   (b) As age increases income increases, health improves and health and income are not closely related up to a certain age, when the relationship between health and income becomes stronger due to the age effect on health and the effect of income as a resource for health,

   (c) When labor force status deteriorates, income decreases and health worsens,

   (d) For higher stress levels health worsens and as stress declines health improves and income increases,

   (e) A female gender suggests a lower income and better health as the male gender implies higher income and poorer health,

4. The additional predictors affect the change in health change in income relationship in same way as they affect the health-income relationship.

4.5 Problems

Like almost every applied research dealing with real data collected from real people, the present investigation also faces some problems:

1. Current health status is self-assessed and self-reported in the SLID and hence may not be consistent with an "objective" measure of health. Although it is assumed that the entries are made after comparing the person's own health to the health of the people his/her age, this is not always the case,

2. The Current stress level, used as a channel variable, is also self-reported,

3. In the SLID there is no wealth variable of any kind that could be used as a substitute for income in special cases like the analysis of the health-income relationship for older people, whose wealth is a determining factor of economic means,

4. The income used in the analysis is transitive and may reflect short term fluctuations. Thus any changes in income might not affect health,

5. There could be correlation between members of the same family, thus producing clusters not having iid errors.

5 Levels Models Results

5.1 Exploration of the Variable Relationships

The study of the relationship between health and income begins by graphical inspection of their association. Figures 1 and 2 present box plots of income 1998 and income 1999 by groups of health 1996.

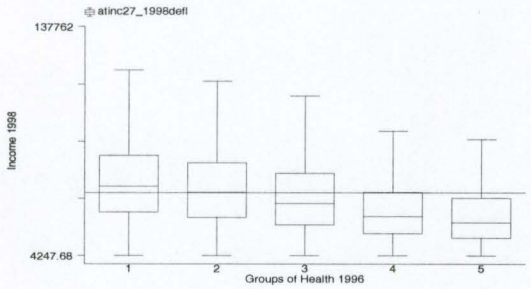

Figure 1: *Box Plot of Income 1998 by Groups of Health Status 1996*

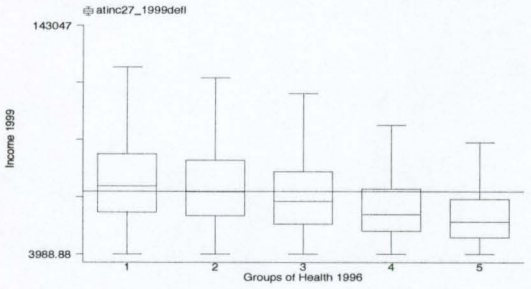

Figure 2: *Box Plot of Income 1999 by Groups of Health Status 1996*

One can see that income tends to be relatively higher for people reporting excellent (1) or very good (2) health, whereas it seems to decrease for persons who characterized their health as fair (4) or poor (5). The overall decreasing pattern of income by categories of health suggests that there exists a positive association between them. In addition, the variance in income appears to be higher for the subjects in the first two groups which might be a result of a third factor influence on the relationship of interest.

Along with the immediate association between income and health, their "partial" relationships with the other variables used in the analysis are also of interest. Figures 3 and 4 present box plots of income 1998 and income 1999 by groups of the variable highest level of education.

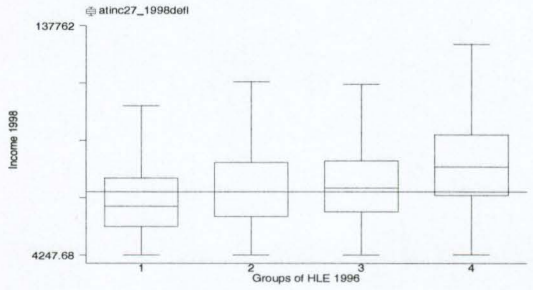

Figure 3: *Box Plot of Income 1998 by Groups of Highest Level of Education 1996*

The group of people who have less than high school education (1) and who are deemed to be the least qualified have the lowest income among all groups. On the contrary, the group of the university graduates (4) beats the income of all other groups rather respectably. The high school graduates (2) and the non-university postsecondary certificate holders (3) seem to be hardly distinguishable in terms of income. The overall increasing pattern of income by groups of education suggests

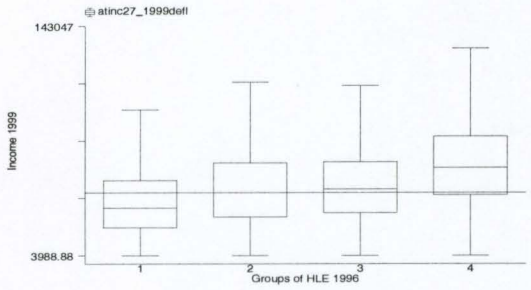

Figure 4: *Box Plot of Income 1999 by Groups of Highest Level of Education 1996*

that there exists a positive association between income and education.

In addition, Figure 5 presents box plots of income 1998 and income 1999 by the groups of the variables annual labor force status 1996, sex and current stress level 1996 respectively.

The income shows dependence on the categories of annual labor force status 1996. For the group of people employed for the whole year 1996 (1), both income 1998 and income 1999 are considerably higher than for the rest of the groups. The difference between the unemployed (2) and all other categories is greatest, which is a result of lower income that the unemployed have.

The variable sex, on the other hand, appears to possess an insignificant discriminating power. The family income for both male (1) and female (2) groups is almost identical, being, however, slightly higher for the males.

The box plots of income by categories of current stress level suggest that stress might have an influential power on income or vice versa. People who reported high (1) or moderate (2) stress levels seem to have higher income than the ones that characterized their current 1996 stress levels as somewhat stressful (3) or not at all stressful (4). A possible explanation might be that persons tend to associate stress

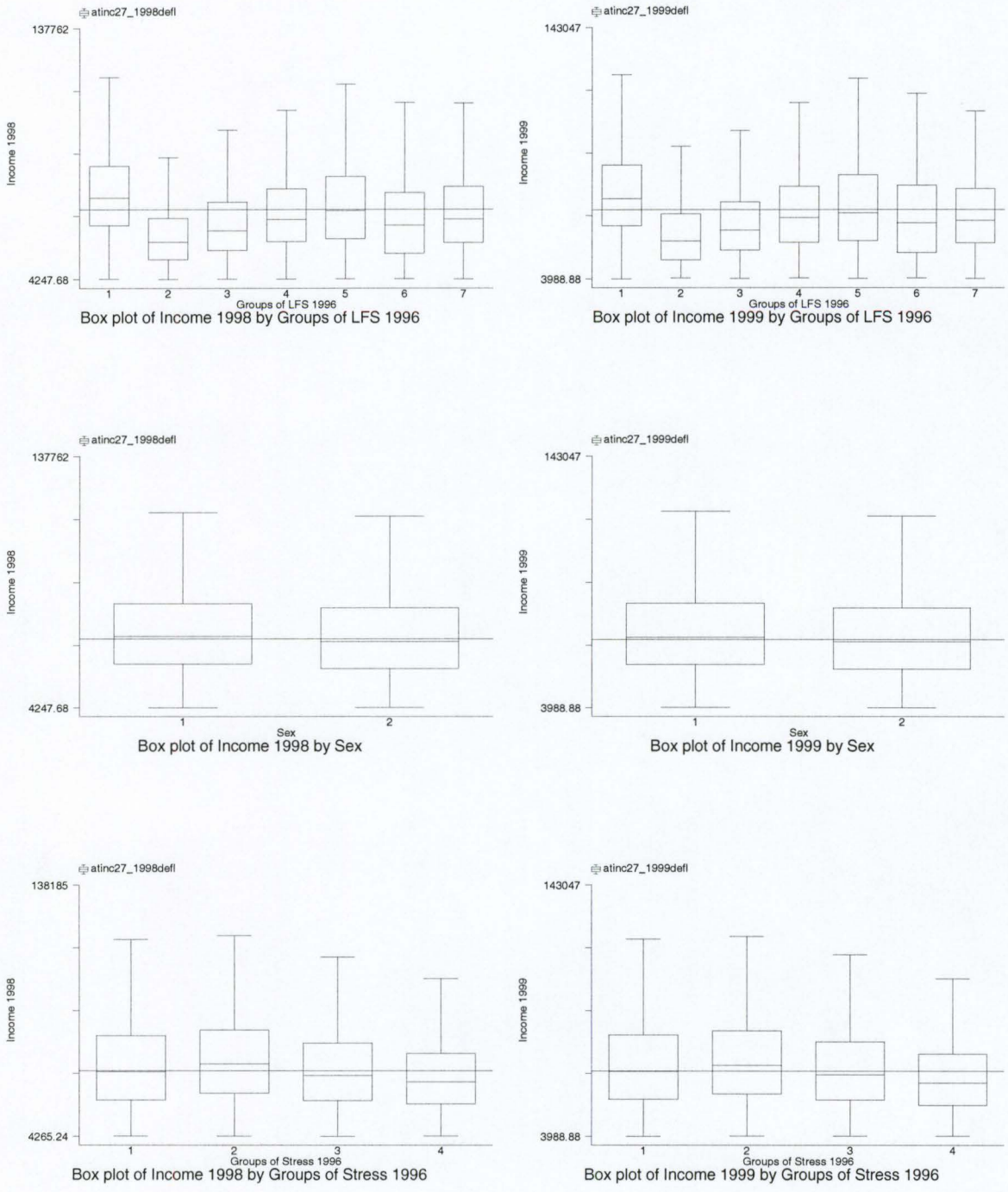

Figure 5: *Box Plots of Income 1998 and Income 1999 by Groups of Various Variables*

with their work responsibilities and environment rather than other factors. Thus higher remuneration corresponds to greater responsibility resulting in a higher level of stress.

It is important to note that the box plots patterns by variable do not change with the lag. This means that the there are steady correspondences between the groups of every variable under consideration within a two and three year lag and no rapid changes in the status of the respondents as a whole have taken place. This could be evidence for a stable medium run association between the events under investigation.

The health "partial" relationships with annual labor force status, education, sex and stress are presented in Tables 1 to 8.

Table 1: *Table of Current State of Health 1998 by Labor Force Status 1996*

CSH 1998	Annual Labor Force Status 1996						
	Employed	Unemployed	NLF	EPY-UPY	EPY-NLFPY	UPY-NLFPY	AOA
Excellent	0.3027	0.2073	0.1866	0.2810	0.3671	0.3065	0.3407
Very good	0.4152	0.3316	0.3030	0.4106	0.3807	0.3417	0.3888
Good	0.2216	0.2694	0.2650	0.2292	0.1767	0.2312	0.2004
Fair	0.0493	0.1295	0.1558	0.0628	0.0589	0.0804	0.0521
Poor	0.0112	0.0570	0.0895	0.0164	0.0151	0.0417	0.0190
Fraction	0.5636	0.0193	0.2079	0.0733	0.0662	0.0199	0.0499
# obs.	41097						

Health 1998 and health 1999, in Tables 1 and 2, appear to be related to labor force status 1996. Employed people in general report better health than the one reported

Table 2: *Table of Current State of Health 1999 by Labor Force Status 1996*

CSH 1999	Annual Labor Force Status 1996						
	Employed	Unemployed	NLF	EPY-UPY	EPY-NLFPY	UPY-NLFPY	AOA
Excellent	0.2857	0.1935	0.1882	0.2661	0.3449	0.2766	0.3206
Very good	0.4168	0.3441	0.2920	0.3901	0.3540	0.3457	0.4081
Good	0.2281	0.2581	0.2670	0.2571	0.2103	0.2447	0.1839
Fair	0.0557	0.1452	0.1613	0.0658	0.0711	0.1011	0.0717
Poor	0.0138	0.0538	0.0920	0.0209	0.0197	0.0266	0.0157
Fraction	0.5730	0.0186	0.2120	0.0669	0.0661	0.0188	0.0446
# obs.	19871						

by all other groups: 71.71% and 70.25% of the employed in 1998 and 1999 respectively report excellent or very good health. An exception of the rule turns out to be the group of persons who have a non-constant labor status (AOA) who report even better health. Poorer health, on the other hand, is reported mainly by individuals who are unemployed or not in the labor force in 1996. About 13% of the unemployed and 16% of the NLF in 1996 reported fair health in 1998, compared to only around 5% of the employed. The differences in 1999 health are close to that margin for the same groups. Overall, the poorest health in 1998 and 1999 seems to be reported by the individuals who are not in the labor force in the year 1996.

An additional feature of the health labor force association is the deterioration of health within the labor force groups as the lag changes from two to three years. Most likely, this is a result of the age effect.

The cross tabulations, Tables 3 and 4, of health 1998 and health 1999 by level of education in 1996 suggest the existence of an association.

Table 3: *Table of Current State of Health 1998 by Highest Level of Education 1996*

CSH 1998	Education 1996			
	LHS	GHS	NUPC	UD
Excellent	0.1919	0.2927	0.2668	0.3429
Very good	0.3138	0.3925	0.4016	0.4076
Good	0.2794	0.2260	0.2340	0.1910
Fair	0.1499	0.0645	0.0725	0.0444
Poor	0.0653	0.0242	0.0255	0.0140
Fraction	0.3168	0.2805	0.2744	0.1283
# obs.	45979			

The individuals having a university degree (UD) in the two years report better health than the individuals in the other three groups: 34.29% and 40.76% of the UD report excellent and very good health for 1998, 34.36% and 40.90% are the respective numbers for health 1999. Furthermore, the percentage of the persons in the UD group

Table 4: *Table of Current State of Health 1999 by Highest Level of Education 1996*

CSH 1999	Education 1996			
	LHS	GHS	NUPC	UD
Excellent	0.1792	0.2759	0.2578	0.3436
Very good	0.3102	0.3951	0.3964	0.4090
Good	0.2871	0.2311	0.2411	0.1865
Fair	0.1529	0.0726	0.0793	0.0496
Poor	0.0710	0.0253	0.0251	0.0120
Fraction	0.3114	0.2921	0.2634	0.1330
# obs.	22031			

reporting good, fair and poor health is considerably smaller than the one in the rest of the groups. The same situation is repeated for health 1999. Poorest health 1998 and 1999 is reported by the individuals having less than a high school education.

Tables 5 and 6 present health 1998 and health 1999 by sex.

Table 5: *Table of Current State of Health 1998 by Sex*

CSH 1998	Sex	
	Male	Female
Excellent	0.282430	0.239779
Very good	0.369964	0.373835
Good	0.228644	0.251379
Fair	0.083527	0.098118
Poor	0.035436	0.036889
Fraction	0.4741	0.5259
# obs.	45979	

Table 6: *Table of Current State of Health 1998 by Sex*

CSH 1999	Sex	
	Male	Female
Excellent	0.266204	0.235137
Very good	0.367424	0.373857
Good	0.237795	0.251905
Fair	0.090067	0.101753
Poor	0.038300	0.037157
Fraction	0.4752	0.5248
# obs.	22031	

The data suggest that male respondents are more inclined to report excellent health compared to the female ones. Along with that, female individuals report more

frequently very good, good and fair health. Overall however, it is difficult to determine whether sex might have a predictive power on health.

The data presented in Tables 7 and 8 suggest that stress in 1996 is probably of importance to the state of health in 1998 and 1999.

Table 7: *Table of Current State of Health 1998 by Current Stress Level 1996*

CSH 1998	Current Stress Level 1996			
	Very Stressful	Somewhat stressful	Not very stressful	Not at all stressful
Excellent	0.2062	0.2630	0.2761	0.2844
Very good	0.3368	0.3945	0.3720	0.3435
Good	0.2596	0.2318	0.2388	0.2489
Fair	0.1202	0.0809	0.0867	0.0962
Poor	0.0779	0.0297	0.0264	0.0278
Fraction	0.1348	0.4547	0.2919	0.1185
# obs.	44936			

Table 8: *Table of Current State of Health 1999 by Current Stress Level 1996*

CSH 1999	Current Stress Level 1996			
	Very Stressful	Somewhat stressful	Not very stressful	Not at all stressful
Excellent	0.1940	0.2502	0.2634	0.2832
Very good	0.3205	0.3867	0.3814	0.3491
Good	0.2696	0.2466	0.2362	0.2299
Fair	0.1337	0.0865	0.0901	0.1014
Poor	0.0821	0.0300	0.0289	0.0363
Fraction	0.1376	0.4533	0.2908	0.1183
# obs.	21875			

An evidence of that is the considerably poorer health 1998 and 1999 of the individuals who described their stress level as very high in comparison to the rest. In addition, the individuals who characterized their 1996 stress level as somewhat stressful, not very stressful and not at all stressful are relatively similar healthwise suggesting a threshold effect of high stress.

The reported health 1998 and health 1999 seem also associated to age as could be seen on Figure 6.

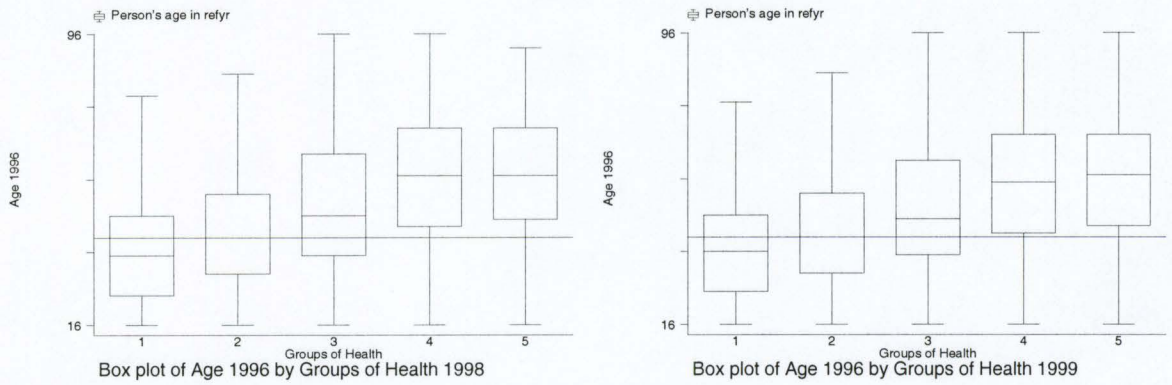

Figure 6: *Box Plot of Age 1996 by the Groups of Current Health Status 1998 and 1999*

It appears that younger persons report better health which is a natural predisposition. The overall increasing pattern of age by categories of health suggests that a negative relationship may exist between them.

5.2 The Health Models

Based on economic theory and supported by the graphical analysis evidence of existing natural associations in the data, models (1) and (2) have been constructed and estimated as ordered probit models.

The estimates of the regression parameters of model (1) are presented in the following table.

Table 9: *Ordered Probit Estimates of Model (1) for Health, 1998*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.105665	0.015954	4802.49	0.000	10010.79	0.0000
Health(Very good)*	-0.518119	0.014431	1288.81	0.000		
Health(Fair)*	0.672299	0.023102	846.81	0.000		
Health(Poor)*	1.538780	0.036755	1753.10	0.000		
Income	-1.95E-06	2.05E-07	90.06	0.000	90.38	0.0000
LFS (Unemployed)*	0.211324	0.039254	28.94	0.000	112.93	0.0000
LFS (NLF)*	0.146239	0.015627	87.61	0.000		
LFS (EPY-UPY)*	0.060866	0.021342	8.12	0.004		
LFS (EPY-NLFPY)*	-0.010670	0.022922	0.22	0.642		
LFS (UPY-NLFPY)*	0.098924	0.039548	6.25	0.012		
LFS (AOA)*	0.041587	0.025907	2.59	0.108		
Sex(Female)*	0.035976	0.011022	10.63	0.001	10.63	0.0010
HLE(GHS)*	-0.076183	0.014776	26.63	0.000	78.00	0.0000
HLE(NUPC)*	-0.068385	0.014914	21.07	0.000		
HLE(UD)*	-0.165838	0.019058	75.69	0.000		
Age	0.011467	0.000428	717.70	0.000	719.57	0.0000
cut1	-0.806429	0.026980				
cut2	0.409545	0.026793				
cut3	1.481797	0.027716				
cut4	2.363663	0.030737				
N	41097					
Log likelihood	-48376.61					
LR chi2(16)	15147.57					

All predictors included in the model prove to have a significant explanatory power based on the likelihood ratio test. Not all estimates, however, seem to be significant. The coefficient of labor force category[1] EPY-NLFPY seems to be insignificant based on the Wald test.

[1]Throughout the analysis, the star symbol next to a category of a predictor represents a dummy variable

For exploring the direct relationships of the predictors and their categories on health 1998, the marginal effects presented in Table 10 were estimated.

Table 10: *Ordered Probit Estimates of Marginal Effects in Model (1)*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.371444	-0.034250	-0.235250	-0.084650	-0.017300
Health(Very good)*	0.164853	0.011196	-0.119850	-0.046750	-0.009460
Health(Fair)*	-0.159770	-0.098570	0.137249	0.092798	0.028292
Health(Poor)*	-0.232710	-0.312460	0.124413	0.254504	0.166258
Income	5.96E-07	9.47E-08	-4.6E-07	-1.91E-07	-3.95E-08
LFS (Unemployed)*	-0.059670	-0.018490	0.048945	0.023700	0.005510
LFS (NLF)*	-0.043290	-0.009530	0.034324	0.015199	0.003304
LFS (EPY-UPY)*	-0.018260	-0.003580	0.014334	0.006184	0.001316
LFS (EPY-NLFPY)*	0.003274	0.000499	-0.002520	-0.001040	-0.000210
LFS (UPY-NLFPY)*	-0.029180	-0.006640	0.023225	0.010344	0.002255
LFS (AOA)*	-0.012540	-0.002330	0.009802	0.004184	0.000883
Sex(Female)*	-0.011010	-0.001740	0.008491	0.003525	0.000729
HLE(GHS)*	0.023558	0.003227	-0.017980	-0.007310	-0.001490
HLE(NUPC)*	0.021129	0.002930	-0.016140	-0.006570	-0.001340
HLE(UD)*	0.052863	0.004057	-0.039050	-0.014950	-0.002920
Age	-0.003510	-0.000560	0.002707	0.001124	0.000233
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

The results obtained are quite expected and not at all surprising. The probability of characterizing personal health as excellent in 1998, conditioned on excellent health in 1996, increases by over 37%, whereas conditioned on poor health, decreases with above 23%. The overall direction in the health 1996 health 1999 relationship turns out to be positive as a higher health status in 1996 is associated with an increase in the probability for a higher health status in 1999. This could also be seen from the regression coefficients in Table 9 where the change from good to very good or excellent health in 1996 is related to an increase in health 1998, whereas the change from good to fair or poor health in 1996 produces an opposite change in health 1998.

Income 1996, although having a quite small effect, contributes to improvement of health status 1998. A unit increase in income produces an increase in the probability of reporting excellent health by 5.96E-07 and reporting very good health by 9.47E-08.

At the same time the probabilities for characterizing the health as good, fair and poor decrease.

Labor force status seems to have some predictive power on health 1998. For the unemployed persons in 1996 the probability for reporting poorer health increases. This is common to all categories of the predictor with the exception of the EPY-NLFPY. However, as the regression coefficient of that dummy was not significant, any inference could be misleading. Thus, in general, health 1998 is affected by labor status 1996 and this relationship is positive. This could also be seen in Table 9 where the change in the status from employed to any other category produces a decrease in health 1998.

The regression coefficient of the predictor sex from Table 9 suggests that males report better health than females. In addition, the marginal effect of sex shows that being a female increases the probability of reporting good, fair or poor health by 0.85%, 0.35% and 0.07% respectively.

The highest level of education 1996 is a significant predictor of health 1998. Table 9 shows that the change from the lowest level of education, less than high school, to any other level produces an increase in health 1998. The marginal effects also suggest that higher education is associated with an increase in the probability of reporting better health.

Age 1996, as already discovered graphically, is negatively associated with health 1998. As seen in both Table 9 and 10, a unit increase in age 1996 produces a decrease in health 1998 as well as a decrease in the probability of reporting excellent and very good health.

The estimates of the regression parameters of model (2) are presented in Table

11. They generally follow the pattern from model (1), with income 1996 having a predictive power on health 1999. Along with that, health 1996 is a significant predictor of health 1999. In this setting, sex seems to be insignificant at the 10% level. In addition, some of the labor force dummies turn out to have no significant predictive power on health 1999, although the predictor labor force 1996 is significant.

Table 11: *Ordered Probit Estimates of Model (2) for Health, 1999*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.024221	0.022671	2041.232	0.000	4339.68	0.0000
Health(Very good)*	-0.466134	0.020647	509.856	0.000		
Health(Fair)*	0.673368	0.032617	426.010	0.000		
Health(Poor)*	1.396575	0.052572	705.434	0.000		
Income	-2.17E-06	2.86E-07	57.305	0.000	57.58	0.0000
Sex(Female)*	0.024652	0.015737	2.465	0.117	2.45	0.1172
LFS (Unemployed)*	0.191487	0.057234	11.223	0.001	41.44	0.0000
LFS (NLF)*	0.122294	0.022052	30.803	0.000		
LFS (EPY-UPY)*	0.077847	0.031666	6.052	0.014		
LFS (EPY-NLFPY)*	0.012623	0.032579	0.152	0.698		
LFS (UPY-NLFPY)*	0.049609	0.057947	0.740	0.392		
LFS (AOA)*	-0.003407	0.038880	0.008	0.930		
HLE(GHS)*	-0.087197	0.021004	17.223	0.000	76.38	0.0000
HLE(NUPC)*	-0.108645	0.021585	25.301	0.000		
HLE(UD)*	-0.233892	0.027077	74.650	0.000		
Age	0.011144	0.000610	333.793	0.000	334.54	0.0000
cut1	-0.854501	0.038400				
cut2	0.334427	0.038062				
cut3	1.371913	0.039215				
cut4	2.242905	0.043093				
N	19871					
Log likelihood	-24025.114					
LR chi2(16)	6727.43					

Education and age predictors retain their significance as higher education suggests better health, whereas the increase of age leads to a decrease in health.

The marginal effects of model (2), presented in Table 12, support the hypothesis that health 1999 is associated with income 1996. The probabilities of reporting excellent or very good health increase by 6.46E-07 and 1.44E-07 respectively for a dollar increase in income 1996. At the same time, the probabilities for reporting worse health decrease.

Table 12: *Ordered Probit Estimates of Marginal Effects in Model (2)*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.337657	-0.009570	-0.217225	-0.090204	-0.020659
Health(Very good)*	0.144570	0.019554	-0.105153	-0.047936	-0.011037
Health(Fair)*	-0.154909	-0.106331	0.125693	0.100476	0.035071
Health(Poor)*	-0.216764	-0.286186	0.110792	0.235976	0.156183
Income	6.46E-07	1.44E-07	-4.93E-07	-2.40E-07	-5.67E-08
Sex(Female)*	-0.007351	-0.001631	0.005611	0.002726	0.000645
LFS (Unemployed)*	-0.052956	-0.019209	0.042273	0.023665	0.006228
LFS (NLF)*	-0.035459	-0.009727	0.027570	0.014133	0.003483
LFS (EPY-UPY)*	-0.022602	-0.006154	0.017570	0.008979	0.002206
LFS (EPY-NLFPY)*	-0.003747	-0.000863	0.002870	0.001406	0.000335
LFS (UPY-NLFPY)*	-0.014517	-0.003739	0.011229	0.005654	0.001373
LFS (AOA)*	0.001017	0.000224	-0.000776	-0.000376	-0.000089
HLE(GHS)*	0.026323	0.005213	-0.019894	-0.009444	-0.002198
HLE(NUPC)*	0.032977	0.006180	-0.024808	-0.011656	-0.002693
HLE(UD)*	0.073991	0.007819	-0.053524	-0.023216	-0.005070
Age	-0.003322	-0.000739	0.002536	0.001233	0.000292
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

The health state in 1996 is a significant predictor of the future health. The probability of reporting excellent health in 1999, conditioned on having reported excellent health in 1996 increases by 33.77% whereas the probability drops conditioned on having reported worse health in 1996. The pattern in the probability for reporting better health 1999 than the one reported in 1996 suggests an overall improvement of health.

Being unemployed or out of the labor force in 1996 also seems to decrease the probability of reporting better health in 1999. Having a higher educational level, on the other hand, increases the probability of characterizing health 1999 as very good or excellent. The healthiest people, keeping all other predictors and conditions fixed, seem to be those with a university degree.

The predictor age appears to have the same negative effect on health 1999 as the one on health 1998. With the increase of age, the probability of reporting good, fair or poor health increases.

These results suggest that income has a significant predictive power on health 1998 and health 1999. In addition to income 1996, lagged health, labor force status, education, sex and age also contribute significantly to the model and could be used as predictors of future health.

Age Groups and Stress in the Health Model

The age groups analysis, the results from which are presented in Tables A.1 to A.16, was undertaken in order to investigate the health income relationship within the different age ranges. The justification for a treatment of that kind lies in the different economic and health behaviors of the subjects of different ages. Controlling for these aspects makes the results of the investigation much more reliable and concrete.

The two effects that deserve special attention in model (1) age groups analysis are the significant (dropping with age) income effect on future health and the positive effect of current health on future health. Model (2) shares the same features, but the three year lag seems to affect this pattern for the group of the 60 and over, where the suggested tendency does not hold.

The effect of income on health seems to be highest for the people in the group range under 20. For models (1) and (2) it is 2.57E-06 and 5.45E-06 respectively, which are the highest values of income for all age groups. Its effect tends to drop until it reaches 1.20E-06 and 1.02E-06 for model (1) and model (2) respectively in the 60 and over and the 50-59 groups correspondingly. In model (2), the people over 60 years of age seem to experience an income effect on health of 2.00E-06, which is higher only than the one in the third group.

Current health appears to have an increasing influence on future health by age

groups. The probability of being in the upper health group from the currently reported one is also increasing, which reconfirms the positive, strengthening with age, association between the current and future health.

The overall pattern of current health, current income and future health association suggests, that as people grow older, their future health is increasingly affected by their current health, whereas the income effect is diminishing.

Another special investigation of the health-income relationship has been done by introducing the current level of stress variable into the models (1) and (2) as an alternative to the current health variable. Tables A.17 to A.36 show the regression parameters' estimates and marginal effects of the predictors on future health for the whole panel.

Stress proves to have a significant predictive power on health. Moreover, with the decrease in the stress level, future health improves. The probabilities of reporting excellent health 1998 increase by 9.34%, 15.97% and 19.96% if the stress level has been been reduced to somewhat stressful, not very stressful or not at all stressful in 1996 respectively. At the same time these probabilities are 9.41%, 17.07% and 25.63% for health 1999.

Current income continues to predict health significantly with the stress variable in the model. A unit increase in income produces a future health improvement of 3.54E-06 in 1998 and 3.63E-06 in 1999. In addition, the marginal effect of income suggests that the probabilities for reporting better health increase when income rises.

Within each age group, the association between stress effect on future health and age appears to be positive. Decreasing stress has a bigger effect on future health for older people than those in the below 20 group. Persons in the range 60 and over seem

to be an exception, but still a decrease in stress improves their future health. The current income effect in these models, on the other hand, has the same, decreasing with age, effect on future health.

5.3 The Income Model

So far, the research was directed toward the predictive power of income on future health. The results achieved suggested that current income 1996 has a significant effect on health 1998 and 1999 and that effect changes with age.

An equally important question is whether current health is a significant predictor of future income. For the investigation of that aspect of the relationship, models (3) and (4) have been constructed and estimated. The marginal effects of the predictors have been calculated. Tables 13 and 14 present the results obtained for model (3).

Table 13: *Gamma GLM estimates of Model (3) for Income, 1998*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000012	1.63E-07	5470.082	0.000	4257.50	0.0000
Age	-0.001669	0.000419	15.840	0.000	17.68	0.0000
Health(Excellent)*	0.041932	0.015204	7.618	0.006	70.98	0.0000
Health(Very good)*	0.026893	0.014337	3.534	0.061		
Health(Fair)*	-0.088463	0.023048	14.746	0.000		
Health(Poor)*	-0.177645	0.034528	26.420	0.000		
Sex(Female)*	-0.029812	0.010747	7.673	0.006	8.59	0.0034
LFS (Unemployed)*	-0.276161	0.038848	50.552	0.000	111.72	0.0000
LFS (NLF)*	-0.100318	0.015420	42.380	0.000		
LFS (EPY-UPY)*	-0.092233	0.020786	19.714	0.000		
LFS (EPY-NLFPY)*	-0.061560	0.022226	7.673	0.006		
LFS (UPY-NLFPY)*	-0.126895	0.038734	10.758	0.001		
LFS (AOA)*	-0.098939	0.025078	15.603	0.000		
HLE(GHS)*	0.071919	0.014357	25.100	0.000	123.47	0.0000
HLE(NUPC)*	0.113585	0.014544	60.996	0.000		
HLE(UD)*	0.177987	0.018300	94.673	0.000		
Constant	10.145930	0.025790	154763.560	0.000		
N	40275					
Log likelihood	-468572.2		AIC	23.26948		
Deviance	7488.29138					

All predictors have a significant explanatory power on the variation in income 1998 at 10% level. In particular, the results for health 1996 suggest that when health improves, income increases. The actual amount of increase in income when health increases from good to very good or excellent is $1120.85 and $1755.81 respectively.

A deterioration of health to fair and poor is related to a drop of income by $3538.40 and $6792.89.

Table 14: *Marginal Effects of Model (3)*

	Income 1998
Variables 1996	Marginal Effect
Income	0.49970
Age	-69.32924
Health(Excellent)*	1755.81200
Health(Very good)*	1120.85200
Health(Fair)*	-3538.39500
Health(Poor)*	-6792.88700
Sex(Female)*	-1238.94200
LFS (Unemployed)*	-10076.59000
LFS (NLF)*	-4048.00200
LFS (EPY-UPY)*	-3684.60100
LFS (EPY-NLFPY)*	-2489.87400
LFS (UPY-NLFPY)*	-4962.38700
LFS (AOA)*	-3932.12700
HLE(GHS)*	3032.37300
HLE(NUPC)*	4833.91700
HLE(UD)*	7900.44200
(*) dy/dx is for discrete change of DV from 0 to 1	

Unemployment and level of education seem to have a considerable effect on income. The unemployed persons in 1996 receive $10076.59 less than the employed for 1998, whereas the individuals having any other than a university degree have less income in comparison to university graduates.

Sex and age have a negative effect on income 1998. An increase in age 1996 by one year is associated with a decrease in income by about $70 and being a female is associated with a drop of $1238.94 compared to being male.

Similar patterns can be seen in the results of model (4) estimation, presented in Tables 15 and 16. The predictors are still significant at the 10% level and their directions of influence are alike but there are some changes in the effects.

With good health as the reference category, income differentials associated with

Table 15: *Gamma GLM estimates of Model (4) for Income, 1999*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	9.94E-06	1.84E-07	2926.810	0.000	1666.42	0.0000
Age	-0.001820	0.000495	13.542	0.000	10.76	0.0010
Health(Excellent)*	0.037771	0.017892	4.452	0.035	39.45	0.0000
Health(Very good)*	0.032219	0.016896	3.648	0.057		
Health(Fair)*	-0.084920	0.026875	9.986	0.002		
Health(Poor)*	-0.197840	0.040965	23.329	0.000		
Sex(Female)*	-0.034319	0.012661	7.344	0.007	5.84	0.0157
LFS (Unemployed)*	-0.269671	0.046098	34.223	0.000	63.71	0.0000
LFS (NLF)*	-0.105562	0.017948	34.574	0.000		
LFS (EPY-UPY)*	-0.107222	0.025354	17.893	0.000		
LFS (EPY-NLFPY)*	-0.063615	0.026067	5.954	0.015		
LFS (UPY-NLFPY)*	-0.113439	0.046580	5.954	0.015		
LFS (AOA)*	-0.131231	0.030741	18.233	0.000		
HLE(GHS)*	0.088290	0.016813	27.563	0.000	95.47	0.0000
HLE(NUPC)*	0.137684	0.017359	62.885	0.000		
HLE(UD)*	0.219431	0.021483	104.244	0.000		
Constant	10.265120	0.030128	116090.118	0.000		
N	20635					
Log likelihood	-240831.4826		AIC	23.34369		
Deviance	4569.56371					

Table 16: *Marginal Effects of Model (4)*

	Income 1999
Variables 1996	Marginal Effect
Income	0.428317
Age	-78.411810
Health(Excellent)*	1639.435000
Health(Very good)*	1394.120000
Health(Fair)*	-3529.531000
Health(Poor)*	-7775.131000
Sex(Female)*	-1479.660000
LFS (Unemployed)*	-10237.170000
LFS (NLF)*	-4414.281000
LFS (EPY-UPY)*	-4413.012000
LFS (EPY-NLFPY)*	-2666.920000
LFS (UPY-NLFPY)*	-4630.779000
LFS (AOA)*	-5330.986000
HLE(GHS)*	3870.627000
HLE(NUPC)*	6122.916000
HLE(UD)*	10260.070000
(*) dy/dx is for discrete change of DV from 0 to 1	

health are \$1639.44 (excellent) and \$1394.12 (very good). Again, a low health is associated with reductions in income of \$3529.53 (fair) and \$7775.13 (poor).

Unemployment and level of education seem to have a bigger effect on income 1999. Unemployment in 1996 produces a drop of \$10237.17 compared to employment. On

the other hand, the university degree premium increases to $10260.07.

Within the context of the results of the analysis, it is possible to conclude that health 1996 has a significant predictive power on income 1998 and income 1999. The association is positive which suggests that an increase in the current health produces an increase in future income.

The additional predictors included in the models also prove to significantly effect income 1998 and income 1999. The ones that have a considerable impact on future income are labor force status and level of education.

Age Groups and Stress in the Income Model

The analysis of the association between future income and current health has been performed within age groups. The results presented in Tables A.37 to A.41 reveal that health 1996 affects income 1998. Better health is associated with a higher income. In addition, it appears that the improved health carries higher income for the people in the range 50-59 years than ones in the 20-49 range. For the persons 60 and over, a drop in health brings about a significant decrease in income.

The highest level of education and labor force status, whenever significant predictors, provide evidence that employed individuals and persons with higher education have higher future income.

Age has a significant effect on future income for the 20-49 group only, where a year increase in age produces about $123 increase in income 1998. Sex, on the other hand, is significant only for the 50-59 age group. Being a female in that group is associated with a $1311 decrease in income.

With an increase of the lag by one year, health becomes insignificant as a predictor

of income for the groups below 20, 50-59 and 60 and over ages. Nonetheless, some of the categories of the current 1996 health are significant and there is still the pattern, although a bit vague, that associates better health with higher future income.

The age group 20-49 is distinguishable from the rest by the significance of the health 1996. Reporting excellent or very good health suggests an increase in future income by around $1489 and $1831 respectively. Poor health, on the other hand, produces a negative effect of $2110 (fair) and $6523 (poor).

Employment and education are both significant for 20-49 and 50-59 age groups and produce the expected effect on health. However, the people in the range 50-59 reporting a UPY-NLFPY labor status experience a drop of $12033 in future income, which, quite unusually, is greater than the drop in the income of the permanently unemployed in 1996. The level of education, being also significant for the persons in the group 60 and over, has a positive relationship with future income where having a university degree produces an increase of $4182.

The age predictor again has a positive effect on income 1999, of $140 dollars, for the group 20-49. Sex once more is significant for the 50-59 age range and shows that being a female produces a decrease in future income by $1447.

Overall, the age groups analysis of the effect of current health on future income provides evidence for differences in the significance and the magnitude of the association within the studied age ranges. The general pattern of relationship: better health resulting in higher income, is present. However, in model (4) it seems to be affected by the increase of the time lag.

Stress, as another dimension of health, was introduced in models (3) and (4) as a substitute of current state of health and its effect on future health was examined.

The results for the whole panel presented in Tables A.47 to A.50 suggest that stress 1996 is a significant predictor of income 1998 and income 1999.

The observed pattern of association between the different categories of stress and income relates a highest stress level and a lack of stress to low income. For model (3), the somewhat stressful category is associated with $2066 increase in income 1998 compared to the stressful. An even greater increase in income, $2272, is predicted if stress decreases to not very stressful level. On the other hand, the not at all stressful category corresponds to a lower income, $1706, than to either of the intermediate stress levels. The same pattern is observed for model (4) but the effects differ in magnitude. The highest income 1999 increase, $2628, is predicted for the people in the not very stressful category.

In the age groups context, stress is not a significant predictor of income 1998 only for the group 60 and over. Everywhere else, the decrease of stress is generally associated with an increase in income. In contrast with the health predictor, stress seems to become more significant in some of the age ranges as the time lag increases.

The results from the introduction of the stress variable provide another perspective of the health income relationship and generally suggest that when stress decreases, income increases. In addition, the age groups analysis provides evidence that age should be controlled for in the stress income relationship and that there might be a time effect of stress on future income.

6 Increments Models Results

The purpose of the health and income increment analysis undertaken in this part of the project is to discover and quantitatively characterize any relationships that exist between change in health and change in income.

6.1 Exploration of the Variable Relationships

The investigation of the relationship between income and health increments begins by graphical exploration of associations between the variables included in the study.

Figure 7 presents a box plot of the increments of income 1998 by the increments of health 1997.

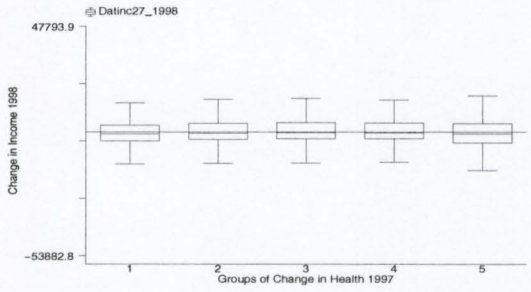

Figure 7: *Box Plot of Change in Income 1998 by Groups of Change in Health 1997*

There seems to be no considerable difference in change in income 1998 by groups of change in health 1997. The persons whose health has improved substantially (1) seem to have an equal median of the change in income with the individuals reported badly

worsened health (5). The groups improved a bit (2), unchanged (3) and worsened (4) appear to have similar medians.

Figure 8 presents box plots of change in income by groups of highest level of education 1998, labor force status 1998, sex and change in stress 1997.

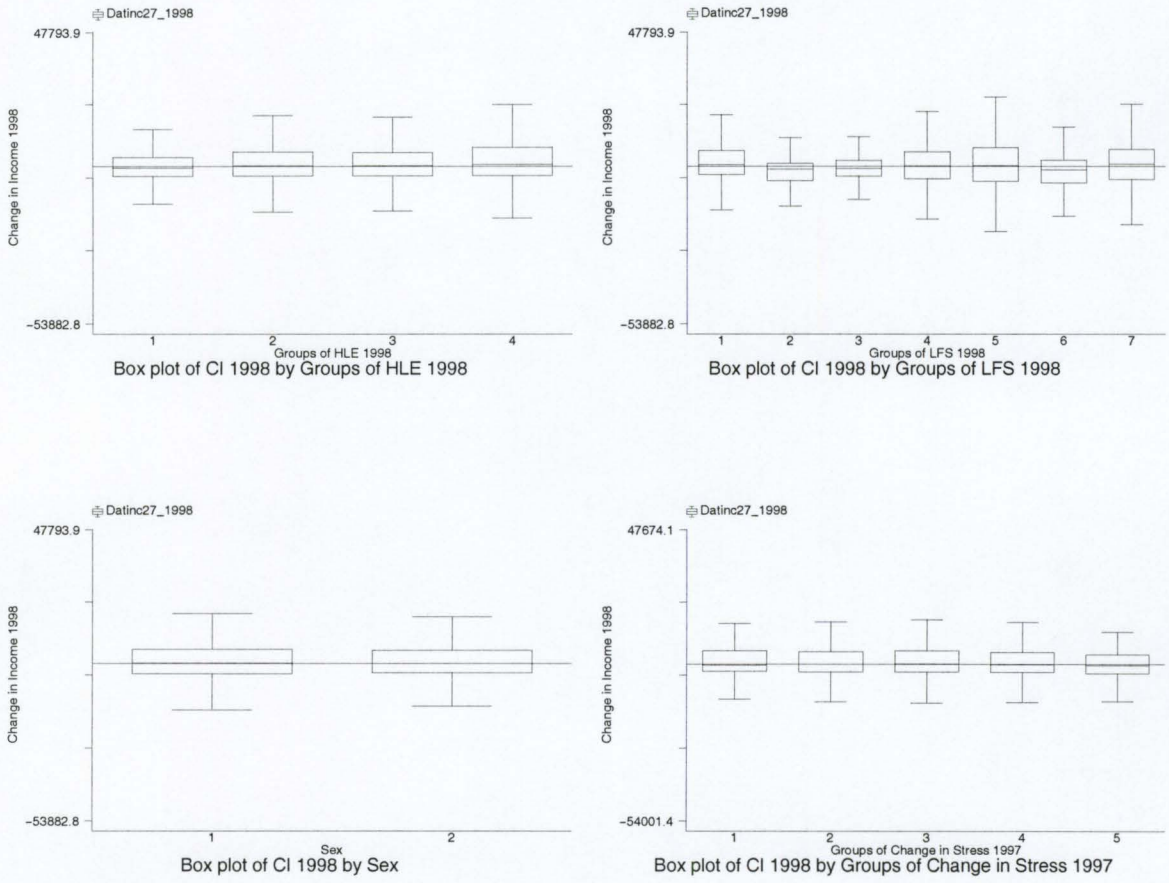

Figure 8: *Box Plots of Change in Income 1998 by Groups of Various Variables*

Change in income seems to be different across the groups of some of the variables considered. Slight differences exist between the medians of the highest level of education categories. The individuals holding a university degree (4) have a higher change

in income 1997 than the rest of the groups. On the other hand, the persons having less than high school education (1) tend to have a lower median of change in income.

Small differences are also observed between the groups of labor force status 1998. It appears that the persons who are unemployed (2), not in the labor force all year (3) or unemployed part-year, not in the labor force part-year (6) have smaller changes in income than the rest of the people.

The investigation of change in health starts with a box plot of the age 1998 by the groups of change in health 1998, Figure 9.

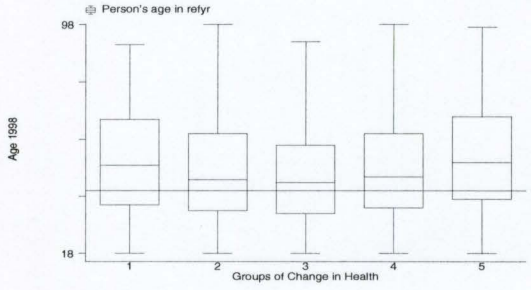

Figure 9: *Box Plot of Age 1998 by Groups of Change in Health 1998*

Persons, who are experiencing a drastic change either positive (1) or negative (5) in their health seem to have a higher age. By comparison, younger people tend to have an unchanged (3) health status or undergo moderate positive (2) or negative (4) health transitions.

Almost half of the male and female respondents have reported unchanged health in 1998 in comparison with 1997, according to Table 17. Overall, there appears to be no difference in the change of health by sex.

Persons holding a university degree seem to be more likely to report unchanged

Table 17: *Table of Change in Health 1998 by Sex*

Change in Health 1998	Sex	
	Male	Female
Significantly improved	0.0080	0.0080
Improved a bit	0.2575	0.2558
Unchanged	0.4925	0.4913
Worsened	0.2364	0.2398
Worsened badly	0.0057	0.0053
Fraction	0.4741	0.5259
# obs.	45979	

health than the rest of the groups, based on Table 18. They also do not report drastic changes in their health in comparison with the individuals in the other groups. Most rapid changes in health appears to be experienced by the respondents having less than high school education. These observations suggest that change in health might be influenced by the level of education.

Table 18: *Table of Change in Health 1998 by Groups of Education 1998*

Change in Health 1998	Education 1998			
	LHS	GHS	NUPC	UD
Significantly improved	0.0107	0.0074	0.0071	0.0058
Improved a bit	0.2677	0.2513	0.2578	0.2417
Unchanged	0.4543	0.5069	0.4931	0.5346
Worsened	0.2591	0.2299	0.2373	0.2150
Worsened badly	0.0086	0.0042	0.0051	0.0024
Fraction	0.2802	0.2845	0.2967	0.1386
# obs.	45979			

Change in health appears to be different by categories of labor status. A bigger fraction of the unemployed persons experience considerable changes in health by comparison with the rest of the groups. In contrast, the employed respondents tend to have unchanged health or undergo moderate changes. In general, the largest fraction report unchanged health, but the other changes within some groups suggest that labor force status 1998 could affect change in health 1998.

Table 19: *Table of Change in Health 1998 by Groups of Labor Status 1998*

Change in Health 1998	Annual Labor Force Status 1998					
	Employed	Unemployed	NLF	EPY-UPY	EPY-NLFPY	UPY-NLFPY & AOA
Significantly improved	0.0053	0.0149	0.0099	0.0066	0.0150	0.0099
Improved a bit	0.2524	0.2762	0.2495	0.2608	0.2430	0.2448
Unchanged	0.5085	0.4420	0.4850	0.4822	0.5077	0.5103
Worsened	0.2305	0.2597	0.2474	0.2430	0.2307	0.2273
Worsened badly	0.0033	0.0122	0.0083	0.0073	0.0039	0.0075
Fraction	0.5831	0.0181	0.1928	0.0786	0.0646	0.0629
# obs.	40197					

The same conclusion could be made for change in stress 1997 variable, based on Table 20.

Table 20: *Table of Change in Health 1998 by Groups of Change in Stress 1997*

Change in Health 1998	Change in Stress Level 1997		
	Subst. reduced & Reduced	Unchanged	Increased & Subst. increased
Significantly improved	0.0079	0.0068	0.0109
Improved a bit	0.2460	0.2491	0.2833
Unchanged	0.4809	0.5046	0.4794
Worsened	0.2562	0.2358	0.2215
Worsened badly	0.0091	0.0037	0.0048
Fraction	0.2533	0.5182	0.2284
# obs.	44936		

The respondents in the different stress categories appear to experience different changes in health 1998. The persons having the largest positive change in health 1998 are the ones who have undergone an increase in stress 1997. On the other hand, the largest negative change in health is reported by the individuals whose stress has reduced. The people in the unchanged stress category appear to report more stable health.

The results of the change in income 1998 exploratory analysis suggest that even though there are some variable categories over which change in income varies, the differences seem quite small, which might affect the investigation of significant predictors and their effects. The same issue seems to exist with the change in health

variable though it appears that a higher variation of change in health is present in some cases. In addition, the exploratory analysis suggests that it is unlikely a strong relationship between change in income and change in health to be present.

6.2 The Health Model

The health model represented by equation (5) was estimated using order probit model and selection of the significant variable including change in income 1997 was performed. The results of the estimation and selection are presented in Table 21 and the marginal effects are shown in Table 22.

Table 21: *Ordered Probit Estimates of Model (5) for Change in Health*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CHealth 97 (Imp. a bit)*	-0.794476	0.065725	146.168	0.000	9230.74	0.0000
CHealth 97 (Unchanged)*	-1.599494	0.065643	593.897	0.000		
CHealth 97 (Worsened)*	-2.190215	0.066258	1092.964	0.000		
CHealth 97 (Wors. badly)*	-3.010705	0.095519	993.510	0.000		
Change in Income 97	2.05E-08	3.08E-07	0.005	0.947	0.00	0.9468
HLE 98(GHS)*	-0.028999	0.014791	3.842	0.050	7.79	0.0506
HLE 98(NUPC)*	-0.024141	0.014302	2.856	0.091		
HLE 98(UD)*	-0.046558	0.017558	7.023	0.008		
Age 98	-0.000668	0.000321	4.326	0.037	4.34	0.0372
cut1	-4.262409	0.071744				
cut2	-2.294413	0.068752				
cut3	-0.797390	0.068418				
cut4	1.319707	0.069534				
N	45979					
Log likelihood	-46257.636					
LR chi2(9)	9236.13					

The predictor of primary interest, change in income 1997, appears to be insignificant. On the other hand, change in health from a previous period, age and level of education turn out to be statistically significant predictors of change in health 1998.

The pattern of the effect of change in health from a previous period over change in health 1998 suggests that in general irrespective to the direction of the health change in 1997 with respect to 1996 health, 1998 health has improved with respect to 1997 health. In addition, a worsened badly 1997 health change is associated with a 61.81% increase in the probability that in 1998 the health would be significantly improved with respect to 1997.

The effects of level of education provide enough evidence to conclude that a higher

Table 22: *Marginal Effects of Model (5)*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CHealth 97 (Imp. a bit)*	0.016148	0.254893	-0.073882	-0.193857	-0.003302
CHealth 97 (Unchanged)*	0.030357	0.441576	-0.024982	-0.429661	-0.017291
CHealth 97 (Worsened)*	0.156147	0.566047	-0.334560	-0.379082	-0.008552
CHealth 97 (Wors. badly)*	0.618145	0.138709	-0.534502	-0.220371	-0.001981
Change in Income 97	-2.24E-10	-6.12E-09	3.07E-10	5.91E-09	1.23E-10
HLE 98(GHS)*	0.000322	0.008676	-0.000516	-0.008311	-0.000170
HLE 98(NUPC)*	0.000267	0.007216	-0.000415	-0.006926	-0.000142
HLE 98(UD)*	0.000531	0.014021	-0.001049	-0.013238	-0.000265
Age 98	7.28E-06	0.000199	-1.00E-05	-0.000192	-3.99E-06
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

level of education is more probable to produce a higher positive change in health. In addition, a unit change in age increases the probability of health improvement.

As a possible reason for the insignificant prediction power of change in income 1997 could be that some of the people in certain age groups in the panel have more or less unchanged income. To deal with that problem an age analysis has been implemented, the results of which are presented in Tables A.61 to A.70.

Change in income appears to have close to 10% level of significance only for the persons in the group 50-59 years of age. Along with that, the sign of the change in income predictor is negative which suggests a positive association with change in health 1998. Based on these results, it is possible to conclude that change in income is probably important for the health of the people in the age 50-59. A unit change in income 1997 is associated with a change in the probability of a substantial improvement, an improvement and unchanged health of 8.37E-09, 2.13E-07 and 9.62E-10 respectively for the ordered probit model. For the ordered logit, these probabilities are 9.76E-09, 2.78E-07 and 3.09E-09 respectively.

In all age groups, change in health from a previous period is of significance for change in health 1998. The trend is consistent with the trend already discovered for

the whole panel. The additional predictors included in the age models like highest level of education, labor force status, age and sex have the expected effect on the change in health, whenever significant.

To investigate another dimension of the relationship between present and future change in health and the possible effects on the significance of change in income as a predictor of future change in health, the variable change in stress 1997 was introduced in the increments models as a substitute of change in health 1998. The estimates of the regression parameters for the significant predictors are presented in Table 23.

Table 23: *Ordered Probit Estimates of Model (5) with Stress*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CStress 97 (Reduced)*	-0.266627	0.084970	9.860	0.002	89.14	0.0000
CStress 97 (Unchanged)*	-0.312336	0.084673	13.616	0.000		
CStress 97 (Increased)*	-0.393311	0.085046	21.344	0.000		
CStress 97 (Subst. increased)*	-0.421267	0.122023	11.903	0.001		
Change in Income 97	-1.90E-07	3.05E-07	0.384	0.533	0.39	0.5328
Age 98	0.005107	0.001584	10.368	0.001	10.4	0.0013
Age 98sq	-0.000054	0.000016	11.628	0.001	11.62	0.0007
HLE 98(GHS)*	-0.029458	0.014689	4.040	0.045	7.74	0.0518
HLE 98(NUPC)*	-0.030677	0.014384	4.537	0.033		
HLE 98(UD)*	-0.044051	0.017593	6.250	0.012		
cut1	-2.648842	0.093803				
cut2	-0.868928	0.092064				
cut3	0.460147	0.092027				
cut4	2.323223	0.094281				
N	44936					
Log likelihood	-49624.963					
LR chi2(10)	105.63					

Though change in income 1997 is still an insignificant predictor of change in health 1998 for the whole panel, change in stress appears to be of importance to future change in health. In addition, the improvement in future health is bigger for the persons with high negative changes in stress 1997. The effects of these stress changes are presented in Table 24.

The increase in stress 1997 rises the probability for a health improvement in the future. Although insignificant, a unit change in the change in income is also associ-

Table 24: *Marginal Effects of Model (5) with Stress*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CStress 97 (Reduced)*	0.006901	0.083611	-0.011190	-0.075892	-0.003430
CStress 97 (Unchanged)*	0.006846	0.094625	-0.003603	-0.092997	-0.004871
CStress 97 (Increased)*	0.011367	0.124827	-0.023042	-0.108520	-0.004632
CStress 97 (Subst. increased)*	0.015297	0.137503	-0.041547	-0.107447	-0.003806
Change in Income 97	4.14E-09	5.79E-08	-2.67E-09	-5.66E-08	-2.86E-09
Age 98	-0.000111	-0.001558	0.000072	0.001520	0.000077
Age 98sq	1.17E-06	0.000016	-7.58E-07	-0.000016	-8.10E-07
HLE 98(GHS)*	0.000652	0.009015	-0.000494	-0.008737	-0.000436
HLE 98(NUPC)*	0.000679	0.009386	-0.000512	-0.009099	-0.000454
HLE 98(UD)*	0.000998	0.013542	-0.000916	-0.012988	-0.000636
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

ated with health improvement. As might be expected, a higher level of education is associated with a higher probability for health improvement, whereas an increase in age by one unit decreases that probability.

The age groups analysis in this setting shows that change in income 1997 is still an insignificant predictor of change in health 1998 at around 10% level for all groups with the exception of the 50-60 years one. The change by a unit in the change of income increases the probabilities of a substantial increase or increase of future health by 2.16E-08 and 2.83E-07 respectively for the ordered probit model.

Change in stress becomes a significant predictor of future health for the people above 20 years of age. Its effect on change in health is coherent with the one for the whole panel. The additional predictors, whenever significant follow the already discovered pattern.

The results from the health model estimation under the increments analysis suggest that change in income 1997 is a significant predictor of future change in health at around 10% level only for the age group 50-59 years.

6.3 The Income Model

The income model (6) in the increments aspect, was estimated using ordinary least squares. The confidence intervals of the estimates were obtained by applying the bootstrap methods in linear regression. Table 25 briefly[2] presents the results obtained.

Table 25: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) for Change in Income*

Variables	Reps	Observed	Std. Err.	95% Normal CI	
Change in Income 97	1000	-0.1519452	0.0075865	-0.1668325	-0.1370579
CHealth 97 (Subst. imp.)*	1000	-1129.833	830.164	-2758.898	499.232
CHealth 97 (Imp. a bit)*	1000	-189.3181	137.7626	-459.655	81.019
CHealth 97 (Worsened)*	1000	2.848337	145.0803	-281.849	287.545
CHealth 97 (Wors. badly)*	1000	-836.9861	874.7398	-2553.524	879.552
LFS 98(Unemployed)*	1000	-3613.345	369.1722	-4337.787	-2888.904
LFS 98 (NLF)*	1000	-1859.29	156.5067	-2166.410	-1552.170
LFS 98(EPY-UPY)*	1000	-1171.935	226.8242	-1617.041	-726.828
LFS 98 (EPY-NLFPY)*	1000	-1073.788	300.9145	-1664.285	-483.291
LFS 98 (UPY-NLFPY)*	1000	-3360.684	416.608	-4178.211	-2543.157
LFS 98 (AOA)*	1000	-1562.81	334.5782	-2219.366	-906.253
HLE 98(GHS)*	1000	258.7125	161.2039	-57.625	575.050
HLE 98(NUPC)*	1000	202.953	154.0629	-99.371	505.277
HLE 98(UD)*	1000	631.1646	215.1229	209.020	1053.309
Age 98	1000	-28.98312	5.107968	-39.007	-18.960
Sex(Female)*	1000	212.238	119.0517	-21.382	445.858
Constant	1000	2698.509	275.2028	2158.467	3238.551

The regression coefficients of the change in health categories suggest that change in income 1998 is only positive if the health has worsened in 1997 in comparison with 1996. The expected change in income in 1998 is highly negative if health has

[2]Comprehensive results could be found in Table 80 in the Appendix

changed rapidly in 1997 in either positive or negative direction. The significance test for these coefficients however, does not provide enough evidence to conclude that they are significant. Thus change in health 1997 appears to be an insignificant predictor of change in income 1998.

Labor status and education turn out to be significant. Unemployed persons are expected to experience a negative change in income whereas the persons holding a university degree are more likely to have a higher income in comparison with the reference category. The increase in age is associated with a negative change in income. On the other hand, sex does not appear to be a significant predictor.

The age groups analysis provides evidence, presented in Tables A.81 to A.84, that the effect of change in health is not identical in direction, though still insignificant for all age groups. An increase in health for the individuals below 20 years is associated with a considerable positive change in income. Badly worsened health is also related to a positive change in income, which is also true for for the group of the over 60 years of age. The change in health effects pattern for the persons within the groups 20-49 and 50-59 follows the one for the whole panel. The 60 and over years old individuals experience a positive change in income when their 1997 health improves a bit with respect to their 1996 health.

The effect of change in stress, as an alternative aspect of health, on change in income was studied. The brief[3] results are presented in Table 26.

An increase in stress is generally associated with a negative change in future income. Though insignificant, a substantially reduced stress provides a positive change in income. Labor force status and the highest level of education affect change in

[3]Comprehensive results could be found in Table 85 in the Appendix

Table 26: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) with Stress*

Variables	Reps	Observed	Std. Err.	95% Normal CI	
Change in Income 97	1000	-0.1539399	0.0079097	-0.169461	-0.138419
CStress 97 (Subst. reduced)*	1000	860.317	1025.756	-1152.566	2873.200
CStress 97 (Reduced)*	1000	-52.20552	142.1739	-331.199	226.788
CStress 97 (Increased)*	1000	-357.7228	155.1973	-662.273	-53.173
CStress 97 (Subst. increased)*	1000	-17.1635	999.3138	-1978.158	1943.831
LFS 98(Unemployed)*	1000	-3658.192	350.4684	-4345.930	-2970.453
LFS 98 (NLF)*	1000	-1875.532	166.3463	-2201.960	-1549.104
LFS 98(EPY-UPY)*	1000	-1154.012	234.7163	-1614.605	-693.419
LFS 98 (EPY-NLFPY)*	1000	-1147.382	285.3843	-1707.403	-587.360
LFS 98 (UPY-NLFPY)*	1000	-3359.781	430.0322	-4203.651	-2515.911
LFS 98 (AOA)*	1000	-1692.293	320.7599	-2321.733	-1062.852
HLE 98(GHS)*	1000	267.0355	166.8652	-60.411	594.482
HLE 98(NUPC)*	1000	191.8385	157.7822	-117.784	501.461
HLE 98(UD)*	1000	613.8696	201.8337	217.803	1009.936
Age 98	1000	-29.90941	5.36597	-40.439	-19.380
Sex(Female)*	1000	204.0447	124.72	-40.699	448.788
Constant	1000	2789.919	291.0311	2218.816	3361.021

income according to the already discovered pattern, where higher education and employment are associated with higher positive change in income. A unit change in age provides a negative change in income, whereas sex is again not a significant predictor.

Change in stress continues to be insignificant by age groups. Irrespectively, the marginal effects suggest that for the below 20 years group, there is a positive change in income only when substantial increase in stress 1997 takes place. In the range 20-49 years only when stress changes most rapidly in a positive or a negative direction an increase in income 1998 with respect to income 1997 is predicted. While change in stress 1997 and change in income 1998 exhibit a negative association for the group

of the people between 50 and 59 years, for the individuals over 60 the association is positive.

Considering the results of the income model estimation in the increments context, there is no significant prediction power of either change in health or change in stress on future change in income. However, the marginal effects provide information that suggests a possible direction of association and magnitude.

7 Discussion

The research results provide evidence that the levels of health and income are related within the time framework implemented. The overall pattern of the relationship presumed that an increase in income is associated with an increase in health and vice versa. Along with that, a number of additional variables also turn out to have a significant predictive power on both health and income, for the whole panel as well as by age groups.

The increments analysis, on the other hand, suggested that the increments of income are a significant predictor of the increments of health for the persons in 50-59 age range only, whereas the increments of health appeared to have no predictive power on the increments of income. The additional variables exhibit unsteady association with both increments by age groups.

These results were obtained by the implementation of a number of statistical techniques for data analysis. In the health models, the analysis involved the latent variable technique as well as ordered probit and ordered logit statistical models, which are deemed to be the most suitable whenever the response has more than two categories. A possible OLS approach, for instance, which applied to the present case would

- Only provide relatively good results if the "cut points" for the categories are about the same distance apart, a condition which is not likely to be true,
- Yield heteroscedastic, non-normal errors, and pose a results reliability problem,

the techniques implemented provide much more reliable results, though there are well-known drawbacks of likelihood estimation.

In the income levels models, the study included a log link gamma GLM. This type of modelling was mainly determined by the shape of the trimmed income 1998 and income 1999 distributions, for the whole panel, presented on Figure 10. The modelling of the income increments, on the other hand, was implemented by means of OLS for the regression parameters estimation and bootstrap techniques for construction of confidence intervals of these estimates. The unconventional distribution of the change in income 1998, seen again on Figure 10, suggested that type of treatment.

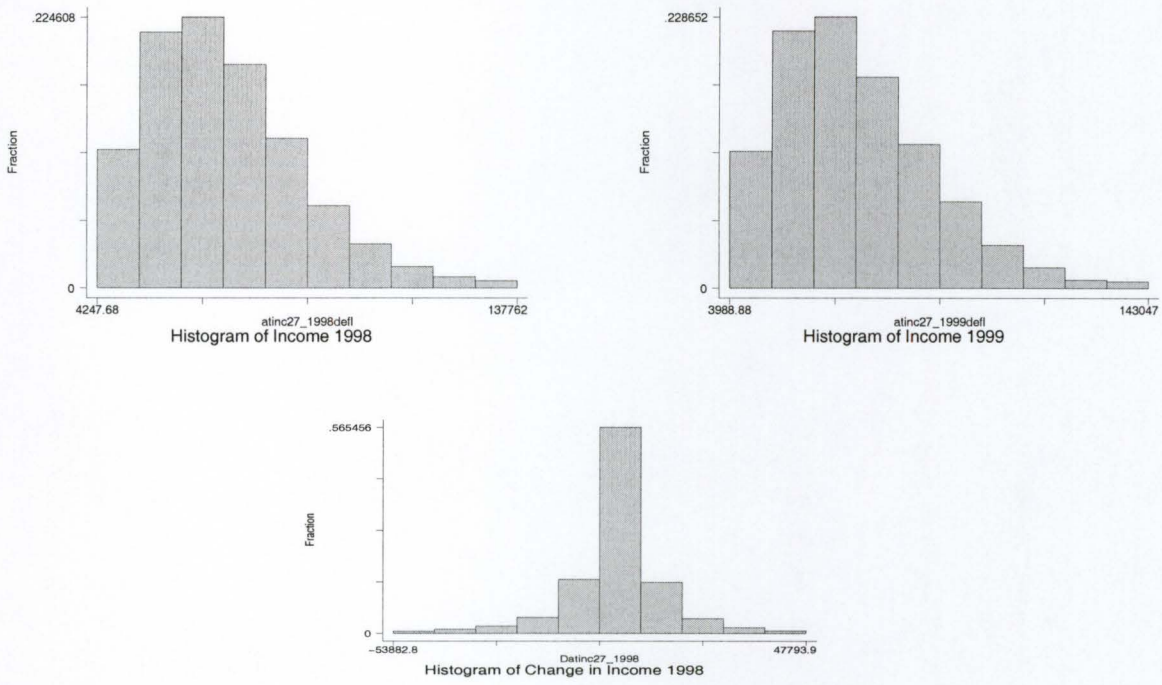

Figure 10: *Histograms of Income 1998, Income 1999 and Change in Income 1998*

In both cases, the residuals analysis supported the choice of the modelling techniques

and the correctness of the results obtained.

Probably, a better estimation of the income increments models could be achieved, if the distribution ambiguity is overcome. However, this and some other issues are left for further research.

8 Future Directions

The future directions in the study could be defined in a common economic and statistical context.

A possible direction is a more comprehensive research of the increments relationships between income and health based on data for subsequent years. To enable that however, it would be necessary to investigate ways of achieving relative conformity between the subjects within different waves of the SLID.

Another research direction (Veall, 2002) is the investigation of possible positive and negative outcomes of an application of different underlying distributions of the latent variable.

Identifying the distribution, modelling and estimation of the change in income regression could be another possible future research, which would enable parametric treatment instead of the non-parametric one used in the project.

9 Conclusion

The objective of the research was to characterize the relationship between income and health, conditioned on income and health from previous periods, for Canada. The study included levels analysis and increments analysis of that relationship as well as investigation of supplementary predictors and channels of influence.

The set of instruments implemented included ordered probit and ordered logit models, gamma GLM models, OLS method and bootstrapping techniques in linear models.

The results of the study provided support to the hypotheses that

- The levels of income and health are positively related,
- A higher educational level produces a higher income as well as better health,
- Labor force status is positively related to both income and health in the levels as well as in the increments context,
- For higher stress levels health worsens and as stress declines health improves and income increases.

The study could not provide definite evidence that change in health and change in income are, in general, positively related, though this turned out to be true for people in the age range 50-59 years.

The hypothesis that females have a lower income and better health whereas males have higher income and poorer health was overruled by the results, which in the

general case suggested that sex is not an important predictor of either health or family income levels or their increments.

As part of a comprehensive study of the health income relationship, the value of the present research is that it provides additional quantitative details of their levels and increments relationship as well as possible directions for future investigation.

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11 Appendix

Follows the complete set of reference tables containing the models estimation results.

Table 1: *Ordered Probit Estimates of Model (1) for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-0.906525	0.062779	208.51	0.000	379.06	0.0000
Health(Very good)*	-0.365351	0.064494	32.04	0.000		
Health(Fair)*	0.537415	0.142259	14.29	0.000		
Health(Poor)*	1.283492	0.278074	21.34	0.000		
Income	-3.57E-06	7.03E-07	25.81	0.000	26.02	0.0000
Sex(Female)*	0.188397	0.039867	22.37	0.000	22.34	0.0000
HLE(GHS)*	-0.164971	0.055051	9.00	0.003	11.98	0.0075
HLE(NUPC)*	0.090751	0.144687	0.40	0.531		
HLE(UD)*	-0.726283	0.771913	0.88	0.347		
Age	0.067499	0.023673	8.12	0.004	8.13	0.0044
cut1	0.387415	0.410384				
cut2	1.537852	0.410924				
cut3	2.430943	0.412569				
cut4	3.347068	0.422404				
N	3340					
Log likelihood	-3452.3205					
LR chi2(10)	497.58					

Table 2: *Ordered Probit Estimates of Model (1) for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.082787	0.019606	3050.35	0.000	5565.30	0.0000
Health(Very good)*	-0.507955	0.018040	792.99	0.000		
Health(Fair)*	0.639230	0.032791	379.86	0.000		
Health(Poor)*	1.536151	0.056559	737.67	0.000		
Income	-1.92E-06	2.66E-07	52.42	0.000	52.63	0.0000
LFS (Unemployed)*	0.165999	0.047167	12.39	0.000	135.68	0.0000
LFS (NLF)*	0.271558	0.024123	126.79	0.000		
LFS (EPY-UPY)*	0.047104	0.023809	3.92	0.048		
LFS (EPY-NLFPY)*	0.031960	0.030658	1.08	0.297		
LFS (UPY-NLFPY)*	0.144517	0.053175	7.40	0.007		
LFS (AOA)*	0.068872	0.030882	4.97	0.026		
HLE(GHS)*	-0.107198	0.020568	27.14	0.000	72.82	0.0000
HLE(NUPC)*	-0.109007	0.020412	28.52	0.000		
HLE(UD)*	-0.209490	0.024588	72.59	0.000		
Age	0.014527	0.000875	275.56	0.000	276.12	0.0000
cut1	-0.767355	0.041032				
cut2	0.472117	0.040868				
cut3	1.582963	0.042065				
cut4	2.397218	0.046048				
N	26588					
Log likelihood	-30693.69					
LR chi2(15)	7459.02					

Table 3: *Ordered Probit Estimates of Model (1) for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.190674	0.041967	804.86	0.000	2008.90	0.0000
Health(Very good)*	-0.562095	0.035350	252.81	0.000		
Health(Fair)*	0.662142	0.048487	186.60	0.000		
Health(Poor)*	1.522299	0.071538	452.84	0.000		
Income	-1.48E-06	4.49E-07	10.82	0.001	10.89	0.0010
LFS (Unemployed)*	0.396676	0.085428	21.53	0.000	82.85	0.0000
LFS (NLF)*	0.294712	0.036898	63.84	0.000		
LFS (EPY-UPY)*	0.069590	0.060464	1.32	0.250		
LFS (EPY-NLFPY)*	0.021420	0.069433	0.10	0.758		
LFS (UPY-NLFPY)*	0.446102	0.126809	12.39	0.000		
LFS (AOA)*	0.134229	0.091697	2.13	0.143		
Sex(Female)*	-0.082328	0.028354	8.41	0.004	8.43	0.0037
HLE(GHS)*	-0.175277	0.037703	21.62	0.000	39.62	0.0000
HLE(NUPC)*	-0.136799	0.034973	15.29	0.000		
HLE(UD)*	-0.251983	0.046052	29.92	0.000		
cut1	-1.471056	0.045847				
cut2	-0.286027	0.042923				
cut3	0.737639	0.043979				
cut4	1.671037	0.051070				
N	6289					
Log likelihood	-7812.1216					
LR chi2(15)	2808.1					

Table 4: *Ordered Probit Estimates of Model (1) for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.109348	0.037489	875.57	0.000	2823.45	0.0000
Health(Very good)*	-0.500238	0.027552	329.79	0.000		
Health(Fair)*	0.612961	0.031693	374.04	0.000		
Health(Poor)*	1.281860	0.049026	683.82	0.000		
Income	-1.20E-06	5.58E-07	4.58	0.032	4.60	0.0320
HLE(GHS)*	-0.075567	0.030150	6.30	0.012	38.56	0.0000
HLE(NUPC)*	-0.123635	0.030224	16.73	0.000		
HLE(UD)*	-0.241780	0.045613	28.09	0.000		
Age	0.013718	0.001500	83.72	0.000	83.75	0.0000
cut1	-0.710210	0.112016				
cut2	0.459887	0.111650				
cut3	1.511110	0.112332				
cut4	2.501410	0.113879				
N	9762					
Log likelihood	-12808.25					
LR chi2(9)	3314.38					

Table 5: *Marginal Effects of Model (1) for the Persons of Age Under 20*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.348332	-0.141590	-0.148055	-0.051302	-0.007385
Health(Very good)*	0.144930	-0.070933	-0.056189	-0.015989	-0.001820
Health(Fair)*	-0.202178	0.052191	0.101187	0.041938	0.006863
Health(Poor)*	-0.389969	-0.046264	0.221686	0.164867	0.049681
Income	1.42E-06	-6.45E-07	-5.83E-07	-1.75E-07	-2.07E-08
Sex(Female)*	-0.074938	0.033698	0.030797	0.009326	0.001117
HLE(GHS)*	0.065717	-0.030727	-0.026360	-0.007732	-0.000898
HLE(NUPC)*	-0.036031	0.015295	0.015311	0.004826	0.000599
HLE(UD)*	0.270649	-0.168700	-0.082035	-0.018234	-0.001680
Age	-0.026893	0.012178	0.011016	0.003308	0.000392
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 6: *Marginal Effects of Model (1) for the People between 20 and 49 Years of Age*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.376198	-0.066556	-0.230348	-0.065100	-0.014194
Health(Very good)*	0.170498	-0.008924	-0.118669	-0.035371	-0.007534
Health(Fair)*	-0.166996	-0.071463	0.145550	0.071101	0.021808
Health(Poor)*	-0.256799	-0.296771	0.177229	0.228784	0.147557
Income	6.30E-07	7.52E-09	-4.63E-07	-1.44E-07	-3.09E-08
LFS (Unemployed)*	-0.051482	-0.005998	0.040231	0.013984	0.003266
LFS (NLF)*	-0.082332	-0.013033	0.065640	0.023921	0.005804
LFS (EPY-UPY)*	-0.015227	-0.000552	0.011363	0.003624	0.000793
LFS (EPY-NLFPY)*	-0.010365	-0.000310	0.007704	0.002440	0.000532
LFS (UPY-NLFPY)*	-0.045131	-0.004664	0.035020	0.012001	0.002773
LFS (AOA)*	-0.022095	-0.001132	0.016640	0.005393	0.001195
HLE(GHS)*	0.035474	-0.000384	-0.025659	-0.007786	-0.001645
HLE(NUPC)*	0.036046	-0.000337	-0.026099	-0.007932	-0.001678
HLE(UD)*	0.071409	-0.005187	-0.049365	-0.014025	-0.002832
Age	-0.004755	-0.000057	0.003493	0.001085	0.000233
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 7: *Marginal Effects of Model(1) for the People between 50 and 59 Years of Age*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.359067	0.046131	-0.240744	-0.132749	-0.031705
Health(Very good)*	0.141814	0.073932	-0.112675	-0.081492	-0.021579
Health(Fair)*	-0.115787	-0.142155	0.084703	0.123310	0.049928
Health(Poor)*	-0.162589	-0.329709	-0.009112	0.261982	0.239427
Income	3.44E-07	2.40E-07	-2.86E-07	-2.33E-07	-6.46E-08
LFS (Unemployed)*	-0.074840	-0.082246	0.059424	0.071960	0.025703
LFS (NLF)*	-0.063258	-0.053600	0.052221	0.049426	0.015211
LFS (EPY-UPY)*	-0.015671	-0.011902	0.013062	0.011267	0.003243
LFS (EPY-NLFPY)*	-0.004933	-0.003533	0.004107	0.003404	0.000955
LFS (UPY-NLFPY)*	-0.081220	-0.094844	0.063076	0.082285	0.030703
LFS (AOA)*	-0.029161	-0.024168	0.024275	0.022345	0.006709
Sex(Female)*	0.019142	0.013345	-0.015912	-0.012974	-0.003602
HLE(GHS)*	0.042899	0.025604	-0.035269	-0.026324	-0.006911
HLE(NUPC)*	0.032805	0.020891	-0.027113	-0.020958	-0.005625
HLE(UD)*	0.064125	0.033372	-0.052019	-0.036333	-0.009146
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 8: *Marginal Effects of Model (1) for the People 60 and Over Years of Age*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.249309	0.169938	-0.186154	-0.179596	-0.053496
Health(Very good)*	0.077088	0.115957	-0.052693	-0.101735	-0.038617
Health(Fair)*	-0.061277	-0.150955	0.003309	0.131653	0.077270
Health(Poor)*	-0.076443	-0.266110	-0.129496	0.207661	0.264388
Income	1.58E-07	2.96E-07	-8.97E-08	-2.56E-07	-1.08E-07
HLE(GHS)*	0.010368	0.018521	-0.006309	-0.016063	-0.006518
HLE(NUPC)*	0.017366	0.030095	-0.010968	-0.026112	-0.010381
HLE(UD)*	0.037183	0.056906	-0.026297	-0.049587	-0.018205
Age	-0.001814	-0.003392	0.001029	0.002942	0.001235
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 9: *Ordered Probit Estimates of Model (2) for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-0.735941	0.090396	66.260	0.000	113.36	0.0000
Health(Very good)*	-0.342843	0.094555	13.177	0.000		
Health(Fair)*	0.332061	0.209605	2.496	0.113		
Health(Poor)*	1.265176	0.438272	8.352	0.004		
Income	-5.45E-06	1.07E-06	25.806	0.000	26.19	0.0000
Sex(Female)*	0.175557	0.058151	9.120	0.003	9.12	0.0025
cut1	-0.831011	0.103128				
cut2	0.299273	0.101775				
cut3	1.260868	0.111031				
cut4	1.945212	0.145822				
N	1518					
Log likelihood	-1650.5089					
LR chi2(6)	164.82					

Table 10: *Ordered Probit Estimates of Model (2) for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.004311	0.027875	1298.161	0.000	2491.17	0.0000
Health(Very good)*	-0.453385	0.025672	311.876	0.000		
Health(Fair)*	0.676079	0.046207	214.037	0.000		
Health(Poor)*	1.457789	0.079307	337.824	0.000		
Income	-2.21E-06	3.75E-07	34.928	0.000	35.01	0.0000
LFS (Unemployed)*	0.168270	0.067222	6.250	0.012	70.88	0.0000
LFS (NLF)*	0.270368	0.033752	64.160	0.000		
LFS (EPY-UPY)*	0.063802	0.035189	3.276	0.070		
LFS (EPY-NLFPY)*	0.045998	0.043381	1.124	0.289		
LFS (UPY-NLFPY)*	0.079518	0.077555	1.061	0.305		
LFS (AOA)*	-0.037866	0.046540	0.656	0.416		
HLE(GHS)*	-0.131641	0.029159	20.340	0.000	61.73	0.0000
HLE(NUPC)*	-0.146865	0.029456	24.900	0.000		
HLE(UD)*	-0.272922	0.034859	61.309	0.000		
Age	0.012355	0.001250	97.812	0.000	97.87	0.0000
cut1	-0.866374	0.058535				
cut2	0.343329	0.058177				
cut3	1.421231	0.059629				
cut4	2.250021	0.064942				
N	12956					
Log likelihood	-15300.991					
LR chi2(15)	3459.83					

Table 11: *Ordered Probit Estimates of Model (2) for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.156261	0.060221	368.640	0.000	877.47	0.0000
Health(Very good)*	-0.521807	0.051337	103.226	0.000		
Health(Fair)*	0.658870	0.068914	91.394	0.000		
Health(Poor)*	1.295018	0.102309	160.276	0.000		
Income	-1.02E-06	5.88E-07	3.028	0.082	3.04	0.0815
LFS (Unemployed)*	0.271819	0.134235	4.080	0.043	19.77	0.003
LFS (NLF)*	0.211217	0.050958	17.140	0.000		
LFS (EPY-UPY)*	0.120436	0.093736	1.638	0.199		
LFS (EPY-NLFPY)*	0.074192	0.094603	0.608	0.433		
LFS (UPY-NLFPY)*	0.052626	0.186688	0.078	0.778		
LFS (AOA)*	0.057462	0.137763	0.176	0.677		
HLE(GHS)*	-0.135462	0.053120	6.503	0.011	25.75	0.0000
HLE(NUPC)*	-0.175569	0.050787	11.972	0.001		
HLE(UD)*	-0.312010	0.066044	22.278	0.000		
cut1	-1.484897	0.062976				
cut2	-0.328522	0.058316				
cut3	0.645909	0.059455				
cut4	1.576161	0.068579				
N	2994					
Log likelihood	-3841.8602					
LR chi2(14)	1184.38					

Table 12: *Ordered Probit Estimates of Model (2) for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Health(Excellent)*	-1.036182	0.052793	385.337	0.000	1184.14	0.0000
Health(Very good)*	-0.470980	0.040331	136.422	0.000		
Health(Fair)*	0.559971	0.046506	144.962	0.000		
Health(Poor)*	1.257874	0.076004	273.903	0.000		
Income	-2.00E-06	8.15E-07	6.003	0.014	6.02	0.0142
HLE(GHS)*	-0.079089	0.044082	3.204	0.073	27.99	0.0000
HLE(NUPC)*	-0.143843	0.043971	10.693	0.001		
HLE(UD)*	-0.313898	0.066833	22.090	0.000		
cut1	-1.676028	0.045331				
cut2	-0.521913	0.039439				
cut3	0.474129	0.039330				
cut4	1.439583	0.045692				
N	4563					
Log likelihood	-6090.2129					
LR chi2(8)	1392.48					

Table 13: *Marginal Effects of Model (2) for the Persons of Age Under 20*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.282567	-0.095656	-0.136674	-0.038747	-0.011489
Health(Very good)*	0.135645	-0.056578	-0.060617	-0.014701	-0.003750
Health(Fair)*	-0.125826	0.031522	0.067067	0.020797	0.006441
Health(Poor)*	-0.363560	-0.084167	0.226252	0.140028	0.081447
Income	2.15E-06	-8.08E-07	-1.01E-06	-2.60E-07	-6.88E-08
Sex(Female)*	-0.069207	0.026057	0.032564	0.008366	0.002221
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 14: *Marginal Effects of Model (2) for the People between 20 and 49 Years of Age*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.345202	-0.043380	-0.215819	-0.070284	-0.015719
Health(Very good)*	0.149397	0.000851	-0.105309	-0.036771	-0.008168
Health(Fair)*	-0.169661	-0.087255	0.143443	0.085207	0.028267
Health(Poor)*	-0.245164	-0.283647	0.155900	0.226934	0.145977
Income	7.12E-07	4.72E-08	-5.25E-07	-1.91E-07	-4.30E-08
LFS (Unemployed)*	-0.051078	-0.008945	0.039766	0.016262	0.003995
LFS (NLF)*	-0.080354	-0.017144	0.063486	0.027112	0.006901
LFS (EPY-UPY)*	-0.020136	-0.002034	0.015128	0.005719	0.001324
LFS (EPY-NLFPY)*	-0.014578	-0.001356	0.010906	0.004088	0.000940
LFS (UPY-NLFPY)*	-0.024888	-0.002915	0.018854	0.007250	0.001699
LFS (AOA)*	0.012302	0.000547	-0.008956	-0.003188	-0.000706
HLE(GHS)*	0.042851	0.001706	-0.031087	-0.011030	-0.002439
HLE(NUPC)*	0.047957	0.001601	-0.034652	-0.012216	-0.002689
HLE(UD)*	0.092495	-0.004068	-0.063478	-0.020648	-0.004300
Age	-0.003970	-0.000263	0.002927	0.001066	0.000240
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 15: *Marginal Effects of Model (2) for the People between 50 and 59 Years of Age*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.336070	0.071979	-0.218359	-0.148738	-0.040952
Health(Very good)*	0.125703	0.077821	-0.092810	-0.084681	-0.026033
Health(Fair)*	-0.109680	-0.144669	0.064511	0.128765	0.061073
Health(Poor)*	-0.144143	-0.287325	-0.007789	0.232759	0.206498
Income	2.27E-07	1.80E-07	-1.71E-07	-1.78E-07	-5.76E-08
LFS (Unemployed)*	-0.052072	-0.055867	0.036843	0.051311	0.019785
LFS (NLF)*	-0.044198	-0.039893	0.032692	0.038108	0.013290
LFS (EPY-UPY)*	-0.025176	-0.022833	0.018685	0.021764	0.007561
LFS (EPY-NLFPY)*	-0.015877	-0.013691	0.011878	0.013221	0.004469
LFS (UPY-NLFPY)*	-0.011361	-0.009607	0.008521	0.009327	0.003120
LFS (AOA)*	-0.012380	-0.010516	0.009280	0.010197	0.003419
HLE(GHS)*	0.031279	0.022393	-0.023669	-0.022893	-0.007110
HLE(NUPC)*	0.040694	0.028806	-0.030760	-0.029576	-0.009164
HLE(UD)*	0.077673	0.044201	-0.058261	-0.049412	-0.014201
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 16: *Marginal Effects of Model (2) for the People 60 and Over Years of Age*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Health(Excellent)*	0.235427	0.158759	-0.163197	-0.173351	-0.057637
Health(Very good)*	0.077320	0.105788	-0.048430	-0.095211	-0.039468
Health(Fair)*	-0.062474	-0.136896	0.008171	0.118217	0.072981
Health(Poor)*	-0.082410	-0.264259	-0.118655	0.195420	0.269906
Income	2.86E-07	4.81E-07	-1.52E-07	-4.23E-07	-1.93E-07
HLE(GHS)*	0.011764	0.018804	-0.006669	-0.016591	-0.007307
HLE(NUPC)*	0.022049	0.033798	-0.013083	-0.029935	-0.012829
HLE(UD)*	0.054190	0.069278	-0.036580	-0.062723	-0.024165
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 17: *Ordered Probit Estimates of Model (1) with Stress*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.281827	0.016050	308.354	0.000	1248.91	0.0000
Stress (Not very stressful)*	-0.507550	0.017583	833.477	0.000		
Stress (Not at all stressful)*	-0.695707	0.022861	925.985	0.000		
Income	-3.54E-06	2.05E-07	297.563	0.000	300.32	0.0000
LFS (Unemployed)*	0.323375	0.039375	67.404	0.000	701.38	0.0000
LFS (NLF)*	0.401283	0.015634	658.949	0.000		
LFS (EPY-UPY)*	0.103072	0.021293	23.426	0.000		
LFS (EPY-NLFPY)*	0.044348	0.022896	3.764	0.053		
LFS (UPY-NLFPY)*	0.253405	0.039414	41.345	0.000		
LFS (AOA)*	0.114179	0.025818	19.536	0.000		
Sex(Female)*	0.031146	0.010973	8.066	0.005	8.06	0.0045
HLE(GHS)*	-0.171572	0.014734	135.490	0.000	401.66	0.0000
HLE(NUPC)*	-0.170414	0.014896	130.874	0.000		
HLE(UD)*	-0.374377	0.019002	388.090	0.000		
Age	0.019438	0.000421	2137.213	0.000	2153.84	0.0000
cut1	-0.378357	0.027390				
cut2	0.716455	0.027572				
cut3	1.635724	0.028338				
cut4	2.358909	0.030192				
N	40296					
Log likelihood	-51634.161					
LR chi2(15)	6207.69					

Table 18: *Marginal Effect of Model (1) with Stress*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.092173	0.008355	-0.057422	-0.030832	-0.012274
Stress (Not very stressful)*	0.175475	-0.005024	-0.103235	-0.049145	-0.018070
Stress (Not at all stressful)*	0.256241	-0.047351	-0.136598	-0.054580	-0.017712
Income	1.16E-06	1.13E-07	-7.25E-07	-3.90E-07	-1.54E-07
LFS (Unemployed)*	-0.094397	-0.028207	0.061610	0.041449	0.019545
LFS (NLF)*	-0.120412	-0.029593	0.077636	0.049670	0.022698
LFS (EPY-UPY)*	-0.032696	-0.004969	0.020845	0.011892	0.004929
LFS (EPY-NLFPY)*	-0.014304	-0.001736	0.009041	0.004986	0.002012
LFS (UPY-NLFPY)*	-0.075966	-0.019214	0.049380	0.031531	0.014269
LFS (AOA)*	-0.036036	-0.005813	0.023029	0.013274	0.005545
Sex(Female)*	-0.010174	-0.000990	0.006382	0.003427	0.001356
HLE(GHS)*	0.057208	0.003226	-0.035302	-0.018163	-0.006969
HLE(NUPC)*	0.056838	0.003175	-0.035067	-0.018031	-0.006914
HLE(UD)*	0.131413	-0.006952	-0.076837	-0.035189	-0.012435
Age	-0.006348	-0.000622	0.003983	0.002140	0.000847
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 19: *Ordered Probit Estimates of Model (2) with Stress*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.296532	0.022742	170.042	0.000	625.34	0.0000
Stress (Not very stressful)*	-0.506579	0.024844	415.752	0.000		
Stress (Not at all stressful)*	-0.707155	0.032336	478.297	0.000		
Income	-3.63E-06	2.84E-07	163.328	0.000	165.10	0.0000
LFS (Unemployed)*	0.301997	0.056783	28.302	0.000	307.48	0.0000
LFS (NLF)*	0.367382	0.021556	290.362	0.000		
LFS (EPY-UPY)*	0.108650	0.031482	11.903	0.001		
LFS (EPY-NLFPY)*	0.068334	0.032312	4.452	0.034		
LFS (UPY-NLFPY)*	0.240805	0.057391	17.640	0.000		
LFS (AOA)*	0.080625	0.038485	4.368	0.036		
HLE(GHS)*	-0.190123	0.020766	83.906	0.000	263.98	0.0000
HLE(NUPC)*	-0.200819	0.021359	88.360	0.000		
HLE(UD)*	-0.429119	0.026827	256.000	0.000		
Age	0.018514	0.000596	965.345	0.000	971.84	0.0000
cut1	-0.517117	0.038252				
cut2	0.567524	0.038349				
cut3	1.474977	0.039328				
cut4	2.210695	0.041849				
N	19750					
Log likelihood	-25723.478					
LR chi2(14)	2981.75					

Table 20: *Marginal Effect of Model (2) with Stress*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.094182	0.014145	-0.058679	-0.035174	-0.014474
Stress (Not very stressful)*	0.170705	0.004806	-0.101357	-0.053751	-0.020403
Stress (Not at all stressful)*	0.256339	-0.036223	-0.138715	-0.061077	-0.020323
Income	1.15E-06	1.85E-07	-7.21E-07	-4.34E-07	-1.78E-07
LFS (Unemployed)*	-0.085613	-0.030466	0.055013	0.041154	0.019911
LFS (NLF)*	-0.107409	-0.032035	0.068473	0.048394	0.022578
LFS (EPY-UPY)*	-0.033276	-0.007364	0.021167	0.013610	0.005863
LFS (EPY-NLFPY)*	-0.021195	-0.004209	0.013428	0.008419	0.003557
LFS (UPY-NLFPY)*	-0.069940	-0.021995	0.044926	0.032055	0.014954
LFS (AOA)*	-0.024881	-0.005169	0.015791	0.010001	0.004258
HLE(GHS)*	0.061630	0.007086	-0.038150	-0.021891	-0.008675
HLE(NUPC)*	0.065425	0.006887	-0.040371	-0.022925	-0.009016
HLE(UD)*	0.148273	-0.002604	-0.086737	-0.043332	-0.015600
Age	-0.005862	-0.000942	0.003683	0.002215	0.000907
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 21: *Ordered Probit Estimates of Model (1) with Stress for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.213219	0.083770	6.503	0.011	31.2	0.0000
Stress (Not very stressful)*	-0.354510	0.084967	17.389	0.000		
Stress (Not at all stressful)*	-0.439202	0.093350	22.090	0.000		
Income	-4.58E-06	7.14E-07	41.088	0.000	41.49	0.0000
LFS (Unemployed)*	0.502055	0.211628	5.617	0.018	15.09	0.0196
LFS (NLF)*	0.109921	0.060388	3.312	0.069		
LFS (EPY-UPY)*	0.316312	0.114523	7.618	0.006		
LFS (EPY-NLFPY)*	0.031588	0.060760	0.270	0.603		
LFS (UPY-NLFPY)*	0.117047	0.082879	1.988	0.158		
LFS (AOA)*	0.126186	0.070049	3.240	0.072		
Sex(Female)*	0.225913	0.040385	31.248	0.000	31.32	0.0000
HLE(GHS)*	-0.233789	0.055903	17.472	0.000	19.26	0.0002
HLE(NUPC)*	-0.028068	0.145453	0.036	0.847		
HLE(UD)*	-0.724128	0.740895	0.960	0.328		
Age	0.091670	0.025353	13.104	0.000	13.08	0.0003
cut1	1.136849	0.448269				
cut2	2.220766	0.449245				
cut3	3.036654	0.450831				
cut4	3.863475	0.458579				
N	3237					
Log likelihood	-3508.4482					
LR chi2(15)	167.49					

Table 22: *Ordered Probit Estimates of Model (1) with Stress for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.274780	0.018866	212.285	0.000	507.37	0.0000
Stress (Not very stressful)*	-0.443952	0.021544	424.772	0.000		
Stress (Not at all stressful)*	-0.532240	0.032076	275.228	0.000		
Income	-3.25E-06	2.65E-07	150.553	0.000	151.77	0.0000
LFS (Unemployed)*	0.281193	0.047138	35.641	0.000	449.59	0.0000
LFS (NLF)*	0.496404	0.024190	421.070	0.000		
LFS (EPY-UPY)*	0.076013	0.023737	10.240	0.001		
LFS (EPY-NLFPY)*	0.054702	0.030512	3.204	0.073		
LFS (UPY-NLFPY)*	0.291953	0.052954	30.360	0.000		
LFS (AOA)*	0.107216	0.030744	12.180	0.000		
Sex(Female)*	0.035050	0.013751	6.503	0.011	6.50	0.0108
HLE(GHS)*	-0.208500	0.020571	102.820	0.000	285.28	0.0000
HLE(NUPC)*	-0.220491	0.020457	116.208	0.000		
HLE(UD)*	-0.414677	0.024606	283.923	0.000		
Age	0.020747	0.000867	573.124	0.000	575.06	0.0000
cut1	-0.372401	0.042267				
cut2	0.752048	0.042430				
cut3	1.719348	0.043406				
cut4	2.390986	0.045947				
N	26171					
Log likelihood	-32643.15					
LR chi2(15)	2311.69					

Table 23: *Ordered Probit Estimates of Model (1) with Stress for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.269727	0.039893	45.698	0.000	272.74	0.0000
Stress (Not very stressful)*	-0.561774	0.043146	169.520	0.000		
Stress (Not at all stressful)*	-0.763141	0.055021	192.377	0.000		
Income	-3.02E-06	4.51E-07	45.024	0.000	45.48	0.0000
LFS (Unemployed)*	0.521116	0.086247	36.482	0.000	479.54	0.0000
LFS (NLF)*	0.750896	0.035909	437.228	0.000		
LFS (EPY-UPY)*	0.110715	0.060585	3.349	0.068		
LFS (EPY-NLFPY)*	0.202507	0.069449	8.526	0.004		
LFS (UPY-NLFPY)*	0.957657	0.125573	58.217	0.000		
LFS (AOA)*	0.266106	0.091784	8.410	0.004		
Sex(Female)*	-0.125424	0.028132	19.892	0.000	19.89	0.0000
HLE(GHS)*	-0.304413	0.037446	66.097	0.000	133.48	0.0000
HLE(NUPC)*	-0.239174	0.034863	47.060	0.000		
HLE(UD)*	-0.474154	0.045747	107.330	0.000		
cut1	-1.421490	0.049713				
cut2	-0.383565	0.048087				
cut3	0.474076	0.048315				
cut4	1.240774	0.051560				
N	6143					
Log likelihood	-8454.6983					
LR chi2(14)	1052.72					

Table 24: *Ordered Probit Estimates of Model (1) with Stress for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.235316	0.061614	14.592	0.000	305.49	0.0000
Stress (Not very stressful)*	-0.619335	0.060476	104.858	0.000		
Stress (Not at all stressful)*	-0.859238	0.064190	179.292	0.000		
Income	-3.01E-06	7.29E-07	17.057	0.000	17.08	0.0000
LFS (Unemployed)*	0.043088	0.170983	0.063	0.801	166.07	0.0000
LFS (NLF)*	0.496433	0.040759	148.352	0.000		
LFS (EPY-UPY)*	0.195031	0.125044	2.434	0.119		
LFS (EPY-NLFPY)*	0.216650	0.078999	7.508	0.006		
LFS (UPY-NLFPY)*	0.036621	0.187859	0.036	0.845		
LFS (AOA)*	0.073797	0.164705	0.203	0.654		
HLE(GHS)*	-0.205701	0.041875	24.108	0.000	87.93	0.0000
HLE(NUPC)*	-0.251948	0.041151	37.454	0.000		
HLE(UD)*	-0.472899	0.060349	61.466	0.000		
cut1	-1.540250	0.071739				
cut2	-0.492900	0.070002				
cut3	0.420803	0.069955				
cut4	1.259002	0.072104				
N	4745					
Log likelihood	-6697.238					
LR chi2(13)	607.59					

Table 25: *Marginal Effects of Model (1) with Stress for the Persons of Age Under 20*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.084880	-0.036433	-0.033770	-0.012453	-0.002225
Stress (Not very stressful)*	0.140692	-0.062027	-0.055080	-0.020032	-0.003553
Stress (Not at all stressful)*	0.172966	-0.085750	-0.062923	-0.020885	-0.003408
Income	1.82E-06	-7.60E-07	-7.38E-07	-2.77E-07	-5.01E-08
LFS (Unemployed)*	-0.190111	0.044324	0.089901	0.045015	0.010873
LFS (NLF)*	-0.043731	0.017575	0.017966	0.006909	0.001281
LFS (EPY-UPY)*	-0.123380	0.038644	0.055126	0.024408	0.005202
LFS (EPY-NLFPY)*	-0.012583	0.005173	0.005119	0.001938	0.000354
LFS (UPY-NLFPY)*	-0.046463	0.017857	0.019450	0.007691	0.001465
LFS (AOA)*	-0.050098	0.019335	0.020935	0.008259	0.001569
Sex(Female)*	-0.089827	0.037062	0.036425	0.013807	0.002533
HLE(GHS)*	0.093053	-0.040702	-0.036653	-0.013342	-0.002356
HLE(NUPC)*	0.011192	-0.004755	-0.004481	-0.001659	-0.000297
HLE(UD)*	0.269474	-0.158897	-0.083681	-0.023556	-0.003340
Age	-0.036534	0.015215	0.014771	0.005544	0.001004
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 26: *Marginal Effects of Model (1) with Stress for the People between 20 and 49 Years of Age*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.093444	-0.000098	-0.059219	-0.024306	-0.009820
Stress (Not very stressful)*	0.159747	-0.020279	-0.093599	-0.033539	-0.012330
Stress (Not at all stressful)*	0.199613	-0.046610	-0.107697	-0.033943	-0.011363
Income	1.11E-06	-1.17E-08	-7.05E-07	-2.84E-07	-1.13E-07
LFS (Unemployed)*	-0.088405	-0.013296	0.059707	0.028842	0.013152
LFS (NLF)*	-0.148384	-0.034891	0.101700	0.054460	0.027114
LFS (EPY-UPY)*	-0.025569	-0.000628	0.016466	0.006909	0.002823
LFS (EPY-NLFPY)*	-0.018473	-0.000314	0.011854	0.004931	0.002001
LFS (UPY-NLFPY)*	-0.091371	-0.014493	0.061860	0.030155	0.013849
LFS (AOA)*	-0.035701	-0.001578	0.023196	0.009949	0.004133
Sex(Female)*	-0.012006	0.000136	0.007596	0.003061	0.001213
HLE(GHS)*	0.072674	-0.003584	-0.044950	-0.017419	-0.006722
HLE(NUPC)*	0.076788	-0.003673	-0.047523	-0.018455	-0.007136
HLE(UD)*	0.150980	-0.022948	-0.087051	-0.030183	-0.010799
Age	-0.007104	0.0000744	0.004496	0.001814	0.000719
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 27: *Marginal Effects of Model (1) with Stress for the People between 50 and 59 Years of Age*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.073939	0.031766	-0.042395	-0.041750	-0.021560
Stress (Not very stressful)*	0.167197	0.045731	-0.095130	-0.079974	-0.037824
Stress (Not at all stressful)*	0.253475	0.015286	-0.138738	-0.092530	-0.037492
Income	8.20E-07	3.71E-07	-4.72E-07	-4.73E-07	-2.46E-07
LFS (Unemployed)*	-0.110650	-0.094145	0.050935	0.089044	0.064816
LFS (NLF)*	-0.169037	-0.123467	0.080617	0.124244	0.087644
LFS (EPY-UPY)*	-0.028719	-0.015161	0.016228	0.017828	0.009824
LFS (EPY-NLFPY)*	-0.050397	-0.030076	0.027777	0.033292	0.019404
LFS (UPY-NLFPY)*	-0.158918	-0.193208	0.032210	0.155068	0.164847
LFS (AOA)*	-0.064029	-0.041765	0.034390	0.044349	0.027055
Sex(Female)*	0.033985	0.015397	-0.019521	-0.019634	-0.010226
HLE(GHS)*	0.088634	0.028761	-0.051296	-0.044777	-0.021322
HLE(NUPC)*	0.067729	0.025377	-0.039176	-0.036120	-0.017811
HLE(UD)*	0.146470	0.031224	-0.083819	-0.065079	-0.028796
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 28: *Marginal Effects of Model (1) with Stress for the People 60 and Over Years of Age*

	Health status 1998				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.050159	0.043255	-0.027540	-0.042852	-0.023023
Stress (Not very stressful)*	0.135326	0.107533	-0.073007	-0.109781	-0.060070
Stress (Not at all stressful)*	0.219782	0.110898	-0.127297	-0.138189	-0.065195
Income	6.08E-07	5.86E-07	-3.16E-07	-5.60E-07	-3.18E-07
LFS (Unemployed)*	-0.008478	-0.008539	0.004258	0.008057	0.004702
LFS (NLF)*	-0.112552	-0.083453	0.063797	0.087340	0.044869
LFS (EPY-UPY)*	-0.035114	-0.040802	0.015019	0.036969	0.023929
LFS (EPY-NLFPY)*	-0.038822	-0.045408	0.016410	0.041065	0.026755
LFS (UPY-NLFPY)*	-0.007232	-0.007237	0.003651	0.006842	0.003976
LFS (AOA)*	-0.014262	-0.014813	0.006971	0.013853	0.008252
HLE(GHS)*	0.044713	0.037082	-0.025063	-0.037219	-0.019512
HLE(NUPC)*	0.055499	0.044657	-0.031399	-0.045300	-0.023456
HLE(UD)*	0.117761	0.068611	-0.070917	-0.079265	-0.036190
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 29: *Ordered Probit Estimates of Model (2) with Stress for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.159261	0.127333	1.563	0.211	13.83	0.0031
Stress (Not very stressful)*	-0.340717	0.127953	7.076	0.008		
Stress (Not at all stressful)*	-0.353967	0.139793	6.401	0.011		
Income	-6.55E-06	1.07E-06	37.454	0.000	38.22	0.0000
Sex(Female)*	0.181083	0.058738	9.486	0.002	9.51	0.0020
cut1	-0.630899	0.133717				
cut2	0.461960	0.133559				
cut3	1.369789	0.140923				
cut4	2.002284	0.165677				
N	1501					
Log likelihood	-1678.6349					
LR chi2(5)	65.09					

Table 30: *Ordered Probit Estimates of Model (2) with Stress for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.291619	0.026751	118.810	0.000	295.81	0.0000
Stress (Not very stressful)*	-0.466209	0.030394	235.316	0.000		
Stress (Not at all stressful)*	-0.600891	0.045309	175.828	0.000		
Income	-3.47E-06	3.72E-07	87.236	0.000	87.91	0.0000
LFS (Unemployed)*	0.287379	0.066631	18.576	0.000	266.46	0.0000
LFS (NLF)*	0.522358	0.032858	252.810	0.000		
LFS (EPY-UPY)*	0.090932	0.034980	6.760	0.009		
LFS (EPY-NLFPY)*	0.076068	0.042903	3.133	0.076		
LFS (UPY-NLFPY)*	0.262056	0.077096	11.560	0.001		
LFS (AOA)*	0.026388	0.046011	0.325	0.566		
HLE(GHS)*	-0.245737	0.028896	72.250	0.000	191.53	0.0000
HLE(NUPC)*	-0.258819	0.029231	78.323	0.000		
HLE(UD)*	-0.477519	0.034605	190.440	0.000		
Age	0.018696	0.001231	230.432	0.000	231.06	0.0000
cut1	-0.564175	0.059644				
cut2	0.546907	0.059678				
cut3	1.500223	0.060853				
cut4	2.201674	0.064338				
N	12884					
Log likelihood	-16304.075					
LR chi2(14)	1252.77					

Table 31: *Ordered Probit Estimates of Model (2) with Stress for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.315747	0.056852	30.803	0.000	117.63	0.0000
Stress (Not very stressful)*	-0.525669	0.061460	73.103	0.000		
Stress (Not at all stressful)*	-0.760225	0.078219	94.478	0.000		
Income	-2.49E-06	5.82E-07	18.233	0.000	18.48	0.0000
LFS (Unemployed)*	0.422680	0.132128	10.240	0.001	163.15	0.0000
LFS (NLF)*	0.620099	0.050451	151.044	0.000		
LFS (EPY-UPY)*	0.129746	0.092970	1.960	0.163		
LFS (EPY-NLFPY)*	0.258833	0.094174	7.563	0.006		
LFS (UPY-NLFPY)*	0.743108	0.183301	16.403	0.000		
LFS (AOA)*	0.305703	0.136989	4.973	0.026		
Sex(Female)*	-0.075103	0.039990	3.534	0.060	3.53	0.0604
HLE(GHS)*	-0.264952	0.052448	25.503	0.000	74.57	0.0000
HLE(NUPC)*	-0.271334	0.050352	29.052	0.000		
HLE(UD)*	-0.528092	0.065243	65.448	0.000		
cut1	-1.482674	0.070433				
cut2	-0.469017	0.067847				
cut3	0.362615	0.067641				
cut4	1.154406	0.071694				
N	2976					
Log likelihood	-4195.3202					
LR chi2(14)	427.78					

Table 32: *Ordered Probit Estimates of Model (2) with Stress for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Stress (Somewhat stressful)*	-0.210559	0.083082	6.401	0.011	119.29	0.0000
Stress (Not very stressful)*	-0.514940	0.081814	39.564	0.000		
Stress (Not at all stressful)*	-0.757817	0.087066	75.690	0.000		
Income	-3.63E-06	1.02E-06	12.603	0.000	12.61	0.0004
LFS (Unemployed)*	0.361434	0.225460	2.560	0.109	54.83	0.0000
LFS (NLF)*	0.410013	0.056593	52.418	0.000		
LFS (EPY-UPY)*	0.253523	0.167486	2.280	0.130		
LFS (EPY-NLFPY)*	0.163143	0.110256	2.190	0.139		
LFS (UPY-NLFPY)*	0.407122	0.292743	1.932	0.164		
LFS (AOA)*	0.269788	0.224816	1.440	0.230		
HLE(GHS)*	-0.254296	0.059270	18.404	0.000	50.93	0.0000
HLE(NUPC)*	-0.229274	0.057839	15.682	0.000		
HLE(UD)*	-0.522319	0.086602	36.361	0.000		
cut1	-1.559055	0.096555				
cut2	-0.502618	0.093438				
cut3	0.388354	0.093592				
cut4	1.202305	0.096792				
N	2389					
Log likelihood	-3400.9562					
LR chi2(13)	268.6					

Table 33: *Marginal Effects of Model (2) with Stress for the Persons of Age Under 20*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.063003	-0.023363	-0.028740	-0.008173	-0.002727
Stress (Not very stressful)*	0.134572	-0.051356	-0.060508	-0.017037	-0.005671
Stress (Not at all stressful)*	0.140451	-0.060968	-0.059320	-0.015375	-0.004787
Income	2.59E-06	-9.29E-07	-1.20E-06	-3.45E-07	-1.17E-07
Sex(Female)*	-0.071469	0.025714	0.032984	0.009542	0.003229
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 34: *Marginal Effects of Model (2) with Stress for the People between 20 and 49 Years of Age*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.097064	0.004667	-0.061864	-0.028622	-0.011246
Stress (Not very stressful)*	0.165038	-0.013987	-0.097789	-0.039276	-0.013986
Stress (Not at all stressful)*	0.224055	-0.048483	-0.120771	-0.041564	-0.013238
Income	1.16E-06	4.74E-08	-7.42E-07	-3.38E-07	-1.30E-07
LFS (Unemployed)*	-0.087743	-0.018529	0.059132	0.032575	0.014564
LFS (NLF)*	-0.150712	-0.045810	0.102212	0.063160	0.031150
LFS (EPY-UPY)*	-0.029755	-0.002537	0.019334	0.009252	0.003706
LFS (EPY-NLFPY)*	-0.024955	-0.002010	0.016187	0.007705	0.003073
LFS (UPY-NLFPY)*	-0.080653	-0.015902	0.054199	0.029385	0.012972
LFS (AOA)*	-0.008775	-0.000479	0.005633	0.002605	0.001016
HLE(GHS)*	0.084009	-0.000278	-0.052366	-0.022817	-0.008548
HLE(NUPC)*	0.088783	-0.000935	-0.055128	-0.023837	-0.008883
HLE(UD)*	0.172104	-0.021474	-0.099473	-0.038084	-0.013073
Age	-0.006262	-0.000255	0.003996	0.001819	0.000702
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 35: *Marginal Effects of Model (2) with Stress for the People between 50 and 59 Years of Age*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.083204	0.042804	-0.043166	-0.053400	-0.029443
Stress (Not very stressful)*	0.149968	0.054789	-0.079715	-0.083232	-0.041811
Stress (Not at all stressful)*	0.243489	0.033183	-0.128649	-0.103750	-0.044273
Income	6.20E-07	3.38E-07	-3.22E-07	-4.09E-07	-2.27E-07
LFS (Unemployed)*	-0.088230	-0.077393	0.035160	0.075172	0.055292
LFS (NLF)*	-0.131704	-0.101648	0.056094	0.104022	0.073236
LFS (EPY-UPY)*	-0.031820	-0.020352	0.015761	0.022775	0.013636
LFS (EPY-NLFPY)*	-0.057271	-0.041669	0.026662	0.043939	0.028339
LFS (UPY-NLFPY)*	-0.127146	-0.144438	0.028674	0.124665	0.118245
LFS (AOA)*	-0.066094	-0.051331	0.029509	0.052582	0.035335
HLE(GHS)*	0.073079	0.031678	-0.039046	-0.043414	-0.022297
HLE(NUPC)*	0.074819	0.033382	-0.039818	-0.045007	-0.023376
HLE(UD)*	0.157930	0.042623	-0.085160	-0.078941	-0.036453
Age	-0.000957	-0.000521	0.000497	0.000631	0.000350
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 36: *Marginal Effects of Model (2) with Stress for the People 60 and Over Years of Age*

	Health status 1999				
Variables 1996	Excellent	Very good	Good	Fair	Poor
Stress (Somewhat stressful)*	0.043575	0.039341	-0.022819	-0.037711	-0.022386
Stress (Not very stressful)*	0.109320	0.091800	-0.057228	-0.090270	-0.053623
Stress (Not at all stressful)*	0.185576	0.106883	-0.104877	-0.123272	-0.064310
Income	7.21E-07	7.15E-07	-3.58E-07	-6.65E-07	-4.14E-07
LFS (Unemployed)*	-0.055799	-0.076091	0.016460	0.064116	0.051315
LFS (NLF)*	-0.093721	-0.075152	0.050814	0.075173	0.042885
LFS (EPY-UPY)*	-0.040153	-0.049527	0.015214	0.043038	0.031429
LFS (EPY-NLFPY)*	-0.030121	-0.034728	0.012743	0.030798	0.021308
LFS (UPY-NLFPY)*	-0.064324	-0.093144	0.014941	0.076980	0.065547
LFS (AOA)*	-0.044611	-0.056753	0.015870	0.048859	0.036635
HLE(GHS)*	0.056030	0.045941	-0.030677	-0.045565	-0.025729
HLE(NUPC)*	0.049899	0.042056	-0.027039	-0.041297	-0.023618
HLE(UD)*	0.130932	0.073807	-0.076940	-0.085736	-0.042062
Age	0.002109	0.002093	-0.001046	-0.001944	-0.001211
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 37: *Gamma GLM Estimates of Model (3) for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000149	3.38E-07	1933.361	0.000	450.98	0.0000
Age	-0.028402	0.007333	14.977	0.000	3.25	0.0716
Health(Very good)*	-0.035486	0.018214	3.803	0.051	5.45	0.2440
Health(Good)*	-0.093076	0.026475	12.390	0.000		
Health(Fair)*	-0.164214	0.059380	7.673	0.006		
Health(Poor)*	-0.347124	0.120761	8.237	0.004		
Constant	10.533660	0.129115	6655.296	0.000		
N	3271					
Log likelihood	-38423.743		AIC	23.49786		
Deviance	1087.77012					

Table 38: *Gamma GLM Estimates of Model (3) for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000148	1.15E-07	16635.840	0.000	2573.66	0.0000
Age	0.002836	0.000310	83.723	0.000	12.03	0.0005
Health(Excellent)*	0.036963	0.006664	30.803	0.000	19.9	0.0005
Health(Very good)*	0.035908	0.006385	31.584	0.000		
Health(Fair)*	-0.040031	0.011829	11.424	0.001		
Health(Poor)*	-0.133950	0.019216	48.581	0.000		
LFS (Unemployed)*	-0.225176	0.016740	180.903	0.000	51.46	0.0000
LFS (NLF)*	-0.109690	0.008520	165.894	0.000		
LFS (EPY-UPY)*	-0.051691	0.008331	38.440	0.000		
LFS (EPY-NLFPY)*	-0.044463	0.010693	17.306	0.000		
LFS (UPY-NLFPY)*	-0.122400	0.018935	41.732	0.000		
LFS (AOA)*	-0.070494	0.010766	42.903	0.000		
HLE(GHS)*	0.072761	0.007238	101.003	0.000	45.89	0.0000
HLE(NUPC)*	0.092814	0.007176	167.185	0.000		
HLE(UD)*	0.150022	0.008572	306.250	0.000		
Constant	9.842089	0.014387	467992.810	0.000		
N	26055					
Log likelihood	-304219.35		AIC	23.35332		
Deviance	4023.77085					

Table 39: *Gamma GLM Estimates of Model (3) for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000163	2.46E-07	4387.738	0.000	869.84	
Age	-0.009391	0.001912	24.108	0.000	4.25	0.0392
Health(Excellent)*	0.055337	0.015766	12.320	0.000	10.16	0.0377
Health(Very good)*	0.047113	0.013957	11.424	0.001		
Health(Fair)*	-0.034787	0.019176	3.276	0.070		
Health(Poor)*	-0.115625	0.026519	19.010	0.000		
Sex(Female)*	-0.033199	0.011178	8.821	0.003	1.56	0.2122
LFS (Unemployed)*	-0.280142	0.033994	67.898	0.000	23.19	0.0007
LFS (NLF)*	-0.113580	0.014798	58.982	0.000		
LFS (EPY-UPY)*	-0.072878	0.023855	9.364	0.002		
LFS (EPY-NLFPY)*	-0.158281	0.027219	33.872	0.000		
LFS (UPY-NLFPY)*	-0.187240	0.051037	13.469	0.000		
LFS (AOA)*	-0.041035	0.036422	1.277	0.260		
HLE(GHS)*	0.096345	0.014853	42.120	0.000	12.02	0.0073
HLE(NUPC)*	0.096869	0.013808	49.280	0.000		
HLE(UD)*	0.097920	0.018063	29.376	0.000		
Constant	10.333920	0.106409	9430.352	0.000		
N	6163					
Log likelihood	-71387.548		AIC	23.17201		
Deviance	1170.70661					

Table 40: *Gamma GLM Estimates of Model (3) for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000103	2.99E-07	1198.544	0.000	1070.65	0.0000
Health(Excellent)*	0.014647	0.041347	0.123	0.723	18.12	0.0012
Health(Very good)*	-0.004685	0.031687	0.023	0.882		
Health(Fair)*	-0.104917	0.036236	8.410	0.004		
Health(Poor)*	-0.085835	0.053718	2.560	0.110		
HLE(GHS)*	0.144466	0.034391	17.640	0.000	116.18	0.0000
HLE(NUPC)*	0.204850	0.034626	35.046	0.000		
HLE(UD)*	0.346910	0.050477	47.197	0.000		
Constant	9.880105	0.024794	158794.280	0.000		
N	9762					
Log likelihood	-109948.24		AIC	22.52761		
Deviance	1841.2377					

Table 41: *Marginal Effects of Model (3)*

	Income 1998			
Variables 1996	ME below 20	ME 20-49	ME 50-59	ME 60 and over
Income	0.69075	0.64219	0.64416	0.29615
Age	-1320.12700	122.81470	-370.64270	
Health(Excellent)*		1610.88700	2218.43500	421.88630
Health(Very good)*	-1638.93600	1561.01200	1872.41800	-134.08590
Health(Good)*	-4175.87700			
Health(Fair)*	-7061.62100	-1702.67800	-1354.82500	-2908.94100
Health(Poor)*	-13653.62000	-5441.24800	-4336.22500	-2369.40900
Sex(Female)*			-1310.70600	
LFS (Unemployed)*		-8772.59900	-9715.57100	
LFS (NLF)*		-4546.00200	-4356.58300	
LFS (EPY-UPY)*		-2192.19300	-2785.39700	
LFS (EPY-NLFPY)*		-1887.84800	-5816.13800	
LFS (UPY-NLFPY)*		-4998.89300	-6753.92200	
LFS (AOA)*		-2958.83100	-1588.27100	
HLE(GHS)*		3191.22300	3910.45000	4345.51100
HLE(NUPC)*		4079.50400	3905.99700	6290.82300
HLE(UD)*		6842.95300	4005.97200	11594.39000
(*) dy/dx is for discrete change of DV from 0 to 1				

Table 42: *Gamma GLM Estimates of Model (4) for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000131	5.40E-07	586.608	0.000	181.84	0.0000
Age	-0.041076	0.012068	11.560	0.001	3.32	0.0686
Health(Excellent)*	0.059600	0.043086	1.904	0.167	1.41	0.8424
Health(Very good)*	0.057580	0.045571	1.588	0.206		
Health(Fair)*	0.072830	0.101173	0.518	0.472		
Health(Poor)*	-0.344257	0.222355	2.403	0.122		
Constant	10.771180	0.217958	2442.336	0.000		
N	1621					
Log likelihood	-19063.06682		AIC	23.52877		
Deviance	710.5784858					

Table 43: *Gamma GLM Estimates of Model (4) for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000131	1.65E-07	6272.640	0.000	1095.45	0.0000
Age	0.003110	0.000459	45.833	0.000	7.49	0.0062
Health(Excellent)*	0.032772	0.009846	11.089	0.001	13.03	0.0112
Health(Very good)*	0.040338	0.009404	18.404	0.000		
Health(Fair)*	-0.047715	0.017332	7.563	0.006		
Health(Poor)*	-0.155422	0.027673	31.584	0.000		
LFS (Unemployed)*	-0.221138	0.024474	81.722	0.000	31.69	0.0000
LFS (NLF)*	-0.127213	0.012284	107.330	0.000		
LFS (EPY-UPY)*	-0.065039	0.012755	26.010	0.000		
LFS (EPY-NLFPY)*	-0.021775	0.015709	1.932	0.166		
LFS (UPY-NLFPY)*	-0.094671	0.028197	11.290	0.001		
LFS (AOA)*	-0.090804	0.016670	29.703	0.000		
HLE(GHS)*	0.086296	0.010626	65.934	0.000	32.74	0.0000
HLE(NUPC)*	0.106590	0.010714	99.003	0.000		
HLE(UD)*	0.176315	0.012638	194.603	0.000		
Constant	9.939054	0.021081	222283.961	0.000		
N	13513					
Log likelihood	-158352.9351		AIC	23.43949		
Deviance	2405.309195					

Table 44: *Gamma GLM Estimates of Model (4) for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000139	3.72E-07	1404.001	0.000	329.29	0.0000
Age	-0.011573	0.002952	15.366	0.000	3.24	0.0721
Health(Excellent)*	0.058766	0.024498	5.760	0.016	4.18	0.3826
Health(Very good)*	0.081318	0.021816	13.913	0.000		
Health(Fair)*	0.008423	0.029143	0.084	0.773		
Health(Poor)*	-0.034410	0.041204	0.706	0.404		
Sex(Female)*	-0.036186	0.017229	4.410	0.036	0.93	0.3347
LFS (Unemployed)*	-0.284412	0.055628	26.112	0.000	11.85	0.0654
LFS (NLF)*	-0.094346	0.022801	17.140	0.000		
LFS (EPY-UPY)*	-0.083574	0.039041	4.580	0.032		
LFS (EPY-NLFPY)*	-0.127179	0.040124	10.049	0.002		
LFS (UPY-NLFPY)*	-0.356398	0.080537	19.625	0.000		
LFS (AOA)*	-0.038938	0.059709	0.423	0.514		
HLE(GHS)*	0.097989	0.022593	18.836	0.000	8.18	0.0424
HLE(NUPC)*	0.107504	0.021714	24.503	0.000		
HLE(UD)*	0.141741	0.028084	25.503	0.000		
Constant	10.532300	0.163895	4129.348	0.000		
N	3068					
Log likelihood	-35576.84909		AIC	23.20329		
Deviance	724.6516749					

Table 45: *Gamma GLM Estimates of Model (4) for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.0000209	3.46E-07	3634.884	0.000	592.46	0.0000
Age	-0.007200	0.000793	82.446	0.000	11.62	0.0007
Health(Excellent)*	0.013106	0.018120	0.518	0.470	2.28	0.6840
Health(Very good)*	0.007913	0.014222	0.314	0.578		
Health(Fair)*	-0.029480	0.016425	3.204	0.073		
Health(Poor)*	-0.079313	0.025665	9.548	0.002		
Sex(Female)*	-0.058507	0.011291	26.832	0.000	3.83	0.0502
HLE(GHS)*	0.074600	0.015609	22.848	0.000	8.31	0.0399
HLE(NUPC)*	0.075425	0.015593	23.426	0.000		
HLE(UD)*	0.138112	0.023540	34.457	0.000		
Constant	10.120650	0.058737	29687.290	0.000		
N	4617					
Log likelihood	-51976.4471		AIC	22.52001		
Deviance	562.8120285					

Table 46: *Marginal Effects of Model (4)*

	Income 1999			
Variables 1996	ME below 20	ME 20-49	ME 50-59	ME 60 and over
Income	0.61623	0.59160	0.55722	0.59436
Age	-1934.75600	140.52250	-462.68970	-205.18930
Health(Excellent)*	2800.84300	1489.41400	2388.34300	375.25380
Health(Very good)*	2741.04000	1830.83100	3291.76800	225.85400
Health(Fair)*	3553.15100	-2110.49600	337.81190	-832.37740
Health(Poor)*	-13736.03000	-6522.54200	-1354.71000	-2182.64600
Sex(Female)*			-1447.03200	-1672.82500
LFS (Unemployed)*		-9007.30200	-9963.68900	
LFS (NLF)*		-5467.97300	-3683.57300	
LFS (EPY-UPY)*		-2861.28600	-3218.69400	
LFS (EPY-NLFPY)*		-974.48240	-4802.82500	
LFS (UPY-NLFPY)*		-4087.79900	-12033.33000	
LFS (AOA)*		-3939.61300	-1527.96600	
HLE(GHS)*		3953.77600	4024.32400	2179.75500
HLE(NUPC)*		4909.95400	4408.88400	2204.27400
HLE(UD)*		8464.76400	5969.79700	4181.84200
(*) dy/dx is for discrete change of DV from 0 to 1				

Table 47: *Gamma GLM Estimates of Model (3) with Stress*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000012	1.66E-07	5286.744	0.000	4252.43	0.0000
Age	-0.002267	0.000421	28.944	0.000	33.78	0.0000
Stress (Somewhat stressful)*	0.049543	0.016375	9.181	0.002	12.35	0.0063
Stress (Not very stressful)*	0.053862	0.017859	9.120	0.003		
Stress (Not at all stressful)*	0.040298	0.022984	3.063	0.080		
Sex(Female)*	-0.031192	0.011087	7.896	0.005	9.21	0.0024
LFS (Unemployed)*	-0.285977	0.040278	50.410	0.000	131.33	0.0000
LFS (NLF)*	-0.121304	0.015954	57.760	0.000		
LFS (EPY-UPY)*	-0.094444	0.021431	19.448	0.000		
LFS (EPY-NLFPY)*	-0.064885	0.023014	7.952	0.005		
LFS (UPY-NLFPY)*	-0.139102	0.040079	12.041	0.001		
LFS (AOA)*	-0.106538	0.025873	16.974	0.000		
HLE(GHS)*	0.079024	0.014810	28.516	0.000	141.20	0.0000
HLE(NUPC)*	0.121700	0.015027	65.610	0.000		
HLE(UD)*	0.193189	0.018824	105.268	0.000		
Constant	10.139490	0.027476	136183.141	0.000		
N	39489					
Log likelihood	-459552.1809		AIC	23.27576		
Deviance	7357.206914					

Table 48: *Marginal Effects of Model (3) with Stress*

	Income 1998
Variables 1996	Marginal Effect
Income	0.50220
Age	-94.44846
Stress (Somewhat stressful)*	2066.46700
Stress (Not very stressful)*	2271.55100
Stress (Not at all stressful)*	1706.63600
Sex(Female)*	-1300.46800
LFS (Unemployed)*	-10420.10000
LFS (NLF)*	-4879.99800
LFS (EPY-UPY)*	-3781.36500
LFS (EPY-NLFPY)*	-2628.81700
LFS (UPY-NLFPY)*	-5425.65200
LFS (AOA)*	-4233.32000
HLE(GHS)*	3347.46000
HLE(NUPC)*	5203.86100
HLE(UD)*	8649.88400
(*) dy/dx is for discrete change of DV from 0 to 1	

Table 49: *Gamma GLM Estimates of Model (4) with Stress*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	9.99E-06	1.85E-07	2909.524	0.000	1697.80	0.0000
Age	-0.002369	0.000490	23.329	0.000	19.13	0.0000
Stress (Somewhat stressful)*	0.043085	0.018916	5.198	0.023	8.07	0.0445
Stress (Not very stressful)*	0.060102	0.020609	8.526	0.004		
Stress (Not at all stressful)*	0.018050	0.026429	0.462	0.495		
Sex(Female)*	-0.034293	0.012894	7.076	0.008	5.79	0.0161
LFS (Unemployed)*	-0.278972	0.046932	35.284	0.000	75.24	0.0000
LFS (NLF)*	-0.126759	0.018289	48.025	0.000		
LFS (EPY-UPY)*	-0.106815	0.025843	17.057	0.000		
LFS (EPY-NLFPY)*	-0.068153	0.026581	6.554	0.010		
LFS (UPY-NLFPY)*	-0.125459	0.047497	6.970	0.008		
LFS (AOA)*	-0.139477	0.031316	19.803	0.000		
HLE(GHS)*	0.097292	0.017079	32.490	0.000	107.97	0.0000
HLE(NUPC)*	0.145129	0.017680	67.404	0.000		
HLE(UD)*	0.235342	0.021815	116.424	0.000		
Constant	10.257700	0.031774	104225.666	0.000		
N	20507					
Log likelihood	-239361.6572		AIC	23.34595		
Deviance	4573.606662					

Table 50: *Marginal Effects of Model (4) with Stress*

	Income 1999
Variables 1996	Marginal Effects
Income	0.43102
Age	-102.21280
Stress (Somewhat stressful)*	1860.82300
Stress (Not very stressful)*	2627.94100
Stress (Not at all stressful)*	784.31960
Sex(Female)*	-1480.30600
LFS (Unemployed)*	-10557.52000
LFS (NLF)*	-5275.31500
LFS (EPY-UPY)*	-4402.10600
LFS (EPY-NLFPY)*	-2854.97000
LFS (UPY-NLFPY)*	-5098.46600
LFS (AOA)*	-5651.98500
HLE(GHS)*	4278.07200
HLE(NUPC)*	6472.49600
HLE(UD)*	11082.78000
(*) dy/dx is for discrete change of DV from 0 to 1	

Table 51: *Gamma GLM Estimates of Model (3) with Stress for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000015	3.44E-07	1935.120	0.000	455.76	0.0000
Age	-0.025338	0.007561	11.223	0.001	2.45	0.1175
Stress (Somewhat stressful)*	0.072270	0.035913	4.040	0.044	1.46	0.6917
Stress (Not very stressful)*	0.071998	0.036276	3.920	0.047		
Stress (Not at all stressful)*	0.102436	0.039421	6.760	0.009		
Sex(Female)*	-0.029629	0.016791	3.098	0.078	0.68	0.4097
Constant	10.382520	0.139675	5524.949	0.000		
N	3171					
Log likelihood	-37254.27609		AIC	23.50128		
Deviance	1067.230569					

Table 52: *Gamma GLM Estimates of Model (3) with Stress for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000015	1.15E-07	16731.423	0.000	2579.68	0.0000
Age	0.002373	0.000310	58.676	0.000	8.41	0.0037
Stress (Somewhat stressful)*	0.038116	0.006742	31.923	0.000	4.94	0.1759
Stress (Not very stressful)*	0.026624	0.007641	12.110	0.000		
Stress (Not at all stressful)*	0.013128	0.011269	1.346	0.244		
LFS (Unemployed)*	-0.232180	0.016918	188.238	0.000	58.36	0.0000
LFS (NLF)*	-0.124237	0.008462	215.502	0.000		
LFS (EPY-UPY)*	-0.051300	0.008397	37.332	0.000		
LFS (EPY-NLFPY)*	-0.044583	0.010776	17.140	0.000		
LFS (UPY-NLFPY)*	-0.126836	0.019078	44.223	0.000		
LFS (AOA)*	-0.071875	0.010840	43.957	0.000		
HLE(GHS)*	0.075295	0.007302	106.296	0.000	48.53	0.0000
HLE(NUPC)*	0.095753	0.007246	174.504	0.000		
HLE(UD)*	0.155936	0.008631	326.525	0.000		
Constant	9.848422	0.014944	434281.000	0.000		
N	25647					
Log likelihood	-299508.3799		AIC	23.35738		
Deviance	3942.415405					

Table 53: *Gamma GLM Estimates of Model (3) with Stress for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000016	2.47E-07	4385.088	0.000	862.05	0.0000
Age	-0.009711	0.001927	25.402	0.000	4.43	0.0353
Stress (Somewhat stressful)*	0.055352	0.015916	12.110	0.001	2.77	0.4288
Stress (Not very stressful)*	0.046968	0.017084	7.563	0.006		
Stress (Not at all stressful)*	0.076515	0.021586	12.532	0.000		
Sex(Female)*	-0.031804	0.011219	8.009	0.005	1.40	0.2359
LFS (Unemployed)*	-0.289862	0.034598	70.224	0.000	32.32	0.0000
LFS (NLF)*	-0.149191	0.014312	108.576	0.000		
LFS (EPY-UPY)*	-0.073035	0.024113	9.181	0.002		
LFS (EPY-NLFPY)*	-0.176672	0.027554	41.088	0.000		
LFS (UPY-NLFPY)*	-0.244464	0.051140	22.848	0.000		
LFS (AOA)*	-0.054707	0.036792	2.220	0.137		
HLE(GHS)*	0.107832	0.014904	52.418	0.000	15.09	0.0017
HLE(NUPC)*	0.107467	0.013888	59.908	0.000		
HLE(UD)*	0.116776	0.018117	41.603	0.000		
Constant	10.324250	0.106809	9343.156	0.000		
N	6019					
Log likelihood	-69750.21706		AIC	23.18200		
Deviance	1140.039735					

Table 54: *Gamma GLM Estimates of Model (3) with Stress for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000010	2.79E-07	1303.210	0.000	808.60	0.0000
Stress (Somewhat stressful)*	-0.069394	0.044652	2.403	0.120	3.39	0.3349
Stress (Not very stressful)*	-0.019769	0.027310	0.518	0.469		
Stress (Not at all stressful)*	-0.033108	0.027256	1.464	0.224		
Sex(Female)*	-0.138116	0.021993	39.438	0.000	42.91	0.0000
HLE(GHS)*	0.142435	0.029958	22.563	0.000	105.99	0.0000
HLE(NUPC)*	0.205671	0.030081	46.786	0.000		
HLE(UD)*	0.324038	0.044031	54.170	0.000		
Constant	9.964811	0.024031	171942.916	0.000		
N	9197					
Log likelihood	-103553.9805		AIC	22.52104		
Deviance	1479.383695					

Table 55: *Marginal Effects of Model (3) with Stress*

	Income 1998			
Variables 1996	ME below 20	ME 20-49	ME 50-59	ME 60 and over
Income	0.70439	0.64753	0.64850	0.28766
Age	-1179.66800	102.98060	-385.21020	
Stress (Somewhat stressful)*	3390.29700	1652.14800	2202.26300	-1923.53700
Stress (Not very stressful)*	3384.19800	1163.25500	1882.15400	-561.85640
Stress (Not at all stressful)*	4935.38400	572.98560	3128.54200	-938.07700
Sex(Female)*	-1378.72700		-1262.05100	-3983.44700
LFS (Unemployed)*		-9034.51500	-10057.94000	
LFS (NLF)*		-5129.28200	-5700.07800	
LFS (EPY-UPY)*		-2180.41100	-2805.32200	
LFS (EPY-NLFPY)*		-1896.75100	-6471.43600	
LFS (UPY-NLFPY)*		-5179.82100	-8627.50000	
LFS (AOA)*		-3021.18900	-2114.50800	
HLE(GHS)*		3310.71300	4413.54900	4266.53700
HLE(NUPC)*		4218.86100	4365.40000	6294.96000
HLE(UD)*		7140.82100	4834.71100	10685.33000
(*) dy/dx is for discrete change of DV from 0 to 1				

Table 56: *Gamma GLM Estimates of Model (4) with Stress for the Persons of Age Under 20*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000013	5.40E-07	590.976	0.000	183.25	0.0000
Age	-0.036722	0.012288	8.940	0.003	2.56	0.1099
Stress (Somewhat stressful)*	0.158384	0.059804	7.023	0.008	1.99	0.5751
Stress (Not very stressful)*	0.137199	0.060118	5.198	0.022		
Stress (Not at all stressful)*	0.153621	0.065032	5.570	0.018		
Sex(Female)*	-0.043978	0.027042	2.657	0.104	0.76	0.3839
Constant	10.627520	0.225725	2216.526	0.000		
N	1602					
Log likelihood	-18841.15457		AIC	23.53078		
Deviance	699.8370331					

Table 57: *Gamma GLM Estimates of Model (4) with Stress for the People between 20 and 49 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000013	1.66E-07	6296.423	0.000	1108.07	0.0000
Age	0.002661	0.000458	33.756	0.000	5.54	0.0186
Stress (Somewhat stressful)*	0.024350	0.009916	6.052	0.014	1.64	0.6515
Stress (Not very stressful)*	0.020386	0.011209	3.312	0.069		
Stress (Not at all stressful)*	-0.009388	0.016457	0.325	0.568		
LFS (Unemployed)*	-0.228557	0.024620	86.118	0.000	37.60	0.0000
LFS (NLF)*	-0.144442	0.012141	141.610	0.000		
LFS (EPY-UPY)*	-0.063930	0.012859	24.701	0.000		
LFS (EPY-NLFPY)*	-0.022938	0.015772	2.103	0.146		
LFS (UPY-NLFPY)*	-0.101338	0.028444	12.674	0.000		
LFS (AOA)*	-0.095977	0.016775	32.718	0.000		
HLE(GHS)*	0.092214	0.010660	74.823	0.000	35.61	0.0000
HLE(NUPC)*	0.110730	0.010776	105.678	0.000		
HLE(UD)*	0.184816	0.012688	212.285	0.000		
Constant	9.954358	0.021904	206533.892	0.000		
N	13434					
Log likelihood	-157438.099		AIC	23.44099		
Deviance	2403.060425					

Table 58: *Gamma GLM Estimates of Model (4) with Stress for the People between 50 and 59 Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000014	3.74E-07	1416.017	0.000	336.17	0.0000
Age	-0.011562	0.002976	15.132	0.000	3.21	0.0730
Stress (Somewhat stressful)*	0.047155	0.024650	3.648	0.056	1.35	0.7172
Stress (Not very stressful)*	0.062604	0.026434	5.617	0.018		
Stress (Not at all stressful)*	0.065194	0.032881	3.920	0.047		
Sex(Female)*	-0.036459	0.017333	4.410	0.035	0.94	0.3312
LFS (Unemployed)*	-0.300014	0.055878	28.837	0.000	15.09	0.0195
LFS (NLF)*	-0.117350	0.022225	27.878	0.000		
LFS (EPY-UPY)*	-0.082863	0.039380	4.410	0.035		
LFS (EPY-NLFPY)*	-0.141859	0.040693	12.180	0.000		
LFS (UPY-NLFPY)*	-0.396000	0.080563	24.206	0.000		
LFS (AOA)*	-0.054986	0.060478	0.828	0.363		
HLE(GHS)*	0.105838	0.022729	21.716	0.000	9.79	0.0204
HLE(NUPC)*	0.116634	0.021874	28.409	0.000		
HLE(UD)*	0.156556	0.028234	30.692	0.000		
Constant	10.521320	0.164694	4080.654	0.000		
N	3050					
Log likelihood	-35368.61346		AIC	23.20303		
Deviance	725.2332615					

Table 59: *Gamma GLM Estimates of Model (4) with Stress for the People 60 and Over Years of Age*

Variables 1996	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
Income	0.000018	4.49E-07	1,631.352	0.000	278.92	0.0000
Stress (Somewhat stressful)*	0.054629	0.030742	3.168	0.076	1.07	0.7837
Stress (Not very stressful)*	0.078337	0.030002	6.812	0.009		
Stress (Not at all stressful)*	0.062699	0.031664	3.920	0.048		
HLE(GHS)*	0.067637	0.021882	9.548	0.002	6.26	0.0997
HLE(NUPC)*	0.090400	0.021238	18.148	0.000		
HLE(UD)*	0.163446	0.031414	27.040	0.000		
Constant	9.647321	0.030453	100,362.240	0.000		
N	2416					
Log likelihood	-27425.56212		AIC	22.70990		
Deviance	344.2145216					

Table 60: *Marginal Effects of Model (4) with Stress*

	Income 1999			
Variables 1996	ME below 20	ME 20-49	ME 50-59	ME 60 and over
Income	0.61897	0.59487	0.56225	0.56776
Age	-1731.31200	120.32890	-462.30470	
Stress (Somewhat stressful)*	7602.55800	1100.58900	1890.59400	1729.54700
Stress (Not very stressful)*	6580.34200	926.72970	2538.02100	2476.73000
Stress (Not at all stressful)*	7628.55400	-422.83410	2673.61500	1996.05500
Sex(Female)*	-2074.02100		-1458.18500	
LFS (Unemployed)*		-9285.28300	-10438.56000	
LFS (NLF)*		-6171.69100	-4556.68800	
LFS (EPY-UPY)*		-2816.00800	-3192.80000	
LFS (EPY-NLFPY)*		-1026.84800	-5323.09900	
LFS (UPY-NLFPY)*		-4365.29100	-13132.78000	
LFS (AOA)*		-4157.86600	-2141.64100	
HLE(GHS)*		4232.62800	4356.43400	2164.68900
HLE(NUPC)*		5108.44000	4794.54700	2911.16400
HLE(UD)*		8906.11100	6630.98300	5490.38800
(*) dy/dx is for discrete change of DV from 0 to 1				

Table 61: *Ordered Probit Estimates of Model (5) for the Persons of Age Under 20*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CHealth 97 (Imp. a bit)*	-1.225048	0.308791	15.761	0.000	711.7	0.0000
CHealth 97 (Unchanged)*	-2.314680	0.308982	56.100	0.000		
CHealth 97 (Worsened)*	-2.717033	0.311211	76.213	0.000		
CHealth 97 (Wors. badly)*	-3.738613	0.441729	71.572	0.000		
Change in Income 97	6.05E-07	9.75E-07	0.384	0.535	0.38	0.5350
Sex(Female)*	-0.067384	0.039462	2.924	0.088	2.92	0.0877
HLE 98(GHS)*	0.131597	0.049486	7.076	0.008	7.75	0.0515
HLE 98(NUPC)*	0.069398	0.070459	0.960	0.325		
HLE 98(UD)*	-0.053622	0.243659	0.048	0.826		
cut1	-4.792913	0.320553				
cut2	-2.837408	0.311131				
cut3	-1.162037	0.309790				
cut4	1.273019	0.309904				
N	3340					
Log likelihood	-3163.8097					
LR chi2(9)	716.8					

Table 62: *Ordered Probit Estimates of Model (5) for the People between 20 and 49 Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CHealth 97 (Imp. a bit)*	-0.864221	0.097660	78.323	0.000	5433.04	0.0000
CHealth 97 (Unchanged)*	-1.712595	0.097584	308.003	0.000		
CHealth 97 (Worsened)*	-2.299559	0.098337	546.624	0.000		
CHealth 97 (Wors. badly)*	-3.026579	0.139089	473.498	0.000		
Change in Income 97	2.14E-07	4.02E-07	0.281	0.594	0.28	0.5945
HLE 98(GHS)*	-0.041031	0.021587	3.610	0.057	7.49	0.0579
HLE 98(NUPC)*	-0.045589	0.020789	4.796	0.028		
HLE 98(UD)*	-0.062824	0.023819	6.970	0.008		
Age 98	-0.001689	0.000844	4.000	0.045	4.00	0.0455
cut1	-4.479364	0.107942				
cut2	-2.474969	0.104108				
cut3	-0.926070	0.103695				
cut4	1.256549	0.104805				
N	26588					
Log likelihood	-26239.949					
LR chi2(9)	5442.28					

Table 63: *Ordered Probit Estimates of Model (5) for the People between 50 and 59 Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CHealth 97 (Imp. a bit)*	-0.734144	0.165848	19.625	0.000	1212.32	0.0000
CHealth 97 (Unchanged)*	-1.473385	0.165437	79.388	0.000		
CHealth 97 (Worsened)*	-2.097838	0.167297	157.252	0.000		
CHealth 97 (Wors. badly)*	-2.819251	0.231273	148.596	0.000		
Change in Income 97	-7.30E-07	6.95E-07	1.103	0.293	1.11	0.2927
LFS 98(Unemployed)*	-0.147096	0.094568	2.434	0.120	21.24	0.0017
LFS 98 (NLF)*	0.063663	0.031828	4.000	0.045		
LFS 98(EPY-UPY)*	0.095842	0.065876	2.103	0.146		
LFS 98 (EPY-NLFPY)*	-0.157424	0.063337	6.200	0.013		
LFS 98 (UPY-NLFPY)*	-0.245613	0.130522	3.534	0.060		
LFS 98 (AOA)*	0.041809	0.090582	0.212	0.644		
cut1	-4.079504	0.174761				
cut2	-2.154853	0.166086				
cut3	-0.680905	0.165294				
cut4	1.349389	0.167578				
N	6289					
Log likelihood	-6416.6854					
LR chi2(11)	1226.06					

Table 64: *Ordered Logit Estimates of Model (5) for the People between 50 and 59 Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CHealth 97 (Imp. a bit)*	-1.370453	0.370010	13.690	0.000	1229.13	0.0000
CHealth 97 (Unchanged)*	-2.697463	0.369303	53.290	0.000		
CHealth 97 (Worsened)*	-3.799320	0.372178	104.244	0.000		
CHealth 97 (Wors. badly)*	-5.172960	0.498175	107.744	0.000		
Change in Income 97	-1.67E-06	1.23E-06	1.823	0.176	1.83	0.1758
LFS 98(Unemployed)*	-0.288037	0.171104	2.822	0.092	18.54	0.0050
LFS 98 (NLF)*	0.103645	0.055180	3.534	0.060		
LFS 98(EPY-UPY)*	0.152280	0.114242	1.769	0.183		
LFS 98 (EPY-NLFPY)*	-0.265048	0.111698	5.617	0.018		
LFS 98 (UPY-NLFPY)*	-0.330034	0.229649	2.074	0.151		
LFS 98 (AOA)*	0.094439	0.162017	0.336	0.560		
cut1	-7.718634	0.394753				
cut2	-3.845195	0.370461				
cut3	-1.354162	0.368569				
cut4	2.748791	0.383672				
N	6289					
Log likelihood	-6408.305					
LR chi2(11)	1242.82					

Table 65: *Ordered Probit Estimates of Model (5) for the People 60 and Over Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CHealth 97 (Imp. a bit)*	-0.676553	0.112454	36.240	0.000	1964.62	0.0000
CHealth 97 (Unchanged)*	-1.343047	0.112239	143.281	0.000		
CHealth 97 (Worsened)*	-1.984540	0.113660	304.852	0.000		
CHealth 97 (Wors. badly)*	-2.981246	0.173472	295.496	0.000		
Change in Income 97	2.04E-07	9.30E-07	0.048	0.826	0.05	0.8261
HLE 98(GHS)*	-0.077508	0.030887	6.300	0.012	9.98	0.0188
HLE 98(NUPC)*	-0.029781	0.030921	0.922	0.335		
HLE 98(UD)*	-0.102262	0.044750	5.244	0.022		
Age 98	-0.004618	0.001542	9.000	0.003	8.97	0.0027
cut1	-4.236611	0.165360				
cut2	-2.295938	0.160020				
cut3	-0.964397	0.159257				
cut4	1.043342	0.161455				
N	9762					
Log likelihood	-10288.995					
LR chi2(9)	1972.46					

Table 66: *Marginal Effects of Model (5) for the Persons of Age Under 20*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CHealth 97 (Imp. a bit)*	0.038543	0.388799	-0.201209	-0.225141	-0.000992
CHealth 97 (Unchanged)*	0.045677	0.539472	0.033807	-0.599419	-0.019537
CHealth 97 (Worsened)*	0.288775	0.536553	-0.466370	-0.356350	-0.002607
CHealth 97 (Wors. badly)*	0.842729	-0.066725	-0.595042	-0.180554	-0.000409
Change in Income 97	-6.22E-09	-1.76E-07	2.51E-08	1.56E-07	8.49E-10
Sex(Female)*	0.000697	0.019626	-0.002837	-0.017390	-0.000094
HLE 98(GHS)*	-0.001440	-0.038827	0.006755	0.033339	0.000173
HLE 98(NUPC)*	-0.000666	-0.019833	0.002037	0.018355	0.000107
HLE 98(UD)*	0.000593	0.015882	-0.002887	-0.013519	-0.000069
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 67: *Marginal Effects of Model (5) for the People between 20 and 49 Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CHealth 97 (Imp. a bit)*	0.016164	0.276493	-0.086894	-0.203075	-0.002688
CHealth 97 (Unchanged)*	0.028987	0.460539	-0.016936	-0.456056	-0.016534
CHealth 97 (Worsened)*	0.162695	0.583275	-0.358368	-0.380560	-0.007043
CHealth 97 (Wors. badly)*	0.601211	0.162989	-0.549688	-0.213039	-0.001473
Change in Income 97	-1.96E-09	-6.28E-08	3.06E-09	6.07E-08	9.81E-10
HLE 98(GHS)*	0.000385	0.012111	-0.000744	-0.011568	-0.000184
HLE 98(NUPC)*	0.000425	0.013436	-0.000780	-0.012876	-0.000206
HLE 98(UD)*	0.000608	0.018689	-0.001478	-0.017548	-0.000272
Age 98	0.000016	0.000496	-0.000024	-0.000479	-7.75E-06
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 68: *Marginal Effects of Ordered Probit Model (5) for the People between 50 and 59 Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CHealth 97 (Imp. a bit)*	0.014870	0.231466	-0.053909	-0.187889	-0.004538
CHealth 97 (Unchanged)*	0.026851	0.403058	-0.000614	-0.408433	-0.020862
CHealth 97 (Worsened)*	0.146172	0.552366	-0.307176	-0.380113	-0.011249
CHealth 97 (Wors. badly)*	0.549184	0.207925	-0.519105	-0.234954	-0.003050
Change in Income 97	8.37E-09	2.13E-07	9.62E-10	-2.16E-07	-6.38E-09
LFS 98(Unemployed)*	0.002038	0.044833	-0.004417	-0.041391	-0.001063
LFS 98 (NLF)*	-0.000707	-0.018432	-0.000434	0.018996	0.000576
LFS 98(EPY-UPY)*	-0.000981	-0.027155	-0.001977	0.029166	0.000945
LFS 98 (EPY-NLFPY)*	0.002183	0.047977	-0.004729	-0.044293	-0.001139
LFS 98 (UPY-NLFPY)*	0.003900	0.076827	-0.012726	-0.066442	-0.001558
LFS 98 (AOA)*	-0.000455	-0.012043	-0.000427	0.012538	0.000386
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 69: *Marginal Effects of Ordered Logit Model (5) for the People between 50 and 59 Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CHealth 97 (Imp. a bit)*	0.011984	0.262066	-0.076579	-0.192419	-0.005053
CHealth 97 (Unchanged)*	0.020933	0.434940	0.000796	-0.439876	-0.016793
CHealth 97 (Worsened)*	0.096975	0.638321	-0.340098	-0.384077	-0.011120
CHealth 97 (Wors. badly)*	0.495352	0.269439	-0.534235	-0.225610	-0.004946
Change in Income 97	9.76E-09	2.78E-07	3.09E-09	-2.83E-07	-7.93E-09
LFS 98(Unemployed)*	0.001938	0.051531	-0.007019	-0.045250	-0.001199
LFS 98 (NLF)*	-0.000595	-0.017095	-0.000590	0.017777	0.000503
LFS 98(EPY-UPY)*	-0.000834	-0.024447	-0.002282	0.026787	0.000776
LFS 98 (EPY-NLFPY)*	0.001749	0.046977	-0.005497	-0.042105	-0.001124
LFS 98 (UPY-NLFPY)*	0.002276	0.059711	-0.009509	-0.051134	-0.001344
LFS 98 (AOA)*	-0.000529	-0.015364	-0.000987	0.016411	0.000470
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 70: *Marginal Effects of Model (5) for the People 60 and Over Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CHealth 97 (Imp. a bit)*	0.015941	0.221661	-0.051555	-0.180961	-0.005086
CHealth 97 (Unchanged)*	0.034107	0.404551	-0.057116	-0.364960	-0.016581
CHealth 97 (Worsened)*	0.138380	0.536200	-0.270047	-0.391086	-0.013447
CHealth 97 (Wors. badly)*	0.649310	0.081169	-0.484751	-0.242212	-0.003516
Change in Income 97	-3.06E-09	-6.42E-08	3.89E-09	6.13E-08	2.03E-09
HLE 98(GHS)*	0.001242	0.024652	-0.002316	-0.022861	-0.000718
HLE 98(NUPC)*	0.000458	0.009399	-0.000691	-0.008878	-0.000288
HLE 98(UD)*	0.001718	0.032811	-0.003843	-0.029784	-0.000902
Age 98	0.000069	0.001450	-0.000088	-0.001386	-0.000046
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 71: *Ordered Probit Estimates of Model (5) with Stress for the Persons of Age Under 20*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CStress 97 (Reduced)*	-0.292340	0.269134	1.188	0.277	5.59	0.2316
CStress 97 (Unchanged)*	-0.309213	0.268409	1.323	0.249		
CStress 97 (Increased)*	-0.396058	0.270050	2.161	0.142		
CStress 97 (Subst. increased)*	-0.389151	0.558271	0.490	0.486		
Change in Income 97	2.01E-07	9.72E-07	0.044	0.836	0.04	0.8364
Age 98	0.033837	0.019175	3.098	0.078	3.11	0.0776
Sex(Female)*	-0.042290	0.039148	1.166	0.280	1.17	0.2800
HLE 98(GHS)*	0.083599	0.051318	2.657	0.103	4.67	0.1972
HLE 98(NUPC)*	0.027390	0.075354	0.130	0.716		
HLE 98(UD)*	-0.223091	0.241623	0.846	0.356		
LFS 98(Unemployed)*	0.105344	0.158358	0.449	0.506	3.53	0.7400
LFS 98 (NLF)*	0.086332	0.068007	1.613	0.204		
LFS 98(EPY-UPY)*	0.021858	0.074073	0.090	0.768		
LFS 98 (EPY-NLFPY)*	0.071579	0.053974	1.769	0.185		
LFS 98 (UPY-NLFPY)*	0.100150	0.088779	1.277	0.259		
LFS 98 (AOA)*	0.016078	0.057585	0.078	0.780		
cut1	-2.048583	0.453665				
cut2	-0.237495	0.448659				
cut3	1.237968	0.449096				
cut4	3.268794	0.462933				
N	3237					
Log likelihood	-3401.7296					
LR chi2(16)	17.18		p-value	0.3738		

Table 72: *Ordered Probit Estimates of Model (5) with Stress for the People between 20 and 49 Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CStress 97 (Reduced)*	-0.128029	0.136205	0.884	0.347	45.84	0.0000
CStress 97 (Unchanged)*	-0.167019	0.135799	1.513	0.219		
CStress 97 (Increased)*	-0.258118	0.136288	3.572	0.058		
CStress 97 (Subst. increased)*	-0.248009	0.186352	1.769	0.183		
Change in Income 97	1.38E-08	3.97E-07	0.001	0.972	0.00	0.9723
HLE 98(GHS)*	-0.046998	0.021381	4.840	0.028	7.92	0.0476
HLE 98(NUPC)*	-0.051499	0.020589	6.250	0.012		
HLE 98(UD)*	-0.059675	0.023540	6.452	0.011		
Age 98	-0.001399	0.000834	2.822	0.093	2.82	0.0933
cut1	-2.753752	0.142577				
cut2	-0.926003	0.140221				
cut3	0.443481	0.140166				
cut4	2.348575	0.143166				
N	26171					
Log likelihood	-28446.643					
LR chi2(9)	55.67					

Table 73: *Ordered Probit Estimates of Model (5) with Stress for the People between 50 and 59 Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CStress 97 (Reduced)*	-0.254274	0.198596	1.638	0.200	20.65	0.0004
CStress 97 (Unchanged)*	-0.318983	0.197553	2.592	0.106		
CStress 97 (Increased)*	-0.405796	0.198585	4.162	0.041		
CStress 97 (Subst. increased)*	-0.790206	0.313629	6.350	0.012		
Change in Income 97	-9.47E-07	6.84E-07	1.904	0.166	1.92	0.1663
LFS 98(Unemployed)*	-0.130979	0.094412	1.932	0.165	20.90	0.0019
LFS 98 (NLF)*	0.072528	0.032762	4.884	0.027		
LFS 98(EPY-UPY)*	0.115078	0.065143	3.133	0.077		
LFS 98 (EPY-NLFPY)*	-0.136931	0.062881	4.752	0.029		
LFS 98 (UPY-NLFPY)*	-0.233164	0.129883	3.240	0.073		
LFS 98 (AOA)*	0.018758	0.091029	0.044	0.837		
Age 98	0.007954	0.004985	2.560	0.111	2.55	0.1106
cut1	-2.254811	0.344841				
cut2	-0.518238	0.341725				
cut3	0.795413	0.341790				
cut4	2.607242	0.345716				
N	6143					
Log likelihood	-6846.4901					
LR chi2(12)	46.75					

Table 74: *Ordered Logit Estimates of Model (5) with Stress for the People between 50 and 59 Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CStress 97 (Reduced)*	-0.437718	0.357102	1.513	0.220	18.92	0.0008
CStress 97 (Unchanged)*	-0.539171	0.355324	2.310	0.129		
CStress 97 (Increased)*	-0.684271	0.357096	3.686	0.055		
CStress 97 (Subst. increased)*	-1.348684	0.541194	6.200	0.013		
Change in Income 97	-2.06E-06	1.20E-06	2.924	0.088	2.91	0.0883
LFS 98(Unemployed)*	-0.231624	0.167020	1.932	0.166	20.95	0.0019
LFS 98 (NLF)*	0.148582	0.054662	7.398	0.007		
LFS 98(EPY-UPY)*	0.182333	0.112531	2.624	0.105		
LFS 98 (EPY-NLFPY)*	-0.217941	0.108548	4.040	0.045		
LFS 98 (UPY-NLFPY)*	-0.327532	0.227641	2.074	0.150		
LFS 98 (AOA)*	0.034316	0.160134	0.044	0.830		
cut1	-5.270136	0.380389				
cut2	-1.581884	0.355591				
cut3	0.557429	0.355060				
cut4	4.452762	0.384892				
N	6143					
Log likelihood	-6848.7106					
LR chi2(11)	42.31					

Table 75: *Ordered Probit Estimates of Model (5) with Stress for the People 60 and Over Years of Age*

Variables	Coefficient	Std. Err.	χ^2-statistic	p-value	LRT Chi2	p-value
CStress 97 (Reduced)*	-0.413009	0.148865	7.673	0.006	25.22	0.0000
CStress 97 (Unchanged)*	-0.472005	0.148322	10.112	0.001		
CStress 97 (Increased)*	-0.531615	0.149040	12.745	0.000		
CStress 97 (Subst. increased)*	-0.498585	0.207733	5.760	0.016		
Change in Income 97	2.78E-07	9.27E-07	0.090	0.764	0.09	0.7640
HLE 98(GHS)*	-0.072549	0.030814	5.523	0.019	6.20	0.1021
HLE 98(NUPC)*	-0.011238	0.030791	0.130	0.715		
HLE 98(UD)*	-0.050387	0.044561	1.277	0.258		
Age 98	-0.003587	0.001553	5.336	0.021	5.33	0.0209
cut1	-3.012700	0.192084				
cut2	-1.299258	0.188669				
cut3	-0.112596	0.188395				
cut4	1.685971	0.191919				
N	9385					
Log likelihood	-10820.554					
LR chi2(9)	35.38					

Table 76: *Marginal Effects of Model (5) with Stress for the People between 20 and 49 Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CStress 97 (Reduced)*	0.002569	0.039585	-0.003625	-0.037020	-0.001509
CStress 97 (Unchanged)*	0.003028	0.050488	-0.001700	-0.049611	-0.002205
CStress 97 (Increased)*	0.005770	0.081178	-0.011715	-0.072468	-0.002766
CStress 97 (Subst. increased)*	0.006218	0.079616	-0.016349	-0.067160	-0.002325
Change in Income 97	-2.54E-10	-4.19E-09	1.89E-10	4.08E-09	1.77E-10
HLE 98(GHS)*	0.000886	0.014358	-0.000839	-0.013815	-0.000589
HLE 98(NUPC)*	0.000964	0.015709	-0.000857	-0.015166	-0.000650
HLE 98(UD)*	0.001151	0.018321	-0.001309	-0.017434	-0.000729
Age 98	0.000026	0.000425	-0.000019	-0.000414	-0.000018
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 77: *Marginal Effects of Ordered Probit Model (5) with Stress for the People between 50 and 59 Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CStress 97 (Reduced)*	0.006864	0.078254	-0.007180	-0.073808	-0.004129
CStress 97 (Unchanged)*	0.007345	0.094752	0.000439	-0.096312	-0.006225
CStress 97 (Increased)*	0.012193	0.126295	-0.017875	-0.114511	-0.006103
CStress 97 (Subst. increased)*	0.045961	0.251329	-0.115301	-0.175741	-0.006249
Change in Income 97	2.16E-08	2.83E-07	-3.96E-10	-2.86E-07	-1.79E-08
LFS 98(Unemployed)*	0.003473	0.040327	-0.003502	-0.038173	-0.002126
LFS 98 (NLF)*	-0.001600	-0.021514	-0.000404	0.022097	0.001421
LFS 98(EPY-UPY)*	-0.002322	-0.033410	-0.002463	0.035719	0.002475
LFS 98 (EPY-NLFPY)*	0.003620	0.042128	-0.003575	-0.039942	-0.002231
LFS 98 (UPY-NLFPY)*	0.007003	0.073181	-0.011181	-0.065655	-0.003348
LFS 98 (AOA)*	-0.000419	-0.005581	-0.000063	0.005700	0.000363
Age 98	-0.000181	-0.002378	3.33E-06	0.002406	0.000150
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 78: *Marginal Effects of Ordered Logit Model (5) with Stress for the People between 50 and 59 Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CStress 97 (Reduced)*	0.004170	0.083570	-0.009319	-0.075714	-0.002707
CStress 97 (Unchanged)*	0.004576	0.097517	0.000563	-0.098882	-0.003775
CStress 97 (Increased)*	0.007014	0.133541	-0.022161	-0.114376	-0.004018
CStress 97 (Subst. increased)*	0.023434	0.290248	-0.139670	-0.168876	-0.005136
Change in Income 97	1.74E-08	3.74E-07	-5.88E-10	-3.77E-07	-1.41E-08
LFS 98(Unemployed)*	0.002187	0.044218	-0.004804	-0.040170	-0.001430
LFS 98 (NLF)*	-0.001221	-0.026655	-0.000759	0.027584	0.001052
LFS 98(EPY-UPY)*	-0.001423	-0.031873	-0.002723	0.034659	0.001360
LFS 98 (EPY-NLFPY)*	0.002030	0.041375	-0.003983	-0.038058	-0.001363
LFS 98 (UPY-NLFPY)*	0.003252	0.063754	-0.009729	-0.055348	-0.001930
LFS 98 (AOA)*	-0.000285	-0.006194	-0.000094	0.006335	0.000240
(*) dy/dx is for discrete change of dummy variable from 0 to 1					

Table 79: *Marginal Effects of Model (5) with Stress for the People 60 and Over Years of Age*

	Change in Health 1998				
Variables	Improved substantially	Improved a bit	Unchanged	Worsened	Worsened badly
CStress 97 (Reduced)*	0.015832	0.131358	-0.020800	-0.119281	-0.007110
CStress 97 (Unchanged)*	0.015716	0.146690	-0.011265	-0.141427	-0.009714
CStress 97 (Increased)*	0.022516	0.169500	-0.034267	-0.149250	-0.008500
CStress 97 (Subst. increased)*	0.026630	0.161327	-0.053131	-0.128955	-0.005871
Change in Income 97	-8.49E-09	-8.67E-08	4.36E-09	8.51E-08	5.78E-09
HLE 98(GHS)*	0.002339	0.022807	-0.001820	-0.021904	-0.001422
HLE 98(NUPC)*	0.000346	0.003508	-0.000192	-0.003430	-0.000231
HLE 98(UD)*	0.001616	0.015830	-0.001219	-0.015233	-0.000993
Age 98	0.000110	0.001118	-0.000056	-0.001097	-0.000075

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table 80: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6)*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1519452	-0.0003977	0.0075865	-0.1668325	-0.1370579	(N)
					-0.1664828	-0.1371194	(P)
					-0.1653944	-0.1358931	(BC)
CHealth 97 (Subst. imp.)*	1000	-1129.833	-4.140325	830.164	-2758.898	499.232	(N)
					-2768.247	473.740	(P)
					-2830.368	419.850	(BC)
CHealth 97 (Imp. a bit)*	1000	-189.3181	-3.693215	137.7626	-459.655	81.019	(N)
					-459.351	66.520	(P)
					-452.255	69.445	(BC)
CHealth 97 (Worsened)*	1000	2.848337	-2.10237	145.0803	-281.849	287.545	(N)
					-270.359	291.192	(P)
					-265.037	298.406	(BC)
CHealth 97 (Wors. badly)*	1000	-836.9861	-33.46674	874.7398	-2553.524	879.552	(N)
					-2657.995	868.725	(P)
					-2582.838	982.235	(BC)
LFS 98(Unemployed)*	1000	-3613.345	-9.076668	369.1722	-4337.787	-2888.904	(N)
					-4319.908	-2922.365	(P)
					-4317.603	-2921.755	(BC)
LFS 98 (NLF)*	1000	-1859.29	5.010948	156.5067	-2166.410	-1552.170	(N)
					-2175.257	-1542.119	(P)
					-2191.781	-1546.730	(BC)
LFS 98(EPY-UPY)*	1000	-1171.935	-4.055265	226.8242	-1617.041	-726.828	(N)
					-1594.462	-737.018	(P)
					-1579.700	-734.085	(BC)
LFS 98 (EPY-NLFPY)*	1000	-1073.788	11.69886	300.9145	-1664.285	-483.291	(N)
					-1677.919	-480.708	(P)
					-1704.996	-488.702	(BC)
LFS 98 (UPY-NLFPY)*	1000	-3360.684	19.50144	416.608	-4178.211	-2543.157	(N)
					-4193.728	-2569.349	(P)
					-4222.388	-2593.589	(BC)
LFS 98 (AOA)*	1000	-1562.81	-8.920867	334.5782	-2219.366	-906.253	(N)
					-2213.629	-926.035	(P)
					-2201.063	-912.274	(BC)
HLE 98(GHS)*	1000	258.7125	-8.160569	161.2039	-57.625	575.050	(N)
					-57.897	553.117	(P)
					-50.972	577.841	(BC)
HLE 98(NUPC)*	1000	202.953	-1.541444	154.0629	-99.371	505.277	(N)
					-118.694	485.198	(P)
					-125.036	473.988	(BC)
HLE 98(UD)*	1000	631.1646	0.3782268	215.1229	209.020	1053.309	(N)
					207.087	1041.042	(P)
					204.118	1027.789	(BC)
Age 98	1000	-28.98312	-0.1339627	5.107968	-39.007	-18.960	(N)
					-39.199	-19.212	(P)
					-38.661	-18.348	(BC)
Sex(Female)*	1000	212.238	-4.927051	119.0517	-21.382	445.858	(N)
					-32.774	437.560	(P)
					-0.701	463.256	(BC)
Constant	1000	2698.509	10.12159	275.2028	2158.467	3238.551	(N)
					2161.973	3228.057	(P)
					2150.981	3222.018	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 81: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) for the Persons of Age Under 20*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	2000	-0.2192924	-0.0013764	0.0280884	-0.2743781	-0.1642068	(N)
					-0.2758427	-0.1669236	(P)
					-0.2712429	-0.1624007	(BC)
CHealth 97 (Subst. imp.)*	2000	6348.795	-72.36743	6220.759	-5851.056	18548.650	(N)
					-6123.463	18119.950	(P)
					-6092.301	18153.050	(BC)
CHealth 97 (Imp. a bit)*	2000	1552.683	-6.215028	800.3973	-17.017	3122.384	(N)
					-52.068	3068.047	(P)
					-50.780	3071.035	(BC)
CHealth 97 (Worsened)*	2000	-221.9899	-14.77181	792.2187	-1775.651	1331.671	(N)
					-1802.912	1314.422	(P)
					-1797.215	1317.634	(BC)
CHealth 97 (Wors. badly)*	2000	962.1774	-166.2725	4012.857	-6907.643	8831.998	(N)
					-6605.624	8764.262	(P)
					-5925.383	9846.988	(BC)
LFS 98(Unemployed)*	2000	-6405.653	16.506	2029.158	-10385.140	-2426.167	(N)
					-10493.780	-2551.152	(P)
					-10640.370	-2648.594	(BC)
LFS 98 (NLF)*	2000	-1987.945	-41.31618	1031.111	-4010.110	34.220	(N)
					-3996.416	20.114	(P)
					-3871.011	236.784	(BC)
LFS 98(EPY-UPY)*	2000	-1351.728	7.720622	1148.765	-3604.630	901.174	(N)
					-3707.213	812.428	(P)
					-3796.320	741.670	(BC)
LFS 98 (EPY-NLFPY)*	2000	-1383.372	-6.174331	897.6642	-3143.828	377.083	(N)
					-3193.500	379.225	(P)
					-3193.976	363.443	(BC)
LFS 98 (UPY-NLFPY)*	2000	-3198.783	11.09657	1057.886	-5273.458	-1124.108	(N)
					-5254.465	-1124.665	(P)
					-5254.896	-1131.495	(BC)
LFS 98 (AOA)*	2000	-2899.933	-30.48591	961.8877	-4786.341	-1013.526	(N)
					-4851.862	-1028.706	(P)
					-4812.689	-988.323	(BC)
HLE 98(GHS)*	2000	515.8502	31.91381	813.8676	-1080.267	2111.968	(N)
					-986.321	2162.166	(P)
					-1072.619	2087.976	(BC)
HLE 98(NUPC)*	2000	-234.0744	50.45603	1236.591	-2659.217	2191.068	(N)
					-2658.496	2184.710	(P)
					-2748.307	1991.166	(BC)
HLE 98(UD)*	2000	188.9626	126.4686	4160.12	-7969.662	8347.587	(N)
					-8250.583	8153.374	(P)
					-8924.624	7667.586	(BC)
Age 98	2000	-339.3291	-6.544902	322.597	-971.991	293.333	(N)
					-986.245	288.675	(P)
					-985.614	295.675	(BC)
Sex(Female)*	2000	-481.5898	-18.22894	625.8452	-1708.967	745.787	(N)
					-1771.957	778.066	(P)
					-1704.546	816.670	(BC)
Constant	2000	8253.964	125.5568	6120.76	-3749.773	20257.700	(N)
					-3801.057	20572.700	(P)
					-4013.385	20308.050	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 82: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) for the People between 20 and 49 Years of Age*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1609016	-0.0009949	0.0085645	-0.1777081	-0.1440952	(N)
					-0.1792785	-0.1460818	(P)
					-0.1772059	-0.1442442	(BC)
CHealth 97 (Subst. imp.)*	1000	-928.228	36.50397	1022.757	-2935.226	1078.770	(N)
					-2942.458	1121.741	(P)
					-3074.150	1012.676	(BC)
CHealth 97 (Imp. a bit)*	1000	-293.6041	3.808419	161.1103	-609.757	22.549	(N)
					-623.482	15.283	(P)
					-642.052	-0.899	(BC)
CHealth 97 (Worsened)*	1000	118.7314	-7.292181	172.5949	-219.959	457.422	(N)
					-220.669	448.932	(P)
					-211.719	475.673	(BC)
CHealth 97 (Wors. badly)*	1000	-536.4304	-43.11863	1152.726	-2798.472	1725.611	(N)
					-2844.780	1651.095	(P)
					-2839.028	1640.580	(BC)
LFS 98(Unemployed)*	1000	-3613.064	-11.55389	403.764	-4405.387	-2820.741	(N)
					-4416.415	-2826.095	(P)
					-4372.941	-2797.403	(BC)
LFS 98 (NLF)*	1000	-1774.257	-2.332749	236.61	-2238.567	-1309.947	(N)
					-2270.431	-1331.037	(P)
					-2285.448	-1341.733	(BC)
LFS 98(EPY-UPY)*	1000	-1074.655	5.231742	256.3255	-1577.653	-571.657	(N)
					-1572.995	-567.699	(P)
					-1602.694	-587.205	(BC)
LFS 98 (EPY-NLFPY)*	1000	-1364.775	5.495233	373.6967	-2098.095	-631.454	(N)
					-2116.034	-599.209	(P)
					-2087.681	-591.538	(BC)
LFS 98 (UPY-NLFPY)*	1000	-3368.938	-6.453768	593.3056	-4533.207	-2204.670	(N)
					-4518.461	-2266.940	(P)
					-4524.652	-2291.107	(BC)
LFS 98 (AOA)*	1000	-1582.175	-5.630452	400.272	-2367.645	-796.704	(N)
					-2349.447	-790.975	(P)
					-2337.959	-780.822	(BC)
HLE 98(GHS)*	1000	329.8902	-3.093048	206.6137	-75.556	735.337	(N)
					-61.873	759.026	(P)
					-60.553	761.535	(BC)
HLE 98(NUPC)*	1000	411.8238	-0.6744381	205.2756	9.003	814.645	(N)
					7.417	835.667	(P)
					6.715	835.522	(BC)
HLE 98(UD)*	1000	1216.656	-11.99339	254.4289	717.380	1715.933	(N)
					704.424	1672.013	(P)
					743.285	1714.031	(BC)
Age 98	1000	-7.026226	0.3077807	9.979608	-26.610	12.557	(N)
					-27.132	12.625	(P)
					-28.063	11.829	(BC)
Sex(Female)*	1000	260.2632	4.39063	145.9076	-26.057	546.584	(N)
					-12.197	557.265	(P)
					-10.962	558.480	(BC)
Constant	1000	1794.868	-9.619103	446.7699	918.153	2671.583	(N)
					871.001	2685.631	(P)
					902.307	2707.256	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 83: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) for the People between 50 and 59 Years of Age*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1351552	-0.0023938	0.0219249	-0.1781793	-0.0921311	(N)
					-0.1793945	-0.0973532	(P)
					-0.1783892	-0.0963628	(BC)
CHealth 97 (Subst. imp.)*	1000	-779.7293	-46.2007	1836.429	-4383.429	2823.971	(N)
					-4362.534	2659.574	(P)
					-4076.641	2862.711	(BC)
CHealth 97 (Imp. a bit)*	1000	-226.5892	-16.52547	384.8245	-981.746	528.568	(N)
					-1013.532	547.682	(P)
					-987.354	586.111	(BC)
CHealth 97 (Worsened)*	1000	220.1647	-12.42602	403.9685	-572.559	1012.889	(N)
					-613.260	989.175	(P)
					-599.664	1017.257	(BC)
CHealth 97 (Wors. badly)*	1000	-2955.074	21.75063	1744.391	-6378.164	468.015	(N)
					-6703.537	225.182	(P)
					-7103.743	-15.586	(BC)
LFS 98(Unemployed)*	1000	-2197.656	-7.110655	866.6102	-3898.242	-497.071	(N)
					-3850.656	-545.228	(P)
					-3848.261	-493.704	(BC)
LFS 98 (NLF)*	1000	-2627.67	-9.516379	385.2841	-3383.729	-1871.611	(N)
					-3416.982	-1920.952	(P)
					-3405.224	-1915.806	(BC)
LFS 98(EPY-UPY)*	1000	-1515.095	-29.63698	710.3771	-2909.097	-121.092	(N)
					-2859.844	-141.503	(P)
					-2775.216	-34.746	(BC)
LFS 98 (EPY-NLFPY)*	1000	-80.06652	-35.33712	948.8243	-1941.984	1781.851	(N)
					-1914.790	1811.197	(P)
					-1887.653	1857.501	(BC)
LFS 98 (UPY-NLFPY)*	1000	-4004.912	33.50533	1390.679	-6733.898	-1275.926	(N)
					-6690.287	-1427.974	(P)
					-6753.167	-1465.738	(BC)
LFS 98 (AOA)*	1000	1483.339	-54.23738	1172.767	-818.030	3784.708	(N)
					-896.653	3724.815	(P)
					-761.017	3830.455	(BC)
HLE 98(GHS)*	1000	564.3912	-31.05215	423.4105	-266.485	1395.267	(N)
					-301.079	1358.570	(P)
					-260.250	1383.165	(BC)
HLE 98(NUPC)*	1000	395.0593	-0.6806683	392.866	-375.878	1165.997	(N)
					-383.460	1200.749	(P)
					-383.868	1199.504	(BC)
HLE 98(UD)*	1000	-332.4826	-10.82701	614.7724	-1538.876	873.911	(N)
					-1524.327	889.137	(P)
					-1504.631	914.149	(BC)
Age 98	1000	65.09822	-0.645678	56.19627	-45.178	175.375	(N)
					-46.602	173.892	(P)
					-49.130	171.494	(BC)
Sex(Female)*	1000	276.8173	13.7065	325.4463	-361.819	915.454	(N)
					-332.219	936.688	(P)
					-344.270	916.323	(BC)
Constant	1000	-3412.052	49.80656	3177.389	-9647.175	2823.071	(N)
					-9279.429	3008.231	(P)
					-9202.806	3037.691	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 84: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) for the People 60 and Over Years of Age*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1183763	-0.0000515	0.0186019	-0.1548795	-0.0818731	(N)
					-0.1555529	-0.0817578	(P)
					-0.1563663	-0.0824588	(BC)
CHealth 97 (Subst. imp.)*	1000	-404.8744	35.68482	915.9692	-2202.319	1392.570	(N)
					-2169.428	1374.064	(P)
					-2287.542	1348.555	(BC)
CHealth 97 (Imp. a bit)*	1000	117.8372	-16.81126	285.0172	-441.464	677.138	(N)
					-497.913	661.662	(P)
					-430.647	688.806	(BC)
CHealth 97 (Worsened)*	1000	-178.6558	-15.39815	291.8954	-751.454	394.143	(N)
					-766.417	384.911	(P)
					-691.326	473.154	(BC)
CHealth 97 (Wors. badly)*	1000	1541.582	-75.41444	1391.659	-1189.329	4272.493	(N)
					-1170.869	4242.958	(P)
					-939.739	4639.166	(BC)
LFS 98(Unemployed)*	1000	-1376.322	30.92808	1132.315	-3598.310	845.666	(N)
					-3494.228	727.335	(P)
					-3920.593	560.544	(BC)
LFS 98 (NLF)*	1000	-552.327	-10.60472	414.8962	-1366.495	261.841	(N)
					-1388.447	217.066	(P)
					-1387.171	222.874	(BC)
LFS 98(EPY-UPY)*	1000	484.6785	42.44723	1088.385	-1651.105	2620.462	(N)
					-1563.135	2704.105	(P)
					-1565.104	2672.796	(BC)
LFS 98 (EPY-NLFPY)*	1000	-1037.016	-23.09869	985.9809	-2971.847	897.815	(N)
					-2973.703	921.279	(P)
					-2856.869	995.002	(BC)
LFS 98 (UPY-NLFPY)*	1000	-1910.18	51.6742	1973.594	-5783.045	1962.684	(N)
					-5567.413	2265.450	(P)
					-5420.628	2357.709	(BC)
LFS 98 (AOA)*	1000	-501.537	-19.891	1377.168	-3204.011	2200.937	(N)
					-3315.679	2078.813	(P)
					-3381.241	2061.170	(BC)
HLE 98(GHS)*	1000	290.8663	-3.658929	342.5284	-381.291	963.024	(N)
					-379.874	973.862	(P)
					-347.600	983.431	(BC)
HLE 98(NUPC)*	1000	-342.6597	-0.0439277	321.9435	-974.423	289.103	(N)
					-952.834	294.325	(P)
					-942.693	297.172	(BC)
HLE 98(UD)*	1000	-141.2812	-11.06124	535.7368	-1192.580	910.017	(N)
					-1257.510	872.656	(P)
					-1171.445	879.554	(BC)
Age 98	1000	6.618227	2.057892	54.45128	-100.234	113.470	(N)
					-100.125	117.370	(P)
					-99.768	116.882	(BC)
Sex(Female)*	1000	140.8042	-0.9514696	239.5069	-329.190	610.799	(N)
					-358.721	613.509	(P)
					-360.710	609.607	(BC)
Constant	1000	199.9536	-113.2733	3499.796	-6667.842	7067.749	(N)
					-6807.844	7045.968	(P)
					-6838.305	6969.150	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 85: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) with Stress*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1539399	-0.0001022	0.0079097	-0.169461	-0.138419	(N)
					-0.169797	-0.138935	(P)
					-0.169914	-0.139130	(BC)
CStress 97 (Subst. reduced)*	1000	860.317	0.2011496	1025.756	-1152.566	2873.200	(N)
					-1087.618	2819.471	(P)
					-1082.280	2823.311	(BC)
CStress 97 (Reduced)*	1000	-52.20552	-8.133353	142.1739	-331.199	226.788	(N)
					-330.067	227.706	(P)
					-326.306	246.536	(BC)
CStress 97 (Increased)*	1000	-357.7228	-2.181628	155.1973	-662.273	-53.173	(N)
					-676.294	-41.473	(P)
					-635.557	-29.088	(BC)
CStress 97 (Subst. increased)*	1000	-17.1635	2.86061	999.3138	-1978.158	1943.831	(N)
					-2068.131	2038.198	(P)
					-2073.185	2025.237	(BC)
LFS 98(Unemployed)*	1000	-3658.192	18.90737	350.4684	-4345.930	-2970.453	(N)
					-4309.775	-2950.868	(P)
					-4386.264	-3015.542	(BC)
LFS 98 (NLF)*	1000	-1875.532	5.323632	166.3463	-2201.960	-1549.104	(N)
					-2195.876	-1549.546	(P)
					-2207.144	-1551.516	(BC)
LFS 98(EPY-UPY)*	1000	-1154.012	1.232206	234.7163	-1614.605	-693.419	(N)
					-1633.691	-723.746	(P)
					-1663.229	-734.856	(BC)
LFS 98 (EPY-NLFPY)*	1000	-1147.382	5.547276	285.3843	-1707.403	-587.360	(N)
					-1685.586	-564.817	(P)
					-1685.665	-565.636	(BC)
LFS 98 (UPY-NLFPY)*	1000	-3359.781	-7.548004	430.0322	-4203.651	-2515.911	(N)
					-4202.245	-2524.024	(P)
					-4197.563	-2526.094	(BC)
LFS 98 (AOA)*	1000	-1692.293	3.520657	320.7599	-2321.733	-1062.852	(N)
					-2296.930	-1063.663	(P)
					-2313.421	-1084.607	(BC)
HLE 98(GHS)*	1000	267.0355	-0.3975645	166.8652	-60.411	594.482	(N)
					-67.193	592.613	(P)
					-68.705	584.257	(BC)
HLE 98(NUPC)*	1000	191.8385	4.243788	157.7822	-117.784	501.461	(N)
					-117.775	502.183	(P)
					-126.068	494.321	(BC)
HLE 98(UD)*	1000	613.8696	2.133933	201.8337	217.803	1009.936	(N)
					216.871	1010.830	(P)
					215.525	1009.373	(BC)
Age 98	1000	-29.90941	0.0665765	5.36597	-40.439	-19.380	(N)
					-40.474	-19.551	(P)
					-40.434	-19.529	(BC)
Sex(Female)*	1000	204.0447	-3.544012	124.72	-40.699	448.788	(N)
					-45.662	451.810	(P)
					-41.597	455.775	(BC)
Constant	1000	2789.919	-5.622323	291.0311	2218.816	3361.021	(N)
					2182.780	3335.692	(P)
					2176.969	3330.329	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 86: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) with Stress for the Persons of Age Under 20*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.2120466	-0.0009043	0.0285709	-0.268113	-0.155981	(N)
					-0.268033	-0.157898	(P)
					-0.265754	-0.155179	(BC)
CStress 97 (Subst. reduced)*	1000	-3850	75.28764	4368.896	-12423.270	4723.267	(N)
					-12240.880	4850.812	(P)
					-12259.620	4845.814	(BC)
CStress 97 (Reduced)*	1000	-378.1679	-1.372062	710.9883	-1773.370	1017.034	(N)
					-1735.462	1094.100	(P)
					-1696.711	1129.495	(BC)
CStress 97 (Increased)*	1000	-1434.396	-6.970977	815.1875	-3034.073	165.280	(N)
					-3069.561	166.439	(P)
					-3117.547	138.934	(BC)
CStress 97 (Subst. increased)*	991	1488.73	124.8736	5470.156	-9245.702	12223.160	(N)
					-7174.034	13425.890	(P)
					-6509.133	15897.120	(BC)
LFS 98(Unemployed)*	1000	-6579.279	89.7245	2174.228	-10845.860	-2312.702	(N)
					-10935.130	-2286.003	(P)
					-11395.560	-2562.557	(BC)
LFS 98 (NLF)*	1000	-2160.43	-13.5301	984.068	-4091.508	-229.353	(N)
					-4165.497	-246.714	(P)
					-4218.351	-251.995	(BC)
LFS 98(EPY-UPY)*	1000	-1291.202	18.17684	1208.822	-3663.323	1080.919	(N)
					-3624.758	1023.418	(P)
					-3661.714	964.499	(BC)
LFS 98 (EPY-NLFPY)*	1000	-1732.788	26.14142	889.7913	-3478.863	13.286	(N)
					-3413.078	22.444	(P)
					-3411.043	23.429	(BC)
LFS 98 (UPY-NLFPY)*	1000	-3035.302	8.31137	1105.945	-5205.545	-865.060	(N)
					-5292.752	-808.385	(P)
					-5444.582	-993.946	(BC)
LFS 98 (AOA)*	1000	-2985.701	-46.18552	959.5631	-4868.691	-1102.710	(N)
					-4805.359	-1066.534	(P)
					-4775.124	-1041.238	(BC)
HLE 98(GHS)*	1000	397.7511	42.45571	803.6719	-1179.328	1974.830	(N)
					-1079.741	2084.469	(P)
					-1107.293	1992.434	(BC)
HLE 98(NUPC)*	1000	-481.7366	54.15994	1260.174	-2954.628	1991.155	(N)
					-2889.008	2165.066	(P)
					-3087.116	1887.421	(BC)
HLE 98(UD)*	1000	-191.4202	35.53489	4252.422	-8536.125	8153.285	(N)
					-8719.174	7261.719	(P)
					-9272.689	7110.528	(BC)
Age 98	1000	-304.8104	-14.73451	331.9968	-956.302	346.681	(N)
					-992.069	326.345	(P)
					-953.751	373.394	(BC)
Sex(Female)*	1000	-517.2297	-21.61107	618.9335	-1731.789	697.329	(N)
					-1807.349	675.159	(P)
					-1752.723	727.387	(BC)
Constant	1000	8621.119	248.3601	6291.191	-3724.345	20966.580	(N)
					-3641.752	21347.590	(P)
					-5086.867	20634.000	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 87: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) with Stress for the People between 20 and 49 Years of Age*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1632071	0.0000757	0.0086197	-0.180122	-0.146292	(N)
					-0.179588	-0.146422	(P)
					-0.179603	-0.146424	(BC)
CStress 97 (Subst. reduced)*	1000	2358.325	105.1909	1828.462	-1229.743000	5946.392000	(N)
					-1007.442000	6069.043000	(P)
					-1164.596000	5836.748000	(BC)
CStress 97 (Reduced)*	1000	-129.373	3.200598	176.4975	-475.721300	216.975300	(N)
					-462.744200	215.994200	(P)
					-459.479300	220.387800	(BC)
CStress 97 (Increased)*	1000	-222.6865	2.515913	175.268	-566.622200	121.249100	(N)
					-552.283900	119.473100	(P)
					-565.729300	110.548200	(BC)
CStress 97 (Subst. increased)*	1000	563.1731	-49.33578	1268.129	-1925.330000	3051.676000	(N)
					-1958.882000	2999.497000	(P)
					-1916.558000	3081.800000	(BC)
LFS 98(Unemployed)*	1000	-3681.477	-17.71834	417.7821	-4501.308000	-2861.646000	(N)
					-4538.404000	-2857.804000	(P)
					-4517.993000	-2845.262000	(BC)
LFS 98 (NLF)*	1000	-1726.026	-0.7583057	251.779	-2220.102000	-1231.949000	(N)
					-2231.785000	-1248.744000	(P)
					-2230.892000	-1252.626000	(BC)
LFS 98(EPY-UPY)*	1000	-1046.934	-17.37209	254.056	-1545.479000	-548.389900	(N)
					-1569.038000	-577.407900	(P)
					-1518.394000	-546.749600	(BC)
LFS 98 (EPY-NLFPY)*	1000	-1374.405	-25.6943	358.6365	-2078.172000	-670.637700	(N)
					-2108.613000	-682.363800	(P)
					-2090.945000	-657.865200	(BC)
LFS 98 (UPY-NLFPY)*	1000	-3463.809	-26.20347	627.477	-4695.133000	-2232.485000	(N)
					-4732.062000	-2265.447000	(P)
					-4642.657000	-2236.127000	(BC)
LFS 98 (AOA)*	1000	-1733.585	17.29434	411.7586	-2541.596000	-925.573700	(N)
					-2533.491000	-889.772000	(P)
					-2562.259000	-927.946500	(BC)
HLE 98(GHS)*	1000	371.7068	-0.1940119	214.3167	-48.855850	792.269400	(N)
					-36.437660	779.976400	(P)
					-39.312360	777.632500	(BC)
HLE 98(NUPC)*	1000	415.1223	8.522133	208.8942	5.200628	825.044000	(N)
					-27.930550	828.005600	(P)
					-52.128240	802.207700	(BC)
HLE 98(UD)*	1000	1212.365	-4.029741	259.6047	702.932300	1721.798000	(N)
					669.710900	1711.380000	(P)
					673.877700	1712.862000	(BC)
Age 98	1000	-7.63113	0.3582275	10.09858	-27.447990	12.185730	(N)
					-26.548230	13.510120	(P)
					-26.720410	12.979910	(BC)
Sex(Female)*	1000	259.4637	-1.386675	142.0178	-19.223760	538.151100	(N)
					-18.456460	561.604000	(P)
					-14.154060	564.963800	(BC)
Constant	1000	1826.916	-16.87668	459.899	924.437400	2729.395000	(N)
					878.390900	2654.143000	(P)
					891.694900	2663.057000	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 88: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) with Stress for the People between 50 and 59 Years of Age*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1390227	-0.0025006	0.0228866	-0.183934	-0.094111	(N)
					-0.186931	-0.098408	(P)
					-0.184913	-0.097690	(BC)
CStress 97 (Subst. reduced)*	1000	1322.976	-31.64569	1685.691	-1984.925	4630.877	(N)
					-1928.546	4842.902	(P)
					-1711.268	5350.644	(BC)
CStress 97 (Reduced)*	1000	364.3316	-4.597221	372.6166	-366.869	1095.533	(N)
					-404.676	1085.003	(P)
					-379.850	1103.578	(BC)
CStress 97 (Increased)*	1000	-785.4662	3.043113	433.2496	-1635.650	64.717	(N)
					-1619.027	63.795	(P)
					-1611.202	66.164	(BC)
CStress 97 (Subst. increased)*	1000	-1615.363	197.9491	3385.817	-8259.491	5028.765	(N)
					-8251.458	5094.129	(P)
					-8471.712	4748.320	(BC)
LFS 98(Unemployed)*	1000	-2248.685	0.7035189	872.8495	-3961.513	-535.856	(N)
					-3878.763	-524.777	(P)
					-3925.137	-553.496	(BC)
LFS 98 (NLF)*	1000	-2841.18	-16.66068	405.3969	-3636.707	-2045.653	(N)
					-3641.385	-2116.230	(P)
					-3620.568	-2080.755	(BC)
LFS 98(EPY-UPY)*	1000	-1582.972	9.873335	726.5854	-3008.780	-157.163	(N)
					-2967.957	-181.512	(P)
					-2964.711	-180.434	(BC)
LFS 98 (EPY-NLFPY)*	1000	-310.3412	-0.7303831	1031.111	-2333.733	1713.050	(N)
					-2347.432	1679.165	(P)
					-2409.481	1625.553	(BC)
LFS 98 (UPY-NLFPY)*	1000	-4154.709	7.630219	1485.521	-7069.809	-1239.610	(N)
					-7095.902	-1366.254	(P)
					-7248.389	-1477.676	(BC)
LFS 98 (AOA)*	1000	1309.803	-45.90249	1205.814	-1056.415	3676.022	(N)
					-1105.044	3620.505	(P)
					-1080.258	3685.520	(BC)
HLE 98(GHS)*	1000	537.9454	-11.06905	410.0689	-266.750	1342.641	(N)
					-328.658	1326.724	(P)
					-259.956	1372.887	(BC)
HLE 98(NUPC)*	1000	359.6082	-7.424488	383.8747	-393.685	1112.901	(N)
					-389.048	1145.795	(P)
					-372.497	1148.597	(BC)
HLE 98(UD)*	1000	-393.1782	-16.70166	614.8957	-1599.814	813.457	(N)
					-1674.935	761.971	(P)
					-1665.129	760.995	(BC)
Age 98	1000	79.22575	1.38527	56.33283	-31.319	189.770	(N)
					-28.187	192.181	(P)
					-29.144	189.005	(BC)
Sex(Female)*	1000	257.6027	1.70818	332.3066	-394.496	909.702	(N)
					-370.375	930.407	(P)
					-374.241	925.181	(BC)
Constant	1000	-4038.837	-64.01479	3154.975	-10229.970	2152.300	(N)
					-10323.430	1917.141	(P)
					-10205.740	1945.724	(BC)

N = normal, P = percentile, BC = bias-corrected

Table 89: *OLS Parameter Estimates and Bootstrap Parameter CI's of Model (6) with Stress for the People 60 and Over Years of Age*

Variables	Reps	Observed	Bias	Std. Err.	95% Conf.	Interval	Interval type
Change in Income 97	1000	-0.1199579	-0.0006842	0.0194359	-0.158098	-0.081818	(N)
					-0.158971	-0.081425	(P)
					-0.157153	-0.079670	(BC)
CStress 97 (Subst. reduced)*	1000	974.0878	-20.34289	1713.077	-2387.554	4335.729	(N)
					-2127.412	4640.552	(P)
					-2066.298	4709.903	(BC)
CStress 97 (Reduced)*	1000	-525.7607	-10.36224	288.5704	-1092.034	40.513	(N)
					-1104.543	23.980	(P)
					-1096.761	36.613	(BC)
CStress 97 (Increased)*	1000	-216.7766	-7.923616	317.0309	-838.899	405.346	(N)
					-821.527	390.349	(P)
					-822.874	381.297	(BC)
CStress 97 (Subst. increased)*	1000	-480.3437	32.17059	1478.685	-3382.029	2421.341	(N)
					-3517.613	2440.660	(P)
					-3634.980	2244.369	(BC)
LFS 98(Unemployed)*	1000	-1368.784	-45.04868	1127.183	-3580.703	843.135	(N)
					-3771.023	774.175	(P)
					-3690.599	854.812	(BC)
LFS 98 (NLF)*	1000	-573.6223	-29.17606	422.9973	-1403.687	256.443	(N)
					-1435.614	239.614	(P)
					-1403.135	275.799	(BC)
LFS 98(EPY-UPY)*	1000	509.4504	-51.66911	1104.804	-1658.552	2677.453	(N)
					-1571.842	2839.665	(P)
					-1467.351	2921.167	(BC)
LFS 98 (EPY-NLFPY)*	1000	-982.1015	-46.96082	985.0833	-2915.171	950.968	(N)
					-2965.717	833.971	(P)
					-2897.001	871.998	(BC)
LFS 98 (UPY-NLFPY)*	1000	-1934.215	28.81277	2066.753	-5989.889	2121.459	(N)
					-5712.913	2208.934	(P)
					-5583.095	2352.439	(BC)
LFS 98 (AOA)*	1000	-561.0274	-24.06745	1383.281	-3275.496	2153.441	(N)
					-3172.589	2339.869	(P)
					-3083.187	2437.088	(BC)
HLE 98(GHS)*	1000	298.0523	3.215104	343.3356	-375.689	971.794	(N)
					-392.470	983.487	(P)
					-418.924	960.145	(BC)
HLE 98(NUPC)*	1000	-332.167	-18.18585	328.0956	-976.003	311.669	(N)
					-958.265	310.811	(P)
					-908.892	365.455	(BC)
HLE 98(UD)*	1000	-220.4368	0.3705085	559.6251	-1318.612	877.739	(N)
					-1334.268	841.078	(P)
					-1358.089	813.956	(BC)
Age 98	1000	14.44918	0.0149341	57.1992	-97.795	126.694	(N)
					-100.438	125.040	(P)
					-101.183	123.796	(BC)
Sex(Female)*	1000	82.24911	2.028571	261.7612	-431.416	595.914	(N)
					-463.983	596.280	(P)
					-475.600	587.228	(BC)
Constant	1000	-66.15809	36.99401	3706.894	-7340.350	7208.034	(N)
					-7255.831	7165.172	(P)
					-7295.601	7129.949	(BC)

N = normal, P = percentile, BC = bias-corrected